

*105th Annual Research Report*

# Rice Research Station



**Crowley, Louisiana • 2013**



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## Cover Photos



Anthesis, flowering and pollen shed in rice. The pale yellow anthers contain pollen that is released from the ends of the anthers and carried by wind to the purple feathery stigmas, where it lands and completes the process of pollination.



An experimental pre-emergence herbicide is applied to Clearfield rice.



These outdoor tanks were used for crawfish trap efficiency studies.



Participants in the LSU AgCenter's Rice Research Station Field Day listen to a presentation at the rice agronomy stop during the field tour.



This promising hybrid combination is shown at the test cross nursery of the hybrid breeding program.



Breeding rows grown at the LSU AgCenter's winter nursery near Lajas, Puerto Rico.

# **105<sup>th</sup> Annual Research Report**

## **RICE RESEARCH STATION**

**Crowley, Louisiana**

**2 0 1 3**

**Louisiana State University Agricultural Center  
Louisiana Agricultural Experiment Station  
Louisiana Cooperative Extension Service  
Louisiana College of Agriculture**

**William B. Richardson, LSU Vice President for Agriculture**

**Southwest Region/Rice Research Station**

**Steve D. Linscombe, Regional Director/Resident Coordinator**

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# TABLE OF CONTENTS

	<u>Page</u>
<b>INTRODUCTION .....</b>	<b>1</b>
<b>MONTHLY RAINFALL DATA .....</b>	<b>2</b>
<b>RICE BREEDING .....</b>	<b>3-84</b>
Genetic Improvement of Rice for Louisiana Production .....	3-70
Introduction .....	3
Commercial-Advanced Trial .....	4-19
Clearfield Experimental Lines .....	20-23
Clearfield Preliminary Yield Trail .....	24-39
Preliminary Yield Trial .....	40-55
Cooperative Uniform Regional Rice Nursery .....	56-66
Date of Planting Studies .....	67-70
Development of Hybrid Rice and Sheath Blight-Resistant Germplasm for Louisiana .....	71-76
Marker-Assisted Breeding and Genetic Improvement of Southern U.S. Rice .....	77-80
Development of Herbicide Resistance in Rice ( <i>Oryza sativa</i> ) .....	81-84
<b>RICE AGRONOMY .....</b>	<b>85-286</b>
Introduction .....	85-87
Rice Fertility and Cultural Practice Research .....	88-261
Introduction .....	88-94
Rice Variety by Nitrogen Experiments at the Rice Research Station .....	95-100
Rice Variety by Nitrogen Experiments at Vermilion Parish .....	101-106
Rice Variety by Nitrogen Experiments at Franklin Parish .....	107-112
Rice Variety by Nitrogen Experiments at St. Landry Parish .....	113-118
Rice Variety by Nitrogen Experiments at Richland Parish .....	119-121
Nitrogen Use Efficiency Response to Variety or Hybrid Selection and Nitrogen	
Time of Application Ratoon Response to First Crop N Application Timing .....	122-126
Evaluation of N Source and Commercially Available N Enhancers, Urease,	
and Nitrification Inhibitors .....	127-131
Rice Hybrid Ratoon Crop Response to Post Harvest N Application Rate	
(Rice Research Station) .....	132-133
Rice Hybrid Ratoon Crop Response to Post Harvest N Application Rate (Vermilion Parish) ..	134-136
Rice Variety Ratoon Crop Response to Post Harvest N Application Rate	
(Rice Research Station) .....	137-138
Rice Variety Ratoon Crop Response to Post Harvest N Application Rate (Vermilion Parish) ..	139-141
Evaluation of Rice Response to Calcium Silicate Slag Fertilization	
Applied at Planting (Rice Research Station) .....	142-143
Evaluation of Rice Response to Calcium Silicate Slag Fertilization	
Applied at Planting (Franklin Parish) .....	144-145
Evaluation of Rice Response to Calcium Silicate Slag Fertilization	
Applied at Planting (Evangeline Parish – K. LaHaye) .....	146-147
Evaluation of Rice Response to Calcium Silicate Slag Fertilization	
Applied at Planting (Evangeline Parish – R. Fontenot) .....	148-150
Evaluation of Rice Response to Calcium Silicate Slag Fertilization	
Applied at Planting (Vermilion Parish) .....	151-152
Evaluation of Rice Response to Potassium Rate .....	153-157
Evaluation of Rice Response to Phosphorus Rate .....	158-162



	<u>Page</u>
<b>RICE AGRONOMY (Continued) .....</b>	<b>85-286</b>
Rice Fertility and Cultural Practice Research (Continued) .....	88-261
Evaluation of Zinc Rate .....	163-167
Evaluation of Potassium Timing on CL111 Main, Ratoon Rice Yield, and Agronomics .....	168-170
Evaluation of Phosphorus Timing on CL111 Main, Ratoon Rice Yield, and Agronomics .....	171-173
Evaluation of Rice Response to Pelletized Poultry Litter .....	174-177
Yield Benefit and Optimum Application Timing of HM0715 (Rice Research Station) .....	178-180
Yield Benefit and Optimum Application Timing of HM0715 (Vermilion Parish) .....	181-183
Evaluation of NZONE MAX-Treated Urea in Rice Production .....	184-186
Effect of Water Management on Rice Grain Yield, Milling Yield, and Grain Arsenic Concentration .....	187-189
Evaluation of Agrotain Volatilization Control When Used in Flooded, Moist, and Dry Soil Conditions (Rice Research Station – Early Planting) .....	190-193
Evaluation of Agrotain Volatilization Control When Used in Flooded, Moist, and Dry Soil Conditions (Rice Research Station – Late Planting) .....	194-197
Evaluation of Mosaic Experimental Fertilizers in Rice Production (Evangeline Parish – R. Fontenot) .....	198-202
Evaluation of Mosaic Experimental Fertilizers in Rice Production (Evangeline Parish – K. LaHaye) .....	203-206
Evaluation of Ammonia Volatilization Using Semi-Open Volatilization Chambers in a Drill-Seeded, Delayed Flood Rice Production System .....	207-209
Evaluation of Three N Fertilizer Sources on Rice Yield, Agronomics, and NUE .....	210-211
Volatilization Loss from Three N Sources Over a 15-Day Period after Surface Broadcast Application .....	212-213
Treatment Means for the Main Effects of N Source and N Rate on Rice Grain Yield, Agronomics, and NUE .....	214-217
Nitrogen Volatilization Loss at Each of the Five Sampling Times and Cumulative N Volatilization Loss from Six N Fertilizer Sources Using Semi-Open Volatilization Chambers in a Rice Production System .....	218-219
Evaluation of N Fertilizer Source and Time of Application on Rice Yield, Agronomics, and NUE .....	220-223
Volatilization Loss Over a 15-Day Period after Surface Broadcast Application .....	224-225
Evaluation of N Fertilizer Source, Rate, and Time of Application on Rice Yield, Agronomics, and NUE (R.R.S./Weyerhaeuser) .....	226-230
Evaluation of Volatilization from Urea, Agrotain-Urea, Urea-Ammonium Sulfate Blend (3:1), Amidis, and Ammonium Sulfate Using Semi-Open Field Volatilization Chambers in a Rice Production System .....	231-232
Evaluation of N Fertilizer Source, Rate, and Time of Application on Rice Yield, Agronomics, and NUE (Rice Research Station) .....	233-240
Determine the Agronomic Response of Drill-Seeded CLXL729 to N Fertilizer Rate and Time of Application Evaluate N-STaR Calibration with Small Plots .....	241-243
Determine the Agronomic Response of Drill-Seeded CL151 to N Fertilizer Rate and Time of Application Evaluate N-STaR Calibration with Small Plots .....	244-246
Evaluation of Stubble Management Practices and Desiccant Use 5d Pre-Harvest on CL111 and CLXL745 Ratoon Yield and Regrowth .....	247-249
Evaluation of Stubble Management Practices and Desiccant Use 16d Pre-Harvest on CL111 and CLXL745 Ratoon Yield and Regrowth .....	250-253

	<u>Page</u>
<b>RICE AGRONOMY (Continued) .....</b>	<b>85-286</b>
Rice Fertility and Cultural Practice Research (Continued).....	88-261
Ratoon Response to First Crop N Application Timing, Ratoon N Rate, and Ratoon N Timing (Rice Research Station) .....	254-257
Ratoon Response to First Crop N Application Timing, Ratoon N Rate, and Ratoon N Timing (Vermilion Parish) .....	258-261
Rotational Crops Research.....	262-286
Introduction.....	262-263
Evaluation of Tillage on Production Agronomics, Nutrient Uptake, and Soil Sustainability of Sweet Sorghum Production (Year 2 - 2013) .....	264-277
Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana (DOP1- DOP6).....	278-286
<b>FOUNDATION SEED RICE PROGRAM .....</b>	<b>287-288</b>
<b>AQUACULTURE RESEARCH.....</b>	<b>289-309</b>
Annual Summary of Environmental Conditions and Crawfish Production .....	289-291
Investigation of Potential Ingredients as Attractants for Crawfish in Cool Water .....	292-298
Preliminary Investigation of Proprietary Formulations as Potential Attractants for Crawfish in Cool and Warm Water .....	299-303
Efficiency of the Baited Trap in Harvesting Crawfish.....	304-306
Efficacy of the Short-Term Salt Water Bath in Purging Crawfish .....	307-309
<b>RICE DISEASE CONTROL RESEARCH.....</b>	<b>310-357</b>
Rice Disease Control Studies, 2013.....	310-337
Introduction.....	310
2013 DN 1 and DN 2 Trials.....	311
2013 DN 3 and DN 4 Trials.....	312
2013 DN 1 – DN 4 Tables .....	313-320
2013 AY, CLPY, and PY Trial .....	321
2013 Variety by Fungicide Trial .....	322-323
2013 Jefferson Davis Variety by Fungicide Trial .....	324-325
2013 Variety by Fungicide – Yield Loss Trial.....	326-327
2013 Sheath Blight Fungicide Trial (SB2-B).....	328-329
2013 Sheath Blight Fungicide Trial (SB3-B).....	330-331
2013 Blast Management Trial .....	332-333
2013 Blast 1 Trial.....	334-335
2013 Blast 2 Trial.....	336-337
Genetic Mapping and Breeding of Rice to Improve Rice Disease Resistance to Bacterial Panicle Blight and Sheath Blight .....	338-357
<b>RICE INSECTS RESEARCH.....</b>	<b>358-359</b>
Comparison of Malathion, Karate Z, and Fastac EC Against Rice Stink Bug.....	358-359
<b>RICE WEED MANAGEMENT .....</b>	<b>360-361</b>
Weed Management in Herbicide Resistant/Tolerant and Conventional Rice .....	360-361

	<u>Page</u>
<b>RICE PRODUCTION ECONOMICS RESEARCH IN 2013.....</b>	<b>362-365</b>
<b>LOUISIANA RICE RESEARCH VERIFICATION PROGRAM - 2013 .....</b>	<b>366-376</b>
<b>COASTAL PLANT PROJECT .....</b>	<b>377-379</b>
Evaluation of Herbicides and Their Applications in Smooth Cordgrass Seed Production Fields .....	377-379
<b>STATION PERSONNEL .....</b>	<b>380-381</b>
<b>LSU AGCENTER CAMPUS PERSONNEL .....</b>	<b>381</b>
<b>COOPERATING PERSONNEL.....</b>	<b>382-383</b>



## **INTRODUCTION**

Research at the Rice Research Station, Crowley, Louisiana, is conducted by scientists with the LSU AgCenter's Louisiana Agricultural Experiment Station. The 2013 rice research program included breeding/variety development, biotechnology, variety testing, fertilization, soil and water management, cultural practices, weed control, insect control, and disease investigations. Crops grown in rotation with rice were evaluated relative to increasing the efficiency of land use. The aquaculture research program places emphasis upon production practices, forages, and multi-cropping of crawfish with agronomic crops. Another important area of work is the production and distribution of foundation seed. The Rice Research Station also conducts research studies in improving species for coastal restoration. In addition, the statewide rice extension agronomist conducts numerous educational programs from the Rice Research Station. Although most research work was performed by members of the Rice Station faculty, several faculty members from the Baton Rouge campus conducted research at this station.

The research activities of this station include both fundamental and applied research, although the latter predominates because of the mission of the Rice Research Station. Research accomplishments and general progress of the Rice Station during 2013 are presented in this report representing the 105<sup>th</sup> Annual Research Report of the Rice Research Station, Louisiana Agricultural Experiment Station, and LSU Agricultural Center. It is significant that this research facility has been providing new technology to the Louisiana rice industry for more than 100 years.

In addition to research responsibilities of the Rice Research Station faculty and cooperators, a large number of farmers, extension personnel, and others were trained and otherwise contacted during 2013. Approximately 500 people attended the annual Rice Research Station field day to view plots and participate in discussions of research findings. Field days also were conducted in Evangeline, Jefferson Davis, Richland, and Vermilion parishes. In addition, the faculty participated in industry meetings, both on and off the station, and worked individually with farmers and others in solving immediate problems. Several thousand people received services from the Rice Research Station during 2013.

Projects at this station are conducted under the supervision of research scientists from the Rice Research Station and also by cooperating personnel from certain departments of the Louisiana Agricultural Experiment Station. Following the reports, station personnel and cooperators in 2013 are listed.

**MONTHLY RAINFALL DATA  
RICE RESEARCH STATION - CROWLEY, LA  
2013**

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	YEAR TOTAL
1				.42						.23	2.05		
2	1.94				.56					.06			
3	.06			3.25	.05	.03						.01	
4				.02					.31				
5		.22		.02				.99		.47			
6	1.73						.09		.10			.03	
7		1.10				1.35	.01				.15		
8													
9	1.38					.20						1.91	
10	9.35				2.15	.02						.18	
11	.50	.71	1.27	.31	2.23				.10				
12	.01	.74		.54			.08	.19					
13										.74			
14	1.15	.02		4.33									
15	.18			.04		.80		1.52				.88	
16	.80			.02			.17			.05			
17	.07						.16						
18						.17	.02				.05		
19		1.25		.12		.04				.61			
20			.10			.07			.08				
21			.12			.06		.28					
22		.10			.11		.09		2.79	.02		.12	
23					.05						.58		
24			.11	1.96					.02				
25		1.03		.11	.12	.07	.68				1.55		
26	.03	1.26						.28			.22		
27								.06					
28							.38			.05		.11	
29						.13				.04		.27	
30	.12			.04					.82				
31													
MONTH TOTAL	17.32	6.43	1.60	11.18	5.27	2.94	1.68	3.32	4.22	2.27	4.60	3.51	64.34
2012	9.39	7.31	5.65	3.35	4.41	6.51	10.55	10.28	4.99	1.74	1.71	7.60	73.49

# **RICE BREEDING**

## **GENETIC IMPROVEMENT OF RICE FOR LOUISIANA PRODUCTION**

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### **INTRODUCTION**

The primary objective of the Rice Breeding Project is the development of superior varieties for the Louisiana rice industry. The Breeding Project is developing improved genotypes of both long- and medium-grain types, which are both important in the state and region. A major area of emphasis is the development of Clearfield varieties of both long- and medium-grain types. The project is also placing major emphasis on the development of special purpose types. Work is also progressing on incorporating the Clearfield trait in the Jazzman and Jazzman-2 varieties.

In addition to the primary objective of varietal development, the Breeding Project also conducts other research that may have direct and/or indirect contributions for varietal development. Included here are studies on milling quality, mutation breeding, date of planting, and herbicide tolerance of new varieties and experimental lines.

The 2013 rice breeding nursery included more than 76,000 breeding rows, 170 F<sub>1</sub> transplant populations, and 235 space planted F<sub>2</sub> populations. About 149 new crosses were made. On- and off-station testing included more than 5,000 yield plots. Yield testing included the Cooperative Uniform Regional Rice Nursery, which contained 200 experimental lines and checks (50 Louisiana entries). The Commercial-Advanced test was conducted at the Rice Research Station and six off-station locations.

The Preliminary Yield testing program evaluated over 1,000 lines (mainly of F<sub>5</sub> and F<sub>6</sub> generations), most for the first time. In addition to yield testing, these lines were also evaluated for seedling vigor, milling characteristics, quality parameters, and numerous other agronomic characteristics.



## COMMERCIAL-ADVANCED TRIAL

The Commercial-Advanced Trial (CA) is a multi-location test conducted by the Rice Breeding Project in the major rice growing regions in Louisiana. The objective of this trial is to evaluate the adaptation and stability of commercial rice varieties and advanced experimental lines for a number of important agronomic and yield characteristics.

Test locations in 2013 included the Rice Research Station (RRS) at Crowley and six on-farm test sites in Jefferson Davis, Evangeline, Vermilion, Acadia, Richland, and St. Landry parishes. The test in Richland Parish was conducted in cooperation with the Rice Agronomy Project.

Sixty entries were tested in a randomized complete block design with three replications. Varieties and hybrids were seeded at 90 and 38 lb/A, respectively. Planting dates were: RRS, March 18; Acadia, March 19; Evangeline, March 22; Franklin, May 20; Jefferson Davis, March 7; Richland, May 21; and St. Landry, March 27. Harvest dates were: RRS, August 8; Acadia, August 13; Evangeline, August 9; Franklin, September 17; Jefferson Davis, August 7; Richland, September 16; and St. Landry, August 19. Results from these trials are shown in Tables 1-7.

Table 1. Entry number, pedigree, grain type, and source information for entries in the Commercial-Advanced Trial, 2013.

Entry	Pedigree	Grain Type <sup>†</sup>	Source <sup>‡</sup>
201	CL111	L	LAES
202	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWB/.../3/...	L	LAES
203	CCDR/JEFF//CFX-26/9702128	L	AAES
204	CL151	L	LAES
205	CL152	L	LAES
206	CL161	L	LAES
207	NEPTUNE//BNGL/CL161	M	LAES
208	NEPTUNE//BNGL/CL161	M	LAES
209	CL261	M	LAES
210	COCODRIE	L	LAES
211	CHENIERE	L	LAES
212	CATAHOULA	L	LAES
213	CYPRESS	L	LAES
214	MERMENTAU	L	LAES
215	WELLS	L	AAES
216	ROY J	L	AAES
217	ANTONIO	L	TAES
218	COLORADO	L	TAES
219	CPRS/KBNT//9502008-A	L	LAES
220	LGRU//KATY/STBN/3/LGRU	L	LAES
221	JZMN/08CLR004/JZMN	L(A)	AAES
222	JAZZMAN	L(A)	LAES
223	JAZZMAN-2	L(A)	LAES
224	DELLA-2	L	LAES
225	NEPTUNE	M	LAES
226	JUPITER	M	LAES

Continued.

Table 1. Continued.

Entry	Pedigree	Grain Type <sup>†</sup>	Source <sup>‡</sup>
227	CAFFEY	M	LAES
228	LAH10	M	LAES
229	LAH25	L	LAES
230	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	L	LAES
231	XL 723	L	RICE TEC
232	XL 753	L	RICE TEC
233	CLXL 729	L	RICE TEC
234	CLXL 745	L	RICE TEC
235	CCDR/AC919	L	LAES
236	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	L	LAES
237	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	L	LAES
238	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	L	LAES
239	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	L	LAES
240	CL131/TRNS	L	LAES
241	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	L	LAES
242	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	L	LAES
243	KATY/CPRS//NWBT/.../3/9502008/4/CLR9/5/KATY/CPRS//NWBT/...	L	LAES
244	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	L	LAES
245	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	L	LAES
246	DREW//CHENIERE/LMNT	L	LAES
247	9502008/3/MBLE//LMNT/200015/4/.../5/KATY/CPRS//NWBT/...	L	LAES
248	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	M	LAES
249	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	L	LAES
250	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	L	LAES
251	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	L	LAES
252	CL131/CHENIERE	L	LAES
253	NEPTUNE//BNGL/CL161	M	LAES
254	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008A/TACAURI//CFX-18	L	LAES
255	WELLS/CFX18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	L	LAES
256	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	M	LAES
257	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	M	LAES
258	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	M	LAES
259	DREW/CFX-18/3/CPRS/KBNT//CFX 18	L	LAES
260	CL131/TRNS	L	LAES

<sup>†</sup> L = Long grain, M = Medium grain, and (A) = Aromatic.

<sup>‡</sup> AAES - Rice Research and Extension Center, Arkansas Agricultural Experiment Station, Stuttgart, AR; LAES - Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Crowley, LA; TAES, USDA, Texas A&M Research and Education Center, Texas Agricultural Experiment Station, U.S. Department of Agriculture, Beaumont, TX.

Table 2. Grain and milling yields and agronomic performance of entries in the 2013 Commercial-Advanced Trial.  
Acadia Parish, LA.

ENT	SOURCE	PEDIGREE	VIG	HDT	HTE	YIELD	WHL	TOTL
234	CLXL 745	CLXL 745	5	92	45	11915	55.9	69.2
233	CLXL 729	CLXL 729	5	92	42	10910	55.2	71.0
231	XL 723	XL 723	5	92	42	10871	55.3	70.4
232	XL 753	XL 753	5	92	42	10854	57.4	71.9
204	CL151	CL151	4	90	39	10306	62.0	71.9
229	1302125	LAH25	6	102	50	9798	56.7	67.9
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	86	38	9704	54.2	70.6
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	89	40	9344	51.6	69.2
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	4	89	33	9281	60.6	70.9
254	CLPS 077	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	5	89	37	9205	54.3	69.9
228	1102071	LAH10	6	100	49	9147	61.3	68.3
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	4	92	39	9117	63.1	70.6
253	CLPY 341	NEPTUNE//BNGL/CL161	4	93	35	9042	55.1	69.3
206	CL161	CL161	4	93	39	8973	66.0	70.0
208	1202065	NEPTUNE//BNGL/CL161	5	92	37	8893	60.9	70.1
207	1202068	NEPTUNE//BNGL/CL161	5	92	36	8879	59.8	69.2
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	4	92	38	8790	62.4	71.4
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	4	91	39	8649	61.5	71.5
238	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	5	89	35	8618	63.0	71.4
209	CL261	CL261	4	90	37	8577	61.6	69.2
220	0801081	LGRU//KATY/STBN/3/LGRU	4	88	38	8517	54.3	70.1
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	4	88	40	8405	59.7	71.7
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	4	96	39	8405	63.1	71.3
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	4	91	35	8368	59.5	70.6
221	1202025	JZMN/08CLR004//JZMN	5	95	40	8264	60.2	69.6
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	5	89	34	8195	53.9	64.8
205	CL152	CL152	4	96	39	8179	63.3	70.7
226	JPTR	JUPITER	5	97	31	8178	59.3	66.5
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	4	91	39	8124	62.9	71.8
227	CCFY	CAFFEY	5	96	34	7878	60.0	68.0
201	CL111	CL111	4	88	36	7857	54.1	71.4
214	MRMT	MERMENTAU	4	87	36	7849	60.1	69.3
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	4	89	36	7811	60.4	71.7
203	1202165	CCDR/JEFF//CFX-26/9702128	5	90	37	7800	58.4	69.0
219	1102034	CPRS/KBNT//9502008-A	5	87	36	7788	61.9	72.4
247	1302180	9502008/3/MBLE/LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	4	90	39	7757	59.2	70.3
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	4	92	34	7732	56.4	70.1

Continued.



Table 2. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHL	TOTL
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	5	93	41	7709	61.4	71.0
246	1302137	DREW//CHENIERE/LMNT	4	99	36	7698	58.3	67.9
240	1302048	CL131/TRNS	5	86	35	7687	54.6	69.7
216	ROY J	ROY J	4	102	40	7612	50.6	68.3
235	1202131	CCDR/AC919	4	86	38	7544	64.5	71.8
212	CTHL	CATAHOULA	4	89	36	7448	54.9	70.4
215	WELLS	WELLS	4	100	38	7416	53.4	69.1
210	CCDR	COCODRIE	5	87	35	7409	59.6	69.8
211	CHNR	CHENIERE	5	93	35	7330	65.7	72.8
217	ANTO	ANTONIO	5	85	34	7288	59.2	70.1
225	NPTN	NEPTUNE	5	95	33	7196	57.5	67.3
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	95	37	7176	56.7	66.1
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	4	92	34	7175	58.5	69.1
213	CPRS	CYPRESS	5	92	35	7052	65.1	71.2
224	DLA2	DELLA-2	4	96	39	6937	62.4	69.4
252	CLPY 061	CL131/CHENIERE	4	91	34	6802	65.0	72.1
223	JZMN2	JAZZMAN-2	4	91	32	6601	66.9	71.6
257	PY 622	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5	91	32	6515	60.7	69.3
248	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	5	93	34	6455	58.4	69.4
218	CLRD	COLORADO	5	83	35	6275	52.5	68.2
260	11CLPS 165	CL131/TRNS	5	90	34	6040	63.8	71.0
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	4	89	35	5954	62.7	69.9
222	JZMN	JAZZMAN	4	102	39	5861	59.4	68.8
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	5	93	41	7709	61.4	71.0
246	1302137	DREW//CHENIERE/LMNT	4	99	36	7698	58.3	67.9

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and agronomic performance of entries in the 2013 Commercial-Advanced Trial.  
Evangeline Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
231	XL 723	XL 723	87	46	11959
233	CLXL 729	CLXL 729	85	44	11304
232	XL 753	XL 753	83	45	11104
234	CLXL 745	CLXL 745	83	43	11054
206	CL161	CL161	87	40	10161
228	1102071	LAH10	92	50	10144
204	CL151	CL151	85	40	10007
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	86	41	9837
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	85	36	9632
229	1302125	LAH25	95	51	9482
201	CL111	CL111	85	41	9344
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	85	38	9275
203	1202165	CCDR/JEFF//CFX-26/9702128	86	38	8979
207	1202068	NEPTUNE//BNGL/CL 161	90	37	8978
240	1302048	CL 131/TRNS	84	37	8928
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWB//.../3/...	90	38	8863
253	CLPY 341	NEPTUNE//BNGL/CL 161	90	38	8763
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	89	38	8716
238	1302042	9602097//.../JAF4//.../6/CCDR//.../7/JAF4/8/FRANCIS/CLR 13	87	38	8671
242	1302082	9502008-A/DREW/3/NWB//KATY//9902207x2/4/DREW/CLR 13	85	41	8653
220	0801081	LGRU//KATY/STBN/3/LGRU	88	40	8616
235	1202131	CCDR/AC919	86	41	8614
247	1302180	9502008/3/MBLE//LMNT/20001-5/4//.../5/KATY/CPRS//NWB//...	86	40	8587
214	MRMT	MERMENTAU	87	38	8562
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	90	40	8552
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	88	36	8498
205	CL152	CL152	92	41	8486
254	CLPS 077	9602097//.../JAF4//.../6/CCDR//.../7/JAF4/8/9502008-A/TACAURI//CFX-18	87	38	8436
208	1202065	NEPTUNE//BNGL/CL161	90	38	8416
219	1102034	CPRS/KBNT//9502008-A	89	39	8391
236	1302028	KATY/CPRS//NWB//.../3/9502008/4/CLR 9/5/KATY/CPRS//...	89	37	8315
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	90	40	8301
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	91	41	8194
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	89	39	8121
257	PY 622	NEPTUNE/4/BNGL/MERC/RICO/3/MERC/RICO//BNGL	93	36	8016
246	1302137	DREW//CHENIERE/LMNT	94	36	7914
243	1302088	KATY/CPRS//NWB//.../3/9502008/4/CLR 9/5/KATY/CPRS//NWB//...	87	40	7907

Continued.

Table 3. Continued.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
212	CTHL	CATAHOULA	91	40	7892
215	WELLS	WELLS	94	40	7826
209	CL261	CL261	85	37	7761
221	1202025	JZMN/08CLR004/JZMN	92	37	7650
218	CLRD	COLORADO	88	41	7598
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	88	38	7366
226	JPTR	JUPITER	92	34	7360
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	88	35	7337
252	CLPY 061	CL131/CHENIERE	88	36	7327
222	JZMN	JAZZMAN	97	37	7318
227	CFFY	CAFFEY	96	38	7274
216	ROY J	ROY J	97	38	6956
211	CHNR	CHENIERE	92	38	6872
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	87	37	6836
260	11CLPS 165	CL131/TRNS	88	35	6671
210	CCDR	COCODRIE	93	40	6513
225	NPTN	NEPTUNE	95	33	6467
224	DLLA2	DELLA-2	94	39	6077
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	92	38	5866
213	CPRS	CYPRESS	94	39	5821
248	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	92	33	5799
223	JZMN2	JAZZMAN-2	91	33	5474
217	ANTO	ANTONIO	93	37	4208



Table 4. Grain and agronomic performance of entries in the 2013 Commercial-Advanced Trial.  
Franklin Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
233	CLXL 729	CLXL 729	72	49	12860
232	XL 753	XL 753	70	49	12729
234	CLXL 745	CLXL 745	73	50	12696
231	XL 723	XL 723	74	47	12372
253	CLPY 341	NEPTUNE//BNGL/CL161	73	45	12277
207	1202068	NEPTUNE//BNGL/CL161	73	44	12245
227	CFFY	CAFFEY	72	44	12150
201	CL111	CL111	66	48	11689
225	NPTN	NEPTUNE	74	40	11504
257	PY 622	NEPTUNE/4/BNGL/MERC/RICO/3/MERC/RICO//BNGL	72	42	11495
248	1302189	BNGL/MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	68	43	11451
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	73	43	11382
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	72	46	11371
238	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	66	43	11348
220	0801081	LGRU//KATY/STBN/3/LGRU	70	48	11300
208	1202065	NEPTUNE//BNGL/CL161	73	47	11242
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	68	43	11222
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	70	46	11203
254	CLPS 077	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	70	44	11119
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	73	47	11107
216	ROY J	ROY J	74	47	11005
240	1302048	CL131/TRNS	68	42	11004
203	1202165	CCDR/JEFF//CFX-26/9702128	70	46	10989
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX-18	74	48	10898
247	1302180	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	73	45	10860
204	CL151	CL151	71	45	10842
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	69	48	10835
252	CLPY 061	CL131/CHENIERE	73	44	10779
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	74	45	10749
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	71	46	10748
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	74	47	10734
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	71	46	10722
260	11CLPS 165	CL131/TRNS	74	44	10685
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	74	46	10652
214	MRMT	MERMENTAU	71	45	10588
205	CL152	CL152	70	46	10565
212	CTHL	CATAHOULA	73	47	10536

Continued.

Table 4. Continued.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
226	JPTR	JUPITER	73	42	10524
217	ANTO	ANTONIO	71	47	10497
215	WELLS	WELLS	73	48	10469
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	74	49	10424
235	1202131	CCDR/AC919	66	47	10415
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	73	44	10392
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	71	42	10280
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	71	44	10133
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	69	47	9958
228	1102071	LAH10	73	49	9946
218	CLRD	COLORADO	68	50	9852
209	CL261	CL261	68	46	9739
210	CCDR	COCODRIE	74	32	9699
224	DLLA2	DELLA-2	76	48	9686
213	CPRS	CYPRESS	76	46	9617
206	CL161	CL161	76	43	9615
211	CHNR	CHENIERE	74	43	9424
229	1302125	LAH25	75	48	9405
246	1302137	DREW//CHENIERE/LMNT	75	43	9347
222	JZMN	JAZZMAN	73	47	9312
219	1102034	CPRS/KBNT//9502008-A	72	46	9028
221	1202025	JZMN/08CLR004//JZMN	72	48	6186
223	JZMN2	JAZZMAN-2	70	42	6098

Table 5. Grain and milling yields and agronomic performance of entries in the 2013 Commercial-Advanced Trial. Jefferson Davis Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD	RATOON	TOTAL YIELD
233	CLXL 729	CLXL 729	81	39	9929	4894	14824
234	CLXL 745	CLXL 745	81	39	8979	4904	13883
232	XL 753	XL 753	81	36	8601	4947	13548
231	XL 723	XL 723	84	41	8879	3778	12656
220	0801081	LGRU//KATY/STBN/3/LGRU	82	37	8697	2722	11419
253	CLPY 341	NEPTUNE//BNGL/CL161	87	33	6936	3877	10813
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	82	33	7394	2959	10353
229	1302125	LAH25	93	44	7160	3018	10178
209	CL261	CL261	81	33	6924	3168	10092
215	WELLS	WELLS	90	37	6634	3354	9988
206	CL161	CL161	88	36	7874	1964	9838
207	1202068	NEPTUNE//BNGL/CL161	85	34	6835	2904	9739
246	1302137	DREW//CHENIERE/LMNT	87	31	6672	3062	9734
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	81	35	7086	2579	9665
208	1202065	NEPTUNE//BNGL/CL161	85	31	6483	3181	9664
204	CL151	CL151	84	33	7502	2102	9604
254	CLPS 077	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI/CFX-18	84	31	6873	2672	9545
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	84	32	7274	2172	9447
214	MRMT	MERMENTAU	87	33	6934	2394	9328
221	1202025	JZMN/08CLR004//JZMN	86	36	7083	1963	9047
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	83	33	6574	2399	8973
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	86	30	6441	2474	8916
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	80	33	6664	2160	8823
227	CFFY	CAFFEY	92	32	5652	3111	8763
228	1102071	LAH10	92	43	5850	2889	8739
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	87	33	6543	2138	8681
212	CTHL	CATAHOULA	87	33	6271	2289	8560
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	83	33	6328	2196	8524
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	80	34	6050	2453	8503
226	JPTR	JUPITER	88	32	5879	2592	8471
216	ROY J	ROY J	91	37	5622	2815	8437
205	CL152	CL152	84	33	6316	2044	8360
219	1102034	CPRS/KBNT//9502008-A	86	32	5761	2439	8200
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	85	30	6153	1955	8108
225	NPTN	NEPTUNE	91	31	4558	3389	7947
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	85	32	6231	1676	7906
247	1302180	9502008/3/MBLE/LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	85	33	6015	1875	7890

Continued.

Table 5. Continued.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD	RATOON	TOTAL YIELD
201	CL111	CL111	81	35	6150	1724	7874
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	83	30	5107	2446	7553
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	87	34	5488	2016	7505
240	1302048	CL131/TRNS	80	31	5393	2095	7488
238	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	80	30	5632	1640	7272
218	CLRD	COLORADO	84	34	4645	2622	7267
248	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	85	32	5602	1640	7243
222	JZMN	JAZZMAN	91	34	5457	1624	7081
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	84	32	4720	2294	7014
224	DLLA2	DELLA-2	92	33	4537	2475	7011
203	1202165	CCDR/JEFF//CFX-26/9702128	84	32	5466	1507	6972
252	CLPY 061	CL 131/CHENIERE	85	29	5044	1508	6552
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	86	35	4203	1984	6187
217	ANTO	ANTONIO	86	33	4539	1568	6106
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	86	31	4243	1844	6087
260	11CLPS 165	CL131/TRNS	85	30	4386	1568	5954
213	CPRS	CYPRESS	94	33	4673	1116	5789
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	87	36	4170	1570	5739
235	1202131	CCDR/AC919	85	35	4586	1150	5736
257	PY 622	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	88	32	3985	1576	5561
223	JZMN2	JAZZMAN-2	90	28	3319	1675	4993
210	CCDR	COCODRIE	91	34	3602	1223	4825
211	CHNR	CHENIERE	91	33	4076	0	4076

Table 6. Grain and milling yields and agronomic performance of entries in the 2013 Commercial-Advanced Trial.  
Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	4	92	38	9780	60.5	69.6
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	90	40	9758	55.2	67.1
232	XL 753	XL 753	5	88	43	9638	58.3	69.3
252	CLPY 061	CL131/CHENIERE	5	91	35	9482	60.4	69.8
226	JPTR	JUPITER	5	92	36	9440	56.4	63.2
221	1202025	JZMN/08CLR004//JZMN	5	95	43	9395	57.7	68.3
253	CLPY 341	NEPTUNE//BNGL/CL161	5	93	39	9322	62.1	68.2
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	5	92	37	9297	58.0	67.9
238	1302042	9602097/...//JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	6	91	37	9229	59.2	68.0
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	88	40	9213	56.9	68.3
201	CL111	CL111	4	88	40	9165	56.9	68.0
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	6	90	37	9135	56.6	66.8
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	5	92	37	9022	61.1	69.8
207	1202068	NEPTUNE//BNGL/CL 161	6	90	37	9003	62.0	70.0
212	C'THL	CATAHOULA	5	88	37	8992	52.9	70.4
231	XL 723	XL 723	5	89	42	8946	57.5	69.9
220	0801081	LGRU//KATY/STBN/3/LGRU	4	87	39	8914	57.6	69.6
240	1302048	CL131/TRNS	5	85	40	8901	55.2	64.9
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	5	91	36	8861	58.4	68.5
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	5	92	40	8841	61.2	70.6
254	CLPS 077	9602097/...//JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	5	91	38	8757	54.3	67.4
215	WELLS	WELLS	4	92	40	8648	53.3	67.9
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	5	93	38	8574	61.6	70.1
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	4	90	36	8501	54.5	67.4
260	11CLPS 165	CL131/TRNS	5	92	36	8490	61.9	70.3

Continued.

Table 6. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
208	1202065	NEPTUNE//BNGL/CL161	6	91	37	8481	60.7	69.8
204	CL151	CL151	4	89	38	8479	58.7	69.8
205	CL152	CL152	4	92	37	8461	63.0	71.0
222	JZMN	JAZZMAN	5	98	42	8419	57.8	67.1
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	5	89	40	8397	58.3	67.8
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	7	92	38	8396	57.9	64.8
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	89	38	8366	59.4	70.8
203	1202165	CCDR/JEFF//CFX-26/9702128	5	90	38	8337	57.6	68.4
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	5	90	39	8335	60.2	70.0
209	CL261	CL261	4	88	39	8247	64.2	68.6
224	DLLA 2	DELLA-2	4	93	38	8238	52.2	63.4
216	ROY J	ROY J	4	95	40	8169	54.6	69.1
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	5	93	40	8165	63.0	71.9
246	1302137	DREW//CHENIERE/LMNT	5	95	38	8123	62.0	70.1
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	4	91	39	7964	59.8	68.8
214	MRMT	MERMENTAU	4	87	37	7957	62.3	70.7
219	1102034	CPRS/KBNT//9502008-A	5	87	35	7942	62.2	70.3
227	CFFY	CAFFEY	5	92	36	7934	57.4	64.5
225	NPTN	NEPTUNE	5	96	34	7792	56.0	63.5
211	CHNR	CHENIERE	5	91	35	7767	61.8	71.2
228	1102071	LAH10	7	97	48	7732	60.6	67.4
213	CPRS	CYPRESS	5	91	36	7663	59.7	68.3
248	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	6	90	34	7657	62.1	67.3
206	CL161	CL161	4	92	39	7626	61.1	70.3
257	PY 622	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5	89	34	7470	60.3	67.3

Continued.

Table 6. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
229	1302125	LAH25	7	102	50	7449	54.0	64.6
218	CLRD	COLORADO	5	85	37	7406	55.3	68.1
234	CLXL 745	CLXL 745	5	88	43	7404	58.6	69.3
233	CLXL 729	CLXL 729	5	88	43	7208	57.1	69.0
210	CCDR	COCODRIE	5	91	36	7105	56.4	67.7
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	6	88	37	6807	58.4	63.5
235	1202131	CCDR/AC919	5	89	36	6788	61.4	70.5
223	JZMN2	JAZZMAN-2	4	91	32	6534	61.3	68.9
247	1302180	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	5	90	41	6305	57.8	69.5
217	ANTO	ANTONIO	6	92	34	5580	56.1	68.7

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 7. Grain and milling yields and agronomic performance of entries in the 2013 Commercial-Advanced Trial. Richland Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	71	40	8624
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	72	40	8618
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	72	37	8551
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	71	38	8497
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	69	38	8470
252	CLPY 061	CL131/CHENIERE	74	36	8419
205	CL152	CL152	71	37	8385
204	CL151	CL151	71	37	8372
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	69	37	8286
208	1202065	NEPTUNE//BNGL/CL161	74	37	8274
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	73	35	8253
233	CLXL 729	CLXL 729	70	36	8211
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	71	38	8208
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	71	39	8185
238	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	72	38	8171
209	CL261	CL261	73	38	8169
260	11CLPS 165	CL 131/TRNS	74	37	8168
201	CL111	CL111	70	38	8116
207	1202068	NEPTUNE//BNGL/CL161	71	38	8112
254	CLPS 077	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	74	37	8109
253	CLPY 341	NEPTUNE//BNGL/CL161	73	39	7983
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	72	38	7968
247	1302180	9502008/3/MBLE/LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	69	39	7964
221	1202025	JZMN/08CLR004//JZMN	71	37	7906
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	71	38	7886
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	71	35	7856
203	1202165	CCDR/JEFF//CFX-26/9702128	71	37	7729
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	72	37	7666
240	1302048	CL131/TRNS	71	36	7517
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	71	35	7206
206	CL161	CL161	71	38	7084
234	CLXL 745	CLXL 745	72	35	7076
235	1302008	TRNS/CL131	73	36	6864
242	1302082	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	71	40	8624
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	72	40	8618
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	72	37	8551
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	71	38	8497

Table 8. Grain and milling yields and agronomic performance of entries in the 2013 Commercial-Advanced Trial. St. Landry Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
229	1302125	LAH25	105	50	9904
233	CLXL 729	CLXL 729	95	42	9483
232	XL 753	XL 753	96	41	8886
231	XL 723	XL 723	98	46	8590
228	1102071	LAH10	102	48	8559
230	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	96	37	8382
204	CL151	CL151	95	36	8322
239	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	97	39	8317
234	CLXL 745	CLXL 745	96	42	8310
221	1202025	JZMN/08CLR004//JZMN	95	39	8135
206	CL161	CL161	100	39	8015
222	JZMN	JAZZMAN	99	39	7911
205	CL152	CL152	97	38	7828
258	PY 616	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	98	37	7724
259	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX 18	96	37	7631
240	1302048	CL131/TRNS	94	35	7571
226	JPTR	JUPITER	101	38	7420
257	PY 622	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	96	33	7386
254	CLPS 077	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	96	33	7383
253	CLPY 341	NEPTUNE//BNGL/CL161	100	35	7350
217	ANTO	ANTONIO	94	35	7329
203	1202165	CCDR/JEFF//CFX-26/9702128	94	37	7302
214	MRMT	MERMENTAU	100	35	7185
244	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	99	38	7182
245	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	98	38	7128
260	11CLPS 165	CL131/TRNS	98	32	7093
256	PY 607	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	93	35	7032
248	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	97	37	6974
236	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	96	35	6923
238	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	98	32	6919
243	1302088	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	95	38	6890
225	NPTN	NEPTUNE	103	31	6850
201	CL111	CL111	93	39	6802
237	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	96	36	6785
247	1302180	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	97	38	6733
251	CLPY 074	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	97	33	6726
252	CLPY 061	CL131/CHENIERE	99	32	6724

Continued.

Table 8. Continued.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD
207	1202068	NEPTUNE//BNGL/CL161	102	34	6692
241	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	94	36	6687
210	CCDR	COCODRIE	99	36	6652
208	1202065	NEPTUNE//BNGL/CL161	100	35	6633
246	1302137	DREW//CHENIERE/LMNT	102	35	6594
211	CHNR	CHENIERE	100	35	6531
249	CLPY 020	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	100	34	6404
218	CLRD	COLORADO	94	37	6323
216	ROY J	ROY J	105	43	6264
220	0801081	LGRU//KATY/STBN/3/LGRU	100	36	6217
212	CTHL	CATAHOULA	98	36	6212
202	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWB//.../3/...	97	35	6185
250	CLPY 021	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	99	38	6118
235	1202131	CCDR/AC919	99	40	5943
215	WELLS	WELLS	103	38	5940
242	1302082	9502008-A/DREW/3/NWB//KATY//9902207x2/4/DREW/CLR 13	95	38	5880
223	JZMN2	JAZZMAN-2	101	34	5774
209	CL261	CL261	94	35	5704
213	CPRS	CYPRESS	101	35	5663
255	CLPS 152	WELLS/CFX-18/5/KATY/CPRS//NWB//.../3/9502008/4/CLR 9	99	32	5583
219	1102034	CPRS/KBNT//9502008-A	98	34	5456
227	CFFY	CAFFEY	99	33	5387
224	DLLA2	DELLA-2	102	39	5123

## CLEARFIELD EXPERIMENTAL LINES

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### Clearfield Multi-Location Trial

The Clearfield Multi-Location Trial is conducted by the Rice Breeding Project in the major rice growing regions in Louisiana. The objective of this trial is to evaluate the adaptation and stability of advanced experimental Clearfield lines for a number of important agronomic and yield characteristics.

Test locations in 2013 included the Rice Research Station (RRS) at Crowley and three on-farm test sites in Evangeline, Vermilion, and Richland parishes. The test in Richland Parish was conducted in cooperation with the Rice Agronomy Project.

Nineteen entries were tested in a randomized complete block design with three replications. Varieties were seeded at 90 lb/A. Planting dates were: RRS, March 18; Evangeline, March 22; Vermilion, March 19; and Richland, May 21. Harvest dates were: RRS, August 8; Evangeline, August 8; Vermilion, August 16; and Richland, September 16. Results from these trials are shown in Tables 1-5.

Table 1. Grain and agronomic performance of entries in the 2013 Clearfield Multi-Location Trial, Evangeline Parish, LA.

ENT	PEDIGREE	HDT	HTE	YIELD
016	CL151	87	39	10613
014	NEPTUNE//BNGL/CL161	92	40	10212
005	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	88	42	10212
004	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	83	40	10180
018	CL111	85	40	10118
009	9502008/3/MBLE/LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	85	42	10069
006	NEPTUNE//BNGL/CL161	88	39	10028
008	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	87	40	10021
001	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	89	39	9969
017	CL152	92	41	9612
013	CL131/CHENIERE	89	38	9524
010	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	87	40	9509
002	CCDR/JEFF//CFX-26/9702128	88	39	9445
012	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	87	39	9363
003	JZMN/08CLR004//JZMN	91	40	9336
007	NEPTUNE//BNGL/CL161	90	40	9264
011	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	90	41	9239
015	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	87	38	9195
019	CL261	86	39	8929

Table 2. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Multi-Location Trial. Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
005	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	89	42	9685	55.3	67.2
014	NEPTUNE//BNGL/CL161	5	92	38	9549	61.1	68.4
008	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	5	94	39	9464	61.0	71.0
007	NEPTUNE//BNGL/CL161	6	91	38	9302	63.3	68.4
001	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT//.../3/...	4	88	39	9302	57.7	68.0
002	CCDR/JEFF//CFX-26/9702128	7	91	37	9269	57.4	67.5
006	NEPTUNE//BNGL/CL161	4	90	37	9229	62.1	69.3
012	KATY/CPRS//NWBT//.../3/9502008/4/CLR 9/5/KATY/CPRS//...	4	92	37	9198	55.9	66.8
016	CL151	4	90	40	9093	58.7	69.8
004	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	88	40	9081	55.7	68.3
015	9602097//.../JAF4//.../6/CCDR//.../7/JAF4/8/9502008-A/TACAURI//CFX-18	5	90	37	8982	53.6	67.8
003	JZMN/08CLR004//JZMN	5	93	41	8878	57.2	69.2
019	CL261	4	89	39	8683	63.4	68.6
010	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	4	94	40	8608	59.6	69.2
013	CL131/CHENIERE	5	89	35	8576	60.1	69.3
017	CL152	4	94	38	8404	60.4	70.1
018	CL111	4	89	40	8078	57.4	69.4
011	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	5	92	39	7968	58.5	68.1
009	9502008/3/MBLE/LMNT/20001-5/4//.../5/KATY/CPRS//NWBT//...	4	91	40	7485	55.3	67.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Multi-Location Trial. Richland Parish, LA.

ENT	PEDIGREE	HDT	HTE	YIELD
009	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	69	40	9538
011	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	70	40	9289
005	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	70	39	9288
018	CL111	69	38	9208
014	NEPTUNE//BNGL/CL161	70	38	9159
006	NEPTUNE//BNGL/CL161	74	40	9139
015	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	70	39	9138
003	JZMN/08CLR004//JZMN	69	40	9132
017	CL152	71	40	9028
007	NEPTUNE//BNGL/CL161	71	40	8957
008	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	72	39	8796
016	CL151	70	39	8757
012	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	69	29	8680
019	CL261	70	39	8674
010	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	74	40	8662
013	CL131/CHENIERE	70	42	8658
001	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	69	44	8637
004	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	71	39	8621
002	CCDR/JEFF//CFX-26/9702128	70	39	8539

Table 4. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Multi-Location Trial. Vermilion Parish, LA.

ENT	PEDIGREE	HDT	HTE	YIELD
016	CL151	95	41	9506
014	NEPTUNE//BNGL/CL161	103	39	8854
001	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	97	40	8775
015	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	99	39	8636
005	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	98	43	8599
006	NEPTUNE//BNGL/CL161	100	39	8491
019	CL261	95	40	8467
010	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	102	42	8438
018	CL111	94	43	8405
004	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	96	41	8355
011	9502008-A/DREW//CFX 26/WELLS/4/CPRS/3/CFX 29//AR 1142/LA 2031	100	41	8312
017	CL152	102	41	8193
007	NEPTUNE//BNGL/CL161	103	38	8178
012	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	98	38	8176
009	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	97	42	7855
013	CL131/CHENIERE	99	37	7466
008	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	103	42	7369
002	CCDR/JEFF//CFX-26/9702128	98	39	7322
003	JZMN/08CLR004//JZMN	105	40	5508



### **CLEARFIELD PRELIMINARY YIELD TRIAL**

The Clearfield Preliminary Yield Trials consist primarily of promising breeding nursery material that is ready to be tested in replicated yield trials. The material in these trials was screened for agronomic and grain characteristics in nurseries prior to this phase of testing. Promising experimental lines were evaluated for seedling vigor, maturity, plant height, lodging resistance, grain yield of main crop, and disease resistance.

Tests were conducted using standard agronomic practices (except that no fungicides were applied) at the Rice Research Station at Crowley, LA. A randomized complete block design was applied to arrange test entries. The plot size was 4.66 x 16 ft. Seeding rate was 90 lb/A. This test was drill-seeded on March 8 and harvested on August 8. Data are presented in Tables 1 to 15.

Table 1. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 1, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
025	CL151	5	96	36	9223	59.9	68.6
004	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	6	92	35	9083	62.5	71.7
008	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	5	95	36	8935	63.4	72.3
002	MILL//9502008/LGRU/3/CCDR/CFX-18	5	89	36	8816	64.5	72.6
020	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	89	35	8714	64.4	72.9
016	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	94	35	8455	66.4	74.0
001	MILL//9502008/LGRU/3/CCDR/CFX-18	6	91	38	8434	62.9	72.5
005	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	5	96	36	8331	65.3	73.0
010	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	5	94	35	8271	64.2	73.2
021	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	98	34	8264	60.7	70.9
017	CCDR/CFX-18/3/9502008-A/DREW//CLR 20	6	99	35	8250	60.8	71.9
012	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	95	37	8230	64.3	73.3
018	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	94	35	8041	60.1	70.8
022	9502008-A/TACAURI//CLR 5/3/TACAURI	6	98	34	7934	61.0	69.2
003	MILL//9502008/LGRU/3/CCDR/CFX-18	5	93	36	7846	62.6	73.3
014	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	6	97	36	7795	64.3	72.7
007	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	6	96	36	7735	64.2	72.7
015	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	6	98	37	7715	62.5	72.3
024	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	101	34	7703	65.7	72.8
006	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	6	98	34	7506	64.3	71.9
011	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	95	37	7345	66.0	73.7
009	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	5	99	36	7337	64.4	72.4
013	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	95	36	7329	64.5	72.9
019	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	93	35	7323	58.7	71.6
023	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	98	34	7057	61.7	71.1

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trail, Group 2, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
050	CL111	5	93	37	10090	57.2	70.8
036	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	5	92	38	9131	57.8	69.8
035	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	5	94	35	8941	58.1	69.5
026	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	5	100	37	8724	66.4	73.8
032	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	99	39	8667	56.8	69.5
029	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	5	98	37	8565	58.1	69.4
028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	5	98	37	8442	57.3	68.4
031	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	98	35	8198	55.9	69.4
030	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	93	37	8091	58.4	71.0
034	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	96	36	8048	59.1	70.0
037	9502008-A/DREW//CFX 29/CCDR/3/CFX-26/9702128	6	101	39	7934	60.2	71.4
040	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	98	37	7709	57.7	69.6
047	MILL//9502008/LGRU/3/CCDR/CFX-18	6	93	33	7292	59.1	71.5
027	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	99	34	7223	64.8	73.3
039	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	100	36	7041	58.9	69.8
044	96INT/ARNT/3/9502008-A/DREW//CLR 20	6	99	36	7001	65.4	71.9
033	9502008-A/DREW//CLR 20/3/CRX-26/9702128	6	95	34	6906	62.1	72.1
046	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/...	7			6732		
041	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	98	37	6683	61.2	71.2
038	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	96	35	6543	56.7	69.1
049	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	7	98	37	6368	58.6	69.9
042	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	7	97	38	6362	60.1	70.4
043	96INT/ARNT/3/9502008-A/DREW//CLR 20	6			6313		
048	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	7	100	34	6119	56.8	69.6
045	9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA/4/DREW/JEFF/CFX-18	6	99	35	6102	65.9	72.7

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 3, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
052	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	95	41	9228	49.0	68.0
062	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/9502008-A/DREW//CLR 20	6	99	36	8272	64.4	72.5
065	9502008-A/DREW//CLR 2/3/CHENIERE	6	96	36	7247	58.2	71.0
059	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	6	96	36	7067	59.9	71.4
072	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	5	100	35	6995	60.8	72.7
061	CL 131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	95	34	6902	58.2	70.7
051	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	6	98	37	6650	57.0	69.2
067	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	6	104	35	6535	60.0	70.5
063	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	6	98	37	6510	59.6	70.0
069	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	6	100	34	6311	61.5	71.7
054	CCDR/3/9502008-A/DREW//CLR 20	6	100	37	6275	61.4	71.9
064	9502008-A/DREW//CLR 2/3/CHENIERE	6	92	32	6258	61.2	70.7
073	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	5	101	34	6184	60.7	71.1
074	CPRS/KBNT//WELLS CFX 18/3/CPRS	6	99	35	6114	59.5	67.9
055	9502008-A/DREW//CLR 2/3/CHENIERE	6	96	39	6100	62.3	71.5
058	CCDR/CFX 18//TAGGART	6	101	37	5957	58.1	69.9
060	FRANCIS/CLR 13/3/CCDR//CFX 26/WELLS	6			5861		
075	CL152	6	102	36	5839	60.1	71.2
066	9502008-A/DREW//CLR 2/3/CHENIERE	6	97	37	5792	63.0	72.8
053	9502008-A/DREW//CLR 20/5/9502008/3/CPRS//...	6			5108		
057	LGRU/CLR 11/4/9302065/3/CFX-29/AR 1142/LA 2031	6	102	31	4155	59.0	71.3
070	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			3233		
071	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			3108		
068	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	7	103	32	3014	59.3	69.8
056	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			2440		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 4, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
095	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	5	93	37	8621	59.8	70.8
094	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	93	37	7884	54.8	70.2
086	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	96	40	7692	58.9	70.9
100	CL131	5	92	35	7529	63.8	72.4
096	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	6	96	38	7135	61.9	71.4
085	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	6	92	37	6812	57.3	69.6
098	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	5	92	37	6640	61.8	71.7
079	CL131/3/CPRS/KBNT//9502008-A	7	99	35	6537	59.8	70.4
099	TAGGART/5/KATY/CPRS//NWB/.../3/9502008/4/CLR 6	6			6325		
078	CL131/3/CPRS/KBNT//9502008-A	6	99	35	6284	60.4	70.9
076	CL131/3/CPRS/KBNT//9502008-A	6	100	40	6276	61.6	71.7
090	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	100	36	6185	62.8	72.3
080	9302065//DREW CLR 13/3/DREW/CLR 13	6	99	35	6151	63.3	72.0
084	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	6			5896		
083	9302065//DREW CLR 13/3/DREW/CLR 13	7			5586		
077	CL131/3/CPRS/KBNT//9502008-A	7			5383		
097	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	6	93	34	5287	58.9	71.6
087	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	7			5110		
092	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	100	37	4783	62.6	71.1
082	9302065//DREW CLR 13/3/DREW/CLR 13	8			4323		
081	9302065//DREW CLR 13/3/DREW/CLR 13	7	100	34	4229	62.5	71.7
093	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7			3855		
091	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7			3793		
088	9502008-A/DREW/3/NWB/KATY//9902207x2/4/DREW/CLR 13	8			3696		
089	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7			3502		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 5, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
117	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	5	98	42	9036	57.8	68.6
101	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	6	91	35	8760	60.0	69.3
123	DREW/CFX-18/3/9502008-A/DREW//CFX 26/WELLS	5	93	37	8543	63.6	72.0
111	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	5	97	43	8345	58.9	69.5
109	CPRS/KBNT//CFX 29/CCDR/4/9502008-A//AR1188/CCDR/3/...	5	99	37	8322	59.3	69.3
116	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	6	96	39	8227	60.2	68.9
106	9502008-A/DREW//CLR 20/3/CL111	6	95	35	8076	58.6	70.6
121	KATY/CPRS//NWB//.../3/9502008/4/CLR 9/5/CL161	5	99	38	8027	63.6	72.0
124	DREW/CFX-18/3/CFX-18//CCDR/9770532 DH2	5	101	40	7940	60.4	71.3
115	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	5	98	41	7857	62.1	71.8
118	9502008-A/TACAURI//CLR 5/3/LGRU/WELLS	6	101	37	7614	62.3	71.4
112	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	5	102	39	7549	58.6	70.7
114	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	6	100	40	7191	58.5	69.2
102	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	7	91	39	7155	58.1	69.7
120	9502008-A/TACAURI//CLR 5/3/LGRU/WELLS	6	101	35	6891	62.6	71.7
119	9502008-A/TACAURI//CLR 5/3/LGRU/WELLS	6	98	35	6815	63.5	71.8
103	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	6	93	36	6424	56.5	71.0
125	CL161	6	100	36	6380	61.7	71.2
113	CPRS/KBNT//CFX 29/CCDR/3/06CFP952	6	99	39	6315	56.7	69.3
105	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	7	92	35	6239	60.3	72.4
108	CPRS/KBNT//CFX 29/CCDR/4/9502008-A//AR1188/CCDR/3/...	7	99	37	6236	59.1	67.8
104	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	6	99	32	6111	61.0	71.7
110	CPRS/KBNT//CFX 29/CCDR/4/9502008-A//AR1188/CCDR/3/...	6	98	36	6028	58.1	68.3
122	DREW/CFX-18//CCDR	6	102	37	5263	62.7	73.2
107	9502008-A//AR1188/CCDR/3/.../4/CPRS/9502008-A/3/CFX 29//AR 1142/LA 2031	6	100	37	5241	60.0	70.7

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 6. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 6, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
150	URN 065	4	93	34	9370	63.3	68.4
149	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/CFX-18//CCDR/9770532 DH2	5	93	40	8977	58.8	69.8
139	CL131/3/CPRS/KBNT//9502008-A	5	94	35	8738	58.4	70.3
140	CL131/3/CPRS/KBNT//9502008-A	5	93	38	8681	58.2	68.7
138	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/9502008-A/TACAURI//CFX-18	5	96	36	8620	59.5	70.6
142	CL131/3/CPRS/KBNT//9502008-A	5	94	33	8613	62.0	71.6
148	CPRS/KBNT//9502008-A /3/CCDR/CFX-18	6	95	37	8549	61.2	72.8
146	CL131/CHENIERE	5	95	33	8463	63.9	72.7
137	MBLE/ALAN/4/L201//.../5/MBLE/.../4/CCDR/.../6/CFX-18//CCDR/9770532 DH2	5	96	41	8411	60.5	71.0
147	CL131/CHENIERE	5	95	34	8385	65.0	72.8
145	CL131/CHENIERE	5	97	33	8293	61.4	72.3
144	CL131/3/CPRS/KBNT//9502008-A	5	95	36	8237	61.3	71.5
136	CCDR/3/CFX 29/AR 1142/LA 2031/4/CFX-18//CCDR/9770532 DH2	5	95	37	8180	65.0	72.8
127	DREW/CFX-18/3/9502008-A/TACAURI//CFX-18	6	96	39	8144	59.8	70.8
126	DREW/CFX-18/3/9502008-A/TACAURI//CLR 5	5	98	39	8137	64.0	72.5
141	CL131/3/CPRS/KBNT//9502008-A	5	99	35	7958	61.5	70.5
143	CL131/3/CPRS/KBNT//9502008-A	5	93	35	7844	60.8	70.8
130	DREW/CFX-18/3/9502008-A/TACAURI//CFX-18	6	98	39	7706	61.7	73.2
128	DREW/CFX-18/3/9502008-A/TACAURI//CFX-18	6	99	39	7544	60.6	71.6
134	9502008-A/DREW//CFX 26/WELLS/3/CL161	6	100	41	7119	60.6	69.3
132	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/AR 1179/3/CPRS//.../4/WELLS	5	100	37	7092	60.8	70.8
135	9502008-A/DREW//CFX 26/WELLS/3/CL161	6	100	36	6808	63.6	71.4
129	DREW/CFX-18/3/9502008-A/TACAURI//CFX-18	7	103	37	5750	63.0	73.1
131	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/AR 1179/3/CPRS//.../4/WELLS	6	103	35	5612	62.5	72.7
133	9502008-A/DREW//CFX 26/WELLS/3/CCDR/9770532 DH1//LGRU	6			5446		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 7. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 7, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
169	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	93	41	10474	59.5	69.9
157	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	90	39	10335	57.6	68.2
168	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	94	40	10166	57.7	68.6
170	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	89	39	10054	57.4	68.6
161	WELLS/CFX-18//CFX-26/9702128	5	94	41	9706	56.5	69.0
152	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	97	38	9385	62.0	70.9
174	9502008-A/DREW//CLR 20/3/TAGGART	5	95	37	9328	58.0	69.4
158	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	5	97	37	9279	57.7	69.1
160	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	94	37	9272	59.6	70.2
172	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	5	96	40	9256	56.6	68.4
171	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	5	93	38	9177	61.3	71.0
154	WELLS/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	94	37	8958	57.9	68.9
159	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	5	94	39	8862	62.6	71.6
153	KATY/CPRS//NWBT/.../3/9502008/4/CLR /5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	93	36	8807	59.5	70.5
166	CL131/CHENIERE	5	93	35	8788	64.0	72.4
163	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	5	96	35	8759	60.2	71.2
173	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	5	96	36	8632	60.9	71.6
151	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/CFX-18//CCDR/9770532 DH2	5	98	41	8603	63.2	71.5
164	CL131/3/CPRS/KBNT//9502008-A	5	93	36	8582	59.1	70.7
165	CL131/3/CPRS/KBNT//9502008-A	5	94	39	8397	59.8	70.0
155	CHENIERE//CFX-26/9702128	5	100	40	8342	63.1	71.8
167	CL131/CHENIERE	6	97	36	7783	64.7	72.7
175	CL261	5	92	36	7753	65.8	70.2
156	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	99	36	7552	64.2	72.8
162	9502008-A/DREW//CLR 20/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	6	93	35	7356	61.0	71.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 8. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 8, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
176	9502008-A/DREW//CLR 20/4/9502008/LGRU/3/CPRS//82CAY21/TBNT	5	97	39	9879	56.5	67.5
181	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	5	93	36	8517	62.5	70.5
187	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	5	96	37	8388	63.3	71.8
200	URN 025	5	100	41	8253	54.1	68.8
177	9502008-A/DREW//CLR 20/3/DREW	7	99	40	8182	55.6	68.9
180	MILL//9502008/LGRU/3/CCDR/CFX-18	6	95	35	7964	65.2	74.0
183	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	5	95	36	7770	65.4	73.5
194	CCDR/CFX-18/3/9502008-A/DREW//CLR 20	5	98	37	7751	58.6	70.2
197	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	93	36	7606	64.1	72.4
190	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	100	38	7542	65.8	74.4
196	CCDR/CFX-18/3/9502008-A/DREW//CLR 20	5	94	35	7529	63.3	72.7
198	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	96	37	7331	59.3	70.0
192	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	6	99	39	7292	63.2	72.1
191	CFX-18//CCDR/9770532 DH2/5/9502008/3/CPRS//82CAY21/.../4/CFX-18	5	99	38	7224	64.8	73.4
178	CL111/4/CPRS/3/9502008-A//AR 1188/CCDR	5	99	40	7091	61.8	71.1
189	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	6	100	37	7070	64.3	72.3
199	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	99	36	6903	58.3	69.9
179	MILL//9502008/LGRU/3/CCDR/CFX-18	7	99	38	6835	63.8	72.7
182	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	6	98	36	6719	64.4	73.3
195	CCDR/CFX-18/3/9502008-A/DREW//CLR 20	5	99	37	6603	62.5	72.3
193	CCDR/CFX-18/3/9502008-A/DREW//CLR 20	6	100	36	5967	62.8	72.3
184	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	7	92	34	5934	63.0	72.5
188	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	6	98	38	5549	64.6	72.7
186	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	7	96	39	4959	66.2	73.7
185	NWBT/KATY//9902207x2/3/CCDR/4/CFX-26/9702128	8			4052		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 9. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 9, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
223	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	5	96	36	9163	64.6	72.6
225	URN 068	5	95	36	8868	64.2	68.1
221	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	96	37	8229	64.3	73.0
218	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	96	35	8202	64.6	72.6
222	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	99	37	8018	63.1	71.7
207	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	99	35	8000	61.6	72.6
224	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	99	34	7553	61.1	70.0
216	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	100	36	7350	62.2	70.7
208	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	7	100	35	7280	63.6	72.7
210	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	7	99	39	7205	62.7	72.4
220	9502008-A/DREW//CLR 20/3/CRX-26/9702128	6	100	39	6585	61.2	72.3
209	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	100	40	6487	68.1	74.5
204	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	101	37	6219	53.6	68.1
214	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	101	36	6171	65.8	73.6
211	9502008-A/TACAURI//CLR 5/3/TACAURI	7	102	35	6144	64.8	74.0
217	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	6	98	36	6130	63.5	73.0
213	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7	103	38	6100	66.8	73.5
205	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	100	39	5887	68.4	75.3
215	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	103	38	5868	65.2	75.0
201	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	7	96	34	5547	61.5	71.9
203	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	7			5517		
219	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	8			5351		
206	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	96	36	4893	67.9	74.9
212	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	8			4420		
202	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	8			4268		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 10. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 10, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
239	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	6	92	37	7631	68.9	76.7
244	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/...	5	97	35	7512	61.6	70.7
247	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	5	100	33	7427	62.3	71.7
248	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	5	99	35	7342	71.4	76.5
234	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	98	36	7236	67.2	72.7
226	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	6	93	37	7218	65.3	74.0
230	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	5	99	39	6865	59.2	69.6
232	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	97	38	6744	69.9	75.7
241	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	6	93	36	6590	70.3	77.3
235	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	99	36	6489	69.8	75.5
243	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/...	6	99	38	6356	70.5	74.8
231	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	99	35	6058	69.6	76.7
242	96INT/ARNT/3/9502008-A/DREW//CLR 20	5	99	33	6056	70.9	74.7
240	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	6			5553		
229	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	6	99	38	5512	68.4	74.7
233	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	98	40	5369	68.6	75.3
246	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/...	6			5104		
237	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/4/WELLS=CFX-18	7	100	33	5087	71.2	76.7
245	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/...	6	97	33	4696	71.1	76.9
238	9502008/3/CPRS//82CAY21/.../4/CFX18/5/9502008-A/DREW//CLR 20	6			4516		
228	CFX-26/9702128/5/AR 1142/JODN/4/NWBT/KATY/3/82CAY21/...	7			4464		
236	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/4/WELLS=CFX-18	7			4411		
227	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	7			4111		
249	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/...	7			4101		
250	URN 192	7	94	36	3896	67.1	74.7

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 11. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 11, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
275	URN 195	4	93	38	8914	70.6	73.5
255	CFX-26/9702128/5/KATY/CPRS//NWBT/.../3/...	5	97	36	8652	71.4	76.3
254	CFX-26/9702128/5/KATY/CPRS//NWBT/.../3/...	5	98	36	8437	70.0	76.1
253	CFX-26/9702128/5/KATY/CPRS//NWBT/.../3/...	5	98	35	8002	72.0	76.6
267	TRNS/CL131	5	93	33	7925	68.8	76.7
258	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	93	36	7725	72.7	76.3
268	CL131/3/CPRS/KBNT//WELLS CFX 18	5	95	34	7698	71.8	76.1
257	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	97	35	7406	73.6	77.4
251	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	94	35	7103	72.9	76.9
259	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	99	36	6914	68.5	74.6
261	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/...	6			6900		
256	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	97	17	6699	73.0	77.8
252	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	6	92	19	6621	72.5	76.5
266	9502008-A/DREW//CLR 2/3/CHENIERE	6			6383		
265	9502008-A/TACAURI//CLR 5/3/CHENIERE VERY LATE	6	101	19	6161	72.5	77.3
272	CPRS/KBNT/4/9502008/3/CPRS//82CAY21/TBNT/3/...	6			5837		
264	9502008-A/TACAURI//CLR 5/3/CHENIERE VERY LATE	6	100	19	5802	68.1	73.9
260	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6			5589		
269	CPRS/CL171	7			5305		
273	CPRS/KBNT/4/9502008/3/CPRS//82CAY21/TBNT/3/...	7			5235		
271	PRESIDO/5/TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	6			4350		
274	CFX-18//CCDR/9770532 DH2/3/CL151	6			3931		
263	9502008-A/TACAURI//CLR 5/3/CHENIERE VERY LATE	6			3832		
270	PRESIDO/5/TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	6			2584		
262	9502008-A/TACAURI//CLR 5/3/CHENIERE VERY LATE	7			2437		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 12. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 12, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
300	CL151	5	95	37	9430	70.0	75.2
288	CCDR/4/9302065/3/CFX-29//AR 1142/LA 2031	5	96	39	9010	63.3	71.6
286	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	92	35	8559	72.9	77.5
298	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	95	37	8465	69.2	76.4
297	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	98	37	8336	68.9	75.9
289	9502008-A/DREW//CLR 2/3/CHENIERE	6	95	34	8298	72.9	77.1
280	FRANCIS/CLR 13/4/CPRS/3/CFX 29//AR 1142/LA 2031	5	96	37	8157	72.3	76.6
281	FRANCIS/CLR 13/4/CPRS/3/CFX 29//AR 1142/LA 2031	5	95	38	8095	69.5	76.0
291	KATY/CPRS//NWBT/.../3/CPRS/KBNT/4/CFX 18/5/AR 1188/CCDR/9502008/LGRU	5	97	32	8067	73.1	76.4
290	CPRS/KBNT//WELLS CFX 18/3/CPRS	6	98	34	7982	69.8	73.8
292	KATY/CPRS//NWBT/.../3/CPRS/KBNT/4/CFX 18/5/AR 1188/CCDR/9502008/LGRU	5	98	32	7963	72.2	75.9
276	CFX-18//CCDR/9770532 DH2/3/CL 151	5	94	38	7608	70.3	75.6
293	902207x2/LGRU//CHENIERE/3/CCDR/CFX 18	5	98	39	7539	70.1	73.5
285	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	92	33	7414	67.6	75.5
279	FRANCIS/CLR 13//9502008-A/DREW	5	100	35	7228	73.9	77.6
299	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	93	34	6997	61.5	71.3
287	CL131/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	96	34	6970	71.6	77.0
295	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/9502008-A/DREW//CLR 20	6	101	34	6939	72.2	76.5
277	FRANCIS/CLR 13//CCDR	6	91	36	6893	64.4	72.7
296	CCDR/CFX-18/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	6	97	35	6829	71.8	75.7
278	FRANCIS/CLR 13//9502008-A/DREW	6	92	35	6595	67.8	75.6
294	902207x2/LGRU//CHENIERE/3/CHENIERE//CFX 29/CCDR	6	100	33	5665	70.7	76.7
282	CL151/5/KATY/CPRS//NWBT/.../3/9502008/4/CLR 9	5	96	34	5341	66.6	74.0
283	9502008-A/TACAURI//CLR 5/3/CL171	5	98	33	5336	72.7	77.2
284	FRANCIS/CLR 22/5/TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	5	100	38	4253	67.2	74.2

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 13. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 13, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
325	CL111	5	92	39	10198	67.7	76.0
301	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	95	36	8527	66.7	74.7
306	9502008-A/DREW//CLR 2/3/CHENIERE	5	93	36	7890	70.3	76.2
315	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	5	101	35	7817	65.5	73.2
302	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	5	99	35	7801	67.1	75.2
319	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	5	100	31	7742	70.3	76.9
309	9502008-A/DREW//CLR 2/3/CHENIERE	5	93	37	7633	68.5	74.1
303	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/4/WELLS=CFX-18	5	95	35	7551	65.6	73.9
305	9502008-A/DREW//CLR 2/3/CHENIERE	6	97	36	7544	70.3	75.4
324	CPRS/KBNT//WELLS CFX 18/3/MBLE	5	98	35	7479	66.8	74.4
308	9502008-A/DREW//CLR 2/3/CHENIERE	5	95	36	7186	70.7	76.6
310	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	6	101	32	7031	65.8	74.3
304	9502008-A/DREW//CLR 2/3/CHENIERE	6	99	35	6708	67.2	75.4
307	9502008-A/DREW//CLR 2/3/CHENIERE	5	101	37	6706	68.4	74.5
323	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	5	104	33	5836	66.3	75.7
314	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	5	104	33	5475	67.5	75.4
316	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	5	102	32	5272	66.8	74.7
317	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	6	102	31	5239	68.7	75.5
318	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	5	103	35	4749	66.9	76.2
313	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	5	101	27	4714	68.9	75.7
312	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	7			3808		
311	9302065/3/CFX-29/AR 1142/LA 2031/4/CHENIERE//CFX 29/CCDR	6	102	33	3537	68.7	75.5
320	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			2522		
322	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			2004		
321	9302065/3/CFX-29/AR 1142/LA 2031/4/902207x2/LGRU//CHENIERE	7			1990		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 14. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 14, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
341	LGRU/CLR 11/4/9302065/3/CFX-29/AR 1142/LA 2031	5	94	37	10294	63.2	71.4
326	CPRS/KBNT//WELLS CFX 18/3/MBLE	5	93	37	9069	63.8	72.0
349	CL131/3/CPRS/KBNT//9502008-A	5	92	36	9016	63.8	72.5
344	CL131/3/CPRS/KBNT//9502008-A	5	93	35	8974	63.3	71.9
348	CL131/3/CPRS/KBNT//9502008-A	5	91	32	8932	59.9	71.8
330	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	95	40	8807	67.8	75.0
337	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	94	34	8770	68.3	74.7
338	CPRS/3/CFX 29//AR 1142/LA 2031/4/CPRS	5	93	37	8751	70.2	75.6
339	CPRS/3/CFX 29//AR 1142/LA 2031/4/CPRS	5	93	39	8750	70.5	76.0
340	LGRU/CLR 11/4/9302065/3/CFX-29/AR 1142/LA 2031	4	96	36	8723	69.8	75.1
333	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	96	34	8712	66.8	73.4
328	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	93	39	8646	66.3	74.6
347	CL131/3/CPRS/KBNT//9502008-A	5	92	35	8617	70.6	76.1
346	CL131/3/CPRS/KBNT//9502008-A	5	91	35	8121	70.0	76.0
335	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	97	33	8007	67.5	74.1
345	CL131/3/CPRS/KBNT//9502008-A	5	92	35	7573	70.2	76.2
332	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	96	34	7539	66.6	72.9
350	CL152	5	100	36	7498	70.8	76.2
342	LGRU/CLR 11/4/9302065/3/CFX-29/AR 1142/LA 2031	5	93	39	7417	67.5	73.1
334	CPRS/KBNT//WELLS CFX 18/3/CPRS	5	97	33	7214	66.9	73.6
327	CPRS/KBNT//WELLS CFX 18/3/MBLE	6	97	37	7204	69.7	75.4
343	CL131/3/CPRS/KBNT//9502008-A	5	91	36	7124	71.3	76.8
336	CPRS/KBNT//WELLS CFX 18/3/CPRS	6	97	34	7019	62.4	71.0
329	CPRS/KBNT//WELLS CFX 18/3/CPRS	6	96	35	6691	65.9	74.2
331	CPRS/KBNT//WELLS CFX 18/3/MBLE	6	91	31	4689	66.3	73.7

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 15. Grain and milling yields and agronomic performance of entries in the 2013 Clearfield Preliminary Yield Trial, Group 15, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
367	JZMN/08CLR004//RU0802146/3/JZM2	5	92	36	9527	66.1	72.2
370	JZMN/08CLR004//RU0802146/3/JZM2	5	94	34	9280	65.0	71.3
361	RICO//PY 678/CL161	5	95	36	8839	63.1	68.6
365	JZMN/08CLR004//RU0802146/3/JZM2	5	92	34	8744	69.7	75.1
360	RICO//PY 678/CL161	5	94	37	8549	65.1	68.6
369	JZMN/08CLR004//RU0802146/3/JZM2	5	96	35	8455	66.5	72.8
368	JZMN/08CLR004//RU0802146/3/JZM2	5	93	37	8352	66.4	73.7
375	CL131	5	93	36	8266	71.9	76.8
366	JZMN*3/08CLR004	4	95	41	8256	68.6	76.1
351	CL131/3/CPRS/KBNT//9502008-A	5	103	37	8195	67.5	73.8
357	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	94	37	7964	68.6	76.1
356	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	95	35	7945	66.6	74.0
371	JZMN*2/08CLR004	4	100	41	7924	68.9	74.8
363	JZMN*2/08CLR004	5	100	38	7714	67.0	74.2
355	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	95	37	7609	67.5	75.2
364	JZMN*2/08CLR004	5	99	40	7609	65.2	73.5
362	RICO//PY 678/CL161	5	96	38	7466	69.9	73.0
372	9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA/4/DREW/JEFF/CFX-18	5	93	36	6533	66.3	73.1
359	NEPTUNE//BNGL/CL161	5	91	37	6224	72.0	74.4
358	NEPTUNE//BNGL/CL161	5	92	37	6071	70.8	74.3
373	9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA/4/DREW/JEFF/CFX-18	5	99	38	5643	69.3	73.1
354	9302065//DREW CLR 13/3/DREW/CLR 13	6	98	33	4789	71.5	76.4
353	9302065//DREW CLR 13/3/DREW/CLR 13	7	99	34	4132	69.2	76.1
352	9302065//DREW CLR 13/3/DREW/CLR 13	5	99	31	3929	68.0	74.9
374	9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA/4/DREW/JEFF/CFX-18	5	99	37	3793	64.6	72.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

## **PRELIMINARY YIELD TRIAL**

Preliminary Yield Trials consist primarily of promising breeding nursery material that is ready to be tested in replicated yield trials. The material in these trials was screened for agronomic and grain characteristics in nurseries prior to this phase of testing. Promising experimental lines were evaluated for seedling vigor, maturity, plant height, lodging resistance, grain yield of main crop, and disease resistance.

Tests were conducted using standard agronomic practices (except that no fungicides were applied) at the Rice Research Station at Crowley, LA. A randomized complete block design was applied to arrange test entries. The plot size was 4.66 x 16 ft. Seeding rate was 90 lb/A. This test was drill-seeded on March 8 and harvested on August 8. Data are presented in Tables 1 to 15.

Table 1. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 1, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
521	CCDR/JEFF/TRNS	7	89	35	7916	63.9	72.5
516	TRNS/4/NWBT/KATY//9902207x2/3/9502008-A/DREW	6	91	32	7153	68.0	75.9
522	CCDR/JEFF/TRNS	7	90	32	6586	66.8	74.3
502	CHNR//AC110DH3/0043752	6	96	35	5691	71.5	76.8
514	AR 1188/CCDR//9502008/LGRU/3/TRNS	5	97	32	5530	66.9	74.6
523	CCDR/JEFF/4/NWBT/KATY//9902207x2/3/CPRS	5	95	34	5526	69.7	76.4
505	9502008-A/DREW/4/TACAURI/3/CPRS//...	7	95	34	5519	69.4	75.7
511	AR 1188/CCDR//9502008/LGRU/3/TRNS	5	96	34	5506	67.4	75.6
518	CPRS/KBNT//9502008-A /3/CCDR/JEFF	6	93	33	5484	69.3	76.0
520	CPRS/KBNT//9502008-A /3/CCDR/JEFF	7	93	33	5446	66.5	75.8
510	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/NWBT/KATY//9902207x2/3/CPRS	6	96	35	5262	68.9	76.2
501	CHNR//9502008-A/DREW	7	96	32	4894	72.3	76.9
517	9302065/4/NWBT/KATY//9902207x2/3/CPRS	6	101	33	4874	68.7	76.2
513	AR 1142/JODN/4/NWBT/KATY/3/82CAY21/.../5/NWBT/...	5	102	34	4632	69.5	75.7
519	CPRS/KBNT//9502008-A /3/CCDR/JEFF	7	93	35	4622	69.4	76.5
524	AR 1188/CCDR//9502008/LGRU/3/TRNS	7	93	32	4595	70.6	76.1
508	CHENIERE//CCDR/9502008-A	6	100	35	4503	73.3	77.2
503	9502008//KATY/902207x2/3/MBLE//TQNG/MBLE	7	97	30	4077	68.7	75.1
515	CPRS/97T1280 DH1/3/CPRS/NWBT//KATY/4/CCDR	6	-90	0	4053		
507	9302065/DREW	6	99	32	3969	67.3	75.0
504	9502008//KATY/902207x2/3/MBLE//TQNG/MBLE	8	97	33	3866	67.8	74.7
512	CPRS/97T1280 DH1/3/CPRS/NWBT//KATY/4/CPRS/KBNT//DREW	7	100	31	3638	67.9	75.8
525	CHENIERE	8	100	35	3570	70.7	76.4
509	9502008-A//AR 1188/CCDR/3/CCDR	6	98	35	3200	67.1	75.1
506	9302065/DREW	6	106	32	2825	66.6	75.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 2, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
545	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	5	94	35	8023	65.8	72.9
541	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	5	96	34	7976	65.9	72.9
543	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	5	98	35	7243	69.7	75.8
542	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	6	98	35	7210	67.4	74.7
532	DREW//CHENIERE/LMNT	6	101	35	7071	68.5	75.3
544	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	5	98	34	7065	69.7	75.6
546	9502008/3/MBLE/LMNT/20001-5/4/WELLS/.../5/TAGGART	5	99	38	7031	68.0	76.6
533	DREW//CHENIERE/LMNT	5	101	36	6948	70.5	75.9
536	LCSN/3/902207x2/LGRU//CHENIERE	6	98	36	6712	69.7	75.8
535	LCSN/3/902207x2/LGRU//CHENIERE	6	98	36	6711	68.2	75.4
537	LCSN/3/902207x2/LGRU//CHENIERE	6	100	32	6657	68.2	75.5
534	DREW//CHENIERE/LMNT	6	99	36	6543	70.6	76.0
538	TRNS/CPRS/KBNT//9502008-A	6	91	35	6406	66.0	74.0
539	TRNS/CPRS/KBNT//9502008-A	6	91	36	6330	63.7	72.9
549	CATAHOULA/CHENIERE	5	92	35	5754	65.8	75.7
529	TRNS/3/CPRS/KBNT//9502008-A	8			5726		
548	CATAHOULA/CHENIERE	5	90	36	5182	66.6	76.6
547	CATAHOULA/CHENIERE	6	93	37	5112	64.3	74.2
528	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW	7	97	32	4914	69.0	75.7
530	TRNS/3/CPRS/KBNT//9502008-A	6	92	37	4814	62.5	73.2
540	TRNS/CPRS/KBNT//9502008-A	6	91	32	4705	68.6	75.1
531	DREW//CHENIERE/LMNT	6	101	34	4696	71.6	75.7
527	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/NWBT/KATY//9902207x2/3/...	6	94	35	4676	68.0	75.1
526	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/NWBT/KATY//9902207x2/3/...	6	94	37	4082	65.7	74.6
550	MERMENTAU	6	100	34	2635	66.5	74.3

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 3, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
573	9502008-A//AR1188/CCDR/3/RU0602128	4	95	38	8497	65.1	72.7
572	CCDR/AC622	6	93	39	8430	60.4	71.1
562	CPRS/KBNT//9502008-A/3/RU0602180	4	96	38	8184	63.2	73.0
557	CCDR//CCDR/JEFF	5	93	34	7198	71.8	75.5
553	CATAHOULA/CHENIERE	4	92	37	6716	67.9	76.3
551	CATAHOULA/CHENIERE	5	89	35	6469	67.5	76.3
554	CATAHOULA/CHENIERE	5	91	37	6447	67.7	76.9
552	CATAHOULA/CHENIERE	5	93	34	6080	68.5	76.8
563	CCDR/0502085/3/MILL//9502008/LGRU	5	89	34	5585	66.3	75.4
560	CCDR/LGRU/3/CPRS/KBNT//9502008-A	4	92	33	5338	70.4	76.4
555	CATAHOULA/CHENIERE	5	92	34	5260	68.1	76.7
564	9502008/AR1121//KATY/CPRS//NWBT/.../3/CPRS/KBNT	5	93	32	5126	65.8	73.8
556	CATAHOULA/CHENIERE	5	94	35	4870	67.7	76.5
575	CATAHOULA	5	93	34	4777	68.4	76.6
574	CPRS/KBNT//9502008-A/3/RU0602180	6			4521		
567	9502008//KATY/902207x2/3/0402082	6			4448		
559	9502008//AR1188/CCDR/3/0402097	6	93	36	4102	66.2	74.8
561	CCDR//9502008-A/DREW	5	92	35	3936	66.0	75.8
558	DREW/CCDR//9502008/DREW	5	94	34	3894	68.9	75.5
570	RU0402022/3/9502008//KATY/902207x2	6	94	32	3600	68.5	75.4
571	CCDR//9502008-A/DREW	6	94	35	3405	71.3	74.9
566	9502008//KATY/902207x2/3/0402082	6	89	33	3357	69.9	76.6
565	CPRS/KBNT//9502008-A/3/9901081/CCDR	6	89	33	3163	65.7	75.2
568	9502008//KATY/902207x2/3/0502091	6			2879		
569	0502171/9302065	6			2345		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 4, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
587	9502008-A//AR1188/CCDR	5	91	37	6995	71.1	76.6
585	FRAN/CCDR//RU0502094	5	94	37	5237	67.6	75.3
577	RU0601004/3/9502008//KATY/902207x2	6	98	33	4156	61.1	76.0
600	COCODRIE	4	95	34	4012	68.6	75.9
597	9502008//KATY/902207x2/3/CCDR/9502008-A	5	98	35	3587	67.4	75.1
578	RU0601004/3/9502008//KATY/902207x2	5	94	32	3487	69.9	76.2
599	9502008//KATY/902207x2/3/CCDR/9502008-A	5	96	33	3330	68.7	75.8
590	NWBT/KATY//9902207x2/3/LCSN	5			3327		
579	9502008//KATY/902207x2/3/CCDR	5			3286		
580	9502008//KATY/902207x2/3/9502008-A//AR1188/CCDR	6	92	33	3272	67.2	74.7
598	9502008//KATY/902207x2/3/CCDR/9502008-A	5	93	33	3167	68.6	74.9
576	9502008-A//AR1188/CCDR/3/CPRS/KBNT//9502008-A	6	87	35	3162	67.7	75.5
591	NWBT/KATY//9902207x2/3/RU0702128	6	100	38	3009	68.2	75.3
586	9502008-A//AR1188/CCDR/3/RU0301041	6	99	33	2606	65.7	74.5
596	9502008//KATY/902207x2/3/CCDR/9502008-A	6	93	34	2332	62.7	74.3
594	9502008//KATY/902207x2/3/CCDR/9502008-A	6	97	34	2230	68.4	76.0
584	FRAN/CCDR//CCDR/JEFF	6			2195		
582	9502008//KATY/902207x2/3/RU0601004	5	93	31	2094	68.4	74.7
595	9502008//KATY/902207x2/3/CCDR/9502008-A	6			2071		
589	NWBT/KATY//9902207x2/3/CCDR	6			2059		
581	9502008//KATY/902207x2/3/9901081/CCDR	6			1723		
583	CPRS//9502008/DREW	6			1665		
593	9502008//KATY/902207x2/3/CCDR/9502008-A	7			1465		
588	RU0702131/3/9502008//KATY/902207x2	6	92	37	1455		
592	9502008//KATY/902207x2/3/CCDR	7			1302		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 5, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
624	RU0802134/RU0902155	5	96	39	7710	67.3	75.5
625	CL151	5	93	36	7214	66.5	73.8
617	RU0902155/RU0902131	6	94	36	7075	63.3	75.6
608	KATY/CPRS/JA85/3/025/YD4//MCR00-0219 (C93-137) KATY/CPRS/JA85	5	96	36	6845	59.1	72.3
623	RU0802134/RU0902155	4	92	35	6840	68.0	76.1
618	RU0902125/RU0902152	6	95	31	5167	66.2	74.3
601	9502008//KATY/902207x2/3/9502008-A//AR1188/CCDR	5	93	34	4247	63.2	74.0
603	9502008//KATY/902207x2/3/RU0602103	5			4231		
612	CCDR/3/KATY/CPRS/JKSN/4/CCDR/JEFF	5	97	36	3910	65.0	74.0
602	9502008//KATY/902207x2/3/RU0602103	7			3892		
615	NWBT/KATY//9902207x2/3/MILL//9502008/LGRU	5	94	35	3876	66.3	75.5
610	C'THL/4/NWBT/KATY//9902207x2/3/CCDR	6			3584		
621	RU0802031/RU0802134	6	94	35	3291	65.6	74.7
614	CCDR/0502085/3/MILL//9502008/LGRU	5			3267		
606	RU0601004/4/KATY/CPRS/JKSN/3/AR1188/CCDR	6			3092		
619	RU0902140/LMNT	6			2873		
622	RU0802031/RU0802134	6			2855		
607	CCDR/0502085/3/MILL//9502008/LGRU	5			2850		
620	RU0802031/RU0902125	6			2534		
605	9502008//KATY/902207x2/3/WELLS/ZHE733	6			2496		
604	9502008//KATY/902207x2/3/9901081/CCDR	5			2457		
611	CCDR/3/KATY/CPRS/JKSN/4/CCDR/JEFF	6			2226		
609	LM-1/CCDR	5	105	30	1700	57.3	73.5
613	CCDR/0502085//CCDR/9502008-A	6			1654		
616	CCDR/RU0902125	7			1470		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 6. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 6, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
627	RU0802134/RU0902155	5	92	35	8274	66.5	73.8
650	CL111	5	94	40	7966	65.6	75.1
630	RU0801093/RU0902152	6	91	35	7641	69.5	76.9
626	RU0802134/RU0902155	6	92	34	7365	70.4	76.6
642	AR1188/CCDR//9502008/LGRU/3/AC1073	6	91	37	6536	69.2	75.6
645	CCDR/9502008-A//AC627	6	95	35	6329	61.6	74.2
636	CPRS/KBNT//9502008-A /3/AC105	5			5312		
648	9502008/CPRS/4/CPRS//82CAY21/TBNT/3/AR1121/5/CCDR//9502008//AR1188/CCDR	5	90	37	4696	66.6	75.9
628	RU0502068/08PY755	6			4578		
649	9502008/CPRS/4/NWBT/KATY//9902207x2/3/CCDR	5	100	33	4010	68.7	74.8
637	CCDR/JEFF/3/CPRS/KBNT//9502008-A	6			3656		
639	CCDR/JEFF/3/CPRS/KBNT//9502008-A	6			3588		
631	CPRS/KBNT//9502008-A /3/CCDR/0502085	5			3465		
641	AR1188/CCDR//9502008/LGRU/3/AC1019	5	98	35	3350	65.4	74.7
646	CTHL/4/NWBT/KATY//9902207x2/3/CCDR	7			3272		
643	CCDR/9502008-A//CTHL	6			3253		
635	CPRS/KBNT//9502008-A /3/AC105	5	96	35	3166	66.1	74.4
632	CPRS/KBNT//9502008-A /3/AC105	6			3075		
633	CPRS/KBNT//9502008-A /3/AC623	6			2907		
640	CCDR/JEFF/3/CPRS/KBNT//9502008-A	6			2643		
638	CCDR/JEFF/3/CPRS/KBNT//9502008-A	7			2472		
629	RU0502068/08PY755	6			2414		
644	CCDR/9502008-A//AC1073	6			2204		
634	CPRS/KBNT//9502008-A /3/AC623	6			2103		
647	CTHL//CCDR/0502085	7			1952		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 7. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 7, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
652	CCDR//9502008//AR1188/CCDR/3/CCDR	6	89	32	6824	68.5	75.2
655	AC630/TRNS	6	96	35	6522	66.9	74.9
661	CBNT/4/CCDR/3/9502008//AR1188/CCDR	6			6519		
651	CCDR/0502085/3/MILL//9502008/LGRU	5	90	34	6209	59.3	71.8
675	CL152	6	99	38	5884	70.2	76.2
654	CCDR//9502008//AR1188/CCDR/3/AC105	6			5238		
670	CTHL/AC105	5			5115		
669	RU0602103/3/9502008-A//AR1188/CCDR	5			5012		
665	9502008-A//AR1188/CCDR/3/CCDR/JEFF	7	92	33	4669	70.1	77.3
673	08-81984/4/NWBT/KATY//9902207x2/3/0302125	6			4627		
653	CCDR//9502008//AR1188/CCDR/3/MILL//9502008/LGRU	5	89	33	4314	67.8	76.5
663	CPRS/9502008-A//9502008-A/DREW	6			4191		
662	CBNT/AC105	7	93	35	4070	68.4	75.7
671	NPTN/08-81984	6			4069		
656	AC630/TRNS	6	92	37	3869	68.4	74.8
658	NWBT/KATY//9902207x2/3/CTHL	6			3675		
664	CCDR//9901081/CCDR	6	92	35	3574	68.4	75.6
667	9502008//KATY/902207x2/3/9502008-A//AR1188/CCDR	6			3283		
668	9502008-A//AR1188/CCDR	6			3041		
660	AC105/3/9502008-A//AR1188/CCDR	6			2781		
674	NWBT/KATY//9902207x2/3/0302125/4/9502008-A/DREW//0302125	5			2673		
657	AC105/3/CPRS/KBNT//9502008-A	6			2526		
672	NWBT/KATY//9902207x2/3/0302125	5			2402		
666	RU0402022/3/9502008//KATY/902207x2	5			2400		
659	AC105/3/CPRS/KBNT//9502008-A	6			2103		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 8. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 8, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
681	JPTR/MEDARK	5	99	35	7274	62.3	65.3
683	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/...	5	97	36	6818	70.1	72.9
680	JPTR/MEDARK	5	99	33	6805	67.5	72.1
679	JPTR/MEDARK	5	100	35	6699	68.2	72.3
682	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/...	5	98	34	6117	65.6	69.7
689	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	5	98	32	5444	67.8	72.2
677	JPTR/MEDARK	5	99	32	5216	64.5	72.0
688	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	6	98	33	5124	68.0	72.1
691	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	6	98	32	5061	68.6	72.5
692	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	6	98	30	5018	67.7	72.5
686	BNGL//MERC/RICO/3/EARL/4/JPTR	5	90	35	4959	67.6	70.6
693	EARL/JPTR	5			4911		
676	MUTATED F2 MG	5	91	31	4874	70.6	74.5
696	BNGL//MERC/RICO/3/MERC/.../4/EARL/CBNT	5	100	30	4483	69.0	73.5
684	JPTR/4/MERC/RICO//MERC/3/MERC/...	6	89	32	4130	68.1	72.2
690	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	6	98	32	4063	66.2	71.2
678	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/BNGL	5	94	30	3494	67.6	74.6
695	BNGL/MERC/RICO/3/MERC/RICO//BNGL/4/...	5	100	28	3449	68.5	73.2
698	EARL/4/MERC//MERC/KOSH/3/MERC/RICO//BNGL	5			3301		
700	CAFFEY	5	99	31	3159	66.7	73.9
694	BNGL/MERC/RICO/3/MERC/RICO//BNGL/4/...	5	92	33	3154	68.5	74.2
685	JPTR/4/MERC/RICO//MERC/3/MERC/...	6			3032		
697	JPTR/4/MERC/RICO//MERC/3/MERC/...	5	90	30	2774	65.2	72.6
699	EARL/4/MERC//MERC/KOSH/3/MERC/RICO//BNGL	6			2476		
687	BNGL//MERC/RICO/3/EARL/4/JPTR	6			2300		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 9. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 9, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
705	EARL//BNGL/SHORT RICO	5	92	31	6475	71.4	73.5
725	JUPITER	5	99	34	5962	67.0	71.7
715	JPTR/4/BNGL//MERC/RICO/3/MERC/...	6	98	34	5617	67.2	72.0
724	MERC/RICO//BNGL/3/SMARS/SMARS/.../4//RICO/3//BNGL	4	97	33	4933	68.6	72.2
719	NPTN/4/BNGL//.../3/MERC/RICO//BNGL	4	93	32	4919	69.6	74.0
710	ORIN//MERC/RICO/3/9602134/4/MEDARK	5	97	32	4847	68.3	73.4
714	BNGL//MERC/RICO/3/MERC/.../4/JPTR	4	97	32	4575	67.7	72.9
711	ORIN//MERC/RICO/3/9602134/4/MEDARK	6	93	34	4179	68.4	72.9
702	MDRK/4/ORIN//MERC/RICO/3/9602134	5	95	30	3802	60.9	69.9
701	Earl/4/MERC//MERC/KOSH/3/MERC/RICO//BNGL	5	97	31	3672	66.6	75.3
717	NPTN//EARL/9902028	6	97	31	3291	69.5	74.2
720	NPTN/4/BNGL//.../3/MERC/RICO//BNGL	5			3011		
712	ORIN//MERC/RICO/3/9602134/4/MEDARK	6	92	32	2935	69.1	73.4
704	ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	28	2892	62.7	74.8
708	BNGL/3/EARL//GP-2/LFTE	6	95	30	2821	67.0	73.8
718	NPTN//EARL/9902028	5	100	30	2782	67.5	72.8
722	9502065/3/MERC//MERC/.../4/BNGL//.../3/MERC/...	6			2706		
703	ORIN/3/MERC/CAM9/MARS/4/BNGL	5	94	32	2581	66.4	73.6
709	MERC/RICO//MERC/3/MERC/LMNT//.../4/BNGL/3/...	5	93	27	2383	69.8	74.8
721	NPTN/4/BNGL//.../3/MERC/RICO//BNGL	5			2112		
723	9502065/3/MERC//MERC/.../4/BNGL//.../3/MERC/...	7			2056		
716	BNGL/MERC/RICO/3/MERC/RICO//BNGL/4/MDRK	7			1546		
706	ORIN/4/BNGL/3/SMARS/MARS//MARS	5	93	37	1520	67.3	73.2
707	MEDARK/3/EARL/GP-2/LFTE	5			1327		
713	EARL/XP716	6			559		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 10. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 10, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
748	JPTR/5/BNGL/SHORT RICO/4/9502065/3/...	4	97	35	7175	68.0	72.5
746	JPTR/LFTE	5	100	34	7142	66.7	72.3
726	MERC/RICO//BNGL/3/SMARS/SMARS/.../4/JPTR	4	93	38	6486	62.0	67.2
745	JPTR/LFTE	6	99	34	6062	67.8	72.9
750	NEPTUNE	4	89	33	5745	68.4	74.1
737	JPTR/MEDARK	5	98	32	5554	67.8	72.0
749	JPTR/5/BNGL/SHORT RICO/4/ORIN//...	5	98	31	5489	68.8	73.0
736	JPTR/MEDARK	5	98	31	5177	69.0	73.2
747	JPTR/5/BNGL/SHORT RICO/4/9502065/3/...	5	98	34	5038	68.2	72.7
731	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	5	99	31	4939	67.0	72.3
744	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/JPTR	5	92	33	4574	69.0	74.5
738	JPTR/5/BNGL/SHORT RICO/4/9502065/3/...	5	95	31	4534	68.9	73.3
732	BNGL/MERC/RICO/3/MERC/RICO//BNGL/4/LFTE	5	92	31	4372	70.5	73.3
730	JPTR/4/MERC/RICO//BNGL/3/SMARS/SMARS/?	5	99	32	4346	68.3	72.6
742	9502065/3/MERC//MERC/.../4/BNGL	5	93	33	4010	65.8	74.4
727	9502065/3/MERC//MERC/.../4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5			3338		
729	BNGL//.../3/MERC/RICO//BNGL/4/BNGL//.../3/MERC/RICO//BNGL	4	100	28	3119	67.7	74.0
741	BNGL/SHORT RICO/4/ORIN//.../5/NEPTUNE	5	93	30	2962	63.8	73.9
740	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/JPTR	6	92	31	2878	64.7	73.7
739	9502065/3/MERC//MERC/.../4/BNGL	6	93	27	2784	61.6	74.3
728	9502065/3/MERC//MERC/.../4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	6	93	28	2313	65.0	74.1
734	JPTR/MARS//LFTE	6	96	31	2138	70.7	74.2
733	EARL/3/BNGL/SHORT RICO//LFTE	5			1065		
735	BNGL//MERC/RICO/3/EARL/4/JPTR	6			947		
743	9502065/3/MERC//MERC/.../4/BNGL	7			783		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 11. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 11, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
775	CL261	5	90	34	7184	67.7	73.0
766	BNGL/MERC/RICO/3/MERC/RICO/BNGL/5/BNGL/SHORT RICO/4/ORIN//...	5	91	29	5594	66.6	73.0
753	JPTR/5/BNGL/SHORT RICO/4/ORIN//...	5	99	31	4857	68.4	73.4
769	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	5	89	32	4739	66.9	72.7
751	JPTR/5/BNGL/SHORT RICO/4/ORIN//...	5	94	33	4323		
754	JPTR/5/BNGL/SHORT RICO/4/ORIN//...	5	100	30	4304	68.3	74.1
763	NEPTUNE/KOKOHUROSE	5	92	33	4298	67.8	73.9
770	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	5	90	29	4199	66.0	72.8
752	JPTR/5/BNGL/SHORT RICO/4/ORIN//...	6	98	31	3843		
765	9502065/3/MERC/MERC/.../4/BNGL	5	88	30	3367	68.6	75.2
771	BNGL/SHORT RICO/4/ORIN//.../5/JPTR	5	89	30	3169		
774	BNGL/SHORT RICO/LFTE/3/MERC	5	90	28	3151		
764	9502065/3/MERC/MERC/.../4/BNGL	5	92	31	3101	69.6	73.5
767	BNGL/MERC/RICO/3/MERC/RICO/BNGL/5/BNGL/SHORT RICO/4/ORIN//...	5	92	30	2876	69.4	75.3
760	NEPTUNE/4/9502065/3/MERC/MERC/...	5	96	26	2847	69.4	74.4
758	ORIN/4/BNGL/MERC/RICO/3/MERC/RICO/BNGL	4	93	29	2779	64.4	73.4
756	BNGL/MERC/RICO/3/MERC/RICO/BNGL/5/BNGL/SHORT RICO/4/ORIN//...	5	92	29	2469	66.6	73.9
755	LFTE/7/BNGL/5/LFTE/4/KATY/CPRS/3/.../6/JPTR	5			2322	66.9	73.6
762	NEPTUNE/KOKOHUROSE	5			2302	59.5	73.1
773	BNGL/SHORT RICO/4/ORIN//.../5/BNGL/SHORT RICO/4/ORIN//...	5	93	27	2063	68.1	73.7
761	NEPTUNE/KOKOHUROSE	6			1983	64.3	72.6
772	BNGL/SHORT RICO/4/ORIN//.../5/BNGL/SHORT RICO/4/ORIN//...	5	89	28	1972	61.8	72.1
757	BNGL/MERC/RICO/3/MERC/RICO/BNGL/4/M-401	5	93	28	1651	64.8	72.3
768	BNGL/SHORT RICO/4/ORIN//.../5/BNGL/SHORT RICO/4/9502065/3/...	5	88	28	1527	36.9	72.7
759	ORIN/4/BNGL/MERC/RICO/3/MERC/RICO/BNGL	5			1180	72.6	75.4

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 12. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 12, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
800	URN 065	5	91	33	8307	71.6	74.4
788	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	31	4606	70.2	74.5
796	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	93	30	4290	69.3	74.6
799	ORIN/3/MERC/CAM9/MARS/4/BNGL/5 BNGL	5	91	31	4211	69.7	73.9
797	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	31	3881	70.7	75.2
794	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	29	3793	69.7	74.5
786	JPTR/4/9502065/3/MERC//MERC/...	5	100	32	3736	69.7	73.7
791	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	32	3629	68.8	71.6
778	JPTR/4/9502065/3/MERC//MERC/...	5	92	33	3527	70.8	74.2
790	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	28	3366	70.2	74.3
792	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	30	3035	70.0	74.0
789	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	30	3009	69.7	74.2
787	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	29	2929	43.2	73.7
777	BNGL//MERC/RICO/3/MERC/RICO/BNGL/4/9502065/3/MERC//MERC/...	6	91	30	2910	70.6	74.0
780	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5			2767		
793	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	92	29	2711	71.1	74.9
784	ORIN/3/MERC/CAM9/MARS/4/BNGL/5/LFTE	5	93	29	2699	66.2	73.5
798	BNGL//MERC/RICO/3/MERC/RICO/BNGL/4/9502065/3/MERC//MERC/...	6			2492		
795	9502065/3/MERC//MERC/.../5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	93	28	2128	70.4	74.7
783	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO/BNGL	6			2116		
782	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO/BNGL	5			1896		
779	JPTR/4/9502065/3/MERC//MERC/...	6			1575		
781	NEPTUNE/4/9502065/3/MERC//MERC/...	6			1118		
776	BNGL//MERC/RICO/3/MERC/RICO/BNGL/4/9502065/3/MERC//MERC/...	6			1095		
785	JPTR/5/BNGL/SHORT RICO/4/9502065/3/.../6/NEPTUNE	6			967		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 13. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 13, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
825	URN 068	5	91	36	8165	71.2	74.0
824	9502065/3/MERC//MERC/.../4/NEPTUNE	5	91	31	2337	69.9	74.7
823	9502065/3/MERC//MERC/.../4/NEPTUNE	5			1525		
822	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5			1188		
821	NEPTUNE/4/9502065/3/MERC//MERC/...	5			904		
820	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5			1035		
819	NEPTUNE/4/9502065/3/MERC//MERC/...	5			1030		
818	JPTR/5/BNGL/SHORT RICO/4/9502065/3/.../6/NEPTUNE	6			1419		
817	JPTR/5/BNGL/SHORT RICO/4/9502065/3/.../6/NEPTUNE	5	95	32	3064	69.7	73.6
816	JPTR/5/BNGL/SHORT RICO/4/9502065/3/.../6/NEPTUNE	5	96	31	2912	66.6	71.9
815	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//MERC/...	5	92	28	2417	66.9	74.6
814	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//MERC/...	5	93	30	3277	70.5	74.8
813	9502065/3/MERC//MERC/.../4/BNGL	5	91	28	2042	67.7	74.5
812	NEPTUNE/4/BNGL//MERC/RICO/3/MERC/RICO//BNGL	5			2726		
811	NEPTUNE/4/9502065/3/MERC//MERC/...	5			1746		
810	NEPTUNE/4/ORIN/3/MERC/CAM9/MARS/4/BNGL	5			890		
809	NEPTUNE/4/ORIN/3/MERC/CAM9/MARS/4/BNGL	5			927		
808	EARL/4/9502065/3/MERC//MERC/...	4	93	33	7913	62.4	69.4
807	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	4	89	31	6275	69.1	73.0
806	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	93	30	5567	69.7	73.8
805	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	6			1592		
804	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	90	30	3682	59.7	72.2
803	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	97	32	4624	68.8	73.1
802	JPTR/5/ORIN/3/MERC/CAM9/MARS/4/BNGL	5	93	30	3107	65.6	72.0
801	JPTR/4/9502065/3/MERC//MERC/...	5	92	29	3930	68.3	74.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 14. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 14, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
827	0702137/07SP160	5	93	37	8137	67.7	73.3
849	JZMN	4	97	39	7592	69.9	75.0
841	CPRS//L-205/DLLA/3/JZMN	5	100	35	7409	64.2	74.4
836	JZMN//AC1027/97 KDM X2-1/3/0302125	5	93	38	7358	58.8	69.2
838	JZMN//JZMN/CCDR/3/JZM2	4	95	37	7308	63.7	71.0
842	CPRS//L-205/DLLA/3/JZMN	5	99	33	6790	68.7	74.6
831	07SP160/JZMN	5	97	36	6461	69.7	74.4
829	JZMN/07SP223	5	100	36	6444	70.9	75.3
837	JZMN//AC1027/97 KDM X2-1/3/0302125	4	97	33	6310	70.6	74.5
833	JZMN//AC1027/97 KDM X2-1/3/0302125	4	100	33	6091	70.4	74.8
828	JZMN/0302125	5	97	36	5993	71.6	75.5
832	07SP160/07PY822	4	93	33	4926	71.5	75.6
848	NWBT/KATY//9902207x2/3/0302125/4/9502008//KATY/9902207x2/3/0302125	4	91	32	3832	71.9	75.1
830	07PY823/07SP160	4	94	33	3516	69.3	73.8
844	NPTN/08-81984	5	94	31	3449	70.2	73.9
850	JZMN-2	5	94	31	2891	69.8	74.6
834	JZMN//JZMN/CCDR/3/JZM2	5			2706		
847	NWBT/KATY//9902207x2/3/0302125/4/CCDR/0302125	5	94	33	2620	67.8	73.7
839	AC780/KDML105//08AY002	5			2614		
840	0302125/KDML105//1002146	5			2512		
835	JSMN/DLLA/LLEAH/DLLA/3/KDML105/4/1002146	5			2138		
845	NPTN/08-81984	5			2015		
843	NPTN/08-81984	5			1932		
826	CCDR/JEFF/3/JSMN/DLLA//96SP287	5	100	31	1725	70.7	75.6
846	NPTN/08-81984	5			1220		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 15. Grain and milling yields and agronomic performance of entries in the 2013 Preliminary Yield Trial, Group 15, Rice Research Station, Crowley, LA.

ENT	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
874	URN 025	4	92	37	8269	65.4	74.4
858	JZMN/0302125	5	92	33	7058	68.9	75.3
875	URN 146	5	88	33	6877	70.2	75.0
854	CPRS//L-205/DLLA/3/JZMN	4	97	38	6772	68.1	74.3
868	JZMN/AC1027	5	94	34	6228	72.1	76.1
869	JZMN/07SP224	5	98	36	5869	70.5	74.9
859	JZMN/4/NWBT/KATY//9902207x2/3/0302125	4	99	34	5754	69.1	75.1
873	JZMN//JZMN/CCDR/3/0802149	4	93	32	5273	69.5	74.0
870	JZMN//JZMN/CCDR/3/JZM2	5	93	34	5198	71.7	75.1
855	CPRS//L-205/DLLA/3/JZMN	5	101	32	4839	64.1	74.0
853	CPRS//L-205/DLLA/3/JZMN	6	101	32	3265	67.8	75.5
871	AC780/KDM105//08AY002	5	93	29	3156	68.6	74.8
863	9502008-A/DREW//0302125/3/JSMN/DLLA//DLLA	5			2901		
865	NWBT/KATY//9902207x2/3/0302125/4/9502008-A/DREW//0302125	5			2503		
857	AC622/4/NWBT/KATY//9902207x2/3/0302125	5	91	30	2439	68.8	75.6
864	9502008-A/DREW//0302125/4/9502008//KATY/9902207x2/3/0302125	5			1930		
861	9502008//KATY/9902207x2/3/0302125/4/NWBT/KATY//9902207x2/3/0302125	4			1816		
866	NWBT/KATY//9902207x2/3/0302125/4/9502008-A/DREW//0302125	5	94	33	1811	68.0	72.8
860	9502008//KATY/9902207x2/3/0302125/4/9502008-A/DREW//0302125	5			1704		
872	AC622/3/DLRS//KBNT/JODN	5	93	28	1635	71.5	75.8
867	NWBT/KATY//9902207x2/3/0302125/4/9502008-A/DREW//0302125	5			1418		
862	9502008//KATY/9902207x2/3/0302125/4/NWBT/KATY//9902207x2/3/0302125	5			1112		
851	NWBT/KATY//9902207x2/3/0302125/4/9502008//KATY/9902207x2/3/0302125	5			891		
856	AC622/4/NWBT/KATY//9902207x2/3/0302125	5			828		
852	NWBT/KATY//9902207x2/3/0302125	5			640		

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

## **COOPERATIVE UNIFORM REGIONAL RICE NURSERY**

The Uniform Regional Rice Nursery (URN) is a multi-state yield nursery conducted by public rice breeders at research locations in Arkansas, Louisiana, Mississippi, Texas, California, and Missouri to evaluate experimental lines and commercial varieties. Entries are exposed to different environments over a wide, diverse growing region and allow researchers to evaluate their adaptation in a single row.

The 2013 URN test included 200 experimental lines and varieties planted in six states. The randomized complete block design was applied, with three replications for groups 1-4 and two replications for groups 5-7. Seeding rate was 90 lb/A for varieties.

The 2013 URN results from the Rice Research Station will be reported. All plots were drill-seeded on March 18. The test was harvested on August 8. Tests were conducted using standard agronomic practices (except that no fungicides were applied). Tables 1-7 show grain and milling yield and agronomic performance (seedling vigor, days to 50% heading, and plant height) of entries in the 2013 URN at the Rice Research Station.

Table 1. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 1, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
018	CL151	CL151	4	91	39	11972	60.7	70.3
017	CL111	CL111	4	88	41	11211	61.8	72.6
016	1104122	CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	4	91	38	10649	57.8	68.1
008	1302008	TRNS/CL131	6	90	35	10472	55.0	70.2
014	1104191	RSMT//3/MARS/NWRX//TBNT	5	91	36	10171	53.5	66.2
020	MRMT	MERMENTAU	4	86	34	9801	62.5	70.5
011	1302011	DREW/CFX-18/3/CPRS/KBNT//CFX-18	5	91	42	9784	64.7	73.1
002	1202082	CPRS/KBNT//9502008-A/5/KATY/CPRS//NWBT/.../3/...	5	90	39	9744	61.7	69.6
004	1201004	BRAZ/TBNT/3/164986-4/NV66//NTAI/4/BNGL/5/RU9201176/4/LBNT/...	4	87	35	9702	63.8	72.2
015	1204194	CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	4	92	43	9492	58.6	68.4
005	1202165	CCDR/JEFF//CFX-26/9702128	5	91	37	9488	60.9	70.4
007	0801081	LGRU//KATY/STBN/3/LGRU	4	88	39	9414	56.9	70.6
010	1201027	TMPL/RU0401164	4	92	38	9239	44.2	68.1
001	1305001	RU9901096/ZHE 733	4	90	37	9127	60.9	69.1
006	0803190	CPRS/CCDR	5	91	32	7873	61.1	70.6
013	1201176	811S/378R	5	95	38	7787	53.7	67.9
019	9903092	PRESIDIO	4	89	35	7724	62.8	70.6
003	1003178	CF4-69/CCDR	6	91	38	7230	61.4	70.5
012	0803147	LCSN/LGRU	6	91	38	7197	56.0	66.9
009	0903141	CPRS/9901081	5	90	37	6999	56.8	68.0

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 2, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
036	1104154	CFX-18(CL161)/PSCL	5	90	39	10580	57.7	69.7
021	1301021	M206/STG99F5-07-118//JPTR	4	83	36	10561	54.2	67.2
031	1302031	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	90	38	10483	56.8	68.7
028	1302028	KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	5	94	38	10408	58.0	69.0
033	1104073	CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	5	91	41	10270	59.1	68.4
039	CL162	CL162	4	90	42	10024	57.9	70.6
025	1202025	JZMN/08CLR004//JZMN	6	97	41	9687	59.2	70.4
030	1301030	M206/STG02PR-01-109//JPTR	4	87	36	9642	62.5	68.2
024	1201024	RU0301041/STG01L-37-069	4	94	43	9384	56.8	69.6
037	JPTR	JUPITER	5	93	38	8979	58.4	65.0
022	1202131	CCDR/AC919	5	87	38	8922	64.9	72.3
038	WLLS	WELLS	4	93	40	8701	54.2	68.7
040	FRNS	FRANCIS	4	92	38	8635	57.6	68.8
035	1104077	8603006//3/MARS/NWRX//TBNT	5	90	36	8035	56.4	67.8
026	1003129	SABR/CCDR	5	96	40	7979	60.3	69.5
029	0803153	CPRS/CCDR	6	94	36	7788	55.8	68.1
027	1301027	JPTR/RU0401136//STG05AC-05-029	5	86	31	6905	63.1	69.4
034	1102034	CPRS/KBNT//9502008-A	7	91	33	6199	61.2	71.2
032	0703190	CCDR/L202	5	85	33	5592	58.7	70.4
023	1303023	FRANCIS/SHU121-1655	6	102	32	2537	55.5	69.3

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 3, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
051	1302051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	5	91	38	10649	62.1	70.6
048	1302048	CL131/TRNS	5	88	37	10570	56.1	65.7
045	1302045	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	4	90	39	10349	57.1	68.4
042	1302042	9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	5	90	37	10338	63.2	71.4
057	REX	REX	4	91	38	9881	55.4	67.7
054	1204122	248CO13E-1	5	92	39	9726	62.6	71.7
053	1204114	248CO13E-1	5	91	38	9452	62.3	71.7
056	TGRT	TAGGART	4	94	41	9372	55.1	69.5
044	1301044	STG05IMI-02-021/STG05IMI-03-002	4	91	34	9324	62.3	71.3
060	CL181 AR	CL181 AR	4	93	34	9285	61.6	70.9
041	1201102	STG05IMI-02-028/STG03L-10-047	5	90	36	9196	64.0	71.5
047	1201047	STG01L-64-105/SPRN	4	92	39	8918	59.8	71.0
050	1201050	STG03L-50-045/RU0401164	4	96	41	8583	53.0	67.4
058	CHNR	CHENIERE	5	90	35	8427	64.5	72.6
055	1204154	CPRS//NWBT/KATY	5	91	34	8014	62.5	71.0
059	CCDR	COCODRIE	5	89	35	7867	60.1	71.4
046	1003116	CPRS/CCDR	6	91	36	7523	61.7	70.9
049	0903147	CCDR/L202	6	90	32	7208	61.6	70.2
052	0703181	CPRS/CCDR	6	94	39	7208	61.2	70.5
043	0803181	CPRS/CCDR	6	91	35	6955	61.6	71.2

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 4, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
071	1102071	LAH10	7	97	47	11981	60.8	67.6
076	1201136	RU0301041/STG01L-37-069	4	95	42	10448	60.3	71.1
068	1202068	NEPTUNE//BNGL/CL161	5	91	36	10320	61.1	69.1
065	1202065	NEPTUNE//BNGL/CL161	5	90	36	10050	63.3	68.3
064	JES	JES	6	101	35	9986	61.7	68.2
080	CFFY	CAFFEY	4	91	38	9881	59.0	66.0
074	1204196	LMNT//TBNT/LA110	6	93	39	9535	62.4	71.0
073	1204156	CFX-18(CL 161)/0004054	4	96	38	9502	63.0	71.5
062	1202171	CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	5	91	38	9433	61.2	69.4
079	ROYJ	ROY J	4	96	42	9356	57.2	68.1
061	1201061	TMPL/ RU0401164	4	91	39	9291	58.6	69.3
070	1301070	STG03L-16-028/STG03L-63-107	4	99	38	9193	60.6	70.9
078	0703184	L201/SABR	5	93	39	9053	56.0	68.3
067	1201185	STG03L-16-028/STG03L-63-107	4	98	40	8181	58.2	69.6
066	0903086	SABR/CCDR	5	97	40	8132	61.2	69.7
077	1204197	RSMT//8203035/GCHW	5	92	39	8027	60.2	70.6
075	0903190	CPRS/CCDR	5	95	38	7847	57.9	69.0
063	1003153	CPRS/CCDR	6	92	34	7361	63.4	70.6
072	0903123	CPRS/NWBT//KATY/3/CCDR	6	90	36	7138	62.6	72.0
069	1303069	Wells/Rondo	5	103	33	6964	60.1	68.2

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 5, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
112	1302112	CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	5	92	40	10683	63.2	71.5
097	1302097	KATY/CPRS//NWB//.../3/9502008/4/CLR 9/5/KATY/CPRS//NWB//...	5	92	37	10507	59.0	69.6
120	CL261	CL261	4	91	36	10497	65.5	69.9
099	1301099	LGRU//LMNT/RA73/3/LGRU/4/LGRU/5/LGRU/6/RNS3/5/IR36M4/4/L201/...	4	95	42	10335	57.6	69.5
100	1304100	248CO13E-1	5	91	39	10088	62.2	70.8
118	CL142 AR	CL142 AR	4	93	44	10032	57.4	69.9
111	1201111	STG03L-50-045/RU0401164	4	92	38	10029	57.1	69.8
085	1302085	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	5	90	36	10028	62.8	71.8
082	1302082	9502008-A/DREW/3/NWB/KATY//9902207x2/4/DREW/CLR 13	5	90	41	9884	63.9	72.0
114	1304114	CFX-18(CL161)/0004054	5	96	37	9879	63.6	71.6
109	1302109	CL131/CHENIERE	5	92	38	9772	63.8	71.4
096	1301096	STG05-IMI-02-055/STG05-IMI-01-113	5	93	37	9756	60.3	70.8
115	1302115	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	6	95	39	9753	66.2	72.9
105	1301105	STG04P-13-015/STG04L-28-085	4	97	43	9710	59.1	71.2
103	1302103	9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	5	90	39	9708	59.8	69.4
081	1301081	STG05IMI-02-028/STG03L-10-047	6	92	36	9628	64.4	71.5
091	1302091	CL131/3/CPRS/KBNT//9502008-A	5	91	36	9570	61.8	70.3
106	1302106	DREW/CFX-18/3/CFX-18//CCDR/9770532 DH2	6	98	40	9408	63.2	71.9
088	1302088	KATY/CPRS//NWB//.../3/9502008/4/CLR 9/5/KATY/CPRS//NWB//...	6	90	37	9401	59.9	70.2
094	1302094	9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	5	94	37	9246	64.0	71.9
102	1301102	RU0801076/FRNS ANTER CULTURE LINE	4	96	40	9043	57.1	69.4
083	1204198	RSMT/KATY	5	92	36	8975	52.5	68.1
093	1301093	LGRU//IRGA409/RXMT/3/CYBT/7/FRNS/6/LBNT/9902/3/DAWN/9695//...	4	93	40	8947	58.0	67.9
084	1301084	STG03AC-37-042(FRAN AC LINE)/RU0801076...	5	92	38	8854	57.0	69.5

Continued.

Table 5. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
087	1301085	RU0801076/6/WLLS/5/LGRU//LMNT/RA73/3/LGRU/4/LGRU	4	96	40	8497	57.0	69.3
095	1303178	SIERRA/DELTABELLE	5	92	38	8143	59.4	69.8
110	1303110	SIERRA/DELTABELLE	5	93	38	8139	54.4	67.6
101	1303101	RONDO/SABINE	5	90	38	8102	63.2	70.9
108	1201108	STG01P-18-011/ RU9701151	4	94	38	7509	58.8	70.7
107	1303107	RONDO/FRANCIS	7	98	38	7472	48.2	65.3
104	1103104	UNKNOWN	6	96	43	6550	59.2	69.8
117	JZMN-2	JAZZMAN 2	5	92	33	6420	63.3	69.8
089	1003089	CPRS/CCDR	6	95	36	6279	60.3	70.2
113	1003113	CPRS/CCDR	7	94	38	6001	58.3	69.0
098	1003098	CPRS/NWBT//KATY/3/CCDR	6	94	35	5924	65.5	72.8
116	1303116	CCDR/L202	7	91	34	5909	60.0	70.5
086	1203086	CCDR/L202	6	94	32	5240	60.4	68.9
090	1301090	RONDO/FRANCIS	6	102	28	5230	61.1	69.7
119	M206	M206	5	77	34	2664	64.9	69.8
092	1303092	LD 183-3/JASMINE 85	8	106	38	2601	54.8	66.5

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.



Table 6. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 6, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
130	1301130	M206/STG03AC-21-047//JPTR	4	91	38	10590	65.4	69.1
125	1302125	LAH25	7	100	47	10369	56.3	67.5
133	1301133	M206/STG03AC-25-109//RU0401127	4	85	36	9905	65.3	70.1
127	1201127	TMPL/RU0401164	4	91	39	9871	61.4	71.2
143	1302143	TRNS//CCDR/9502008-A	5	85	38	9868	57.2	69.5
137	1302137	DREW//CHENIERE/LMNT	5	95	37	9759	64.0	71.9
139	1201139	STG03L-50-045/RU0401164	4	93	39	9620	62.5	71.9
145	1301145	FRANCIS/8_13(IR140//KATY/JASMINE 85)	4	92	40	9496	57.7	69.6
121	1301121	M206/STG03AC-25-109//RU0401127	4	86	36	9490	65.4	69.7
124	1301124	STG02P-02-072/RU0502137//STG03F5-04-002	4	85	37	9390	60.5	68.4
140	1302140	DREW//CHENIERE/LMNT	5	95	36	9386	64.6	72.5
160	TMPL	TEMPLETON	4	91	39	9339	64.7	72.1
126	1303126	DELTABELLE//LGRU/LCSN/CF4-85	4	92	38	9283	60.5	68.8
136	1301136	STG05-IMI-02-055/STG05-IMI-01-113	5	96	38	9268	63.7	73.2
158	DLLA-2	DELLA-2	5	94	39	9239	61.9	70.4
157	1304157	8804032/Katy	5	92	38	9197	59.6	70.0
151	1201151	STG05-IMI-02-055/CL142-AR	5	97	39	9195	62.4	72.2
142	1301142	STG05L-45-056/STG05IMI-02-055	5	93	36	9082	63.3	72.6
146	1302146	TRNS//CCDR/9502008-A	5	88	40	9053	57.8	71.1
154	1304154	8804032/KATY	5	91	37	8822	60.2	71.8
122	1304122	IR36/8603006	4	91	40	8363	62.6	72.0
131	1302131	CCDR/JEFF/3/CPRS/KBNT//9502008-A	6	93	37	7974	59.0	70.0
134	1302134	CPRS/KBNT//9502008-A/3/CCDR	6	92	37	7927	61.9	71.7
150	1103178	(MARS/CM101)/(LBNT_WX/RU8703190)	5	98	37	7922	57.0	67.8

Continued.

Table 6. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
152	1302152	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/NWBT/KATY//...	5	90	40	7898	56.3	70.8
144	1303144	CCDR/L202	6	90	35	7729	57.9	71.0
141	1003141	CPRS/CCDR	6	95	38	7723	59.1	70.5
129	1203129	CPRS/CCDR	6	90	35	7686	61.7	71.5
147	1203147	FRAN/WELLS	7	98	38	7520	53.6	68.2
155	1305155	BNGL/9502065	5	99	40	7511	39.4	58.5
156	1304156	IR36/8603006	4	91	41	7458	60.9	71.7
159	0703144	ANTONIO	7	95	37	7299	60.0	71.7
135	1303135	CCDR/L202	6	90	36	7020	57.8	69.3
149	1302149	CPRS/KBNT//9502008-A /3/CCDR/JEFF	6	85	33	7007	59.3	70.8
132	1003132	CPRS/9901081	6	92	35	6787	59.9	71.1
138	1303138	IR64/IR 1321-12	8	99	37	6334	62.8	69.5
123	1003123	CPRS/CCDR	6	95	40	6152	59.5	71.1
128	1302128	07PY823/07PY824	5	91	31	5962	65.3	71.0
153	1303153	IR64/IR 1321-12	8	103	38	5510	57.1	68.8
148	1301148	8_2(KATY/IR140//JASMINE 85/RONDO)	6	101	30	3094	53.1	67.3

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 7. Grain and milling yields and agronomic performance of entries in the 2013 Uniform Regional Rice Nursery, Group 7, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
192	1302192	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/BNGL/CFX18	5	90	39	11260	62.4	69.0
177	1302177	9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	5	90	39	11231	58.5	69.7
182	1301182	341A/377R	5	92	38	10906	60.2	71.7
165	1302165	CL131//DREW/CLR 13	5	90	40	10411	56.3	68.6
162	1302162	CL131/CHENIERE	5	92	34	10012	63.1	71.8
195	1302195	RICO//PY 678/CL161	5	91	39	9957	61.1	68.4
167	1301167	341A/367R	7	103	51	9850	49.5	65.7
197	1304197	CHENIERE/PRESIDO	5	90	37	9471	64.2	72.0
168	1302168	9502008-A/DREW/3/NWBT/KATY//9902207x2/4/CFX-18//CCDR/...	5	93	40	9393	63.2	71.1
178	1305178	RU0001081/LEMONT	4	86	35	9308	59.1	70.9
171	1302171	CL131/CHENIERE	5	90	35	9261	62.5	70.9
200	CL152	CL152	4	94	38	9257	59.6	71.0
183	1302183	9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6	101	47	9194	45.2	64.9
187	1305187	9502008//KATY/902207x2	4	85	35	9106	63.3	72.1
189	1302189	BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	6	91	35	9086	61.9	69.2
180	1302180	9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	5	92	39	8901	60.1	72.0
174	1302174	CL131/CHENIERE	5	91	35	8898	62.8	72.2
194	1304194	RSMT/RXMT/IR36	4	94	39	8733	62.7	71.3
191	1304191	RSMT/RXMT/IR36	5	90	36	8708	48.6	69.0
181	1303181	043752/0047277/CHEN	5	93	38	8658	63.9	72.3
196	1304196	MBLE//82CAY21/LMNT	5	90	36	8453	60.3	70.7
186	1304186	COCODRIE/PRISCILLA	5	91	39	8289	61.1	71.3
185	1301185	810-1S/188R	5	91	40	8078	64.0	72.3
188	1301188	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS/6/19951166	4	100	40	8024	46.6	67.7

Continued.

Table 7. Continued.

ENT	SOURCE	PEDIGREE	VIG <sup>1</sup>	HDT	HTE	YIELD	WHOLE	TOTAL
193	1304193	RSMT/RXMT/IR36	4	92	38	8003	52.7	70.0
190	1203190	CPRS/NWBT//KATY/3/CCDR	7	93	36	7620	59.6	71.3
176	1301176	805S/352R	6	92	39	7515	56.8	69.6
184	1303184	FRAN/LQ39a	6	97	38	7391	60.2	70.4
161	1101161	LGRU//IRGA409/RXMT/3/CYBT	4	98	40	7372	60.3	71.0
172	1303172	CPRS/NWBT//KATY/3/CCDR	6	98	35	7318	65.4	73.0
169	1203169	SABR/CCDR	6	102	42	7096	60.4	70.3
170	1301170	811S/377R	6	94	39	6567	43.1	67.9
163	1303163	CPRS/SABR	6	91	37	6497	59.2	70.6
173	1201173	811S/376R	5	97	37	6240	55.1	68.3
164	1301164	811S/352R	6	94	39	6127	60.3	70.7
175	1303175	AC110DH2/AC108DH2//CHEN	6	95	35	6122	64.2	72.4
179	1201179	873A/190R	6	100	42	6039	37.0	63.7
166	1003166	CPRS/NWBT//KATY/3/CCDR	7	100	37	6027	65.1	72.9
198	1304198	CPRS/3/L201//TBNT/BLMT	6	104	30	4247	59.4	70.2
199	0603075	RONDO	6	104	31	4121	63.6	69.6

<sup>1</sup> Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

## DATE OF PLANTING STUDIES

The purpose of these trials is to determine the grain yield, milling quality, and other agronomic characteristics of major rice varieties, experimental lines, and hybrids planted at various times. The choice of planting date can significantly impact growth, development, and yield, and the information generated from these trials is important for understanding the impact on the important economic and production characteristics associated with rice production.

**Experiment:** Date of Planting

**Location:** Rice Research Station, Crowley, LA

**Planting Method:** Drill-seeded

**Plot size:** 4.66 x 16 ft

**Planting Dates:** March 4, March 15, March 28, April 23, May 1, May 15, May 30, and June 14

**Entries:** Cheniere, CL111, CL151, CL152, CL261, Jazzman-2, LA 2022, LA 2025, LA 2034, LA 2065, LAH10, LAH25, and Mermentau

**Experimental Design:** Replicated complete block design with three replications

**Results:** Results can be found in Tables 1-6, which are arranged across planting dates.

**Table 1.** Grain yields<sup>†</sup> of 13 rice varieties and experimental lines planted over eight planting dates, 2013.  
Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
LAH25	7214	8096	9416	10243	10724	8658	8506	6399	8657
LAH10	4485	7462	9181	11053	10445	7746	9117	9256	8593
CL151	8191	8338	8957	9557	8388	7061	7622	7847	8245
CL111	7995	8985	9360	9019	7918	6752	7081	7057	8021
LA 2065	5817	8743	8706	8926	8158	5991	7755	7641	7717
CL261	8097	8493	8310	8594	7413	6143	5709	6765	7441
CL152	6910	8525	8456	8422	7698	6391	6316	6267	7373
LA 2025	6587	7811	8759	8038	7398	5295	7050	7160	7262
MERMENTAU	5856	7871	7552	8023	7624	5712	7286	7342	7158
LA 2034	5783	6749	6525	7505	8180	4222	7661	7011	6704
LA 2022	5323	6665	7666	6664	6965	5416	6967	7147	6602
CHENIERE	5683	6817	7213	6967	7343	4188	6935	6967	6514
JAZZMAN-2	5391	6004	5878	6892	6639	4497	6024	6127	5932
Mean	6410	7735	8152	8454	8069	6005	7233	7153	

<sup>†</sup> Yield is in pounds of rough rice per acre at 12% moisture.

**Table 2.** Seedling vigor<sup>†</sup> of 13 rice varieties and experimental lines planted over eight planting dates, 2013.  
Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
CHENIERE	5	5	5	5	5	5	6	5	5
CL111	5	4	5	4	3	3	4	3	4
CL151	5	5	5	4	4	4	4	4	4
CL152	6	5	5	4	4	4	4	4	4
CL261	4	4	4	3	3	3	3	4	4
JAZZMAN-2	5	5	5	4	4	5	5	5	5
LA 2022	6	5	5	4	4	5	5	4	5
LA 2025	5	5	4	4	4	3	4	4	4
LA 2034	5	5	5	5	4	5	5	4	5
LA 2065	6	5	5	5	4	4	4	4	5
LAH10	8	7	6	6	5	4	6	4	6
LAH25	8	7	7	6	5	3	6	5	6
MERMENTAU	5	5	4	4	4	5	5	4	4
Mean	6	5	5	5	4	4	5	4	5

<sup>†</sup> Subjective rating of 1 to 9 where 1 is the highest seedling vigor and 9 is the lowest seedling vigor.

**Table 3.** Days to 50% heading of 13 rice varieties and experimental lines planted over eight planting dates, 2013.  
Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
CHENIERE	101	94	86	75	70	70	72	69	80
CL111	97	92	83	72	66	61	64	63	75
CL151	96	94	85	75	69	68	70	67	78
CL152	103	96	86	75	70	70	71	69	80
CL261	94	91	83	75	70	66	69	69	77
JAZZMAN-2	101	96	85	75	69	69	71	67	79
LA 2022	100	96	83	72	65	64	67	64	76
LA 2025	98	96	84	76	70	69	69	68	79
LA 2034	97	91	83	72	68	68	69	67	77
LA 2065	100	93	85	75	71	68	72	69	79
LAH10	104	100	91	79	73	73	73	72	83
LAH25	104	99	92	84	76	74	75	72	84
MERMENTAU	98	92	84	73	68	67	68	67	77
Mean	99	95	85	75	70	68	70	68	

**Table 4.** Plant height<sup>†</sup> of 13 rice varieties and experimental lines planted over eight planting dates, 2013.  
Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
CHENIERE	35	34	34	35	35	34	37	35	35
CL111	38	39	37	40	37	36	38	38	38
CL151	37	38	38	39	35	38	38	39	38
CL152	36	36	35	38	35	35	38	37	36
CL261	38	37	38	40	36	35	38	41	38
JAZZMAN-2	33	32	32	33	32	33	33	34	33
LA 2022	37	37	35	35	36	36	38	38	36
LA 2025	40	40	40	40	38	38	40	40	39
LA 2034	35	24	34	35	33	34	37	34	33
LA 2065	35	36	35	37	36	34	36	39	36
LAH10	45	47	47	48	51	47	47	46	47
LAH25	46	46	46	48	52	47	47	47	47
MERMENTAU	37	37	34	34	35	34	37	36	35
Mean	38	37	37	38	38	37	39	39	

<sup>†</sup> Plant height in inches from the soil surface to the tip of the main panicle.

**Table 5.** Whole milling percentage<sup>†</sup> of 13 rice varieties and experimental lines planted over eight planting dates, 2013. Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
CHENIERE	67.4	64.5	64.5	67.4	66.9	67.3	69.4	70.1	67.2
CL111	58.0	61.4	62.8	62.3	60.8	58.7	63.1	64.4	61.4
CL151	64.5	64.2	63.1	59.4	61.0	59.3	64.4	63.0	62.4
CL152	64.2	65.3	66.8	62.8	63.1	63.9	64.0	62.7	64.1
CL261	66.2	66.1	63.9	64.9	63.3	62.0	67.3	65.2	64.8
JAZZMAN-2	67.5	66.1	67.9	64.8	63.8	62.7	66.9	66.6	65.8
LA 2022	64.4	63.1	62.8	64.4	65.3	63.8	66.9	67.2	64.7
LA 2025	62.1	63.9	60.2	57.0	60.5	54.3	62.2	66.7	60.8
LA 2034	62.4	57.5	60.6	59.4	60.1	63.4	66.7	66.8	62.1
LA 2065	64.9	61.8	62.2	62.2	58.1	61.7	66.2	68.0	63.1
LAH10	55.1	60.4	60.8	60.4	59.0	60.8	66.0	65.6	61.0
LAH25	55.5	53.8	53.4	56.6	56.0	58.5	60.9	62.7	57.2
MERMENTAU	64.6	65.3	63.9	61.1	63.0	64.2	64.0	66.1	64.0
Mean	62.8	62.6	62.5	61.7	61.6	61.6	65.2	65.8	

<sup>†</sup> The percentage of unbroken grains after the removal of the hulls and broken grains.

**Table 6.** Total milling percentage<sup>†</sup> of 13 rice varieties and experimental lines planted over eight planting dates, 2013. Rice Research Station, Crowley, LA.

Entry	Planting Date								Mean
	March 4	March 15	March 28	April 23	May 1	May 15	May 30	June 14	
CHENIERE	73.8	72.5	73.3	74.0	73.0	73.2	75.3	75.2	74
CL111	70.4	72.1	72.1	72.0	70.3	71.0	73.3	73.1	72
CL151	72.3	72.2	71.8	69.4	70.6	70.4	73.4	72.1	72
CL152	71.9	72.5	73.2	71.1	71.1	71.2	72.0	72.4	72
CL261	70.2	69.6	69.5	69.6	68.8	68.6	71.5	69.9	70
JAZZMAN-2	71.8	71.5	72.5	70.0	70.3	70.1	72.5	72.1	71
LA 2022	72.3	71.9	71.2	71.9	72.4	71.7	73.5	74.3	72
LA 2025	71.3	72.0	71.1	68.9	70.4	68.4	71.2	73.1	71
LA 2034	71.7	70.6	70.8	69.5	70.0	71.0	73.6	73.2	71
LA 2065	70.6	71.6	70.8	69.7	68.0	68.5	71.9	72.2	70
LAH10	68.3	69.7	69.7	69.3	68.3	68.8	71.7	71.6	70
LAH25	68.3	68.5	67.7	68.1	68.1	68.2	68.7	70.5	69
MERMENTAU	72.5	72.2	72.1	70.7	71.3	71.1	72.2	72.6	72
Mean	71.2	71.3	71.2	70.3	70.2	70.2	72.3	72.5	

<sup>†</sup> The cumulative percentage of broken and unbroken grains after the removal of the hulls.



## DEVELOPMENT OF HYBRID RICE AND SHEATH BLIGHT-RESISTANT GERMPLASM FOR LOUISIANA

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### INTRODUCTION

Hybrid rice, produced from the first generation ( $F_1$ ) of seeds between a cross of two genetically dissimilar pure line (inbred) parents, represents a relatively new option for Louisiana farmers. Commercial hybrids typically yield 10-20% more than the best inbreds grown under similar conditions believed to be the result of hybrid vigor or heterosis from crossing the two parents. Research goals of the Hybrid Rice program at the Rice Research Station include: 1) development of and identifying male sterile lines (cytoplasmic A or environmental sensitive S), restorer (R) and maintainer (B) lines adapted to the southern U.S. environmental conditions; 2) identifying elite cross combinations through extensive test-crossing; and 3) exploring the feasibility of economical hybrid seed production.

The 2013 hybrid breeding nurseries included an Observational Trial that evaluated 600 test crosses for agronomic and milling performance. Advanced yield, variety x nitrogen, seeding rate, and disease evaluation trials were carried out in Acadia, Franklin, and St. Landry parishes. Additional nurseries at the Rice Station included 1,600 rows for male sterile S line development, 2,500 rows for restorer, and 500 rows for maintainer line development. Four 3-line male steriles were developed with Louisiana backgrounds, and 30 two-line male steriles were selected and advanced. A total of 21 micro and small-scale plots were evaluated at the Rice Research Station with four different management options to maximize hybrid seed production. DNA technology was used to identify and begin validation of more than 50 candidate markers for low chalk percentage in hybrids and inbred varieties.

Sheath blight disease caused by the fungus *Rhizoctonia solani* is a major constraint for high grain and milling yields. Our goal is to develop sheath blight-resistant germplasm by traditional crossing and selection in conjunction with DNA marker technology. In 2013, 424 crosses for sheath blight were made. In addition, 2,100  $F_1$  plants, 37 backcross (BC) populations, and 49 space-planted  $F_2$  populations were evaluated. A total of 286 early and advanced lines were tested in inoculated field plots at the Rice Research Station. DNA technology was used to accelerate development of 16 BC populations for sheath blight resistance.

### Observational (Testcross) Trial

The objective of the Observational Trial is to identify new hybrid combinations with high grain yield, good milling performance, height, maturity, lodging percentage, and other agronomic characteristics. Planting date was March 19, 2013. The total number of single-row plots for this trial was 2,040. Testcrosses consisted of  $F_1$  seeds derived from introduced Chinese male sterile lines mated with elite Louisiana long-grain or Chinese genotypes in 2012. A total of 59 selected cross combinations, 25 three-line and 34 two-line candidate hybrids produced >10% higher yields than the inbred check CL111. Fifty-three hybrid selections produced greater yields than the commercial check XL723. Results from nine selected hybrids are shown in Table 1. Five selected hybrids produced >20% grain yield vs. CL111, and three selections produced higher yields than the commercial hybrid CLXL729. Milling performance of selected lines was similar to that of the check CL111. From all testcross lines, eight were identified with low chalk values similar to those of CL152 and CL111. In related studies, 28 southern long-grain varieties/lines were found to have either partial or full restoring ability to Chinese 3-line male steriles, and 36 southern long-grain varieties/lines were found to have either partial or full restoring ability to Chinese 2-line male sterile lines.

Table 1. Observational (Testcross) Trial, Rice Research Station, 2013.

Hybrid/Variety	Pedigree	Days to 50% Heading	Height (inches)	Yield (lb/A)	Head Rice/ Total	Notes
13TC1924	CJS4/12XB003	97	43	14,084	55/68	MG, 2-Line†
13TC1225	17633S/12XB005	92	43	13,650	61/68	LG, 2-Line
13TC1809	CJS3/CPRS	102	48	13,250	55/71	LG, 2-Line
13TC1027	CLXL729	99	43	13,000	61/72	LG, CL-? line
13TC1602	12XB017/CJR7	101	44	12,934	64/73	MG, 3-Line
13TC1014	XL723	97	43	12820	58/71	LG, ?-Line
13TC2002	CJS4/12HB073	96	46	12,466	59/71	LG, 2-Line
13TC1427	CLXL745	99	44	11,619	58/70	LG, CL, ?-Line
13TC808	16138S/CL161	92	44	11,608	62/69	LG, CL, 2-Line
13TC1812	CJS3/12XB004	90	45	11,239	53/71	LG, 2-Line
13TC427	LAH10	109	50	11,201	58/70	MG, 3-Line
CL111	9502008-A/'Drew' /3/CFX-29....	95	40	9,688	59/70	LG, Pure line

† CL = Clearfield long-grain, L = long-grain, and M = medium-grain.

### Advanced Hybrid Yield Trials

The objective of the Advanced Hybrid Yield Trials is to evaluate agronomic and milling performance at multiple locations of selected entries for vigor, maturity, height, grain yield, and head rice yields. The three trials were planted March 19 to April 23, 2013, at the seeding rate of ~38 lb/A. Results from these trials are shown in Tables 2-4. In general, the three hybrids LAH10, LAH25, and LAH28, showed high yield potential with good milling performance across the different locations vs. the checks CL151, CL152, Caffey, and XL723. The Clearfield 2-line selection, 08S x CL161, produced slightly higher grain yield than commercial hybrid CLXL746 and approached (93%) grain yield of CLXL729.

Table 2. 2013 Advanced Yield Trial, hybrid entries, Rice Research Station, Crowley, LA, March 24, 2013.

Entry	Type†	Vigor	50% Heading Date	Plant Height (inches)	Yield (lb/A)
CLXL729	H, L, CL	4	87	42	9,177
CL152	L	5	89	44	8,861
08S x CL161	H, L, CL	5	93	38	8,525
CLXL745	H, L, CL	7	90	43	8,472
08A x CL161	H, L, CL	5	91	44	8,246
CL151	L	6	91	46	8,221
08A x CL131	H, L, CL	4	87	38	7,859

†H = hybrid, L = long-grain, and CL = Clearfield.

Table 3. Agronomic and milling performance of Advanced Yield Trial, hybrid entries, Rice Research Station, LA, Planting date, March 19, 2013.

Entry	Type†	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)	Milling % Head/Total
LAH28	L	101	48	11,872	57/68
LAH25	L	98	47	11,490	57/69
XL723	L	90	41	11,287	63/72
LAH10	M	95	47	9,929	58/70
CL152	CL	93	38	9,499	65/71
Caffey	M	91	38	7,583	57/70

† CL = Clearfield long-grain, L = long-grain, and M = medium-grain.

Table 4. Agronomic and milling performance of Advanced Yield Trial, hybrid entries, Rice Research Station, LA, Planting date, April 23, 2013.

Entry	Type†	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)	Milling % Head/Total§
LAH28	L	101	48	11,872	nd
LAH25	L	93	47	11,392	nd
LAH28	L	96	48	11,123	nd
XL723	L	85	41	9,170	nd
LAH10	M	90	47	8,467	nd
CL152	CL	88	38	6,703	nd
Caffey	M	86	37	5,133	nd

† CL = Clearfield long-grain, L = long-grain, and M = medium-grain.

§ nd = no data taken.

### Variety X Nitrogen Trials

The objective of the Variety x Nitrogen Trials is to evaluate maturity, height, and grain yield at two different nitrogen rates for the hybrid LAH10 and one nitrogen rate for CL152 at multiple locations. The three trials were planted March 15 to May 20, 2013, at a seeding rate of ~30 lb/A for LAH10 and ~67 lb/A for CL152. Results from these trials are shown in Table 6. High yields for LAH10 vs. CL152 were produced at both 60 and 90 lb/A rates. Small to moderate increases in maturity, height, and grain yield were observed for LAH10 at the 90 lb N/A vs. 60 lb N/A rate.

Table 6. 2013 Variety (LAH10, CL152) x Nitrogen Trials, Rice Research Station (Acadia Parish), St. Landry Parish, and Franklin Parish.

Location	Hybrid/ Line	lb N/A	Days to 50% Heading	Plant Height (inches)	Grain Yield (lb/A)†
Rice Research Station	LAH10	60	103a§	44a	10,894b
	LAH10	90	103a	45b	11,832a
	CL152	120	102a	35c	10,727b
	c.v.%	-	0.7	1.7	6.0
	LSD0.05	-	1.2	2.4	640.0
St. Landry Parish	LAH10	60	92a	49a	10,542a
	LAH10	90	91a	49a	10,440a
	CL152	120	85b	41b	8,794b
	c.v.%	-	0.8	3.0	9.5
	LSD0.05	-	1.1	2.1	1,291
Franklin Parish	LAH10	60	80a	51a	11,910a
	LAH10	90	79ab	51a	12,131a
	CL152	120	78b	46b	10,600b
	c.v.%	-	1.4	2.3	7.9
	LSD0.05	-	1.6	1.6	1,194

†Main and ratoon crop for Acadia; main crop only for St. Landry and Franklin parishes.

All plots seeded at 14 seeds/ft<sup>2</sup> (~30.1 lb seeds/A).

§Means followed by same letter do not significantly differ (P=.05, LSD).

### Seeding Rate Trial

The goal of the Seeding and Nitrogen Rate Trial was to determine the optimum seeding rate for the advanced hybrid LAH10. The trial was planted March 11, 2013, Acadia Parish, at 45, 70, and 90 lb N/A. Results from the trial are shown in Table 7. High yields were produced at both seeding rates of 25 and 35 lb/A that are similar to commercial hybrid planting densities.

Table 7. Seeding and Nitrogen Rate Trial, LAH10, Rice Research Station, 2013.

Seeding Rate (lb/A)	Seedlings/ft <sup>2</sup>	lb N/A	Days to 50% Heading	Height (inches)	Yield† (lb/A)
25.0	12	45	104	44	9,755
25.0	12	70	103	44	10,500
25.0	12	90	104	44	11,754
35.0	16	45	104	43	10,417
35.0	16	70	103	43	10,881
35.0	16	90	102	45	12,417
c.v.%	-	-	0.7	1.7	6.0
LSD 0.05	-	-	1.2	2.4	640.0

†Main and ratoon crop for Acadia; main crop only for St. Landry and Franklin parishes. All plots seeded at 14 seeds/ft<sup>2</sup> (~30.1 lb seeds/A).

### Uniform Regional Rice Nursery

The Uniform Regional Rice Nursery (URN) is a multi-state, cooperative trial carried out each year in the southern U.S. to evaluate agronomic performance of advanced inbred and hybrid lines. Table 8 shows heading date, height, and grain yield for 16 hybrid entries of the 2013 URN carried out at the Rice Research Station. High yield potential was observed for Louisiana hybrids LAH10 and LAH25 and the 3-line hybrid 341A/377R from Arkansas.

Table 8. 2013 Uniform Regional Rice Nursery, Rice Research Station, hybrid entries.

Hybrid/Variety	Days to 50% Heading	Height (inches)	Yield (lb/A)	Origin
LAH10	97	47	11,981	LA
CL111	88	41	11,211	LA
341A/377R	92	38	10,906	AR
LAH25	100	47	10,369	LA
341A/367R	103	51	9,850	AR
810-1S/188R	91	40	8,078	AR
811S/378R	95	38	7,787	AR
805S/352R	92	39	7,515	AR
811S/377R	94	39	6,567	AR
811S/376R	97	37	6,240	AR
811S/352R	94	39	6,127	AR
811S/377R	94	39	6,567	AR
811S/376R	97	37	6,240	AR
811S/352R	94	39	6,127	AR
873A/190R	100	42	6,039	AR
811S/377R	94	39	6,567	AR
811S/376R	97	37	6,240	AR

### Disease Evaluation Nursery

The purpose of the Disease Evaluation Nursery is to determine response of selected hybrids to infection by fungal pathogens that cause sheath blight, leaf blast, bacterial panicle blight, and narrow brown leaf spot. Table 9 shows that the 15 selected hybrids exhibit moderate to high levels of tolerance to sheath blight, leaf blast, and narrow brown leaf spot vs. the checks CL111, CL151, and CL152.

Table 9. Disease ratings of LA and AR hybrids and varieties for sheath blight, leaf blast, bacterial panicle blight, and narrow brown leaf spot, Rice Research Station, Crowley, LA.

Variety Name	Sheath Blight (0-9)	Leaf Blast (0-9)	Bacterial Panicle Blight (0-9)	Narrow Brown Leaf Spot (0-9)	Origin
CL111	7.3	6.0	7.0	3.2	LA
CL151	6.5	6.3	6.3	1.2	LA
CL152	6.0	4.0	4.5	0.8	LA
Mermentau	6.3	5.8	5.3	nd†	LA
LAH10	3.8	0.0	1.6	0	LA
LAH25	4.0	0.0	2.0	nd	LA
805S/352R	4.0	0.0	2.5	nd	AR
810-1S/188R	4.0	0.0	2.0	nd	AR
811S/352R	5.0	0.0	4.0	nd	AR
811S/378R	5.5	0.0	3.5	nd	AR
811S/377R	4.5	0.0	4.5	nd	AR
811S/376R	6.0	0.0	3.0	nd	AR
341A/367R	5.5	0.0	2.5	nd	AR
341A/377R	3.5	0.0	2.0	nd	AR
873A/190R	3.5	0.0	2.0	nd	AR
XL723	5.6	1.0	2.4	0	RiceTec
XL753	4.8	0.0	2.2	0	RiceTec
CLXL729	5.6	0.0	1.8	0	RiceTec
CLXL745	5.2	0.0	2.6	0	RiceTec

† nd = no data taken

### Development of Sheath Blight-Resistant Germplasm

Twenty-three BC candidate sheath blight-resistant lines were developed by a combination of traditional crossing, DNA marker, and *in-vitro* cell (anther) culture technologies. Six selected lines showed similar height, maturity, and grain type compared to the Cocodrie check. In addition, 15 tolerant lines in the F<sub>4</sub>-F<sub>5</sub> generations were developed by the standard pedigree method. All material developed will be evaluated in 2014 inoculated plots at the Rice Research Station.

## MARKER-ASSISTED BREEDING AND GENETIC IMPROVEMENT OF SOUTHERN U.S. RICE

H.S. Utomo and S.D. Linscombe

Five advanced lines developed from marker-assisted selections were tested in the Commercial Advanced (CA) Trials in collaboration with Dr. Steve Linscombe in 2013 growing season. These promising lines were selected from promising lines that were previously tested in the Preliminary Yield (PY) Trials in 2012. The CA trials provided the performance information of advanced marker-assisted lines under the influence of different environments and management practices. The four testing locations were Evangeline, Vermilion, and Jefferson Davis parishes, and the Rice Research Station near Crowley. Preliminary Yield (PY) Trials were also conducted to include 22 lines from marker-assisted breeding to be tested with four cultivar checks (Catahoula, Mermentau, CL151, and Cocodrie). The PY trials employed a standard plot size of 4 x 16 ft using typical cultural management. The tests were conducted to evaluate their yield potential, milling performance, and other agronomic traits in addition to marker-based selection for disease resistant traits. Around five of the most promising lines showing high yield potential with plant height, heading date, and vigor similar to typical Louisiana rice cultivars were selected to enter CA trials next year. Several advanced lines from the marker-assisted selection have excellent yield potential, milling quality, and other agronomic traits (Table 1).

In total, 8,000 headrow tests were conducted to achieve various objectives of the marker-assisted breeding program. The ongoing marker-assisted breeding includes introgression of important genes, such as drought-tolerant, cold-tolerant (at seedling stage), salt-tolerant, aroma (Jasmine), grain weight, and panicle blight-resistant genes from outside the U.S. genetic pool into adapted Louisiana cultivars and breeding lines. The marker-assisted selections were focused in the early generations of  $F_2$  and  $F_3$  lines. Lines containing fixed alleles for the target genes were grouped to facilitate cost and labor efficiency. For a single gene target, fixed target alleles can usually be obtained through screening of the  $F_2$  or  $F_3$  progeny lines. More elaborate crossing schemes, however, were used for a multiple gene target. The schemes were developed to keep the volume and cost of marker screening at its minimum level. Once the target genes have been fixed, the progeny lines were advanced and subjected to regular breeding selections. The most viable/promising breeding lines were then selected. Performance of a subset of these selected lines, i.e. 50  $Pi-ta^2/Pi-b$  lines, is presented in Table 2. Tables 3 and 4 indicate the field performance of pyramided lines from backcrossing and anther culture, respectively. Milling characteristics, grain appearance, and percent chalk for select advance lines from marker-assisted breeding are present in Table 5.

Work continues to evaluate natural nucleotide variation in the DHDP5 gene associated with grain lysine content. DHDP5 gene encodes the production of lysine and threonine. The DHDP5 enzyme is regulated by feedback inhibition. The variation of its nucleotides provides different sensitivity of the enzyme to the products in the enzymatic reaction pathways. Verification studies are being conducted in two specific genomic regions that were identified to encode the percent protein increase of 49 and 35%. In addition to the continuation of research conducted last year, the proposed project will include genetic mapping of purple pigment associated with the purple brand of rice. The brand of purple rice possesses bioactive properties, a rich source of natural anthocyanin compounds, such as cyanidin 3-glucoside, and peonidin 3-glucoside, which possess anti-oxidative and anti-inflammatory activities. These antioxidant compounds can eliminate reactive oxygen species and lower cholesterol content. Marker studies will help identify the genetic basis for these traits that can be incorporated in the breeding process to strengthen/expand the characteristic of U.S. premium rice. A bi-parental population for grain chalkiness is being advanced and will be used to map the trait. Grain chalkiness is one of the most important factors determining grain appearance and milling qualities. It is an undesirable characteristic that can be encountered during the development of both purebred and hybrid cultivars. Molecular markers associated with this trait will help breeders to minimize the problem in the very early stage. Work also continues involving the use of the USDA minicore collection. Recovery of recurrent genetic background from crosses between Louisiana breeding lines and five USDA lines were conducted by employing extensive SSR marker analyses. The chromosomal segment of these donors that affect potential yield improvement during the breeding process are being evaluated.

Table 1. Field performance evaluation of advanced lines in Preliminary Yield tests at the Rice Research Station locations (averaged over 2 years of tests).

Plot	Line	Edt	Vig	Hdt	Hte	Milling		Yield		
						Whole	Total	Main crop	Ratoon	Total
1	11R-3028	88.2	4.5	91.3	75.7	61.6	71.4	8,575.6	1,959.7	10,535.3
2	11R-3044	90.6	5.5	94.3	75.6	58.2	70.7	8,717.7	2,703.9	11,421.6
3	11R-3054	90.0	4.4	97.2	73.5	54.5	68.0	8,119.2	2,369.8	10,489.0
4	11R-3084	89.0	5.3	84.6	80.1	60.4	71.7	8,757.3	1,962.1	10,719.4
5	11R-3088	90.0	5.6	90.1	81.6	54.8	69.3	8,442.7	3,569.9	12,012.6
6	11R-3090	90.4	4.4	90.0	75.5	53.6	69.7	7,751.4	3,167.1	10,918.5
7	11R-3111	89.5	3.5	98.6	73.4	58.2	69.7	8,918.9	2,987.6	11,906.5
8	11R-3591	90.4	5.1	95.7	73.5	55.8	68.2	7,621.3	2,981.2	10,602.5
9	11R-4447	88.8	4.5	99.4	82.2	55.4	67.6	10,021.5	2,531.5	12,553.0
10	11R-4570	89.5	3.4	95.3	78.9	60.8	71.1	7,836.8	2,733.9	10,570.7
11	11R-4571	90.3	4.4	90.4	80.5	59.7	70.0	7,291.5	2,108.7	9,400.2
12	11R-4584	91.2	4.5	97.5	80.1	59.3	68.5	7,113.3	2,574.8	9,688.1
13	11R-4596	88.3	3.4	94.7	76.5	60.6	71.8	7,987.3	2,466.2	10,453.5
14	11R-4605	90.8	5.2	95.4	74.6	59.7	69.5	7,837.2	2,145.9	9,983.1
15	11R-4612	90.8	4.5	100.3	80.5	57.4	71.2	7,941.6	2,196.8	10,138.4
16	11R-4622	88.2	4.4	99.3	82.0	62.6	71.4	7,464.9	1,951.1	9,416.0
17	11R-5145	87.4	6.1	98.4	75.5	58.7	70.7	7,563.6	1,924.7	9,488.3
18	11R-5167	90.4	4.5	97.6	78.3	59.4	70.3	7,779.8	2,862.2	10,642.0
19	11R-5169	90.3	5.3	77.9	73.4	56.4	69.0	7,136.7	3,049.5	10,186.2
20	11R-5171	90.6	6.2	85.5	71.5	58.5	69.2	6,993.7	1,904.0	8,897.7
21	11R-5173	90.2	4.4	84.9	84.5	60.8	72.7	7,636.5	2,542.7	10,179.2
22	11R-5263	90.4	5.6	96.8	72.8	55.1	71.9	7,278.6	2,899.9	10,178.5
23	CCDR	89.2	4.3	91.3	74.8	59.4	70.7	7,919.4	2,435.7	10,355.1
24	CL152	88.5	4.4	98	77.4	57.3	67.7	6,932.7	2,989.9	9,922.6
25	MRMT	90.3	4.2	76	80.2	59.7	71.0	7,119.4	2,265.8	9,385.2



Table 2. 2013 Field performance of some select lines carrying Pi-ta<sup>2</sup>/Pi-b lines. Rice Research Station.

No.	Plant ID	Blast genes	Grain type <sup>§</sup>	Vigor <sup>¶</sup>	Plant height (cm)	Heading date	Panicle length (cm)	Panicle weight (g)	Row yield (g)
1	09F11233	Pi-ta <sup>2</sup> ,Pi-b	L	2	74	88	30.7	8.6	801
2	09F11234	Pi-ta <sup>2</sup> ,Pi-b	L	1	81	89	27.6	8.9	728
3	09F11235	Pi-ta <sup>2</sup> ,Pi-b	L	2	75	80	27.6	8.7	694
4	09F11236	Pi-ta <sup>2</sup> ,Pi-b	L	3	75	97	28.6	7.4	629
5	09F11237	Pi-ta <sup>2</sup> ,Pi-b	L	3	75	83	29.5	9.1	590
6	09F12134	Pi-ta <sup>2</sup> ,Pi-b	L	4	78	75	35.5	6.1	499
7	09F12135	Pi-ta <sup>2</sup> ,Pi-b	L	2	81	85	27.7	6.6	547
8	09F12138	Pi-ta <sup>2</sup> ,Pi-b	L	3	79	93	24.9	6.9	696
9	09F12139	Pi-ta <sup>2</sup> ,Pi-b	L	3	83	90	29.8	7.4	567
10	09F19122	Pi-ta <sup>2</sup> ,Pi-b	L	3	76	82	36.3	6.7	774
11	09F19123	Pi-ta <sup>2</sup> ,Pi-b	L	2	74	83	30.2	7.9	482
12	09F19125	Pi-ta <sup>2</sup> ,Pi-b	L	5	77	88	27.9	7.0	572
13	09F19126	Pi-ta <sup>2</sup> ,Pi-b	L	3	82	81	28.1	7.3	569
14	09F19338	Pi-ta <sup>2</sup> ,Pi-b	L	1	78	87	32.5	6.9	607
15	09F19341	Pi-ta <sup>2</sup> ,Pi-b	L	2	81	74	26.7	6.7	788
16	09F23022	Pi-ta <sup>2</sup> ,Pi-b	L	2	82	84	27.2	5.4	560
17	09F23023	Pi-ta <sup>2</sup> ,Pi-b	L	5	85	77	33.9	6.3	674
18	09F23026	Pi-ta <sup>2</sup> ,Pi-b	L	1	84	77	37.0	6.4	576
19	09F23044	Pi-ta <sup>2</sup> ,Pi-b	L	2	82	85	27.7	8.7	666
20	09F23045	Pi-ta <sup>2</sup> ,Pi-b	L	4	78	74	32.4	9.1	590
21	09F23751	Pi-ta <sup>2</sup> ,Pi-b	L	3	77	76	27.9	7.8	667
22	09F23755	Pi-ta <sup>2</sup> ,Pi-b	L	2	74	84	28.3	7.9	590
23	09F23756	Pi-ta <sup>2</sup> ,Pi-b	L	3	82	77	26.0	8.6	623
24	09F23759	Pi-ta <sup>2</sup> ,Pi-b	L	1	82	77	33.2	6.7	567
25	09F24532	Pi-ta <sup>2</sup> ,Pi-b	L	4	82	84	34.7	8.8	589
26	09F24533	Pi-ta <sup>2</sup> ,Pi-b	L	1	78	90	36.3	8.6	695
27	09F24541	Pi-ta <sup>2</sup> ,Pi-b	L	2	83	82	28.9	8.9	777
28	09F24542	Pi-ta <sup>2</sup> ,Pi-b	L	4	85	77	35.9	7.6	580
29	09F24544	Pi-ta <sup>2</sup> ,Pi-b	L	2	81	81	27.5	7.8	667
30	09F26232	Pi-ta <sup>2</sup> ,Pi-b	L	3	83	83	29.8	7.9	458
31	09F26233	Pi-ta <sup>2</sup> ,Pi-b	L	2	82	85	32.3	7.3	677
32	09F26234	Pi-ta <sup>2</sup> ,Pi-b	L	2	78	90	32.1	8.5	667
33	09F26237	Pi-ta <sup>2</sup> ,Pi-b	L	2	77	86	27.3	6.8	434
34	09F26238	Pi-ta <sup>2</sup> ,Pi-b	L	3	78	76	32.9	9.5	555
35	09F22639	Pi-ta <sup>2</sup> ,Pi-b	L	1	81	78	27.7	7.2	790
36	09F26727	Pi-ta <sup>2</sup> ,Pi-b	L	1	81	75	25.3	5.9	487
37	09F26728	Pi-ta <sup>2</sup> ,Pi-b	L	3	78	88	29.2	6.6	577
38	09F23846	Pi-ta <sup>2</sup> ,Pi-b	L	1	81	81	30.7	7.8	767
39	09F23847	Pi-ta <sup>2</sup> ,Pi-b	L	2	84	84	36.4	7.8	533
40	09F21751	Pi-ta <sup>2</sup> ,Pi-b	L	2	85	80	35.3	7.7	789
41	09F21752	Pi-ta <sup>2</sup> ,Pi-b	L	2	77	81	24.2	8.2	569
42	09F21753	Pi-ta <sup>2</sup> ,Pi-b	L	3	77	79	30.9	6.9	779
43	09F21756	Pi-ta <sup>2</sup> ,Pi-b	L	2	79	78	35.5	8.1	671
44	09F28258	Pi-ta <sup>2</sup> ,Pi-b	L	1	85	78	35.1	7.4	649
45	09F28259	Pi-ta <sup>2</sup> ,Pi-b	L	1	91	90	30.4	5.8	705
46	09F28455	Pi-ta <sup>2</sup> ,Pi-b	L	1	87	79	28.5	7.5	576
47	09F28456	Pi-ta <sup>2</sup> ,Pi-b	L	1	79	89	33.4	7.7	453
48	09F28544	Pi-ta <sup>2</sup> ,Pi-b	L	2	81	85	29.4	5.3	659
49	09F28548	Pi-ta <sup>2</sup> ,Pi-b	L	1	85	91	25.8	6.6	789
50	09F28549	Pi-ta <sup>2</sup> ,Pi-b	L	3	88	79	21.5	7.5	556
51	CCDR		L	1	97	87	29.7	7.6	570

<sup>§</sup>L= Long grain; <sup>¶</sup> Subjective rating (1 = excellent, 9 = poor).

Table 3. Field performance of two marker-assisted backcrossing lines to pyramid Pi-ta<sup>2</sup>, Pi-b, and Pi-kh genes into the recurrent parental lines Cocodrie (CCDR) and Mermentau (MRMT). Rice Research Station.

	Allele compot. (%) <sup>†</sup>	Grain type <sup>§</sup>	Vigor <sup>¶</sup>	Days to 50% heading	Plant height (cm)	Row yield (g)
mbCCDR-33	77(C);4(L);10(S);9(K)	L	1	87	97	545
mbMRMT-09	69(M);17(L);9(S);5(K)	L	2	86	98	578
CCDR ck		L	2	82	100	499
MRMT ck		L	2	83	99	503
C.V. (%)			4.7	4.5	4.2	26.8
LSD (0.05)			0.7	4.6	4.1	25.3

<sup>†</sup>C=Cocodrie, L=Lemont, S=Saber, K=Katy, and M=Mermentau; <sup>§</sup>L= long grain; <sup>¶</sup> Subjective rating (1 = excellent, 9 = poor).

Table 4. Field performance of double haploid lines carrying Pi-ta<sup>2</sup>, Pi-b, and Pi-kh genes. Rice Research Station.

	Allele compot. (%) <sup>†</sup>	Grain type <sup>§</sup>	Vigor <sup>¶</sup>	Days to 50% heading	Plant height (cm)	Row yield (g)
mbCCDR-33	65(C);11(L);13(S);11(K)	L	1	89	102	531
mbMRMT-09	62(M);11(L);15(S);12(K)	L	2	93	101	496
CCDR ck		L	1	81	101	505
MRMT ck		L	1	84	98	517
C.V. (%)			3.4	3.1	6.9	29.2
LSD (0.05)			0.4	4.1	3.1	19.0

<sup>†</sup>C=Cocodrie, L=Lemont, S=Saber, K=Katy, and M=Mermentau; <sup>§</sup>L= long grain; <sup>¶</sup> Subjective rating (1 = excellent, 9 = poor).

Table 5. Milling quality and grain appearance of advanced select lines from marker assisted breeding. Rice Research Station.

Lines	Grain type <sup>§</sup>	Whole	Milled	Appearance & Size homogeneity <sup>¶</sup>	% Chalk
<b>09R-B-1558</b>	L	51.00	65.73	7.5	15
<b>09R-B-1982</b>	L	44.83	61.30	8.0	10
<b>09R-B-746</b>	L	44.85	63.16	8.5	5
<b>09R-B-338</b>	L	49.67	65.15	8.0	10
<b>09R-B-1650</b>	L	48.53	62.75	8.5	5
<b>09R-B-958</b>	L	48.67	64.53	8.0	15
<b>09R-6731</b>	L	49.00	64.48	8.5	10
<b>09R-6716</b>	L	45.66	63.49	8.0	10
<b>09R-6703</b>	L	48.27	63.58	8.0	7.5
<b>09R-6718</b>	L	45.42	63.20	8.5	7.5
<b>09R-6750</b>	L	50.85	63.40	9.0	5

<sup>§</sup>L= long grain; <sup>¶</sup> Subjective rating (1 = poor, 9 = excellent).

## DEVELOPMENT OF HERBICIDE RESISTANCE IN RICE (*ORYZA SATIVA*)

I. Wenefrida, H.S. Utomo, and S.D. Linscombe

Clearfield technology is effective in controlling red rice. This weed control methodology relies on Clearfield rice that was developed from an induced mutation to acquire resistance to imidazolinone herbicides. This specific herbicide-resistant characteristic allows a selective control against red rice. Without it, it would be very difficult to chemically control red rice in the rice field, since red rice is closely related to commercial rice. Clearfield technology has helped improve and stabilize yield potentials in many regions contaminated by red rice. In recent years, its sustainability has become a concern. Extensive utilization of Clearfield varieties can lead to higher probabilities of field outcrossing between Clearfield rice with red rice. The outcrossing allows red rice to acquire resistance to the herbicide and therefore renders Clearfield technology ineffective. New types of herbicide-resistant rice with different resistance modes are needed to rapidly eliminate red rice and other weeds that possess resistance to Newpath herbicide. These new herbicide-resistant rice lines will help keep the effective weed controlling technology viable. The objectives of this research are to develop new herbicide resistant lines, confirm the resistance, and characterize herbicide-resistant gene(s). Three different herbicides, including trifloxysulfuron sodium (Envoke), sethoxydim (Poast, Grass Getter), and glyphosate (Roundup) will be used in this research. Each of these herbicides has different modes of action than the imidazolinone herbicide.

### Materials and Methods:

Last year, the M<sub>2</sub> plants from cultivars Cypress and Catahoula were grown in the field at the Rice Research Station experimental site. The herbicide trifloxysulfuron sodium was applied on young seedlings with 3 to 5 leaves using a rice buggy sprayer with air pressure and herbicide solution set to deliver the herbicide containing twice the amount of the recommended rate (0.3 oz ai/A). Surviving plants were dug up and transferred to the greenhouse and grown to maturity. Seeds were collected from each plant, dried to reach moisture content of 12%, and then planted on 12- x 24-inch trays (5 g of seed/tray). When they reached 3- to 5- leaf stage, the new seedlings were re-treated with the same herbicide using a backpack sprayer with air pressure of 32 psi to deliver herbicide twice the amount of the recommended rate. The plants with confirmed/consistent resistance to the herbicide were grown in the greenhouse. Seeds will be collected at harvest time. Crosses with non-resistant wild type varieties will be conducted to determine inheritance of the traits.

### Results:

Due to unknown conditions, the herbicide spray using twice the rate recommended did not kill the seedlings. The majority of the seedlings remained green, stopped growing for a while, and resumed growing. Because of that, the spray was repeated with similar results. The third spray was carried out about one month following the second spray. The field remained green, but the majority of the plants were stunted with a high degree of sterility. Several plants, however, exhibited normal growth characteristics producing fertile seeds. These plants were dug up and transferred to the greenhouse. Small portions of the M<sub>2</sub> seeds were grown in flats in the greenhouse, sprayed with the same rate, and brought back to the greenhouse for selection.

The remaining M<sub>2</sub> seeds will be subjected to selection for Roundup and sethoxydim herbicides in the next growing season. Summary of the results is presented in Table 1. Figures 1 to 6 are the sequence of screening steps.

Table 1. Number of plants recovered and retested (putative-resistant) lines.

No.	Screening	Number of plants recovered	Retested (putative-resistant) line	Follow up test and genetic study
1	Field	Seven plants		
		1	+	Grown for seed and crosses
		2	-	
		3	-	
		4	+	Grown for seed and crosses
		5	-	
		6	n/a	
2	Greenhouse	One Plant		
		1	+	Grown for seed and crosses

Figure 1. Production of  $M_1$  seeds.



Figure 2.  $M_2$  plants sprayed at 2- to 3- leaf-stage prior to spraying with trifloxysulfuron sodium herbicide, twice the recommended rate.



Figure 3. Field appearance two weeks after the herbicide spray.



Figure 4. Third spray with trifloxysulfuron sodium herbicide, twice the recommended rate.





Figure 5. Putative-resistant plant.



Figure 6. Fully mature plant recovered from herbicide spray.



## **RICE AGRONOMY**

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### **INTRODUCTION**

The following three sections of the report documented research conducted in rice plant nutrition, cultural management, and rice rotational crops. Rice plant nutrition studies were conducted at the LSU AgCenter Rice Research Station, as well as multiple off station locations, in an effort to generate agronomic production information representative of all Louisiana rice production areas. Rice nutrition studies were conducted in Acadia Parish at the Rice Research Station, in addition to Vermilion, St. Landry, Franklin, Richland, and Evangeline parishes. Cultural management studies were conducted at the Rice Research Station north and south units.

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Throughout the following sections, multiple abbreviations are used to represent common units of measure and agricultural chemicals; these abbreviations are explained below in Tables 1 and 2, respectively.

Table 1. Common abbreviations used in agronomic research at the Rice Research Station.

Abbreviation	Explanation
A	Acre
ANOVA	Analysis of variance
bushel/A	Bushels per acre
Ca	Calcium
COC	Crop oil concentrate
DAT	Days after treatment
DPP	Days prior to planting
Fe	Iron
ft	Feet
ft <sup>2</sup>	Square feet
gal/A	Gallons product per acre
Head Rice	Percent unbroken kernels left after milling
in	Inches
lb	Pounds
lb/A	Pounds product per acre
lb ai/A	Pounds active ingredient per acre
Ldg-Rate	Lodging rate in percent
Ldg-Type	Lodging type on a scale from 0 to 5: where 0 = no lodging, 1 = slightly lodged (approximately 1 - 23° angle) and 5 = lodged to ground (90° angle)
K	Potassium
Main	First rice crop; crop growth stage prior to first harvest
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
N	Nitrogen
Na	Sodium
NA	Information not available/applicable
NUE	Nitrogen use efficiency
oz/A	Ounces product per acre
P	Phosphorus
PD	Panicle differentiation
PI	Panicle initiation
pl/m <sup>2</sup>	Plant densities measured 14 days after seeding emergence by counting the main-stem numbers in a randomly selected area of 1 m <sup>2</sup> in each plot
Postharvest	Application applied immediately following main crop harvest
ppm	Parts per million
PRE	Application prior to crop emergence
Preflood	Preflood application applied 1 to 2 days prior to permanent flood establishment
Preplant	Preplanting application prior to flooding and seeding
pt/A	Pints product per acre
Ratoon	Second rice crop growth, after harvest of first (main) crop
RRS	Rice Research Station, Crowley, LA
RYG	Relative grain yield
S	Sulfur
SB Severity	Sheath blight infestation on a scale from 1 to 9; where 1 = no sheath blight and 9 = severe sheath blight infestation
Total Mill	Percent of rice kernels left after milling
Zn	Zinc
10% Heading(HD)	Crop growth stage: where 10% of plants within a plot have visible panicles
50% Heading(HD)	Number of days from effective seeding date to 50% panicle exertion



Table 2. Common crop protection chemicals and formulations used in agronomic research at the Rice Research Station.

Trade Name	Common Name	Formulation	Company
<u>Herbicides</u>			
Aim	Carfentrazone	EC2	FMC Corp.
Arrosolo	Propanil + molinate	3 lb + 3 lb	RiceCo
Basagran	Bentazon	4 lb	BASF
Clincher	Cyhalofop	2.38 lb	Dow Agro Science LLC
Command	Clomazone	3ME	FMC Corp.
Duet	Propanil + bensulfuron	4 lb + 0.48 oz	Rice Co.
Grandstand R	Triclopyr	3 lb	Dow Agro Science LLC
Grasp	Penoxsulam	SC2	Dow Agro Science LLC
Honcho Plus	Glyphosate	4 lb	Monsanto
Liberty	Glufosinate ammonium	18.19%	Bayer CropScience
Londax	Bensulfuron	60% DF	DuPont
Newpath	Imazethapyr	2 lb	BASF
Permit	Halosulfuron	75% WSG	Monsanto
Prowl	Pendimethalin	EL 3.3	BASF
Regiment	Bispyribac-sodium	80% DF	Valent USA
Rice Beaux	Propanil + Thiobencarb		Rice Co LLC
Roundup Weatherman	Glyphosate	4 lb	Monsanto
Stam M4	Propanil	4 lb	Dow Agro Science LLC
Weedar 64	2,4-D	3.8 lb	Aventis
<u>Insecticides</u>			
Dermacor	Rynaxypyr		DuPont
Karate Z	Cyhalothrin	2.08 lb	Syngenta
Mustang Max	Zeta-cypermethrin	0.8	FMC Corp.
Methyl Parathion	Methyl Parathion	4 lb	Cheminova
<u>Fungicides</u>			
Dithane DF	Mancozeb	75% DF	Dow Agro Science LLC
Stratego	Propiconazole + Trifloxystrobin	1.04 lb + 1.04 lb	Bayer Crop Science LLC
Quadris	Azoxystrobin	2.08 lb	Syngenta
Quilt	Azoxystrobin + Propiconazole	1.04 lb + 0.62 lb	Syngenta

## **RICE FERTILITY AND CULTURAL PRACTICE RESEARCH**

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### **Variety by Nitrogen Rate and Application Timing Experiments**

Variety by nitrogen (N) experiments are conducted yearly throughout Louisiana in order to establish N requirements for new commercial varieties and advanced experimental lines. Rice varieties vary in their response to N rates and timing of application. These varietal N response differences can be attributed to several factors including such traits as lodging, disease susceptibility, and N use efficiency. Environmental influences also impact the N rate needed to produce optimum yields. These include such factors as soil type, weather, disease, and insect pressure. For this reason, trials are conducted not only at the Rice Research Station (RRS), but also at cooperator sites in Vermilion (VP), Franklin (FP), St. Landry (SLP), and Richland (RP) parishes. The soils at RRS, VP, FP, SLP, and RP are classified as Crowley silt loam, Kaplan silt loam, Sharkey clay, Tensas-Sharkey complex, and Hebert silty clay, respectively. Eight single pre-flood N rates (0, 30, 60, 90, 120, 150, 180, and 210 lb/A), four split rates applied at the 4- to 5-leaf stage, and at panicle differentiation (45/45, 75/45, 105/45, and 135/45 lb N/A) were evaluated. The N requirement, days to 50% heading, lodging susceptibility, and plant height were all determined. Ratoon data is also determined for trials in Southwest Louisiana. A minimum of 3 years of data for each variety are needed before final recommendations are established. These recommendations can be found in Rice Varieties and Management Tips 2013, LAES publication number 2270. Electronic copies of this publication can be accessed from the LSU AgCenter Website: (<http://www.lsuagcenter.com>).

One advanced experimental rice line and four conventional rice varieties were evaluated for their response to N application rate and time of application in 2013. Complete results for each variety by N trials at each location are presented in Tables 1 – 20. The Rice Research Station location was drill-seeded into a stale seedbed on March 14. Statistically, optimum grain yields at the RRS were obtained after applying 180 lb N/A for CL162, Caffey, and Antonio, and 150 lb N/A for CL152 and experimental line CL2065.

Rice was drill-seeded into a conventionally tilled seedbed on March 19 at the VP location. Only Clearfield varieties were planted at this location. Optimal rice grain yields at VP were obtained at 90 lb N/A for CL2065 and when no N was applied for CL152 and CL162. CL2065 did begin to lodge when 180 lb N/A was applied.

Variety by N trials at FP were drill-seeded to a spring stale seedbed on May 20. Optimal rice yields at FP were 60 lb N/A for Antonio and CL2065, 90 lb N/A for CL152, and 150 lb N/A for Caffey.

Rice was drill-seeded to a conventionally tilled seedbed at the SLP location on March 27. Optimal rice yields at SLP were obtained at 150 lb N/A for Antonio and 90 lb N/A for CL152, CL162, CL2065, and Caffey. Medium grains CL2065 and Caffey at SLP were lodged due to the bedding and feeding from wild hogs. No long-grain rice varieties were damaged by the hogs.

Rice was drill-seeded to a fall stale seedbed at the RP location on May 21. Only the Clearfield experimental CL2065 and Clearfield variety CL152 were tested at this location. CL152 yield was optimized at an N rate of 90 lb N/A, while CL2065 yield was optimized at an N rate of 60 lb N/A.

### **Other Rice Fertility Research**

A trial was conducted at the RRS location to evaluate and compare the N Use Efficiency (NUE) of three rice hybrids (CLXL729, CLXL745, and XL723) and three rice varieties (CL111, CL152, and Mermentau). N was applied at a rate of 150 lb N/A and three application methods. Application methods included a single pre-flood application (SPF), a 120/30 lb N/A application split between pre-flood and green ring (PF/GR), and a 120/30 lb N/A split between pre-flood and 10% heading (PF/HD). Results of this trial are presented in Table 21. NUE for CLXL729 ranged from 75 to 112% and was not significantly different between the SPF and PF/HD applications. CLXL745 NUE ranged from 96 to 103% of applied N and was not significantly different between application timings. XL723 NUE ranged from 67 to 94% and was most efficient with the SPF application. CL111 NUE ranged from 54 to 84% and was not statically different between SPF and SFP/GR applications. CL152 NUE ranged from

53 to 77%, while Mermentau NUE ranged from 31 to 46%. Significant difference in NUE between the application timings for Mermentau and CL152 were not observed.

Trials were established at the RRS and VP locations to evaluate the hybrid ratoon crop response to post-harvest N application rates. Three hybrids (CLXL745, CLXL729, and XL723) and 6 rates of N (0, 30, 60, 90, 120, and 150 lb N/A) were evaluated. Results of the RRS trial are presented in Table 23. Optimum ratoon N rate for CLXL729 and CLXL745 was 120 lb N/A, while XL723 was optimized at an N rate of 150 lb N/A. At the VP location (Table 24), CL151 was substituted for XL723 in order to use only Clearfield cultivars at this location. CLXL745 was optimized at 90 lb N/A, CLXL729 was optimized at 150 lb N/A, and CL151 was optimized at 60 lb N/A.

Trials were established at the RRS and VP locations to evaluate three rice varieties (CL111, CL152, and Mermentau) for their response to ratoon fertilization rate. Six rates of N were evaluated (0, 30, 60, 90, 120, and 150 lb N/A). Results for the RRS location and the VP location are presented in Tables 25 and 26, respectively. Optimum ratoon yields at the RRS location were obtained at a rate of 90 lb N/A for Mermentau and CL111, while yields were optimized at an N rate of 120 lb N/A for CL152. At the VP location, CL151 was substituted for Mermentau in order to grow only Clearfield varieties at this location. Optimum ratoon yields were obtained with an N rate of 90 lb N/A for CL151 and CL111, while yield was optimized at an N rate of 120 lb N/A for CL152.

Rice response to potassium (K) fertilization rate was evaluated at the LaHaye farm near Mamou, LA. Mehlich-3 soil test K at this location was 37 ppm. Potash fertilizer was surface broadcast at planting at rates of 0, 30, 60, 90, 120, and 150 lb K<sub>2</sub>O/A. Results of this trial are presented in Table 32. Main crop and total rice yield were both optimized at a K<sub>2</sub>O rate of 90 lb/A.

Rice response to phosphorus (P) fertilization rate was evaluated at the LaHaye farm near Mamou, LA. Mehlich-3 soil test P ranged from 2.4 to 7.3 ppm. Fertilizer P was applied as triplesuper phosphate surface broadcast at planting. Rates of P<sub>2</sub>O<sub>5</sub> were 0, 30, 60, 90, 120, and 150 lb P<sub>2</sub>O<sub>5</sub>/A. Results of this trial are presented in Table 33. Main crop rice yield was optimized at a rate of 30 lb P<sub>2</sub>O<sub>5</sub>/A; however, the ratoon crop was optimized when 120 lb P<sub>2</sub>O<sub>5</sub>/A was applied. Total yield (main plus ratoon crop) was optimized statistically at 90 lb P<sub>2</sub>O<sub>5</sub>/A.

A trial to evaluate rice main and ratoon crop response to K fertilization timing was established at the LaHaye farm near Mamou, LA. Mehlich-3 soil test K at this location was 37 ppm. One rate of K<sub>2</sub>O (120 lb K<sub>2</sub>O/A) was applied at eight application timings. Also included was one untreated control treatment. All applications were surface broadcast using potash (0-0-60). Application timings included: 1) at planting, 2) pre-flood, 3) mid-tillering (approximately 2 weeks post flood), 4) Green ring, 5) 50% heading, 6) post main crop harvest (for ratoon crop evaluation only), 7) split application at pre-flood (60 lb K<sub>2</sub>O) and 50% heading (60 lb K<sub>2</sub>O), and 8) split application at planting (60 lb K<sub>2</sub>O) and post main crop harvest (60 lb K<sub>2</sub>O). Both main crop and total yield (main plus ratoon crop) were optimized with the planting application timing (7,436 lb/A), and yield was reduced at all later application timings with the exception of the at planting /50% heading split application.

A trial to evaluate rice main and ratoon crop response to P fertilization timing was established at the LaHaye farm near Mamou, LA. Mehlich-3 soil test P ranged from 2.4 to 7.3 ppm. One rate of P<sub>2</sub>O<sub>5</sub> (120 lb P<sub>2</sub>O<sub>5</sub>/A) was applied at eight application timings. Also included was one untreated control treatment. All applications were surface broadcast using triplesuper phosphate. Application timings included: 1) at planting, 2) pre-flood, 3) mid-tillering (approximately 2 weeks post flood), 4) Green ring, 5) 50% heading, 6) post main crop harvest (for ratoon crop evaluation only), 7) split application at pre-flood (60 lb P<sub>2</sub>O<sub>5</sub>) and 50% heading (60 lb P<sub>2</sub>O<sub>5</sub>), and 8) split application at planting (60 lb P<sub>2</sub>O<sub>5</sub>) and post main crop harvest (60 lb P<sub>2</sub>O<sub>5</sub>). Main and total (main plus ratoon) crop yields were maximized with the planting application and the pre-flood application timings. Yields were significantly reduced at later application timings. Split applications were not significantly different from the planting and pre-flood application timings.

Two trials (a mid-March and mid-April planting) were established to evaluate: 1) the effect of soil moisture (dry, moist, or flooded soil) on N fertilizer efficiency and yield, and 2) the potential benefit of NBPT treated urea when applied on different soil moistures. Three N fertilizer sources [urea, Agrotain-urea (3 qt/ton), and Agrotain-urea (4 qt/ton)] were evaluated. All fertilizer was applied as a surface broadcast application 10 days before permanent flood application. Where fertilizer N was applied in standing water, the flood was maintained for the remainder of the growing season. Agronomic results for the March and April planting are presented in Tables 42

and 43, respectively. In the April planting, a paired trial also measured volatilization losses using semi-open field volatilization chambers. These results are presented in Figure 1. In the March planting trial, when urea was the N fertilizer source, rice grain yields were greatest when applied on dry soil (7,359 lb/A), were significantly reduced when applied on moist soil (6,168 lb/A), and significantly reduced further when applied into a standing flood (4,354 lb/A). A similar trend was observed for rice grain yields with Agrotain-urea (3 qt/ton) as the N fertilizer source. Grain yields were 7,725, 6,852, and 4,515 lb/A when applied on a dry, moist, and flooded soil, respectively. Rice grain yields were not significantly different when applied on a dry or moist soil (7,589 and 7,047 lb/A) when Agrotain-urea was used at the high application rate (4 qt/ton). However, yields did statistically decline when Agrotain-urea (4 qt/A) was applied into a flooded soil. In the mid-April trial, when urea was the fertilizer source, rice grain yields were greatest when applied on dry ground (7,773 lb/A) and were statistically reduced when applied on moist (5,793 lb/A) or flooded (3,865 lb/A) soil.

A trial was established at the RRS to evaluate the total and rate of ammonia volatilization from the surface application of three N fertilizer sources when surface broadcast onto dry soil 10 days prior to permanent flood establishment in a drill-seeded, delayed flood rice production system. N fertilizer sources included urea, HM1152A treated urea (3 qt/ton application rate), and HM1152A treated urea (4 qt/ton application rate). Fertilizer was applied by hand into a volatilization chamber containing two rice plants on a dry soil at a rate of 120 lb N/A. Phosphoric acid-treated sponges were used to trap the ammonia gas released. The sponges were removed for analysis and replaced 9, 7, 5, 3, and 1 day(s) before the permanent flood was established, as well as 1 and 5 days post flooding. N volatilization loss at each of the five sampling times and cumulative N volatilization loss are presented in Table 46 and Figure 2, respectively. Cumulative N loss over the 15-day period of time was 14.6, 3.2, and 2.3% from urea, HM1152A-urea (3 qt/ton), and HM1152A-urea (4 qt/ton), respectively. Cumulative volatilization losses from HM1152A-urea (3 qt/ton) and HM1152A-urea (4 qt/ton) were significantly lower ( $P \leq 0.0001$ ;  $LSD = 2.6$ ) than urea (Table 1 and Fig. 1). Volatilization losses from HM1152A-urea (3 qt/ton) and HM1152A-urea (4 qt/ton) were not significantly different from each other. Agronomic results from a paired field trial are presented in Table 47. Rice grain yields were 3,466, 6,814, 6,982, and 7,168 lb/A from the untreated control, HM1152A-urea (4 qt/ton), urea, and HM1152A-urea (3 qt/ton), respectively. All treatments, which received N fertilizer, were significantly higher than the untreated control ( $P = 0.0001$ ;  $LSD = 353$ ; Table 1). Rice grain yield from urea was not significantly different than either of the HM1152A-ureas. Total N uptake was 30 lb/A for the untreated control and 110, 112, and 113 lb/A for HM1152A-urea (3 qt/ton), HM1152A-urea (4 qt/ton), and urea, respectively. All sources of N fertilizer increased total N uptake; however, they were not significantly different from each other ( $P = 0.0034$ ;  $LSD = 41.7$ ; Table 1). NUE values for HM1152A-urea (3 qt/ton), HM1152A (4 qt/ton), and urea were 66, 67, and 69%, respectively. NUE was not significantly different between N fertilizer sources. It should be noted that the two rainfall events most likely had a beneficial effect on all urea fertilizers (HM1152A-treated and untreated) when it was applied 10 days prior to flood establishment by helping incorporate the N into the soil and not leaving it exposed on the soil surface where it would be most susceptible to losses from ammonia volatilization. This may help explain why total N uptake and NUE were not significantly different between N fertilizer sources when pooled across all N rates.

A trial was established at the RRS location to evaluate the total and rate of ammonia volatilization from the surface application of three N fertilizer sources: 1) urea, 2) Agrotain Ultra-urea, and 3) Factor-urea when surface broadcast onto dry soil 10 days prior to permanent flood establishment in a drill-seeded, delayed flood rice production system. N volatilization loss at each of the five sampling times and cumulative N volatilization loss is presented in Table 48, while the accumulative N loss as a percent of the total N applied is presented graphically in Figure 3. Accumulative N loss over the 15-day period of time was 13.7, 3.7, and 3.5% from urea, Agrotain Ultra-urea, and Factor-urea, respectively. Cumulative volatilization losses from Factor-urea and Agrotain Ultra-urea were significantly lower ( $P \leq 0.0004$ ;  $LSD = 3.2$ ) than untreated urea (Table 1 and Fig. 1). Cumulative volatilization loss from Agrotain Ultra-urea was not statistically different from Factor-urea. A companion trial to the first trial was also established in order to evaluate the corresponding rice grain yield loss and fertilizer efficiency associated with three N sources and three rates when applied 10 days before permanent flood establishment. The trial was set up as a randomized complete block design with three N sources [urea (46%N), Agrotain Ultra treated urea (at 3 qt/ton urea), and Factor treated urea (at 3 qt/ton urea)] and three rates of N fertilization (60, 90, and 120 lb/A). Treatments were replicated four times. A check plot, which did not receive N fertilizer, was also included as a reference to help estimate NUE. Analysis of variance (ANOVA) results from the factorial arrangement of treatments (not including the check treatment) are presented in Tables 49 and 50 for the main effects and the 2-way interaction, respectively. Results from the ANOVA using the randomized complete block design, including the check treatment, are presented

in Table 51. Rice grain yield was adjusted to 12% moisture. Rice grain yields were not affected by the 2-way interaction of N source and N rate ( $P = 0.5235$ ; Table 2), or by the main effect of N source ( $P = 0.8623$ ; Table 1). Rice grain yield was significantly increased ( $P = 0.0001$ ;  $LSD = 265$ ; Table 1) from the 60 lb N/A (4,770 lb/A) to the 90 lb N/A rate (5,863 lb/A) and again from the 90 lb N/A to the 120 lb N/A application rate (6,531 lb/A). Total N uptake was not significantly altered due to the 2-way interaction of N source and N rate ( $P = 0.5072$ ; Table 2) or by the main effect of N source at the  $\alpha = 0.05$  level of confidence ( $P = 0.0770$ ; Table 1). However, total N uptake was increased with increasing N rate ( $P = 0.0034$ ; Table 1). Total N uptake was 55, 70, and 91 lb/A for the 60, 90, and 120 lb N/A application rates, respectively. Excluding the check plot, NUE ranged from 50 to 68% across all N sources and N rates, and was not significantly different between N sources, N rate, or the 2-way interaction of N rate and N source. It should be noted that the two rainfall events most likely had a beneficial effect on all urea fertilizers (NBPT-treated and untreated) when it was applied 10 days prior to flood establishment by helping incorporate the N into the soil and not leaving it exposed on the soil surface where it would be most susceptible to losses from ammonia volatilization. This may help explain why rice grain yield, total N uptake, and NUE were not significantly different between N fertilizer sources when pooled across all N rates.

A trial was established to evaluate the total and rate of ammonia volatilization from the surface application of six N fertilizer sources when surface broadcast onto dry soil 10 days prior to permanent flood establishment in a drill-seeded, delayed flood rice production system. Fertilizer treatments included: 1) urea, 2) Agrotain Ultra treated urea (at a rate of 3 qt/ton urea; Agrotain Ultra-urea; 26.7% NBPT), 3) Agrotain treated urea (at a rate of 3 qt/ton urea; Agrotain-urea; 20% NBPT), 4) Arborite AG treated urea (at a rate of 3 qt/ton of urea; Arborite AG-urea; NBPT % unknown), 5) Nutrisphere treated urea (Nutrisphere-urea; 2 qt/ton urea), and 6) NZone Max treated urea (NZone Max-urea; 3 qt/ton urea). N volatilization loss at each of the five sampling times and cumulative N volatilization loss is presented in Table 52. The accumulative N loss as a percent of the total N applied is presented graphically in Figure 1. Accumulative N loss over the 15-day period of time was 16.8, 15.1, 14.6, 5.2, 3.3, and 3.8% from urea, NZone Max-urea, Nutrisphere-urea, Arborite AG-urea, Agrotain-urea, and Agrotain Ultra-urea, respectively. Cumulative volatilization losses from Agrotain Ultra-urea, Agrotain-urea, and Arborite AG-urea were significantly lower ( $P \leq 0.0002$ ;  $LSD = 5.0$ ) than urea, NZone Max-urea, and Nutrisphere-urea. Volatilization losses from Agrotain Ultra-urea, Agrotain-urea, and Arborite AG-urea were not significantly different from each other. A field trial was conducted as a companion trial to the volatilization trial in order to evaluate the corresponding rice grain yield loss and fertilizer efficiency associated with the same six N sources when applied 10, 3, and 1 day(s) before permanent flood establishment. A check plot, which did not receive N fertilizer, was also included as a reference to help estimate NUE. The trial was drill-seeded with the rice variety CL152 on March 15 into a fall-state seedbed. Rice emerged on March 28. A detailed assessment of all agronomic data can be seen in Appendix B. The first N fertilizer application occurred when the rice was at the 3- to 4-leaf stage of development. It should be noted that two significant rainfall events did occur during the first 10 days of the trial. The rainfall events occurred on the fourth and fifth day of the trial and had an approximate total of 2.2 and 2.23 in, respectively. The original protocol of the trial called for a 5-day application timing; however, due to the rainfall events, this application timing was changed to a 3-day preflood application time. ANOVA results from the factorial arrangement of treatments (not including the check treatment) are presented in Tables 53 and 54 for the main effects and the 2-way interaction, respectively. Results from the ANOVA using the randomized complete block design, including the check treatment, are presented in Table 55. Rice grain yield was adjusted to 12% moisture. A significant ( $P = 0.0006$ ;  $LSD = 650$ ) interaction between N fertilizer source and time of application was observed. Rice grain yields from all N sources ranged from 7,077 to 7,658 lb/A at the 1-day preflood application timing. Rice grain yields were not statistically different between N fertilizer sources at the 1-day preflood application timing. Rice grain yields from all six N sources ranged from 6,351 to 6,741 lb/A at the 10-day preflood application timing. Rice yields among all N fertilizer sources were not statistically different from each other at the 10-day preflood application timing. The lack of a yield separation between N sources at the 10-day preflood application time is most likely due to the 4 in of rain, which occurred on days four (6-days preflood) and five (5-days preflood) of the trial. Rice grain yields between N fertilizer sources ranged from 5,510 to 7,447 lb/A at the 3-day preflood application timing. Rice grain yields for Agrotain ultra-urea (7,447 lb/A), Agrotain-urea (7,427 lb/A), and Arborite AG-urea (7,189 lb/A) were statistically greater than those observed for urea (6,230 lb/A), Nutrisphere-urea (5,881 lb/A), and NZone Max-urea (5,510 lb/A) at the 3-day application timing. It should be noted that the ground was damp from the previous rains at the 3-day application timing. Rice grain yields at the 3-day application timing did not differ statistically among all three NBPT treated urea fertilizers evaluated in this study. NUE, listed as N fertilizer efficiency in the tables, was not significantly affected by the 2-way interaction of N source and time of application. NUE was significantly affected at the  $P = 0.1020$  level of probability for the main effect of N source when pooled across all application timings.

(LSD = 15). NUE was highest for Arborite AG-urea (61%), followed by Agrotain Ultra-urea (56%), Agrotain-urea (55%), Nutrisphere-urea (52%), NZone Max-urea (43%), and urea (43%). NUE was also significantly ( $P = 0.0255$ ; LSD = 12) affected by time of application. The 3-day preflood application timing, which was applied on damp ground, had the lowest NUE (42%), followed by the 10-day preflood application timing (52%), and the 1-day preflood application timing (61%) when pooled across all N fertilizer sources. The 1-day preflood application timing was significantly higher than the 3-day application timing, but not the 10-day application timing. However, it should be noted that the rainfall events most likely had a beneficial effect on the 10-day preflood application timing by helping incorporate the N into the soil. In addition, the rainfall events most likely had a negative effect on the 3-day application timing, since application of urea fertilizers onto damp soils can increase the initial rate of N volatilization.

A trial was established at the RRS to evaluate the total and rate of ammonia volatilization from the surface application of three N fertilizer sources (urea, Agrotain Ultra-urea, and Arborite AG-urea) when surface broadcast onto dry soil 10 days prior to permanent flood establishment in a drill-seeded, delayed flood rice production system. Semi-open volatilization chambers were used to estimate ammonia volatilization loss. Fertilizer was applied by hand into a volatilization chamber containing two rice plants on a dry soil at a rate of 120 lb N/A. Phosphoric acid-treated sponges were used to trap the ammonia gas released. The sponges were removed for analysis and replaced 9, 7, 5, 3, and 1 day(s) before the permanent flood was established, as well as 1 and 5 days post flooding. N volatilization loss at each of the five sampling times and cumulative N volatilization loss is presented in Table 56, while the accumulative N loss as a percent of the total N applied is presented graphically in Figure 5. Accumulative N loss over the 15-day period of time was 13.8, 3.4, 2.5, and 1% from urea, Agrotain Ultra-urea, Arborite AG-urea, and the untreated control, respectively. Cumulative volatilization losses from Arborite AG-urea and Agrotain Ultra-urea were significantly lower ( $P \leq 0.0001$ ; LSD = 1.9) than untreated urea (Table 56 and Fig. 5). Volatilization losses from Arborite AG-urea and Agrotain Ultra-urea were not significantly different from each other. A field trial was conducted as a companion trial to the volatilization trial in order to evaluate the corresponding rice grain yield loss and fertilizer efficiency associated with the same three N sources when applied 10, 5, or 1 day(s) before permanent flood establishment. The trial was set up as a randomized complete block design with three N sources and three application timings (10, 5, and 1 day(s) prior to flood establishment, DPF). Treatments were replicated four times. A check plot, which did not receive N fertilizer, was also included as a reference to help estimate NUE. The trial was drill-seeded with the rice variety CL152 on March 15 into a fall-stale seedbed. Rice emerged on March 28. The first N fertilizer application occurred when the rice was at the 3- to 4-leaf stage of development. It should be noted that two significant rainfall events did occur during the first 10 days of the trial. The rainfall events occurred on the fourth and fifth day of the trial and had an approximate total of 2.2 and 2.23 in, respectively. ANOVA results from the factorial arrangement of treatments (not including the check treatment) are presented in Tables 57, 58, and 59 for the main effects, 2-way, and 3-way interactions, respectively. Results from the ANOVA using the randomized complete block design, including the check treatment, are presented in Table 60. Rice grain yield was adjusted to 12% moisture. Rice grain yield was not significantly ( $\alpha = 0.05$ ) affected by the 3-way (Table 59) or any of the 2-way (Table 58) interactions between N source, rate, or time of application. Rice grain yield was significantly affected by the main effect of N source (Table 57;  $P = 0.0311$ ; LSD = 251) when pooled across N rate and time of application. Rice grain yield, when Arborite AG-urea was the N fertilizer source (6,326 lb/A), was significantly higher than untreated urea (6,085 lb/A) and statistically similar to Agrotain Ultra-urea (6449 lb/A). The main effect of N rate was also statically significant (Table 57;  $P = 0.0011$ ; LSD = 493) on rice grain yield when pooled across N source and time of application. Rice grain yield was higher (7244 lb/A) at the 120 lb/A application rate as compared with the 60 lb/A application rate (5,329 lb/A). The main effect of time of application was also statistically significant for rice grain yield (Table 57;  $P = 0.0067$ ; LSD = 539) when pooled across N source and rate. One-day preflood statistically out yielded (6886 lb/A) both 5-day (6198 lb/A) and 10-day preflood (5776 lb/A); however, 5-day and 1-day preflood application timings were not statistically different from each other. NUE, listed as N fertilizer efficiency in the tables, was not significant for the 3-way (Table 59) or any of the 2-way (Table 58) interactions between N source, rate, or time of application. NUE was statistically significant (Table 57) at the  $P = 0.0968$  level of confidence for the main effect of N source when pooled over N rate and time of application (LSD = 16). NUE for untreated urea (53%) was statistically lower than Arborite AG treated urea (69%) as well as Agrotain treated urea (66%). NUE for Arborite-urea and Agrotain-urea were not statistically different from each other. The main effect of time of application when pooled over N rate and N source was also statistically significant at the  $P = 0.097$  level of confidence (Table 57; LSD = 15). In general, NUE was highest for the 1-day preflood application timing (70%), followed by the 5-day (64%), and 10-day (54%) application timing.

A trial was established at the RRS to evaluate the amount and rate of ammonia volatilization loss from five N fertilizer sources over a 15-day period of time. Fertilizer N sources evaluated included: 1) urea (46% N), 2) Agrotain treated urea (Agrotain-urea; at 4 qt/ton urea; 46% N), 3) Ammonium sulfate (AMS; 21% N), 4) A 3:1 urea-ammonium sulfate blend (urea-AMS; 39.75% N), and 5) Amidis (40% N). Semi-open volatilization chambers similar to that described by Norman et al. (2009) were used to estimate ammonia volatilization loss. Fertilizer was applied by hand into a volatilization chamber containing two rice plants on a dry soil at a rate of 130 lb N/A. Phosphoric acid-treated sponges were used to trap the ammonia gas released. The sponges were removed for analysis and replaced 9, 7, 5, 3, and 1 day(s) before the permanent flood was established, as well as 1 and 5 days post flooding. Volatilization losses from each sampling time are presented in Table 61. Cumulative N loss over the 15-day period, after fertilizer N application, is presented graphically in Figure 6. Accumulative N loss over the 15-day period of time was 2.3, 4.3, 13.1, 14.7, and 16.4% from AMS, Agrotain-urea, urea-AMS blend, urea, and Amidis, respectively. Cumulative volatilization losses from AMS and Agrotain-urea were significantly lower ( $P \leq 0.0001$ ;  $LSD = 3.7$ ) than all other N sources in the trial (Table 61 and Fig. 6). Volatilization losses from urea, urea-AMS blend, and Amidis were not statistically different from each other. A field trial was conducted as a companion to the volatilization trial in order to evaluate the corresponding rice grain yield loss and fertilizer efficiency associated with four N sources when applied 10, 5, or 1 day(s) before permanent flood establishment. The trial was set up as a randomized complete block design with four N sources, two rates of N (80 and 130 lb N/A), and three application timings (10, 5, and 1 day(s) prior to flood establishment, DPF). Treatments were replicated four times. A check plot, which did not receive N fertilizer, was also included as a reference to help estimate NUE. The trial was drill-seeded with the rice variety CL152 on March 15 into a fall-stale seedbed. Rice emerged on March 28. The first N fertilizer application occurred when the rice was at the 3- to 4-leaf stage of development. It should be noted that two significant rainfall events did occur during the first 10 days of the trial. The rainfall events occurred on the fourth and fifth day of the trial and had an approximate total of 2.2 and 2.23 in, respectively. ANOVA results from the factorial arrangement of treatments (not including the check treatment) are presented in Tables 62, 63, and 64 for the main effects, 2-way, and 3-way interactions, respectively. Results from the ANOVA using the randomized complete block design, including the check treatment, are presented in Table 65. Rice grain yield was not significantly affected by the 3-way interaction (Table 64). A significant 2-way interaction between the main effects of N source and time of application was observed (Table 63;  $P = 0.0026$ ;  $LSD = 638$  lb/A). Rice grain yields for all N fertilizer sources applied 1 day prior to permanent flood establishment ranged from 6984 to 7,360 lb/A and were not statistically different from each other. This observation is expected, since surface broadcast applications of N fertilizer quickly followed by surface irrigation and establishment of the permanent flood is the most efficient way to apply fertilizer N in commercial rice production. The slow surface irrigation incorporates the fertilizer deeper into the soil, thus slowing potential surface N volatilization losses. All fertilizer N sources applied 10 days prior to permanent flood establishment ranged from 6,083 to 6,588 lb/A and were not significantly different from each other; however, they were significantly lower than all fertilizer sources applied 1 day before permanent flood establishment. The lack of yield separation between N sources at the 10-day preflood application time is most likely due to the 4 in of rain, which occurred on days four (6-days preflood) and five (5-days preflood) of the trial. Rice grain yield for N fertilizer sources applied 5 days before permanent flood establishment were 4930, 5369, 5869, and 7139 for the urea, urea-AMS, Amidis, and Agrotain-urea, respectively. It should be noted that fertilizers applied at the 5-day preflood application timing were applied on saturated soils from the first rainfall event and were rained on again the following day. Surface applications of urea onto saturated soils will increase the initial rate of ammonia volatilization. Rice grain yields for the Agrotain-urea (7,139 lb/A) were significantly higher than all other N fertilizer sources at the 5-day preflood application timing. Rice grain yields from urea-AMS (5,869 lb/A) were significantly higher than urea (4,930 lb/A) at the 5-day preflood application timing. Rice grain yields from Amidis (5,369 lb/A) were not significantly different than urea-AMS or urea at the 5-day preflood application timing. NUE was not significantly affected by the 3-way interaction (Table 64). Two significant 2-way interactions were observed. The first significant interaction was between the main effects of N source and time of application (Table 63;  $P = 0.0031$ ;  $LSD = 16$ ). The NUE between the N fertilizer sources for the 1-day preflood application timing ranged from 62 to 77% and were not significantly different from each other. NUE for all fertilizer sources applied 10 days prior to permanent flood establishment ranged from 41 to 51%, but were not significantly different from each other. NUE for urea (15%) applied 5 days prior to permanent flood establishment was significantly lower than both Amidis (38%) and Agrotain-urea (64%), but not significantly different than urea-AMS (29%). The second significant 2-way interaction (Table 63) was between the main effects of N fertilizer source and N rate ( $P = 0.0066$ ;  $LSD = 9$ ). At the low N rate of 80 lb/A, Agrotain-urea had a significantly higher NUE (63%) as compared with urea (41%), urea-AMS (48%), and Amidis (43%). At the higher N rate of 130 lb/A, NUE for Amidis (63%) and urea (59%) fertilizer sources were significantly higher than both urea (44%) and urea-AMS (44%).

Validation and improved calibration of the N-STaR soil test for high extractable N soils (low N fertilizer recommendation) is one ongoing objective of this project. Small plot N response trials on producer's fields are utilized for this objective. Rates of N evaluated ranging from 0 to 240 lb N/A and also include current N-STaR recommendations at the 95 and 100% relative grain yield recommendations. Two trials were conducted in 2013 at the Dwight Hardee farm in Gueydan, LA and the R&N Fontenot Farm near Vidrine, LA. Results from the Hardee and Fontenot trials are presented in Tables 66 and 67, respectively. Current N-STaR recommendations at the Hardee farm were 75 and 105 lb N/A for the 95 and 100% relative grain yield (RGY) recommendation curves, respectively. Statistically optimum N rate at the Hardee location was 90 lb N/A. Grain yield from both N-STaR recommendations were not statistically different from the optimum. Current N-STaR recommendations from the Fontenot farm were 45 and 75 lb N/A for the 95 and 100% RGY calibration curves, respectively. Optimal yields at this location occurred when 90 lb N/A were applied. The 95% RGY N-STaR N rate recommendation was statistically lower than optimum, while the 100% RGY recommendation was not statistically different. One new data from each location will be used to improve the current N-STaR calibration curve based on this data set.

### **Rice Cultural Management Research**

Two trials were established to evaluate the effects of post-harvest stubble management practices and the use of a main crop harvest desiccant has on main and ratoon crop yields. The first trial was conducted at the RRS location. Four post-harvest stubble management practices were evaluated: 1) harvesting at a normal harvest height (approximately 16"), 2) harvesting at a normal harvest height followed by mowing the stubble to 8", 3) harvesting low at approximately 8", and 4) harvesting at a normal harvest height (approximately 16") followed by rolling the stubble. Two post-harvest desiccant treatments were also evaluated: 1) sodium chlorate applied at 5 day pre-harvest interval, and 2) no harvest desiccant used. One rice variety (CL111) and one rice hybrid (CLXL745) were evaluated. Results from the RRS location are presented in Table 68. Main crop rice yields were greater for CLXL745 as compared with CL111; however, harvest height and the use of a harvest desiccant did not significantly reduce main crop yields. CL111 ratoon yields ranged from a low of 687 lb/A to a high of 2,920 lb/A. Ratoon yields for CL111 were significantly lower when post-harvest rolling was incorporated (with and without using a harvest desiccant). Ratoon rice yields for CLXL745 ranged from 996 to 4,154 lb/A. When a harvest desiccant was not used on CLXL745, ratoon yields were greatest when harvested normally (4,154 lb/A), followed by post-harvest flail mowing (3,497 lb/A), harvesting low (3,304 lb/A), and rolling (996 lb/A). When sodium chlorate was used, grain yields were significantly reduced when harvesting at a normal height (3,259 lb/A), post-harvest flail mowing (2,331 lb/A), and harvesting low (1,773 lb/A). Results at the VP location are presented in Table 69. Sodium chlorate was used at a 16 day pre-harvest interval at VP location. Ratoon yields for CL111 when sodium chlorate was not used ranged from 2295 to 1,763 lb/A. Significant differences in yield were not observed for stubble management treatments for CL111 when sodium chlorate was not used. The use of sodium chlorate as a harvest desiccant did not reduce ratoon yields for CL111. CLXL745 ratoon rice yields were significantly higher when sodium chlorate was not used for the low harvest height (5,379 lb/A), post-harvest flail mowing (4847 lb/A), post-harvest rolling (4,818 lb/A) as compared with normal harvest height (4,668 lb/A). Using sodium chlorate as a harvest desiccant reduced ratoon grain yields for CLXL745 in all management scenarios.



## Rice Variety by Nitrogen Experiments at the Rice Research Station

<b>Experiment number</b> .....	Rice Research Station VxN Studies
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 14
<b>Seeding rate/depth</b> .....	40 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 6
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
	90 lb/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 1. Determine the agronomic response of drill-seeded CL152 to nitrogen fertilizer rate and time of application (RRS.3). Rice Research Station.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top											
Rating Date								7/30/2013		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013	
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Yield	
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/A	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage															
1	UREA	0	lb ai/A	4-5 leaf	115 g	100 g	29 h	15.1 d	49.3 ab	2970 h	17.6 a	2241 g	5211 h						
2	UREA	30	lb ai/A	4-5 leaf	115 fg	100 fg	32 g	14.7 d	49.4 a	5083 g	18.0 a	2502 f	7585 g						
3	UREA	60	lb ai/A	4-5 leaf	116 efg	101 efg	34 f	15.5 d	49.2 ab	6101 f	18.2 a	2619 ef	8720 f						
4	UREA	90	lb ai/A	4-5 leaf	117 def	102 def	36 def	20.3 c	48.0 cd	7470 e	18.3 a	2880 cd	10350 e						
5	UREA	120	lb ai/A	4-5 leaf	118 bc	103 bc	38 bc	22.1 bc	47.7 de	7823 cde	18.6 a	2919 cd	10742 de						
6	UREA	150	lb ai/A	4-5 leaf	118 bcd	103 bcd	39 ab	23.0 abc	47.4 de	8829 ab	19.1 a	3240 b	12070 ab						
7	UREA	180	lb ai/A	4-5 leaf	120 a	105 a	39 ab	24.0 ab	47.4 de	9021 a	20.2 a	3199 b	12220 ab						
8	UREA	210	lb ai/A	4-5 leaf	121 a	106 a	41 a	25.7 a	47.0 e	9130 a	19.7 a	3572 a	12702 a						
9	UREA	45	lb ai/A	4-5 leaf	115 g	100 g	35 ef	16.8 d	48.7 bc	6261 f	18.5 a	2769 de	9030 f						
	UREA	45	lb ai/A	PD															
10	UREA	75	lb ai/A	4-5 leaf	116 efg	101 efg	36 cde	17.4 d	48.7 bc	7600 de	19.1 a	2759 def	10358 e						
	UREA	45	lb ai/A	PD															
11	UREA	105	lb ai/A	4-5 leaf	117 cde	102 cde	38 bcd	23.0 abc	47.5 de	8104 cd	18.6 a	3085 bc	11189 cd						
	UREA	45	lb ai/A	PD															
12	UREA	135	lb ai/A	4-5 leaf	118 b	103 b	38 bc	22.9 abc	47.6 de	8358 bc	18.7 a	3245 b	11604 bc						
	UREA	45	lb ai/A	PD															
LSD (P=.05)				1.50		1.50		2.04		2.80		0.66		602.20		1.78		257.50	
Standard Deviation				1.00		1.00		1.41		1.94		0.46		417.10		1.23		178.40	
CV				0.87		1.00		3.92		9.66		0.95		5.77		6.60		6.11	
Treatment F				14.868		14.868		22.376		16.287		13.891		77.201		1.315		17.301	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.2601		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 2. Determine the agronomic response of drill-seeded CL162 to nitrogen fertilizer rate and time of application (RRS.3). Rice Research Station.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		
Rating Date								7/30/2013		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013		
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Yield		
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/A		
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		
MC+RC																				
Trt	Trt	Rate	Growth																	
No.	Name	Rate	Unit	Stage																
1	UREA	0	lb ai/A	4-5 leaf	107	f	93	f	33	e	17.6	cde	48.4	a-e	3654	h	13.8	c	2202	c
2	UREA	30	lb ai/A	4-5 leaf	108	ef	94	ef	37	d	15.5	e	49.2	ab	5871	g	14.2	c	2517	b
3	UREA	60	lb ai/A	4-5 leaf	109	de	95	de	41	bc	15.3	e	49.4	a	7312	f	14.0	c	2595	ab
4	UREA	90	lb ai/A	4-5 leaf	110	cd	96	cd	42	ab	20.6	abc	47.8	de	8127	e	14.2	c	2756	ab
5	UREA	120	lb ai/A	4-5 leaf	112	ab	98	ab	43	ab	18.7	bcd	48.4	b-e	9153	bc	15.5	a	2826	a
6	UREA	150	lb ai/A	4-5 leaf	112	a	98	a	43	ab	19.8	a-d	48.1	cde	9293	b	15.2	ab	2759	ab
7	UREA	180	lb ai/A	4-5 leaf	112	a	98	a	43	ab	20.9	ab	47.9	cde	9387	ab	15.5	a	2598	ab
8	UREA	210	lb ai/A	4-5 leaf	113	a	99	a	44	a	21.8	a	47.4	e	9843	a	15.7	a	2790	a
9	UREA	45	lb ai/A	4-5 leaf	108	ef	94	ef	38	cd	17.4	de	48.7	a-d	7441	f	14.1	c	2668	ab
	UREA	45	lb ai/A	PD																
10	UREA	75	lb ai/A	4-5 leaf	110	cd	96	cd	40	bc	16.8	de	48.9	abc	8363	de	14.5	bc	2814	a
	UREA	45	lb ai/A	PD																
11	UREA	105	lb ai/A	4-5 leaf	111	bc	97	bc	42	ab	19.6	a-d	48.1	cde	8718	cd	14.4	bc	2853	a
	UREA	45	lb ai/A	PD																
12	UREA	135	lb ai/A	4-5 leaf	112	ab	98	ab	42	ab	19.5	a-d	48.1	cde	9178	bc	16.1	a	2761	ab
	UREA	45	lb ai/A	PD																
LSD (P=.05)					1.20		1.20		2.66		3.04		1.00		521.10		0.95		268.10	
Standard Deviation					0.80		0.80		1.84		2.10		0.69		360.90		0.66		185.70	
CV					0.73		0.83		4.56		11.28		1.43		4.50		4.45		6.93	
Treatment F					18.765		18.765		11.880		4.069		2.827		96.519		5.632		3.892	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0008		0.0103		0.0001		0.0001		0.0012	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 3. Determine the agronomic response of drill-seeded CL2065 to nitrogen fertilizer rate and time of application (RRS.1). Rice Research Station.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013	
Rating Date					50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Yield	
Rating Type					days		days		in		%		lb/bu		lb/A		%		lb/A	
Rating Unit					Main		Main		Main		Main		Main		Main		Ratoon		Ratoon	
Crop Stage Majority					Main		Main		Main		Main		Main		Main		Ratoon		Ratoon	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage																
1	UREA	0	lb ai/A	4-5 leaf	111	def	97	def	29	g	16.2	bcd	48.9	a-d	3340	h	15.5	d	1893	c
2	UREA	30	lb ai/A	4-5 leaf	110	F	96	f	33	f	16.2	bcd	49.1	abc	5454	g	16.7	bcd	2256	b
3	UREA	60	lb ai/A	4-5 leaf	110	F	96	f	36	de	13.9	d	49.8	a	7585	f	16.5	cd	2295	b
4	UREA	90	lb ai/A	4-5 leaf	111	ef	97	ef	36	cde	20.5	ab	47.8	cde	8745	de	17.0	bc	2599	ab
5	UREA	120	lb ai/A	4-5 leaf	113	abc	99	abc	39	ab	18.6	abc	48.3	b-e	9421	bcd	17.0	bc	2773	a
6	UREA	150	lb ai/A	4-5 leaf	113	ab	99	ab	38	a-d	20.9	a	47.6	de	10027	ab	18.0	ab	2857	a
7	UREA	180	lb ai/A	4-5 leaf	114	a	100	a	39	a	20.5	ab	48.0	cde	10119	ab	17.9	abc	2821	a
8	UREA	210	lb ai/A	4-5 leaf	114	a	100	a	38	abc	22.6	a	47.1	e	10462	a	18.8	a	2884	a
9	UREA	45	lb ai/A	4-5 leaf	110	f	96	f	34	ef	20.2	ab	47.6	de	7101	f	16.8	bcd	2298	b
	UREA	45	lb ai/A	PD																
10	UREA	75	lb ai/A	4-5 leaf	110	ef	96	ef	35	de	15.0	cd	49.4	ab	8509	e	17.3	bc	2361	b
	UREA	45	lb ai/A	PD																
11	UREA	105	lb ai/A	4-5 leaf	112	cde	98	cde	37	bcd	21.8	a	47.4	e	9261	cd	17.6	abc	2813	a
	UREA	45	lb ai/A	PD																
12	UREA	135	lb ai/A	4-5 leaf	112	bcd	98	bcd	37	bcd	18.3	a-d	48.5	a-e	9864	abc	17.7	abc	2748	a
	UREA	45	lb ai/A	PD																
LSD (P=.05)					1.40		1.40		2.50		4.53		1.39		736.20		1.38		354.90	
Standard Deviation					0.90		0.90		1.73		3.14		0.96		509.90		0.95		245.80	
CV					0.85		0.97		4.85		16.74		1.99		6.13		5.52		9.64	
Treatment F					11.140		11.140		11.716		3.245		3.230		70.593		3.133		6.751	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0043		0.0044		0.0001		0.0054		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 4. Determine the agronomic response of drill-seeded Caffey to nitrogen fertilizer rate and time of application (RRS.3). Rice Research Station.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice					
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice					
Rating Date								7/30/2013		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013					
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Yield		Total Yield			
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/A		lb/A			
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		MC+RC			
Trt	Trt	Rate	Growth																				
No.	Name	Rate	Unit	Stage																			
1	UREA	0	lb ai/A	4-5 leaf	115	cd	101	cd	27	g	17.5	c-f	48.7	abc	1464	i	18.3	a	1346	ef	2810	h	
2	UREA	30	lb ai/A	4-5 leaf	114	d	100	d	29	f	16.0	f	49.1	a	3135	h	18.7	a	1163	f	4298	g	
3	UREA	60	lb ai/A	4-5 leaf	115	cd	101	cd	32	cd	16.5	ef	49.1	ab	3835	fg	18.6	a	1505	de	5340	f	
4	UREA	90	lb ai/A	4-5 leaf	115	bc	101	bc	31	cde	18.7	bcd	48.5	cd	4542	e	18.2	a	1520	de	6062	e	
5	UREA	120	lb ai/A	4-5 leaf	115	bc	101	bc	32	cd	18.1	b-e	48.8	abc	5623	cd	17.9	a	1791	cd	7414	cd	
6	UREA	150	lb ai/A	4-5 leaf	117	a	103	a	33	bc	19.4	b	48.5	cd	6032	c	18.6	a	1931	bc	7963	c	
7	UREA	180	lb ai/A	4-5 leaf	118	a	104	a	35	ab	22.2	a	48.0	de	6760	ab	18.2	a	2177	b	8936	b	
8	UREA	210	lb ai/A	4-5 leaf	118	a	104	a	36	a	23.2	a	47.8	e	7294	a	18.9	a	2564	a	9858	a	
9	UREA	45	lb ai/A	4-5 leaf	114	d	100	d	29	ef	17.0	def	48.7	abc	3437	gh	19.1	a	1160	f	4597	g	
10	UREA	45	lb ai/A	PD																			
	UREA	75	lb ai/A	4-5 leaf	115	cd	101	cd	31	def	17.1	def	48.9	abc	4315	ef	18.1	a	1312	ef	5627	ef	
11	UREA	45	lb ai/A	PD																			
	UREA	105	lb ai/A	4-5 leaf	116	b	102	b	32	cd	17.5	c-f	48.8	abc	5243	d	17.1	a	1840	c	7083	d	
12	UREA	45	lb ai/A	PD																			
	UREA	135	lb ai/A	4-5 leaf	116	b	102	b	33	cd	19.1	bc	48.6	bc	6122	bc	17.2	a	1825	c	7947	c	
LSD (P=.05)				0.90		0.90		2.24		1.93		0.53		664.50		1.93		287.70		702.90			
Standard Deviation				0.60		0.60		1.55		1.33		0.37		460.20		1.33		199.30		486.80			
CV				0.53		0.61		4.90		7.21		0.76		9.55		7.32		11.88		7.50			
Treatment F				16.240		16.240		10.939		10.898		4.551		53.559		0.863		18.225		72.133			
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001		0.0003		0.0001		0.5828		0.0001		0.0001			

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 5. Determine the agronomic response of drill-seeded Antonio to nitrogen fertilizer rate and time of application (RRS.1). Rice Research Station.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice				
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice				
Rating Date								7/30/2013		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013				
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Yield		Total Yield		
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/A		lb/A		
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		MC+RC		
Trt	Trt	Rate	Rate	Growth																		
No.	Name	Rate	Unit	Stage																		
1	UREA	0	lb ai/A	4-5 leaf	108	g	94	g	27	e	13.7	g	50.0	a	1577	f	15.8	c	1595	cd	3172	i
2	UREA	30	lb ai/A	4-5 leaf	108	g	94	g	30	de	14.5	fg	49.5	ab	2800	e	17.6	abc	1547	cde	4347	h
3	UREA	60	lb ai/A	4-5 leaf	109	ef	95	ef	32	c	15.1	fg	49.3	bcd	3731	d	18.1	ab	1506	cde	5237	g
4	UREA	90	lb ai/A	4-5 leaf	110	de	96	de	35	b	15.5	f	49.4	bcd	5076	c	18.6	a	1383	de	6460	ef
5	UREA	120	lb ai/A	4-5 leaf	111	d	97	d	35	b	17.5	cd	48.8	de	6039	b	18.7	a	1431	de	7469	cd
6	UREA	150	lb ai/A	4-5 leaf	113	b	99	b	36	ab	19.5	b	48.3	ef	6134	b	18.0	ab	1780	bc	7914	bc
7	UREA	180	lb ai/A	4-5 leaf	114	a	100	a	36	ab	21.7	a	47.9	fg	6581	ab	17.8	ab	1963	b	8544	b
8	UREA	210	lb ai/A	4-5 leaf	115	a	101	a	38	a	23.1	a	47.5	g	7103	a	16.5	bc	2320	a	9423	a
9	UREA	45	lb ai/A	4-5 leaf	108	fg	94	fg	32	c	14.9	fg	49.4	bc	3716	d	18.4	a	1484	cde	5200	g
10	UREA	45	lb ai/A	PD																		
	UREA	75	lb ai/A	4-5 leaf	109	e	95	e	32	cd	15.5	ef	49.3	bcd	4786	c	19.3	a	1249	e	6035	f
11	UREA	45	lb ai/A	PD																		
	UREA	105	lb ai/A	4-5 leaf	111	cd	97	cd	33	bc	17.1	de	48.9	cde	5305	c	18.2	ab	1510	cde	6815	de
12	UREA	45	lb ai/A	PD																		
	UREA	135	lb ai/A	4-5 leaf	112	bc	98	bc	36	ab	18.7	bc	48.5	e	6605	ab	19.1	a	1632	cd	8237	b
LSD (P=.05)					1.20		1.20		2.30		1.56		0.59		609.10		1.90		325.80		725.70	
Standard Deviation					0.80		0.80		1.59		1.08		0.41		421.80		1.31		225.70		502.60	
CV					0.76		0.86		4.78		6.26		0.83		8.51		7.29		13.96		7.65	
Treatment F					34.594		34.605		13.743		30.326		12.927		64.975		2.430		6.517		54.606	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0256		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## Rice Variety by Nitrogen Experiments at Vermilion Parish

<b>Experiment number</b> .....	Vermilion Parish VxN Studies
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	40 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21
	90 lb N/A 46-0-0, August 20
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20
	2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7
	1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 6. Determine the agronomic response of drill-seeded CL152 to nitrogen fertilizer rate and time of application (VP.3). Vermilion Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		Rice top		Rice		Rice		Rice			
Rating Date									8/1/2013		8/16/2013		8/16/2013		8/16/2013			
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.			
Rating Unit					days		days		in		% plot		rate		%			
Crop Stage Majority					Main		Main		Main		Main		Main		Main			
Trt	Trt	Rate	Growth															
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	105	f	91	f	40	d	.	.	14.7	a	44.2	a	8596	a
2	UREA	30	lb ai/A	4-5 leaf	107	ef	93	ef	42	c	.	.	14.8	a	44.1	ab	8370	a
3	UREA	60	lb ai/A	4-5 leaf	108	de	94	de	44	ab	.	.	15.9	a	43.5	a-d	8986	a
4	UREA	90	lb ai/A	4-5 leaf	111	bc	97	bc	43	abc	.	.	16.3	a	43.2	a-d	9337	a
5	UREA	120	lb ai/A	4-5 leaf	112	ab	98	ab	44	ab	.	.	16.1	a	43.4	a-d	9166	a
6	UREA	150	lb ai/A	4-5 leaf	114	a	100	a	44	a	.	.	17.3	a	42.6	d	8606	a
7	UREA	180	lb ai/A	4-5 leaf	113	ab	99	ab	44	a	.	.	17.2	a	42.7	cd	8405	a
8	UREA	210	lb ai/A	4-5 leaf	114	a	100	a	44	a	30	2	16.2	a	43.3	a-d	8160	a
9	UREA	45	lb ai/A	4-5 leaf	110	cd	96	cd	43	abc	.	.	15.4	a	43.8	abc	8697	a
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	110	cd	96	cd	44	a	.	.	16.9	a	42.9	cd	8851	a
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	112	ab	98	ab	42	bc	.	.	17.7	a	42.3	d	8763	a
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	114	a	100	a	44	ab	.	.	16.8	a	43.1	bcd	8831	a
	UREA	45	lb ai/A	PD														
LSD (P=.05)					2.08		2.08		1.98		.		1.96		1.13		843.20	
Standard Deviation					1.44		1.44		1.37		.		1.35		0.78		584.00	
CV					1.30		1.49		3.20		.		8.32		1.80		6.69	
Treatment F					16.365		16.365		4.075				2.014		2.135		1.327	
Treatment Prob(F)					0.0001		0.0001		0.0008				0.0594		0.0457		0.2538	

Continued.



**Table 6. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/5/2013		11/5/2013		11/5/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	16.6	ef	42.8	a	2479	ab	11075	ab
2	UREA	30	lb ai/A	4-5 leaf	17.2	ef	42.6	ab	2365	abc	10735	a-d
3	UREA	60	lb ai/A	4-5 leaf	16.1	f	42.9	a	2630	a	11616	a
4	UREA	90	lb ai/A	4-5 leaf	18.4	cde	42.3	abc	2146	cde	11482	a
5	UREA	120	lb ai/A	4-5 leaf	20.8	ab	41.7	d	2018	def	11185	ab
6	UREA	150	lb ai/A	4-5 leaf	20.0	abc	41.9	cd	1892	efg	10499	bcd
7	UREA	180	lb ai/A	4-5 leaf	22.2	a	41.5	d	1633	g	10039	cd
8	UREA	210	lb ai/A	4-5 leaf	21.8	a	41.6	d	1715	fg	9875	d
9	UREA	45	lb ai/A	4-5 leaf	17.3	def	42.5	ab	2300	bcd	10997	ab
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	17.3	def	42.5	ab	2256	bcd	11106	ab
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	18.2	c-f	42.4	abc	2195	b-e	10958	abc
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	19.4	bcd	42.0	bcd	2089	cde	10920	abc
	UREA	45	lb ai/A	PD								
LSD (P=.05)					2.27		0.62		323.70		950.20	
Standard Deviation					1.57		0.43		224.20		658.00	
CV					8.37		1.02		10.46		6.05	
Treatment F					6.750		5.010		6.973		2.512	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0202	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 7. Determine the agronomic response of drill-seeded CL162 to nitrogen fertilizer rate and time of application (VP.3). Vermilion Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice					
Description					plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice					
Rating Date							8/1/2013		8/16/2013		8/16/2013		8/16/2013		11/5/2013		11/5/2013		11/5/2013					
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit					days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt	Rate	Rate	Growth																				
No.	Name	Rate	Unit	Stage																				
1	UREA	0	lb ai/A	4-5 leaf	100	h	86	h	43	a	14.9	a	44.2	a	8417	a	14.8	a	43.1	a	1811	a	10229	a
2	UREA	30	lb ai/A	4-5 leaf	101	h	87	h	46	a	14.6	a	44.3	a	8242	a	14.3	a	43.3	a	1591	a	9834	a
3	UREA	60	lb ai/A	4-5 leaf	103	fg	89	fg	47	a	15.9	a	43.4	a	7844	a	15.0	a	43.0	a	1717	a	9561	a
4	UREA	90	lb ai/A	4-5 leaf	104	de	90	de	46	a	15.3	a	43.7	a	8618	a	14.9	a	43.1	a	1680	a	10297	a
5	UREA	120	lb ai/A	4-5 leaf	105	abc	91	abc	46	a	15.5	a	43.7	a	7944	a	14.8	a	43.0	a	1571	a	9515	a
6	UREA	150	lb ai/A	4-5 leaf	105	bcd	91	bcd	46	a	14.9	a	43.8	a	7717	a	16.0	a	42.6	a	1409	a	9126	a
7	UREA	180	lb ai/A	4-5 leaf	106	ab	92	ab	45	a	15.5	a	43.6	a	8183	a	15.6	a	42.8	a	1490	a	9672	a
8	UREA	210	lb ai/A	4-5 leaf	106	a	92	a	47	a	15.1	a	43.9	a	7443	a	14.6	a	43.3	a	1499	a	8941	a
9	UREA	45	lb ai/A	4-5 leaf	103	g	89	g	45	a	15.0	a	43.8	a	8239	a	13.9	a	43.5	a	1533	a	9772	a
10	UREA	45	lb ai/A	PD																				
	UREA	75	lb ai/A	4-5 leaf	104	ef	90	ef	46	a	15.3	a	43.6	a	7891	a	16.0	a	42.5	a	1508	a	9399	a
11	UREA	45	lb ai/A	PD																				
	UREA	105	lb ai/A	4-5 leaf	105	cde	91	cde	47	a	14.5	a	44.2	a	7559	a	14.2	a	43.3	a	1538	a	9097	a
12	UREA	45	lb ai/A	PD																				
	UREA	135	lb ai/A	4-5 leaf	106	ab	92	ab	48	a	14.7	a	44.1	a	7855	a	14.8	a	43.1	a	1653	a	9508	a
	UREA	45	lb ai/A	PD																				
	LSD (P=.05)				0.96		0.96		2.49		1.05		0.66		907.20		1.56		0.76		245.70		1032.90	
Standard Deviation				0.67		0.67		1.72		0.73		0.46		628.30		1.08		0.53		170.10		715.40		
CV				0.64		0.74		3.77		4.82		1.04		7.86		7.25		1.23		10.75		7.47		
Treatment F				31.060		31.060		1.813		1.321		1.670		1.243		1.474		1.261		1.771		1.375		
Treatment Prob(F)				0.0001		0.0001		0.0919		0.2570		0.1246		0.2991		0.1883		0.2888		0.1004		0.2303		

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 8. Determine the agronomic response of drill-seeded CL2065 to nitrogen fertilizer rate and time of application (VP.1). Vermilion Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		Rice top		Rice		Rice		Rice			
Rating Date									8/1/2013		8/1/2013		8/17/2013		8/17/2013			
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.			
Rating Unit					days		days		in		% plot      rate		%		lb/bu			
Crop Stage Majority					Main		Main		Main		Main    Main		Main		Main			
Trt	Trt		Rate	Growth														
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	104	h	90	h	39	a	.	.	15.2	a	43.8	a	8680	bc
2	UREA	30	lb ai/A	4-5 leaf	106	gh	92	gh	40	a	.	.	16.0	a	43.4	a	8851	bc
3	UREA	60	lb ai/A	4-5 leaf	108	ef	94	ef	42	a	.	.	16.9	a	42.9	a	8730	bc
4	UREA	90	lb ai/A	4-5 leaf	109	e	95	e	42	a	.	.	16.6	a	43.2	a	9521	ab
5	UREA	120	lb ai/A	4-5 leaf	112	cd	98	cd	41	a	.	.	17.4	a	42.8	a	9711	a
6	UREA	150	lb ai/A	4-5 leaf	113	abc	99	abc	41	a	.	.	19.6	a	41.8	a	9275	abc
7	UREA	180	lb ai/A	4-5 leaf	114	ab	100	ab	43	a	20	2	17.3	a	42.9	a	9366	ab
8	UREA	210	lb ai/A	4-5 leaf	115	a	101	a	42	a	63	3	17.2	a	42.8	a	9727	a
9	UREA	45	lb ai/A	4-5 leaf	107	fg	93	fg	40	a	.	.	16.5	a	43.2	a	8440	c
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	109	e	95	e	42	a	.	.	17.5	a	42.7	a	8885	abc
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	111	d	97	d	41	a	.	.	18.0	a	42.6	a	9354	ab
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	113	bc	99	bc	41	a	.	.	18.0	a	42.6	a	9474	ab
	UREA	45	lb ai/A	PD														
LSD (P=.05)					1.25		1.25		2.39		.	.	2.24		1.17		858.60	
Standard Deviation					0.87		0.87		1.65		.	.	1.55		0.81		594.60	
CV					0.79		0.90		4.04		.	.	9.04		1.90		6.49	
Treatment F					64.349		64.349		1.943				2.015		1.472		2.111	
Treatment Prob(F)					0.0001		0.0001		0.0693				0.0592		0.1890		0.0481	

Continued.

**Table 8. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/5/2013		11/5/2013		11/5/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt	Rate	Rate	Growth								
No.	Name	Rate	Unit	Stage								
1	UREA	0	lb ai/A	4-5 leaf	14.1	e	43.5	a	2423	ab	11103	a
2	UREA	30	lb ai/A	4-5 leaf	14.8	de	43.2	ab	2463	ab	11314	a
3	UREA	60	lb ai/A	4-5 leaf	15.2	de	42.9	abc	2515	a	11245	a
4	UREA	90	lb ai/A	4-5 leaf	16.2	bcd	42.9	bcd	2538	a	12059	a
5	UREA	120	lb ai/A	4-5 leaf	17.4	bc	42.4	cde	2610	a	12321	a
6	UREA	150	lb ai/A	4-5 leaf	17.6	bc	42.4	c-f	2538	a	11814	a
7	UREA	180	lb ai/A	4-5 leaf	19.6	a	41.8	f	2159	b	11526	a
8	UREA	210	lb ai/A	4-5 leaf	19.5	a	41.9	ef	1795	c	11522	a
9	UREA	45	lb ai/A	4-5 leaf	14.8	de	43.3	ab	2362	ab	10802	a
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	16.0	cd	42.8	bcd	2449	ab	11335	a
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	17.5	bc	42.3	def	2564	a	11918	a
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	17.7	b	42.3	def	2635	a	12109	a
	UREA	45	lb ai/A	PD								
LSD (P=.05)					1.66		0.60		324.50		917.60	
Standard Deviation					1.15		0.42		224.70		635.50	
CV					6.88		0.98		9.28		5.48	
Treatment F					9.944		6.704		4.352		2.079	
Treatment Prob(F)					0.0001		0.0001		0.0005		0.0516	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Variety by Nitrogen Experiments at Franklin Parish

<b>Experiment number</b> .....	Franklin Parish VxN Studies
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Franklin Parish / John Owen
<b>Tillage type</b> .....	Spring Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.87
<b>pH</b> .....	6.8
<b>Extractable nutrients ppm</b> .....	Ca-4971; Cu-5.47; Mg-1013; P-78; K-408; Na-71; S-10.6; Zn-4.9
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / May 20
<b>Seeding rate/depth</b> .....	40 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	May 24
<b>Harvest date</b> .....	September 17
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	No blanket applications
<b>Water management</b> .....	
<b>Flush</b> .....	May 21, May 29
<b>Flood</b> .....	June 11
<b>Drain</b> .....	September 3
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1.5 qt/A Glyphosate, May 21
	3 qt/A Propanil + .5 oz/A Permit + 2 pt/A Prowl + 1 oz/A Londax, May 28
	3 qt/A Propanil + .5 oz/A Permit + 1 oz/A Londax, June 5
	3 qt/A Propanil, June 10
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
	2.5 oz/A Karate Z, May 28
<b>Fungicides</b> .....	None

**Table 9. Determine the agronomic response of drill-seeded CL152 to nitrogen fertilizer rate and time of application (FP.3). Franklin Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top					
Rating Date									9/17/2013		9/17/2013		9/17/2013	
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit					days		days		in		%		lb/bu	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	80	cd	76	cd	32	h	21.1	a	42.2	a
2	UREA	30	lb ai/A	4-5 leaf	78	e	74	e	37	g	21.3	a	42.2	a
3	UREA	60	lb ai/A	4-5 leaf	78	e	74	e	39	fg	23.0	a	41.8	a
4	UREA	90	lb ai/A	4-5 leaf	79	de	75	de	40	ef	21.5	a	42.2	a
5	UREA	120	lb ai/A	4-5 leaf	82	ab	78	ab	41	de	20.9	a	42.6	a
6	UREA	150	lb ai/A	4-5 leaf	83	a	79	a	44	abc	23.6	a	41.6	a
7	UREA	180	lb ai/A	4-5 leaf	82	abc	78	abc	45	ab	24.0	a	41.7	a
8	UREA	210	lb ai/A	4-5 leaf	82	ab	78	ab	45	a	24.4	a	41.6	a
9	UREA	45	lb ai/A	4-5 leaf	78	e	74	e	38	g	21.9	a	42.0	a
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	81	bcd	77	bcd	42	cd	21.9	a	42.1	a
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	81	abc	77	abc	42	cd	22.0	a	42.2	a
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	83	a	79	a	43	bc	20.9	a	42.5	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					1.80		1.80		1.55		3.51		1.11	
Standard Deviation					1.30		1.30		1.08		2.43		0.77	
CV					1.59		1.67		2.65		10.97		1.83	
Treatment F					9.698		9.698		49.105		0.997		0.733	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.4692		0.6994	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 10. Determine the agronomic response of drill-seeded CL162 to nitrogen fertilizer rate and time of application (FP.3). Franklin Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		Rice top		Rice		Rice		Rice			
Rating Date									9/17/2013		9/17/2013		9/17/2013		9/17/2013			
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.			
Rating Unit					days		days		in		% plot		rate		%			
Crop Stage Majority					Main		Main		Main		Main		Main		Main			
Trt	Trt	Rate	Rate	Growth														
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	77.8	f	74	f	34	g	.	.	21.0	a	42.2	a	5417	f
2	UREA	30	lb ai/A	4-5 leaf	78.5	ef	75	ef	39	f	.	.	21.2	a	42.2	a	6809	e
3	UREA	60	lb ai/A	4-5 leaf	78.0	ef	74	ef	42	ef	.	.	20.5	a	42.5	a	7834	cde
4	UREA	90	lb ai/A	4-5 leaf	78.5	ef	75	ef	45	cd	.	.	21.2	a	42.2	a	8584	bcd
5	UREA	120	lb ai/A	4-5 leaf	79.5	cd	76	cd	47	abc	.	.	20.6	a	42.4	a	9320	ab
6	UREA	150	lb ai/A	4-5 leaf	79.5	cd	76	cd	47	abc	.	.	23.7	a	41.4	a	9042	a-d
7	UREA	180	lb ai/A	4-5 leaf	80.5	ab	77	ab	47	ab	.	.	21.8	a	42.1	a	8890	a-d
8	UREA	210	lb ai/A	4-5 leaf	81.0	a	77	a	49	a	35	3	22.4	a	41.9	a	9691	ab
9	UREA	45	lb ai/A	4-5 leaf	78.0	ef	74	ef	43	de	.	.	22.2	a	41.8	a	7833	de
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	78.8	de	75	de	45	bc	.	.	21.6	a	42.1	a	9068	abc
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	80.3	abc	76	abc	46	bc	.	.	20.7	a	42.5	a	10009	a
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	80.0	bc	76	bc	48	a	.	.	21.5	a	42.2	a	9232	ab
	UREA	45	lb ai/A	PD														
LSD (P=.05)					0.93		0.90		2.41		.	.	3.37		1.32		1234.30	
Standard Deviation					0.64		0.60		1.67		.	.	2.34		0.92		854.80	
CV					0.81		0.86		3.77		.	.	10.85		2.17		10.08	
Treatment F					11.411		11.411		25.480				0.586		0.469		9.416	
Treatment Prob(F)					0.0001		0.0001		0.0001				0.8265		0.9094		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 11. Determine the agronomic response of drill-seeded CL2065 to nitrogen fertilizer rate and time of application (FP.1). Franklin Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		Rice top									
Rating Date									9/17/2013		9/17/2013		9/17/2013		9/17/2013			
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.			
Rating Unit					days		days		in		% plot      rate		%		lb/bu			
Crop Stage Majority					Main		Main		Main		Main    Main		Main		Main			
Trt	Trt		Rate	Growth														
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	84	a	80	a	31	f	.	.	21.4	a	42.3	a	5958	d
2	UREA	30	lb ai/A	4-5 leaf	83	a	79	a	35	e	.	.	24.2	a	41.3	a	7750	c
3	UREA	60	lb ai/A	4-5 leaf	84	a	80	a	38	d	.	.	23.7	a	41.7	a	9975	ab
4	UREA	90	lb ai/A	4-5 leaf	84	a	80	a	41	bc	.	.	26.0	a	40.9	a	10021	ab
5	UREA	120	lb ai/A	4-5 leaf	85	a	81	a	42	abc	.	.	24.6	a	41.4	a	9992	ab
6	UREA	150	lb ai/A	4-5 leaf	84	a	80	a	43	ab	.	.	26.3	a	40.9	a	10050	ab
7	UREA	180	lb ai/A	4-5 leaf	85	a	81	a	44	a	50	3	25.7	a	40.9	a	10543	ab
8	UREA	210	lb ai/A	4-5 leaf	85	a	81	a	43	ab	63	3	23.0	a	41.8	a	10307	ab
9	UREA	45	lb ai/A	4-5 leaf	84	a	80	a	40	cd	.	.	24.9	a	41.3	a	9607	b
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	85	a	81	a	41	bc	.	.	26.6	a	40.6	a	10639	a
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	85	a	81	a	43	ab	10	2	24.6	a	41.4	a	10367	ab
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	85	a	81	a	44	a	20	2	24.9	a	41.2	a	10437	ab
	UREA	45	lb ai/A	PD														
LSD (P=.05)					1.47		1.50		2.37		.	.	5.07		1.68		978.10	
Standard Deviation					1.02		1.00		1.64		.	.	3.51		1.16		677.40	
CV					1.21		1.27		4.06		.	.	14.23		2.81		7.03	
Treatment F					1.453		1.453		21.624				0.708		0.646		16.720	
Treatment Prob(F)					0.1964		0.1964		0.0001				0.7221		0.7764		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



**Table 12. Determine the agronomic response of drill-seeded Caffey to nitrogen fertilizer rate and time of application (FP.3). Franklin Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		top									
Rating Date							9/17/2013		9/17/2013		9/17/2013		9/17/2013		9/17/2013			
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.			
Rating Unit					days		days		in		% plot		rate		%			
Crop Stage Majority					Main		Main		Main		Main		Main		Main			
Trt	Trt	Rate	Rate	Growth														
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	85	a	81	a	31	e	.	.	20.7	a	42.9	a	652060	g
2	UREA	30	lb ai/A	4-5 leaf	83	e	79	e	35	d	.	.	20.8	a	43.0	a	946367	f
3	UREA	60	lb ai/A	4-5 leaf	84	b-e	80	b-e	36	cd	.	.	24.4	a	41.9	a	1166988	e
4	UREA	90	lb ai/A	4-5 leaf	84	b-e	80	b-e	37	cd	.	.	24.1	a	41.9	a	1254485	de
5	UREA	120	lb ai/A	4-5 leaf	84	a-d	80	a-d	39	ab	.	.	26.4	a	41.2	a	1334794	bcd
6	UREA	150	lb ai/A	4-5 leaf	84	b-e	80	b-e	40	a	.	.	28.1	a	40.9	a	1405000	ab
7	UREA	180	lb ai/A	4-5 leaf	84	abc	80	abc	41	a	45	a	3	a	24.5	a	1420084	ab
8	UREA	210	lb ai/A	4-5 leaf	85	a	81	a	41	a	65	a	3	a	23.9	a	1408760	ab
9	UREA	45	lb ai/A	4-5 leaf	84	b-e	80	b-e	38	bc	.	.	25.6	a	41.4	a	1281325	cd
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	83	cde	79	cde	39	ab	.	.	26.6	a	41.2	a	1359081	abc
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	83	de	79	de	41	a	.	.	25.1	a	41.7	a	1426834	ab
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	85	ab	81	ab	40	a	45	a	3	a	24.9	a	1451173	a
	UREA	45	lb ai/A	PD														
LSD (P=.05)					1.20		1.20		2.04		254.12		0.00		4.86		1.49	94936.40
Standard Deviation					0.83		0.80		1.42		20.00		0.00		3.36		1.03	65749.50
CV					0.99		1.04		3.73		38.71		0.00		13.69		2.47	5.22
Treatment F					3.180		3.180		19.449		0.667		0.000		1.658		1.513	52.628
Treatment Prob(F)					0.0049		0.0049		0.0001		0.6547		1.0000		0.1296		0.1750	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 13. Determine the agronomic response of drill-seeded Antonio to nitrogen fertilizer rate and time of application (FP.1). Franklin Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top							
Rating Date									9/17/2013		9/17/2013		9/17/2013		9/17/2013	
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.	
Rating Unit					days		days		in		% plot		rate		%	
Crop Stage Majority					Main		Main		Main		Main		Main		Main	
Trt	Trt		Rate	Growth												
No.	Name	Rate	Unit	Stage												
1	UREA	0	lb ai/A	4-5 leaf	82	a	78	a	35	e	.	.	21.2	a	42.5	a
2	UREA	30	lb ai/A	4-5 leaf	56	a	52	a	40	d	.	.	22.1	a	42.2	a
3	UREA	60	lb ai/A	4-5 leaf	81	a	77	a	40	d	.	.	22.2	a	42.2	a
4	UREA	90	lb ai/A	4-5 leaf	83	a	79	a	41	cd	.	.	24.0	a	41.7	a
5	UREA	120	lb ai/A	4-5 leaf	83	a	79	a	44	ab	.	.	21.4	a	42.6	a
6	UREA	150	lb ai/A	4-5 leaf	83	a	79	a	44	a	.	.	22.7	a	42.1	a
7	UREA	180	lb ai/A	4-5 leaf	84	a	80	a	44	a	.	.	23.7	a	41.9	a
8	UREA	210	lb ai/A	4-5 leaf	85	a	81	a	43	abc	10	2	24.1	a	41.7	a
9	UREA	45	lb ai/A	4-5 leaf	80	a	76	a	41	cd	.	.	20.5	a	42.9	a
	UREA	45	lb ai/A	PD												
10	UREA	75	lb ai/A	4-5 leaf	81	a	77	a	42	bcd	.	.	23.3	a	42.0	a
	UREA	45	lb ai/A	PD												
11	UREA	105	lb ai/A	4-5 leaf	82	a	78	a	43	abc	.	.	21.7	a	42.5	a
	UREA	45	lb ai/A	PD												
12	UREA	135	lb ai/A	4-5 leaf	83	a	79	a	44	a	.	.	24.0	a	41.6	a
	UREA	45	lb ai/A	PD												
LSD (P=.05)					21.08		21.10		2.25		.		3.42		1.14	
Standard Deviation					14.60		14.60		1.56		.		2.37		0.79	
CV					18.22		19.18		3.75		.		10.49		1.86	
Treatment F					1.158		1.158		11.756				1.088		0.968	
Treatment Prob(F)					0.3521		0.3521		0.0001				0.4001		0.4927	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Variety by Nitrogen Experiments at St. Landry Parish

<b>Experiment number</b> .....	St. Landry Parish VxN Studies
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	St. Landry Parish / Charlie Fontenot
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	2.82
<b>pH</b> .....	6.8
<b>Extractable nutrients ppm</b> .....	Ca-5730; Cu-1.66; Mg-1111; P-76; K-352; Na-67; S-9.5; Zn-1.69
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 27
<b>Seeding rate/depth</b> .....	40 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 13
<b>Harvest date</b> .....	August 19
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	No blanket applications
<b>Water management</b> .....	
<b>Flush</b> .....	NA
<b>Flood</b> .....	May 8
<b>Drain</b> .....	July 31
<b>Pest management</b> .....	
<b>Herbicides</b> .....	2 pt/A Glyphosate + 1.8 pt/A Command + 2 oz/A Sharpen, March 1 oz/A Permit + 0.5 oz/A Regiment, May 6
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 14. Determine the agronomic response of drill-seeded CL152 to nitrogen fertilizer rate and time of application (SLP.3). St. Landry Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice		
Description					plant-hd		emer-hd		top		hog damage						
Rating Date									8/19/2013		8/19/2013						
Rating Type					50% HD		50% HD		Height		Harvestable		Moist		Test Wt.		
Rating Unit					days		days		in		% plot		%		lb/bu		
Crop Stage Majority					Main		Main		Main		Main		Main		Main		
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage													
1	UREA	0	lb ai/A	4-5 leaf	101	cd	84	cd	34	e	.	12.2	a	48.6	a	6905	d
2	UREA	30	lb ai/A	4-5 leaf	100	d	83	d	37	d	.	13.0	a	48.3	ab	8301	c
3	UREA	60	lb ai/A	4-5 leaf	101	cd	84	cd	39	cd	.	13.5	a	48.1	ab	9160	abc
4	UREA	90	lb ai/A	4-5 leaf	101	bcd	84	bcd	39	cd	.	16.1	a	47.2	abc	9808	a
5	UREA	120	lb ai/A	4-5 leaf	102	bc	85	bc	41	abc	.	15.7	a	47.5	ab	9497	ab
6	UREA	150	lb ai/A	4-5 leaf	103	b	86	b	42	ab	.	16.0	a	47.1	bc	9994	a
7	UREA	180	lb ai/A	4-5 leaf	104	a	87	a	42	ab	80	16.6	a	47.2	abc	10095	a
8	UREA	210	lb ai/A	4-5 leaf	105	a	88	a	43	a	.	16.8	a	46.9	bc	9825	a
9	UREA	45	lb ai/A	4-5 leaf	100	d	83	d	39	cd	.	22.0	a	45.8	c	8532	bc
	UREA	45	lb ai/A	PD													
10	UREA	75	lb ai/A	4-5 leaf	101	cd	84	cd	40	bc	.	14.4	a	47.8	ab	9870	a
	UREA	45	lb ai/A	PD													
11	UREA	105	lb ai/A	4-5 leaf	101	cd	84	cd	41	abc	.	21.7	a	45.8	c	9342	abc
	UREA	45	lb ai/A	PD													
12	UREA	135	lb ai/A	4-5 leaf	102	bcd	85	bcd	43	a	.	16.4	a	47.2	abc	9709	a
	UREA	45	lb ai/A	PD													
LSD (P=.05)					1.40		1.40		2.17		.	6.09		1.50		1083.30	
Standard Deviation					1.00		1.00		1.50		.	4.22		1.04		750.20	
CV					0.94		1.13		3.78		.	26.02		2.20		8.11	
Treatment F					10.351		10.351		11.219		.	2.061		2.880		6.136	
Treatment Prob(F)					0.0001		0.0001		0.0001		.	0.0537		0.0092		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 15. Determine the agronomic response of drill-seeded CL162 to nitrogen fertilizer rate and time of application (SLP.3). St. Landry Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice		
Description					plant-hd		emer-hd		top		hog damage						
Rating Date									8/19/2013		8/19/2013		8/19/2013		8/19/2013		
Rating Type					50% HD		50% HD		Height		Harvestable		Moist		Test Wt.		
Rating Unit					days		days		in		% plot		%		lb/bu		
Crop Stage Majority					Main		Main		Main		Main		Main		Main		
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage													
1	UREA	0	lb ai/A	4-5 leaf	99	f	82	f	35	g	.	13.5	a	48.0	a	6520	e
2	UREA	30	lb ai/A	4-5 leaf	99	f	82	f	39	f	.	14.5	a	47.5	a	8296	d
3	UREA	60	lb ai/A	4-5 leaf	100	e	83	e	42	cde	.	13.2	a	47.9	a	8695	bcd
4	UREA	90	lb ai/A	4-5 leaf	101	c	84	c	42	cde	.	14.9	a	47.3	a	9124	a-d
5	UREA	120	lb ai/A	4-5 leaf	101	cd	84	cd	42	bcd	.	12.6	a	48.3	a	8975	a-d
6	UREA	150	lb ai/A	4-5 leaf	102	b	85	b	44	a-d	.	16.0	a	46.8	a	8942	a-d
7	UREA	180	lb ai/A	4-5 leaf	102	b	85	b	44	ab	.	15.1	a	47.2	a	9741	a
8	UREA	210	lb ai/A	4-5 leaf	103	a	86	a	45	a	.	15.3	a	47.1	a	9593	ab
9	UREA	45	lb ai/A	4-5 leaf	99	f	82	f	40	ef	95	17.4	a	46.4	a	8523	cd
	UREA	45	lb ai/A	PD													
10	UREA	75	lb ai/A	4-5 leaf	101	de	84	de	42	de	.	11.8	a	48.8	a	8941	a-d
	UREA	45	lb ai/A	PD													
11	UREA	105	lb ai/A	4-5 leaf	101	c	84	c	43	a-d	.	15.6	a	47.0	a	9385	abc
	UREA	45	lb ai/A	PD													
12	UREA	135	lb ai/A	4-5 leaf	101	c	84	c	44	abc	.	13.2	a	48.2	a	9236	a-d
	UREA	45	lb ai/A	PD													
LSD (P=.05)					0.50		0.54		2.21		.	3.65		1.38		997.20	
Standard Deviation					0.40		0.38		1.53		.	2.53		0.96		690.60	
CV					0.37		0.45		3.67		.	17.51		2.01		7.82	
Treatment F					45.750		45.750		12.006		.	1.602		2.067		5.908	
Treatment Prob(F)					0.0001		0.0001		0.0001		.	0.1441		0.0529		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 16. Determine the agronomic response of drill-seeded CL2065 to nitrogen fertilizer rate and time of application (SLP.1). St. Landry Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		top		hog damage							
Rating Date									8/19/2013		8/19/2013		8/19/2013		8/19/2013			
Rating Type					50% HD		50% HD		Height		Harvestable		Moist		Test Wt.			
Rating Unit					days		days		in		% plot		%		lb/bu			
Crop Stage Majority					Main		Main		Main		Main		Main		Main			
Trt	Trt	Rate	Growth															
No.	Name	Rate	Unit	Stage														
1	UREA	0	lb ai/A	4-5 leaf	100	f	83	f	34	e	.	10.5	d	49.4	a	6331	e	
2	UREA	30	lb ai/A	4-5 leaf	100	ef	83	ef	35	de	90	11.8	bcd	48.6	abc	7851	d	
3	UREA	60	lb ai/A	4-5 leaf	101	de	84	de	36	de	95	11.5	bcd	48.9	abc	8588	cd	
4	UREA	90	lb ai/A	4-5 leaf	102	cd	85	cd	38	bc	95	14.6	b	47.5	c	9183	abc	
5	UREA	120	lb ai/A	4-5 leaf	102	bc	85	bc	39	ab	.	12.0	bcd	48.7	abc	9768	a	
6	UREA	150	lb ai/A	4-5 leaf	102	bc	85	bc	40	a	95	14.4	bc	47.7	bc	9617	ab	
7	UREA	180	lb ai/A	4-5 leaf	103	ab	86	ab	41	a	88	13.6	bcd	48.0	abc	9771	a	
8	UREA	210	lb ai/A	4-5 leaf	103	a	86	a	40	a	90	14.3	bc	47.5	c	9928	a	
9	UREA	45	lb ai/A	4-5 leaf	102	bc	85	bc	36	cd	.	13.5	bcd	48.0	abc	8729	bcd	
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	102	cd	85	cd	37	cd	90	11.3	cd	49.0	ab	9024	abc	
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	100	f	83	f	39	ab	.	18.9	a	45.9	d	9491	abc	
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	101	cd	84	cd	40	ab	.	13.8	bc	48.0	abc	9715	a	
	UREA	45	lb ai/A	PD														
LSD (P=.05)					0.80		0.80		2.14		.		3.31		1.47		973.90	
Standard Deviation					0.60		0.60		1.48		.		2.29		1.02		674.50	
CV					0.57		0.68		3.91		.		17.17		2.12		7.49	
Treatment F					12.069		12.069		10.906		.		3.766		3.255		9.511	
Treatment Prob(F)					0.0001		0.0001		0.0001		.		0.0015		0.0042		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 17. Determine the agronomic response of drill-seeded Caffey to nitrogen fertilizer rate and time of application (SLP.3). St. Landry Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top		hog damage			
Rating Date									8/19/2013		8/19/2013		8/19/2013	
Rating Type					50% HD		50% HD		Height		Harvestable		Moist	
Rating Unit					days		days		in		% plot		%	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	101	f	84	f	32	e	78	a	11.3	d
2	UREA	30	lb ai/A	4-5 leaf	101	ef	84	ef	34	de	77	a	11.2	d
3	UREA	60	lb ai/A	4-5 leaf	102	e	85	e	35	d	80	a	11.5	cd
4	UREA	90	lb ai/A	4-5 leaf	103	d	86	d	37	c	79	a	12.5	bcd
5	UREA	120	lb ai/A	4-5 leaf	103	d	86	d	40	ab	89	a	11.9	cd
6	UREA	150	lb ai/A	4-5 leaf	105	a	88	a	40	ab	68	a	15.6	a
7	UREA	180	lb ai/A	4-5 leaf	105	a	88	a	40	a	76	a	13.9	abc
8	UREA	210	lb ai/A	4-5 leaf	104	abc	87	abc	40	a	53	a	15.4	a
9	UREA	45	lb ai/A	4-5 leaf	104	ab	87	ab	36	cd	96	a	14.7	ab
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	102	e	85	e	37	c	94	a	11.7	cd
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	103	cd	86	cd	38	bc	87	a	13.6	a-d
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	104	bcd	87	bcd	40	ab	79	a	13.5	a-d
	UREA	45	lb ai/A	PD										
LSD (P=.05)					1.00		1.00		2.16		27.83		2.60	
Standard Deviation					0.70		0.70		1.49		18.22		1.80	
CV					0.64		0.77		4.01		22.86		13.79	
Treatment F					15.061		15.061		13.261		1.679		3.131	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.1857		0.0054	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 18. Determine the agronomic response of drill-seeded Antonio to nitrogen fertilizer rate and time of application (SLP.1). St. Landry Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top					
Rating Date									8/19/2013		8/19/2013		8/19/2013	
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit					days		days		in		%		lb/bu	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt	Trt	Rate		Growth										
No.	Name	Rate	Unit	Stage										
1	UREA	0	lb ai/A	4-5 leaf	98	e	81	e	35	f	11.2	a	49.1	a
2	UREA	30	lb ai/A	4-5 leaf	98	e	81	e	37	e	12.9	a	48.2	a
3	UREA	60	lb ai/A	4-5 leaf	98	e	81	e	37	e	10.8	a	49.3	a
4	UREA	90	lb ai/A	4-5 leaf	99	d	82	d	37	de	14.7	a	47.6	a
5	UREA	120	lb ai/A	4-5 leaf	100	c	83	c	39	cd	11.6	a	48.9	a
6	UREA	150	lb ai/A	4-5 leaf	103	a	86	a	41	ab	13.2	a	48.0	a
7	UREA	180	lb ai/A	4-5 leaf	103	a	86	a	42	a	15.6	a	47.4	a
8	UREA	210	lb ai/A	4-5 leaf	103	a	86	a	41	ab	13.5	a	48.1	a
9	UREA	45	lb ai/A	4-5 leaf	98	e	81	e	38	de	14.0	a	47.8	a
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	99	d	82	d	40	bc	11.4	a	49.1	a
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	101	b	84	b	40	bc	13.9	a	48.0	a
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	101	b	84	b	41	ab	12.8	a	48.5	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					0.60		0.60		1.94		3.45		1.40	
Standard Deviation					0.40		0.40		1.34		2.39		0.97	
CV					0.43		0.52		3.47		18.44		2.00	
Treatment F					89.566		89.566		11.044		1.571		1.644	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.1537		0.1317	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



## Rice Variety by Nitrogen Experiments at Richland Parish

<b>Experiment number</b> .....	Richland Parish VxN Studies
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Richland Parish / Ashley Dixon
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.79
<b>pH</b> .....	7.2
<b>Extractable nutrients ppm</b> .....	Ca-3121; Cu-3.02; Mg-638; P-20; K-166; Na-173; S-29.9; Zn-1.28
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / May 21
<b>Seeding rate/depth</b> .....	40 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	May 24
<b>Harvest date</b> .....	September 16
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	100 lb/A DAP
<b>Water management</b> .....	
<b>Flush</b> .....	May 22, May 30
<b>Flood</b> .....	June 12
<b>Drain</b> .....	September 3
<b>Pest management</b> .....	
<b>Herbicides</b> .....	4 qt/A Propanil + .5 oz/A Permit + 2 pt/A Prowl + 1 oz/A Londax, May 27
	4 qt/A Propanil + .5 oz/A Permit + 1 oz/A Londax, June 4
	15 oz/A Ricestar, June 12
	25 oz/A Clincher, July 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
	2.5 oz/A Karate Z, May 27
<b>Fungicides</b> .....	None

**Table 19. Determine the agronomic response of drill-seeded CL152 to nitrogen fertilizer rate and time of application (RP.3). Richland Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top					
Rating Date									9/16/2013		9/16/2013		9/16/2013	
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit					days		days		in		%		lb/bu	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	77	h	74	h	27	f	15.8	e	44.4	a
2	UREA	30	lb ai/A	4-5 leaf	78	gh	75	gh	32	e	16.9	de	43.9	abc
3	UREA	60	lb ai/A	4-5 leaf	78	fgh	75	fgh	33	de	17.1	de	43.8	abc
4	UREA	90	lb ai/A	4-5 leaf	81	cde	78	cde	36	bc	20.1	c	42.6	de
5	UREA	120	lb ai/A	4-5 leaf	82	cd	79	cd	37	abc	19.3	cd	42.9	cd
6	UREA	150	lb ai/A	4-5 leaf	84	ab	81	ab	38	a	20.7	bc	42.5	de
7	UREA	180	lb ai/A	4-5 leaf	84	ab	81	ab	38	a	23.1	ab	41.8	ef
8	UREA	210	lb ai/A	4-5 leaf	85	a	82	a	39	a	25.0	a	41.2	f
9	UREA	45	lb ai/A	4-5 leaf	79	fgh	76	fgh	33	de	18.6	cd	43.2	bcd
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	79	efg	76	efg	35	cd	17.0	de	43.9	ab
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	80	def	77	def	37	abc	20.2	c	42.7	de
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	83	bc	80	bc	38	ab	20.2	c	42.7	de
	UREA	45	lb ai/A	PD										
LSD (P=.05)					1.90		1.90		2.08		2.58		1.01	
Standard Deviation					1.30		1.30		1.44		1.79		0.70	
CV					1.60		1.66		4.11		9.18		1.63	
Treatment F					16.740		16.740		22.758		8.990		6.962	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 20. Determine the agronomic response of drill-seeded CL2065 to nitrogen fertilizer rate and time of application (RP.1). Richland Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top					
Rating Date									9/16/2013		9/16/2013		9/16/2013	
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit					days		days		in		%		lb/bu	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	86	a	83	a	28	g	23.5	a	41.8	a
2	UREA	30	lb ai/A	4-5 leaf	84	cd	81	cd	32	f	22.3	a	41.9	a
3	UREA	60	lb ai/A	4-5 leaf	83	d	80	d	34	de	21.5	a	42.4	a
4	UREA	90	lb ai/A	4-5 leaf	85	bc	82	bc	34	de	19.4	a	43.0	a
5	UREA	120	lb ai/A	4-5 leaf	84	bcd	81	bcd	36	bc	18.8	a	43.2	a
6	UREA	150	lb ai/A	4-5 leaf	85	ab	82	ab	36	bc	18.7	a	43.3	a
7	UREA	180	lb ai/A	4-5 leaf	86	ab	83	ab	38	ab	19.1	a	43.0	a
8	UREA	210	lb ai/A	4-5 leaf	85	ab	82	ab	38	a	18.5	a	43.5	a
9	UREA	45	lb ai/A	4-5 leaf	84	bcd	81	bcd	33	ef	21.4	a	42.3	a
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	85	bc	82	bc	33	ef	20.3	a	42.6	a
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	85	bc	82	bc	35	cd	21.5	a	42.0	a
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	85	ab	82	ab	36	c	20.0	a	42.6	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					1.40		1.40		1.61		4.04		1.65	
Standard Deviation					0.90		0.90		1.11		2.80		1.14	
CV					1.11		1.15		3.26		13.71		2.68	
Treatment F					3.103		3.103		26.792		1.359		0.970	
Treatment Prob(F)					0.0058		0.0058		0.0001		0.2380		0.4910	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Experiment number ..... : 13-CM-06

Site and design ..... :

Location/Cooperator ..... : Rice Research Station (Crowley Main)

Tillage type ..... : Fall Stale

Experimental design ..... : Randomized complete block

Number of reps ..... : 4

Plot size ..... : 4.66 x 16 ft

Row width/rows per plot ..... : 8 in / 7

Soil type ..... : Crowley silt loam

% organic matter ..... : 1.115

pH ..... : 7.26

Extractable nutrients ppm ..... : Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7

Crop/Variety ..... : Rice / See data sheet

Planting method/date ..... : Drill-seeded / March 14

Seeding rate/depth ..... : 14-hyb and 33-conventional seeds/ft<sup>2</sup> / .5 in

Emergence date ..... : March 28

Harvest date ..... : August 6

Ratoon Harvest date ..... : October 30

Seed treatment/cwt ..... :

Conventional rice treatments ..... : Dithane (fungicide) - 114 g  
Release (gibberellic acid) - 10 g  
Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml  
AV-1011 (bird repellent) - 18.3 oz

Hybrid rice treatments ..... : Maxim (fungicide) - .08 oz  
Apron (fungicide) - .32 oz  
Dynasty (fungicide) - .15 oz  
Zinc - 8 oz  
Enlarge (GA3) - .5 oz  
AV - 1011 (bird repellent) - 18.3 oz

Fertilization ..... : 230 lb/A 0-24-24-2.8, March 15  
90 lb/A 46-0-0, August 8

Water management ..... :

Flush ..... : None

Flood ..... : May 16

Drain ..... : July 24

Ratoon Flood ..... : August 9

Ratoon Drain ..... : October 21

Pest management ..... :

Herbicides ..... : 1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21  
1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7  
4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18  
4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H<sub>2</sub>O, May 15  
25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28

Insecticides ..... : 0.137 lb ai/cwt Dermacor seed treatment

Fungicides ..... : 6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 21. Nitrogen use efficiency response to variety or hybrid selection and nitrogen time of application (RRS,1). Ratoon response to first crop N application timing. Rice Research Station.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description		plant-hd		emer-hd		top															
Rating Date				7/30/2013		8/6/2013		8/6/2013		8/6/2013		8/6/2013		10/30/2013		10/30/2013		10/30/2013			
Rating Type		50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit		days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Unit																		
1	CLXL729			111	ef	97	ef	43	ab	14.5	efg	49.6	d-g	11852	a	11.9	hij	46.9	efg	4214	bc
	SPF	150	lb ai/A																	16065	a
2	CLXL729			110	f	96	f	42	abc	12.3	ghi	50.5	c	11627	ab	11.0	j	47.2	e	4207	bc
	120 PF/30 GR	120	lb ai/A																	15834	a
	120 PF/30 GR	30	lb ai/A																		
3	CLXL729			110	f	96	f	44	a	12.7	gh	50.2	cd	11612	ab	9.4	kl	47.7	cd	4657	a
	120 PF/30 HD	120	lb ai/A																	16269	a
	120 PF/30 HD	30	lb ai/A																		
4	CLXL729			104	h	90	h	35	hi	10.4	ijk	51.4	ab	4779	h	7.9	lm	48.3	ab	3725	de
	0 lb N/A	0	lb ai/A																	8504	g
5	CLXL745			111	ef	97	ef	42	abc	12.9	fgh	50.1	cd	11848	a	11.0	j	47.2	e	4114	bcd
	SPF	150	lb ai/A																	15963	a
6	CLXL745			110	f	96	f	41	a-d	12.8	gh	50.2	cd	11942	a	10.9	jk	47.2	de	4033	bcd
	120 PF/30 GR	120	lb ai/A																	15975	a
	120 PF/30 GR	30	lb ai/A																		
7	CLXL745			111	ef	97	ef	41	bcd	13.5	fgh	49.9	c-f	11699	ab	9.2	l	47.8	bc	4317	ab
	120 PF/30 HD	120	lb ai/A																	16015	a
	120 PF/30 HD	30	lb ai/A																		
8	CLXL745			104	h	90	h	34	ij	9.9	jk	51.5	ab	5676	g	7.6	m	48.5	a	3801	cde
	0 lb N/A	0	lb ai/A																	9477	g
9	XL723			112	def	98	def	44	ab	13.9	fgh	49.8	c-f	11263	ab	12.4	g-j	46.7	e-h	2527	jk
	SPF	150	lb ai/A																	13790	bc
10	XL723			111	def	97	def	43	ab	13.1	fgh	50.1	cde	11013	b	13.3	e-h	46.4	g-j	2174	kl
	120 PF/30 GR	120	lb ai/A																	13187	cd
	120 PF/30 GR	30	lb ai/A																		
11	XL723			111	def	97	def	43	ab	13.1	fgh	50.0	cde	11381	ab	11.2	ij	47.0	ef	2912	hij
	120 PF/30 HD	120	lb ai/A																	14294	b
	120 PF/30 HD	30	lb ai/A																		
12	XL723			104	h	90	h	34	ij	8.8	k	52.1	a	4401	hi	8.4	lm	48.0	abc	2711	ij
	0 lb N/A	0	lb ai/A																	7112	h

Continued.

Table 21. Continued.

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice	
Rating Date								7/30/2013		8/6/2013		8/6/2013		8/6/2013		10/30/2013		10/30/2013		10/30/2013	
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield	
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon	
Trt No.	Trt Name	Rate	Rate Unit																		
13	CL111 SPF	150	lb ai/A	113	cd	99	cd	42	abc	15.1	def	49.6	d-g	9814	c	14.9	a-e	45.9	j-m	2979	ghi
14	CL111 120 PF/30 GR	120	lb ai/A	111	def	97	def	39	def	14.2	efg	49.9	c-f	9445	cd	14.2	c-f	46.1	i-m	2739	ij
15	CL111 120 PF/30 HD	120	lb ai/A	112	cd	98	cd	39	cde	14.5	efg	49.5	d-g	9706	c	12.8	f-i	46.6	f-i	2972	hi
16	CL111 0 lb N/A	0	lb ai/A	105	h	91	h	32	j	11.8	hij	50.7	bc	3791	i	12.7	f-i	46.3	h-k	2184	kl
17	CL152 SPF	150	lb ai/A	118	a	104	a	38	e-h	19.4	ab	48.3	ijk	9795	c	15.8	abc	45.8	k-n	3394	efg
18	CL152 120 PF/30 GR	120	lb ai/A	116	b	102	b	36	f-i	21.5	a	47.8	k	8311	e	16.0	ab	45.7	lmn	3210	fgh
19	CL152 120 PF/30 HD	120	lb ai/A	117	ab	103	ab	38	d-g	20.4	a	48.0	jk	8882	de	15.3	a-d	45.8	klm	3497	ef
20	CL152 0 lb N/A	0	lb ai/A	111	def	97	def	29	k	15.0	def	49.3	e-h	3787	i	16.4	a	45.2	n	2067	l
21	Mermentau SPF	150	lb ai/A	114	c	100	c	36	ghi	17.9	bc	48.6	hij	6967	f	14.5	b-e	46.0	i-m	1900	l
22	Mermentau 120 PF/30 GR	120	lb ai/A	112	cde	98	cde	35	ij	16.3	cde	49.1	f-i	6885	f	15.7	abc	45.6	mn	1777	l
23	Mermentau 120 PF/30 HD	120	lb ai/A	111	def	97	def	34	ij	16.8	cd	49.0	ghi	6850	f	13.9	d-g	46.1	i-m	2153	kl
24	Mermentau 0 lb N/A	0	lb ai/A	107	g	93	g	27	k	13.2	fgh	50.1	cd	2135	j	13.5	e-h	46.2	h-l	1925	l
LSD (P=.05)				1.80		1.80		2.93		2.22		0.84		768.40		1.61		0.57		417.10	
Standard Deviation				1.30		1.30		2.07		1.95		0.73		672.20		1.41		0.50		364.90	
CV				1.17		1.34		5.47		13.57		1.47		7.85		11.27		1.07		11.80	
Treatment F				32.450		32.447		20.503		15.617		12.185		128.923		21.379		20.097		35.893	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001	

Continued.

**Table 21. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description			Grain		Straw		Total Biomass		Straw N		Grain N		N Uptake		N Uptake		Total N Uptake		N Fert. Eff.	
Part Rated			Abvgrd -		Abvgrd -		Abvgrd -		Abvgrd -		Abvgrd -		grain -		straw -		0 N -		NUE -	
Rating Date			8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013	
Rating Type			Biomass-dry		Biomass-dry		Grain+Straw				%N		lb/A		lb/A		lb/A			
Rating Unit			lb/A		lb/A		lb/A		%N		%N		lb/A		lb/A		lb/A		%N	
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Main		Main		by block	
Crop Stage Scale			Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity	
Trt No.	Trt Name	Rate	Rate Unit																	
1	CLXL729		12984	ab	8841	b-g	21825	a-d	0.609	b-e	1.173	abc	152	a	53	c-f	206	abc	95	abc
	SPF	150	lb ai/A																	
2	CLXL729		10831	c	8734	b-h	19565	b-g	0.611	b-e	1.125	a-e	122	cd	54	c-f	176	c-f	75	c-f
	120 PF/30 GR	120	lb ai/A																	
	120 PF/30 GR	30	lb ai/A																	
3	CLXL729		13071	a	13327	a	26397	a	0.616	b-e	1.148	a-e	150	ab	82	ab	232	a	112	a
	120 PF/30 HD	120	lb ai/A																	
	120 PF/30 HD	30	lb ai/A																	
4	CLXL729		4486	f	4913	ghi	9398	ij	0.575	cde	0.761	j	34	j	29	fgh	63	k	0	j
	0 lb N/A	0	lb ai/A																	
5	CLXL745		11575	abc	10991	a-e	22566	a-d	0.684	abc	1.205	ab	140	abc	77	abc	217	ab	103	ab
	SPF	150	lb ai/A																	
6	CLXL745		12001	abc	11882	abc	23883	ab	0.653	a-e	1.148	a-e	138	abc	77	abc	215	ab	102	ab
	120 PF/30 GR	120	lb ai/A																	
	120 PF/30 GR	30	lb ai/A																	
7	CLXL745		11479	abc	11888	abc	23367	ab	0.627	a-e	1.145	a-e	132	abc	74	abc	206	abc	96	abc
	120 PF/30 HD	120	lb ai/A																	
	120 PF/30 HD	30	lb ai/A																	
8	CLXL745		4737	f	4772	ghi	9509	ij	0.545	de	0.768	j	37	j	26	h	63	k	0	j
	0 lb N/A	0	lb ai/A																	
9	XL723		11320	bc	11715	abc	23035	abc	0.608	b-e	1.153	a-e	130	bc	70	a-d	200	a-d	94	a-d
	SPF	150	lb ai/A																	
10	XL723		10868	c	9939	a-f	20807	bcd	0.529	e	0.984	e-h	107	de	53	c-g	160	efg	67	e-h
	120 PF/30 GR	120	lb ai/A																	
	120 PF/30 GR	30	lb ai/A																	
11	XL723		11267	c	6837	e-i	18104	d-g	0.615	b-e	1.105	a-f	125	cd	41	e-h	166	d-g	71	c-g
	120 PF/30 HD	120	lb ai/A																	
	120 PF/30 HD	30	lb ai/A																	
12	XL723		4121	fg	4501	hi	8622	ij	0.601	b-e	0.806	ij	33	j	27	gh	60	k	0	j
	0 lb N/A	0	lb ai/A																	

Continued.

**Table 21. Continued.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description				Grain		Straw		Total Biomass		Straw N		Grain N		N Uptake		N Uptake		Total N Uptake		N Fert. Eff.	
Part Rated				Abvgrd -		Abvgrd -		Abvgrd -		Abvgrd -		Abvgrd -		grain -		straw -		0 N -		NUE -	
Rating Date				8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013		8/5/2013	
Rating Type				Biomass-dry		Biomass-dry		Grain+Straw										Grain+Straw			
Rating Unit				lb/A		lb/A		lb/A		%N		%N		lb/A		lb/A		lb/A		%	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Main		Main		by block	
Crop Stage Scale				Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity		Maturity	
Trt No.	Trt Name	Rate	Rate Unit																		
13	CL111 SPF	150	lb ai/A	8810	d	11506	abc	20316	b-e	0.670	a-d	1.210	a	106	de	77	abc	184	b-e	84	b-e
14	CL111 120 PF/30 GR	120	lb ai/A	8590	d	9835	a-f	18425	c-g	0.643	a-e	1.113	a-e	96	ef	65	b-e	161	efg	69	d-h
	120 PF/30 GR	30	lb ai/A																		
15	CL111 120 PF/30 HD	120	lb ai/A	8286	d	7720	c-i	16006	e-h	0.557	de	1.117	a-e	93	efg	43	e-h	135	gh	54	f-i
	120 PF/30 HD	30	lb ai/A																		
16	CL111 0 lb N/A	0	lb ai/A	3212	fg	4458	hi	7670	j	0.613	b-e	0.890	g-j	29	j	29	fgh	58	k	0	j
17	CL152 SPF	150	lb ai/A	7610	de	12787	ab	20397	b-e	0.745	a	1.173	abc	89	efg	93	a	181	cde	77	b-f
18	CL152 120 PF/30 GR	120	lb ai/A	8401	d	9711	a-f	18112	d-g	0.634	a-e	0.997	d-h	84	fgh	62	b-e	145	fgh	53	f-i
	120 PF/30 GR	30	lb ai/A																		
19	CL152 120 PF/30 HD	120	lb ai/A	8676	d	11128	a-d	19804	b-f	0.653	a-e	1.165	a-d	101	ef	70	a-d	171	def	70	c-h
	120 PF/30 HD	30	lb ai/A																		
20	CL152 0 lb N/A	0	lb ai/A	3257	fg	6402	f-i	9659	ij	0.591	cde	0.833	hij	27	j	39	e-h	66	jk	0	j
21	Mermentau SPF	150	lb ai/A	6468	e	8825	b-g	15292	fgh	0.606	b-e	1.013	c-g	65	hi	54	c-f	119	hi	45	hi
22	Mermentau 120 PF/30 GR	120	lb ai/A	6453	e	6780	e-i	13234	hi	0.596	cde	0.934	f-j	59	i	39	e-h	98	ij	31	i
	120 PF/30 GR	30	lb ai/A																		
23	Mermentau 120 PF/30 HD	120	lb ai/A	7651	de	7207	d-i	14857	gh	0.629	a-e	0.982	e-i	74	ghi	46	d-h	120	hi	46	ghi
	120 PF/30 HD	30	lb ai/A																		
24	Mermentau 0 lb N/A	0	lb ai/A	2504	g	3596	i	6100	j	0.725	ab	1.032	b-g	27	j	24	h	51	k	0	j
LSD (P=.05)				1674.80		4278.00		4764.30		0.13		0.18		20.70		26.60		33.60		26.00	
Standard Deviation				1184.20		3025.00		3368.90		0.09		0.12		14.60		18.80		23.80		18.40	
CV				14.31		34.85		19.87		14.46		11.93		16.30		34.70		16.51		32.89	
Treatment F				30.746		3.752		12.095		1.260		5.297		33.702		4.648		24.813		17.406	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.2290		0.0001		0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).



## Evaluation of N Source and Commercially Available N Enhancers, Urease, and Nitrification Inhibitors

<b>Experiment number</b> .....	13-CM-09
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 2
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 22. Evaluation of N source and commercially available N enhancers, urease, and nitrification inhibitors (RRS.3). Rice Research Station.**

Crop Name Description Rating Date Rating Type Rating Unit Crop Stage Majority					Rice plant-hd		Rice emer-hd		Rice top 7/31/2013 Height in Main		Rice 8/2/2013 Moist % Main		Rice 8/2/2013 Test Wt. lb/bu Main		Rice 8/2/2013 Yield lb/A Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage												
1	60 lb N/A rate Urea	60	lb ai/A	10 DPF	106	b	93	b	34	efg	14.8	e	48.8	a	5203	cde
2	60 lb N/A rate Agrotain Ultra	60	lb ai/A	10 DPF	106	b	93	b	34	def	15.3	e	48.6	ab	5516	cd
3	60 lb N/A rate Arborite AG	3	qt/ton	10 DPF	106	b	93	b	33	fg	14.9	e	48.8	a	5068	cde
4	60 lb N/A rate Factor	60	lb ai/A	10 DPF	106	b	93	b	33	fg	15.0	e	48.8	a	5493	cd
5	60 lb N/A rate Super-U	3	qt/ton	10 DPF	106	b	93	b	34	def	15.0	e	48.8	a	5237	cde
6	60 lb N/A rate* AMS*	60	lb ai/A	10 DPF	.	.	.	.	.	.	.	.	.	.	.	.
7	60 lb N/A rate Urea-AMS (33%)	60	lb ai/A	10 DPF	106	b	93	b	36	cde	14.6	e	48.9	a	5059	cde
8	60 lb N/A rate Amidis	60	lb ai/A	10 DPF	106	b	93	b	33	fg	14.7	e	48.9	a	4939	e
9	60 lb N/A rate Instinct	60	lb ai/A	10 DPF	106	b	93	b	34	def	14.5	e	48.9	a	5133	cde
10	60 lb N/A rate Nutrisphere	35	oz/A	10 DPF	106	b	93	b	34	d-g	14.7	e	48.9	a	5546	c
11	60 lb N/A rate N-ZoneMax	2	qt/ton	10 DPF	106	b	93	b	34	def	15.4	e	48.5	ab	5472	cde
12	120 lb N/A rate Urea	1.5	qt/ton	10 DPF	106	b	93	b	34	def	15.4	e	48.5	ab	5472	cde
13	120 lb N/A rate Agrotain Ultra	120	lb ai/A	10 DPF	108	a	95	a	38	a	18.1	bcd	47.8	cde	7239	ab
14	120 lb N/A rate Arborite AG	120	lb ai/A	10 DPF	108	a	95	a	37	abc	17.7	bcd	47.9	cde	6972	b
		3	qt/ton	10 DPF	109	a	96	a	37	abc	18.9	ab	47.5	de	6855	b

Continued.

**Table 22. Continued.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top		Rice		Rice	
Rating Date									7/31/2013		8/2/2013		8/2/2013	
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit					days		days		in		%		lb/bu	
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage										
15	120 lb N/A rate	120	lb ai/A	10 DPF	108	a	95	a	38	ab	17.9	bcd	47.8	cde
	Factor	3	qt/ton											
16	120 lb N/A rate	120	lb ai/A	10 DPF	109	a	96	a	37	abc	19.8	a	47.3	e
	Super-U													
17	120 lb N/A rate*	120	lb ai/A	10 DPF	.	.	.	.	.	.	.	.	.	.
	AMS*													
18	120 lb N/A rate	120	lb ai/A	10 DPF	108	a	95	a	37	abc	17.7	bcd	47.9	cde
	Urea-AMS (33%)													
19	120 lb N/A rate	120	lb ai/A	10 DPF	109	a	96	a	37	abc	16.9	d	48.1	bc
	Amidis													
20	120 lb N/A rate	120	lb ai/A	10 DPF	109	a	96	a	38	ab	18.4	abc	47.6	cde
	Instinct	35	oz/A											
21	120 lb N/A rate	120	lb ai/A	10 DPF	108	a	95	a	38	abc	17.3	cd	48.0	bcd
	Nutrisphere	2	qt/ton											
22	120 lb N/A rate	120	lb ai/A	10 DPF	108	a	95	a	36	bcd	17.9	bcd	47.9	cde
	N-ZoneMax	1.5	qt/ton											
23	0 lb N/A				104	c	91	c	32	fg	15.3	e	48.5	ab
	LSD (P=.05)				0.70		0.70		2.15		1.43		0.59	
	Standard Deviation				0.50		0.50		1.52		1.01		0.41	
	CV				0.49		0.56		4.34		6.19		0.86	
	Treatment F				29.734		29.734		6.984		11.485		6.615	
	Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001		0.0001	

\* N Rate error. Treatment thrown out.

Continued.

**Table 22. Continued.**

Crop Name		Rice		Rice		Rice		Rice		Rice	
Description		Tissue		Tissue N		N Uptake		N uptake/rep		N fert Eff.	
Part Rated		Abvgrd -		Abvgrd -		total -		0 N -			
Rating Date		7/1/2013		7/1/2013		7/1/2013				7/1/2013	
Rating Type		Biomass-Dry									
Rating Unit		lb/A		% N		lb/A		lb/A		%	
Crop Stage Majority		Main		Main		Main		0 N plot		by block	
Crop Stage Scale		50% HD		50% HD		50% HD		by block		50% HD	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage							
1	60 lb N/A rate Urea	60	lb ai/A	10 DPF	7625	d-g	0.8388 ef	64 de	29.3 a	58 abc	
2	60 lb N/A rate Agrotain Ultra	60	lb ai/A	10 DPF	7153	e-h	0.8603 ef	62 def	29.3 a	54 a-d	
3	60 lb N/A rate Arborite AG	3	qt/ton	10 DPF	7153	e-h	0.8045 ef	58 def	29.3 a	47 b-e	
4	60 lb N/A rate Factor	60	lb ai/A	10 DPF	7686	c-g	0.8400 ef	64 de	29.3 a	58 abc	
5	60 lb N/A rate Super-U	3	qt/ton	10 DPF	8233	a-f	0.8560 ef	70 cd	29.3 a	68 a	
6	60 lb N/A rate AMS	60	lb ai/A	10 DPF	5859	h	0.7688 f	45 fg	29.3 a	26 fg	
7	60 lb N/A rate Urea-AMS (33%)	60	lb ai/A	10 DPF	7035	fgh	0.8000 ef	56 def	29.3 a	44 c-f	
8	60 lb N/A rate Amidis	60	lb ai/A	10 DPF	6234	gh	0.8100 ef	50 ef	29.3 a	35 d-g	
9	60 lb N/A rate Instinct	60	lb ai/A	10 DPF	7765	b-g	0.8285 ef	64 de	29.3 a	58 abc	
10	60 lb N/A rate Nutrisphere	35	oz/A	10 DPF	7836	b-g	0.8853 de	69 cd	29.3 a	67 ab	
11	60 lb N/A rate N-ZoneMax	2	qt/ton	10 DPF	5949	h	0.8258 ef	49 ef	29.3 a	33 efg	
12	120 lb N/A rate Urea	1.5	qt/ton	10 DPF	9219	a-d	1.0653 abc	99 ab	29.3 a	58 abc	
13	120 lb N/A rate Agrotain Ultra	120	lb ai/A	10 DPF	8698	a-e	0.9823 bcd	86 bc	29.3 a	47 b-e	
14	120 lb N/A rate Arborite AG	3	qt/ton	10 DPF	7804	b-g	1.0950 a	85 bc	29.3 a	47 b-e	

Continued.

**Table 22. Continued.**

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description					Tissue		Tissue N		N Uptake		N uptake/rep		N fert Eff.	
Part Rated					Abvgrd -		Abvgrd -		total -		0 N -			
Rating Date					7/1/2013		7/1/2013		7/1/2013				7/1/2013	
Rating Type					Biomass-Dry									
Rating Unit					lb/A		% N		lb/A		lb/A		%	
Crop Stage Majority					Main		Main		Main		0 N plot		by block	
Crop Stage Scale					50% HD		50% HD		50% HD		by block		50% HD	
Trt	Trt		Rate	Growth										
No.	Name	Rate	Unit	Stage										
15	120 lb N/A rate	120	lb ai/A	10 DPF	9773	a	1.0420	abc	102	ab	29.3	a	60	abc
	Factor	3	qt/ton											
16	120 lb N/A rate	120	lb ai/A	10 DPF	9396	ab	1.1050	a	104	a	29.3	a	62	abc
	Super-U													
17	120 lb N/A rate	120	lb ai/A	10 DPF	7151	e-h	0.7848	ef	57	def	29.3	a	23	g
	AMS													
18	120 lb N/A rate	120	lb ai/A	10 DPF	8704	a-e	0.9820	bcd	86	bc	29.3	a	47	b-e
	Urea-AMS (33%)													
19	120 lb N/A rate	120	lb ai/A	10 DPF	9275	abc	1.0825	ab	100	ab	29.3	a	59	abc
	Amidis													
20	120 lb N/A rate	120	lb ai/A	10 DPF	8680	a-e	1.0390	abc	90	ab	29.3	a	51	a-e
	Instinct	35	oz/A											
21	120 lb N/A rate	120	lb ai/A	10 DPF	9696	a	0.9760	cd	95	ab	29.3	a	54	a-d
	Nutrisphere	2	qt/ton											
22	120 lb N/A rate	120	lb ai/A	10 DPF	8803	a-d	1.0913	a	96	ab	29.3	a	55	a-d
	N-ZoneMax	1.5	qt/ton											
23	0 lb N/A				3863	i	0.7573	f	29	g	29.3	a	0	h
LSD (P=.05)					1634.00		0.11		17.70		0.00		20.60	
Standard Deviation					1155.40		0.08		12.50		0.00		14.60	
CV					14.80		8.18		17.16		0.00		30.09	
Treatment F					6.109		10.573		11.492		0.000		4.807	
Treatment Prob(F)					0.0001		0.0001		0.0001		1.0000		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Hybrid Ratoon Crop Response to Post Harvest N Application Rate

<b>Experiment number</b> .....	13-CM-20
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	Rice / CLXL745, CLXL729, XL723
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	14 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 6
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15 120 lb N/A 46-0-0, May 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 23. Rice hybrid ratoon crop response to post harvest N application rate (RRS.1). Rice Research Station.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top											
Rating Date						7/31/2013		8/6/2013		8/6/2013		8/6/2013		11/4/2013		11/4/2013		11/4/2013	
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.	
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/bu	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon	
Trt	Trt	N	Rate																
No.	Name	Rate	Unit																
1	CLXL745	0	lb ai/A	108	a	95	a	43	a	17.5	a	47.1	a	10885	a-e	14.6	e	42.6	ab
2	CLXL745	30	lb ai/A	108	a	95	a	42	a	17.2	a	47.0	a	11108	a-d	14.8	e	42.5	ab
3	CLXL745	60	lb ai/A	108	a	95	a	42	a	16.1	a	47.8	a	11286	abc	15.9	b-e	41.9	b-f
4	CLXL745	90	lb ai/A	108	a	95	a	41	a	17.4	a	47.3	a	10180	b-f	15.5	de	42.1	bcd
5	CLXL745	120	lb ai/A	108	a	95	a	41	a	15.4	a	48.2	a	11759	ab	17.5	ab	41.3	def
6	CLXL745	150	lb ai/A	108	a	95	a	42	a	15.8	a	48.1	a	9871	c-f	17.4	ab	41.3	def
7	CLXL729	0	lb ai/A	108	a	95	a	43	a	17.1	a	47.1	a	11972	a	14.8	e	42.4	bc
8	CLXL729	30	lb ai/A	108	a	95	a	43	a	18.6	a	46.7	a	11005	a-e	15.0	de	42.4	bc
9	CLXL729	60	lb ai/A	108	a	95	a	42	a	15.0	a	48.2	a	10726	a-e	15.6	cde	42.1	b-e
10	CLXL729	90	lb ai/A	108	a	95	a	41	a	14.1	a	48.5	a	12123	a	17.3	abc	41.3	def
11	CLXL729	120	lb ai/A	108	a	95	a	43	a	18.0	a	47.0	a	10785	a-e	16.8	a-d	41.6	c-f
12	CLXL729	150	lb ai/A	108	a	95	a	43	a	16.0	a	47.6	a	10605	a-e	18.1	a	41.1	f
13	XL723	0	lb ai/A	108	a	95	a	44	a	17.8	a	46.9	a	8800	f	12.4	f	43.3	a
14	XL723	30	lb ai/A	108	a	95	a	44	a	19.0	a	46.6	a	9436	def	15.5	de	41.8	b-f
15	XL723	60	lb ai/A	108	a	95	a	45	a	15.9	a	47.9	a	9690	c-f	15.9	b-e	41.9	b-f
16	XL723	90	lb ai/A	108	a	95	a	44	a	16.8	a	47.4	a	9893	c-f	17.4	ab	41.2	ef
17	XL723	120	lb ai/A	108	a	95	a	43	a	16.6	a	47.5	a	10572	a-e	18.2	a	41.0	f
18	XL723	150	lb ai/A	108	a	95	a	43	a	18.1	a	47.0	a	9307	ef	17.5	ab	41.2	ef
LSD (P=.05)				0.00		0.00		2.31		4.91		2.25		1756.60		1.82		0.90	
Standard Deviation				0.00		0.00		1.63		3.48		1.59		1242.10		1.29		0.64	
CV				0.00		0.00		3.82		20.68		3.35		11.77		7.98		1.53	
Treatment F				0.000		0.000		1.773		0.559		0.508		2.263		5.596		4.057	
Treatment Prob(F)				1.0000		1.0000		0.0590		0.9061		0.9368		0.0128		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Hybrid Ratoon Crop Response to Post Harvest N Application Rate

<b>Experiment number</b> .....	13-VP-20
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	14/33 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21 120 lb N/A 46-0-0, May 6
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 22
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20 2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7 1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 24. Rice hybrid (CLXL745, CLXL729, CL151) ratoon crop response to post harvest N application (VP.1). Vermilion Parish.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top							
Rating Date								8/1/2013		8/17/2013		8/17/2013		8/17/2013	
Rating Type				50% HD		50% HD		Height		Lodge		Moist		Test Wt.	
Rating Unit				days		days		in		% plot rate		%		lb/bu	
Crop Stage Majority				Main		Main		Main		Main Main		Main		Main	
Trt No.	Trt Name	N Rate	Rate Unit												
1	CLXL745	0	lb ai/A	106	c	92	c	49	ab	.	.	14.3	de	45.1	ab
2	CLXL745	30	lb ai/A	108	a	94	a	49	ab	.	.	15.4	b-e	44.5	bcd
3	CLXL745	60	lb ai/A	107	abc	93	abc	49	ab	.	.	14.7	cde	44.8	abc
4	CLXL745	90	lb ai/A	107	abc	93	abc	49	ab	.	.	14.5	cde	44.9	abc
5	CLXL745	120	lb ai/A	107	bc	93	bc	51	a	.	.	14.8	cde	44.7	abc
6	CLXL745	150	lb ai/A	107	bc	93	bc	50	a	.	.	15.3	b-e	44.4	cd
7	CLXL729	0	lb ai/A	106	c	92	c	49	ab	.	.	14.4	de	45.0	abc
8	CLXL729	30	lb ai/A	107	bc	93	bc	50	ab	.	.	14.7	cde	44.9	abc
9	CLXL729	60	lb ai/A	107	abc	93	abc	49	ab	.	.	14.6	cde	44.8	abc
10	CLXL729	90	lb ai/A	107	abc	93	abc	48	b	.	.	14.9	b-e	44.7	abc
11	CLXL729	120	lb ai/A	106	c	92	c	50	ab	.	.	16.2	ab	44.0	d
12	CLXL729	150	lb ai/A	107	ab	93	ab	49	ab	10	2	14.2	e	45.2	a
13	CL151	0	lb ai/A	106	c	92	c	44	c	.	.	15.1	b-e	44.8	abc
14	CL151	30	lb ai/A	106	c	92	c	44	c	20	2	16.7	a	43.9	d
15	CL151	60	lb ai/A	106	c	92	c	43	c	.	.	15.3	b-e	44.7	abc
16	CL151	90	lb ai/A	106	c	92	c	44	c	.	.	15.3	b-e	44.7	abc
17	CL151	120	lb ai/A	106	c	92	c	44	c	50	3	15.5	a-d	44.4	cd
18	CL151	150	lb ai/A	106	c	92	c	44	c	15	3	15.6	abc	44.4	cd
LSD (P=.05)				0.82		0.82		2.60		.		1.24		0.71	
Standard Deviation				0.58		0.58		1.84		.		0.87		0.50	
CV				0.55		0.63		3.88		.		5.75		1.12	
Treatment F				2.168		2.168		8.814				2.283		2.042	
Treatment Prob(F)				0.0173		0.0173		0.0001				0.0123		0.0261	

Continued.

**Table 24. Continued.**

Crop Name				Rice		Rice		Rice		Rice	
Rating Date				11/5/2013		11/5/2013		11/5/2013			
Rating Type				Moist		Test Wt.		Yield		Total Yield	
Rating Unit				%		lb/bu		lb/A		lb/A	
Crop Stage Majority				Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	N Rate	Rate Unit								
1	CLXL745	0	lb ai/A	12.7	f	44.3	a	3334	d	15769	cd
2	CLXL745	30	lb ai/A	13.3	def	44.1	a	4011	c	16434	abc
3	CLXL745	60	lb ai/A	13.3	def	44.0	ab	4587	b	16722	ab
4	CLXL745	90	lb ai/A	13.6	def	43.8	ab	4670	ab	16230	bcd
5	CLXL745	120	lb ai/A	13.6	def	43.8	ab	4529	b	16474	abc
6	CLXL745	150	lb ai/A	14.5	de	43.5	b	4919	a	17300	a
7	CLXL729	0	lb ai/A	13.0	ef	44.1	a	3406	d	15387	d
8	CLXL729	30	lb ai/A	12.9	f	44.2	a	3874	c	16397	abc
9	CLXL729	60	lb ai/A	13.1	def	44.1	a	4446	b	16283	bcd
10	CLXL729	90	lb ai/A	13.8	def	43.8	ab	4467	b	16726	ab
11	CLXL729	120	lb ai/A	13.7	def	43.8	ab	4580	b	16159	bcd
12	CLXL729	150	lb ai/A	14.6	d	43.5	b	4738	ab	16960	ab
13	CL151	0	lb ai/A	19.5	c	41.8	c	1762	f	12955	ef
14	CL151	30	lb ai/A	20.7	bc	41.6	c	1933	f	12643	f
15	CL151	60	lb ai/A	20.9	bc	41.5	cd	2291	e	12713	ef
16	CL151	90	lb ai/A	20.6	c	41.6	c	2367	e	12797	ef
17	CL151	120	lb ai/A	22.2	ab	41.3	cd	2488	e	13615	e
18	CL151	150	lb ai/A	23.1	a	41.0	d	2417	e	13355	ef
LSD (P=.05)				1.52		0.52		310.50		933.00	
Standard Deviation				1.07		0.37		219.60		652.80	
CV				6.70		0.86		6.10		4.27	
Treatment F				50.071		42.829		101.623		27.381	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Variety Ratoon Crop Response to Post Harvest N Application Rate

<b>Experiment number</b> .....	13-CM-21
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	Rice / CL111, CL152, Mermentau
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 7
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15 150 lb N/A 46-0-0, May 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 25. Rice variety ratoon crop response to post harvest N application rate (RRS.1). Rice Research Station.**

Table 20: Rice variety Ratoon crop response to post-harvest application rate (2005), Rice Research Station																							
Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice			
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice			
Rating Date								7/31/2013		8/7/2013		8/7/2013		8/7/2013		11/4/2013		11/4/2013		11/4/2013			
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit				days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	N Rate	Rate Unit																				
1	CL111	0	lb ai/A	110	f	97	f	41	a	14.6	h	49.0	a	10406	a	18.2	bcd	40.6	b-f	1110	hi	11517	de
2	CL111	30	lb ai/A	111	f	98	f	40	a-d	15.0	gh	48.9	a	9995	abc	18.2	bcd	40.9	a-e	1594	g	11589	de
3	CL111	60	lb ai/A	111	f	98	f	41	ab	16.0	e-h	48.6	ab	9928	a-d	21.6	a	39.4	f	2095	ef	12023	a-d
4	CL111	90	lb ai/A	110	f	97	f	41	abc	15.9	fgh	48.5	ab	10286	a	19.9	abc	40.2	c-f	2377	de	12663	abc
5	CL111	120	lb ai/A	110	f	97	f	41	abc	15.7	fgh	48.6	ab	10224	ab	19.2	abc	40.5	c-f	2696	c	12920	ab
6	CL111	150	lb ai/A	111	ef	98	ef	41	ab	17.4	d-g	48.0	bc	10343	a	19.4	abc	40.4	c-f	2658	cd	13001	a
7	CL152	0	lb ai/A	116	a	103	a	39	cde	21.5	a	46.9	efg	9179	cde	21.9	a	39.4	f	1389	gh	10568	e
8	CL152	30	lb ai/A	115	a	102	a	38	de	20.8	abc	47.0	d-g	9587	a-e	20.2	ab	40.2	c-f	1956	f	11543	de
9	CL152	60	lb ai/A	115	ab	102	ab	39	cde	21.3	ab	47.0	d-g	9373	b-e	21.1	ab	39.9	ef	2474	cd	11847	cd
10	CL152	90	lb ai/A	116	a	103	a	39	b-e	22.4	a	46.6	g	9053	de	20.8	ab	40.0	def	2753	bc	11807	cd
11	CL152	120	lb ai/A	116	a	103	a	38	e	22.7	a	46.6	g	8866	e	20.4	ab	40.2	c-f	3046	ab	11912	bcd
12	CL152	150	lb ai/A	116	a	103	a	39	b-e	22.2	a	46.7	fg	8887	e	21.4	a	39.9	ef	3072	a	11959	a-d
13	Mermentau	0	lb ai/A	113	cd	100	cd	36	fg	17.6	d-g	47.9	bc	6929	f	15.4	d	41.9	ab	882	i	7811	g
14	Mermentau	30	lb ai/A	112	cde	99	cde	35	gh	18.3	c-f	47.6	cde	6735	fg	17.0	cd	41.3	a-d	1210	h	7945	g
15	Mermentau	60	lb ai/A	114	bc	101	bc	35	gh	18.7	bcd	47.6	cde	5993	g	15.6	d	42.1	a	1595	g	7589	g
16	Mermentau	90	lb ai/A	113	cd	100	cd	35	gh	18.2	def	47.8	bcd	7313	f	17.0	cd	41.4	abc	1980	f	9293	f
17	Mermentau	120	lb ai/A	114	bc	101	bc	38	ef	18.3	c-f	47.6	cde	6430	fg	15.8	d	42.0	a	2105	ef	8536	fg
18	Mermentau	150	lb ai/A	111	def	98	def	34	h	18.5	cde	47.5	c-f	6958	f	19.1	abc	40.5	c-f	2096	ef	9054	f
LSD (P=.05)				1.70		1.70		1.90		2.60		0.86		894.40		3.00		1.34		312.00		1060.30	
Standard Deviation				1.20		1.20		1.35		1.84		0.61		632.50		2.12		0.95		220.60		749.70	
CV				1.09		1.23		3.52		9.88		1.28		7.27		11.15		2.33		10.71		6.97	
Treatment F				12.604		12.604		12.922		8.191		6.769		23.364		4.024		3.232		35.901		24.504	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0006		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Variety Ratoon Crop Response to Post Harvest N Application Rate

<b>Experiment number</b> .....	13-VP-21
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21
	120 lb N/A 46-0-0, May 6
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 22
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20
	2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7
	1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 26. Rice variety ratoon crop response to post harvest N application rate (VP.1). Vermilion Parish.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top		8/17/2013		8/17/2013		8/17/2013		8/17/2013	
Rating Date				50% HD		50% HD		Height		Lodge		Moist		Test Wt.		Yield	
Rating Type				days		days		in		% plot		rate		%		lb/bu	
Rating Unit				Main		Main		Main		Main		Main		Main		Main	
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Main	
Trt No.	Trt Name	N Rate	Rate Unit														
1	CL111	0	lb ai/A	106	e	92	e	47	ab	.	.	14.3	e-i	45.2	a-e	9943	d-h
2	CL111	30	lb ai/A	106	e	92	e	45	a-f	29	d	3	c	14.9	b-h	44.7	b-g
3	CL111	60	lb ai/A	106	de	92	de	46	a-e	.	.	14.1	ghi	45.3	a-d	9626	gh
4	CL111	90	lb ai/A	106	cde	92	cde	45	b-f	.	.	13.7	i	45.6	a	9903	d-h
5	CL111	120	lb ai/A	106	e	92	e	47	a	.	.	14.1	f-i	45.3	abc	9823	e-h
6	CL111	150	lb ai/A	106	e	92	e	47	abc	.	.	13.9	hi	45.4	ab	10195	c-g
7	CL152	0	lb ai/A	114	b	100	b	44	ef	.	.	16.3	a	44.1	g	9367	hi
8	CL152	30	lb ai/A	114	b	100	b	45	b-f	.	.	15.2	a-g	44.8	b-g	9702	fgh
9	CL152	60	lb ai/A	115	a	101	a	46	a-d	.	.	16.1	ab	44.3	fg	8762	i
10	CL152	90	lb ai/A	114	b	100	b	44	f	.	.	15.3	a-f	44.6	d-g	10129	c-h
11	CL152	120	lb ai/A	115	ab	101	ab	44	ef	.	.	15.9	abc	44.3	fg	9520	ghi
12	CL152	150	lb ai/A	115	ab	101	ab	45	b-f	.	.	15.5	a-e	44.5	efg	9704	fgh
13	CL151	0	lb ai/A	107	c	93	c	44	def	55	abc	3	bc	16.2	ab	44.2	g
14	CL151	30	lb ai/A	107	cde	93	cde	45	b-f	60	ab	4	ab	15.6	a-d	44.5	efg
15	CL151	60	lb ai/A	107	cd	93	cd	45	c-f	33	cd	3	bc	15.4	a-e	44.6	c-g
16	CL151	90	lb ai/A	107	cd	93	cd	45	b-f	55	abc	3	bc	14.5	d-i	45.1	a-e
17	CL151	120	lb ai/A	107	c	93	c	44	def	40	bcd	3	bc	14.6	d-i	45.1	a-e
18	CL151	150	lb ai/A	107	cd	93	cd	45	a-f	70	a	5	a	14.8	c-i	45.0	a-f
LSD (P=.05)				0.83		0.83		2.02		22.37		1.17		1.24		0.72	
Standard Deviation				0.59		0.59		1.43		10.66		0.56		0.88		0.51	
CV				0.54		0.62		3.16		21.74		16.87		5.85		1.14	
Treatment F				181.39		181.39		2.24		5.86		5.29		3.50		3.21	
Treatment Prob(F)				0.0001		0.0001		0.0137		0.0357		0.0439		0.0003		0.0007	

Continued.

**Table 26. Continued.**

Crop Name				Rice		Rice		Rice		Rice	
Rating Date				11/5/2013		11/5/2013		11/5/2013			
Rating Type				Moist		Test Wt.		Yield		Total Yield	
Rating Unit				%		lb/bu		lb/A		lb/A	
Crop Stage Majority				Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	N Rate	Rate Unit								
1	CL111	0	lb ai/A	17.9	g	42.2	a	1758	fgh	11701	efg
2	CL111	30	lb ai/A	19.2	fg	41.9	ab	1820	e-h	11670	efg
3	CL111	60	lb ai/A	18.6	g	42.0	a	1993	d-g	11619	efg
4	CL111	90	lb ai/A	19.8	efg	41.7	a-d	2170	bcd	12073	de
5	CL111	120	lb ai/A	21.3	def	41.4	b-e	2055	c-f	11879	def
6	CL111	150	lb ai/A	19.7	efg	41.8	abc	2059	c-f	12254	cde
7	CL152	0	lb ai/A	23.3	a-d	41.2	c-f	1703	gh	11070	fg
8	CL152	30	lb ai/A	23.4	a-d	41.2	c-f	2063	cde	11765	d-g
9	CL152	60	lb ai/A	23.4	a-d	41.2	def	2176	bcd	10938	g
10	CL152	90	lb ai/A	24.3	ab	41.0	ef	2183	bcd	12312	cde
11	CL152	120	lb ai/A	22.8	bcd	41.3	c-f	2403	ab	11922	def
12	CL152	150	lb ai/A	23.2	a-d	41.2	def	2465	ab	12168	cde
13	CL151	0	lb ai/A	21.9	cde	41.3	c-f	1667	h	12608	bcd
14	CL151	30	lb ai/A	23.5	a-d	41.0	ef	1829	e-h	12398	cde
15	CL151	60	lb ai/A	24.1	abc	41.0	ef	2060	c-f	13335	ab
16	CL151	90	lb ai/A	23.5	a-d	41.2	c-f	2310	abc	13019	abc
17	CL151	120	lb ai/A	25.3	a	40.8	f	2210	a-d	13534	a
18	CL151	150	lb ai/A	23.7	abc	41.1	def	2497	a	12981	abc
LSD (P=.05)				2.27		0.57		302.10		904.30	
Standard Deviation				1.60		0.40		213.60		639.40	
CV				7.24		0.97		10.28		5.25	
Treatment F				7.49		3.81		5.57		5.00	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Calcium Silicate Slag Fertilization Applied at Planting

<b>Experiment number</b> .....	13-CM-27
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 14
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Ratoon Harvest date</b> .....	October 30
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
	120 lb N/A 46-0-0, May 14
	90 lb/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 27. Evaluation of rice response to calcium silicate slag fertilization applied at planting (RRS.1). Rice Research Station.**

Table 27. Evaluation of Rice Response to calcium silicate slag fertilization applied at planting (RRS-1). Rice Research Station.																						
Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice					
Description			plant-hd		emer-hd		top															
Rating Date					7/30/2013		8/5/2013		8/5/2013		8/5/2013		10/30/2013		10/30/2013		10/30/2013					
Rating Type			50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt		Rate																			
No.	Name		Rate	Unit																		
1	Check (no slag, no lime)	0	ton/A	111 a	97 a	39 a	17.1 a	48.8 a	9513 a	16.5 a	45.5 a	3074 a	12588 a									
2	Ca Silicate slag	0.5	ton/A	111 a	97 a	39 a	17.7 a	48.6 a	9123 a	16.2 a	45.5 a	3026 a	12149 a									
3	Ca Silicate slag	1	ton/A	111 a	97 a	39 a	17.1 a	48.8 a	9330 a	15.7 a	45.7 a	3085 a	12415 a									
4	Ca Silicate slag	2	ton/A	111 a	97 a	38 a	17.3 a	48.9 a	9804 a	17.7 a	45.3 a	3113 a	12917 a									
5	Ca Silicate slag	3	ton/A	111 a	97 a	39 a	17.2 a	48.9 a	9333 a	17.0 a	45.4 a	3019 a	12352 a									
6	Ca Silicate slag	4	ton/A	111 a	97 a	39 a	17.8 a	48.7 a	9650 a	17.6 a	45.3 a	2900 a	12550 a									
7	Ag lime	1	ton/A	111 a	97 a	39 a	17.3 a	48.8 a	9423 a	15.8 a	45.7 a	3239 a	12661 a									
8	Ag lime	2	ton/A	111 a	97 a	39 a	17.2 a	48.9 a	9452 a	16.4 a	45.6 a	3024 a	12476 a									
LSD (P=.05)				1.10	1.10	2.18	1.61	0.53	694.80	1.46	0.43	461.10	1018.10									
Standard Deviation				0.70	0.70	1.48	1.10	0.36	472.40	0.99	0.29	313.50	692.20									
CV				0.66	0.75	3.82	6.33	0.74	5.00	5.95	0.65	10.25	5.53									
Treatment F				0.267	0.267	0.193	0.232	0.215	0.780	2.403	1.242	0.379	0.432									
Treatment Prob(F)				0.9602	0.9602	0.9837	0.9727	0.9778	0.6109	0.0566	0.3250	0.9041	0.8713									

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Calcium Silicate Slag Fertilization Applied at Planting

<b>Experiment number</b> .....	13-FP-27
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Franklin Parish / John Owen
<b>Tillage type</b> .....	Spring Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.87
<b>pH</b> .....	6.8
<b>Extractable nutrients ppm</b> .....	Ca-4971; Cu-5.47; Mg-1013; P-78; K-408; Na-71; S-10.6; Zn-4.9
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / May 20
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	May 24
<b>Harvest date</b> .....	September 17
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, June 11
<b>Water management</b> .....	
<b>Flush</b> .....	May 21, May 29
<b>Flood</b> .....	June 11
<b>Drain</b> .....	September 3
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1.5 qt/A Glyphosate, May 21
	3 qt/A Propanil + .5 oz/A Permit + 2 pt/A Prowl + 1 oz/A Londax, May 28
	3 qt/A Propanil + .5 oz/A Permit + 1 oz/A Londax, June 5
	3 qt/A Propanil, June 10
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
	2.5 oz/A Karate Z, May 28
<b>Fungicides</b> .....	None

**Table 28. Evaluation of rice response to calcium silicate slag fertilization (FP.1). Franklin Parish.**

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice
Description					plant-hd	emer-hd	top			
Rating Date							9/17/2013	9/17/2013	9/17/2013	9/17/2013
Rating Type					50% HD	50% HD	Height	Moist	Test Wt.	Yield
Rating Unit					days	days	in	%	lb/bu	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Main
Trt	Trt		Rate	Growth						
No.	Name		Rate	Unit	Stage					
1	Check (no slag, no lime)		0	ton/A	at plant	76 a	72 a	43 a	18.5 a	43.3 a 9673 a
2	Ca Silicate slag		0.5	ton/A	at plant	76 a	72 a	43 a	18.1 a	43.5 a 9697 a
3	Ca Silicate slag		1	ton/A	at plant	76 a	72 a	44 a	18.4 a	43.4 a 9530 a
4	Ca Silicate slag		2	ton/A	at plant	76 a	72 a	43 a	18.9 a	43.2 a 10172 a
5	Ca Silicate slag		3	ton/A	at plant	76 a	72 a	44 a	18.5 a	43.5 a 9593 a
6	Ca Silicate slag		4	ton/A	at plant	76 a	72 a	44 a	18.0 a	43.4 a 8901 a
7	Ag lime		1	ton/A	at plant	76 a	72 a	44 a	18.0 a	43.5 a 9413 a
8	Ag lime		2	ton/A	at plant	76 a	72 a	44 a	19.0 a	43.1 a 9356 a
LSD (P=.05)						0.00	0.00	1.33	1.82	0.82 783.30
Standard Deviation						0.00	0.00	0.90	1.24	0.55 532.60
CV						0.00	0.00	2.08	6.71	1.28 5.58
Treatment F						0.000	0.000	0.213	0.378	0.290 1.818
Treatment Prob(F)						1.0000	1.0000	0.9784	0.9048	0.9506 0.1364

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Calcium Silicate Slag Fertilization Applied at Planting

<b>Experiment number</b> .....	13-KL-27
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8 MID - 1.3 FILL - 1.5*
<b>pH</b> .....	CUT - 6.2 MID - 5.2 FILL - 5.7*
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0 MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8*
*Note: Study was planted in Fill area.	
<b>Crop/Variety</b> .....	Rice / CL111
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 29. Evaluation of rice response to calcium silicate slag fertilization (LaHaye.1). Evangeline Parish.**

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice												
Description		plant-hd	emer-hd	top																			
Rating Date				8/14/2013	8/16/2013	8/16/2013	8/16/2013	11/6/2013	11/6/2013	11/6/2013													
Rating Type		50% HD	50% HD	Height	Moist	Test Wt.	Yield	Moist	Test Wt.	Yield	Total Yield												
Rating Unit		days	days	in	%	lb/bu	lb/A	%	lb/bu	lb/A	lb/A												
Crop Stage Majority		Main	Main	Main	Main	Main	Main	Ratoon	Ratoon	Ratoon	MC+RC												
Trt	Trt	Rate																					
No.	Name	Rate	Unit																				
1	Check (no slag, no lime)	0	ton/A	107	a	94	a	40	a	12.3	a	49.2	a	9021	a	22.4	a	41.1	a	2218	a	11238	a
2	Ca Silicate slag	0.5	ton/A	106	a	93	a	40	a	12.6	a	49.1	a	9264	a	20.9	a	41.5	a	1910	a	11174	a
3	Ca Silicate slag	1	ton/A	108	a	95	a	41	a	12.8	a	49.0	a	9285	a	20.7	a	41.4	a	2356	a	11641	a
4	Ca Silicate slag	2	ton/A	107	a	94	a	41	a	13.1	a	48.8	a	9486	a	22.2	a	41.1	a	2230	a	11716	a
5	Ca Silicate slag	3	ton/A	109	a	96	a	41	a	12.7	a	49.0	a	8851	a	23.8	a	40.9	a	2253	a	11103	a
6	Ca Silicate slag	4	ton/A	108	a	95	a	41	a	12.4	a	49.2	a	9215	a	21.7	a	41.3	a	2353	a	11568	a
7	Ag lime	1	ton/A	109	a	96	a	41	a	12.2	a	49.2	a	8977	a	21.5	a	41.2	a	2256	a	11232	a
8	Ag lime	2	ton/A	108	a	95	a	41	a	12.2	a	49.3	a	9357	a	23.8	a	40.5	a	2305	a	11662	a
LSD (P=.05)				1.90		1.90		2.20		1.01		0.49		1098.10		4.31		1.16		446.40		1211.00	
Standard Deviation				1.30		1.30		1.50		0.69		0.34		746.60		2.93		0.79		303.50		823.40	
CV				1.17		1.33		3.76		5.50		0.68		8.13		13.22		1.92		13.58		7.21	
Treatment F				1.591		1.591		0.525		0.897		0.841		0.327		0.650		0.610		0.870		0.375	
Treatment Prob(F)				0.1927		0.1927		0.8058		0.5270		0.5662		0.9328		0.7101		0.7411		0.5458		0.9064	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Calcium Silicate Slag Fertilization Applied at Planting

<b>Experiment number</b> .....	13-RF-27
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Richard Fontenot
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.83
<b>pH</b> .....	5.57
<b>Extractable nutrients ppm</b> .....	Ca-1325; Cu-1.57; Mg-413; P-14.4; K-129; Na-64; S-18.4; Zn-2.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 17
<b>Seeding rate/depth</b> .....	14 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	March 30
<b>Harvest date</b> .....	August 9
<b>Seed treatment/cwt</b> .....	
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
120 lb/A 46-0-0, May 7	
<b>Water management</b> .....	
<b>Flush</b> .....	NA
<b>Flood</b> .....	May 7
<b>Drain</b> .....	July 25
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 6 oz/A Newpath + 2 pt/A Prowl H <sub>2</sub> O, May 7
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	19 oz/A Stratego, June 26

**Table 30. Evaluation of rice response to calcium silicate slag fertilization (Fontenot.1). Vidrine, LA.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice					
Description		plant-hd		emer-hd		top													
Rating Date						7/31/2013		8/9/2013		8/9/2013		8/9/2013		8/9/2013					
Rating Type		50% HD		50% HD		Height		Lodge		Moist		Test Wt.		Yield					
Rating Unit		days		days		in		% plot		rate		%		lb/bu					
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Main					
Trt	Trt	Rate																	
No.	Name	Rate	Unit																
1	Check (no slag, no lime)	0	ton/A	107	a	94	a	48	abc	33	a	3	a	13.6	a	44.0	a	12784	a
2	Ca Silicate slag	0.5	ton/A	107	a	94	a	49	a	28	a	3	a	16.1	a	43.1	a	12779	a
3	Ca Silicate slag	1	ton/A	107	a	94	a	48	ab	33	a	3	a	13.9	a	43.9	a	12851	a
4	Ca Silicate slag	2	ton/A	107	a	94	a	47	a-d	30	a	2	a	13.6	a	44.0	a	12604	a
5	Ca Silicate slag	3	ton/A	107	a	94	a	46	bcd	23	a	2	a	13.7	a	44.0	a	13176	a
6	Ca Silicate slag	4	ton/A	107	a	94	a	47	a-d	28	a	2	a	13.9	a	43.9	a	13061	a
7	Ag lime	1	ton/A	107	a	94	a	45	d	28	a	2	a	13.7	a	44.0	a	13112	a
8	Ag lime	2	ton/A	107	a	94	a	46	cd	23	a	2	a	14.4	a	43.6	a	13020	a
LSD (P=.05)				0.00		0.00		2.17		20.59		1.07		2.36		0.98		880.50	
Standard Deviation				0.00		0.00		1.48		14.00		0.73		1.61		0.66		598.60	
CV				0.00		0.00		3.17		50.33		35.29		11.37		1.51		4.63	
Treatment F				0.000		0.000		2.673		0.308		1.449		1.092		1.019		0.439	
Treatment Prob(F)				1.0000		1.0000		0.0381		0.9425		0.2387		0.4031		0.4467		0.8667	

Continued.

**Table 30. Continued.**

Table 50. Continued.											
Crop Name				Rice		Rice		Rice		Rice	
Rating Date				11/6/2013		11/6/2013		11/6/2013			
Rating Type				Moisture		Test Wt.		Yield		Total Yield	
Rating Unit				%		lb/bu		lb/A		lb/A	
Crop Stage Majority				Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt	Rate									
No.	Name	Rate	Unit								
1	Check (no slag, no lime)	0	ton/A	22.1	a	41.4	a	5845	a	18629	a
2	Ca Silicate slag	0.5	ton/A	22.9	a	41.1	a	5941	a	18721	a
3	Ca Silicate slag	1	ton/A	23.3	a	41.0	a	6072	a	18924	a
4	Ca Silicate slag	2	ton/A	24.1	a	40.9	a	6294	a	18898	a
5	Ca Silicate slag	3	ton/A	22.8	a	41.2	a	6349	a	19525	a
6	Ca Silicate slag	4	ton/A	23.5	a	41.0	a	6277	a	19338	a
7	Ag lime	1	ton/A	24.4	a	40.7	a	6309	a	19421	a
8	Ag lime	2	ton/A	22.4	a	41.3	a	6064	a	19084	a
LSD (P=.05)				3.01		0.68		510.90		1032.70	
Standard Deviation				2.04		0.46		347.30		702.10	
CV				8.81		1.13		5.65		3.68	
Treatment F				0.636		0.936		1.193		0.893	
Treatment Prob(F)				0.7212		0.5004		0.3488		0.5296	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



## Evaluation of Rice Response to Calcium Silicate Slag Fertilization Applied at Planting

<b>Experiment number</b> .....	13-VP-27
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21
	120 lb N/A 46-0-0, May 6
	90 lb N/A 46-0-0, August 20
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20
	2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7
	1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 31. Evaluation of rice response to calcium silicate slag fertilization applied at planting (VP.1). Vermilion Parish.**

Table 21. Evaluation of Rice Response to Calcium Silicate Slag Fertilization applied at planting (V412) - Vermilion Parish																							
Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice				
Description			plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice				
Rating Date					8/1/2013		8/16/2013		8/16/2013		8/16/2013		11/5/2013		11/5/2013		11/5/2013						
Rating Type			50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moisture		Test Wt.		Yield		Total Yield		
Rating Unit			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A		
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC		
Trt	Trt	Rate																					
No.	Name	Rate	Unit																				
1	Check (no slag, no lime)	0	ton/A	106	a	92	a	45	a	15.9	a	43.6	a	9778	a	16.8	a	42.6	a	2044	a	11822	a
2	Ca Silicate slag	0.5	ton/A	106	a	92	a	44	a	16.5	a	43.1	a	10119	a	18.3	a	42.2	a	1944	a	12062	a
3	Ca Silicate slag	1	ton/A	107	a	93	a	45	a	15.1	a	44.0	a	9274	a	17.7	a	42.4	a	1911	a	11185	a
4	Ca Silicate slag	2	ton/A	107	a	93	a	43	a	15.5	a	43.7	a	9955	a	17.5	a	42.4	a	2000	a	11955	a
5	Ca Silicate slag	3	ton/A	107	a	93	a	44	a	16.4	a	43.2	a	9506	a	17.9	a	42.3	a	1975	a	11482	a
6	Ca Silicate slag	4	ton/A	107	a	93	a	45	a	16.1	a	43.5	a	9477	a	16.7	a	42.7	a	1967	a	11444	a
7	Ag lime	1	ton/A	107	a	93	a	44	a	16.7	a	43.0	a	10050	a	18.1	a	42.2	a	1891	a	11941	a
8	Ag lime	2	ton/A	107	a	93	a	44	a	16.4	a	43.2	a	9534	a	16.9	a	42.6	a	1966	a	11500	a
LSD (P=.05)				0.78		0.78		2.45		1.99		1.17		832.90		1.40		0.53		230.10		921.00	
Standard Deviation				0.53		0.53		1.67		1.35		0.80		566.30		0.95		0.36		156.50		626.20	
CV				0.50		0.57		3.77		8.41		1.83		5.83		5.45		0.84		7.97		5.36	
Treatment F				1.508		1.508		0.739		0.658		0.703		1.184		1.618		1.041		0.385		0.994	
Treatment Prob(F)				0.2185		0.2185		0.6422		0.7046		0.6697		0.3535		0.1849		0.4334		0.9009		0.4621	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Potassium Rate

<b>Experiment number</b> .....	13-KL-02
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8* MID - 1.3 FILL - 1.5
<b>pH</b> .....	CUT - 6.2* MID - 5.2 FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0* MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in Cut area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Flood</b> .....	August 17
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 32. Evaluation of rice response to potassium rate (LaHaye.1). Evangeline Parish.**

Crop Name				Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top					
Rating Date										8/16/2013		8/16/2013	
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit				days		days		in		%		lb/bu	
Crop Stage Majority				Main		Main		Main		Main		Main	
Trt	Trt	Rate											
No.	Name	Rate	Unit										
1	0 lb K <sub>2</sub> O	0	lb ai/A	118	a	104.5	a	32	c	16.2	a	47.5	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
2	30 lb K <sub>2</sub> O	30	lb ai/A	111	b	97.5	b	36	b	16.6	a	47.4	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
3	60 lb K <sub>2</sub> O	60	lb ai/A	112	b	99.3	b	36	b	16.4	a	47.5	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
4	90 lb K <sub>2</sub> O	90	lb ai/A	109	b	95.5	b	36	b	16.0	a	47.6	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
5	120 lb K <sub>2</sub> O	120	lb ai/A	113	ab	100.3	ab	36	b	17.5	a	47.2	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
6	150 lb K <sub>2</sub> O	150	lb ai/A	110	b	96.5	b	39	a	17.0	a	47.3	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A										
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A										
LSD (P=.05)				4.80		4.84		2.12		1.23		0.40	
Standard Deviation				3.20		3.21		1.41		0.81		0.27	
CV				2.87		3.25		3.95		4.89		0.56	
Treatment F				4.071		4.071		9.738		1.963		1.511	
Treatment Prob(F)				0.0155		0.0155		0.0003		0.1431		0.2448	

Continued.

**Table 32. Continued.**

Crop Name				Rice	Rice	Rice	Rice
Rating Date				11/6/2013	11/6/2013	11/6/2013	
Rating Type				Moist	Test Wt.	Yield	Total Yield
Rating Unit				%	lb/bu	lb/A	lb/A
Crop Stage Majority				Ratoon	Ratoon	Ratoon	MC+RC
Trt	Trt	Rate					
No.	Name	Rate	Unit				
1	0 lb K <sub>2</sub> O	0	lb ai/A	19.5	a	41.6	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			550	b
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				6562 d
2	30 lb K <sub>2</sub> O	30	lb ai/A	20.1	a	41.7	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			689	b
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				8078 c
3	60 lb K <sub>2</sub> O	60	lb ai/A	17.2	a	42.6	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			746	ab
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				8162 bc
4	90 lb K <sub>2</sub> O	90	lb ai/A	19.2	a	42.0	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			1058	a
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				9101 a
5	120 lb K <sub>2</sub> O	120	lb ai/A	17.2	a	42.6	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			1084	a
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				8801 ab
6	150 lb K <sub>2</sub> O	150	lb ai/A	17.1	a	42.5	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A			849	ab
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A				9168 a
LSD (P=.05)				4.55	1.29	343.70	647.70
Standard Deviation				3.02	0.86	228.10	429.80
CV				16.41	2.03	27.50	5.17
Treatment F				0.816	1.197	3.411	20.504
Treatment Prob(F)				0.5570	0.3571	0.0295	0.0001

Continued.

**Table 32. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		
Description			Tissue												
Part Rated			Abvgrd -		Al		B		Ca		Cu		Fe		
Rating Date			7/8/2013												
Rating Type			Biomass-Dry		Tissue		Tissue		Tissue		Tissue		Tissue		
Rating Unit			lb/A		ppm		ppm		%		ppm		ppm		
Crop Stage Majority			Main		Main		Main		Main		Main		Main		
Crop Stage Scale			50% HD		50% HD		50% HD		50% HD		50% HD		50% HD		
Trt	Trt	Rate													
No.	Name	Rate	Unit												
1	0 lb K <sub>2</sub> O	0	lb ai/A	6471	b	161.3	a	4.640	a	0.228	a	2.83	a	262.3	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
2	30 lb K <sub>2</sub> O	30	lb ai/A	8937	a	219.3	a	4.688	a	0.220	a	2.63	a	323.3	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
3	60 lb K <sub>2</sub> O	60	lb ai/A	7785	ab	234.0	a	4.243	a	0.205	a	2.10	a	333.8	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
4	90 lb K <sub>2</sub> O	90	lb ai/A	8821	a	137.8	a	4.290	a	0.205	a	2.70	a	220.0	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
5	120 lb K <sub>2</sub> O	120	lb ai/A	7263	ab	165.0	a	4.045	a	0.200	a	2.33	a	248.5	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
6	150 lb K <sub>2</sub> O	150	lb ai/A	8552	a	162.3	a	4.803	a	0.220	a	2.60	a	252.8	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
LSD (P=.05)				1713.70		121.25		0.85		0.04		0.63		165.61	
Standard Deviation				1137.30		80.47		0.56		0.02		0.42		109.91	
CV				14.27		44.73		12.66		11.33		16.39		40.20	
Treatment F				2.955		0.881		1.132		0.832		1.661		0.672	
Treatment Prob(F)				0.0472		0.5171		0.3858		0.5468		0.2047		0.6508	

Continued.

**Table 32. Continued.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice	
Part Rated				Mn		Mo		P		K		Na		S	
Rating Type				Tissue		Tissue		Tissue		Tissue		Tissue		Tissue	
Rating Unit				ppm		ppm		%		%		ppm		%	
Crop Stage Majority				Main		Main		Main		Main		Main		Main	
Crop Stage Scale				50% HD		50% HD		50% HD		50% HD		50% HD		50% HD	
Trt No.	Trt Name	Rate	Unit												
1	0 lb K <sub>2</sub> O	0	lb ai/A	836.3	a	1.718	a	0.223	a	0.480	e	7637.3	a	0.145	a
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
2	30 lb K <sub>2</sub> O	30	lb ai/A	784.8	a	1.600	a	0.198	a	0.758	d	6285.3	ab	0.120	b
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
3	60 lb K <sub>2</sub> O	60	lb ai/A	673.5	a	1.478	a	0.195	a	0.928	c	5413.0	bc	0.115	b
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
4	90 lb K <sub>2</sub> O	90	lb ai/A	842.5	a	1.588	a	0.213	a	0.955	bc	4318.0	c	0.113	b
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
5	120 lb K <sub>2</sub> O	120	lb ai/A	676.5	a	1.810	a	0.223	a	1.223	a	4469.0	c	0.115	b
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
6	150 lb K <sub>2</sub> O	150	lb ai/A	832.0	a	1.425	a	0.195	a	1.110	ab	4333.0	c	0.113	b
	TSP (60 lb P <sub>2</sub> O <sub>5</sub> )	60	lb ai/A												
	ZnSO <sub>4</sub> (15 lb Zn/A)	15	lb ai/A												
LSD (P=.05)				247.18		0.56		0.03		0.16		1368.10		0.02	
Standard Deviation				164.04		0.37		0.02		0.11		907.93		0.01	
CV				21.19		23.32		8.21		11.66		16.78		11.08	
Treatment F				0.941		0.594		2.448		24.801		8.700		3.566	
Treatment Prob(F)				0.4828		0.7054		0.0820		0.0001		0.0005		0.0252	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Phosphorus Rate

<b>Experiment number</b> .....	13-KL-03
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8* MID - 1.3 FILL - 1.5
<b>pH</b> .....	CUT - 6.2* MID - 5.2 FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0* MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in Cut area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Flood</b> .....	August 17
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None



**Table 33. Evaluation of rice response to phosphorus rate (LaHaye.1). Evangeline Parish.**

Table 33: Evaluation of Rice Response to Phosphorus Rate (Baray, 1971; Evangeline Parish)														
Crop Name				Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice			
Description				plant-hd	emer-hd	top								
Rating Date							8/16/2013	8/16/2013	8/16/2013					
Rating Type				50% HD	50% HD	Height	Moist	Test Wt.	Yield					
Rating Unit				days	days	in	%	lb/bu	lb/A					
Crop Stage Majority				Main	Main	Main	Main	Main	Main	Main	Main			
Trt	Trt	Rate												
No.	Name	Rate	Unit											
1	0 lb P <sub>2</sub> O <sub>5</sub>	0	lb ai/A	123	a	110	a	36	a	19.8	a			
	60 lb K <sub>2</sub> O	60	lb ai/A							46.8	b			
	15 lb Zn	15	lb ai/A											
2	30 lb P <sub>2</sub> O <sub>5</sub>	30	lb ai/A	108	b	95	b	36	a	14.2	b			
	15 lb Zn	15	lb ai/A							48.2	a			
	60 lb K <sub>2</sub> O	60	lb ai/A											
3	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	109	b	96	b	36	a	13.7	b			
	15 lb Zn	15	lb ai/A							48.4	a			
	60 lb K <sub>2</sub> O	60	lb ai/A											
4	90 lb P <sub>2</sub> O <sub>5</sub>	90	lb ai/A	111	b	98	b	36	a	13.9	b			
	15 lb Zn	15	lb ai/A							48.3	a			
	60 lb K <sub>2</sub> O	60	lb ai/A											
5	120 lb P <sub>2</sub> O <sub>5</sub>	120	lb ai/A	109	b	96	b	35	a	14.7	b			
	15 lb Zn	15	lb ai/A							48.0	a			
	60 lb K <sub>2</sub> O	60	lb ai/A											
6	150 lb P <sub>2</sub> O <sub>5</sub>	150	lb ai/A	109	b	96	b	36	a	14.4	b			
	15 lb Zn	15	lb ai/A							48.1	a			
	60 lb K <sub>2</sub> O	60	lb ai/A											
LSD (P=.05)				4.40		4.38		1.83		1.68		0.43		807.00
Standard Deviation				2.90		2.90		1.22		1.12		0.28		535.50
CV				2.61		2.95		3.40		7.38		0.59		7.33
Treatment F				15.437		15.437		0.474		17.315		16.637		20.715
Treatment Prob(F)				0.0001		0.0001		0.7902		0.0001		0.0001		0.0001

Continued.

**Table 33. Continued.**

Crop Name				Rice	Rice	Rice	Rice
Rating Date				11/6/2013	11/6/2013	11/6/2013	
Rating Type				Moist	Test Wt.	Yield	Total Yield
Rating Unit				%	lb/bu	lb/A	lb/A
Crop Stage Majority				Ratoon	Ratoon	Ratoon	MC+RC
Trt	Trt	Rate					
No.	Name	Rate	Unit				
1	0 lb P <sub>2</sub> O <sub>5</sub>	0	lb ai/A	13.7	c	43.3	a
	60 lb K <sub>2</sub> O	60	lb ai/A			457	c
	15 lb Zn	15	lb ai/A				
2	30 lb P <sub>2</sub> O <sub>5</sub>	30	lb ai/A	15.2	bc	42.8	a
	15 lb Zn	15	lb ai/A			439	c
	60 lb K <sub>2</sub> O	60	lb ai/A				
3	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	19.0	ab	41.9	a
	15 lb Zn	15	lb ai/A			984	b
	60 lb K <sub>2</sub> O	60	lb ai/A				
4	90 lb P <sub>2</sub> O <sub>5</sub>	90	lb ai/A	20.1	a	41.7	a
	15 lb Zn	15	lb ai/A			1285	ab
	60 lb K <sub>2</sub> O	60	lb ai/A				
5	120 lb P <sub>2</sub> O <sub>5</sub>	120	lb ai/A	18.6	ab	42.1	a
	15 lb Zn	15	lb ai/A			1457	a
	60 lb K <sub>2</sub> O	60	lb ai/A				
6	150 lb P <sub>2</sub> O <sub>5</sub>	150	lb ai/A	18.8	ab	42.1	a
	15 lb Zn	15	lb ai/A			1528	a
	60 lb K <sub>2</sub> O	60	lb ai/A				
LSD (P=.05)				4.17		1.22	
Standard Deviation				2.77		0.81	
CV				15.75		1.92	
Treatment F				3.327		2.216	
Treatment Prob(F)				0.0321		0.1067	
						0.0001	
							0.0001

Continued.

**Table 33. Continued.**

Crop Name				Rice		Rice		Rice		Rice		Rice	
Description				Tissue									
Part Rated				Abvgrd -		Al		B		Ca		Cu	
Rating Date				7/3/2013									
Rating Type				Biomass-Dry		Tissue		Tissue		Tissue		Tissue	
Rating Unit				lb/A		ppm		ppm		%		ppm	
Crop Stage Majority				Main		Main		Main		Main		Main	
Crop Stage Scale				50% HD		50% HD		50% HD		50% HD		50% HD	
Trt No.	Trt Name	Rate	Rate Unit										
1	0 lb P <sub>2</sub> O <sub>5</sub>	0	lb ai/A	3273	b	319.8	a	4.668	a	0.213	a	2.88	a
	60 lb K <sub>2</sub> O	60	lb ai/A										
	15 lb Zn	15	lb ai/A										
2	30 lb P <sub>2</sub> O <sub>5</sub>	30	lb ai/A	9383	a	137.0	a	4.275	a	0.213	a	2.18	a
	15 lb Zn	15	lb ai/A										
	60 lb K <sub>2</sub> O	60	lb ai/A										
3	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	9197	a	174.8	a	4.465	a	0.215	a	2.28	a
	15 lb Zn	15	lb ai/A										
	60 lb K <sub>2</sub> O	60	lb ai/A										
4	90 lb P <sub>2</sub> O <sub>5</sub>	90	lb ai/A	9337	a	505.0	a	5.000	a	0.238	a	2.45	a
	15 lb Zn	15	lb ai/A										
	60 lb K <sub>2</sub> O	60	lb ai/A										
5	120 lb P <sub>2</sub> O <sub>5</sub>	120	lb ai/A	8897	a	174.3	a	4.635	a	0.228	a	2.28	a
	15 lb Zn	15	lb ai/A										
	60 lb K <sub>2</sub> O	60	lb ai/A										
6	150 lb P <sub>2</sub> O <sub>5</sub>	150	lb ai/A	9331	a	228.0	a	4.865	a	0.225	a	2.63	a
	15 lb Zn	15	lb ai/A										
	60 lb K <sub>2</sub> O	60	lb ai/A										
LSD (P=.05)				1532.70		343.40		0.82		0.04		0.83	
Standard Deviation				1017.20		227.90		0.54		0.02		0.55	
CV				12.35		88.86		11.65		10.63		22.56	
Treatment F				22.976		1.452		0.937		0.732		0.915	
Treatment Prob(F)				0.0001		0.2627		0.4852		0.6105		0.4978	

Continued.

**Table 33. Continued.**

Crop Name			Rice	Rice	Rice	Rice	Rice	Rice	Rice								
Part Rated			Mn	Mo	P	K	Na	S	Zn								
Rating Type			Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue								
Rating Unit			ppm	ppm	%	%	ppm	%	ppm								
Crop Stage Majority			Main	Main	Main	Main	Main	Main	Main								
Crop Stage Scale			50% HD	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD								
Trt No.	Trt Name	Rate	Unit														
1	0 lb P <sub>2</sub> O <sub>5</sub>	0	lb ai/A	806.8	a	2.538	a	0.105	e	1.100	a	2820.3	b	0.160	a	44.0	a
	60 lb K <sub>2</sub> O	60	lb ai/A														
	15 lb Zn	15	lb ai/A														
2	30 lb P <sub>2</sub> O <sub>5</sub>	30	lb ai/A	743.8	a	1.858	a	0.163	d	0.813	b	5359.0	a	0.120	b	57.5	a
	15 lb Zn	15	lb ai/A														
	60 lb K <sub>2</sub> O	60	lb ai/A														
3	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	733.0	a	1.810	a	0.198	c	0.845	b	5432.0	a	0.118	b	57.3	a
	15 lb Zn	15	lb ai/A														
	60 lb K <sub>2</sub> O	60	lb ai/A														
4	90 lb P <sub>2</sub> O <sub>5</sub>	90	lb ai/A	805.5	a	1.888	a	0.210	bc	0.848	b	5473.0	a	0.118	b	49.8	a
	15 lb Zn	15	lb ai/A														
	60 lb K <sub>2</sub> O	60	lb ai/A														
5	120 lb P <sub>2</sub> O <sub>5</sub>	120	lb ai/A	806.0	a	1.783	a	0.235	ab	0.925	b	5521.8	a	0.118	b	46.8	a
	15 lb Zn	15	lb ai/A														
	60 lb K <sub>2</sub> O	60	lb ai/A														
6	150 lb P <sub>2</sub> O <sub>5</sub>	150	lb ai/A	780.3	a	1.963	a	0.238	a	0.863	b	5130.3	a	0.113	b	48.8	a
	15 lb Zn	15	lb ai/A														
	60 lb K <sub>2</sub> O	60	lb ai/A														
LSD (P=.05)				220.35		0.81		0.03		0.16		1104.31		0.02		13.56	
Standard Deviation				146.23		0.53		0.02		0.11		732.86		0.01		9.00	
CV				18.77		27.11		9.33		11.75		14.79		10.29		17.76	
Treatment F				0.208		1.125		31.913		3.981		8.294		7.694		1.526	
Treatment Prob(F)				0.9539		0.3892		0.0001		0.0169		0.0006		0.0009		0.2407	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Zinc Rate

<b>Experiment number</b> .....	13-KL-04
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8* MID - 1.3 FILL - 1.5
<b>pH</b> .....	CUT - 6.2* MID - 5.2 FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0* MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in Cut area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Flood</b> .....	August 17
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 34. Evaluation of zinc rate (LaHaye.1). Evangeline Parish.**

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice
Description		plant-hd	emer-hd	top			
Rating Date					8/16/2013	8/16/2013	8/16/2013
Rating Type		50% HD	50% HD	Height	Moist	Test Wt.	Yield
Rating Unit		days	days	in	%	lb/bu	lb/A
Crop Stage Majority		Main	Main	Main	Main	Main	Main
Trt	Trt	Rate					
No.	Name	Rate	Unit				
1	0 lb Zn/A	112	a	99	a	37	a
	0-24-24 (250 lb/A)	250	lb/A	14.6	a	48.3	a
2	5 lb Zn/A	106	a	93	a	36	a
	0-24-24 (250 lb/A)	250	lb/A	12.6	a	48.9	a
3	7.5 lb Zn/A	112	a	99	a	38	a
	0-24-24 (250 lb/A)	250	lb/A	13.4	a	48.5	a
4	10 lb Zn/A	111	a	98	a	36	a
	0-24-24 (250 lb/A)	250	lb/A	13.2	a	48.8	a
5	15 lb Zn/A	106	a	93	a	37	a
	0-24-24 (250 lb/A)	250	lb/A	12.2	a	49.1	a
6	20 lb Zn/A	109	a	96	a	36	a
	0-24-24 (250 lb/A)	250	lb/A	11.9	a	49.2	a
LSD (P=.05)		7.10		7.10		2.04	
Standard Deviation		4.70		4.70		1.36	
CV		4.30		4.89		3.71	
Treatment F		1.339		1.339		0.964	
Treatment Prob(F)		0.3013		0.3013		0.4703	
						2.94	
						1.95	
						15.05	
						1.27	
						1.004	
						1.252	
						1.124	
						0.3341	
						0.3896	

Continued.

**Table 34. Continued.**

Crop Name		Rice		Rice		Rice		Rice	
Rating Date		11/6/2013		11/6/2013		11/6/2013			
Rating Type		Moist		Test Wt.		Yield		Total Yield	
Rating Unit		%		lb/bu		lb/A		lb/A	
Crop Stage Majority		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Unit						
1	0 lb Zn/A			14.3	a	31.5	a	882	a
	0-24-24 (250 lb/A)	250	lb/A						
2	5 lb Zn/A	5	lb ai/A	20.2	a	41.4	a	1137	a
	0-24-24 (250 lb/A)	250	lb/A						
3	7.5 lb Zn/A	7.5	lb ai/A	17.5	a	42.2	a	859	a
	0-24-24 (250 lb/A)	250	lb/A						
4	10 lb Zn/A	10	lb ai/A	18.0	a	41.7	a	891	a
	0-24-24 (250 lb/A)	250	lb/A						
5	15 lb Zn/A	15	lb ai/A	19.2	a	41.7	a	894	a
	0-24-24 (250 lb/A)	250	lb/A						
6	20 lb Zn/A	20	lb ai/A	23.2	a	40.6	a	889	a
	0-24-24 (250 lb/A)	250	lb/A						
LSD (P=.05)				9.19		13.03		483.60	1368.70
Standard Deviation				6.10		8.65		320.90	908.30
CV				32.56		21.68		34.68	10.87
Treatment F				0.950		0.908		0.422	0.850
Treatment Prob(F)				0.4779		0.5017		0.8264	0.5361

Continued.

**Table 34. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice	
Description			Tissue											
Part Rated			Abvgrd -		Al		B		Ca		Cu		Fe	
Rating Date			7/3/2013											
Rating Type			Biomass-Dry		Tissue		Tissue		Tissue		Tissue		Tissue	
Rating Unit			lb/A		ppm		ppm		%		ppm		ppm	
Crop Stage Majority			Main		Main		Main		Main		Main		Main	
Crop Stage Scale			50% HD		50% HD		50% HD		50% HD		50% HD		50% HD	
Trt	Trt													
No.	Name	Rate												
1	0 lb Zn/A		7940	a	342.3	a	4.623	a	0.218	a	3.25	a	351.3	a
	0-24-24 (250 lb/A)	250												
2	5 lb Zn/A	5	9808	a	181.5	a	4.293	a	0.250	a	2.80	ab	240.0	a
	0-24-24 (250 lb/A)	250												
3	7.5 lb Zn/A	7.5	8556	a	148.3	a	4.190	a	0.220	a	2.33	bc	197.8	a
	0-24-24 (250 lb/A)	250												
4	10 lb Zn/A	10	7611	a	307.0	a	4.108	a	0.213	a	2.15	bc	390.0	a
	0-24-24 (250 lb/A)	250												
5	15 lb Zn/A	15	9605	a	166.8	a	4.350	a	0.225	a	2.65	abc	232.8	a
	0-24-24 (250 lb/A)	250												
6	20 lb Zn/A	20	8512	a	121.0	a	4.103	a	0.213	a	2.03	c	166.0	a
	0-24-24 (250 lb/A)	250												
LSD (P=.05)			2644.40		251.19		0.89		0.03		0.70		209.11	0.05
Standard Deviation			1754.90		166.70		0.59		0.02		0.46		138.77	0.03
CV			20.24		78.96		13.82		8.83		18.27		52.77	14.66
Treatment F			1.003		1.189		0.439		2.049		3.908		1.621	0.563
Treatment Prob(F)			0.4492		0.3604		0.8148		0.1294		0.0181		0.2146	0.7269

Continued.



**Table 34. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice			
Part Rated			Mn		Mo		P		K		Na		S			
Rating Type			Tissue		Tissue		Tissue		Tissue		Tissue		Tissue			
Rating Unit			ppm		ppm		%		%		ppm		%			
Crop Stage Majority			Main		Main		Main		Main		Main		Main			
Crop Stage Scale			50% HD		50% HD		50% HD		50% HD		50% HD		50% HD			
Trt	Trt															
No.	Name	Rate														
1	0 lb Zn/A		827.3	a	2.350	a	0.210	a	1.005	a	5687.8	a	0.138	a	21.0	c
	0-24-24 (250 lb/A)	250														
2	5 lb Zn/A	5	880.0	a	2.528	a	0.215	a	0.880	a	5219.8	a	0.120	a	35.5	b
	0-24-24 (250 lb/A)	250														
3	7.5 lb Zn/A	7.5	747.8	a	2.655	a	0.228	a	1.013	a	5196.0	a	0.130	a	44.3	b
	0-24-24 (250 lb/A)	250														
4	10 lb Zn/A	10	707.5	a	2.245	a	0.203	a	0.830	a	5726.5	a	0.120	a	38.5	b
	0-24-24 (250 lb/A)	250														
5	15 lb Zn/A	15	787.5	a	1.925	a	0.185	a	0.903	a	5229.8	a	0.115	a	45.3	b
	0-24-24 (250 lb/A)	250														
6	20 lb Zn/A	20	715.0	a	1.850	a	0.173	a	0.865	a	4414.0	a	0.113	a	59.0	a
	0-24-24 (250 lb/A)	250														
LSD (P=.05)			155.42		0.57		0.04		0.18		1153.36		0.03		13.48	
Standard Deviation			103.14		0.38		0.02		0.12		765.41		0.02		8.95	
CV			13.27		16.75		11.77		13.20		14.59		14.14		22.05	
Treatment F			1.712		2.885		2.891		1.572		1.532		1.200		7.876	
Treatment Prob(F)			0.1924		0.0509		0.0506		0.2275		0.2389		0.3557		0.0008	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Potassium Timing on CL111 Main, Ratoon Rice Yield, and Agronomics

<b>Experiment number</b> .....	13-KL-33
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8* MID - 1.3 FILL - 1.5
<b>pH</b> .....	CUT - 6.2* MID - 5.2 FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0* MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in Cut area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 35. Evaluation of potassium timing on CL111 main, ratoon rice yield, and agronomics (LaHaye.1). Evangeline Parish.**

Crop Name				Rice		Rice		Rice		Rice		Rice				
Description				plant-hd		emer-hd		top								
Rating Date								8/14/2013		8/16/2013		8/16/2013				
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.				
Rating Unit				days		days		in		%		lb/bu				
Crop Stage Majority				Main		Main		Main		Main		Main				
Trt	Trt	Rate	Growth													
No.	Name	Unit	Stage													
1	UT Check	0	lb ai/A	115	ab	102	ab	33	cd	15.2	a	47.8	a	5585	e	
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
2	Muriate of Potash 0-0-60	120	lb ai/A	ATPLAN	106	c	93	c	38	a	15.7	a	47.8	a	8608	a
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
3	Muriate of Potash 0-0-60	120	lb ai/A	PREFLD	115	ab	102	ab	39	a	17.0	a	47.3	a	7436	bc
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
4	Muriate of Potash 0-0-60	120	lb ai/A	MIDTILL	115	ab	102	ab	33	cd	14.8	a	47.9	a	6038	de
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
5	Muriate of Potash 0-0-60	120	lb ai/A	GR	118	a	105	a	35	bc	16.0	a	47.6	a	6192	de
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
6	Muriate of Potash 0-0-60	120	lb ai/A	50%HD	115	ab	102	ab	35	bc	16.6	a	47.4	a	6814	cd
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
7	Muriate of Potash 0-0-60	120	lb ai/A	ATHARV	115	ab	102	ab	32	d	15.4	a	47.8	a	5967	e
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
8	Muriate of Potash 0-0-60	60	lb ai/A	ATPLAN	110	bc	97	bc	37	a	15.2	a	47.9	a	7890	ab
	Muriate of Potash 0-0-60	60	lb ai/A	GR												
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
9	Muriate of Potash 0-0-60	60	lb ai/A	ATPLAN	111	bc	98	bc	37	ab	15.9	a	47.7	a	7467	bc
	Muriate of Potash 0-0-60	60	lb ai/A	ATHARV												
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN												
	15 lb Zn/A	15	lb ai/A	ATPLAN												
LSD (P=.05)				6.60		6.60		2.11		1.60		0.46		798.90		
Standard Deviation				4.50		4.50		1.45		1.09		0.31		547.40		
CV				3.98		4.50		4.11		6.95		0.65		7.95		
Treatment F				2.652		2.652		10.604		1.710		1.663		13.944		
Treatment Prob(F)				0.0307		0.0307		0.0001		0.1474		0.1595		0.0001		

Continued.

Table 35. Continued.

Table 55: Continued.												
Crop Name				Rice		Rice		Rice		Rice		
Rating Date				11/6/2013		11/6/2013		11/6/2013				
Rating Type				Moist		Test Wt.		Yield		Total Yield		
Rating Unit				%		lb/bu		lb/A		lb/A		
Crop Stage Majority				Ratoon		Ratoon		Ratoon		MC+RC		
Trt	Trt		Rate	Growth								
No.	Name	Rate	Unit	Stage								
1	UT Check	0	lb ai/A		14.7	a	31.6	a	536	a	6121	e
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
2	Muriate of Potash 0-0-60	120	lb ai/A	ATPLAN	19.9	a	41.7	a	986	a	9594	a
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
3	Muriate of Potash 0-0-60	120	lb ai/A	PREFLD	18.4	a	42.1	a	845	a	8281	bc
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
4	Muriate of Potash 0-0-60	120	lb ai/A	MIDTILL	13.2	a	32.0	a	678	a	6716	de
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
5	Muriate of Potash 0-0-60	120	lb ai/A	GR	14.0	a	31.4	a	549	a	6740	de
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
6	Muriate of Potash 0-0-60	120	lb ai/A	50%HD	17.5	a	42.4	a	682	a	7497	cd
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
7	Muriate of Potash 0-0-60	120	lb ai/A	ATHARV	18.1	a	42.0	a	601	a	6568	de
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
8	Muriate of Potash 0-0-60	60	lb ai/A	ATPLAN	19.6	a	41.9	a	868	a	8758	ab
	Muriate of Potash 0-0-60	60	lb ai/A	GR								
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
9	Muriate of Potash 0-0-60	60	lb ai/A	ATPLAN	18.5	a	41.6	a	579	a	8046	bc
	Muriate of Potash 0-0-60	60	lb ai/A	ATHARV								
	60 lb P <sub>2</sub> O <sub>5</sub> /A	60	lb ai/A	ATPLAN								
	15 lb Zn/A	15	lb ai/A	ATPLAN								
LSD (P=.05)					7.85		17.43		398.70		1147.30	
Standard Deviation					5.38		11.94		273.20		786.10	
CV					31.44		31.01		38.88		10.36	
Treatment F					0.849		0.740		1.378		8.708	
Treatment Prob(F)					0.5702		0.6561		0.2557		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Phosphorus Timing on CL111 Main, Ratoon Rice Yield, and Agronomics

<b>Experiment number</b> .....	13-KL-34
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8* MID - 1.3 FILL - 1.5
<b>pH</b> .....	CUT - 6.2* MID - 5.2 FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0* MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1 FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in Cut area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 36. Evaluation of phosphorus timing on CL111 main, ratoon rice yield, and agronomics (LaHaye.1). Evangeline Parish.**

Crop Name				Rice		Rice		Rice		Rice		Rice	
Description				plant-hd		emer-hd		top					
Rating Date								8/14/2013		8/16/2013		8/16/2013	
Rating Type				50% HD		50% HD		Height		Moist		Test Wt.	
Rating Unit				days		days		in		%		lb/bu	
Crop Stage Majority				Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Unit	Growth Stage									
1	UT Check	0	lb ai/A			127	ab	114	ab	33	cd	20.6	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								46.7	c
	15 lb Zn	15	lb ai/A	ATPLAN									
2	TSP	120	lb ai/A	ATPLAN		110	d	97	d	38	a	14.0	b
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								48.3	ab
	15 lb Zn	15	lb ai/A	ATPLAN									
3	TSP	120	lb ai/A	PREFLD		118	c	105	c	37	a	15.4	b
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								47.8	b
	15 lb Zn	15	lb ai/A	ATPLAN									
4	TSP	120	lb ai/A	MIDTILL		124	bc	111	bc	36	abc	21.9	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								46.4	c
	15 lb Zn	15	lb ai/A	ATPLAN									
5	TSP	120	lb ai/A	GR		124	b	111	b	37	ab	21.1	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								46.6	c
	15 lb Zn	15	lb ai/A	ATPLAN									
6	TSP	120	lb ai/A	50%HD		128	ab	115	ab	33	bc	23.5	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								46.3	c
	15 lb Zn	15	lb ai/A	ATPLAN									
7	TSP	120	lb ai/A	ATHARV		131	a	118	a	30	d	21.6	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								46.5	c
	15 lb Zn	15	lb ai/A	ATPLAN									
8	TSP	60	lb ai/A	ATPLAN		108	d	95	d	38	a	13.4	b
	TSP	60	lb ai/A	GR								48.5	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN									
	15 lb Zn	15	lb ai/A	ATPLAN									
9	TSP	60	lb ai/A	ATPLAN		110	d	97	d	37	a	13.6	b
	TSP	60	lb ai/A	ATHARV								48.4	ab
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN									
	15 lb Zn	15	lb ai/A	ATPLAN									
LSD (P=.05)						5.90		5.90		3.40		3.93	
Standard Deviation						4.00		4.00		2.33		2.69	
CV						3.38		3.79		6.59		14.67	
Treatment F						19.074		19.070		5.492		9.443	
Treatment Prob(F)						0.0001		0.0001		0.0005		0.0001	

Continued.

Table 36. Continued.

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/6/2013		11/6/2013		11/6/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage								
1	UT Check	0	lb ai/A		15.0	e	42.6	a	471	d	4184	c
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
2	TSP	120	lb ai/A	ATPLAN	20.8	ab	41.5	bc	1284	b	9284	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
3	TSP	120	lb ai/A	PREFLD	19.0	a-d	41.9	abc	1224	b	8298	a
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
4	TSP	120	lb ai/A	MIDTILL	16.6	de	42.4	ab	674	cd	6123	b
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
5	TSP	120	lb ai/A	GR	18.3	bcd	42.0	abc	761	c	6207	b
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
6	TSP	120	lb ai/A	50%HD	16.7	de	42.6	a	1287	b	5237	bc
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
7	TSP	120	lb ai/A	ATHARV	17.3	cde	42.6	a	1667	a	3929	c
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
8	TSP	60	lb ai/A	ATPLAN	20.0	abc	41.7	abc	1302	b	9512	a
	TSP	60	lb ai/A	GR								
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
9	TSP	60	lb ai/A	ATPLAN	22.1	a	41.2	c	1146	b	8681	a
	TSP	60	lb ai/A	ATHARV								
	60 lb K <sub>2</sub> O	60	lb ai/A	ATPLAN								
	15 lb Zn	15	lb ai/A	ATPLAN								
LSD (P=.05)					3.18		1.00		288.50		1365.80	
Standard Deviation					2.18		0.68		197.70		935.80	
CV					11.82		1.62		18.12		13.70	
Treatment F					4.361		2.411		14.580		21.485	
Treatment Prob(F)					0.0023		0.0456		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Rice Response to Pelletized Poultry Litter

<b>Experiment number</b> .....	13-CM-28
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	Rice / CL111
<b>Planting method/date</b> .....	Drill-seeded / March 14
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Ratoon Harvest date</b> .....	October 30
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15 90 lb/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 37. Evaluation of rice response to pelletized poultry litter (RRS.1). Rice Research Station.**

Crop Name					Rice		Rice		Rice		Rice		Rice			
Description					plant-hd		emer-hd		top							
Rating Date									7/30/2013		8/5/2013		8/5/2013			
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.			
Rating Unit					days		days		in		%		lb/bu			
Crop Stage Majority					Main		Main		Main		Main		Main			
Trt	Trt		Rate	Rate	Growth											
No.	Name			Unit	Stage											
1	UTC				107	b	93	b	30	b	13.3	b	49.9	a	3017	d
2	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	106	b	92	b	31	b	13.1	b	50.0	a	3178	cd
3	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	106	b	92	b	31	b	13.4	b	49.8	a	3137	cd
4	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	111	a	97	a	38	a	15.8	a	49.2	bc	8072	ab
	120 lb N/A total (108 PF urea)	108	lb ai/A	PF												
	60 lb P <sub>2</sub> O <sub>5</sub> total (52 lb fm TSP)	52	lb ai/A	at plant												
	60 lb K <sub>2</sub> O total (48 lb fm MOP)	48	lb ai/A	at plant												
5	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	111	a	97	a	37	a	15.7	a	49.2	bc	7617	ab
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF												
	60 lb P <sub>2</sub> O <sub>5</sub> total (48 lb fm TSP)	48	lb ai/A	at plant												
	60 lb K <sub>2</sub> O total (42 lb fm MOP)	42	lb ai/A	at plant												
6	120 lb N/A total	120	lb ai/A	PF	111	a	97	a	38	a	16.0	a	49.2	c	8117	a
	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	at plant												
	60 lb K <sub>2</sub> O	60	lb ai/A	at plant												
7	12 lb N/A total	12	lb ai/A	PF	107	b	93	b	32	b	13.9	b	49.6	abc	3417	cd
	8 lb P <sub>2</sub> O <sub>5</sub>	8	lb ai/A	at plant												
	12 lb K <sub>2</sub> O	12	lb ai/A	at plant												
8	18 lb N/A total	18	lb ai/A	PF	107	b	93	b	31	b	13.7	b	49.7	ab	3625	c
	12 lb P <sub>2</sub> O <sub>5</sub>	12	lb ai/A	at plant												
	18 lb K <sub>2</sub> O	18	lb ai/A	at plant												
9	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	111	a	97	a	38	a	15.8	a	49.2	bc	7529	b
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF												
LSD (P=.05)					0.80		0.80		1.92		1.52		0.56		574.50	
Standard Deviation					0.60		0.60		1.31		1.04		0.38		393.70	
CV					0.53		0.61		3.89		7.17		0.77		7.43	
Treatment F					65.511		65.511		28.393		5.783		3.073		150.675	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0004		0.0157		0.0001	

Continued.

**Table 37. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					10/30/2013		10/30/2013		10/30/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt		Rate	Growth								
No.	Name		Rate	Unit	Stage							
1	UTC				12.6	d	46.5	ab	3033	a	6050	b
2	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	12.7	d	46.4	ab	2826	a	6004	b
3	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	13.5	cd	46.1	bc	2829	a	5966	b
4	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	15.9	a	45.6	d	2892	a	10963	a
	120 lb N/A total (108 PF urea)	108	lb ai/A	PF								
	60 lb P <sub>2</sub> O <sub>5</sub> total (52 lb fm TSP)	52	lb ai/A	at plant								
	60 lb K <sub>2</sub> O total (48 lb fm MOP)	48	lb ai/A	at plant								
5	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	14.1	bc	46.1	bc	2865	a	10482	a
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF								
	60 lb P <sub>2</sub> O <sub>5</sub> total (48 lb fm TSP)	48	lb ai/A	at plant								
	60 lb K <sub>2</sub> O total (42 lb fm MOP)	42	lb ai/A	at plant								
6	120 lb N/A total	120	lb ai/A	PF	14.8	ab	45.9	cd	2733	a	10850	a
	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	at plant								
	60 lb K <sub>2</sub> O	60	lb ai/A	at plant								
7	12 lb N/A total	12	lb ai/A	PF	12.3	d	46.6	a	2959	a	6376	b
	8 lb P <sub>2</sub> O <sub>5</sub>	8	lb ai/A	at plant								
	12 lb K <sub>2</sub> O	12	lb ai/A	at plant								
8	18 lb N/A total	18	lb ai/A	PF	12.5	d	46.5	ab	2879	a	6504	b
	12 lb P <sub>2</sub> O <sub>5</sub>	12	lb ai/A	at plant								
	18 lb K <sub>2</sub> O	18	lb ai/A	at plant								
9	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	14.8	abc	45.9	cd	2763	a	10291	a
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF								
LSD (P=.05)					1.26		0.45		353.20		730.40	
Standard Deviation					0.87		0.31		242.00		500.50	
CV					6.34		0.67		8.45		6.13	
Treatment F					8.649		4.610		0.585		89.578	
Treatment Prob(F)					0.0001		0.0017		0.7805		0.0001	

Continued.

**Table 37. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Description					Tissue		Tissue N		N Uptake		N fert Eff.	
Part Rated					Abvgrd -		Abvgrd -		Total			
Rating Date					7/3/2013		7/3/2013		7/3/2013		7/3/2013	
Rating Type					Biomass-Dry							
Rating Unit					lb/A		% N		lb/A		%	
Crop Stage Majority					Main		Main		Main		by block	
Crop Stage Scale					50% HD		50% HD		50% HD		50% HD	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage								
1	UTC				3680	b	0.7003	c	26	b	0	e
2	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	4243	b	0.7400	c	31	b	15	cde
3	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	3852	b	0.7543	c	29	b	9	de
4	poultry litter (3-2-3) 400 lb/A	400	lb/A	at plant	9118	a	0.9518	b	87	a	39	ab
	120 lb N/A total (108 PF urea)	108	lb ai/A	PF								
	60 lb P <sub>2</sub> O <sub>5</sub> total (52 lb fm TSP)	52	lb ai/A	at plant								
	60 lb K <sub>2</sub> O total (48 lb fm MOP)	48	lb ai/A	at plant								
5	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	8524	a	1.0073	ab	86	a	35	abc
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF								
	60 lb P <sub>2</sub> O <sub>5</sub> total (48 lb fm TSP)	48	lb ai/A	at plant								
	60 lb K <sub>2</sub> O total (42 lb fm MOP)	42	lb ai/A	at plant								
6	120 lb N/A total	120	lb ai/A	PF	9002	a	1.0168	a	91	a	55	a
	60 lb P <sub>2</sub> O <sub>5</sub>	60	lb ai/A	at plant								
	60 lb K <sub>2</sub> O	60	lb ai/A	at plant								
7	12 lb N/A total	12	lb ai/A	PF	4138	b	0.7540	c	31	b	42	ab
	8 lb P <sub>2</sub> O <sub>5</sub>	8	lb ai/A	at plant								
	12 lb K <sub>2</sub> O	12	lb ai/A	at plant								
8	18 lb N/A total	18	lb ai/A	PF	4136	b	0.7435	c	31	b	28	bcd
	12 lb P <sub>2</sub> O <sub>5</sub>	12	lb ai/A	at plant								
	18 lb K <sub>2</sub> O	18	lb ai/A	at plant								
9	poultry litter (3-2-3) 600 lb/A	600	lb/A	at plant	8751	a	0.9990	ab	87	a	51	ab
	120 lb N/A total (102 PF urea)	102	lb ai/A	PF								
LSD (P=.05)					1338.40		0.06		10.90		23.10	
Standard Deviation					917.10		0.04		7.50		15.80	
CV					14.89		4.78		13.47		51.96	
Treatment F					31.190		45.027		68.030		5.785	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0004	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Yield Benefit and Optimum Application Timing of HM0715

<b>Experiment number</b> .....	13-CM-25
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Helena
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 7
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
	120 lb N/A 46-0-0, May 15
	92 lb N/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 38. Yield benefit and optimum application timing of HM0715 on CL151 (RRS.2). Rice Research Station.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top							
Rating Date							7/31/2013		8/7/2013		8/7/2013		8/7/2013			
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.		Yield	
Rating Unit					days		days		in		%		lb/bu		lb/A	
Crop Stage Majority					Main		Main		Main		Main		Main		Main	
Trt	Trt		Rate	Growth												
No.	Name	Rate	Unit	Stage												
1	Grower Standard				111	a	98	a	39	a	16.8	a	48.2	a	10455	a
2	HM-0715	1.0	pt/A	LP/PF	111	a	98	a	40	a	19.3	a	47.3	a	10112	a
	HM-9110	0.25	% v/v	LP/PF												
3	HM-0715	1.0	pt/A	PI	111	a	98	a	38	a	19.5	a	47.2	a	10238	a
	HM-9110	0.25	% v/v	PI												
4	HM-0715	1.0	pt/A	PD+7D	111	a	98	a	39	a	18.7	a	47.5	a	10188	a
	HM-9110	0.25	% v/v	PD+7D												
5	HM-0715	1.0	pt/A	B-Split	111	a	98	a	40	a	19.8	a	47.1	a	10305	a
	HM-9110	0.25	% v/v	B-Split												
6	HM-0715	1.0	pt/A	10% HD	111	a	98	a	39	a	18.0	a	47.7	a	10017	a
	HM-9110	0.25	% v/v	10% HD												
7	HM-0715	1.0	pt/A	MILK	111	a	98	a	40	a	18.6	a	47.5	a	10247	a
	HM-9110	0.25	% v/v	MILK												
LSD (P=.05)					0.90		0.90		1.81		3.56		1.36		634.00	
Standard Deviation					0.60		0.60		1.22		2.38		0.91		425.00	
CV					0.52		0.59		3.13		12.77		1.92		4.16	
Treatment F					0.857		0.857		0.808		0.740		0.629		0.433	
Treatment Prob(F)					0.5439		0.5439		0.5770		0.6252		0.7053		0.8467	

Continued.

**Table 38. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/4/2013		11/4/2013		11/4/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt		Rate	Growth								
No.	Name	Rate	Unit	Stage								
1	Grower Standard				18.1	a	40.9	a	3989	a	14445	a
2	HM-0715	1.0	pt/A	LP/PF	18.1	a	40.9	a	3458	a	13571	a
	HM-9110	0.25	% v/v	LP/PF								
3	HM-0715	1.0	pt/A	PI	18.5	a	40.7	a	3131	a	13369	a
	HM-9110	0.25	% v/v	PI								
4	HM-0715	1.0	pt/A	PD+7D	18.2	a	40.9	a	3815	a	14003	a
	HM-9110	0.25	% v/v	PD+7D								
5	HM-0715	1.0	pt/A	B-Split	18.8	a	40.6	a	3481	a	13786	a
	HM-9110	0.25	% v/v	B-Split								
6	HM-0715	1.0	pt/A	10% HD	18.7	a	40.7	a	3329	a	13346	a
	HM-9110	0.25	% v/v	10% HD								
7	HM-0715	1.0	pt/A	MILK	17.4	a	41.2	a	3742	a	13989	a
	HM-9110	0.25	% v/v	MILK								
LSD (P=.05)					1.42		0.64		832.10		1127.70	
Standard Deviation					0.95		0.43		557.70		755.90	
CV					5.21		1.05		15.65		5.48	
Treatment F					1.073		0.877		1.149		1.091	
Treatment Prob(F)					0.4164		0.5319		0.3773		0.4066	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Yield Benefit and Optimum Application Timing of HM0715

<b>Experiment number</b> .....	13-VP-25
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry and Helena
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21
	120 lb N/A 46-0-0, May 6
	90 lb N/A 46-0-0, August 20
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 22
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20
	2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7
	1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 39. Yield benefit and optimum application timing of HM0715 (VP.2). Vermilion Parish.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		top							
Rating Date							8/1/2013		8/17/2013		8/17/2013		8/17/2013			
Rating Type					50% HD		50% HD		Height		Moist		Test Wt.		Yield	
Rating Unit					days		days		in		%		lb/bu		lb/A	
Crop Stage Majority					Main		Main		Main		Main		Main		Main	
Trt No.	Trt Name	Rate	Unit	Growth Stage												
1	Grower Standard				106.5	a	92.5	a	43	a	14.3	a	45.3	a	10719	a
2	HM-0715	1.0	pt/A	LP/PF	106.8	a	92.8	a	43	a	14.6	a	44.8	a	10735	a
	HM-9110	0.25	% v/v	LP/PF											63.50	a
3	HM-0715	1.0	pt/A	PI	106.5	a	92.5	a	44	a	15.4	a	44.6	a	10109	a
	HM-9110	0.25	% v/v	PI											63.84	a
4	HM-0715	1.0	pt/A	PD + 7 D	106.5	a	92.5	a	43	a	15.3	a	44.8	a	9866	a
	HM-9110	0.25	% v/v	PD + 7 D											63.37	a
5	HM-0715	1.0	pt/A	BS	106.8	a	92.8	a	43	a	14.8	a	45.1	a	9932	a
	HM-9110	0.25	% v/v	BS											63.08	a
6	HM-0715	1.0	pt/A	10% HD	107.0	a	93.0	a	43	a	14.9	a	44.4	a	10196	a
	HM-9110	0.25	% v/v	10% HD											63.63	a
7	HM-0715	1.0	pt/A	MILK	106.8	a	92.8	a	42	a	14.9	a	45.2	a	10452	a
	HM-9110	0.25	% v/v	MILK											63.26	a
LSD (P=.05)					0.70		0.70		1.48		1.70		0.75		1214.50	
Standard Deviation					0.47		0.47		0.99		1.13		0.51		810.20	
CV					0.44		0.51		2.32		7.64		1.13		7.88	
Treatment F					0.643		0.643		1.000		0.439		1.648		0.770	
Treatment Prob(F)					0.6951		0.6951		0.4552		0.8419		0.1916		0.6045	

Continued.



**Table 39. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/5/2013		11/5/2013		11/5/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage								
1	Grower Standard				21.1	a	41.7	a	2469	a	13188	a
2	HM-0715	1.0	pt/A	LP/PF	22.0	a	41.5	a	1948	a	12682	a
	HM-9110	0.25	% v/v	LP/PF								
3	HM-0715	1.0	pt/A	PI	22.7	a	41.3	a	1967	a	12006	a
	HM-9110	0.25	% v/v	PI								
4	HM-0715	1.0	pt/A	PD + 7 D	22.2	a	41.3	a	2092	a	11874	a
	HM-9110	0.25	% v/v	PD + 7 D								
5	HM-0715	1.0	pt/A	BS	21.6	a	41.6	a	2177	a	12109	a
	HM-9110	0.25	% v/v	BS								
6	HM-0715	1.0	pt/A	10% HD	22.4	a	41.3	a	2070	a	12266	a
	HM-9110	0.25	% v/v	10% HD								
7	HM-0715	1.0	pt/A	MILK	21.5	a	41.5	a	2105	a	12557	a
	HM-9110	0.25	% v/v	MILK								
LSD (P=.05)					1.30		0.37		444.60		985.80	
Standard Deviation					0.87		0.25		299.30		657.60	
CV					3.99		0.61		14.13		5.31	
Treatment F					1.662		1.793		1.350		1.938	
Treatment Prob(F)					0.1878		0.1573		0.2870		0.1359	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment Prob(F) is significant at mean comparison OSL.

## Evaluation of NZONE MAX-Treated Urea in Rice Production

<b>Experiment number</b> .....	13-CM-33
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 40. Evaluation of NZONE MAX-treated urea in rice production (RRS.1). Rice Research Station.**

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice						
Description					plant-hd	emer-hd	top									
Rating Date							7/30/2013	8/5/2013	8/5/2013	8/5/2013						
Rating Type					50% HD	50% HD	Height	Moist	Test Wt.	Yield						
Rating Unit					days	days	in	%	lb/bu	lb/A						
Crop Stage Majority					Main	Main	Main	Main	Main	Main						
Trt	Trt	Rate		Growth												
No.	Name	Rate	Unit	Stage												
1	UTC	0	lb ai/A	3 DPF	110	d	97	d	29	e	15.2	d	49.3	a	3650	e
2	NZone Maxx-urea (50 lb N/A)	50	lb ai/A	3 DPF	110	d	97	d	31	de	16.4	cd	48.9	ab	5085	d
3	NZone Maxx-urea (100 lb N/A)	100	lb ai/A	3 DPF	112	bc	99	bc	34	bc	16.0	cd	49.0	ab	6730	bc
4	NZone Maxx-urea (150 lb N/A)	150	lb ai/A	3 DPF	113	ab	100	ab	36	ab	19.6	ab	48.1	c	7857	ab
5	NZone Maxx-urea (200 lb N/A)	200	lb ai/A	3 DPF	114	a	101	a	36	b	20.7	a	47.9	c	8122	a
6	Urea (50 lb N/A)	50	lb ai/A	3 DPF	110	d	97	d	33	cd	14.5	d	49.5	a	5021	d
7	Urea (100 lb N/A)	100	lb ai/A	3 DPF	111	cd	98	cd	33	c	15.8	d	49.1	ab	5733	cd
8	Urea (150 lb N/A)	150	lb ai/A	3 DPF	112	abc	99	abc	36	ab	18.2	bc	48.4	bc	7758	ab
9	Urea (200 lb N/A)	200	lb ai/A	3 DPF	113	abc	100	abc	38	a	20.6	a	47.9	c	8163	a
LSD (P=.05)					1.60		1.60		2.14		2.37		0.66		1174.10	
Standard Deviation					1.10		1.10		1.47		1.62		0.45		804.40	
CV					0.98		1.12		4.32		9.31		0.93		12.46	
Treatment F					8.054		8.054		15.045		8.393		7.267		16.809	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001		0.0001		0.0001	

Continued.

**Table 40. Continued.**

Table Not Continued												
Crop Name					Rice			Rice			Rice	
Description					Tissue			Tissue N			N Uptake	
Part Rated					Abvgrd -			Abvgrd -			total -	
Rating Date								8/5/2013			8/5/2013	
Rating Type					Biomass-Dry							
Rating Unit					lb/A			% N			lb/A	
Crop Stage Majority					Main			Main			Main	
Crop Stage Scale					50% HD			50% HD			50% HD	
Trt	Trt		Rate	Growth								
No.	Name	Rate	Unit	Stage								
1	UTC	0	lb ai/A	3 DPF	4717	c	0.74	d	35	d	0	a
2	NZone Maxx-urea (50 lb N/A)	50	lb ai/A	3 DPF	7148	bc	0.83	bcd	60	cd	49	a
3	NZone Maxx-urea (100 lb N/A)	100	lb ai/A	3 DPF	8900	ab	0.89	a-d	79	abc	44	a
4	NZone Maxx-urea (150 lb N/A)	150	lb ai/A	3 DPF	10199	a	1.05	a	108	a	49	a
5	NZone Maxx-urea (200 lb N/A)	200	lb ai/A	3 DPF	9339	ab	1.03	ab	103	ab	34	a
6	Urea (50 lb N/A)	50	lb ai/A	3 DPF	8345	ab	0.82	bcd	69	a-d	61	a
7	Urea (100 lb N/A)	100	lb ai/A	3 DPF	8173	ab	0.77	cd	64	bcd	29	a
8	Urea (150 lb N/A)	150	lb ai/A	3 DPF	10001	a	0.98	abc	99	abc	42	a
9	Urea (200 lb N/A)	200	lb ai/A	3 DPF	10000	a	1.00	ab	101	ab	33	a
LSD (P=.05)					2611.40		0.22		39.40		36.00	
Standard Deviation					1789.30		0.15		27.00		24.70	
CV					20.96		16.59		33.86		65.40	
Treatment F					3.829		2.467		3.330		1.944	
Treatment Prob(F)					0.0050		0.0415		0.0105		0.0994	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment Prob(F) is significant at mean comparison OSL.

## Effect of Water Management on Rice Grain Yield, Milling Yield, and Grain Arsenic Concentration

<b>Experiment number</b> .....	13-CM-30
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.13
<b>pH</b> .....	7.14
<b>Extractable nutrients ppm</b> .....	Ca-1179; Cu-1.8; Mg-254; P-13; K-68; Na-86; S-9.4; Zn-7.4
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	Hyb-14, Conventional-33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 8
<b>Ratoon Harvest date</b> .....	November 13
<b>Seed treatment/cwt</b> .....	
<b>Conventional rice treatments</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15 120 lb N/A 46-0-0, May 15 90 lb/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 29
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 25
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 2 pt/A Prowl H <sub>2</sub> O + 3 qt/A Propanil + .5 oz/A Permit, May 1 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 41. Effect of water management on rice grain yield, milling yield, and grain arsenic concentration: A Multi-State Effort (RRS.1). Rice Research Station.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description		plant-hd		emer-hd		Rice top		8/8/2013		8/8/2013		8/8/2013		8/2/2013		11/13/2013		11/13/2013		11/13/2013	
Rating Date						8/8/2013															
Rating Type		50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit		days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name																				
1	Continuous flood CL151	113	h	100	h	37	bcd	21.0	cde	47.0	f-k	8706	ef	12.9	c-f	40.5	b-e	3252	abc	11958	cd
2	Continuous flood Cheniere	118	cde	105	cde	34	def	22.0	abc	46.6	ijk	6054	g-j	13.0	cde	40.4	de	1806	hi	7860	ijk
3	Continuous flood Jupiter	120	b	107	b	36	cde	24.4	a	46.4	k	6882	g	13.9	bcd	39.8	def	2950	cde	9832	fg
4	Continuous flood Presidio	117	def	104	def	34	def	21.6	bcd	46.5	jk	6310	gh	9.9	g	42.2	a	3516	ab	9826	fg
5	Continuous flood CLXL729	112	h	99	h	41	a	15.6	ij	48.2	abc	11204	a	12.5	c-f	40.6	bcd	2981	cde	14184	a
6	Continuous flood CLXL745	112	h	99	h	41	a	16.0	ij	48.1	a-d	10777	ab	14.3	bc	39.5	d-g	2618	ef	13395	ab
7	Aerobic (flush only as needed) CL151	116	fg	103	fg	32	f-k	19.3	c-f	47.4	d-h	8011	f	20.0	a	35.0	i	502	m	8512	hi
8	Aerobic (flush only as needed) Cheniere	116	fg	103	fg	30	k	18.0	f-i	47.6	c-f	6136	ghi	14.8	bc	37.7	h	560	m	6696	lm
9	Aerobic (flush only as needed) Jupiter	122	a	109	a	31	jk	24.3	a	46.8	h-k	6209	ghi	14.8	bc	38.3	gh	853	klm	7062	j-m
10	Aerobic (flush only as needed) Presidio	117	d-g	104	d-g	31	h-k	16.7	g-j	47.9	b-e	6301	gh	11.4	efg	40.4	de	1196	jk	7497	i-l
11	Aerobic (flush only as needed) CLXL729	116	fg	103	fg	34	d-g	17.9	f-i	47.7	c-f	8286	f	11.4	efg	39.9	def	691	lm	8977	gh
12	Aerobic (flush only as needed) CLXL745	116	g	103	g	32	g-k	16.4	hij	48.1	a-d	9181	de	10.5	fg	40.1	de	654	lm	9835	fg
13	Intermittent flood irrigation CL151	113	h	100	h	34	e-h	19.4	c-f	47.3	e-i	8695	ef	15.8	b	38.7	fgh	2058	gh	10753	ef
14	Intermittent flood irrigation Cheniere	117	efg	104	efg	30	k	18.7	e-h	47.3	d-i	5079	k	12.9	cde	39.5	d-g	992	kl	6071	m
15	Intermittent flood irrigation Jupiter	118	bcd	105	bcd	34	def	23.7	ab	46.8	g-k	5237	jk	14.4	bc	39.4	efg	1620	i	6856	klm
16	Intermittent flood irrigation Presidio	117	d-g	104	d-g	31	ijk	18.8	e-h	47.2	e-k	5184	jk	9.7	g	41.7	abc	3200	bcd	8384	hi
17	Intermittent flood irrigation CLXL729	113	h	100	h	39	ab	14.9	j	48.5	ab	9814	cd	13.9	bcd	39.6	def	1548	ij	11362	de
18	Intermittent flood irrigation CLXL745	113	h	100	h	39	ab	14.6	j	48.8	a	10450	abc	12.8	c-f	40.1	de	1437	ij	11888	cd

Continued.

**Table 41. Continued.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description		plant-hd		emer-hd		top		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Rating Date						8/8/2013		8/8/2013		8/8/2013		8/2/2013		11/13/2013		11/13/2013		11/13/2013			
Rating Type		50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit		days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt	Trt																				
No.	Name																				
19	Straight head mgmt. CL151	113	h	100	h	37	bc	18.8	e-h	47.3	d-h	8818	ef	11.9	d-g	40.6	b-e	3612	a	12430	bc
20	Straight head mgmt. Cheniere	117	efg	104	efg	33	f-j	19.2	d-g	47.2	e-j	5367	ijk	13.1	cde	39.6	def	1554	ij	6921	klm
21	Straight head mgmt. Jupiter	119	bc	106	bc	34	e-i	23.8	ab	46.5	jk	5630	h-k	11.9	d-g	40.5	cde	2354	fg	7984	hij
22	Straight head mgmt. Presidio	117	d-g	104	d-g	33	f-i	16.8	f-j	47.6	c-g	5189	jk	9.6	g	41.7	ab	2845	de	8034	hij
23	Straight head mgmt. CLXL729	112	h	99	h	38	bc	15.8	ij	48.2	abc	9901	bcd	13.3	cde	39.7	def	2754	e	12655	bc
24	Straight head mgmt. CLXL745	112	h	99	h	38	bc	15.2	j	48.2	abc	10215	bc	11.8	d-g	40.6	bcd	2940	cde	13155	ab
LSD (P=.05)		1.70		1.70		2.60		2.63		0.75		887.40		2.34		1.25		393.60		1061.90	
Standard Deviation		1.20		1.20		1.90		1.86		0.53		627.50		1.66		0.88		278.30		750.90	
CV		1.03		1.17		5.38		9.87		1.12		8.20		12.82		2.22		13.77		7.76	
Treatment F		22.554		22.554		12.958		11.162		6.422		43.297		7.259		10.545		54.232		42.642	
Treatment Prob(F)		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment Prob(F) is significant at mean comparison OSL.

## Evaluation of Agrotain Volatilization Control When Used in Flooded, Moist, and Dry Soil Conditions

<b>Experiment number</b> .....	13-CM-29 Early Planting
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.13
<b>pH</b> .....	7.14
<b>Extractable nutrients ppm</b> .....	Ca-1179; Cu-1.8; Mg-254; P-13; K-68; Na-86; S-9.4; Zn-7.4
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 2
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
	90 lb/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	Flood Bay – July 19, Mud Bay – July 24, Dry Bay – July 29
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 42. Evaluation of Agrotain volatilization control when used in flooded, moist, and dry soil conditions (RRS.1). Early Planting Trial.**  
**Rice Research Station.**

Crop Name Description Rating Date Rating Type Rating Unit Crop Stage Majority					Rice plant-hd	Rice emer-hd	Rice top 8/1/2013 Height in Main	Rice 8/2/2013 Moist % Main	Rice 8/2/2013 Test Wt. lb/bu Main	Rice 8/2/2013 Yield lb/A Main
Trt No.	Trt Name	Rate	Unit	Growth Stage						
1	Urea Dry	120	lb ai/A	10 DPF	110 a	97 a	35 ab	22.0 a	46.8 d	7359 ab
2	Urea Moist	120	lb ai/A	10 DPF	109 a	96 a	35 ab	20.9 a	46.8 d	6168 c
3	Urea Flooded (2" initial)	120	lb ai/A	10 DPF	105 bc	92 bc	32 c	18.8 b	47.4 bc	4354 d
4	Agrotain-Urea (3 qt/ton) Dry	120	lb ai/A	10 DPF	110 a	97 a	36 a	21.6 a	46.8 d	7725 a
5	Agrotain-Urea (3 qt/ton) Moist	120	lb ai/A	10 DPF	110 a	97 a	36 a	20.6 a	47.0 cd	6852 b
6	Agrotain-Urea (3 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	104 c	91 c	33 bc	17.3 b	47.8 a	4515 d
7	Agrotain-Urea (4 qt/ton) Dry	120	lb ai/A	10 DPF	109 a	96 a	35 ab	21.9 a	46.7 d	7589 a
8	Agrotain-Urea (4 qt/ton) Moist	120	lb ai/A	10 DPF	110 a	97 a	35 a	21.5 a	46.9 d	7047 ab
9	Agrotain-Urea (4 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	106 bc	93 bc	31 cd	18.5 b	47.4 ab	4353 d
10	UTC (no N) Dry	0	lb ai/A	10 DPF	106 b	93 b	30 d	17.6 b	47.7 ab	3855 de
11	UTC (no N) Moist	0	lb ai/A	10 DPF	106 b	93 b	31 cd	17.6 b	47.8 a	3522 ef
12	UTC (no N) Flooded (2" initial)	0	lb ai/A	10 DPF	104 c	91 c	31 cd	18.0 b	47.7 ab	3146 f
LSD (P=.05)					1.30	1.30	2.27	1.57	0.41	681.40
Standard Deviation					0.90	0.90	1.57	1.08	0.29	471.90
CV					0.82	0.94	4.74	5.51	0.61	8.52
Treatment F					27.237	27.237	8.871	11.996	10.060	54.175
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Continued.

**Table 42. Continued.**

Crop Name					Rice		Rice		Rice		Rice	
Rating Date					11/4/2013		11/4/2013		11/4/2013			
Rating Type					Moist		Test Wt.		Yield		Total Yield	
Rating Unit					%		lb/bu		lb/A		lb/A	
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage								
1	Urea Dry	120	lb ai/A	10 DPF	18.9	a	40.5	d	1919	bc	9279	ab
2	Urea Moist	120	lb ai/A	10 DPF	18.3	ab	40.7	d	1853	bc	8021	c
3	Urea Flooded (2" initial)	120	lb ai/A	10 DPF	15.1	d	42.2	a	2613	a	6967	d
4	Agrotain-Urea (3 qt/ton) Dry	120	lb ai/A	10 DPF	17.7	ab	41.1	cd	1946	bc	9670	a
5	Agrotain-Urea (3 qt/ton) Moist	120	lb ai/A	10 DPF	16.9	bc	41.3	bcd	1987	bc	8839	b
6	Agrotain-Urea (3 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	14.9	d	42.4	a	2381	a	6896	d
7	Agrotain-Urea (4 qt/ton) Dry	120	lb ai/A	10 DPF	18.3	ab	40.7	d	2014	bc	9603	a
8	Agrotain-Urea (4 qt/ton) Moist	120	lb ai/A	10 DPF	16.9	bc	41.3	bcd	1828	c	8875	b
9	Agrotain-Urea (4 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	15.4	cd	42.0	ab	2565	a	6918	d
10	UTC (no N) Dry	0	lb ai/A	10 DPF	16.0	cd	41.8	abc	2094	b	5949	e
11	UTC (no N) Moist	0	lb ai/A	10 DPF	15.5	cd	42.0	ab	1968	bc	5490	e
12	UTC (no N) Flooded (2" initial)	0	lb ai/A	10 DPF	14.8	d	42.4	a	2405	a	5551	e
LSD (P=.05)					1.69		0.81		261.70		697.10	
Standard Deviation					1.17		0.56		181.30		482.80	
CV					7.08		1.35		8.51		6.29	
Treatment F					6.353		6.032		9.611		42.331	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001	

Continued.

**Table 42. Continued.**

Crop Name				Rice		Rice		Rice		Rice	
Description				Tissue		Tissue N		N Uptake		N fert Eff.	
Part Rated				Abvgrd -		Abvgrd -		Total -		NUE -	
Rating Date				7/1/2013		7/1/2013		7/1/2013		7/1/2013	
Rating Type				Biomass-Dry							
Rating Unit				lb/A		% N		lb/A		%	
Crop Stage Majority				Main		Main		Main		by block	
Crop Stage Scale				50% HD		50% HD		50% HD		50% HD	
Trt	Trt		Rate								
No.	Name	Rate	Unit								
1	Urea Dry	120	lb ai/A	9284	a	1.11	a	104	a	58	a
2	Urea Moist	120	lb ai/A	6112	c	0.88	bc	54	b	22	cde
3	Urea Flooded (2" initial)	120	lb ai/A	3694	d	0.86	bc	32	c	6	ef
4	Agrotain-Urea (3 qt/ton) Dry	120	lb ai/A	9182	a	1.11	a	102	a	57	a
5	Agrotain-Urea (3 qt/ton) Moist	120	lb ai/A	7277	bc	0.97	b	70	b	36	bc
6	Agrotain-Urea (3 qt/ton) Flooded (2" initial)	120	lb ai/A	4261	d	0.82	c	35	c	8	def
7	Agrotain-Urea (4 qt/ton) Dry	120	lb ai/A	8601	ab	1.08	a	93	a	49	ab
8	Agrotain-Urea (4 qt/ton) Moist	120	lb ai/A	6507	c	0.88	bc	57	b	24	cd
9	Agrotain-Urea (4 qt/ton) Flooded (2" initial)	120	lb ai/A	3851	d	0.86	bc	33	c	7	ef
10	UTC (no N) Dry	0	lb ai/A	4258	d	0.80	c	34	c	0	f
11	UTC (no N) Moist	0	lb ai/A	3490	d	0.80	c	28	c	0	f
12	UTC (no N) Flooded (2" initial)	0	lb ai/A	2973	d	0.84	c	25	c	0	f
LSD (P=.05)				1357.60		0.11		18.30		17.00	
Standard Deviation				940.20		0.08		12.70		11.80	
CV				16.24		8.24		22.77		52.84	
Treatment F				24.890		9.908		22.435		14.634	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Agrotain Volatilization Control When Used in Flooded, Moist, and Dry Soil Conditions

<b>Experiment number</b> .....	12-CM-29 Late Planting
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.075
<b>pH</b> .....	7.23
<b>Extractable nutrients ppm</b> .....	Ca-1307; Cu-1.8; Mg-246; P-12; K-73; Na-77; S-8.1; Zn-6.2
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / May 9
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	May 17
<b>Harvest date</b> .....	August 29
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, May 15
<b>Water management</b> .....	
<b>Flush</b> .....	May 16, May 27
<b>Flood</b> .....	June 14
<b>Drain</b> .....	August 22
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 16
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 43. Evaluation of Agrotain volatilization control when used in flooded, moist, and dry soil conditions (RRS.1). Late Planting Trial. Rice Research Station.**

Crop Name Description Rating Date Rating Type Rating Unit Crop Stage Majority					Rice plant-hd		Rice emer-hd		Rice top 8/29/2013 Height in Main		Rice 8/29/2013 Moist % Main		Rice 8/29/2013 Test Wt. lb/bu Main		Rice 8/29/2013 Yield lb/A Main	
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage												
1	Urea Dry	120	lb ai/A	10 DPF	79	ab	71	ab	33	a	18.0	a	45.8	f	7773	a
2	Urea Moist	120	lb ai/A	10 DPF	77	c	69	c	30	b	16.0	bc	46.4	abc	5793	c
3	Urea Flooded (2" initial)	120	lb ai/A	10 DPF	74	d	66	d	28	c	15.6	bc	46.4	a-d	3865	e
4	Agrotain-Urea (3 qt/ton) Dry	120	lb ai/A	10 DPF	79	a	71	a	34	a	17.4	a	46.0	def	7846	a
5	Agrotain-Urea (3 qt/ton) Moist	120	lb ai/A	10 DPF	78	b	70	b	32	a	17.3	a	46.0	def	6796	b
6	Agrotain-Urea (3 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	74	d	66	d	29	c	15.5	bc	46.5	ab	4169	de
7	Agrotain-Urea (4 qt/ton) Dry	120	lb ai/A	10 DPF	78	ab	70	ab	34	a	17.4	a	46.1	c-f	7701	a
8	Agrotain-Urea (4 qt/ton) Moist	120	lb ai/A	10 DPF	78	b	70	b	33	a	17.5	a	45.9	f	6891	b
9	Agrotain-Urea (4 qt/ton) Flooded (2" initial)	120	lb ai/A	10 DPF	74	d	66	d	29	c	16.3	b	45.9	ef	4029	de
10	UTC (no N) Dry	0	lb ai/A	10 DPF	75	d	67	d	30	bc	15.9	bc	46.4	a-d	4324	de
11	UTC (no N) Moist	0	lb ai/A	10 DPF	75	d	67	d	28	c	15.2	c	46.7	a	4360	d
12	UTC (no N) Flooded (2" initial)	0	lb ai/A	10 DPF	74	d	66	d	29	bc	15.8	bc	46.3	b-e	4026	de
LSD (P=.05)					0.90		0.90		1.73		0.92		0.38		488.40	
Standard Deviation					0.60		0.60		1.20		0.64		0.26		338.20	
CV					0.79		0.88		3.91		3.87		0.57		6.01	
Treatment F					39.252		39.252		15.074		9.041		4.415		96.858	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001		0.0004		0.0001	

Continued.

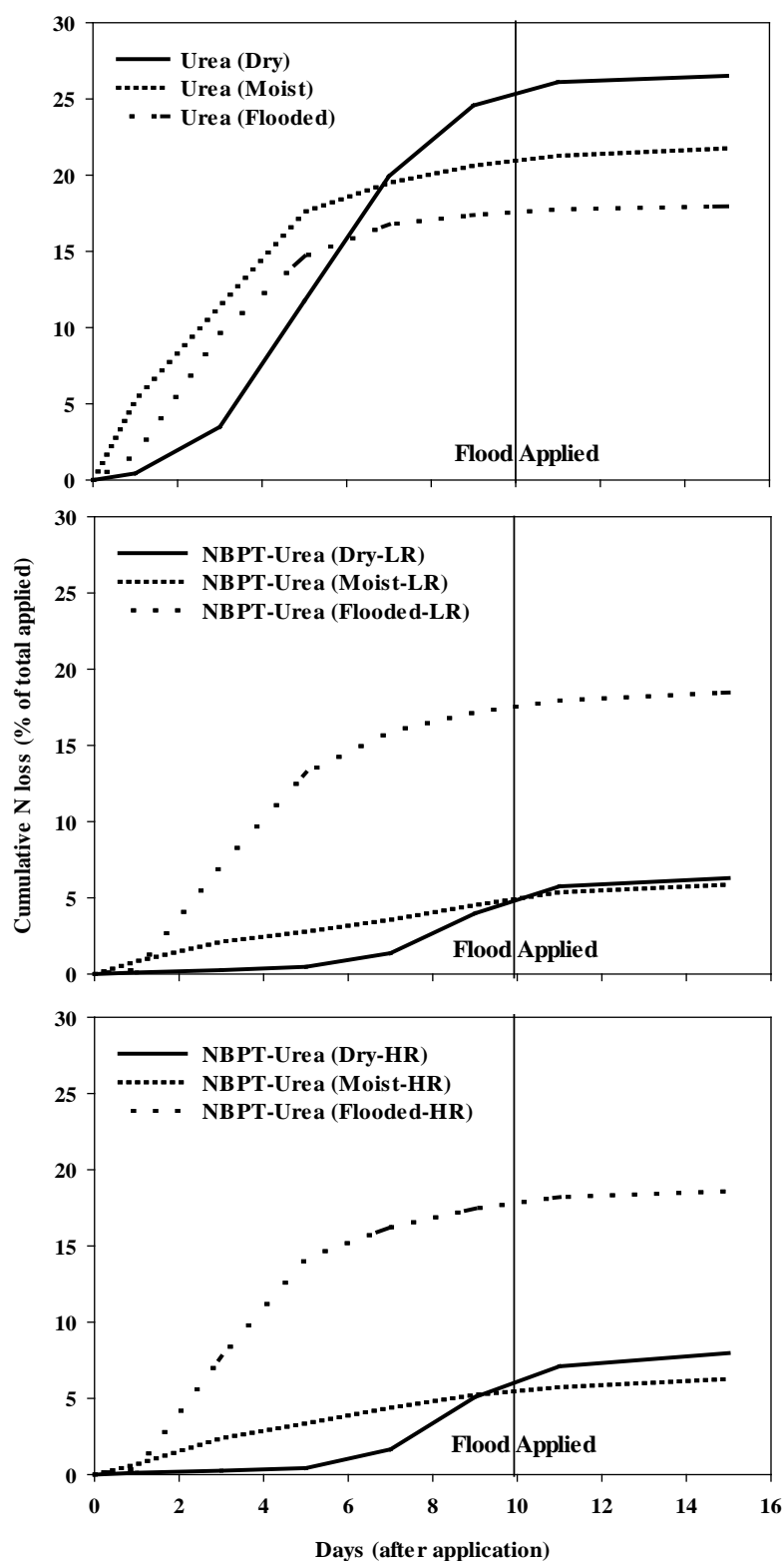
**Table 43. Continued.**

Crop Name					Rice		Rice		Rice		Rice		
Description					Tissue		Tissue N		N Uptake		N fert Eff.		
Part Rated					Abvgrd -		Abvgrd -		Total -		NUE -		
Rating Date					7/29/2013		7/29/2013		7/29/2013		7/29/2013		
Rating Type					Biomass-Dry								
Rating Unit					lb/A		% N		lb/A		%		
Crop Stage Majority					Main		Main		Main		by block		
Crop Stage Scale					50% HD		50% HD		50% HD		50% HD		
Trt	Trt		Rate	Growth									
No.	Name		Rate	Unit	Stage								
1	Urea		120	lb ai/A	10 DPF	9319	a	1.13	a	105	a	59	a
	Dry												
2	Urea		120	lb ai/A	10 DPF	7369	b	0.77	de	57	d	18	e
	Moist												
3	Urea		120	lb ai/A	10 DPF	4167	c	0.80	de	34	e	2	f
	Flooded (2" initial)												
4	Agrotain-Urea (3 qt/ton)		120	lb ai/A	10 DPF	8803	a	1.12	a	98	ab	53	ab
	Dry												
5	Agrotain-Urea (3 qt/ton)		120	lb ai/A	10 DPF	8405	ab	1.00	b	84	bc	41	cd
	Moist												
6	Agrotain-Urea (3 qt/ton)		120	lb ai/A	10 DPF	5037	c	0.76	de	38	e	4	f
	Flooded (2" initial)												
7	Agrotain-Urea (4 qt/ton)		120	lb ai/A	10 DPF	9059	a	1.00	b	91	b	48	bc
	Dry												
8	Agrotain-Urea (4 qt/ton)		120	lb ai/A	10 DPF	8394	ab	0.91	bc	76	c	34	d
	Moist												
9	Agrotain-Urea (4 qt/ton)		120	lb ai/A	10 DPF	4780	c	0.73	e	34	e	2	f
	Flooded (2" initial)												
10	UTC (no N)		0	lb ai/A	10 DPF	4820	c	0.70	e	34	e	0	f
	Dry												
11	UTC (no N)		0	lb ai/A	10 DPF	4165	c	0.84	cd	35	e	0	f
	Moist												
12	UTC (no N)		0	lb ai/A	10 DPF	4507	c	0.76	de	34	e	0	f
	Flooded (2" initial)												
LSD (P=.05)					1397.10		0.11		13.20		8.60		
Standard Deviation					967.60		0.07		9.10		6.00		
CV					14.73		8.47		15.21		27.29		
Treatment F					19.614		16.770		39.717		63.118		
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001		

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Figure 1. Evaluation of Agrotain volatilization control when used in flooded, moist, and dry soil conditions using semi-open volatilization chambers in a drill-seeded rice production system.**



## Evaluation of Mosaic Experimental Fertilizers in Rice Production

**Experiment number** .....: 13-RF-08

**Site and design** .....:

**Location/Cooperator** .....: Evangeline Parish / Richard Fontenot

**Tillage type**.....: Conventional

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 4.67 x 16 ft

**Row width/rows per plot**.....: 8 in / 7

**Soil type** .....: Mowata silt loam

**% organic matter**.....: 1.83

**pH**.....: 5.57

**Extractable nutrients ppm** .....: Ca-1325; Cu-1.57; Mg-413; P-14.4; K-129; Na-64; S-18.4; Zn-2.1

**Crop/Variety** .....: Rice / CLXL729

**Planting method/date** .....: Drill-seeded / March 17

**Seeding rate/depth**.....: 14 seeds/ft<sup>2</sup> / .75 in

**Emergence date**.....: March 30

**Harvest date** .....: August 9

**Seed treatment/cwt** .....:

**Hybrid rice treatments**.....: Maxim (fungicide) - .08 oz

Apron (fungicide) - .32 oz

Dynasty (fungicide) - .15 oz

Zinc - 8 oz

Enlarge (GA3) - .5 oz

AV – 1011 (bird repellent) - 18.3 oz

**Fertilization** .....: 120 lb/A 46-0-0, May 7

**Water management** .....:

**Flush** .....: NA

**Flood** .....: May 7

**Drain** .....: July 25

**Pest management** .....:

**Herbicides**.....: 8 oz/A Newpath, March 21

6 oz/A Newpath + 2 pt/A Prowl H<sub>2</sub>O, May 7

**Insecticides** .....: 0.137 lb ai/cwt Dermacor seed treatment

**Fungicides**.....: 19 oz/A Stratego, June 26



**Table 44. Evaluation of Mosaic experimental fertilizers in rice production (RiceZNR13) (Fontenot.1). Vidrine, LA.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description			Stand count		plant-hd		emer-hd		Rice top		8/9/2013		8/9/2013		8/9/2013	
Rating Date									7/31/2013							
Rating Type			number		50% HD		50% HD		Height		Lodge		Moist		Test Wt.	
Rating Unit			plants		days		days		in		% plot		rate 1-5		lb/bu	
Sample Size, Unit			10 ft													
Collection Basis, Unit			1 row													
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Main	
Crop Stage Scale			2-3 leaf													
Trt No.	Trt Name	Rate	Rate Unit													
1	Urea	21	lb ai/A		48.0	a	110	a	97	a	49	a	26	a	1	a
	MOP	60	lb ai/A													
2	DAP	40	lb ai/A		40.0	a	107	bc	94	bc	49	a	31	a	1	a
	AS	10	lb ai/A													
	MOP	60	lb ai/A													
3	DAP	40	lb ai/A		38.8	a	107	bcd	94	bcd	46	a	25	a	1	a
	AS	10	lb ai/A													
	ZnSO <sub>4</sub>	2	lb ai/A													
	MOP	60	lb ai/A													
4	DAP	40	lb ai/A		42.5	a	107	b	94	b	48	a	28	a	1	a
	AS	10	lb ai/A													
	ZnSO <sub>4</sub>	5	lb ai/A													
	MOP	60	lb ai/A													
5	DAP	40	lb ai/A		49.0	a	107	bc	94	bc	46	a	30	a	1	a
	AS	10	lb ai/A													
	ZnSO <sub>4</sub>	8	lb ai/A													
	MOP	60	lb ai/A													
6	DAP	40	lb ai/A		45.0	a	107	bc	94	bc	49	a	26	a	1	a
	AS	10	lb ai/A													
	ZnSO <sub>4</sub>	10	lb ai/A													
	MOP	60	lb ai/A													
7	MESZ	40	lb ai/A		47.8	a	107	cde	94	cde	47	a	17	a	1	a
	MOP	60	lb ai/A													
8	MESZ	40	lb ai/A		40.0	a	106	de	93	de	48	a	46	a	1	a
	ZnSO <sub>4</sub>	1	lb ai/A													
	MOP	60	lb ai/A													
9	MESZ	40	lb ai/A		47.8	a	106	e	93	e	48	a	43	a	2	a
	EM-2	60	lb ai/A													
10	DAP	40	lb ai/A		41.0	a	107	bc	94	bc	46	a	37	a	1	a
	AS	10	lb ai/A													
	EM-2	60	lb ai/A													
LSD (P=.05)			10.06		0.62		0.62		2.51		16.21		0.46		1.43	
Standard Deviation			6.93		0.43		0.43		1.73		8.92		0.25		0.98	
CV			15.77		0.40		0.46		3.64		28.86		24.62		6.59	
Treatment F			1.303		29.760		29.760		1.867		3.867		2.080		4.015	
Treatment Prob(F)			0.2811		0.0001		0.0001		0.1014		0.0752		0.2172		0.0024	

Continued.

**Table 44. Continued.**

Crop Name				Rice		Rice		Rice		Rice	
Rating Date				11/6/2013		11/6/2013		11/6/2013			
Rating Type				Moisture		Test Wt.		Yield		Total Yield	
Rating Unit				%		lb/bu		lb/A		lb/A	
Crop Stage Majority				Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Rate	Rate Unit								
1	Urea	21	lb ai/A	23.1	a	41.1	a	5760	a	19351	a
	MOP	60	lb ai/A								
2	DAP	40	lb ai/A	22.5	a	41.1	a	6037	a	19181	a
	AS	10	lb ai/A								
	MOP	60	lb ai/A								
3	DAP	40	lb ai/A	21.9	a	41.2	a	6304	a	19339	a
	AS	10	lb ai/A								
	ZnSO <sub>4</sub>	2	lb ai/A								
	MOP	60	lb ai/A								
4	DAP	40	lb ai/A	25.1	a	40.3	a	5993	a	19435	a
	AS	10	lb ai/A								
	ZnSO <sub>4</sub>	5	lb ai/A								
	MOP	60	lb ai/A								
5	DAP	40	lb ai/A	22.2	a	41.2	a	5776	a	18885	a
	AS	10	lb ai/A								
	ZnSO <sub>4</sub>	8	lb ai/A								
	MOP	60	lb ai/A								
6	DAP	40	lb ai/A	23.1	a	40.9	a	6039	a	19274	a
	AS	10	lb ai/A								
	ZnSO <sub>4</sub>	10	lb ai/A								
	MOP	60	lb ai/A								
7	MESZ	40	lb ai/A	21.2	a	41.4	a	5881	a	18903	a
	MOP	60	lb ai/A								
8	MESZ	40	lb ai/A	22.2	a	41.2	a	6081	a	19811	a
	ZnSO <sub>4</sub>	1	lb ai/A								
	MOP	60	lb ai/A								
9	MESZ	40	lb ai/A	21.1	a	41.4	a	6295	a	19599	a
	EM-2	60	lb ai/A								
10	DAP	40	lb ai/A	22.8	a	41.0	a	5931	a	19184	a
	AS	10	lb ai/A								
	EM-2	60	lb ai/A								
LSD (P=.05)				2.78		0.74		815.50		1288.50	
Standard Deviation				1.91		0.51		562.10		888.00	
CV				8.50		1.24		9.35		4.60	
Treatment F				1.419		1.475		0.442		0.411	
Treatment Prob(F)				0.2290		0.2072		0.8998		0.9180	

Continued.

Table 44. Continued.

Table 47: Continued.																	
Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		
Description			Tissue		Al		B		Ca		Cu		Fe		Mg		
Part Rated			Abvgrd -														
Rating Date			8/9/2013														
Rating Type			Biomass-Dry		Tissue		Tissue		Tissue		Tissue		Tissue		Tissue		
Rating Unit			lb/A		ppm		ppm		%		ppm		ppm		%		
Crop Stage Majority			Main														
Crop Stage Scale			Mid Till														
Trt No.	Trt Name	Rate	Rate Unit														
1	Urea	21	lb ai/A	2293	b	655	a	5.7	c	0.20	c	20	a	531	a	0.12	d
	MOP	60	lb ai/A														
2	DAP	40	lb ai/A	5172	a	926	a	6.6	ab	0.23	ab	14	bc	741	a	0.22	a
	AS	10	lb ai/A														
	MOP	60	lb ai/A														
3	DAP	40	lb ai/A	5030	a	1427	a	7.3	a	0.24	a	14	bc	1088	a	0.21	abc
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	2	lb ai/A														
	MOP	60	lb ai/A														
4	DAP	40	lb ai/A	4477	a	793	a	6.7	ab	0.23	ab	16	b	659	a	0.21	abc
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	5	lb ai/A														
	MOP	60	lb ai/A														
5	DAP	40	lb ai/A	4331	a	871	a	7.3	a	0.23	ab	16	bc	1170	a	0.19	bc
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	8	lb ai/A														
	MOP	60	lb ai/A														
6	DAP	40	lb ai/A	4742	a	731	a	6.3	bc	0.21	bc	14	c	589	a	0.21	abc
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	10	lb ai/A														
	MOP	60	lb ai/A														
7	MESZ	40	lb ai/A	4473	a	680	a	6.8	ab	0.23	ab	14	bc	566	a	0.22	ab
	MOP	60	lb ai/A														
8	MESZ	40	lb ai/A	5690	a	1032	a	6.4	bc	0.21	c	11	d	785	a	0.19	c
	ZnSO <sub>4</sub>	1	lb ai/A														
	MOP	60	lb ai/A														
9	MESZ	40	lb ai/A	4444	a	675	a	5.9	bc	0.21	bc	11	d	537	a	0.20	abc
	EM-2	60	lb ai/A														
10	DAP	40	lb ai/A	4625	a	859	a	6.6	ab	0.23	ab	14	bc	643	a	0.22	abc
	AS	10	lb ai/A														
	EM-2	60	lb ai/A														
LSD (P=.05)				1394.20		543.70		0.86		0.02		2.00		628.50		0.03	
Standard Deviation				960.90		374.70		0.60		0.01		1.40		433.10		0.02	
CV				21.22		43.33		9.07		6.39		9.84		59.27		11.23	
Treatment F				3.427		1.537		2.890		3.171		11.413		1.094		6.801	
Treatment Prob(F)				0.0062		0.1855		0.0158		0.0096		0.0001		0.3994		0.0001	

Continued.

Table 44. Continued.

Crop Name Part Rated Rating Type Rating Unit				Rice Mn Tissue ppm		Rice Mo Tissue ppm		Rice P Tissue %		Rice K Tissue %		Rice Na Tissue ppm		Rice S Tissue %		Rice Zn Tissue ppm	
Trt No.	Trt Name	Rate	Rate Unit														
1	Urea	21	lb ai/A	722	c	0.0	a	0.17	d	3.2	bc	848	a	0.25	d	49	de
	MOP	60	lb ai/A														
2	DAP	40	lb ai/A	1243	a	0.6	a	0.37	ab	3.2	bc	1087	a	0.26	bcd	45	e
	AS	10	lb ai/A														
	MOP	60	lb ai/A														
3	DAP	40	lb ai/A	1131	ab	0.6	a	0.33	bc	3.2	bc	1421	a	0.27	abc	61	cd
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	2	lb ai/A														
	MOP	60	lb ai/A														
4	DAP	40	lb ai/A	1180	ab	0.8	a	0.35	abc	3.4	ab	1028	a	0.28	a	65	c
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	5	lb ai/A														
	MOP	60	lb ai/A														
5	DAP	40	lb ai/A	1187	ab	0.5	a	0.32	c	3.5	a	744	a	0.27	ab	109	a
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	8	lb ai/A														
	MOP	60	lb ai/A														
6	DAP	40	lb ai/A	1003	b	0.8	a	0.34	abc	3.1	c	1287	a	0.26	a-d	85	b
	AS	10	lb ai/A														
	ZnSO <sub>4</sub>	10	lb ai/A														
	MOP	60	lb ai/A														
7	MESZ	40	lb ai/A	1277	a	0.6	a	0.38	a	3.5	a	778	a	0.28	a	47	e
	MOP	60	lb ai/A														
8	MESZ	40	lb ai/A	1025	b	0.8	a	0.34	abc	3.4	ab	951	a	0.25	cd	52	de
	ZnSO <sub>4</sub>	1	lb ai/A														
	MOP	60	lb ai/A														
9	MESZ	40	lb ai/A	1088	ab	1.0	a	0.36	ab	3.1	bc	867	a	0.26	cd	47	e
	EM-2	60	lb ai/A														
10	DAP	40	lb ai/A	1171	ab	0.3	a	0.35	abc	3.2	bc	1204	a	0.27	abc	43	e
	AS	10	lb ai/A														
	EM-2	60	lb ai/A														
LSD (P=.05)				211.70		0.93		0.04		0.27		460.90		0.02		13.30	
Standard Deviation				145.90		0.64		0.03		0.19		317.60		0.01		9.20	
CV				13.23		108.85		8.38		5.67		31.09		4.17		15.21	
Treatment F				4.800		0.800		18.847		2.409		2.040		3.312		21.550	
Treatment Prob(F)				0.0007		0.6193		0.0001		0.0374		0.0737		0.0076		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Mosaic Experimental Fertilizers in Rice Production

<b>Experiment number</b> .....	13-KL-08
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Evangeline Parish / Kenneth LaHaye
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	CUT - 0.8 MID - 1.3* FILL - 1.5
<b>pH</b> .....	CUT - 6.2 MID - 5.2* FILL - 5.7
<b>Extractable nutrients ppm</b> .....	CUT - Ca-763; Cu-0.9; Mg-298; P-2.4; K-37; Na-80; S-12.6; Zn-1.0 MID - Ca-1270; Cu-1.5; Mg-417; P-7.3; K-58; Na-67; S-14; Zn-1.1* FILL - Ca-636; Cu-1.0; Mg-209; P-7.2; K-50; Na-50; S-15.1; Zn-0.8
*Note: Study was planted in MID area.	
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 18
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 31
<b>Harvest date</b> .....	August 16
<b>Ratoon Harvest date</b> .....	November 6
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	120 lb N/A 46-0-0, May 16 90 lb N/A 46-0-0, August 16
<b>Water management</b> .....	
<b>Flush</b> .....	May 6
<b>Flood</b> .....	May 20
<b>Drain</b> .....	July 29
<b>Ratoon Drain</b> .....	October 17
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, March 21 2.4 oz/A Grasp + 1 oz/A Londax, May 15
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	None

**Table 45. Evaluation of Mosaic experimental fertilizers in rice production (RiceZNR13) (LaHaye.1). Evangeline Parish.**

Table 45. Evaluation of Mosaic Experimental Fertilizers in Rice Production (Rice2, R13) (Lalaya,1). Evangeline Parish.																									
Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice			
Description				Stand count		plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice			
Rating Date										8/14/2013		8/2/2013		8/2/2013		8/2/2013		11/6/2013		11/6/2013		11/6/2013			
Rating Type				number		50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moisture		Test Wt.		Yield			
Rating Unit				plants		days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A			
Sample Size, Unit				10 ft																					
Collection Basis, Unit				1 row																					
Crop Stage Majority				3-4 till		Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon			
Trt	Trt		Rate	Rate																					
No.	Name		Unit																						
1	Urea	21	lb ai/A	83.0	e	119	a	106	a	34	b	16.1	a	47.7	b	4310	b	17.2	a	42.0	a	917	d	5227	b
	MOP	60	lb ai/A																						
2	DAP	40	lb ai/A	96.0	b-e	106	b	93	b	42	a	12.4	b	49.0	a	9717	a	21.2	a	41.4	a	1845	bc	11562	a
	AS	10	lb ai/A																						
	MOP	60	lb ai/A																						
3	DAP	40	lb ai/A	122.0	ab	103	bcd	90	bcd	42	a	11.4	b	49.4	a	9370	a	18.2	a	42.1	a	2426	a	11796	a
	AS	10	lb ai/A																						
	ZnSO <sub>4</sub>	2	lb ai/A																						
	MOP	60	lb ai/A																						
4	DAP	40	lb ai/A	113.5	a-d	103	bcd	90	bcd	42	a	11.9	b	49.2	a	9535	a	19.9	a	41.5	a	2522	a	12057	a
	AS	10	lb ai/A																						
	ZnSO <sub>4</sub>	5	lb ai/A																						
	MOP	60	lb ai/A																						
5	DAP	40	lb ai/A	120.3	abc	105	bcd	92	bcd	41	a	11.3	b	49.6	a	9499	a	20.0	a	41.6	a	1960	abc	11459	a
	AS	10	lb ai/A																						
	ZnSO <sub>4</sub>	8	lb ai/A																						
	MOP	60	lb ai/A																						
6	DAP	40	lb ai/A	132.5	a	103	bcd	90	bcd	42	a	11.9	b	49.2	a	9565	a	18.2	a	42.0	a	2433	a	11998	a
	AS	10	lb ai/A																						
	ZnSO <sub>4</sub>	10	lb ai/A																						
	MOP	60	lb ai/A																						
7	MESZ	40	lb ai/A	103.0	b-e	102	cd	89	cd	42	a	11.9	b	49.2	a	9459	a	18.9	a	41.8	a	2304	ab	11762	a
	MOP	60	lb ai/A																						
8	MESZ	40	lb ai/A	102.0	b-e	101	d	88	d	41	a	11.4	b	49.5	a	9406	a	18.2	a	42.0	a	2445	a	11851	a
	ZnSO <sub>4</sub>	1	lb ai/A																						
	MOP	60	lb ai/A																						
9	MESZ	40	lb ai/A	94.5	cde	106	bc	93	bc	41	a	11.8	b	49.4	a	10088	a	21.2	a	41.3	a	1676	c	11764	a
	EM-2	60	lb ai/A																						
10	DAP	40	lb ai/A	93.3	de	105	bc	92	bc	42	a	11.9	b	49.3	a	9713	a	20.3	a	41.5	a	1842	bc	11555	a
	AS	10	lb ai/A																						
	EM-2	60	lb ai/A																						
LSD (P=.05)				26.69		3.70		3.70		2.87		1.20		0.56		1462.50		2.76		0.68		576.00		1739.60	
Standard Deviation				18.39		2.50		2.50		1.98		0.83		0.38		1007.90		1.90		0.47		397.00		1198.90	
CV				17.35		2.42		2.76		4.86		6.77		0.78		11.12		9.82		1.12		19.49		10.80	
Treatment F				2.846		14.784		14.784		5.747		11.455		7.613		11.165		2.109		1.548		6.337		11.962	
Treatment Prob(F)				0.0170		0.0001		0.0001		0.0002		0.0001		0.0001		0.0001		0.0648		0.1818		0.0001		0.0001	

Continued.

Table 45. Continued.

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice	
Part Rated		Abvgrd -		Al		B		Ca		Cu		Fe	
Rating Date		8/9/2013											
Rating Type		Biomass-Dry		Tissue		Tissue		Tissue		Tissue		Tissue	
Rating Unit		lb/A		ppm		ppm		%		ppm		ppm	
Crop Stage Majority		Main		Main		Main		Main		Main		Main	
Crop Stage Scale		Mid Till		Mid Till		Mid Till		Mid Till		Mid Till		Mid Till	
Trt No.	Trt Name	Rate	Rate Unit										
1	Urea	21	lb ai/A	588	c	489	a	6.1	a	0.23	a	9	a
	MOP	60	lb ai/A										
2	DAP	40	lb ai/A	3535	b	778	a	5.9	a	0.19	bc	7	cd
	AS	10	lb ai/A										
	MOP	60	lb ai/A										
3	DAP	40	lb ai/A	3654	ab	563	a	6.2	a	0.19	bcd	7	cd
	AS	10	lb ai/A										
	ZnSO <sub>4</sub>	2	lb ai/A										
	MOP	60	lb ai/A										
4	DAP	40	lb ai/A	4646	a	900	a	6.4	a	0.19	bcd	9	ab
	AS	10	lb ai/A										
	ZnSO <sub>4</sub>	5	lb ai/A										
	MOP	60	lb ai/A										
5	DAP	40	lb ai/A	3584	ab	619	a	5.7	a	0.17	cd	7	cde
	AS	10	lb ai/A										
	ZnSO <sub>4</sub>	8	lb ai/A										
	MOP	60	lb ai/A										
6	DAP	40	lb ai/A	3935	ab	694	a	5.7	a	0.19	b	8	bc
	AS	10	lb ai/A										
	ZnSO <sub>4</sub>	10	lb ai/A										
	MOP	60	lb ai/A										
7	MESZ	40	lb ai/A	3757	ab	522	a	5.5	a	0.18	bcd	6	e
	MOP	60	lb ai/A										
8	MESZ	40	lb ai/A	3702	ab	478	a	5.7	a	0.19	bcd	6	de
	ZnSO <sub>4</sub>	1	lb ai/A										
	MOP	60	lb ai/A										
9	MESZ	40	lb ai/A	3295	b	472	a	5.7	a	0.18	bcd	6	e
	EM-2	60	lb ai/A										
10	DAP	40	lb ai/A	3030	b	361	a	5.4	a	0.17	d	7	cd
	AS	10	lb ai/A										
	EM-2	60	lb ai/A										
LSD (P=.05)				1076.50		355.80		0.81		0.02		1.20	
Standard Deviation				741.90		245.20		0.56		0.02		0.80	
CV				22.00		41.73		9.60		7.94		11.65	
Treatment F				8.252		1.756		1.241		5.384		7.621	
Treatment Prob(F)				0.0001		0.1243		0.3125		0.0003		0.0001	

Continued.

**Table 45. Continued.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice	
Part Rated				Mn		Mo		P		K		Na		S	
Rating Type				Tissue		Tissue		Tissue		Tissue		Tissue		Tissue	
Rating Unit				ppm		ppm		%		%		ppm		%	
Crop Stage Majority				Main		Main		Main		Main		Main		Main	
Crop Stage Scale				Mid Till		Mid Till		Mid Till		Mid Till		Mid Till		Mid Till	
Trt No.	Trt Name	Rate	Rate Unit												
1	Urea	21	lb ai/A	626	cd	0.0	a	0.05	e	1.3	c	818	c	0.18	e
	MOP	60	lb ai/A												
2	DAP	40	lb ai/A	732	abc	1.4	a	0.31	ab	2.4	ab	2164	ab	0.23	abc
	AS	10	lb ai/A												
	MOP	60	lb ai/A												
3	DAP	40	lb ai/A	774	abc	1.5	a	0.29	abc	2.6	ab	2219	ab	0.23	abc
	AS	10	lb ai/A												
	ZnSO <sub>4</sub>	2	lb ai/A												
	MOP	60	lb ai/A												
4	DAP	40	lb ai/A	871	a	1.6	a	0.28	cd	2.6	ab	2339	ab	0.24	a
	AS	10	lb ai/A												
	ZnSO <sub>4</sub>	5	lb ai/A												
	MOP	60	lb ai/A												
5	DAP	40	lb ai/A	600	cd	1.3	a	0.26	d	2.4	ab	3249	a	0.24	ab
	AS	10	lb ai/A												
	ZnSO <sub>4</sub>	8	lb ai/A												
	MOP	60	lb ai/A												
6	DAP	40	lb ai/A	855	ab	1.0	a	0.26	cd	2.6	a	2213	ab	0.23	ab
	AS	10	lb ai/A												
	ZnSO <sub>4</sub>	10	lb ai/A												
	MOP	60	lb ai/A												
7	MESZ	40	lb ai/A	685	bcd	1.3	a	0.27	cd	2.3	ab	2533	ab	0.20	de
	MOP	60	lb ai/A												
8	MESZ	40	lb ai/A	721	a-d	1.4	a	0.27	cd	2.4	ab	2007	bc	0.22	bcd
	ZnSO <sub>4</sub>	1	lb ai/A												
	MOP	60	lb ai/A												
9	MESZ	40	lb ai/A	546	d	1.0	a	0.28	bcd	2.2	b	3245	a	0.21	cd
	EM-2	60	lb ai/A												
10	DAP	40	lb ai/A	647	cd	1.1	a	0.32	a	2.5	ab	3200	ab	0.23	abc
	AS	10	lb ai/A												
	EM-2	60	lb ai/A												
LSD (P=.05)				175.50		1.16		0.03		0.39		1193.20		0.02	
Standard Deviation				120.90		0.80		0.02		0.27		822.40		0.01	
CV				17.14		68.33		8.42		11.57		34.28		6.59	
Treatment F				3.095		1.309		46.675		8.243		3.206		6.717	
Treatment Prob(F)				0.0110		0.2780		0.0001		0.0001		0.0091		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



# **Evaluation of Ammonia Volatilization Using Semi-Open Volatilization Chambers in a Drill-Seeded, Delayed Flood Rice Production System**

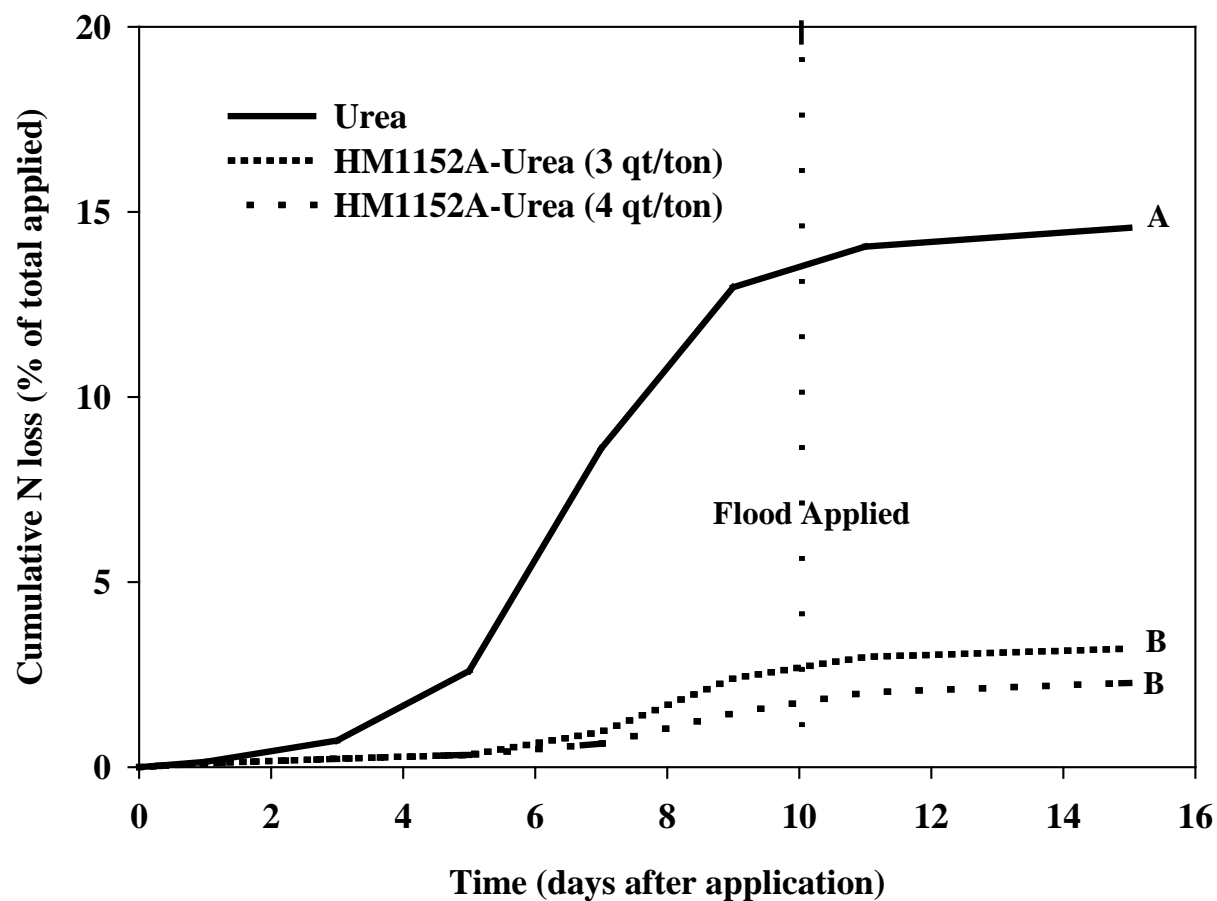
<b>Experiment number</b> .....	13-CM-10E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Helena
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	Did not Harvest
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 46. Nitrogen (N) volatilization loss at each of the five sampling times and cumulative N volatilization loss from three N fertilizer sources [urea, HM1152A (3 qt/ton) treated urea, and HM1152A (4 qt/ton) treated urea] using semi-open volatilization chambers in a rice production system. LSU AgCenter Rice Research Station, 2013. Flood applied 10 days after surface broadcast application.**

				TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTAL N
days pre flood/post flood				9 DPF	7 DPF	5 DPF	3 DPF	1 DPF	1 DPostF	5 DPostF	Cumulative
days post application				1 DPA	3 DPA	5 DPA	7 DPA	9 DPA	11 DPA	15 DPA	total
Trt	Treatment	Rate	Growth								
No.	Name	Rate Unit	Stage								
1	Urea	120 LB AI/A	10 DPF	2.3 a	9.5 a	30.8 a	98.6 a	71.5 a	18.0 a	8.4 a	239 a
2	HM1152A-Urea (3 qt/ton)	120 LB AI/A	10 DPF	1.6 a	2.1 b	1.7 b	10.2 b	23.7 b	9.5 b	3.7 b	53 b
3	HM1152A-Urea (4 qt/ton)	120 LB AI/A	10 DPF	1.6 a	2.0 b	1.8 b	5.0 b	13.6 b	9.1 b	4.2 b	37 b
LSD (P=.05)				0.88	4.04	23.15	26.94	31.46	7.12	4.25	42.8
Standard Deviation				0.51	2.33	13.38	15.57	18.18	4.12	2.46	24.7
CV				27.85	51.6	117.11	41.04	50.12	33.72	45.2	22.54
Replicate F				2.027	0.869	1.047	0.119	0.780	0.713	1.358	0.566
Replicate Prob(F)				0.2117	0.5072	0.4376	0.9454	0.5470	0.5789	0.3420	0.6575
Treatment F				2.678	13.429	6.267	45.719	11.574	6.059	4.513	82.813
Treatment Prob(F)				0.1475	0.0061	0.0339	0.0002	0.0087	0.0363	0.0637	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Figure 2. Volatilization loss from three N sources [urea, HM1152A-treated urea (3 qt/ton), and HM1152A-treated urea (4 qt/ton)] over a 15-day period of time after surface broadcast application on a Crowley silt loam soil. Flood applied on day 10. Rice Research Station, 2013.



## Evaluation of Three N Fertilizer Sources on Rice Yield, Agronomics, and NUE

<b>Experiment number</b> .....	13-CM-11E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Helena
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	Rice / CL152
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 47. Analysis of variance for all treatment means, including the untreated control, which did not receive N fertilizer. Evaluation of rice response to N fertilization from three N sources [urea, HM1152A (3 qt/ton)-treated urea, and HM1152A (4 qt/ton)-treated urea] in a rice production system. LSU AgCenter Rice Research Station, 2013. Flood applied 10 days after surface broadcast application.**

Crop Name			Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description			plant-hd	emer-hd	Tip of				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated					panicle				Abvgrd -	Abvgrd -	total -	(NUE)
Rating Date					7/30/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013
Rating Type			50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit			days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority			Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale									50% HD	50% HD	50% HD	50% HD
Treatment	Rate	Growth										
Name	Rate Unit	Stage										
HM1152A (3 quarts)-Urea	120 LB AI/A	10 DPF	114 a	101 a	34.3 a	20.9 a	47.7 b	7168 a	10477 a	1.04 a	110 a	66 a
HM1152A (4 quarts)-Urea	120 LB AI/A	10 DPF	114 a	101 a	35.8 a	21.6 a	47.6 b	6814 b	10938 a	1.01 a	112 a	67 a
Urea	120 LB AI/A	10DPF	114 a	101 a	35.0 a	21.0 a	47.6 b	6982 ab	10474 a	1.07 a	113 a	69 a
UTC	0 LB AI/A	10 DPF	109 b	96 b	27.5 b	16.3 b	48.7 a	3466 c	4300 b	0.70 b	30 b	0 b
LSD (P=.05)			0.8	0.8	4.27	1.99	0.52	353	2301.3	0.23	41.7	33.9
Standard Deviation			0.5	0.5	2.67	1.24	0.32	221	1438.8	0.14	26.1	21.2
CV			0.4	0.5	8.1	6.2	0.7	3.6	15.9	14.9	28.6	41.7
Replicate F			1.000	1.000	0.198	3.025	3.238	19.247	1.694	1.146	1.365	0.648
Replicate Prob(F)			0.4363	0.4363	0.8948	0.0862	0.0746	0.0003	0.2373	0.3822	0.3146	0.6037
Treatment F			121.0	121.0	8.1	15.3	10.9	256.0	19.4	5.9	9.8	10.2
Treatment Prob(F)			0.0001	0.0001	0.0064	0.0007	0.0024	0.0001	0.0003	0.0166	0.0034	0.0030

Means followed by same letter do not significantly differ (P=.05, LSD).

## Volatilization Loss from Three N Sources Over a 15-Day Period after Surface Broadcast Application

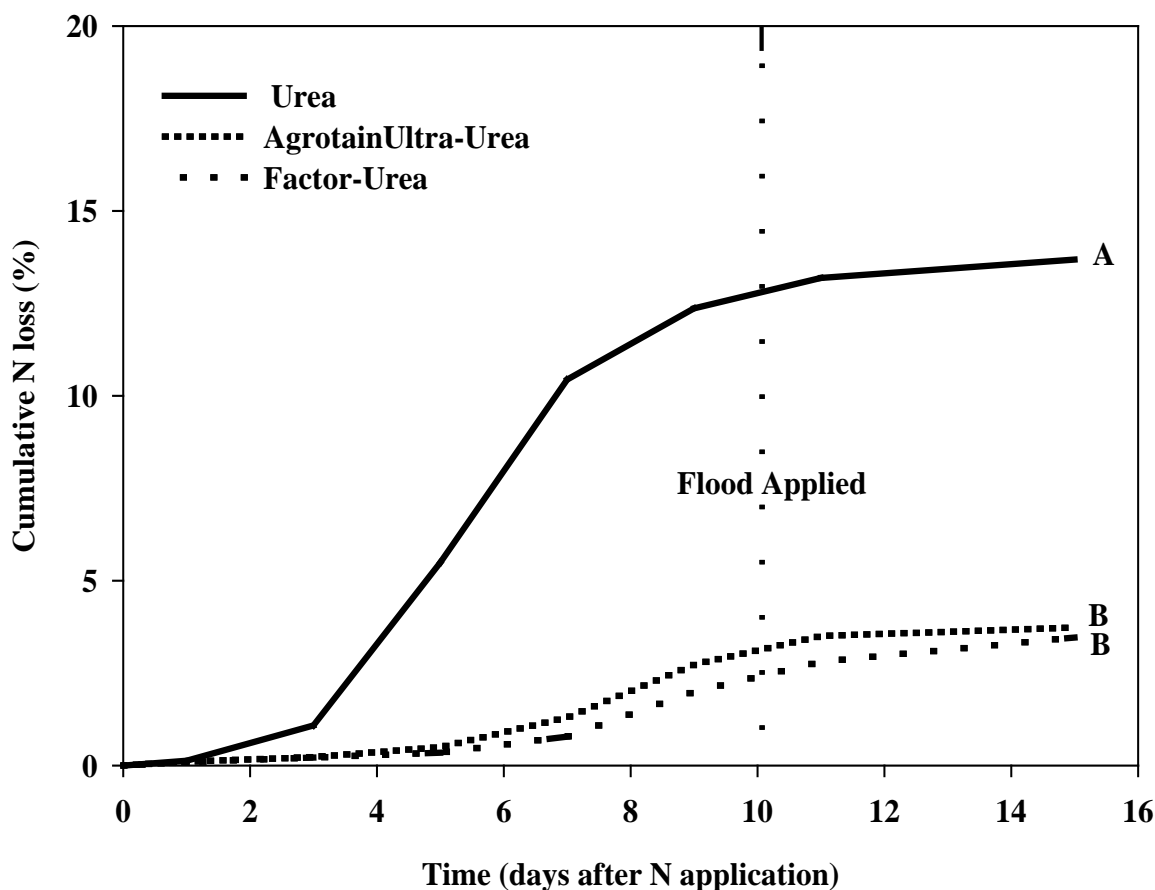
<b>Experiment number</b> .....	13-CM-12E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Rosen's
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	Did not Harvest
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 48. Nitrogen (N) volatilization loss at each of the five sampling times and cumulative N volatilization loss from three N fertilizer sources (urea, Agrotain Ultra-urea, and Factor-urea) using semi-open volatilization chambers in a rice production system. LSU AgCenter Rice Research Station, 2013. Flood applied 10 days after application (Day 10).**

					TOTALN 9 DPF 1 DPA	TOTALN 7 DPF 3 DPA	TOTALN 5 DPF 5 DPA	TOTALN 3 DPF 7 DPA	TOTALN 1 DPF 9 DPA	TOTALN 1 DPostF 11 DPA	TOTALN 5 DPostF 15 DPA	TOTALN Cumulative total
Trt	Treatment	Rate	Unit	Growth Stage 1	-----ppm-----							
No.	Name											
1	Urea	120	LB AI/A	10-DPF	2.1 a	15.7 a	72.3 a	81.2 a	31.6 a	13.5 a	8.1 a	224 a
2	AgrotainUltra-Urea	120	LB AI/A	10-DPF	1.6 a	2.1 b	4.4 b	13.2 b	23.5 a	12.6 a	3.8 a	61 b
3	Factor-Urea	120	LB AI/A	10-DPF	1.5 a	2.0 b	2.2 b	7.1 b	20.0 a	13.2 a	10.8 a	57 b
LSD (P=.05)					1.01	7.29	30.34	20.42	14.20	9.23	10.86	53.0
Standard Deviation					0.59	4.21	17.54	11.80	8.21	5.34	6.28	30.7
CV					33.79	63.99	66.74	34.86	32.77	40.74	83.05	26.86
Replicate F					0.320	1.251	1.106	0.532	0.456	0.984	0.381	0.933
Replicate Prob(F)					0.8110	0.3717	0.4170	0.6771	0.7229	0.4610	0.7706	0.4807
Treatment F					1.095	14.083	20.665	48.606	2.094	0.024	1.249	38.823
Treatment Prob(F)					0.3933	0.0054	0.0020	0.0002	0.2043	0.9759	0.3496	0.0004

Means followed by same letter do not significantly differ (P=.05, LSD).

**Figure 3. Volatilization loss from three N sources (urea, Agrotain Ultra-urea, and Factor-urea) over a 15-day period of time after surface broadcast application on a Crowley silt loam soil. Flood applied on day 10. LSU AgCenter Rice Research Station 2013.**



## Treatment Means for the Main Effects of N Source and N Rate on Rice Grain Yield, Agronomics, and NUE

<b>Experiment number</b> .....	13-CM-13E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Rosen's
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	Rice / CL152
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 16
<b>Drain</b> .....	
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 49. Treatment means for the main effects of N source and N rate on rice grain yield, agronomics, and NUE. Rice response to N fertilization from three N sources (Agrotain Ultra-urea, Factor-urea, and untreated urea) and three N rates (60, 90, and 120 lb/A). Untreated control was excluded from analysis.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	(NUE)
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/9/2013	7/9/2013	7/9/2013	7/9/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source Means</b>										
Urea	112	99	32.4	17.2	48.6	5740	9180	0.80	75	59
Agrotain Ultra-urea	112	99	33.0	17.8	48.4	5756	9204	0.76	71	54
Factor-urea	112	99	32.4	18.0	48.3	5667	8690	0.82	71	58
<i>P</i>	0.9211	0.9211	0.6757	0.1084	0.0480	0.8623	0.3112	0.5150	0.0770	0.7430
LSD (0.05)	1	1	1.8	0.7	0.2	420	841	0.11	14	16
<b>N Rate Means</b>										
60 lb N/A 10 DPF	110	97	31.2	16.4	48.7	4770	7650	0.72	55	56
90 lb N/A 10 DPF	112	99	33.2	17.3	48.6	5863	8883	0.80	70	56
120 lb N/A 10 DPF	113	100	33.5	19.4	48.0	6531	10541	0.86	91	59
<i>P</i>	0.0002	0.0002	0.1141	0.0002	0.0001	0.0001	0.0375	0.0214	0.0034	0.9403
LSD (0.05)	1	1	2.4	0.8	0.2	265	2056	0.08	15	20

**Table 50. Treatment means for the 2-way interaction of N source and N rate on rice grain yield, agronomics, and NUE. Rice response to N fertilization from three N sources and three N rates. Untreated control was excluded from analysis.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle					Tissue	Tissue N	N Uptake
Part Rated								Abvgrd -	Abvgrd -	total -
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/9/2013	7/9/2013	7/9/2013	7/9/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source X N Rate Means</b>										
Urea	110	97	30.5	15.5	49.0	4785	8041	0.70	56	59
60 lb N/A	10 DPF									
AgrotainUltra-urea	111	98	31.8	17.1	48.5	4896	7424	0.71	54	50
60 lb N/A	10 DPF									
Factor-urea	111	98	31.3	16.7	48.7	4628	7485	0.75	56	60
60 lb N/A	10 DPF									
Urea	112	99	32.8	16.7	48.7	5915	8667	0.76	66	51
90 lb N/A	10 DPF									
AgrotainUltra-urea	111	98	33.3	17.1	48.6	5890	9377	0.75	70	56
90 lb N/A	10 DPF									
Factor-urea	112	99	33.5	17.9	48.4	5785	8606	0.89	75	62
90 lb N/A	10 DPF									
Urea	114	101	34.0	19.4	48.0	6521	10833	0.94	101	68
120 lb N/A	10 DPF									
AgrotainUltra-urea	113	100	34.0	19.2	48.1	6482	10812	0.83	89	57
120 lb N/A	10 DPF									
Factor-urea	113	100	32.5	19.4	48.0	6589	9979	0.80	81	51
120 lb N/A	10 DPF									
<i>P</i>	0.0526	0.0526	0.6905	0.722	0.5336	0.5235	0.8447	0.4084	0.5072	0.4924
LSD (0.05)	1	1	2.8	2.3	0.5	328	1986	0.21	25	24

**Table 51. Analysis of variance for all treatment means including the untreated control, which did not receive N fertilizer. Rice response to N fertilization from three N sources (Agrotain Ultra-urea, Factor-urea, and untreated urea) and three N rates (60, 90, and 120 lb/A). Check plot was included in analysis.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.	
Part Rated							Abvgrd -	Abvgrd -	total -	N use efficiency (NUE)	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/9/2013	7/9/2013	7/9/2013	7/9/2013	
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	biomass-dry				
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%	
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block	
Crop Stage Scale							50% Head	50% Head	50% Head	50% Head	
Treatment Name	Growth Stage										
Urea 60 lb N/A	10 DPF	110 ef	97 ef	30.5 bc	15.5 d	49.0 a	4785 c	8041 bc	0.70 bc	56 d	59 a
Urea 90 lb N/A	10 DPF	112 bc	99 bc	32.8 ab	16.7 bcd	48.7 abc	5915 b	8667 bc	0.76 abc	66 cd	51 a
Urea 120 lb N/A	10 DPF	114 a	101 a	34.0 a	19.4 a	48.0 d	6521 a	10833 a	0.94 a	101 a	68 a
AgrotainUltra-urea 60 lb N/A	10 DPF	111 de	98 de	31.8 ab	17.1 bcd	48.5 bc	4896 c	7424 c	0.71 abc	54 d	50 a
AgrotainUltra-urea 90 lb N/A	10 DPF	111 cd	98 cd	33.3 ab	17.1 bc	48.6 bc	5890 b	9377 abc	0.75 abc	70 bcd	56 a
AgrotainUltra-urea 120 lb N/A	10 DPF	113 a	100 a	34.0 a	19.2 a	48.1 d	6482 a	10812 a	0.83 ab	89 ab	57 a
Factor-urea 60 lb N/A	10 DPF	111 cd	98 cd	31.3 abc	16.7 bcd	48.7 abc	4628 c	7485 c	0.75 abc	56 d	60 a
Factor-urea 90 lb N/A	10 DPF	112 bc	99 bc	33.5 a	17.9 ab	48.4 cd	5785 b	8606 bc	0.89 ab	75 bcd	62 a
Factor-urea 120 lb N/A	10 DPF	113 ab	100 ab	32.5 ab	19.4 a	48.0 d	6589 a	9979 ab	0.80 ab	81 abc	51 a
Check (0 lb N/A)	10 DPF	109 f	96 f	28.8 c	16.0 cd	48.9 ab	3327 d	4138 d	0.58 c	20 e	0 b
LSD (P=.05)		1.2	1.2	2.79	1.63	0.40	407.6	2039.2	0.227	21.8	24.1
Standard Deviation		0.8	0.8	1.92	1.12	0.28	280.9	1405.4	0.156	15.0	16.6
CV		0.75	0.85	5.96	6.41	0.57	5.12	16.46	20.25	22.47	32.37
Replicate F		2.968	2.968	1.201	2.129	2.072	6.894	1.264	1.266	0.731	6.829
Replicate Prob(F)		0.0496	0.0496	0.3282	0.1199	0.1274	0.0014	0.3065	0.3060	0.5427	0.0014
Treatment F		11.266	11.266	3.083	6.512	6.845	56.069	7.920	1.709	8.960	5.146
Treatment Prob(F)		0.0001	0.0001	0.0112	0.0001	0.0001	0.0001	0.0001	0.1355	0.0001	0.0004

Means followed by same letter do not significantly differ (P=.05, LSD).

**Nitrogen Volatilization Loss at Each of the Five Sampling Times and Cumulative N Volatilization Loss from Six N Fertilizer Sources Using Semi-Open Volatilization Chambers in a Rice Production System**

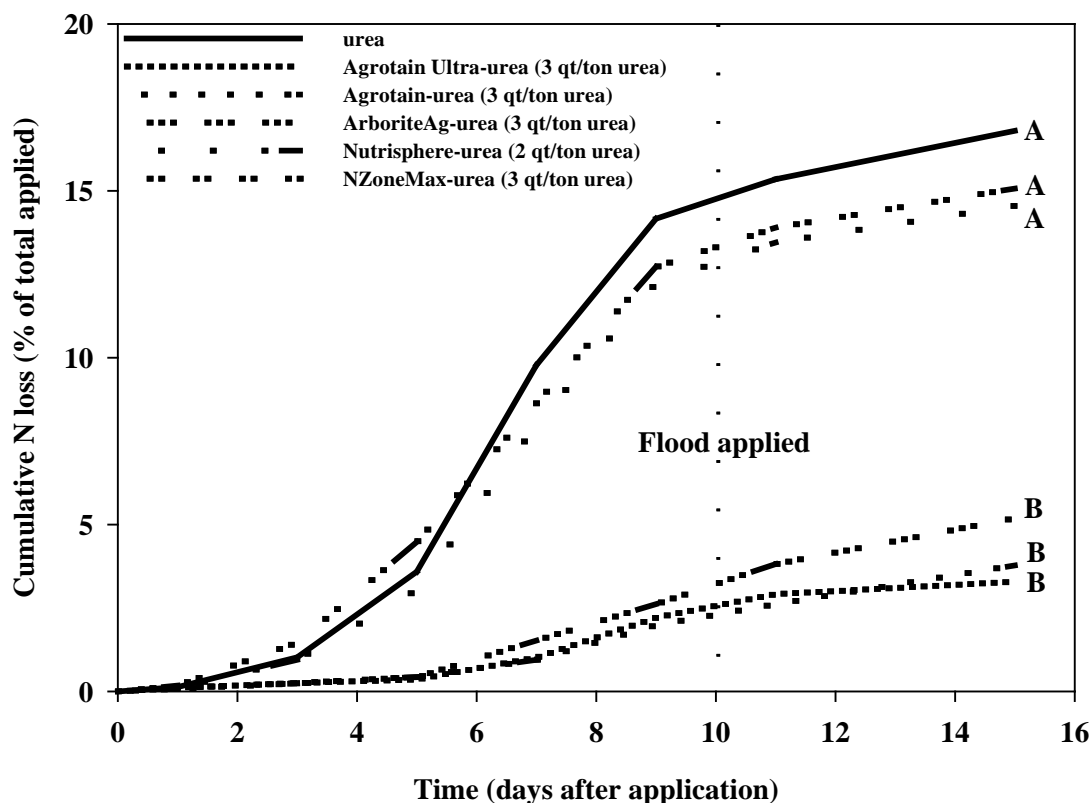
<b>Experiment number</b> .....	13-CM-14E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Koch
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	Did not Harvest
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 52. N volatilization loss at each of the five sampling times and cumulative N volatilization loss from six N fertilizer sources using semi-open volatilization chambers in a rice production system. LSU AgCenter Rice Research Station, 2013. Flood applied on 10 days after application (day 10).**

Trt No.	Treatment Name	Rate	Unit	Growth Stage	TOTALN 9 DPF 1 DPA	TOTALN 7 DPF 3 DPA	TOTALN 5 DPF 5 DPA	TOTALN 3 DPF 7 DPA	TOTALN 1 DPF 9 DPA	TOTALN 1 DPostF 11 DPA	TOTALN 5 DPostF 15 DPA	TOTAL N Cumulative total
1	urea	120	LB AI/A	10 DPF	2.1 ab	14.6 ab	42.1 a	101.6 a	72.0 a	19.4 a	23.8 ab	291 a
2	AgrotainUltra-urea	120	LB AI/A	10 DPF	1.7 ab	2.3 b	1.9 b	10.7 b	19.6 b	11.6 a	6.1 b	54 c
3	Agrotain-urea	120	LB AI/A	10 DPF	1.3 b	2.6 b	3.2 b	8.4 b	17.1 b	10.3 a	19.0 ab	62 c
4	ArboriteAg-urea	120	LB AI/A	10 DPF	1.7 ab	2.4 b	2.9 b	18.0 b	41.7 ab	19.7 a	40.1 a	127 bc
5	Nutrisphere-urea	120	LB AI/A	10 DPF	1.6 b	13.9 ab	34.4 ab	81.4 a	69.6 a	19.8 a	18.1 ab	239 ab
6	NZoneMax-urea	120	LB AI/A	10 DPF	2.9 a	21.1 a	49.5 a	68.3 a	66.9 a	19.3 a	19.2 ab	247 ab
LSD (P=.05)					1.33	14.67	32.66	45.90	43.30	12.11	25.30	121.7
Standard Deviation					0.87	9.74	21.68	30.46	28.74	8.04	16.79	80.2
CV					46.4	102.67	96.98	63.39	60.1	48.16	79.88	47.26
Replicate F					1.784	0.873	0.299	0.618	0.573	0.757	3.739	0.916
Replicate Prob(F)					0.1964	0.4767	0.8256	0.6138	0.6414	0.5356	0.0346	0.4586
Treatment F					1.701	2.783	4.149	7.128	3.098	1.227	1.732	6.495
Treatment Prob(F)					0.1992	0.0568	0.0145	0.0013	0.0406	0.3445	0.1880	0.0025

Means followed by same letter do not significantly differ (P=.05, LSD)

**Figure 4. Volatilization loss from six N sources over a 15-day period of time after surface broadcast application on a Crowley silt loam soil. Flood applied on day 10. LSU AgCenter Rice Research Station, 2013.**



## Evaluation of N Fertilizer Source and Time of Application on Rice Yield, Agronomics, and NUE

<b>Experiment number</b> .....	13-CM-15E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Koch
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 16
<b>Drain</b> .....	
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 53. Treatment means for the main effects of N-source and time of N fertilizer application on rice grain yield, agronomics, and NUE. Evaluation of rice response to N fertilization from six N sources (Agrotain Ultra-urea, Agrotain-urea, Arborite AG-urea, NZone Max-urea, Nutrisphere-urea, and urea) and three application timings (10-, 3-, and 1-day pre-flood). Untreated control was excluded from analysis.**

urea, and urea) and three application timings (10-, 3-, and 1-day pre-flood). Unfertilized control was excluded from analysis.												
Crop Name			Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	
Description			plant-hd	emer-hd	Tip of panicle			Tissue	Tissue N	N Uptake	N fert Eff.	
Part Rated								Abvgrd -	Abvgrd -	total -		
Rating Date					7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	
Rating Type			50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit			days	days	in	%	lb/bu	lb/A	lb/A	% N	%	
Crop Stage Majority			Main	Main	Main	Main	Main	Main	Main	Main	by block	
Crop Stage Scale								50% HD	50% HD	50% HD	50% HD	
N Source Means												
urea		120 LB AI/A	113	100	35.2	19.1	48.1	6873	9023	0.86	79	43
AgrotainUltra-urea	(26.7% NBPT)	120 LB AI/A	114	101	35.5	20.9	47.8	7195	9993	0.94	95	56
Agrotain-urea	(20% NBPT)	120 LB AI/A	114	101	35.1	20.8	47.8	7233	9914	0.95	94	55
ArboriteAG-urea		120 LB AI/A	114	101	35.4	21.4	47.7	6936	9991	1.00	100	61
Nutrisphere-urea		120 LB AI/A	113	100	33.9	19.8	48.0	6511	9831	0.91	90	52
NZoneMax-urea		120 LB AI/A	113	100	34.3	20.0	48.0	6426	8587	0.90	79	43
P			0.0105	0.0105	0.2575	0.0140	0.0257	0.0123	0.3037	0.0373	0.1041	0.1020
LSD (0.05)			1	1	1.6	1.2	0.3	488	1570	0.08	18	15
Time of Application Means												
10 days pre-flood			113	100	34.7	19.9	48.0	6562	9962	0.90	90	52
3 days pre-flood			113	100	34.3	19.5	48.1	6614	8503	0.89	78	42
1 day pre-flood			114	101	35.7	21.6	47.6	7411	10204	0.99	101	61
P			0.0369	0.0369	0.0115	0.0026	0.0020	0.0040	0.0340	0.0363	0.0251	0.0255
LSD (0.05)			1	1	0.8	0.9	0.2	413	1272	0.07	15	12

**Table 54. Treatment means for the 2-way interaction of N-source and time of N fertilizer application on rice grain yield, agronomics, and NUE. Evaluation of rice response to N fertilization from six N sources (Agrotain Ultra-urea, Agrotain-urea, Arborite AG-urea, NZone Max-urea, Nutrisphere-urea, and urea) and three application timings (10-, 3-, and 1-day pre-flood). Untreated control was excluded from analysis.**

Crop Name			Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice		
Description			plant-hd	emer-hd	Tip of panicle			Tissue	Tissue N	N Uptake	N fert Eff.		
Part Rated								Abvgrd -	Abvgrd -	total -			
Rating Date					7/30/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013		
Rating Type			50% HD	50% HD	Height	Moist	Test Wt.	Biomass-dry					
Rating Unit			days	days	in	%	lb/bu	lb/A	% N	lb/A	%		
Crop Stage Majority			Main	Main	Main	Main	Main	Main	Main	Main	by block		
Crop Stage Scale								50% HD	50% HD	50% HD	50% HD		
N Source x Time of Application Means													
urea			120 LB AI/A	113	100	35.3	19.3	48.1	6741	9776	0.83	81	44
10 days pre-flood													
AgrotainUltra-urea	(26.7% NBPT)		120 LB AI/A	113	100	34.8	19.9	48.0	6538	10214	0.82	82	46
10 days pre-flood													
Agrotain-urea	(20% NBPT)		120 LB AI/A	114	101	34.5	19.6	48.1	6614	9277	0.90	83	46
10 days pre-flood													
ArboriteAG-urea			120 LB AI/A	114	101	35.0	20.9	47.8	6351	10495	0.98	104	64
10 days pre-flood													
Nutrisphere-urea			120 LB AI/A	113	100	34.0	20.1	47.9	6574	10300	1.01	103	63
10 days pre-flood													
NZoneMax-urea			120 LB AI/A	112	99	34.5	19.7	48.0	6555	9709	0.88	86	49
10 days pre-flood													
urea			120 LB AI/A	112	99	34.0	17.9	48.4	6230	7225	0.80	60	27
3 days pre-flood													
AgrotainUltra-urea	(26.7% NBPT)		120 LB AI/A	114	101	35.5	20.8	47.8	7447	9371	0.97	93	55
5 days pre-flood													
Agrotain-urea	(20% NBPT)		120 LB AI/A	114	101	35.3	21.2	47.7	7427	9770	0.96	93	55
3 days pre-flood													
ArboriteAG-urea			120 LB AI/A	114	101	35.5	21.1	47.7	7189	9614	1.03	100	61
3 days pre-flood													
Nutrisphere-urea			120 LB AI/A	112	99	32.5	17.5	48.5	5881	8764	0.78	68	34
3 days pre-flood													
NZoneMax-urea			120 LB AI/A	112	99	33.3	18.6	48.2	5510	6276	0.83	52	21
3 days pre-flood													
urea			120 LB AI/A	113	100	36.3	20.1	47.9	7649	10067	0.95	97	58
1 day pre-flood													
AgrotainUltra-urea	(26.7% NBPT)		120 LB AI/A	114	101	36.3	21.9	47.6	7599	10395	1.04	110	68
1 day pre-flood													
Agrotain-urea	(20% NBPT)		120 LB AI/A	114	101	35.5	21.7	47.6	7658	10694	0.99	106	65
1 day pre-flood													
ArboriteAG-urea			120 LB AI/A	114	101	35.8	22.3	47.5	7269	9864	1.00	97	58
1 day pre-flood													
Nutrisphere-urea			120 LB AI/A	115	102	35.3	21.8	47.6	7077	10428	0.95	99	60
1 day pre-flood													
NZoneMax-urea			120 LB AI/A	114	101	35.3	21.7	47.6	7214	9775	1.00	98	59
1 day pre-flood													
P			0.1189	0.1189	0.6269	0.0644	0.0839	0.0006	0.6132	0.0162	0.2334	0.2287	
LSD (0.05)			2	2	2.1	1.8	0.4	650	2573	0.13	31	26	



**Table 55. Analysis of variance for all treatment means including the untreated control, which did not receive N fertilizer. Evaluation of rice response to N fertilization from six N sources (Agrotain Ultra-urea, Agrotain-urea, Arborite AG-urea, NZone Max-urea, Nutrisphere-urea, and urea) and three application timings (10-, 3-, and 1-day pre-flood).**

Crop Name			Rice plant-hd	Rice emer-hd	Rice Tip of panicle	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description												
Part Rated												
Rating Date					7/30/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type			50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit			days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority			Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale									50% HD	50% HD	50% HD	50% HD
Trt	Treatment											
No.	Name	Description	Rate	Unit								
1	urea		120	LB A/I/A	113 bc	100 bc	35.3 abc	19.3 e-h	48.1 cde	6741 b-e	9776 a	0.83 cd
	10 days pre-flood											81 b-e
2	urea		120	LB A/I/A	112 c	99 c	34.0 bcd	17.9 ghi	48.4 abc	6230 ef	7225 bc	0.80 d
	3 days pre-flood											60 de
3	urea		120	LB A/I/A	113 ab	100 ab	36.3 a	20.1 c-f	47.9 d-g	7649 a	10067 a	0.95 abc
	1 day pre-flood											97 ab
4	AgrotainUltra-urea	(26.7% NBPT)	120	LB A/I/A	113 ab	100 ab	34.8 abc	19.9 def	48.0 d-g	6538 def	10214 a	0.82 d
	10 days pre-flood											82 a-d
5	AgrotainUltra-urea	(26.7% NBPT)	120	LB A/I/A	114 ab	101 ab	35.5 ab	20.8 a-e	47.8 e-h	7447 a	9371 ab	0.97 ab
	3 days pre-flood											93 abc
6	AgrotainUltra-urea	(26.7% NBPT)	120	LB A/I/A	114 a	101 a	36.3 a	21.9 ab	47.6 gh	7599 a	10395 a	1.04 a
	1 day pre-flood											110 a
7	Agrotain-urea	(20% NBPT)	120	LB A/I/A	114 a	101 a	34.5 a-d	19.6 d-g	48.1 cde	6614 cde	9277 ab	0.90 bcd
	10 days pre-flood											83 a-d
8	Agrotain-urea	(20% NBPT)	120	LB A/I/A	114 a	101 a	35.3 abc	21.2 a-d	47.7 e-h	7427 ab	9770 a	0.96 abc
	3 days pre-flood											93 abc
9	Agrotain-urea	(20% NBPT)	120	LB A/I/A	114 ab	101 ab	35.5 ab	21.7 abc	47.6 fgh	7658 a	10694 a	0.99 ab
	1 day pre-flood											106 ab
10	ArboriteAG-urea		120	LB A/I/A	114 ab	101 ab	35.0 abc	20.9 a-e	47.8 e-h	6351 ef	10495 a	0.98 ab
	10 days pre-flood											104 ab
11	ArboriteAG-urea		120	LB A/I/A	114 ab	101 ab	35.5 ab	21.1 a-d	47.7 e-h	7189 a-d	9614 ab	1.03 a
	3 days pre-flood											100 ab
12	ArboriteAG-urea		120	LB A/I/A	114 a	101 a	35.8 ab	22.3 a	47.5 h	7269 abc	9864 a	1.00 ab
	1 day pre-flood											97 abc
13	Nutrisphere-urea		120	LB A/I/A	113 ab	100 ab	34.0 bcd	20.1 b-f	47.9 d-g	6574 c-f	10300 a	1.01 ab
	10 days pre-flood											103 ab
14	Nutrisphere-urea		120	LB A/I/A	112 c	99 c	32.5 d	17.5 hi	48.5 ab	5881 fg	8764 ab	0.78 de
	3 days pre-flood											68 cde
15	Nutrisphere-urea		120	LB A/I/A	115 a	102 a	35.3 abc	21.8 abc	47.6 gh	7077 a-d	10428 a	0.95 abc
	1 day pre-flood											99 ab
16	NZoneMax-urea		120	LB A/I/A	112 bc	99 bc	34.5 a-d	19.7 d-g	48.0 c-f	6555 def	9709 a	0.88 bcd
	10 days pre-flood											86 a-d
17	NZoneMax-urea		120	LB A/I/A	112 c	99 c	33.3 cd	18.6 fgh	48.2 bcd	5510 g	6276 cd	0.83 cd
	3 days pre-flood											52 ef
18	NZoneMax-urea		120	LB A/I/A	114 a	101 a	35.3 abc	21.7 abc	47.6 gh	7214 a-d	9775 a	1.00 ab
	1 day pre-flood											98 ab
19	check (0 lb N/A)		0	LB A/I/A	110 d	97 d	28.5 e	16.7 i	48.7 a	3050 h	4103 d	0.67 e
												27 f
LSD (P=.05)					1.4	1.4	2.14	1.82	0.40	704.6	2464	0.130
Standard Deviation					1.0	1.0	1.51	1.29	0.28	498.2	1743	0.092
CV					0.9	1.02	4.37	6.4	0.59	7.48	19	10.04
												23.95
Replicate F					9.730	9.730	0.683	7.795	5.676	2.146	0.769	4.326
Replicate Prob(F)					0.0001	0.0001	0.5662	0.0002	0.0019	0.1051	0.5166	0.0083
Treatment F					5.460	5.460	5.385	6.233	5.849	18.341	3.678	4.925
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).

## Volatilization Loss Over a 15-Day Period after Surface Broadcast Application

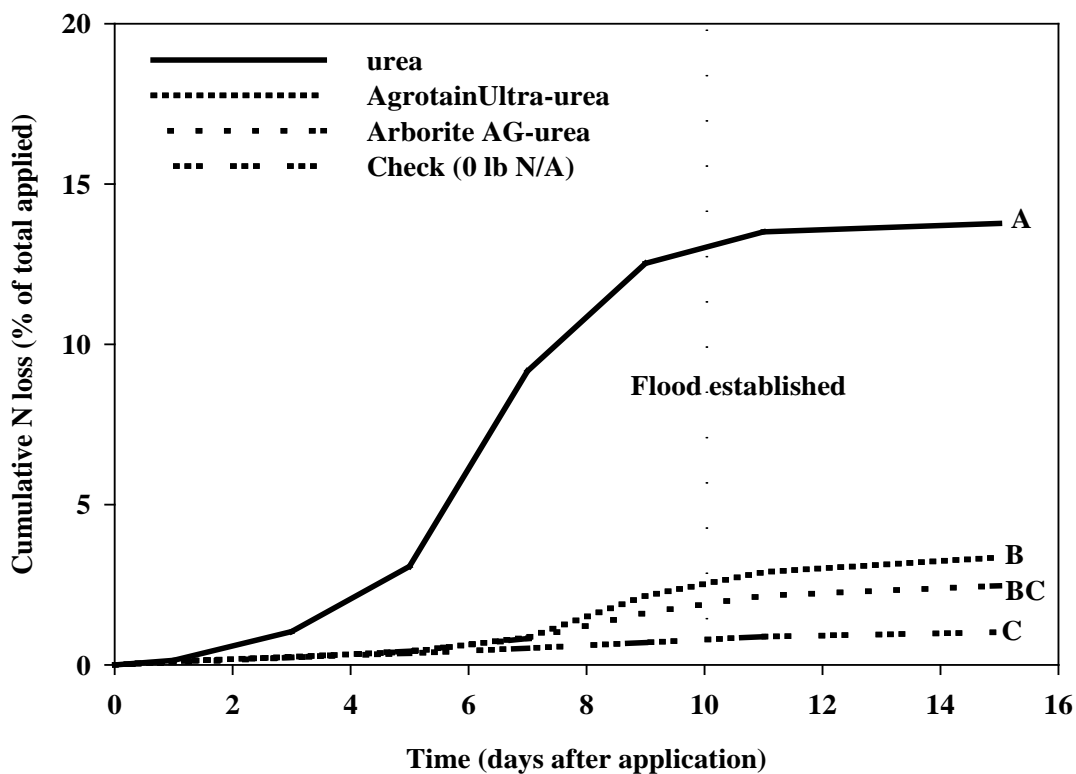
<b>Experiment number</b> .....	13-CM-16E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Weyerhaeuser
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	Did not Harvest
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 56. N volatilization loss at each of the five sampling times and cumulative N volatilization loss from three N fertilizer sources and an untreated control using semi-open volatilization chambers in a rice production system. Rice Research Station, 2013. Flood applied on 10 days after application (day 10).**

Trt Treatment	Rate	Unit	Growth Stage	Comment	days preflood/post flood	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN
					days post application	9 DPF	7 DPF	5 DPF	3 DPF	1 DPF	1 DPostF	5 DPostF	Cumulative
					1 DPA	3 DPA	5 DPA	7 DPA	9 DPA	11 DPA	15 DPA		total
1 urea	120 LB AI/A	10 DPF				2.3 a	14.7 a	33.4 a	100.0 a	55.1 a	16.1 a	4.3 a	225.8 a
2 AgrotainUltra-urea	120 LB AI/A	10 DPF	3 qt/ton urea			1.7 b	2.4 b	2.6 b	7.3 b	21.3 b	12.2 ab	7.5 a	55.0 b
3 Arborite AG-urea	120 LB AI/A	10 DPF	3 qt/ton urea			1.2 c	2.5 b	3.3 b	6.5 b	13.1 bc	8.8 b	5.1 a	40.4 bc
4 Check (0 lb N/A)	0 LB AI/A	10 DPF				1.7 b	2.2 b	2.0 b	2.6 b	2.9 c	3.0 c	2.2 a	15.9 c
LSD (P=.05)						0.40	3.12	8.81	27.32	17.35	4.51	5.62	38.02
Standard Deviation						0.25	1.95	5.51	17.08	10.64	2.77	3.51	22.73
CV						14.53	35.86	53.49	58.65	46.08	27.64	73.4	26.98
Replicate F						10.306	0.426	1.138	0.823	1.387	2.555	2.707	0.976
Replicate Prob(F)						0.0029	0.7392	0.3850	0.5133	0.3154	0.1284	0.1079	0.4565
Treatment F						14.702	39.891	31.248	30.664	18.035	16.023	1.611	70.924
Treatment Prob(F)						0.0008	0.0001	0.0001	0.0001	0.0006	0.0010	0.2544	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).

**Figure 5. Volatilization loss from three N sources and an untreated control over a 15-day period of time after surface broadcast application on a Crowley silt loam soil. Flood applied on day 10. Rice Research Station, 2013.**



## Evaluation of N Fertilizer Source, Rate, and Time of Application on Rice Yield, Agronomics, and NUE

<b>Experiment number</b> .....	13-CM-17E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Weyerhaeuser
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	Rice / CL152
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 57. Treatment means for the main effects of N-source, N-rate, and time of N fertilizer application on rice grain yield, agronomics, and NUE. Evaluation of rice response to N fertilization from three N sources (Arborite AG-urea, Agrotain-urea, and urea), two N rates (120 and 60 lb/A), and three application timings (10-, 5-, and 1-day pre flood). Untreated control was excluded from analysis.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle					Tissue	Tissue N	N Uptake
Part Rated								Abvgrd -	Abvgrd -	total -
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source Means</b>										
urea	112	99	33.7	17.1	48.7	6085	8587	0.89	78	53
AgrotainUltra-urea	113	100	34.2	18.0	48.4	6449	9387	0.96	92	66
Arborite AG-urea	113	100	34.0	17.9	48.5	6326	9728	0.96	94	69
<i>P</i>	0.0833	0.0833	0.6777	0.0397	0.1073	0.0311	0.1398	0.0652	0.0813	0.0895
LSD (0.05)	1	1	1.3	0.7	0.2	251	1215	0.06	16	16
<b>N Rate Means</b>										
60 lb N/A	111	98	32.6	15.8	49.0	5329	8395	0.82	70	62
120 lb N/A	114	101	35.4	19.6	48.1	7244	10073	1.05	106	63
<i>P</i>	0.0072	0.0072	0.0038	0.0003	0.0002	0.0011	0.0012	0.0010	0.0013	0.6009
LSD (0.05)	1	1	1.1	0.6	0.1	493	440	0.05	10	7
<b>Time of Application Means</b>										
10 days pre flood	112	99	33.3	17.1	48.7	5776	8716	0.90	80	54
5 days pre flood	112	99	33.9	17.6	48.6	6198	9059	0.96	88	64
1 day pre flood	113	100	34.8	18.3	48.4	6886	9927	0.95	95	70
<i>P</i>	0.0008	0.0008	0.0324	0.0019	0.0030	0.0067	0.0560	0.4170	0.1732	0.0968
LSD (0.05)	1	1	1.0	0.5	0.1	539	982	0.10	17	15

**Table 58. Treatment means for the 2-way interactions between N-source, N-rate, and time of N fertilizer application on rice grain yield, agronomics, and NUE. Evaluation of rice response to N fertilization from three N sources (Arborite AG-urea, Agrotain-urea, and urea), two N rates (120 and 60 lb/A), and three application timings (10-, 5- and 1-day pre-flood). Untreated control was excluded from analysis.**

Crop Name	Rice plant-hd	Rice emer-hd	Rice Tip of panicle	Rice	Rice	Rice	Rice	Rice Tissue	Rice Tissue N	Rice N Uptake	Rice N fert Eff.
Description											
Part Rated											
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry				
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N		lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD	50% HD
<b>N Source x N Rate Means</b>											
urea	111	98	32.7	15.7	49.1	5058	7863	0.79	63	53	
60 lb N/A											
AgrotainUltra-urea	112	99	32.6	16.1	48.9	5362	8333	0.85	72	64	
60 lb N/A											
Arborite AG-urea	111	98	32.4	15.5	49.1	5566	8989	0.83	75	69	
60 lb N/A											
urea	113	100	34.8	18.6	48.3	7111	9312	0.99	93	52	
120 lb N/A											
AgrotainUltra-urea	114	101	35.8	19.9	48.0	7535	10441	1.06	112	68	
120 lb N/A											
Arborite AG-urea	114	101	35.5	20.3	47.9	7086	10467	1.09	114	69	
120 lb N/A											
<i>P</i>	0.48	0.48	0.2099	0.0113	0.0782	0.1431	0.6345	0.3139	0.618	0.8923	
LSD (0.05)	1	1	1.1	0.7	0.3	514	1301	0.07	18	19	
<b>N Source x Time of Application Means</b>											
urea	112	99	33.6	16.8	48.7	5733	8756	0.90	79	55	
10 days pre-flood											
AgrotainUltra-urea	112	99	33.5	17.5	48.6	5777	8380	0.92	80	51	
10 days pre-flood											
Arborite AG-urea	112	99	32.6	17.0	48.7	5818	9011	0.90	82	55	
10 days pre-flood											
urea	112	99	32.9	16.0	49.0	5679	7405	0.84	63	35	
5 days pre-flood											
AgrotainUltra-urea	113	100	34.5	18.1	48.4	6450	9586	0.98	95	72	
5 days pre-flood											
Arborite AG-urea	113	100	34.3	18.7	48.4	6464	10186	1.06	107	84	
5 days pre-flood											
urea	113	100	34.6	18.6	48.3	6841	9601	0.94	92	68	
1 day pre-flood											
AgrotainUltra-urea	113	100	34.6	18.4	48.3	7120	10195	0.97	101	75	
1 day pre-flood											
Arborite AG-urea	112	99	35.0	18.1	48.4	6697	9985	0.92	94	68	
1 day pre-flood											
<i>P</i>	0.0521	0.0521	0.3142	0.0012	0.0004	0.0631	0.2764	0.016	0.0622	0.0196	
LSD (0.05)	1	1	1.8	0.9	0.2	482	2065	0.09	22	22	
<b>Time of Application x N Rate Means</b>											
60 lb N/A	111	98	31.3	15.4	49.2	4865	7411	0.80	59	49	
10 days pre-flood											
120 lb N/A	113	100	35.3	18.8	48.2	6687	10021	1.01	101	59	
10 days pre-flood											
60 lb N/A	112	99	33.0	15.7	49.1	5173	8577	0.85	74	67	
5 days pre-flood											
120 lb N/A	113	100	34.8	19.4	48.1	7222	9541	1.06	103	61	
5 days pre-flood											
60 lb N/A	112	99	33.4	16.2	48.9	5949	9195	0.82	76	71	
1 day pre-flood											
120 lb N/A	114	101	36.1	20.5	47.8	7824	10658	1.07	115	70	
1 day pre-flood											
<i>P</i>	0.5104	0.5104	0.0444	0.0944	0.4257	0.4779	0.2237	0.7586	0.5718	0.4602	
LSD (0.05)	1	1	1.2	0.6	0.2	317	1482	0.12	21	22	

**Table 59. Treatment means for the 3-way interaction between N-source, N-rate, and time of N fertilizer application on rice grain yield, agronomics, and NUE. Evaluation of rice response to N fertilization from three N sources (Arborite AG-urea, Agrotain-urea, and urea), two N rates (120 and 60 lb/A), and three application timings (10-, 5- and 1-day pre-flood). Untreated control was excluded from analysis.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD	50% HD
<b>N Source x Time of Application x N Rate Means</b>										
urea 60 lb N/A 10 days pre-flood	111	98	31.5	15.4	49.1	4845	8270	0.79	66	59
AgrotainUltra-urea 60 lb N/A 10 days pre-flood	111	98	31.8	15.7	49.0	4702	6785	0.80	54	40
Arborite AG-urea 60 lb N/A 10 days pre-flood	111	98	30.5	15.0	49.3	5048	7179	0.81	58	47
urea 120 lb N/A 10 days pre-flood	113	100	35.8	18.2	48.3	6621	9242	1.00	92	52
AgrotainUltra-urea 120 lb N/A 10 days pre-flood	114	101	35.3	19.3	48.1	6851	9976	1.05	105	63
Arborite AG-urea 120 lb N/A 10 days pre-flood	114	101	34.8	18.9	48.2	6589	10844	0.98	106	63
urea 60 lb N/A 5 days pre-flood	111	98	32.5	15.2	49.2	4525	6267	0.76	47	28
AgrotainUltra-urea 60 lb N/A 5 days pre-flood	112	99	33.5	16.4	48.8	5203	8845	0.90	80	78
Arborite AG-urea 60 lb N/A 5 days pre-flood	112	99	33.0	15.6	49.1	5792	10620	0.89	95	94
urea 120 lb N/A 5 days pre-flood	113	100	33.3	16.8	48.7	6834	8544	0.92	79	41
AgrotainUltra-urea 120 lb N/A 5 days pre-flood	113	100	35.5	19.7	48.0	7696	10326	1.05	111	67
Arborite AG-urea 120 lb N/A 5 days pre-flood	115	102	35.5	21.8	47.7	7135	9753	1.22	119	74
urea 60 lb N/A 1 day pre-flood	112	99	34.0	16.5	48.8	5806	9051	0.82	75	71
AgrotainUltra-urea 60 lb N/A 1 day pre-flood	112	99	32.5	16.1	48.9	6181	9368	0.86	81	74
Arborite AG-urea 60 lb N/A 1 day pre-flood	111	98	33.8	16.0	49.0	5859	9167	0.78	72	67
urea 120 lb N/A 1 day pre-flood	114	101	35.3	20.6	47.8	7877	10150	1.07	108	65
AgrotainUltra-urea 120 lb N/A 1 day pre-flood	114	101	36.8	20.7	47.8	8059	11021	1.09	121	75
Arborite AG-urea 120 lb N/A 1 day pre-flood	114	101	36.3	20.2	47.9	7535	10803	1.07	116	70
<i>P</i>	0.5235	0.5235	0.6795	0.2198	0.5138	0.8129	0.0449	0.5621	0.6842	0.1088
LSD (0.05)	1	1	2.9	2.1	0.6	965	1760	0.17	24	23

**Table 60. Analysis of variance of all treatment means including the untreated control, which did not receive N fertilizer. Evaluation of rice response to N fertilization from three N sources (Arborite AG-urea, Agrotain-urea, and urea), two N rates (120 and 60 lb/A), and three application timings (10-, 5- and 1-day pre flood).**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
Trt	Treatment									
No.	Name									
1	urea	111 gh	98 gh	31.5 hi	15.4 gh	49.1 ab	4845 j	8270 d-g	0.79 fgh	66 fgh
60 lb N/A										
10 days pre flood										
2	urea	111 gh	98 gh	32.5 f-i	15.2 gh	49.2 a	4525 j	6267 g	0.76 gh	47 hi
60 lb N/A										
5 days pre flood										
3	urea	112 efg	99 efg	34.0 b-g	16.5 fg	48.8 bc	5806 ghi	9051 a-e	0.82 fgh	75 efg
60 lb N/A										
1 day pre flood										
4	urea	113 b-e	100 b-e	35.8 abc	18.2 e	48.3 de	6621 def	9242 a-e	1.00 bcd	92 b-f
120 lb N/A										
10 days pre flood										
5	urea	113 cde	100 cde	33.3 d-h	16.8 f	48.7 cd	6834 cde	8544 c-f	0.92 c-f	79 d-g
120 lb N/A										
5 days pre flood										
6	urea	114 ab	101 ab	35.3 a-e	20.6 abc	47.8 gh	7877 ab	10150 a-d	1.07 b	108 ab
120 lb N/A										
1 day pre flood										
7	AgrotainUltra-urea	111 gh	98 gh	31.8 ghi	15.7 fgh	49.0 abc	4702 j	6785 fg	0.80 fgh	54 ghi
60 lb N/A										
10 days pre flood										
8	AgrotainUltra-urea	112 def	99 def	33.5 c-h	16.4 fg	48.8 bc	5203 hij	8845 b-f	0.90 d-g	80 c-g
60 lb N/A										
5 days pre flood										
9	AgrotainUltra-urea	112 efg	99 efg	32.5 f-i	16.1 fgh	48.9 abc	6181 efg	9368 a-d	0.86 e-h	81 c-g
60 lb N/A										
1 day pre flood										
10	AgrotainUltra-urea	114 a-d	101 a-d	35.3 a-e	19.3 cde	48.1 efg	6851 cde	9976 a-d	1.05 bc	105 a-d
120 lb N/A										
10 days pre flood										
11	AgrotainUltra-urea	113 a-d	100 a-d	35.5 a-d	19.7 bcd	48.0 e-h	7696 ab	10326 a-d	1.05 bc	111 ab
120 lb N/A										
5 days pre flood										
12	AgrotainUltra-urea	114 abc	101 abc	36.8 a	20.7 ab	47.8 gh	8059 a	11021 a	1.09 ab	121 a
120 lb N/A										
1 day pre flood										
13	Arborite AG-urea	111 gh	98 gh	30.5 ij	15.0 h	49.3 a	5048 ij	7179 efg	0.81 fgh	58 gh
60 lb N/A										
10 days pre flood										
14	Arborite AG-urea	112 efg	99 efg	33.0 e-h	15.6 fgh	49.1 ab	5792 ghi	10620 abc	0.89 d-g	95 a-e
60 lb N/A										
5 days pre flood										
15	Arborite AG-urea	111 fgh	98 fgh	33.8 c-h	16.0 fgh	49.0 abc	5859 fgh	9167 a-e	0.78 fgh	72 e-h
60 lb N/A										
1 day pre flood										
16	Arborite AG-urea	114 a-d	101 a-d	34.8 a-f	18.9 de	48.2 ef	6589 def	10844 ab	0.98 b-e	106 abc
120 lb N/A										
10 days pre flood										
17	Arborite AG-urea	115 a	102 a	35.5 a-d	21.8 a	47.7 h	7135 bcd	9753 a-d	1.22 a	119 ab
120 lb N/A										
5 days pre flood										
18	Arborite AG-urea	114 abc	101 abc	36.3 ab	20.2 bcd	47.9 fgh	7535 abc	10803 ab	1.07 b	116 ab
120 lb N/A										
1 day pre flood										
19	Check (0 lb N/A)	110 h	97 h	28.8 j	16.0 fgh	48.9 abc	2992 k	4055 h	0.75 h	30 i
LSD (P=.05)	1.3	1.3	2.25	1.35	0.37	762.6	2109.3	0.139	27.0	26.7
Standard Deviation	0.9	0.9	1.59	0.96	0.26	539.2	1491.5	0.098	19.1	18.9
CV	0.84	0.95	4.73	5.45	0.54	8.82	16.64	10.63	22.48	31.88
Replicate F	5.293	5.293	1.477	3.649	2.535	3.244	0.349	0.633	0.701	10.368
Replicate Prob(F)	0.0028	0.0028	0.2310	0.0181	0.0664	0.0289	0.7897	0.5970	0.5558	0.0001
Treatment F	8.481	8.481	6.950	21.424	17.541	24.540	5.901	7.704	7.568	5.011
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).



**Evaluation of Volatilization from Urea, Agrotain-Urea, Urea-Ammonium Sulfate Blend (3:1), Amidis, and Ammonium Sulfate Using Semi-Open Field Volatilization Chambers in a Rice Production System**

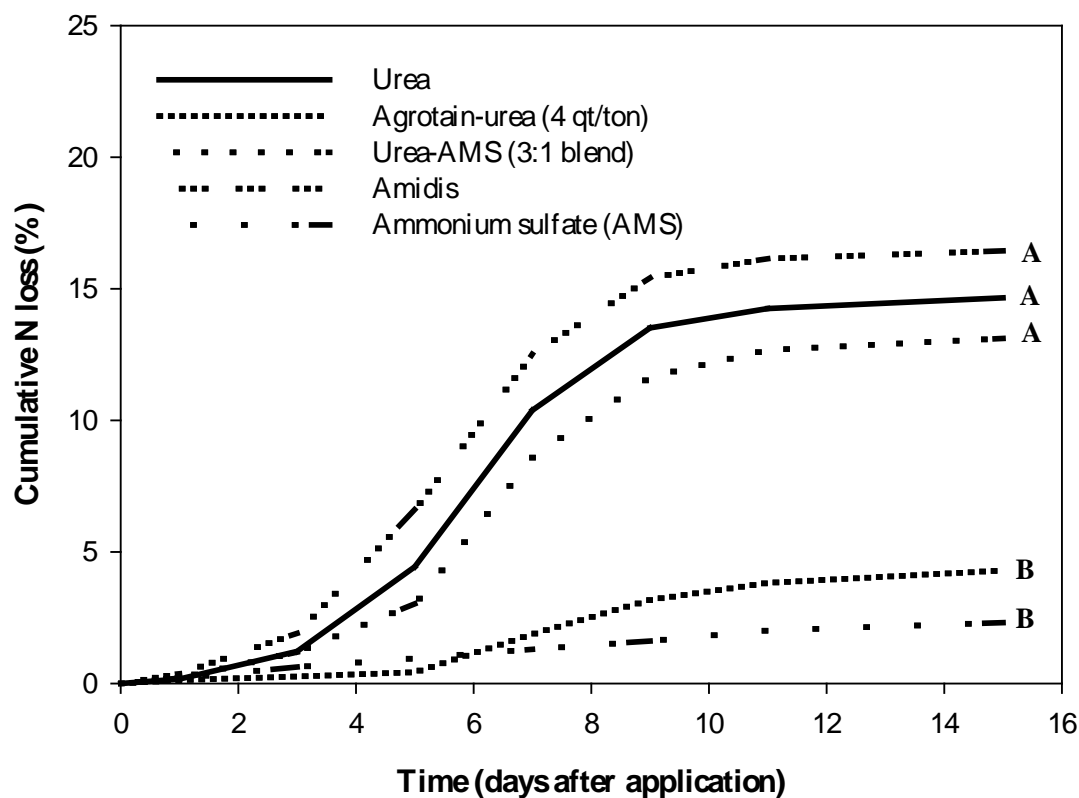
<b>Experiment number</b> .....	13-CM-18E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main) / Yara
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	Did not Harvest
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 16
<b>Drain</b> .....	July 24
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 61. N volatilization loss at each of the five sampling times and cumulative N volatilization loss from five N fertilizer sources using semi-open volatilization chambers in a rice production system. LSU AgCenter Rice Research Station, 2013. Flood applied on 10 days after application (day 10).**

Trt No.	Treatment Name	Rate	Unit	Growth Stage	days preflood/post flood	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTALN	TOTAL N
					days post application	9 DPF 1 DPA	7 DPF 3 DPA	5 DPF 5 DPA	3 DPF 7 DPA	1 DPF 9 DPA	1 DPostF 11 DPA	5 DPostF 15 DPA	Cumulative total
1	Urea	130	LB AI/A	10 DPF		3.0 bc	18.6 ab	57.2 b	105.8 a	55.6 a	13.1 b	7.2 a	261 a
2	Agrotain-urea (20% ; 4 qt/ton)	130	LB AI/A	10 DPF		2.2 c	2.4 c	3.0 d	25.7 b	23.1 b	11.5 bc	8.3 a	76 b
3	Urea-AMS (3:1 blend)	130	LB AI/A	10 DPF		3.7 b	17.5 ab	32.6 c	99.0 a	54.3 a	18.1 a	7.9 a	233 a
4	Amidis	130	LB AI/A	10 DPF		6.5 a	27.3 a	83.6 a	105.1 a	51.5 a	13.0 b	5.3 a	283 a
5	ammonium sulfate (AMS)	130	LB AI/A	10 DPF		3.5 bc	7.6 bc	5.9 d	6.1 b	5.5 b	7.2 c	5.3 a	41 b
LSD (P=.05)						1.47	11.77	24.20	38.19	18.61	4.55	4.20	65.2
Standard Deviation						0.95	7.47	15.55	24.54	12.08	2.95	2.72	41.4
CV						25.08	50.85	42.67	35.91	31.79	23.5	40.16	23.13
Replicate F						2.304	0.650	1.080	0.029	0.684	0.126	1.124	0.125
Replicate Prob(F)						0.1334	0.6009	0.3975	0.9929	0.5787	0.9428	0.3782	0.9431
Treatment F						12.033	6.892	19.515	15.577	13.944	7.024	1.111	29.276
Treatment Prob(F)						0.0005	0.0062	0.0001	0.0002	0.0002	0.0037	0.3960	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).

**Figure 6. Volatilization loss from five N sources over a 15-day period of time after application on a Crowley silt loam soil. Flood applied on day 10. LSU AgCenter-Rice Research Station, 2013.**



## Evaluation of N Fertilizer Source, Rate, and Time of Application on Rice Yield, Agronomics, and NUE

<b>Experiment number</b> .....	13-CM-19E
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.115
<b>pH</b> .....	7.26
<b>Extractable nutrients ppm</b> .....	Ca-1463; Cu-1.9; Mg-271; P-25; K-73; Na-83; S-9.0; Zn-6.7
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 5
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	
<b>Flood</b> .....	May 16
<b>Drain</b> .....	
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21
	1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18
	4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit + 2 pt/A Prowl H <sub>2</sub> O, May 15
	25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 62. Treatment means for the main effects of N-source, N rate, and N application timing. Evaluation of four N sources (Amidis, urea, agrotain-urea, and AMS-Urea 3:1 blend) and time of application (10-, 5-, and 1-day pre-flood) on rice grain yield (2013, year 1, Early planting). Rice Research Station.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N Fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source Means</b>										
urea	112	99	33.5	17.3	48.6	6124	8599	0.85	75	42
Agrotain-urea	113	100	35.4	19.0	48.2	7009	10075	0.94	96	61
Urea-AMS (3:1 blend)	113	100	34.3	18.0	48.5	6152	9213	0.83	79	46
Amidis	113	100	35.1	18.1	48.4	6383	9776	0.89	89	53
<i>P</i>	0.1071	0.1071	0.0158	0.0333	0.0152	0.0018	0.0720	0.0192	0.0279	0.0509
LSD (0.05)	1	1	1.1	1.0	0.2	383	1148	0.06	13	13
<b>Time of Application Means</b>										
10 days pre flood	113	100	34.4	18.1	48.4	6240	9177	0.86	80	46
5 days pre flood	111	98	33.6	16.7	48.8	5826	8624	0.78	69	36
1 day reflood	114	101	35.7	19.5	48.1	7185	10447	1.00	106	70
<i>P</i>	0.0018	0.0018	0.0102	0.0020	0.0023	0.0001	0.0030	0.0001	0.0002	0.0002
LSD (0.05)	1	1	1.1	1.0	0.3	290	767	0.05	9	9
<b>N Rate Means</b>										
80 lb N/A	112	99	33.5	16.5	48.8	5729	8768	0.79	70	49
130 lb N/A	114	101	35.7	19.7	48.1	7105	10064	0.97	99	53
<i>P</i>	0.0013	0.0013	0.0009	0.0008	0.0006	0.0003	0.0034	0.0112	0.0009	0.2956
LSD (0.05)	1	1	0.5	0.7	0.2	217	482	0.10	7	10

**Table 63. Factorial analysis treatment means for the 2-way interactions.**  
**Evaluation of four N sources (Amidis, urea, agrotain-urea, and AMS-Urea 3:1 blend) and time of application (10-, 5-, and 1-day pre flood) on rice grain yield (2013, year 1, Early planting).**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	'ip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source x Time of Application Means</b>										
urea	112	99	33.8	18.2	48.4	6083	9347	0.89	84	50
10 days pre flood										
Agrotain-urea	113	100	34.9	18.2	48.4	6588	9005	0.84	76	42
10 days pre flood										
Urea-AMS (3:1 blend)	114	101	34.4	18.7	48.2	6102	8623	0.84	72	41
10 days pre flood										
Amidis	112	99	34.8	17.3	48.6	6186	9733	0.87	86	51
10 days pre flood										
urea	110	97	32.1	15.2	49.2	4930	6653	0.68	46	15
5 days pre flood										
Agrotain-urea	113	100	35.5	19.2	48.2	7139	10455	0.92	96	64
5 days pre flood										
Urea-AMS (3:1 blend)	111	98	33.0	15.5	49.1	5369	8357	0.71	60	29
5 days pre flood										
Amidis	111	98	33.9	17.0	48.6	5869	9029	0.79	73	38
5 days pre flood										
urea	113	100	34.8	18.6	48.3	7360	9797	0.98	97	62
1 day reflood										
Agrotain-urea	114	101	35.8	19.6	48.1	7301	10765	1.06	115	77
1 day reflood										
Urea-AMS (3:1 blend)	114	101	35.6	19.8	48.0	6984	10657	0.96	104	69
1 day reflood										
Amidis	114	101	36.6	19.9	48.0	7093	10567	0.99	107	70
1 day reflood										
<i>P</i>	0.0132	0.0132	0.1047	0.0009	0.0004	0.0026	0.0213	0.0027	0.0034	0.0031
LSD (0.05)	1	1	1.4	1.4	0.3	638	1468	0.08	16	16
<b>N Source x N Rate Means</b>										
urea	111	98	32.2	16.1	48.9	5445	7871	0.79	63	41
80 lb N/A										
Agrotain-urea	112	99	34.8	16.6	48.8	6413	9833	0.84	84	63
80 lb N/A										
Urea-AMS (3:1 blend)	112	99	33.0	16.5	48.8	5363	8937	0.76	69	48
80 lb N/A										
Amidis	111	98	34.0	16.8	48.7	5694	8432	0.76	65	43
80 lb N/A										
urea	113	100	34.9	18.6	48.3	6804	9328	0.91	88	44
130 lb N/A										
Agrotain-urea	115	102	35.9	21.4	47.7	7605	10318	1.04	107	59
130 lb N/A										
Urea-AMS (3:1 blend)	114	101	35.7	19.5	48.1	6940	9488	0.91	88	44
130 lb N/A										
Amidis	114	101	36.2	19.3	48.1	7072	11121	1.01	112	63
130 lb N/A										
<i>P</i>	0.2936	0.2936	0.4415	0.0725	0.0510	0.5826	0.0799	0.3509	0.0036	0.0066
LSD (0.05)	1	1	1.7	1.4	0.3	430	1315	0.11	9	9
<b>Time of Application x N Rate Means</b>										
10 days pre flood	112	99	33.4	16.5	48.8	5519	8598	0.76	65	43
80 lb N/A										
5 days pre flood	110	97	32.5	15.7	49.1	5145	8028	0.73	60	36
80 lb N/A										
1 day reflood	113	100	34.6	17.4	48.6	6523	9678	0.88	86	66
80 lb N/A										
10 days pre flood	114	101	35.5	19.7	48.0	6961	9756	0.96	94	49
130 lb N/A										
5 days pre flood	112	99	34.8	17.8	48.5	6508	9220	0.82	77	36
130 lb N/A										
1 day reflood	115	102	36.8	21.6	47.6	7846	11215	1.12	126	73
130 lb N/A										
<i>P</i>	0.4409	0.4409	0.9706	0.0062	0.0246	0.9089	0.8479	0.0092	0.1049	0.7572
LSD (0.05)	1	1	1	0.7	0.2	472	1243	0.057	15	17

**Table 64. Factorial analysis treatment means for the 3-way interactions.**

**Evaluation of four N sources (Amidis, urea, agrotain-urea, and AMS-Urea 3:1 blend) and time of application (10-, 5-, and 1-day pre flood) on rice grain yield (2013, year 1, Early planting).**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source x Time of Application x N Rate Means</b>										
Urea	112	99	32.3	16.7	48.7	5388	8377	0.82	69	48
10 days pre flood										
80 lb N/A										
Agrotain-urea	111	98	34.5	15.9	49.0	6052	8308	0.72	60	37
10 days pre flood										
80 lb N/A										
Urea-AMS (3:1 blend)	113	100	33.0	17.1	48.6	5264	8979	0.74	66	45
10 days pre flood										
80 lb N/A										
Amidis	111	98	33.8	16.5	48.8	5373	8728	0.75	66	44
10 days pre flood										
80 lb N/A										
Urea	110	97	30.5	14.7	49.4	4354	6293	0.67	42	15
5 days pre flood										
80 lb N/A										
Agrotain-urea	112	99	35.3	16.7	48.7	6566	10471	0.84	88	71
5 days pre flood										
80 lb N/A										
Urea-AMS (3:1 blend)	111	98	31.5	15.0	49.3	4540	8209	0.70	58	35
5 days pre flood										
80 lb N/A										
Amidis	110	97	32.8	16.2	48.8	5120	7137	0.71	50	25
5 days pre flood										
80 lb N/A										
Urea	112	99	33.8	17.0	48.7	6594	8943	0.87	78	59
1 day pre flood										
80 lb N/A										
Agrotain-urea	113	100	34.8	17.3	48.6	6623	10719	0.96	104	80
1 day pre flood										
80 lb N/A										
Urea-AMS (3:1 blend)	113	100	34.5	17.4	48.5	6286	9623	0.85	83	65
1 day pre flood										
80 lb N/A										
Amidis	113	100	35.5	17.8	48.5	6589	9429	0.83	78	60
1 day pre flood										
80 lb N/A										

Continued.

**Table 64. Continued.**

Crop Name	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd	emer-hd	Tip of panicle				Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated							Abvgrd -	Abvgrd -	total -	
Rating Date			7/30/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry			
Rating Unit	days	days	in	%	lb/bu	lb/A	lb/A	% N	lb/A	%
Crop Stage Majority	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale							50% HD	50% HD	50% HD	50% HD
<b>N Source x Time of Application x N Rate Means</b>										
Urea	113	100	35.3	19.7	48.0	6779	10318	0.96	99	53
10 days pre flood										
130 lb N/A										
Agrotain-urea	114	101	35.3	20.5	47.8	7125	9702	0.97	93	48
10 days pre flood										
130 lb N/A										
Urea-AMS (3:1 blend)	115	102	35.8	20.4	47.9	6940	8267	0.94	78	36
10 days pre flood										
130 lb N/A										
Amidis	114	101	35.8	18.2	48.3	6998	10738	0.99	106	58
10 days pre flood										
130 lb N/A										
Urea	111	98	33.8	15.7	49.1	5505	7014	0.69	49	14
5 days pre flood										
130 lb N/A										
Agrotain-urea	114	101	35.8	21.7	47.7	7711	10440	1.00	104	57
5 days pre flood										
130 lb N/A										
Urea-AMS (3:1 blend)	112	99	34.5	15.9	49.0	6198	8506	0.72	61	24
5 days pre flood										
130 lb N/A										
Amidis	113	100	35.0	17.8	48.4	6618	10920	0.88	96	51
5 days pre flood										
130 lb N/A										
Urea	114	101	35.8	20.3	47.9	8127	10651	1.09	116	66
1 day pre flood										
130 lb N/A										
Agrotain-urea	115	102	36.8	21.9	47.6	7979	10811	1.16	126	73
1 day pre flood										
130 lb N/A										
Urea-AMS (3:1 blend)	115	102	36.8	22.2	47.6	7682	11692	1.07	126	73
1 day pre flood										
130 lb N/A										
Amidis	116	103	37.8	21.9	47.5	7598	11704	1.16	135	81
1 day pre flood										
130 lb N/A										
<i>P</i>	0.8197	0.8197	0.3900	0.3646	0.5349	0.4066	0.4205	0.8043	0.6371	0.6779
LSD (0.05)	2	2	1.7	1.9	0.4	487	2284	0.132	28	25

**Table 65. Analysis of variance for all treatment means including control, which did not receive N fertilizer.  
Evaluation of four N sources (Amidis, urea, agrotain-urea, and AMS-Urea 3:1 blend) and time of application (10-, 5-, and 1-day pre-flood)  
on rice grain yield (2013, year 1, Early planting).**

On Rice Grain Yield (2010, Year 1, Early Planting)														
Crop Name	Rice				Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description	plant-hd		emer-hd	Tip of panicle							Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated											Abvgrd -	Abvgrd -	total -	
Rating Date				7/30/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type	50% HD		50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry						
Rating Unit	days		days	in	%	lb/bu	lb/A	lb/A			% N	lb/A		%
Crop Stage Majority	Main		Main	Main	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale											50% HD	50% HD	50% HD	50% HD
Trt No.	Treatment	Rate	Unit	Growth Stage										
1	Urea 10 days pre flood 80 lb N/A	80	LB AI/A	10 DPF	112 ghi	99 ghi	32.3 fgh	16.7 e-j	48.7 b-f	5388 ij	8377 efg	0.82 h-m	69 g-j	48 efg
2	Urea 10 days pre flood 130 lb N/A	130	LB AI/A	10 DPF	113 c-f	100 c-f	35.3 bc	19.7 cd	48.0 ghi	6779 def	10318 a-e	0.96 b-f	99 c-f	53 c-g
3	Urea 5 days pre flood 80 lb N/A	80	LB AI/A	5 DPF	110 j	97 j	30.5 h	14.7 k	49.4 a	4354 l	6293 hi	0.67 n	42 kl	15 ij
4	Urea 5 days pre flood 130 lb N/A	130	LB AI/A	5 DPF	111 hij	98 hij	33.8 c-f	15.7 h-k	49.1 abc	5505 hij	7014 gh	0.69 n	49 jkl	14 ij
5	Urea 1 day pre flood 80 lb N/A	80	LB AI/A	1 DPF	112 fgh	99 fgh	33.8 c-f	17.0 e-i	48.7 c-f	6594 d-g	8943 b-g	0.87 e-i	78 f-i	59 a-e
6	Urea 1 day Pre flood 130 lb N/A	130	LB AI/A	1 DPF	114 b-e	101 b-e	35.8 abc	20.3 bc	47.9 hij	8127 a	10651 abc	1.09 ab	116 abc	66 a-e
7	Agrotain-urea 10 days pre flood 80 lb N/A	80	LB AI/A	10 DPF	111 hij	98 hij	34.5 cde	15.9 h-k	49.0 a-d	6052 ghi	8308 e-h	0.72 k-n	60 h-k	37 f-i
8	Agrotain-urea 10 days pre flood 130 lb N/A	130	LB AI/A	10 DPF	114 b-e	101 b-e	35.3 bc	20.5 abc	47.8 ij	7125 bcd	9702 a-f	0.97 b-f	93 def	48 efg
9	Agrotain-urea 5 days pre flood 80 lb N/A	80	LB AI/A	5 DPF	112 ghi	99 ghi	35.3 bc	16.7 e-j	48.7 c-f	6566 d-g	10471 a-d	0.84 f-k	88 d-g	71 a-d
10	Agrotain-urea 5 days pre flood 130 lb N/A	130	LB AI/A	5 DPF	114 a-d	101 a-d	35.8 abc	21.7 ab	47.7 ij	7711 ab	10440 a-d	1.00 bcd	104 b-e	57 c-g

Continued.



**Table 65. Continued.**

Crop Name				Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description				plant-hd	emer-hd	Tip of panicle					Tissue	Tissue N	N Uptake	N fert Eff.
Part Rated											Abvgrd -	Abvgrd -	total -	
Rating Date						7/30/2013	8/5/2013	8/5/2013	8/5/2013	8/5/2013	7/8/2013	7/8/2013	7/8/2013	7/8/2013
Rating Type				50% HD	50% HD	Height	Moist	Test Wt.	Yield	Biomass-dry				
Rating Unit				days	days	in	%	lb/bu	lb/A	lb/A		% N	lb/A	%
Crop Stage Majority				Main	Main	Main	Main	Main	Main	Main	Main	Main	Main	by block
Crop Stage Scale											50% HD	50% HD	50% HD	50% HD
Trt No.	Treatment Name	Rate	Unit	Growth Stage										
11	Agrotain-urea 1 day pre flood 80 lb N/A	80	LB AI/A	1 DPF	113 c-g	100 c-g	34.8 b-e	17.3 e-i	48.6 def	6623 d-g	10719 abc	0.96 c-g	104 b-e	80 ab
12	Agrotain-urea 1 day pre flood 130 lb N/A	130	LB AI/A	1 DPF	115 ab	102 ab	36.8 ab	21.9 ab	47.6 ij	7979 a	10811 ab	1.16 a	126 ab	73 abc
13	Urea-AMS (3:1 blend) 10 days pre flood 80 lb N/A	80	LB AI/A	10 DPF	113 e-h	100 e-h	33.0 d-g	17.1 e-i	48.6 def	5264 j	8979 b-g	0.74 j-n	66 g-j	45 e-h
14	Urea-AMS (3:1 blend) 10 days pre flood 130 lb N/A	130	LB AI/A	10 DPF	115 abc	102 abc	35.8 abc	20.4 abc	47.9 ij	6940 cde	8267 e-h	0.94 d-h	78 f-i	36 f-i
15	Urea-AMS (3:1 blend) 5 days pre flood 80 lb N/A	80	LB AI/A	5 DPF	111 ij	98 ij	31.5 gh	15.0 jk	49.3 a	4540 kl	8209 fgh	0.70 mn	58 ijk	35 ghi
16	Urea-AMS (3:1 blend) 5 days pre flood 130 lb N/A	130	LB AI/A	5 DPF	112 ghi	99 ghi	34.5 cde	15.9 g-k	49.0 a-d	6198 fgh	8506 d-g	0.72 k-n	61 h-k	24 hi
17	Urea-AMS (3:1 blend) 1 day pre flood 80 lb N/A	80	LB AI/A	1 DPF	113 e-h	100 e-h	34.5 cde	17.4 e-h	48.5 ef	6286 efg	9623 b-f	0.85 f-j	83 e-h	65 a-e
18	Urea-AMS (3:1 blend) 1 day pre flood 130 lb N/A	130	LB AI/A	1 DPF	115 ab	102 ab	36.8 ab	22.2 a	47.6 ij	7682 ab	11692 a	1.07 abc	126 ab	73 a-d
19	Amidis 10 days pre flood 80 lb N/A	80	LB AI/A	10 DPF	111 hij	98 hij	33.8 c-f	16.5 e-k	48.8 b-e	5373 ij	8728 c-g	0.75 i-n	66 g-j	44 e-h
20	Amidis 10 days pre flood 130 lb N/A	130	LB AI/A	10 DPF	114 b-f	101 b-f	35.8 abc	18.2 de	48.3 fgh	6998 b-e	10738 abc	0.99 b-e	106 bcd	58 b-f

Continued.

**Table 65. Continued.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description		plant-hd		emer-hd		Tip of panicle				Tissue		Tissue N		N Uptake	
Part Rated										Abvgrd -		Abvgrd -		total -	
Rating Date				7/30/2013		8/5/2013		8/5/2013		8/5/2013		7/8/2013		7/8/2013	
Rating Type		50% HD		50% HD		Height		Moist		Test Wt.		Yield		Biomass-dry	
Rating Unit		days		days		in		%		lb/bu		lb/A		% N	
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Main	
Crop Stage Scale												50% HD		50% HD	
Trt	Treatment	Rate		Growth											
No.	Name	Rate	Unit	Stage											
21	Amidis	80	LB AI/A	5 DPF	110 ij	97 ij	32.8 efg	16.2 f-k	48.8 b-e	5120 jk	7137 gh	0.71 lmn	50 jkl	25 hi	
	5 days pre flood														
	80 lb N/A	80	LB AI/A												
22	Amidis	130	LB AI/A	5 DPF	113 d-g	100 d-g	35.0 bcd	17.8 efg	48.4 efg	6618 d-g	10920 ab	0.88 d-i	96 c-f	51 d-g	
	5 days pre flood														
	130 lb N/A	130	LB AI/A												
23	Amidis	80	LB AI/A	1 DPF	113 d-g	100 d-g	35.5 bc	17.8 def	48.5 ef	6589 d-g	9429 b-f	0.83 g-l	78 f-i	60 a-e	
	1 day pre flood														
	80 lb N/A														
24	Amidis	130	LB AI/A	1 DPF	116 a	103 a	37.8 a	21.9 ab	47.5 j	7598 abc	11704 a	1.16 a	135 a	81 a	
	1 day pre flood														
	130 lb N/A														
25	UTC	0	LB AI/A	10 DPF	110 j	97 j	28.0 i	15.4 ijk	49.2 ab	2919 m	4681 i	0.65 n	30 l	0 j	
LSD (P=.05)					1.6	1.6	2.03	1.89	0.44	713.3	2054.5	0.13	23.0	22.5	
Standard Deviation					1.1	1.1	1.44	1.34	0.31	504.4	1452.7	0.09	16.2	15.9	
CV					1.0	1.13	4.19	7.43	0.64	8.04	15.75	10.47	19.71	32.66	
Replicate F					2.977	2.977	2.774	0.098	0.976	2.333	0.485	0.514	0.941	8.260	
Replicate Prob(F)					0.0371	0.0371	0.0475	0.9607	0.4089	0.0812	0.6934	0.6740	0.4254	0.0001	
Treatment F					10.315	10.315	8.745	12.518	13.970	24.345	5.665	11.655	11.708	7.330	
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

**Determine the Agronomic Response of Drill-Seeded CLXL729 to N Fertilizer Rate and Time of Application**  
**Evaluate N-STaR Calibration with Small Plots**

**Experiment number** .....: 13-RF-01

**Site and design .....**

**Location/Cooperator** .....: Evangeline Parish / Richard Fontenot

**Tillage type**.....: Conventional

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 4.67 x 16 ft

**Row width/rows per plot.....: 8 in / 7**

**Soil type** .....: Mowata silt loam

**% organic matter**.....: 1.83

pH.....: 5.57

**Extractable nutrients ppm .....**: Ca-1325; Cu-1.57; Mg-413; P-14.4; K-129; Na-64; S-18.4; Zn-2.1

## Crop/Variety .....: Rice / CLXL729

**Planting method/date** .....: Drill-seeded / March 17

**Seeding rate/depth**.....: 14 seeds/ft<sup>2</sup> / .75 in

**Emergence date.....: March 30**

Harvest date .....: August 9

**Ratoon harvest date.....: November 6**

**Seed treatment/cwt .....**

**Hybrid rice treatments**.....: Maxim (fungicide) - .08 oz

Apron (fungicide) - .32 oz

Dynasty (fungicide) - .15 oz

Zinc - 8 oz

Enlarge (GA3) - .5 oz

AV – 1011 (bird repellent) - 18.3 oz

**Fertilization**.....: 240 lb/A 0-24-24-2.8, March 26

90 lb N/A 46-0-0, ratoon

**Water management .....**

**Flush** .....: NA

**Flood** .....: May 7

**Drain**.....: July 25

**Pest management .....**

**Herbicides.....**: 8 oz/A Newpath, March 21

6 oz/A Newpath + 2 pt/A Prowl H<sub>2</sub>O, May 7

**Insecticides** .....: 0.137 lb ai/cwt Dermacor seed treatment

**Fungicides.....**: 19 oz/A Stratego, June 26

**Table 66. Determine the agronomic response of drill-seeded CLXL729 to N fertilizer rate and time of application (RF.1). Evaluate N-STaR calibration with small plots. Vidrine, LA.**

Table 66: Determine the agronomic response of grain-seeded UREA/22 to N fertilizer rate and time of application (R1-1): Evaluate N-B-Tak calibration with small plots. Vietnam, LA.																				
Crop Name					Rice			Rice			Rice			Rice						
Description					plant-hd		emer-hd		Rice top		Rice			Rice						
Rating Date									7/31/2013		8/9/2013			8/9/2013						
Rating Type					50% HD		50% HD		Height		Lodge			Moist						
Rating Unit					days		days		in		% plot			%						
Crop Stage Majority					Main		Main		Main		Main			Main						
Trt	Trt		Rate	Growth																
No.	Name		Unit	Stage																
1	UREA	0	lb ai/A	4-5 leaf	99.0	h	86.0	h	40	f	.	.	12.4	ef	44.6	a	10023	g		
2	UREA	30	lb ai/A	4-5 leaf	100.5	fg	87.5	fg	42	ef	.	.	12.4	ef	44.6	a	11997	f		
3	UREA	60	lb ai/A	4-5 leaf	101.3	f	88.3	f	46	a-d	.	.	14.7	b-f	43.3	b-e	12484	def		
4	UREA	90	lb ai/A	4-5 leaf	104.0	e	91.0	e	45	bcd	.	.	15.0	bcd	43.4	bcd	13120	a-e		
5	UREA	120	lb ai/A	4-5 leaf	106.0	d	93.0	d	45	bcd	17.5	c	0.7	a	14.8	b-e	43.4	bcd	13159	a-d
6	UREA	150	lb ai/A	4-5 leaf	107.3	c	94.3	c	47	ab	47.5	b	1.3	a	15.6	abc	43.0	de	13017	a-e
7	UREA	180	lb ai/A	4-5 leaf	109.0	b	96.0	b	45	bcd	55.0	ab	1.3	a	16.2	ab	42.9	de	13712	a
8	UREA	210	lb ai/A	4-5 leaf	110.0	a	97.0	a	46	abc	57.4	ab	1.8	a	17.0	ab	42.5	de	12907	b-e
9	UREA	240	lb ai/A	4-5 leaf	110.3	a	97.3	a	48	a	67.5	a	2.5	a	17.8	a	42.3	e	12696	c-f
10	UREA	45	lb ai/A	4-5 leaf	101.0	f	88.0	f	43	de	.	.	12.3	f	44.6	a	12721	cde		
	UREA	45	lb ai/A	PD																
11	UREA	75	lb ai/A	4-5 leaf	103.3	e	90.3	e	45	bcd	.	.	15.8	ab	43.2	cde	12456	ef		
	UREA	45	lb ai/A	PD																
12	UREA	105	lb ai/A	4-5 leaf	105.8	d	92.8	d	46	a-d	.	.	15.7	ab	43.0	de	13096	a-e		
	UREA	45	lb ai/A	PD																
13	UREA	135	lb ai/A	4-5 leaf	107.8	c	94.8	c	45	cde	45.8	b	1.1	a	15.6	abc	43.1	de	13576	ab
	UREA	45	lb ai/A	PD																
14	N-STaR 90% - PF	45	lb ai/A	4-5 leaf	99.8	gh	86.8	gh	43	de	.	.	12.8	def	44.4	ab	12013	f		
	N-STaR 90%-MS	0	lb ai/A	PD																
15	N-STaR 100% - PF	75	lb ai/A	4-5 leaf	104.0	e	91.0	e	45	bcd	56.0	ab	1.7	a	13.2	c-f	44.2	abc	13205	abc
	N-STaR 100%-MS	0	lb ai/A	PD																
LSD (P=.05)					0.95		0.95		2.64		15.20		1.16		2.50		1.08		702.80	
Standard Deviation					0.67		0.67		1.85		9.65		0.74		1.75		0.76		491.80	
CV					0.64		0.73		4.13		19.48		50.29		11.88		1.75		3.88	
Treatment F					128.441		128.441		4.698		10.777		2.462		4.024		4.171		12.955	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0007		0.0998		0.0002		0.0002		0.0001	

Continued.

**Table 66. Continued.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description																		
Part Rated																		
Rating Date					11/6/2013		11/6/2013		11/6/2013				7/3/2013		7/3/2013		7/3/2013	
Rating Type					Moisture		Test Wt.		Yield		Total Yield		Biomass-dry					
Rating Unit					%		lb/bu		lb/A		lb/A		lb/A		%N			
Crop Stage Majority					Ratoon		Ratoon		Ratoon		MC+RC		Main		Main			
Crop Stage Scale													50% HD		50% HD			
Trt No.	Trt Name	Rate	Rate Unit	Growth Stage														
1	UREA	0	lb ai/A	4-5 leaf	19.6	cd	41.9	a	5901	bc	15924	f	8635	c	0.8998	h	78	f
2	UREA	30	lb ai/A	4-5 leaf	20.1	bcd	41.7	a	5912	b	17908	e	12800	ab	1.0810	gh	139	e
3	UREA	60	lb ai/A	4-5 leaf	20.2	bcd	41.7	a	6204	ab	18688	b-e	11720	ab	1.2000	fg	141	e
4	UREA	90	lb ai/A	4-5 leaf	21.1	a-d	41.5	a	5924	b	19044	abc	12598	ab	1.3325	ef	169	de
5	UREA	120	lb ai/A	4-5 leaf	22.5	ab	41.1	a	5600	bc	18759	b-e	13644	a	1.6750	cd	230	bc
6	UREA	150	lb ai/A	4-5 leaf	23.2	a	40.9	a	5844	bc	18860	bcd	12733	ab	1.8450	c	235	bc
7	UREA	180	lb ai/A	4-5 leaf	21.1	a-d	41.6	a	5867	bc	19579	ab	12693	ab	2.0575	b	261	ab
8	UREA	210	lb ai/A	4-5 leaf	22.8	a	41.2	a	5255	c	18162	cde	12413	ab	2.2875	a	283	a
9	UREA	240	lb ai/A	4-5 leaf	22.3	ab	41.4	a	5585	bc	18281	cde	13212	a	2.1650	ab	285	a
10	UREA	45	lb ai/A	4-5 leaf	21.4	abc	41.4	a	6216	ab	18937	abc	10990	b	1.1450	fg	127	e
	UREA	45	lb ai/A	PD														
11	UREA	75	lb ai/A	4-5 leaf	21.3	a-d	41.5	a	6629	a	19085	abc	12452	ab	1.3375	ef	167	de
	UREA	45	lb ai/A	PD														
12	UREA	105	lb ai/A	4-5 leaf	22.0	abc	41.3	a	5705	bc	18802	b-e	12948	ab	1.4975	de	194	cd
	UREA	45	lb ai/A	PD														
13	UREA	135	lb ai/A	4-5 leaf	23.5	a	41.0	a	6230	ab	19807	a	12399	ab	1.6225	d	202	cd
	UREA	45	lb ai/A	PD														
14	N-STaR 90%- PF	45	lb ai/A	4-5 leaf	18.9	d	42.0	a	5931	b	17944	de	12599	ab	1.0933	gh	138	e
	N-STaR 90%-MS	0	lb ai/A	PD														
15	N-STaR 100% - PF	75	lb ai/A	4-5 leaf	21.4	abc	41.3	a	6182	ab	19388	ab	13292	a	1.1973	fg	159	de
	N-STaR 100%-MS	0	lb ai/A	PD														
LSD (P=.05)					2.46		0.75		652.80		923.50		2146.40		0.20		42.80	
Standard Deviation					1.72		0.52		456.80		646.20		1501.90		0.14		29.90	
CV					8.04		1.26		7.70		3.47		12.17		9.17		15.99	
Treatment F					2.395		1.449		2.118		8.268		2.573		39.466		16.776	
Treatment Prob(F)					0.0147		0.1740		0.0308		0.0001		0.0091		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Determine the Agronomic Response of Drill-Seeded CL151 to N Fertilizer Rate and Time of Application  
Evaluate N-STaR Calibration with Small Plots**

<b>Experiment number</b> .....	13-DH-01
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Dwight Hardee
<b>Tillage type</b> .....	5 yr. No-Till
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	NA
<b>pH</b> .....	NA
<b>Extractable nutrients ppm</b> .....	Ca-; Cu-; Mg-; P-; K-; Na-; S-; Zn-(Not Available)
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / April 1
<b>Seeding rate/depth</b> .....	33 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 11
<b>Harvest date</b> .....	August 16
<b>Seed treatment/cwt</b> .....	
	Dithane (fungicide) - 114 g
	Release (gibberellic acid) - 10 g
	Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml
	AV-1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	No Blanket Applications
<b>Water management</b> .....	
<b>Flush</b> .....	NA
<b>Flood</b> .....	May 8
<b>Drain</b> .....	July 29
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Newpath, April 2
	1.5 qt/A Glyphosate, April 2
	6 oz/A Clear path + 3 oz/A League, May 6
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	19 oz/A Stratego + 1.7 oz/A Gem, June 21

**Table 67. Determine the agronomic response of drill-seeded CL151 to N fertilizer rate and time of application (DH.1). Evaluate N-STaR calibration with small plots. Gueydan, LA.**

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Description					plant-hd		emer-hd		Rice top							
Rating Date									8/16/2013		8/16/2013		8/16/2013		8/16/2013	
Rating Type					50% HD		50% HD		Height		Lodge		Moist		Test Wt.	
Rating Unit					days		days		in		% plot		rate		%	
Crop Stage Majority					Main		Main		Main		Main		Main		Main	
Trt	Trt		Rate	Growth												
No.	Name		Unit	Stage												
1	UREA	0	lb ai/A	4-5 leaf	89	ef	79.3	ef	33	g			12.1	a	49.7	a
2	UREA	30	lb ai/A	4-5 leaf	89	f	79.0	f	36	f			12.2	a	49.4	a
3	UREA	60	lb ai/A	4-5 leaf	89	f	79.0	f	38	cd			12.6	a	49.5	a
4	UREA	90	lb ai/A	4-5 leaf	90	ef	79.5	ef	37	def			11.8	a	49.9	a
5	UREA	120	lb ai/A	4-5 leaf	90	def	80.0	def	38	bcd			11.5	a	49.9	a
6	UREA	150	lb ai/A	4-5 leaf	91	bc	81.3	bc	40	ab	15.0	c	2.5	c	11.6	a
7	UREA	180	lb ai/A	4-5 leaf	92	b	81.8	b	39	a-d	65.0	ab	3.3	b	11.3	a
8	UREA	210	lb ai/A	4-5 leaf	93	a	83.0	a	40	abc	78.8	a	4.0	a	12.0	a
9	UREA	240	lb ai/A	4-5 leaf	94	a	83.5	a	40	abc	82.5	a	4.0	a	12.1	a
10	UREA	45	lb ai/A	4-5 leaf	89	ef	79.3	ef	36	ef			13.5	a	48.9	a
	UREA	45	lb ai/A	PD												
11	UREA	75	lb ai/A	4-5 leaf	90	def	80.0	def	38	bcd	8.2	c	0.7	d	11.0	a
	UREA	45	lb ai/A	PD												
12	UREA	105	lb ai/A	4-5 leaf	90	cde	80.3	cde	38	bcd	9.0	c	0.9	d	11.0	a
	UREA	45	lb ai/A	PD												
13	UREA	135	lb ai/A	4-5 leaf	91	bcd	81.0	bcd	40	a	47.5	b	3.0	bc	13.1	a
	UREA	45	lb ai/A	PD												
14	N-STaR 90% - PF	75	lb ai/A	4-5 leaf	90	ef	79.8	ef	38	de			13.7	a	48.8	a
	N-STaR 90%-MS	0	lb ai/A	PD												
15	N-STaR 100% - PF	105	lb ai/A	4-5 leaf	90	ef	79.8	ef	37	def			11.5	a	49.9	a
	N-STaR 100%-MS	0	lb ai/A	PD												
LSD (P=.05)					1.00		1.01		1.93		20.60	0.68	2.54		1.34	1097.90
Standard Deviation					0.70		0.71		1.35		13.49	0.44	1.78		0.94	768.20
CV					0.78		0.88		3.58		30.87	16.98	14.73		1.89	7.34
Treatment F					15.854		15.854		8.707		23.796	37.580	0.916		0.926	5.311
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001	0.0001	0.5497		0.5395	0.0001

Continued.

**Table 67. Continued.**

Crop Name					Rice	Rice	Rice	Rice				
Description					Tissue	Tissue	N Uptake	N fert Eff.				
Part Rated					Abvgrd -	Abvgrd -	total -	NUE -				
Rating Date					7/2/2013	7/2/2013	7/3/2013	7/3/2013				
Rating Type					Biomass-dry							
Rating Unit					lb/A	%N						
Crop Stage Majority					Main	Main	Main	Main				
Crop Stage Scale					50% HD	50% HD	50% HD	50% HD				
Trt	Trt	Rate	Growth									
No.	Name	Rate	Unit	Stage								
1	UREA	0	lb ai/A	4-5 leaf	4789	e	1.06	g	50	h	0	e
2	UREA	30	lb ai/A	4-5 leaf	6572	de	1.08	g	71	gh	69	abc
3	UREA	60	lb ai/A	4-5 leaf	9237	bc	1.10	fg	101	efg	85	a
4	UREA	90	lb ai/A	4-5 leaf	8858	bc	1.25	def	110	ef	67	abc
5	UREA	120	lb ai/A	4-5 leaf	9642	ab	1.31	cde	126	de	63	a-d
6	UREA	150	lb ai/A	4-5 leaf	10072	ab	1.44	bc	144	cd	63	a-d
7	UREA	180	lb ai/A	4-5 leaf	11405	a	1.60	b	183	ab	74	ab
8	UREA	210	lb ai/A	4-5 leaf	10140	ab	1.79	a	180	ab	62	a-d
9	UREA	240	lb ai/A	4-5 leaf	11553	a	1.77	a	203	a	64	a-d
10	UREA	45	lb ai/A	4-5 leaf	8441	bcd	1.17	efg	99	efg	55	bcd
	UREA	45	lb ai/A	PD								
11	UREA	75	lb ai/A	4-5 leaf	9128	bc	1.22	efg	113	def	52	bcd
	UREA	45	lb ai/A	PD								
12	UREA	105	lb ai/A	4-5 leaf	8514	bcd	1.40	cd	119	de	46	cd
	UREA	45	lb ai/A	PD								
13	UREA	135	lb ai/A	4-5 leaf	11645	a	1.43	c	167	bc	65	a-d
	UREA	45	lb ai/A	PD								
14	N-STaR 90%- PF	75	lb ai/A	4-5 leaf	7415	cd	1.10	fg	82	fg	43	d
	N-STaR 90%-MS	0	lb ai/A	PD								
15	N-STaR 100% - PF	105	lb ai/A	4-5 leaf	10164	ab	1.19	efg	121	de	68	abc
	N-STaR 100%-MS	0	lb ai/A	PD								
LSD (P=.05)					2028.00		0.16		31.50		23.80	
Standard Deviation					1419.10		0.11		22.00		16.60	
CV					15.47		8.53		17.67		28.46	
Treatment F					7.072		18.213		15.788		5.414	
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



**Evaluation of Stubble Management Practices and Desiccant Use 5d Pre-Harvest on CL111 and CLXL745  
Ratoon Yield and Regrowth**

<b>Experiment number</b> .....	13-CM-23
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	Rice / CL111, CLXL745
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	Hyb-14, Conventional-33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 7
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
<b>Conventional rice treatments</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV - 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15 150 lb N/A 46-0-0, May 15 90 lb N/A 46-0-0, August 8
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 68. Evaluation of stubble management practices and desiccant use 5d pre-harvest on CL111 and CLXL745 ratoon yield and regrowth (RRS.1).  
Rice Research Station.**

Rice Research Station.					Rice		Rice		Rice		Rice		Rice		Rice	
Crop Name					plant-hd		emer-hd		top							
Description									7/31/2013		8/7/2013		8/7/2013		8/7/2013	
Rating Date					50% HD		50% HD		Height		Moist		Test Wt.		Yield	
Rating Type					days		days		in		%		lb/bu		lb/A	
Rating Unit					Main		Main		Main		Main		Main		Main	
Crop Stage Majority																
Trt	Trt		Rate	Growth												
No.	Name		Unit	Stage												
1	with sodium chlorate Norm harv ht (16") CL111	3	qt/A	5d preha	108	a	95	a	42	cd	12.9	fg	49.4	abc	10282	c
2	with sodium chlorate Norm harv ht (16") CLXL745	3	qt/A	5d preha	108	a	95	a	46	a	14.2	c-f	48.7	b-e	12508	ab
3	with sodium chlorate Low harv ht (8") CL111	3	qt/A	5d preha	108	a	95	a	43	bcd	13.2	efg	49.2	abc	10035	c
4	with sodium chlorate Low harv ht (8") CLXL745	3	qt/A	5d preha	108	a	95	a	44	abc	13.6	d-g	48.9	bcd	11998	b
5	with sodium chlorate flail mowed (=<8") CL111	3	qt/A	5d preha	108	a	95	a	42	d	12.2	fg	49.8	ab	10429	c
6	with sodium chlorate flail mowed (=<8") CLXL745	3	qt/A	5d preha	108	a	95	a	44	abc	11.1	g	50.2	a	12941	a
7	with sodium chlorate rolled (16") CL111	3	qt/A	5d preha	108	a	95	a	41	d	16.1	a-d	48.1	cde	10389	c
8	with sodium chlorate rolled (16") CLXL745	3	qt/A	5d preha	108	a	95	a	46	a	10.9	g	50.3	a	12839	a
9	without sodium chlorate Norm harv ht (16") CL111	0	qt/A	5d preha	108	a	95	a	41	d	18.1	a	47.7	de	10046	c
10	without sodium chlorate Norm harv ht (16") CLXL745	0	qt/A	5d preha	108	a	95	a	45	ab	17.0	ab	47.6	e	12400	ab
11	without sodium chlorate Low harv ht (8") CL111	0	qt/A	5d preha	108	a	95	a	41	d	16.6	abc	48.2	cde	10406	c
12	without sodium chlorate Low harv ht (8") CLXL745	0	qt/A	5d preha	108	a	95	a	45	ab	16.1	a-d	48.0	de	12902	a
13	without sodium chlorate flail mowed (=<8") CL111	0	qt/A	5d preha	108	a	95	a	41	d	15.8	a-e	48.5	cde	10589	c
14	without sodium chlorate flail mowed (=<8") CLXL745	0	qt/A	5d preha	108	a	95	a	44	abc	14.3	c-f	48.8	b-e	12950	a
15	without sodium chlorate rolled (16") CL111	0	qt/A	5d preha	108	a	95	a	41	d	16.4	abc	48.3	cde	10171	c
16	without sodium chlorate rolled (16") CLXL745	0	qt/A	5d preha	108	a	95	a	45	a	14.5	b-f	48.8	b-e	12878	a
LSD (P=.05)					0.00		0.00		2.07		2.68		1.25		687.10	
Standard Deviation					0.00		0.00		1.45		1.88		0.87		480.80	
CV					0.00		0.00		3.36		12.90		1.79		4.19	
Treatment F					0.000		0.000		6.223		5.289		3.690		27.484	
Treatment Prob(F)					1.0000		1.0000		0.0001		0.0001		0.0003		0.0001	

Continued.

Table 68. Continued.

Crop Name					Rice			Rice		Rice		Rice		Rice		
Rating Date					8/7/2013			11/4/2013		11/4/2013		11/4/2013				
Rating Type					Milling			Moist		Test Wt.		Yield		Total Yield		
Rating Unit								%		lb/bu		lb/A		lb/A		
Crop Stage Majority					whole			total		Ratoon		Ratoon		MC+RC		
Trt	Trt		Rate	Growth												
No.	Name		Unit	Stage												
1	with sodium chlorate Norm harv ht (16") CL111	3	qt/A	5d preha	.	.		18.7	e	40.7	b	2747	b-e	13029	cd	
2	with sodium chlorate Norm harv ht (16") CLXL745	3	qt/A	5d preha	.	.		15.8	f	42.0	a	3259	bcd	15767	ab	
3	with sodium chlorate Low harv ht (8") CL111	3	qt/A	5d preha	63.2	a	73.1	a	22.4	bc	39.6	de	2682	cde	12717	d
4	with sodium chlorate Low harv ht (8") CLXL745	3	qt/A	5d preha	58.5	c	71.2	b	18.9	e	40.7	b	1773	f	13771	c
5	with sodium chlorate flail mowed (=<8") CL111	3	qt/A	5d preha	.	.		24.0	ab	39.4	e	2224	ef	12653	d	
6	with sodium chlorate flail mowed (=<8") CLXL745	3	qt/A	5d preha	.	.		18.9	e	40.6	b	2331	ef	15272	b	
7	with sodium chlorate rolled (16") CL111	3	qt/A	5d preha	.	.		26.5	a	38.6	f	775	g	11164	e	
8	with sodium chlorate rolled (16") CLXL745	3	qt/A	5d preha	.	.		20.5	cde	40.2	bcd	1020	g	13859	c	
9	without sodium chlorate Norm harv ht (16") CL111	0	qt/A	5d preha	.	.		18.9	e	40.5	bc	2920	b-e	12966	cd	
10	without sodium chlorate Norm harv ht (16") CLXL745	0	qt/A	5d preha	.	.		14.9	f	42.5	a	4154	a	16554	a	
11	without sodium chlorate Low harv ht (8") CL111	0	qt/A	5d preha	62.9	a	72.5	a	22.5	bc	39.6	de	2605	cde	13011	cd
12	without sodium chlorate Low harv ht (8") CLXL745	0	qt/A	5d preha	60.7	b	71.3	b	19.4	de	40.6	bc	3304	bc	16205	ab
13	without sodium chlorate flail mowed (=<8") CL111	0	qt/A	5d preha	.	.		23.3	b	39.4	e	2535	de	13123	cd	
14	without sodium chlorate flail mowed (=<8") CLXL745	0	qt/A	5d preha	.	.		18.6	e	40.9	b	3497	ab	16447	a	
15	without sodium chlorate rolled (16") CL111	0	qt/A	5d preha	.	.		26.7	a	38.5	f	687	g	10858	e	
16	without sodium chlorate rolled (16") CLXL745	0	qt/A	5d preha	.	.		22.0	bcd	39.9	cde	996	g	13873	c	
LSD (P=.05)					1.88	0.58		2.79		0.70		752.40		999.30		
Standard Deviation					1.18	0.36		1.95		0.49		526.50		699.20		
CV					1.92	0.51		9.40		1.22		22.46		5.06		
Treatment F					13.562	25.490		12.140		18.665		15.580		25.566		
Treatment Prob(F)					0.0011	0.0001		0.0001		0.0001		0.0001		0.0001		

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Stubble Management Practices and Desiccant Use 16d Pre-Harvest on CL111 and CLXL745  
Ratoon Yield and Regrowth**

<b>Experiment number</b> .....	13-VP-23
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	33/14 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
<b>Conventional rice treatments</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
	250 lb/A 8-24-24, March 21 150 lb N/A 46-0-0, May 6 90 lb N/A 46-0-0, August 20
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 22
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20 2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7 1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 69. Evaluation of stubble management practices and desiccant use 16d pre-harvest on CL111 and CLXL745 ratoon yield and regrowth (VP.1).Vermilion Parish.**

Crop Name		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description		plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice	
Rating Date						8/1/2013		8/17/2013		8/17/2013		8/17/2013		8/17/2013		8/17/2013	
Rating Type		50% HD		50% HD		Height		Lodge		Moist		Test Wt.		Yield		Milling	
Rating Unit		days		days		in		% plot		rate		%		lb/bu		lb/A	
Crop Stage Majority		Main		Main		Main		Main		Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Unit														
1	with sodium chlorate Norm harv ht (16") CL111	3	qt/A	106.0	b	92.0	b	45	c	.	.	14.3	a	44.3	a	9638	cd
2	with sodium chlorate Norm harv ht (16") CLXL745	3	qt/A	108.0	a	94.0	a	51	a	.	.	15.2	a	43.7	a	11719	a
3	with sodium chlorate Low harv ht (8") CL111	3	qt/A	106.3	b	92.3	b	47	b	.	.	14.0	a	44.5	a	9395	d
4	with sodium chlorate Low harv ht (8") CLXL745	3	qt/A	108.3	a	94.3	a	51	a	.	.	13.9	a	44.5	a	12060	a
5	with sodium chlorate flail mowed (=8") CL111	3	qt/A	106.0	b	92.0	b	46	bc	.	.	14.2	a	44.4	a	10122	bc
6	with sodium chlorate flail mowed (=8") CLXL745	3	qt/A	108.0	a	94.0	a	51	a	.	.	14.2	a	44.3	a	11807	a
7	with sodium chlorate rolled (16") CL111	3	qt/A	106.0	b	92.0	b	45	c	.	.	14.6	a	44.1	a	9679	cd
8	with sodium chlorate rolled (16") CLXL745	3	qt/A	108.0	a	94.0	a	52	a	86	a	1	a	14.3	a	12134	a
9	without sodium chlorate Norm harv ht (16") CL111	0	qt/A	106.0	b	92.0	b	45	c	.	.	14.8	a	44.0	a	10699	b

Continued.

**Table 69. Continued.**

Crop Name				Rice		Rice		Rice		Rice		Rice		Rice		Rice											
Description				plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice											
Rating Date								8/1/2013		8/17/2013		8/17/2013		8/17/2013		8/17/2013											
Rating Type				50% HD		50% HD		Height		Lodge		Moist		Test Wt.		Yield		Milling									
Rating Unit				days		days		in		% plot		rate		%		lb/bu		lb/A		whole		total					
Crop Stage Majority				Main		Main		Main		Main		Main		Main		Main		Main		Main		Main					
Trt	Treatment			Rate		Unit																					
No.	Name			Rate		Unit																					
10	without sodium chlorate Norm harv ht (16") CLXL745			0		qt/A		107.8 a		93.8 a		51 a		65 a		1 a		15.2 a		43.7 a		11778 a		. .			
11	without sodium chlorate Low harv ht (8") CL111			0		qt/A		106.3 b		92.3 b		45 bc		. .		16.6 a		43.1 a		10168 bc		62.0 a		73.0 a			
12	without sodium chlorate Low harv ht (8") CLXL745			0		qt/A		108.0 a		94.0 a		51 a		75 a		1 a		15.1 a		43.8 a		12258 a		59.3 b		71.4 b	
13	without sodium chlorate flail mowed (= < 8") CL111			0		qt/A		106.0 b		92.0 b		45 bc		. .		14.4 a		44.2 a		10036 bcd		. .					
14	without sodium chlorate flail mowed (= < 8") CLXL745			0		qt/A		108.0 a		94.0 a		52 a		68 a		1 a		16.2 a		43.2 a		12311 a		. .			
15	without sodium chlorate rolled (16") CL111			0		qt/A		105.8 b		91.8 b		45 c		. .		14.4 a		44.3 a		10478 b		. .					
16	without sodium chlorate rolled (16") CLXL745			0		qt/A		107.5 a		93.5 a		50 a		86 a		1 a		15.2 a		43.7 a		12261 a		. .			
LSD (P=.05)				0.86		0.86		2.18		34.23		0.43		1.90		1.18		718.30		1.93		0.82					
Standard Deviation				0.60		0.60		1.53		21.00		0.26		1.33		0.83		502.60		1.21		0.52					
CV				0.56		0.65		3.17		27.66		25.18		8.97		1.88		4.56		2.04		0.72					
Treatment F				11.152		11.152		14.398		0.899		0.747		1.335		1.073		18.988		19.557		14.289					
Treatment Prob(F)				0.0001		0.0001		0.0001		0.5077		0.5866		0.2219		0.4060		0.0001		0.0003		0.0009					

Continued.

Table 69. Continued.

Crop Name		Rice		Rice		Rice		Rice	
Rating Date		11/5/2013		11/5/2013		11/5/2013			
Rating Type		Moist		Test Wt.		Yield		Total Yield	
Rating Unit		%		lb/bu		lb/A		lb/A	
Crop Stage Majority		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Treatment Name	Rate	Rate Unit						
1	with sodium chlorate Norm harv ht (16") CL111	3	qt/A	18.5	de	42.1	cde	1984	de
2	with sodium chlorate Norm harv ht (16") CLXL745	3	qt/A	14.5	gh	43.6	a	3925	c
3	with sodium chlorate Low harv ht (8") CL111	3	qt/A	21.4	bc	41.6	fg	2324	d
4	with sodium chlorate Low harv ht (8") CLXL745	3	qt/A	19.1	de	42.4	cd	3438	c
5	with sodium chlorate flail mowed (=8") CL111	3	qt/A	24.2	a	41.1	gh	1771	de
6	with sodium chlorate flail mowed (=8") CLXL745	3	qt/A	19.6	cd	42.2	cd	3537	c
7	with sodium chlorate rolled (16") CL111	3	qt/A	23.0	ab	41.4	g	1675	e
8	with sodium chlorate rolled (16") CLXL745	3	qt/A	16.6	f	43.0	b	3591	c
9	without sodium chlorate Norm harv ht (16") CL111	0	qt/A	19.1	de	42.0	def	2262	de
10	without sodium chlorate Norm harv ht (16") CLXL745	0	qt/A	13.9	h	43.7	a	4668	b
11	without sodium chlorate Low harv ht (8") CL111	0	qt/A	21.2	bc	41.6	efg	2295	d
12	without sodium chlorate Low harv ht (8") CLXL745	0	qt/A	16.2	fg	43.1	b	5379	a
13	without sodium chlorate flail mowed (=8") CL111	0	qt/A	23.0	ab	41.3	gh	2047	de
14	without sodium chlorate flail mowed (=8") CLXL745	0	qt/A	17.6	ef	42.6	bc	4847	ab
15	without sodium chlorate rolled (16") CL111	0	qt/A	24.7	a	40.8	h	1763	de
16	without sodium chlorate rolled (16") CLXL745	0	qt/A	14.5	gh	43.6	a	4818	ab
LSD (P=.05)				1.82		0.53		593.10	
Standard Deviation				1.27		0.37		415.00	
CV				6.65		0.87		13.20	
Treatment F				30.122		26.117		38.298	
Treatment Prob(F)				0.0001		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Ratoon Response to First Crop N Application Timing, Ratoon N Rate, and Ratoon N Timing

<b>Experiment number</b> .....	13-CM-24
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (Crowley Main)
<b>Tillage type</b> .....	Fall Stale
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.66 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	Crowley silt loam
<b>% organic matter</b> .....	1.17
<b>pH</b> .....	7.36
<b>Extractable nutrients ppm</b> .....	Ca-1541; Cu-2.1; Mg-266; P-36; K-77; Na-90; S-11.5; Zn-8.2
<b>Crop/Variety</b> .....	Rice / CL111, CLXL745
<b>Planting method/date</b> .....	Drill-seeded / March 15
<b>Seeding rate/depth</b> .....	Hyb-14, Conventional-33 seeds/ft <sup>2</sup> / .5 in
<b>Emergence date</b> .....	March 28
<b>Harvest date</b> .....	August 7
<b>Ratoon Harvest date</b> .....	November 4
<b>Seed treatment/cwt</b> .....	
<b>Conventional rice treatments</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	230 lb/A 0-24-24-2.8, March 15
<b>Water management</b> .....	
<b>Flush</b> .....	None
<b>Flood</b> .....	May 17
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 9
<b>Ratoon Drain</b> .....	October 21
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1 qt/A Glyphosate + 1 pt/A 2,4-D + 2 oz/A Valor + .25% NIS, November 21 1.5 qt/A Glyphosate + 1 oz/A Londax + .5 oz/A Permit + .25% NIS, March 7 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, April 18 4 qt/A Propanil + 1 oz/A Londax + .5 oz/A Permit, May 15 25 oz/A Clincher + 2.3 oz/A Grasp + 1 qt/A COC, May 28
<b>Insecticides</b> .....	0.137 lb ai/cwt Dermacor seed treatment
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27



**Table 70. Ratoon response to first crop N application timing, ratoon N rate, and ratoon N timing (RRS.1). Rice Research Station.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice			
Description			plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice			
Rating Date			50% HD		50% HD		7/31/2013		8/7/2013		8/7/2013		8/7/2013		11/4/2013		11/4/2013		11/4/2013			
Rating Type			days		days		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield			
Rating Unit			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A			
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon			
Trt No.	Trt Name	Growth Stage	108	a	95	a	41	c-g	14.1	abc	49.0	d-g	10207	c	15.5	e	42.1	e	1516	k	11723	fg
1	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 0 lb N/A	PF GR post har																				
2	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 90 lb N/A	PF GR post har	108	a	95	a	41	c-g	14.1	abc	49.0	d-g	9802	c	17.5	cd	41.2	f	2645	fgh	12446	ef
3	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 150 lb N/A	PF GR post har	108	a	95	a	40	fg	14.4	ab	49.0	d-g	10035	c	18.0	cd	41.0	fg	2852	efg	12887	e
4	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 45 lb N/A 45 lb N/A	PF GR post har 2WPH	108	a	95	a	42	a-e	14.9	a	48.7	g	10154	c	17.4	d	41.2	f	2476	ghi	12630	e
5	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 75 lb N/A 75 lb N/A	PF GR post har 2WPH	108	a	95	a	41	c-g	13.8	bcd	49.2	b-f	10117	c	18.8	c	40.6	gh	2932	efg	13049	de
6	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 0 lb N/A	PF GR post har	108	a	95	a	40	fg	14.7	ab	48.8	fg	9862	c	18.2	cd	40.9	fg	1279	k	11141	g
7	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 90 lb N/A	PF GR post har	108	a	95	a	40	efg	14.0	abc	49.2	c-g	10088	c	20.3	b	40.3	hi	2917	efg	13006	de

Continued.

**Table 70. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description			plant-hd		emer-hd		Rice top		8/7/2013		8/7/2013		8/7/2013		11/4/2013		11/4/2013		11/4/2013		Total Yield	
Rating Date			50% HD		50% HD		7/31/2013		8/7/2013		8/7/2013		8/7/2013		11/4/2013		11/4/2013		11/4/2013		Total Yield	
Rating Type			50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		Total Yield	
Rating Unit			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Trt No.	Trt Name	Growth Stage																				
8	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 150 lb N/A	PF GR post har	108	a	95	a	41	d-g	14.1	abc	49.1	c-g	9830	c	21.6	a	39.9	i	3234	e	13064	de
9	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 45 lb N/A 45 lb N/A	PF GR post har 2WPH	108	a	95	a	41	efg	14.3	ab	49.0	d-g	10108	c	21.0	ab	39.9	i	2272	hi	12381	ef
10	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 75 lb N/A 75 lb N/A	PF GR post har 2WPH	108	a	95	a	39	g	14.7	ab	48.9	efg	9789	c	21.2	ab	40.0	i	3015	ef	12804	e
11	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 0 lb N/A	PF 50% HD post har	108	a	95	a	44	a	12.3	e	49.7	a	11826	b	12.7	h	43.6	a	2109	ij	13935	c
12	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 90 lb N/A	PF 50% HD post har	108	a	95	a	44	ab	12.8	e	49.4	a-d	12148	ab	13.7	fgh	42.9	bc	4162	bcd	16310	ab
13	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 150 lb N/A	PF 50% HD post har	108	a	95	a	43	abc	13.1	cde	49.7	a	12036	ab	14.4	efg	42.6	cde	4610	ab	16646	a
14	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 45 lb N/A 45 lb N/A	PF 50% HD post har 2WPH	108	a	95	a	43	ab	12.1	e	49.6	ab	12556	a	13.2	gh	43.4	ab	3832	d	16388	ab

Continued.

**Table 70. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice					
Description			plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice					
Rating Date							7/31/2013		8/7/2013		8/7/2013		8/7/2013		11/4/2013		11/4/2013		11/4/2013					
Rating Type			50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield					
Rating Unit			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A					
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon					
Trt No.	Trt Name	Growth Stage	15	CLXL745	108	a	95	a	42	a-e	12.4	e	49.6	ab	12318	ab	13.7	fgh	42.9	bc	4401	abc	16719	a
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Normal Harvest (16")																							
	75 lb N/A	post har																						
	75 lb N/A	2WPH																						
16	CLXL745		108	a	95	a	43	ab	12.6	e	49.5	abc	11948	b	14.3	efg	42.7	cd	1729	jk	13677	cd		
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Low harvest ht (8")																							
	0 lb N/A	post har																						
17	CLXL745		108	a	95	a	43	a-d	12.1	e	49.7	ab	12032	ab	15.2	e	42.3	de	4080	cd	16111	ab		
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Low harvest ht (8")																							
	90 lb N/A	post har																						
18	CLXL745		108	a	95	a	42	b-f	12.2	e	49.7	ab	11767	b	17.2	d	41.3	f	4779	a	16547	ab		
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Low harvest ht (8")																							
	150 lb N/A	post har																						
19	CLXL745		108	a	95	a	44	ab	13.0	de	49.3	a-e	12056	ab	14.6	ef	42.6	cde	3812	d	15868	b		
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Low harvest ht (8")																							
	45 lb N/A	post har																						
	45 lb N/A	2WPH																						
20	CLXL745		108	a	95	a	42	a-e	12.9	de	49.3	a-e	11993	ab	15.4	e	42.2	de	4320	abc	16313	ab		
	120 lb N/A	PF																						
	30 lb N/A	50% HD																						
	Low harvest ht (8")																							
	75 lb N/A	post har																						
	75 lb N/A	2WPH																						
LSD (P=.05)			0.00		0.00		2.19		1.08		0.45		594.30		1.26		0.56		474.50		726.10			
Standard Deviation			0.00		0.00		1.55		0.77		0.32		420.20		0.89		0.39		335.50		513.40			
CV			0.00		0.00		3.70		5.71		0.65		3.81		5.35		0.95		10.66		3.62			
Treatment F			0.000		0.000		3.436		6.535		4.069		26.354		40.400		37.284		40.175		56.205			
Treatment Prob(F)			1.0000		1.0000		0.0002		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001			

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Ratoon Response to First Crop N Application Timing, Ratoon N Rate, and Ratoon N Timing

<b>Experiment number</b> .....	13-VP-24
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Vermilion Parish / Kent Lounsberry
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	4.67 x 16 ft
<b>Row width/rows per plot</b> .....	8 in / 7
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.14
<b>pH</b> .....	4.91
<b>Extractable nutrients ppm</b> .....	Ca-997; Cu-0.9; Mg-110; P-35; K-63; Na-40; S-11.7; Zn-4.1
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 19
<b>Seeding rate/depth</b> .....	33/14 seeds/ft <sup>2</sup> / .75 in
<b>Emergence date</b> .....	April 2
<b>Harvest date</b> .....	August 17
<b>Ratoon Harvest date</b> .....	November 5
<b>Seed treatment/cwt</b> .....	
<b>Conventional rice treatments</b> .....	Dithane (fungicide) - 114 g Release (gibberellic acid) - 10 g Zinc Plus (10% Zn & 4.9% combined sulfur) - 296 ml AV-1011 (bird repellent) - 18.3 oz
<b>Hybrid rice treatments</b> .....	Maxim (fungicide) - .08 oz Apron (fungicide) - .32 oz Dynasty (fungicide) - .15 oz Zinc - 8 oz Enlarge (GA3) - .5 oz AV – 1011 (bird repellent) - 18.3 oz
<b>Fertilization</b> .....	
250 lb/A 8-24-24, March 21	
<b>Water management</b> .....	
<b>Flush</b> .....	March 31
<b>Flood</b> .....	May 9
<b>Drain</b> .....	July 24
<b>Ratoon Flood</b> .....	August 22
<b>Ratoon Drain</b> .....	October 16
<b>Pest management</b> .....	
<b>Herbicides</b> .....	8 oz/A Command + 8 oz/A Newpath, March 20 2 qt/A Rice Shot + 1 qt/A Rice Beaux, May 7 1 oz/A Londax + .5 oz/A Permit + 3 oz/A Newpath, May 7
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	6.8 oz/A Sercadis + 19 oz/A Stratego, June 27

**Table 71. Ratoon response to first crop N application timing, ratoon N rate, and ratoon N timing (VP.1). Vermilion Parish.**

Crop Name			Rice				Rice				Rice				Rice				Rice				Rice			
Description			plant-hd				emer-hd				Rice top				Rice				Rice				Rice			
Rating Date			50% HD				50% HD				8/1/2013				8/17/2013				8/17/2013				8/17/2013			
Rating Type			days				days				Height				Moist				Test Wt.				Yield			
Rating Unit			Main				Main				Main				Main				Main				Main			
Crop Stage Majority			Main				Main				Main				Main				Main				Main			
Trt No.	Trt Name	Growth Stage	105.3	cd	91.3	cd	44	c	13.5	a	44.8	a	10146	de	16.5	fg	42.8	cd	1655	g	11801	ef				
1	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 0 lb N/A	PF GR post har	104.8	cd	90.8	cd	44	c	14.4	a	44.2	a	10241	cde	18.8	de	42.2	efg	2436	f	12677	d				
2	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 90 lb N/A	PF GR post har	105.8	bc	91.8	bc	44	c	14.2	a	44.4	a	10261	cde	19.4	cd	41.9	fgh	2600	f	12861	d				
3	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 150 lb N/A	PF GR post har	105.5	cd	91.5	cd	44	c	14.6	a	44.0	a	10402	cd	18.0	def	42.3	def	2420	f	12822	d				
4	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 45 lb N/A 45 lb N/A	PF GR post har 2WPH	104.8	cd	90.8	cd	45	c	13.9	a	44.7	a	9813	e	18.5	de	42.1	efg	2441	f	12255	de				
5	CL111 120 lb N/A 30 lb N/A Normal Harvest (16") 75 lb N/A 75 lb N/A	PF GR post har 2WPH	104.8	cd	90.8	cd	45	c	14.7	a	44.1	a	9857	de	20.7	bc	41.2	i	1675	g	11532	f				
6	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 0 lb N/A	PF GR post har	104.5	d	90.5	d	44	c	14.8	a	44.1	a	9710	e	20.8	bc	41.5	hi	2643	f	12353	de				
7	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 90 lb N/A	PF GR post har																								

Continued.

**Table 71. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice	
Description			plant-hd		emer-hd		Rice top		8/1/2013		8/17/2013		8/17/2013		11/5/2013		11/5/2013		11/5/2013		Total Yield	
Rating Date			50% HD		50% HD		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield		lb/A	
Rating Type			days		days		in		%		lb/bu		lb/A		%		lb/bu		lb/A		lb/A	
Rating Unit			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon		MC+RC	
Crop Stage Majority																						
Trt No.	Trt Name	Growth Stage																				
8	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 150 lb N/A	PF GR  post har	104.8	cd	90.8	cd	46	c	14.9	a	44.0	a	10043	de	22.8	a	41.3	i	2753	ef	12795	d
9	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 45 lb N/A 45 lb N/A	PF GR  post har 2WPH	104.8	cd	90.8	cd	45	c	14.0	a	44.5	a	10103	de	20.6	bc	41.6	ghi	2407	f	12510	d
10	CL111 120 lb N/A 30 lb N/A Low harvest ht (8") 75 lb N/A 75 lb N/A	PF GR  post har 2WPH	105.0	cd	91.0	cd	45	c	14.0	a	44.6	a	10044	de	21.7	ab	41.5	hi	2801	ef	12845	d
11	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 0 lb N/A	PF 50% HD  post har	107.3	a	93.3	a	50	ab	14.7	a	43.9	a	11974	ab	12.9	i	44.3	a	3113	de	15087	c
12	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 90 lb N/A	PF 50% HD  post har	106.8	ab	92.8	ab	49	ab	15.0	a	43.8	a	11915	ab	13.8	i	43.8	a	4675	c	16589	ab
13	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 150 lb N/A	PF 50% HD  post har	106.8	ab	92.8	ab	51	a	15.1	a	43.6	a	11566	b	14.1	hi	43.8	ab	4960	bc	16526	b
14	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 45 lb N/A 45 lb N/A	PF 50% HD  post har 2WPH	106.8	ab	92.8	ab	50	ab	15.8	a	43.2	a	10789	c	13.5	i	43.9	a	4697	c	15486	c

Continued.

**Table 71. Continued.**

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice		Rice						
Description			plant-hd		emer-hd		Rice top		Rice		Rice		Rice		Rice		Rice		Rice						
Rating Date			50% HD		50% HD		8/1/2013		8/17/2013		8/17/2013		8/17/2013		11/5/2013		11/5/2013		11/5/2013						
Rating Type			days		days		Height		Moist		Test Wt.		Yield		Moist		Test Wt.		Yield						
Rating Unit			Main		Main		in		%		lb/bu		lb/A		%		lb/bu		lb/A						
Crop Stage Majority			Main		Main		Main		Main		Main		Main		Ratoon		Ratoon		Ratoon						
Trt No.	Trt Name	Growth Stage	15	CLXL745 120 lb N/A 30 lb N/A Normal Harvest (16") 75 lb N/A 75 lb N/A	PF 50% HD post har 2WPH	106.8	ab	92.8	ab	49	ab	15.0	a	43.8	a	11873	ab	13.9	i	43.8	ab	4804	c	16677	ab
16	CLXL745 120 lb N/A 30 lb N/A Low harvest ht (8") 0 lb N/A	PF 50% HD post har	107.0	a	93.0	a	48	b	15.8	a	43.3	a	11754	ab	14.0	hi	43.8	a	3427	d	15181	c			
17	CLXL745 120 lb N/A 30 lb N/A Low harvest ht (8") 90 lb N/A	PF 50% HD post har	107.0	a	93.0	a	50	ab	15.3	a	43.6	a	12149	a	16.4	fg	42.9	c	5026	abc	17176	a			
18	CLXL745 120 lb N/A 30 lb N/A Low harvest ht (8") 150 lb N/A	PF 50% HD post har	107.3	a	93.3	a	49	ab	15.9	a	43.3	a	11764	ab	17.3	efg	42.6	cde	5432	a	17196	a			
19	CLXL745 120 lb N/A 30 lb N/A Low harvest ht (8") 45 lb N/A 45 lb N/A	PF 50% HD post har 2WPH	107.0	a	93.0	a	49	ab	15.6	a	43.5	a	12053	ab	15.7	gh	43.2	bc	5002	bc	17056	ab			
20	CLXL745 120 lb N/A 30 lb N/A Low harvest ht (8") 75 lb N/A 75 lb N/A	PF 50% HD post har 2WPH	107.0	a	93.0	a	51	a	15.7	a	43.3	a	11683	ab	17.1	efg	42.6	cde	5301	ab	16984	ab			
LSD (P=.05)			1.05		1.05		2.39		2.60		1.55		582.00		1.75		0.61		405.40		628.70				
Standard Deviation			0.74		0.74		1.69		1.84		1.10		411.50		1.24		0.43		286.70		444.50				
CV			0.70		0.81		3.60		12.38		2.49		3.77		7.16		1.01		8.16		3.08				
Treatment F			8.079		8.079		10.172		0.605		0.814		19.907		23.918		21.232		82.736		91.802				
Treatment Prob(F)			0.0001		0.0001		0.0001		0.8870		0.6820		0.0001		0.0001		0.0001		0.0001		0.0001				

Means followed by same letter do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## ROTATIONAL CROP RESEARCH

D.L. Harrell, J.P. Leonards, R.P. Regan, J.S. Fluitt, and J. Li

### Rotational Crop Research

A multi-year trial was established in 2012 and continued in 2013 to evaluate the combined effects of tillage and fertilization on sweet sorghum yield, agronomics, and fermentable solids for a mono-crop system. Two tillage practices (conventional tillage (CT) and no-till (NT)) and two fertilization practices (no fertilization (NF) and maintenance fertilization (MF)). The MF treatment consisted of a surface broadcast application of 40 and 60 lb/A of  $P_2O_5$  and  $K_2O$ , respectively. Potash (0-0-60) and triple-super phosphate (0-46-0) were the fertilizer sources used. Harvest was done by hand at the soft dough stage of grain development. At harvest, a sub-sample was taken for tissue analysis. Sweet sorghum was separated into the seed head, stalk, green leaves (upper 2/3 of the leaves), and brown leaves (senesced leaves, lower 1/3). 'Dura Sweet' sweet sorghum was drill-seeded into a conventionally tilled or no-till seedbed on April 23 at a seeding rate of 60,000 seeds/A. Sorghum was harvested at the soft dough stage of development on Aug. 22. Plant samples were then dried, ground, and analyzed for total nutrient content. Agronomic and sugar analysis results are presented in Table 1. Nutrient analysis results from the seed head, stalk, green leaves, and brown leaves are presented in Tables 2, 3, 4, and 5, respectively. Mean nutrient content of the plant components at the soft dough stage of development is presented in Table 6. Soil Mehlich-3 extractable nutrients and soil pH at three depths (0-3, 3-6, and 6-12 in) are presented in Table 7. Harvestable stalks ranged from 49,223 to 57,064 stalks/A. Plant height ranged from 120-128 in. Total biomass at harvest ranged from 30.7 to 38.3 tons/A, while stalk diameter ranged from 18.1 – 19.4 cm at the stalk base. Fermentable solids ranged from 2.1 – 2.9 tons/A. Fermentable solids in the NT-NF treatment (2.1 tons/A) were significantly less than the CT-SF treatment (2.9 tons/A). No other significant differences in fermentable solids were observed for the four treatments. Sweet sorghum plant height, total biomass, stalk biomass, stalk diameter, and soluble solids were not significantly affected by any tillage and fertilization combination in year two of this trial (Table 1). Nutrient P content of the seed head was significantly lower in the NT-NF treatment as compared with the CT-MF treatment (Table 2). No other significant differences were observed for the seed head P content. Seed head K and Mg concentration was significantly lower for NT-NF as compared with the CT-MF treatment. No differences in nutrient concentration were observed for the stalks, green, or brown leaves (Tables 3, 4, and 5, respectively). Soil organic matter (OM) content at the 0-3 in depth soil post-harvest was lower in the CT-MF treatment (2.05%) as compared with the NT-MF (2.48%) treatment (Table 7). Soil test P (Mehlich-3) was higher in the NT-MF treatment at a depth of 6-12 in as compared to all other treatments. No other differences were observed in the post-harvest soil samples at the 0-3, 3-6, or 6-12 in depths.

A date of planting trial was conducted for the first time in 2013 at the Rice Research Station in Crowley, LA evaluating 4 Group IV (DG4765, S49-F8, 94Y80, and Rev 49R94) and 4 Group V (S51-1-19, 56R53, AG5233, and DG5575) soybeans. Actual dates of planting were March 22, April 9, April 23, May 9, May 23, and June 12. Results of the main effects of planting date and variety are presented in Table 8. Results of the interactions of date of planting by variety are presented in Table 9. Poor emergence was observed for the May 9 (fourth date of planting), which resulted in low yields. A significant soybean yield response ( $P \leq 0.0001$ ; LSD = 4.0 bu/A) was observed for the main effect of date of planting when pooled over all soybean varieties. Soybean yields were 16.1, 28.2, 32.1, 14.7\* (poor stand), 43.8, and 28.2 bu/A, respectively. Yields were significantly reduced after the May 23 date of planting. Similarly, mean plant height was significantly affected by date of planting when pooled over all varieties ( $P \leq 0.0001$ ; LSD = 1 in). Mean plant height was 15.0, 18.5, 17.7, 17.2, 23, and 20.3 in for the March 22, April 9, April 23, May 9, May 23, and June 12 dates of planting, respectively. Analysis of multiple years of data will be needed before inferences of the optimum date of planting window for Group IV and V soybeans in southwest Louisiana can be made.

Separate variety trials were conducted for Group III and early Group IV, mid/late Group IV, and Group V soybeans. The data is not included in this text; however, it can be found online at [www.lsuagcenter.com](http://www.lsuagcenter.com). Soybean variety trials are conducted annually to evaluate the maturity group (groups III – VI) and varietal response to the environmental and soil conditions in southwest Louisiana. In 2013, the varieties with the highest yield at the Rice Research Station location included R2C4541 (early group IV; 57 bu/A), DeltaGrow 4967 LL (mid/late group IV; 59 bu/A), and REV 51R53 (group V; 56 bu/A).



Wheat varietal and experimental lines are evaluated annually. The top three yielding commercially available varieties at the Crowley location in 2013 were USG 3120 (96 bu/A), AGS 2038 (95.4 bu/A), and AGS 2040 (94.3 bu/A). The full data set for the Crowley location, as well as from other locations, can be found online at [www.lsuagcenter.com](http://www.lsuagcenter.com).

Grain sorghum hybrids are evaluated annually for their yield response with 24 entries evaluated in 2013. The highest yielding grain sorghum hybrids at the Crowley location in 2013 were Pioneer 83P17, REV RV9973, and REV RV9782 with yields of 6,657, 6,623, and 6,227 lb/A, respectively. The complete Crowley dataset, as well as the data from all other locations, can be found online at [www.lsuagcenter.com](http://www.lsuagcenter.com).

**Evaluation of Tillage on Production Agronomics, Nutrient Uptake, and Soil Sustainability of Sweet Sorghum  
Production (Year 2 - 2013)**

<b>Experiment number</b> .....	SS-CAP-2013
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (South Unit)
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	10 ft x 30 ft
<b>Row width/rows per plot</b> .....	30 in / 4
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.70
<b>pH</b> .....	5.25
<b>Extractable nutrients ppm</b> .....	Ca-1196; Cu-1.4; Mg-258; P-56; K-83; Na-31; S-12.3; Zn-4.6
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / April 23
<b>Seeding rate/depth</b> .....	60,000 seeds/A / .5 in
<b>Emergence date</b> .....	April 30
<b>Harvest date</b> .....	August 22
<b>Seed treatment/cwt</b> .....	
	NA
<b>Fertilization</b> .....	
	90 lb N/A 46-0-0, May 24
<b>Water management</b> .....	
<b>Flush</b> .....	NA
<b>Flood</b> .....	NA
<b>Drain</b> .....	NA
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1.5 pt/A Charger Max + 4 pt/A Atrazine 4L, March 22 1.5 qt/A Glyphosate, April 23 1.5 pt/A Charger Max + 3.2 pt/A Atrazine 5L, May 9
<b>Insecticides</b> .....	None
<b>Fungicides</b> .....	None

**Table 1. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 - 2013). Rice Research Station.**

Table 1. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 = 2013). Rice Research Station.																							
Description		50% HD		50% HD		Plant		Harvestable		% Tillers		Height		Total		Stalk		Stalk diameter		Sol. Solids		Ferm. Solids	
Part Rated						Population		Stalks		at Harvest				Biomass		Biomass		@ base -		stalk -		stalk -	
Rating Date						8/24/2013		8/22/2013		8/22/2013		8/22/2013		8/22/2013						8/22/2013			
Rating Type		plant-hd		emerg-hd								mean						mean		BRIX			
Rating Unit		days		days		plants/A		stalks/A		% tiller		in		ton/A		ton/A		mm		w/w		ton/A	
Crop Stage Majority						3 leaf		soft dou				soft dou		soft dou		soft dou		soft dou					
Crop Stage Scale								harvest		harvest		harvest		harvest		harvest		harvest					
Trt	Treatment																						
No.	Name																						
1	Conventional Tillage	104	a	97	a	64033	a	56628	a	-13	a	120	a	38.3	a	28.4	a	18.1	a	10.7	a	2.7	ab
	No Fertilization																						
2	Conventional Tillage	104	a	97	a	52708	a	49223	a	-8	a	128	a	35.8	a	29.8	a	19.4	a	10.8	a	2.9	a
	Maintenance Fertilization																						
	40 lb P <sub>2</sub> O <sub>5</sub>																						
	60 lb K <sub>2</sub> O																						
3	No-Till	106	a	99	a	54886	a	54886	a	0	a	125	a	30.7	a	23.5	b	18.5	a	10.1	a	2.1	b
	No Fertilization																						
4	No-Till	105	a	98	a	57499	a	57064	a	-1	a	127	a	34.2	a	26.5	ab	19.1	a	10.3	a	2.5	ab
	Maintenance Fertilization																						
	40 lb P <sub>2</sub> O <sub>5</sub>																						
	60 lb K <sub>2</sub> O																						
LSD (P=.05)		2.800		2.800		15520		11398		19.600		6.730		5.550		3.310		1.610		1.770		0.480	
Standard Deviation		1.620		1.620		8970		6587		11.300		3.890		3.210		1.910		0.930		1.020		0.280	
CV		1.550		1.660		15.660		12.100		0.000		3.110		9.220		7.070		4.940		9.730		10.810	
Bartlett's X2		1.365		1.365		4.356		4.279		4.307		1.199		2.301		0.212		1.379		0.235		0.198	
P(Bartlett's X2)		0.714		0.714		0.225		0.233		0.230		0.753		0.512		0.976		0.711		0.972		0.978	
Replicate F		2.349		2.349		0.336		1.131		0.227		5.825		1.484		1.093		1.228		1.098		1.903	
Replicate Prob(F)		0.172		0.172		0.800		0.409		0.874		0.033		0.311		0.421		0.378		0.420		0.230	
Treatment F		2.349		2.349		1.198		1.201		1.156		3.228		3.896		8.124		1.571		0.455		5.599	
Treatment Prob(F)		0.172		0.172		0.388		0.387		0.401		0.103		0.074		0.016		0.292		0.723		0.036	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 2. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 - 2013).****Nutrient concentration of sweet sorghum seed head.**

Description			Weight		N		P		K		S		Ca		Mg	
Part Rated			head		head		head		head		head		head		head	
Rating Unit			%		%		%		%		%		%		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	10.50	a	1.87	a	0.34	ab	0.45	b	0.12	a	0.06	a	0.21	ab
	FERT	No Fertilization														
2	CULT	Conventional Tillage	11.65	a	1.74	a	0.38	a	0.55	a	0.11	a	0.09	a	0.25	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	10.56	a	1.81	a	0.27	b	0.45	b	0.11	a	0.07	a	0.16	b
	FERT	No Fertilization														
4	CULT	No-Till	7.79	a	2.06	a	0.33	ab	0.51	ab	0.13	a	0.09	a	0.21	ab
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			3.530		0.258		0.071		0.073		0.016		0.034		0.052	
Standard Deviation			2.040		0.149		0.041		0.042		0.010		0.020		0.030	
CV			20.15		7.98		12.47		8.59		8.19		26.19		14.61	
Replicate F			2.099		1.109		1.321		3.617		2.231		0.685		1.299	
Replicate Prob(F)			0.202		0.416		0.352		0.084		0.185		0.593		0.358	
Treatment F			2.602		3.366		5.363		5.917		2.719		2.774		4.956	
Treatment Prob(F)			0.147		0.096		0.039		0.032		0.137		0.133		0.046	

Continued.

**Table 2. Continued.****Nutrient concentration of sweet sorghum seed head.**

Description			Zn		Fe		Mn		Na		Al		B		C	
Part Rated			head		head		head		head		head		head		head	
Rating Unit			ppm		ppm		ppm		ppm		ppm		ppm		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	32.40	a	91.65	a	47.77	a	19.81	a	58.19	a	3.27	b	47.18	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	38.24	a	166.11	a	53.62	a	24.00	a	146.10	a	5.40	a	46.63	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	29.10	a	142.25	a	51.57	a	21.32	a	127.92	a	4.04	ab	46.25	a
	FERT	No Fertilization														
4	CULT	No-Till	38.61	a	80.76	a	61.43	a	20.06	a	39.70	a	5.33	a	46.73	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			6.963		163.125		16.693		6.718		201.182		1.311		0.978	
Standard Deviation			4.024		94.276		9.647		3.883		116.271		0.758		0.566	
CV			11.63		78.44		18.0		18.23		125.05		16.8		1.21	
Replicate F			2.864		1.512		4.138		0.334		1.558		1.282		0.952	
Replicate Prob(F)			0.126		0.305		0.066		0.802		0.294		0.363		0.473	
Treatment F			5.302		0.745		1.424		0.981		0.798		7.524		1.812	
Treatment Prob(F)			0.040		0.563		0.325		0.462		0.539		0.019		0.245	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 3. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production. (Year 2 - 2013).****Nutrient concentration of sweet sorghum stalks.**

Description			Weight		N		P		K		S		Ca		Mg	
Part Rated			stalk		stalk		stalk		stalk		stalk		stalk		stalk	
Rating Unit			%		%		%		%		%		%		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	67.22	a	0.34	a	0.04	a	0.37	a	0.05	a	0.21	a	0.21	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	66.63	a	0.35	a	0.05	a	0.48	a	0.05	a	0.19	a	0.17	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	67.39	a	0.31	a	0.04	a	0.27	a	0.05	a	0.21	a	0.17	a
	FERT	No Fertilization														
4	CULT	No-Till	70.12	a	0.35	a	0.04	a	0.30	a	0.05	a	0.19	a	0.20	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			5.257		0.192		0.018		0.154		0.021		0.053		0.037	
Standard Deviation			3.038		0.111		0.010		0.089		0.012		0.030		0.021	
CV			4.48		32.91		23.57		25.03		24.77		15.1		11.37	
Replicate F			1.648		0.411		0.909		0.968		0.232		0.305		4.161	
Replicate Prob(F)			0.2755		0.7510		0.4904		0.4671		0.8710		0.8214		0.0650	
Treatment F			1.050		0.135		0.107		4.504		0.074		0.667		3.119	
Treatment Prob(F)			0.4366		0.9356		0.9527		0.0557		0.9719		0.6022		0.1095	

Continued.

**Table 3. Continued.****Nutrient concentration of sweet sorghum stalks.**

Description			Zn		Fe		Mn		Na		Al		B		C	
Part Rated			stalk		stalk		stalk		stalk		stalk		stalk		stalk	
Rating Unit			ppm		ppm		ppm		ppm		ppm		ppm		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	43.67	a	23.58	a	81.46	a	47.65	a	15.16	a	3.01	a	46.83	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	29.84	a	24.38	a	65.35	a	43.78	a	16.92	a	2.85	a	47.25	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	31.12	a	20.82	a	68.26	a	59.28	a	17.24	a	2.74	a	46.78	a
	FERT	No Fertilization														
4	CULT	No-Till	34.88	a	22.51	a	70.53	a	135.22	a	13.48	a	2.85	a	46.98	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			16.569		12.180		30.633		178.624		9.753		0.809		0.735	
Standard Deviation			9.576		7.039		17.704		103.234		5.637		0.468		0.425	
CV			27.45		30.84		24.8		144.41		35.9		16.33		0.91	
Replicate F			5.088		2.018		2.665		1.373		2.160		5.304		3.402	
Replicate Prob(F)			0.0436		0.2129		0.1417		0.3382		0.1938		0.0400		0.0942	
Treatment F			1.699		0.192		0.631		0.694		0.382		0.226		1.021	
Treatment Prob(F)			0.2657		0.8983		0.6214		0.5885		0.7702		0.8753		0.4469	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 4. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 - 2013).****Nutrient concentration of sweet sorghum green leaves.**

Description			Weight		N		P		K		S		Ca		Mg	
Part Rated			green		green		green		green		green		green		green	
Rating Unit			%		%		%		%		%		%		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	14.25	a	0.69	b	0.21	a	0.63	a	0.10	a	0.70	a	0.56	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	14.37	a	0.66	b	0.22	a	0.69	a	0.11	a	0.67	a	0.47	b
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	15.73	a	0.65	b	0.24	a	0.59	a	0.11	a	0.75	a	0.59	a
	FERT	No Fertilization														
4	CULT	No-Till	15.54	a	0.85	a	0.23	a	0.64	a	0.12	a	0.69	a	0.56	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			5.676		0.133		0.043		0.125		0.024		0.084		0.070	
Standard Deviation			3.281		0.077		0.025		0.072		0.014		0.048		0.040	
CV			21.91		10.79		10.89		11.33		12.3		6.87		7.42	
Replicate F			1.884		6.238		4.014		0.809		1.946		0.205		7.602	
Replicate Prob(F)			0.233		0.028		0.070		0.534		0.224		0.890		0.018	
Treatment F			0.221		5.985		1.415		1.348		1.348		2.212		6.579	
Treatment Prob(F)			0.879		0.031		0.328		0.345		0.345		0.188		0.025	

Continued.



**Table 4. Continued.****Nutrient concentration of sweet sorghum green leaves.**

Description			Zn		Fe		Mn		Na		Al		B		C	
Part Rated			green		green		green		green		green		green		green	
Rating Unit			ppm		ppm		ppm		ppm		ppm		ppm		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	32.87	a	147.67	a	155.06	a	23.87	a	88.46	a	6.54	a	42.40	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	30.40	a	137.00	a	141.00	a	27.58	a	92.69	a	6.00	a	43.25	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	29.82	a	130.25	a	152.35	a	29.41	a	70.93	a	5.93	a	42.98	a
	FERT	No Fertilization														
4	CULT	No-Till	30.60	a	102.51	a	130.78	a	40.05	a	48.14	a	7.43	a	42.85	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			12.483		83.675		79.391		22.922		86.145		1.373		1.943	
Standard Deviation			7.214		48.359		45.883		13.248		49.787		0.793		1.123	
CV			23.33		37.38		31.69		43.83		66.34		12.25		2.62	
Replicate F			5.182		3.006		5.153		3.302		1.975		5.811		0.342	
Replicate Prob(F)			0.042		0.117		0.043		0.099		0.219		0.033		0.796	
Treatment F			0.138		0.636		0.236		1.098		0.663		3.054		0.399	
Treatment Prob(F)			0.934		0.619		0.868		0.420		0.605		0.114		0.759	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 5. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 - 2013).****Nutrient concentration of sweet sorghum brown leaves.**

Description			Weight		N		P		K		S		Ca		Mg	
Part Rated			brown		brown		brown		brown		brown		brown		brown	
Rating Unit			%		%		%		%		%		%		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	8.03	A	1.69	a	0.09	a	0.12	a	0.07	a	0.74	a	0.56	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	7.34	A	1.67	a	0.08	a	0.13	a	0.06	a	0.71	a	0.51	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	6.32	A	1.68	a	0.08	a	0.10	a	0.07	a	0.77	a	0.58	a
	FERT	No Fertilization														
4	CULT	No-Till	6.55	A	1.92	a	0.09	a	0.15	a	0.08	a	0.77	a	0.52	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			2.425		0.365		0.020		0.067		0.009		0.084		0.097	
Standard Deviation			1.402		0.211		0.011		0.039		0.005		0.048		0.056	
CV			19.85		12.14		13.39		31.2		7.81		6.45		10.31	
Replicate F			3.461		1.238		5.616		2.151		2.736		7.559		3.606	
Replicate Prob(F)			0.0914		0.3755		0.0355		0.1950		0.1359		0.0184		0.0849	
Treatment F			1.254		1.276		1.229		0.879		4.382		1.387		1.491	
Treatment Prob(F)			0.3707		0.3643		0.3780		0.5028		0.0588		0.3345		0.3092	

Continued.

**Table 5. Continued.****Nutrient concentration of sweet sorghum brown leaves.**

Description			Zn		Fe		Mn		Na		Al		B		C	
Part Rated			brown		brown		brown		brown		brown		brown		brown	
Rating Unit			ppm		ppm		ppm		ppm		ppm		ppm		%	
Trt	Treatment															
No.	Type	Name														
1	CULT	Conventional Tillage	36.33	a	625.44	a	203.44	a	27.75	a	800.52	a	6.91	a	45.05	a
	FERT	No Fertilization														
2	CULT	Conventional Tillage	32.39	a	471.82	a	160.15	a	42.48	a	546.04	a	6.63	a	45.48	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
3	CULT	No-Till	34.05	a	659.47	a	232.87	a	34.14	a	682.19	a	7.22	a	45.35	a
	FERT	No Fertilization														
4	CULT	No-Till	35.75	a	682.96	a	191.70	a	41.68	a	908.20	a	6.95	a	46.05	a
	FERT	Maintenance Fertilization														
	FERT	40 lb P <sub>2</sub> O <sub>5</sub>														
	FERT	60 lb K <sub>2</sub> O														
LSD (P=.05)			14.075		618.740		54.667		21.581		676.377		1.784		1.559	
Standard Deviation			8.134		357.593		31.594		12.473		390.904		1.031		0.901	
CV			23.49		58.63		16.03		34.16		53.24		14.88		1.98	
Replicate F			16.779		0.776		18.038		0.102		1.909		1.297		1.529	
Replicate Prob(F)			0.003		0.549		0.002		0.956		0.229		0.359		0.301	
Treatment F			0.191		0.283		3.625		1.241		0.635		0.216		0.864	
Treatment Prob(F)			0.899		0.837		0.084		0.375		0.619		0.882		0.509	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Table 6. Mean nutrient content of seed head, stalk, and leaves pooled over treatments.**

	N	P	K	S	Ca	Mg	Zn	Fe	Mn	Na	Al	B	C
	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	%
Seed Head	1.87	0.33	0.49	0.12	0.08	0.21	34.59	120.19	53.60	21.30	92.98	4.51	46.69
Stalk	0.34	0.04	0.35	0.05	0.20	0.19	34.88	22.82	71.40	71.48	15.70	2.86	46.96
Leaves (Green)	0.71	0.23	0.64	0.11	0.70	0.54	30.92	129.36	144.80	30.23	75.05	6.48	42.87
Leaves (Brown)	1.74	0.08	0.12	0.07	0.75	0.54	34.63	609.92	197.04	36.51	734.24	6.93	45.48

**Table 7. Evaluation of tillage on production agronomics, nutrient uptake, and soil sustainability of sweet sorghum production (Year 2 - 2013).****Nutrient concentration of soil at different depths.**

Description		Ca		Cu		Mg		pH (1:1 Water)		P		K		Na		S		Zn		OM	
Part Rated		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -	
Rating Type		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in		0-3 in	
Rating Unit		ppm		ppm		ppm				ppm		ppm		ppm		ppm		ppm		%	
Crop Stage Majority		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har	
Trt	Treatment																				
No.	Name																				
1	Conventional Tillage No Fertilization	1276.21	a	1.73	a	211.68	ab	5.20	a	57.28	a	66.94	a	14.52	a	12.92	a	6.18	a	2.34	ab
2	Conventional Tillage Maintenance Fertilization 40 lb P <sub>2</sub> O <sub>5</sub> 60 lb K <sub>2</sub> O	1374.01	a	1.72	a	200.72	B	5.45	a	65.39	a	79.54	a	14.25	a	12.59	a	6.22	a	2.05	b
3	No-Till No Fertilization	1301.68	a	1.81	a	221.79	A	5.21	a	55.33	a	65.13	a	16.47	a	13.47	a	5.70	a	2.28	ab
4	No-Till Maintenance Fertilization 40 lb P <sub>2</sub> O <sub>5</sub> 60 lb K <sub>2</sub> O	1435.76	a	1.71	a	225.90	A	5.30	a	63.96	a	76.67	a	15.69	a	12.96	a	5.09	a	2.48	a
LSD (P=.05)		380.076		0.190		16.713		0.227		7.616		12.368		3.032		1.948		1.288		0.249	
Standard Deviation		219.660		0.110		9.659		0.131		4.401		7.148		1.752		1.126		0.744		0.144	
CV		16.310		6.310		4.490		2.480		7.280		9.920		11.500		8.670		12.840		6.300	
Bartlett's X2		0.466		0.884		1.103		0.908		1.154		4.696		2.729		5.506		4.288		1.063	
P(Bartlett's X2)		0.926		0.829		0.776		0.824		0.764		0.195		0.435		0.138		0.232		0.786	
Replicate F		9.077		3.930		20.385		35.460		11.576		0.382		1.191		0.367		0.852		9.517	
Replicate Prob(F)		0.012		0.073		0.002		0.000		0.007		0.770		0.390		0.780		0.514		0.011	
Treatment F		0.433		0.641		5.428		3.107		5.023		3.955		1.397		0.412		2.011		6.130	
Treatment Prob(F)		0.737		0.616		0.038		0.110		0.045		0.072		0.332		0.751		0.214		0.029	

Continued.

**Table 7. Continued.**

Description		Ca		Cu		Mg		pH (1:1 Water)		P		K		Na		S		Zn		OM	
Part Rated		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -	
Rating Type		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in		3-6 in	
Rating Unit		ppm		ppm		ppm				ppm		ppm		ppm		ppm		ppm		%	
Crop Stage Majority		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har	
Trt	Treatment																				
No.	Name																				
1	Conventional Tillage No Fertilization	1342.55	a	1.66	a	197.87	a	5.49	a	42.00	a	40.39	a	19.03	a	11.41	b	3.54	a	1.76	a
2	Conventional Tillage Maintenance Fertilization 40 lb P <sub>2</sub> O <sub>5</sub> 60 lb K <sub>2</sub> O	1449.87	a	1.64	a	189.31	a	5.76	a	42.22	a	40.85	a	19.22	a	11.57	b	3.62	a	1.64	a
3	No-Till No Fertilization	1453.69	a	1.82	a	210.71	a	5.53	a	42.63	a	42.08	a	19.95	a	11.45	b	3.28	a	1.55	a
4	No-Till Maintenance Fertilization 40 lb P <sub>2</sub> O <sub>5</sub> 60 lb K <sub>2</sub> O	1542.59	a	1.69	a	211.63	a	5.50	a	42.93	a	43.43	a	21.52	a	12.26	a	3.58	a	1.81	a
LSD (P=.05)		412.306		0.163		20.306		0.628		10.877		4.045		3.196		0.545		0.791		0.210	
Standard Deviation		238.287		0.094		11.736		0.363		6.286		2.337		1.847		0.315		0.457		0.122	
CV		16.470		5.540		5.800		6.520		14.810		5.610		9.270		2.700		13.030		7.180	
Bartlett's X2		0.626		2.931		0.910		5.507		1.909		0.369		0.565		1.361		0.953		1.571	
P(Bartlett's X2)		0.891		0.402		0.823		0.138		0.591		0.947		0.904		0.715		0.813		0.666	
Replicate F		12.305		9.275		14.052		10.202		1.323		18.281		7.597		8.071		3.011		3.764	
Replicate Prob(F)		0.006		0.011		0.004		0.009		0.351		0.002		0.018		0.016		0.116		0.079	
Treatment F		0.472		2.910		3.353		0.500		0.018		1.360		1.510		6.453		0.450		3.721	
Treatment Prob(F)		0.713		0.123		0.097		0.696		0.997		0.342		0.305		0.026		0.727		0.080	

Continued.

**Table 7. Continued.**

Description		Ca		Cu		Mg		pH (1:1 Water)		P		K		Na		S		Zn		OM		
Part Rated		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		soil -		
Rating Type		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		6-12 in		
Rating Unit		ppm		ppm		Ppm				ppm		ppm		ppm		ppm		ppm		%		
Crop Stage Majority		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		Post Har		
Trt	Treatment																					
No.	Name																					
1	Conventional Tillage	1575.17	a	1.27	a	264.39	A		5.78	a	11.43	b	41.05	a	29.61	a	11.79	a	0.59	a	1.18	a
	No Fertilization																					
2	Conventional Tillage	1587.21	a	1.29	a	253.56	A		6.04	a	13.99	b	45.08	a	26.75	a	13.68	a	1.21	a	1.04	a
	Maintenance Fertilization																					
	40 lb P <sub>2</sub> O <sub>5</sub>																					
	60 lb K <sub>2</sub> O																					
3	No-Till	1544.44	a	1.35	a	263.03	A		5.83	a	13.04	b	40.75	a	28.36	a	12.61	a	0.71	a	1.14	a
	No Fertilization																					
4	No-Till	1688.12	a	1.46	a	238.81	A		5.87	a	24.11	a	40.72	a	28.19	a	13.97	a	1.29	a	1.23	a
	Maintenance Fertilization																					
	40 lb P <sub>2</sub> O <sub>5</sub>																					
	60 lb K <sub>2</sub> O																					
LSD (P=.05)		352.254		0.193		31.203			0.451		7.609		11.071		2.726		2.770		0.740		0.161	
Standard Deviation		203.581		0.112		18.033			0.261		4.398		6.399		1.575		1.601		0.427		0.093	
CV		12.730		8.320		7.070			4.440		28.110		15.270		5.580		12.300		44.990		8.110	
Bartlett's X2		7.759		1.362		1.906			3.096		8.381		6.268		1.467		8.992		10.911		2.622	
P(Bartlett's X2)		0.051		0.714		0.592			0.377		0.039*		0.099		0.690		0.029*		0.012*		0.454	
Replicate F		4.830		4.082		0.857			16.166		5.234		0.647		5.715		1.881		2.102		2.098	
Replicate Prob(F)		0.049		0.068		0.512			0.003		0.041		0.613		0.034		0.234		0.201		0.202	
Treatment F		0.374		2.292		1.709			0.760		6.823		0.442		2.219		1.575		2.690		2.918	
Treatment Prob(F)		0.775		0.178		0.264			0.556		0.023		0.732		0.187		0.291		0.140		0.122	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

<b>Experiment number</b> .....	Soybean 2013 DOP1
<b>Site and design</b> .....	
<b>Location/Cooperator</b> .....	Rice Research Station (South Unit)
<b>Tillage type</b> .....	Conventional
<b>Experimental design</b> .....	Randomized complete block
<b>Number of reps</b> .....	4
<b>Plot size</b> .....	5 ft x 20 ft
<b>Row width/rows per plot</b> .....	15 in / 4
<b>Soil type</b> .....	
<b>% organic matter</b> .....	1.42
<b>pH</b> .....	5.08
<b>Extractable nutrients ppm</b> .....	Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3
<b>Crop/Variety</b> .....	
<b>Planting method/date</b> .....	Drill-seeded / March 22
<b>Seeding rate/depth</b> .....	130,000 seeds/A / .5 in
<b>Emergence date</b> .....	April 1
<b>Harvest date</b> .....	September 10
<b>Seed treatment/cwt</b> .....	
NA	
<b>Fertilization</b> .....	
230 lb/A 0-24-24-2.8, May 8	
<b>Water management</b> .....	
<b>Flush</b> .....	NA
<b>Flood</b> .....	NA
<b>Drain</b> .....	NA
<b>Pest management</b> .....	
<b>Herbicides</b> .....	1.67 pt/A Charger Max, March 22 1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23 1.3 pt/A Charger Max, May 9
<b>Insecticides</b> .....	2 oz/A Karate, July 2 2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant
<b>Fungicides</b> .....	None



## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

**Experiment number** .....: Soybean 2013 DOP2

**Site and design** .....:

**Location/Cooperator** .....: Rice Research Station (South Unit)

**Tillage type**.....: Spring Stale

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 5 ft x 20 ft

**Row width/rows per plot**.....: 15 in / 4

**Soil type** .....: Crowley silt loam

**% organic matter**.....: 1.42

**pH**.....: 5.08

**Extractable nutrients ppm** .....: Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3

**Crop/Variety** .....: Soybeans / See data sheet

**Planting method/date** .....: Drill-seeded / April 9

**Seeding rate/depth**.....: 130,000 seeds/A / 1 in

**Emergence date**.....: April 18

**Harvest date** .....: September 10

**Seed treatment/cwt** .....: NA

**Fertilization** .....: 230 lb/A 0-24-24-2.8, May 8

**Water management** .....:

**Flush** .....: NA

**Flood** .....: NA

**Drain**.....: NA

**Pest management** .....:

**Herbicides**.....: 1.67 pt/A Charger Max, March 22\*

1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23

1.3 pt/A Charger Max, May 9

**Insecticides** .....: 2 oz/A Karate, July 2

2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant

**Fungicides**.....: None

\*Note - Early Herbicide applications were applied across fields for weed control in spring stale seedbed.

## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

**Experiment number** .....: Soybean 2013 DOP3

**Site and design** .....:

**Location/Cooperator** .....: Rice Research Station (South Unit)

**Tillage type**.....: Spring Stale

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 5 ft x 20 ft

**Row width/rows per plot**.....: 15 in / 4

**Soil type** .....: Crowley silt loam

**% organic matter**.....: 1.42

**pH**.....: 5.08

**Extractable nutrients ppm** .....: Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3

**Crop/Variety** .....: Soybeans / See data sheet

**Planting method/date** .....: Drill-seeded / April 23

**Seeding rate/depth**.....: 130,000 seeds/A / 1 in

**Emergence date**.....: May 2

**Harvest date** .....: September 10

**Seed treatment/cwt** .....: NA

**Fertilization** .....: 230 lb/A 0-24-24-2.8, May 8

**Water management** .....:

**Flush** .....: NA

**Flood** .....: NA

**Drain**.....: NA

**Pest management** .....:

**Herbicides**.....: 1.67 pt/A Charger Max, March 22\*

1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23

1.3 pt/A Charger Max, May 9

**Insecticides** .....: 2 oz/A Karate, July 2

2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant

**Fungicides**.....: None

\*Note - Early Herbicide applications were applied across fields for weed control in spring stale seedbed.

## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

**Experiment number** .....: Soybean 2013 DOP4

**Site and design** .....:

**Location/Cooperator** .....: Rice Research Station (South Unit)

**Tillage type**.....: Spring Stale

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 5 ft x 20 ft

**Row width/rows per plot**.....: 15 in / 4

**Soil type** .....: Crowley silt loam

**% organic matter**.....: 1.42

**pH**.....: 5.08

**Extractable nutrients ppm** .....: Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3

**Crop/Variety** .....: Soybeans / See data sheet

**Planting method/date** .....: Drill-seeded / May 9

**Seeding rate/depth**.....: 130,000 seeds/A / 1 in

**Emergence date**.....: May 22

**Harvest date** .....: September 26

**Seed treatment/cwt** .....: NA

**Fertilization** .....: 230 lb/A 0-24-24-2.8, June 12

**Water management** .....:

**Flush** .....: NA

**Flood** .....: NA

**Drain**.....: NA

**Pest management** .....:

**Herbicides**.....: 1.67 pt/A Charger Max, March 22\*

1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23\*

1.3 pt/A Charger Max, May 9

**Insecticides** .....: 2 oz/A Karate, July 2

2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant

**Fungicides**.....: None

\*Note - Early Herbicide applications were applied across fields for weed control in spring stale seedbed.

## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

**Experiment number** ..... : Soybean 2013 DOP5

**Site and design** ..... :

**Location/Cooperator** ..... : Rice Research Station (South Unit)

**Tillage type**..... : Spring Stale

**Experimental design**..... : Randomized complete block

**Number of reps** ..... : 4

**Plot size**..... : 5 ft x 20 ft

**Row width/rows per plot**..... : 15 in / 4

**Soil type** ..... : Crowley silt loam

**% organic matter**..... : 1.42

**pH**..... : 5.08

**Extractable nutrients ppm** ..... : Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3

**Crop/Variety** ..... : Soybeans / See data sheet

**Planting method/date** ..... : Drill-seeded / May 23

**Seeding rate/depth**..... : 130,000 seeds/A / .75 in

**Emergence date**..... : May 30

**Harvest date** ..... : MG4's-September 26, MG5's-October 7

**Seed treatment/cwt** ..... : NA

**Fertilization** ..... : 230 lb/A 0-24-24-2.8, June 12

**Water management** ..... :

**Flush** ..... : NA

**Flood** ..... : NA

**Drain**..... : NA

**Pest management** ..... :

**Herbicides**..... : 1.67 pt/A Charger Max, March 22\*

1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23\*

1.3 pt/A Charger Max, May 9

**Insecticides** ..... : 2 oz/A Karate, July 2

2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant

**Fungicides**..... : None

\*Note - Early Herbicide applications were applied across fields for weed control in spring stale seedbed.

## Evaluation of Date of Planting on Non-Irrigated Soybeans in Southwest Louisiana

**Experiment number** .....: Soybean 2013 DOP6

**Site and design** .....:

**Location/Cooperator** .....: Rice Research Station (South Unit)

**Tillage type**.....: Spring Stale

**Experimental design**.....: Randomized complete block

**Number of reps** .....: 4

**Plot size**.....: 5 ft x 20 ft

**Row width/rows per plot**.....: 15 in / 4

**Soil type** .....: Crowley silt loam

**% organic matter**.....: 1.42

**pH**.....: 5.08

**Extractable nutrients ppm** .....: Ca-864; Cu-1.4; Mg-173; P-31; K-95; Na-24; S-13.8; Zn-6.3

**Crop/Variety** .....: Soybeans / See data sheet

**Planting method/date** .....: Drill-seeded / June 12

**Seeding rate/depth**.....: 130,000 seeds/A / .75 in

**Emergence date**.....: June 20

**Harvest date** .....: October 7

**Seed treatment/cwt** .....: NA

**Fertilization** .....: 230 lb/A 0-24-24-2.8, June 12

**Water management** .....:

**Flush** .....: NA

**Flood** .....: NA

**Drain**.....: NA

**Pest management** .....:

**Herbicides**.....: 1.67 pt/A Charger Max, March 22\*

1.67 pt/A Charger Max + 1 qt/A Glyphosate, April 23\*

1.3 pt/A Charger Max, May 9

**Insecticides** .....: 2 oz/A Karate, July 2

2 oz/A Belt + 2.8 oz/A Leverage 360 + .25% Surfactant

**Fungicides**.....: None

\*Note - Early Herbicide applications were applied across fields for weed control in spring stale seedbed.

**Table 8. Evaluation of date of planting on non-irrigated soybeans in Southwest Louisiana. Main Effects.**

Description		Plt Height	Moisture	Test Wt.	Yield
Rating Unit		in	%	lb/bu	bu/A
<b>Date of Planting</b>					
1	March 22	15.0	16.1	53.3	16.1
2	April 9	18.5	12.5	55.3	28.2
3	April 23	17.7	12.1	55.3	32.1
4	May 9	17.2	11.5	52.8	14.7
5	May 23	23.0	14.5	51.2	43.8
6	June 12	20.3	15.8	48.6	28.4
	<i>P</i>	0.0001	0.0001	0.0001	0.0001
	LSD	1.0	1.2	2.1	4.0
<b>Variety</b>					
1	DG 4765 RR2/STS	21.3	14.6	53.1	29.7
2	S49-F8	19.5	13.5	53.4	28.9
3	Pioneer 94Y80	20.6	13.6	53.5	30.9
4	REV 49R94	19.9	13.2	53.5	25.1
5	S51-1-19	14.7	12.7	50.9	19.2
6	REV 56R53	18.5	14.5	52.5	33.1
7	AG 5233	18.9	14.1	52.7	22.5
8	DG 5575 RR2	15.6	13.9	52.6	28.3
	<i>P</i>	0.0001	0.0003	0.4652	0.0001
	LSD	1.1	0.7	2.5	3.5

**Table 9. Evaluation of date of planting on non-irrigated soybeans in Southwest Louisiana.**  
**Date of planting by variety interaction.**

Description Rating Unit	Plt Height in	Moisture %	Test Wt. lb/bu	Yield bu/A
<b>Date of Planting x Variety</b>				
1 DOP-1	16.8	20.4	51.9	12.3
1 DG 4765 RR2/STS				
2 DOP-2	20.5	12.9	55.2	30.9
1 DG 4765 RR2/STS				
3 DOP-3	20.0	11.6	55.6	33.9
1 DG 4765 RR2/STS				
4 DOP-4	21.5	12.8	54.0	19.0
1 DG 4765 RR2/STS				
5 DOP-5	25.8	13.8	53.5	45.7
1 DG 4765 RR2/STS				
6 DOP-6	23.0	15.9	48.5	36.6
1 DG 4765 RR2/STS				
1 DOP-1	17.0	15.4	52.8	11.6
2 S49-F8				
2 DOP-2	18.3	12.2	55.6	27.8
2 S49-F8				
3 DOP-3	17.3	11.9	55.4	30.5
2 S49-F8				
4 DOP-4	19.3	12.7	54.1	21.7
2 S49-F8				
5 DOP-5	25.0	13.1	53.9	49.4
2 S49-F8				
6 DOP-6	20.0	15.5	48.7	32.2
2 S49-F8				
1 DOP-1	16.0	15.4	53.5	12.7
3 Pioneer 94Y80				
2 DOP-2	21.8	12.2	55.6	40.2
3 Pioneer 94Y80				
3 DOP-3	19.3	11.9	55.5	34.6
3 Pioneer 94Y80				
4 DOP-4	19.5	12.4	54.1	18.1
3 Pioneer 94Y80				
5 DOP-5	25.3	13.6	53.6	47.0
3 Pioneer 94Y80				
6 DOP-6	21.8	15.9	48.6	32.7
3 Pioneer 94Y80				
1 DOP-1	16.3	13.2	53.8	14.3
4 REV 49R94				
2 DOP-2	18.0	12.4	55.3	23.3
4 REV 49R94				
3 DOP-3	18.8	11.9	55.3	31.7
4 REV 49R94				
4 DOP-4	20.5	12.4	54.1	16.8
4 REV 49R94				
5 DOP-5	25.0	13.3	53.7	41.0
4 REV 49R94				
6 DOP-6	20.8	16.0	48.5	23.7
4 REV 49R94				

Continued.

**Table 9. Continued.**

Description Rating Unit		Plt Height in	Moisture %	Test Wt. lb/bu	Yield bu/A
<b>Date of Planting x Variety</b>					
1	DOP-1	11.0	15.8	53.7	20.9
5	S51-1-19				
2	DOP-2	16.3	12.4	55.3	16.2
5	S51-1-19				
3	DOP-3	13.8	11.6	55.5	21.6
5	S51-1-19				
4	DOP-4	11.5	5.4	43.3	3.7
5	S51-1-19				
5	DOP-5	18.0	15.4	48.8	29.1
5	S51-1-19				
6	DOP-6	17.8	15.6	48.7	23.9
5	S51-1-19				
1	DOP-1	14.8	17.4	53.4	21.6
6	REV 56R53				
2	DOP-2	20.3	12.7	55.2	42.0
6	REV 56R53				
3	DOP-3	18.0	12.6	55.1	40.7
6	REV 56R53				
4	DOP-4	14.5	12.6	54.0	15.0
6	REV 56R53				
5	DOP-5	21.8	15.8	48.8	50.8
6	REV 56R53				
6	DOP-6	21.5	16.2	48.4	28.4
6	REV 56R53				
1	DOP-1	16.8	17.4	52.9	11.8
7	AG 5233				
2	DOP-2	16.8	11.8	55.7	19.6
7	AG 5233				
3	DOP-3	19.3	12.8	55.2	28.0
7	AG 5233				
4	DOP-4	18.3	12.3	54.3	14.2
7	AG 5233				
5	DOP-5	22.5	14.9	49.1	37.6
7	AG 5233				
6	DOP-6	20.0	15.6	48.8	23.8
7	AG 5233				
1	DOP-1	11.8	13.9	54.4	23.5
8	DG 5575 RR2				
2	DOP-2	16.0	13.4	54.8	25.6
8	DG 5575 RR2				
3	DOP-3	15.5	12.8	54.9	35.7
8	DG 5575 RR2				
4	DOP-4	12.5	11.1	54.6	9.4
8	DG 5575 RR2				
5	DOP-5	20.5	16.1	48.6	49.7
8	DG 5575 RR2				
6	DOP-6	17.5	16.0	48.5	26.0
8	DG 5575 RR2				
	<i>P</i>	0.0001	0.5983	0.7696	0.0001
	LSD	2.1	1.5	5.9	7.2



## **FOUNDATION SEED RICE PROGRAM**

Lawrence M. White III

### **INTRODUCTION**

Foundation seed rice has been produced by the LSU AgCenter's Rice Research Station for distribution to Louisiana farmers since 1949. The Rice Research Station's seed rice program was instituted in response to the critical shortage of pure planting stocks that existed during and after World War II. Since its inception, the program has made available to Louisiana growers more than 170,760 cwt. of pedigreed stock of 45 rice varieties.

Concurrent with the distribution of pure seed by the Rice Research Station, an industry was developed in Louisiana composed of independent seed dealers for farmers to buy registered and certified classes of pedigreed rice.

Foundation seed rice, the planting stock from which registered and certified seed is produced, is the farmer's link with the work of the plant breeder. It is the product of successive generations of selection and testing to establish its value as crop seed and eventually as a commercial commodity. For this reason, foundation seed and the basic stocks from which it is produced must be grown and conditioned in a manner that will ensure that viability is maintained and that it will be genetically pure and free from mechanical mixtures or contamination by noxious weeds.

Through the Rice Research Station's seed program, Louisiana farmers may obtain seed rice of improved varieties developed through the Rice Research Station's breeding program and established commercial varieties originating either at Crowley or at research centers in neighboring states.

To fulfill the objectives of the seed program, the Rice Research Station uses the personnel, land, machinery, and other facilities needed to plant, harvest, condition, and store its annual seed rice crop. The production of breeder seed, planting stock for the foundation fields, and the maintenance of purity in commercial rice varieties are functions of the seed program. Breeder seed is sometimes grown within fields of foundation rice or in a special nursery set aside for propagating the Rice Research Station's seed stocks. The nursery also serves as a site for evaluating, purifying, and increasing selections from the Rice Research Station's breeding program that show promise as new varieties.

The distribution of pedigreed seed rice produced by the Rice Research Station is done according to a formula adopted by the Louisiana Seed Rice Growers Association. For each rice-producing parish, the amount of seed allotted is determined by the percentage of the state's total rice acreage grown in that parish during the previous crop year.

Personnel with the Louisiana Cooperative Extension Service, in cooperation with parish committees of the Seed Rice Growers Association, assists in the allocation of foundation seed rice. It is at the parish committee level that the allocation of seed to individual growers is decided. The county agents receive applications for seed rice from growers and handle information and publicity for the pure seed program.

In this state, the official seed-certifying agency for all crops is the Louisiana Department of Agriculture and Forestry. The rules and regulations pertaining to the certification of agricultural seeds are part of the Louisiana Seed Law. They are formulated by the Louisiana Seed Commission and enforced by the Agronomic Programs Division of the Louisiana Department of Agriculture and Forestry. Personnel of the Agronomic Programs Division, operating from district offices, conduct field inspections of growing rice and sampling of bagged rice for laboratory analyses, which consist of purity determinations and germination tests.

### **PRODUCTION PRACTICES**

Each year, the Rice Research Station devotes approximately 80 acres of land to the production of foundation seed rice. To eliminate noxious weeds, especially red rice, that can disqualify rice from certification, the fields are fallowed for a 2-year period preceding planting. This also enables the fields to meet the crop history requirements specified in the seed rice regulations.

Seedbed preparation of foundation fields are performed in the fall. Burndown herbicides are applied prior to seeding. The foundation fields are planted into a stale seedbed by means of a 24-runner minimum tillage drill. The

breeder stock is planted at rates that may vary from 10 to 100 lb/A. The rice receives a pre-flood application of urea in which the rate of N may vary from 45 to 90 lb/A, as well as basic fertilizer applications based on soil test recommendations. A midseason application of N in rates from 21 to 55 lb/A is also applied.

Seedling grasses and weeds are controlled by means of commercially available herbicides applied by airplane or ground rig. Similarly, aerial applications of insecticides are used to protect the fields from outbreaks of harmful insects.

Roguing of the rice fields for the removal of off-types, varietal mixtures, and noxious weeds begins at the onset of heading and continues until the rice is harvested. During this interval, the headed rice is inspected by personnel of the Agronomic Programs Division to determine whether it meets minimum field standards of the certifying agency.

The rice is harvested with a conventional combine and dried in the Rice Research Station's eight 21-foot diameter grain bins, equipped with vented drying floors and centrifugal fans with temperature-controlled heaters. The rice is dried to a moisture level of approximately 12%. During the storage period between drying and cleaning, the rice is treated with an insecticide to protect it from stored-grain insects.

Cleaning of foundation and breeder seed usually starts in late October and continues until late December. The rice first moves through an air-and-screen cleaner that removes chaff, straw, and other foreign material and grades the grain according to width and thickness.

It then flows through three length-grading machines that consist of rotating, indented metal cylinders. The first two remove small grains and broken or dehulled kernels of rice. The third one removes stemmy rice, grains that have very long awns that are attached to portions of the panicle. In the next phase of cleaning, the rice moves through a machine that performs precision grading of the grain by means of rotating perforated cylinders. This machine is designed to separate medium-grain and/or red rice from long-grain rice. It is also capable of removing shriveled and slender kernels from medium-grain rice.

In the final phase of cleaning, the rice moves through a machine that aspirates the grain, removing any chaff, straw, and other foreign material from the conditioned product.

From the cleaning machines, foundation and breeder seed rice are bagged, assigned lot numbers, and placed in storage in the Rice Research Station's seed rice warehouse where they remain until they are distributed to Louisiana farmers.

The field and laboratory purity standards for foundation seed rice are very strict with regard to varietal mixtures and noxious weeds. In all phases of production, therefore, great care must be exercised to prevent these impurities from contaminating the seed stocks. It is routine procedure at the Rice Research Station to partially disassemble all planting and harvesting equipment and to clean it thoroughly with water and/or compressed air before using it in the field. The dryer and cleaning plant, including all elevators and other conveying equipment, are also subjected to meticulous cleaning and inspection before and after having been used in stubble fields. Therefore, tractors, plows, harrows, and land levelers are carefully washed before they enter land that is in a fallow cycle. These measures, together with the inspection and roguing, which are done during the growing season, help to ensure that foundation seed is genetically pure and free of mechanical mixtures and noxious weed seeds.

## **2013 ACTIVITIES**

Of the 943 cwt. of foundation seed rice sold in 2013, the varieties and quantities were as follows: Mermentau, 338 cwt.; Cheniere, 198 cwt.; Jazzman-2, 154 cwt.; Jupiter, 124 cwt.; Della-2, 64 cwt.; Caffey, 55 cwt.; and Toro-2, 10 cwt.

The Rice Research Station's foundation seed crop in 2013 consisted of 8.3 acres of Mermentau, 4.7 acres of Cheniere, and 1 acre of Pirogue.

Headrows of Mermentau, Catahoula, Cheniere, and Pirogue were grown for replenishment of breeder seed stock.

# AQUACULTURE RESEARCH

## ANNUAL SUMMARY OF ENVIRONMENTAL CONDITIONS AND CRAWFISH PRODUCTION

W.R. McClain and J.J. Sonnier

Table 1 contains the average weekly data for environmental conditions and crawfish catch, 2012-2013 season, crawfish research project, Rice Research Station, Crowley, LA. The catch consisted exclusively of red swamp crawfish (*Procambarus clarkii*). The production summary is composed of cumulative yield from both experimental units (i.e., traps) and non-experimental trap lifts.

**Pond History:** Pond was fallow for a period of 10 months following the previous crawfish season of 2011 - 2012.

**Pond Area:** 14.0 A

**Soil Type:** Midland silty clay loam

**Water Source:** Ground water

**Forage Crops:** Rice variety 'Caffey' was drill-seeded on April 13, 2012, at 65 lb/A. Grain was harvested by a rice combine on September 4, 2012, and a ratoon forage crop was managed for crawfish production.

**Fertilizer:** Main Crop: 8-24-24 at 250 lb/A post plant application, 46-0-0 at 200 lb/A (topdress) on June 5; Ratoon Crop: No additional fertilization.

**Herbicide:** Rice Beaux at 3 qts/A + Permit Plus 1 oz/A as tank mix on May 7; Rice star HT 30 oz/A + Soysurf Extra 1 qt/A as tank mix on May 22.

**Insecticide:** None

**Fungicide:** None

**Crawfish Stocking Rate:** 29.3 lb/A from June 11-12, 2012

**Permanent Flood Date:** October 1, 2012

**Feed:** None

**Trap Type and Density:** 3-funnel pyramid trap: (0.75-inch square mesh); Density = 14 traps/A.

**Bait Used:** Manufactured bait: *Southern Pride* (Purina Mills, Inc., Shreveport, LA) or fish baits that included gizzard shad or menhaden (pogy).

**Crawfish Harvest:** January 16 - June 19, 2013 (1,120 total trap-sets/A)

**Fields Drained:** June 20, 2013

**Table 1.** Annual environmental conditions and crawfish production (averaged or totaled weekly). Rice Research Station, Crowley, LA 2012-2013.

Weeks (2012 - 2013)	<u>Soil Temp.</u> <sup>1</sup>		<u>Air Temp.</u>		<u>Water Temp.</u>		Total Rainfall	Crawfish Harvest	Total Trapsets
	Min.	Max.	Min.	Max.	Min.	Max.			
	-----deg.F-----						(inches)	(lb/A)	(#/A)
June 1-2	79.5	90.0	66.0	86.5					
June 3-9	80.1	91.7	70.7	91.0			4.10		
June 10-16	77.9	86.1	71.6	86.0			1.81		
June 17-23	79.1	88.7	71.6	87.3			.12		
June 24-30	86.1	98.4	73.7	95.6					
July 1-7	87.0	100.1	72.9	94.0					
July 8-14	78.6	83.1	72.0	81.9			4.20		
July 15-21	79.3	90.4	73.3	90.6			.28		
July 22-28	79.4	87.7	74.3	89.0			3.58		
July 29-Aug 4	82.1	91.4	76.4	93.0			.46		
Aug 5-11	82.7	91.8	74.9	91.1			.99		
Aug 12-18	82.7	90.6	75.1	91.9			.40		
Aug 19-25	78.1	85.9	71.3	86.1			1.40		
Aug 26-Sept 1	78.0	84.6	73.7	87.3			3.78		
Sept 2-8	79.7	88.6	75.1	91.4			.64		
Sept 9-15	77.0	88.0	65.4	86.0			.86		
Sept 16-22	74.1	84.6	64.3	85.0			.98		
Sept 23-29	77.4	85.7	68.9	88.6					
Sept 30-Oct 6	72.4	79.9	63.0	81.7			2.50		
Oct 7-13	70.9	78.0	56.0	78.3	72.7	81.8			
Oct 14-20	71.3	78.7	59.3	82.1	66.7	78.0	.69		
Oct 21-27	69.6	79.9	58.7	83.4	66.0	77.3			
Oct 28-Nov 3	62.6	72.4	45.9	72.4	58.1	68.1			
Nov 4-10	63.7	72.6	50.3	74.9	61.8	69.1	1.50		
Nov 11-17	56.9	65.1	43.7	66.9	53.8	61.1	.74		
Nov 18-24	56.7	66.4	43.7	72.9	54.3	63.2			
Nov 25-Dec 1	54.4	63.7	42.0	65.9	53.5	61.5	.50		
Dec 2-8	61.7	67.4	56.4	73.0	62.2	66.7	1.15		
Dec 9-15	53.3	61.1	44.1	64.7	52.6	59.4			
Dec 16-22	54.4	62.9	47.6	68.6	54.5	60.6	2.35		
Dec 23-29	51.1	58.9	41.0	63.9	50.2	56.4	2.01		
Dec 30-Jan 5	47.6	53.6	38.3	54.4	46.1	50.3	1.86		

Continued.

**Table 1.** Continued.

Weeks (2013)	<u>Soil Temp.</u> <sup>1</sup>		<u>Air Temp.</u>		<u>Water Temp.</u>		Total Rainfall (inches)	Crawfish Harvest (lb/A)	Total Trapsets (#/A)
	Min.	Max.	Min.	Max.	Min.	Max.			
	-----deg.F-----								
Jan 6-12	52.7	57.7	50.6	61.0	54.3	58.1	10.45		
Jan 13-19	48.9	55.6	40.9	54.4	45.3	51.7	2.55	2.1	14
Jan 20-26	50.0	59.1	45.1	67.7	53.8	61.5			
Jan 27-Feb 2	56.9	64.3	50.0	68.4	57.3	65.8	.22		
Feb 3-9	57.0	64.1	51.4	67.9	58.4	65.0	1.38	4.6	14
Feb 10-16	55.6	62.7	46.6	65.0	55.7	63.4	1.42	13.9	42
Feb 17-23	52.1	60.0	45.6	64.0	54.7	63.6	.26	11.5	42
Feb 24-Mar 2	52.3	60.1	41.3	62.7	53.0	63.7	2.05	23.9	70
Mar 3-9	50.3	60.9	39.4	63.3	54.1	65.3		19.4	56
Mar 10-16	53.6	63.3	44.1	67.9	57.3	69.9	1.20	15.1	56
Mar 17-23	60.7	70.3	53.9	74.9	63.3	74.1		27.2	56
Mar 24-30	56.3	68.4	43.3	65.9	56.0	73.9	.30	27.4	56
Mar 31-Apr 6	59.6	68.6	51.1	69.7	60.2	74.2	2.25	40.5	56
Apr 7-13	62.4	71.1	56.4	74.1	66.0	80.5	.86	29.6	56
Apr 14-20	65.6	75.1	59.6	77.3	67.4	80.1	3.62	26.0	56
Apr 21-27	63.4	75.4	55.1	73.4	65.9	82.0	.84	21.9	56
Apr 28-May 4	66.9	75.6	59.1	75.9	68.1	79.7	1.06	24.4	56
May 5-11	65.1	75.4	56.7	74.9	67.7	81.1	3.00	20.4	56
May 12-18	68.7	79.3	63.6	80.4	71.8	87.2		22.3	70
May 19-25	77.4	86.9	71.7	86.7	77.2	91.8	.30	25.6	70
May 26-June 1	79.4	89.4	72.3	86.9	78.1	92.4		17.7	56
June 2-8	80.1	91.3	72.0	88.4	79.9	94.9	.86	25.7	70
June 9-15	80.0	91.3	73.3	90.1	81.7	98.8	.28	20.8	70
June 16-19	81.3	90.0	74.5	89.8	80.8	93.9	.60	7.6	42
							<b>68.66<sup>2</sup></b>	<b>427.6</b>	<b>1120</b>

<sup>1</sup> Soil temperature was measured at a depth of 4 inches.

<sup>2</sup> Rainfall total is for one year only (June 1, 2012 - May 31, 2013) and does not include additional rainfall for the extended harvest period (June 2013).

## INVESTIGATION OF POTENTIAL INGREDIENTS AS ATTRACTANTS FOR CRAWFISH IN COOL WATER

W.R. McClain, D. Gatlin III, and J.J. Sonnier

### INTRODUCTION

Cut fish is used for baiting crawfish traps for a large part of the harvest season – during cooler water temperatures. This is not by choice, as cut fish requires refrigerated storage and transport, often requires cutting into smaller portions, and is more expensive – costing twice that of commercially formulated bait. However, the catch with cut fish is far superior to commercially formulated crawfish baits at the cooler water temperatures, and is still more cost effective. Fish baits though are frequently in short supply and costs continue to increase.

Although several recent studies have attempted to identify effective attractants for capturing crawfish, suitable alternatives have not yet been identified. This lab, however, has been instrumental in investigating experimental protocols for testing the efficacy of attractants to crawfish, and has identified one protocol that seems to be best suited. Numerous efforts to conduct control attractant studies in the laboratory have been disappointing. The response of crawfish to field-proven attractants in a controlled laboratory setting, even at optimum temperatures with acclimated and/or starved captive stock, proved inconsistent and unpredictable. More reliable and repeatable results with known attractants were observed by incorporating the attractants in a gelatin-based matrix and testing *in situ* in earthen ponds under simulated commercial crawfish aquaculture conditions.

This protocol was used to evaluate a number of feedstuffs and substances, and with proven attractants, a relative assessment of a host of potential and experimental attractants were documented. These attractants were then ranked into categories of “best,” “mediocre,” and “poor showing.” Several baits in each category were analyzed for amino acid composition and a correlation analysis was conducted for amino acid levels in baits and corresponding mean catch values for those baits. Those amino acids that exhibited strong positive correlation to relative crawfish catch were compared to an amino acid profile of cut pogy (experimental control). Amino acids that exhibited significant correlation coefficients corresponding to crawfish catch and were also found at relatively high concentrations in pogy were identified as taurine, histidine, alanine, serine, leucine, glycine, valine, lysine, and glutamate.

Those findings suggest that some or all of these amino acids, in some combination and/or in similar concentrations could be important for formulating an effective cool-water bait as an alternative to fish. Therefore, this study was initiated, whereby single ingredients, high in one or more of these key amino acids, and a custom mixture of synthetic amino acids were tested as attractants utilizing the gelatin-based bait matrix under commercial conditions. Capture results were compared with the industry standard (cut fish), as well as a popular (warm water) formulated bait and a non-baited trap. Development of an effective, economical cool-water formulated crawfish bait would address not only some of the cost and handling/storage issues with fish baits, but also will help conserve the fishery for many of these bait species.

**Test Sites:** A commercial crawfish pond in Acadia Parish, located east of Crowley, LA and an experimental pond at the Rice Research Station.

**Crawfish Production Scenario:** Rice-crawfish field rotational practice.

**Trap Type:** Industry standard 3-funnel pyramid traps that were equipped with bait retention wells constructed of 0.75-inch plastic hexagon mesh. Bait wells extended above the water line and were used to position the bait in the center of the trap.

**Baits:** Various potential attractants were tested in this study, and the resulting baits constituted the experimental treatments (Figures 4 and 5). Cut pogy (menhaden) was used as the industry standard (control treatment), and traps without bait were used as a negative control. A commercially available manufactured bait (Southern Pride, Purina Mills, Shreveport, LA) was also used in all trials for comparative results.

**Cool Water Experimental Attractants:** Treatments were no bait, seabird guano (Guano), feather meal plus taurine and glycine (Fmeal++), feather meal (Fmeal), feather meal plus glycine (Fmeal+G), bloodmeal (Bmeal), feather meal plus taurine (Fmeal+T), fish hydrolyzate (Fhydro), amino acid mixture 2x rate (AA2X), Grobionic-A (Grobio), amino acid mixture (AA), crab meal (Crab), poultry meal – regular ash (Pmeal-R), Purina manufactured crawfish bait (Purina), poultry meal – pet food grade (Pmeal-P), and fish (cut pogy).

**Test Matrix:** A gelatin-based matrix was used as a means to test the various attractants in the lab-formulated products. A lab-grade beef gelatin (Sigma-Aldrich, St. Louis, MO), 250 bloom, 40-mm mesh, was utilized and activated with water heated to 103°F. Oatmeal was added to the gelatin baits as an aid to help bind the gelatin and maintain the bait block as a single unit for the duration of the trap-soak interval.

**Bait Quantity:** All fish and commercially manufactured baits were used at approximately 1/4 lb (115 g) per trap wet weight. Formulations for the gelatin-based test products were based on dry weight and adjusted for moisture content. All baits exhibited some residual after the 24-hr soak and it was not apparent that bait quantity was a limiting factor in this study.

**Trap Soak Duration:** Approximately 24 hr.

**Water Temperature:** Trials were conducted February 1-27, 2013. Average daily water temperature ranged from 56 to 61°F.

**Experimental Design:** Traps were placed in a cordoned-off section of the commercial pond and were isolated from ongoing harvesting activities, and test traps constituted a majority of the traps used in the Rice Station pond. All traps were placed in a row within designated trapping lanes and spaced at approximately 50-ft intervals. Bait selection order was randomly assigned for each trial with the exception that no replicates of the same treatment were placed in successive order.

**Replicates:** A single trap-set or soak constituted a replica for each bait treatment per trial, and there were 20 replicas per treatment. Replication was achieved over 10 harvest days spread out over one month.

**Parameters:** Crawfish catch per unit effort, by numbers of crawfish and weight of crawfish per trap; average weight of individual crawfish; and percentage captured (by numbers and by weight) compared with cut pogy, the industry standard.

**Support:** USDA Southern Regional Aquaculture Center

**Comments:** This was a good comparison of multiple test attractants, with 20 replicated trap lifts for each test bait in a “heads-up” comparison over 10 days, spread out over the month of February. This test was conducted in a cordoned-off section of a commercial pond with the exception of the last harvest date, where the test was implemented in the experimental pond at the Rice Research Station. This commercial pond was chosen because it had a harvestable population of crawfish early in the season when water temperatures were in the desired range (<65°F).

The results (Table 1) however, are a little perplexing upon initial examination. While there were some subtle differences in the rankings when the mean crawfish catch was expressed as numbers of crawfish caught per trap lift as opposed to weight of crawfish caught per trap, the findings were generally similar. No significant differences were found among mean crawfish size for the various baits. Figures 1, 2, and 3 show the relative catches and trends per bait among the different harvest dates. The bold series lines (with no markers) represent the three control baits (fish, Purina, and no bait).

One unexpected observation (illustrated in Figures 1, 2, and 3) is the relative catch values for cut fish, Purina, and no bait. For the first five sampling dates, the results were as expected – with fish catching much better than the commercial Purina bait, which in turn caught much better than no bait. However, after the fifth sampling date, the Purina bait did surprisingly well compared to fish, even though water temperatures remained relatively cool. This changed with the last harvest date (trap sets executed in a different pond), although catch differences were minor among all baits in that pond due to the lower population density. The unexpected change in relative catch values for

fish and Purina cannot be easily explained, given the cool water temperatures, and is contrary to previous observations where the catch with fish remained high in comparison to manufactured bait under cool water conditions. Perhaps the current data had something to do with the excessive overcrowded conditions in the commercial pond as evident by the small size of individual crawfish (Table 2), owing to the inverse relationship between high population density and size at harvest. The unusual trend in relative catch between fish and manufactured bait in the commercial pond was the impetus for implementing the last trap set in a different pond, with a much lower population density.

One possible explanation for the unexpectedly low catch with cut fish compared to the other baits about midway into the trial may have something to do with the rate at which fish bait was consumed under the very high population density. Although all baits were partially consumed and some residue remained for each one, even the fish, after the 24-hr soak, the rate at which fish could have been depleted may have differed due to its softer nature. As the already high crawfish biomass of the commercial pond increased with time, the most succulent portions of the cut fish may have been consumed early in the 24-hr period, rendering it less attractive thereafter when compared to the more uniform nature of the other baits.

Given that a larger quantity of cut fish and/or a more moderate population density in the pond, catch with fish would have likely been greater in comparison to the other baits. Nonetheless, meaningful results were gained for the relative efficacy of the various attractants, especially in comparison to that with Purina and no bait. The most notable observation was that poultry meal resulted in very good catches, and was fairly consistent throughout the trial. It resulted in catches as good as, or better than, Purina, and in several cases exceeded that with cut fish. Catch with poultry meal represented some of the best for the single set of trap lifts in the experimental crawfish pond. Poultry meal also was among the better performers in a previous trial. This ingredient, alone or as a base for formulation, deserves further scrutiny as a potential alternative to cut fish for cool water trapping of crawfish. Further research is needed.

**Table 1.** Summary of results for experimental trials during the 2013 cool-water crawfish bait study. No significant differences were detected among treatments for mean weight at harvest. Catch, both by number of crawfish and weight of crawfish by trap, is also expressed as a percentage of that caught with fish (cut pogy). Values within columns with the same superscript were not significantly different ( $P>0.05$ ).

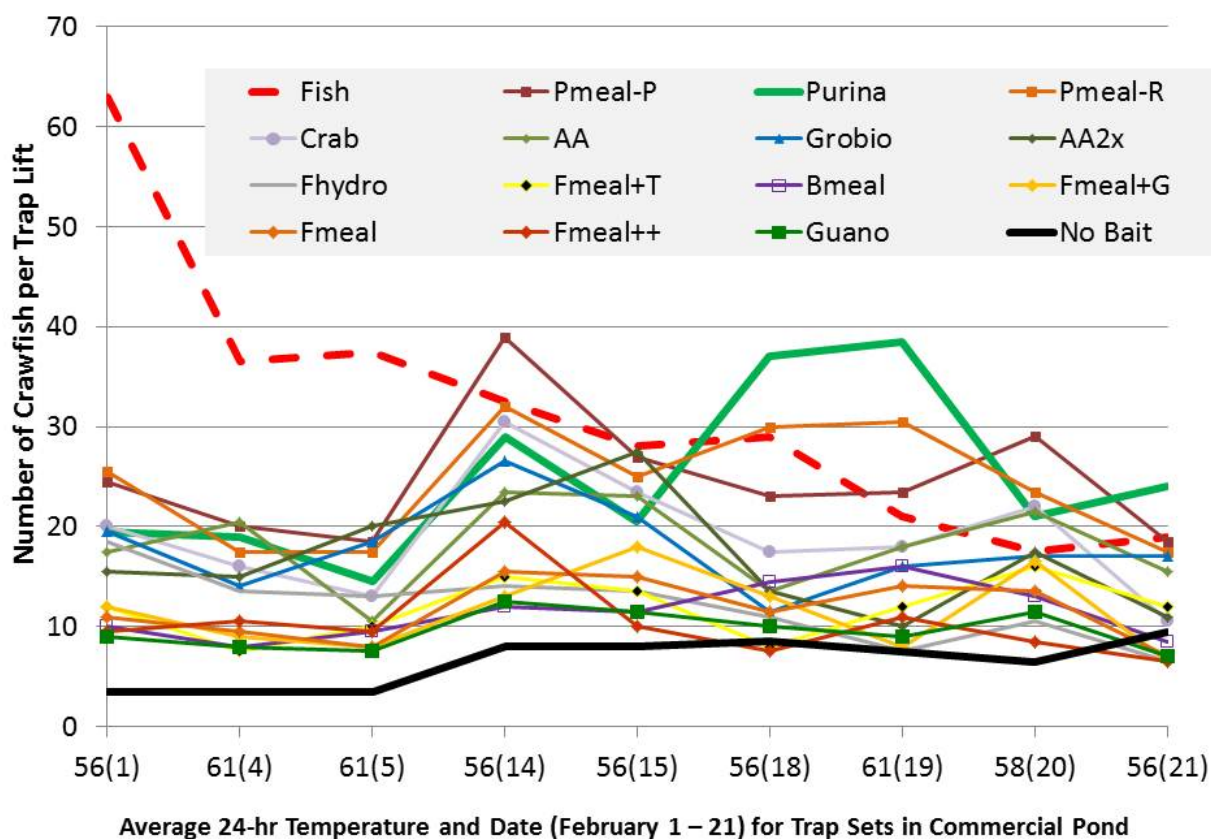
Treatment (Attractant) <sup>1</sup>	Avg Catch (No/Trp)	Avg Catch (Lb/Trp)	Avg Wt. (g)	% of Cut Menhaden (by No.)	% of Cut Menhaden (by Wt.)
<i>n=20 traps; Water Temperature(F) = 53 min / 64 max / 58 average</i>					
No Bait	6.2 <sup>G</sup>	0.26 <sup>G</sup>	19.3	21.5	20.3
Guano	8.8 <sup>FG</sup>	0.34 <sup>G</sup>	17.4	30.3	26.7
Fmeal++	9.6 <sup>EF</sup>	0.44 <sup>FG</sup>	21.3	33.3	34.8
Fmeal	10.6 <sup>DEFG</sup>	0.42 <sup>FG</sup>	18.7	36.7	32.6
Fmeal+G	10.6 <sup>DEFG</sup>	0.42 <sup>FG</sup>	17.4	36.7	33.2
Bmeal	10.7 <sup>DEFG</sup>	0.44 <sup>FG</sup>	18.9	37.1	34.5
Fmeal+T	10.9 <sup>DEFG</sup>	0.43 <sup>FG</sup>	18.4	37.6	33.5
Fhydro	11.3 <sup>DEFG</sup>	0.52 <sup>EF</sup>	20.9	39.0	40.5
AA2x	15.5 <sup>CDEF</sup>	0.67 <sup>DEF</sup>	20.2	53.7	52.2
Grobio	16.5 <sup>BCDE</sup>	0.70 <sup>CDEF</sup>	18.5	57.2	54.5
AA	16.7 <sup>BCDE</sup>	0.70 <sup>CDEF</sup>	19.0	57.9	54.8
Crab	17.4 <sup>BCD</sup>	0.77 <sup>CDE</sup>	20.7	60.1	60.4
Pmeal-R	22.4 <sup>ABC</sup>	1.05 <sup>AB</sup>	21.8	77.6	82.3
Purina	22.6 <sup>ABC</sup>	0.87 <sup>BCD</sup>	18.3	78.2	67.9
Pmeal-P	22.8 <sup>AB</sup>	0.95 <sup>BC</sup>	19.5	78.9	74.8
Fish	28.9 <sup>A</sup>	1.28 <sup>A</sup>	20.8	-	-

<sup>1</sup> Treatments were no bait, seabird guano (Guano), feather meal plus taurine and glycine (Fmeal++), feather meal (Fmeal), feather meal plus glycine (Fmeal+G), bloodmeal (Bmeal), feather meal plus taurine (Fmeal+T), fish hydrolyzate (Fhydro), amino acid mixture 2x rate (AA2x), Grobionic-A (Grobio), amino acid mixture (AA), crab meal (Crab), poultry meal – regular ash (Pmeal-R), Purina manufactured crawfish bait (Purina), poultry meal – pet food grade (Pmeal-P), and fish (cut pogy).

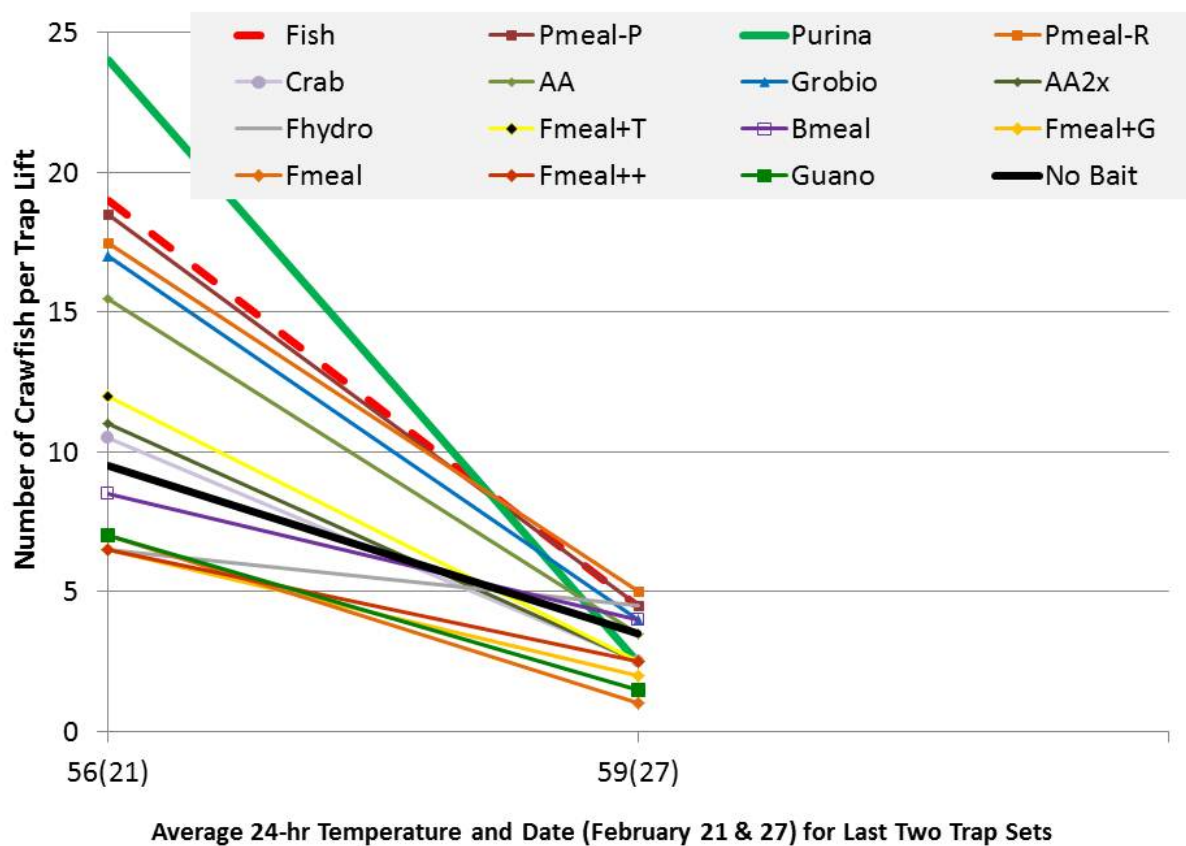


**Table 2.** Average daily water temperature (°F), crawfish yield (lb/trap), and individual crawfish weight (g) by harvest date/location.

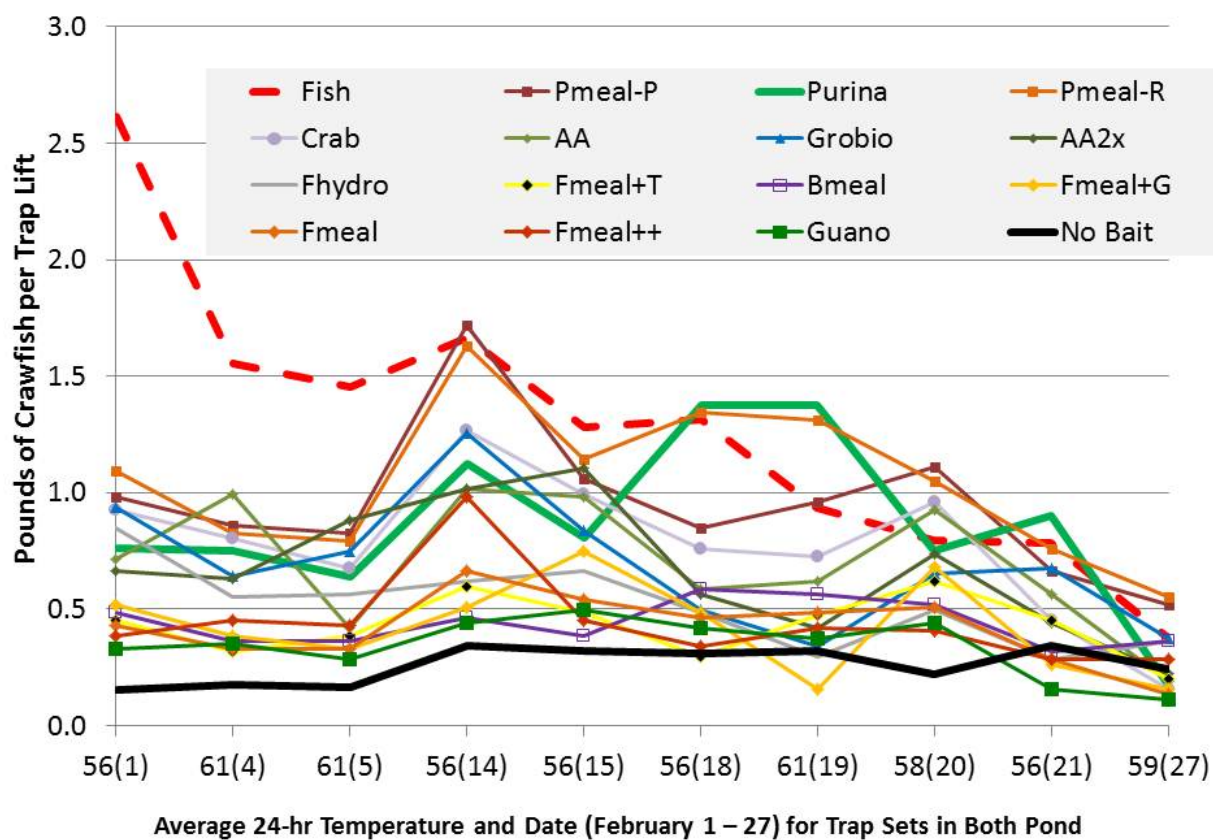
Harvest Date	Pond	Temperature	Yield per Trap	Crawfish Weight
2/1/2013	Commercial	55.9	0.77	19.2
2/4/2013	Commercial	61.0	0.62	19.9
2/5/2013	Commercial	60.5	0.58	19.4
2/14/2013	Commercial	56.1	0.96	19.6
2/15/2013	Commercial	56.4	0.77	18.7
2/18/2013	Commercial	56.2	0.67	18.7
2/19/2013	Commercial	60.8	0.61	16.8
2/20/2013	Commercial	58.4	0.68	18.6
2/21/2013	Commercial	55.7	0.48	17.6
2/27/2013	Rice Res. Station	58.7	0.28	39.5



**Figure 1.** Catch results (number of crawfish per trap) for all bait treatments for each of nine harvest days beginning on February 1 and ending on February 21, 2013. Average 24-hr water temperature (°F) is presented at each harvest date (February 1, 4, 5, 14, 15, 18, 19, 20, 21). All harvests for these dates occurred in a commercial crawfish pond.



**Figure 2.** Catch (number of crawfish per trap) for each treatment during the last harvest date (February 21, 2013) in the commercial pond and the only harvest date (February 27, 2013) in the Rice Research Station experimental crawfish pond. Average 24-hr water temperature ( $^{\circ}\text{F}$ ) is presented at each harvest date (February 21 and 27). Note the differences in magnitude of crawfish caught between the two sites as well as the relative ranking among treatments.



**Figure 3.** Catch results (pounds of crawfish per trap) for all bait treatments for each of 10 harvest days beginning on February 1 and ending on February 27, 2013. Average 24-hr water temperature (°F) is presented at each harvest date (February 1, 4, 5, 14, 15, 18, 19, 20, 21, 27). Harvest on all but the last date occurred in a commercial crawfish pond, and the last harvest occurred in an experimental crawfish pond.



**Figure 4.** Photo of all baits used for the 15 treatments prior to their placement in traps. Baits from left to right beginning with the top row and ending with the bottom row contained the following ingredients: bloodmeal, seabird guano, crab meal, cut pogy, Purina manufactured crawfish bait, poultry meal – pet food grade, Grobionic-A, amino acid mixture, amino acid mixture 2x rate, fish hydrolyzate, feather meal, feather meal plus taurine, feather meal plus glycine, feather meal plus taurine and glycine, poultry meal – regular ash.



**Figure 5.** Photo of baits after 24-hr soak duration in traps place in experimental pond. Baits from left to right beginning with the top row and ending with the bottom row contained the following ingredients: bloodmeal, seabird guano, crab meal, cut pogy, Purina manufactured crawfish bait, poultry meal – pet food grade, Grobionic-A, amino acid mixture, amino acid mixture 2x rate, fish hydrolyzate, feather meal, feather meal plus taurine, feather meal plus glycine, feather meal plus taurine and glycine, poultry meal – regular ash.

# **PRELIMINARY INVESTIGATION OF PROPRIETARY FORMULATIONS AS POTENTIAL ATTRACTANTS FOR CRAWFISH IN COOL AND WARM WATER**

W.R. McClain and J.J. Sonnier

## **INTRODUCTION**

Crawfish are harvested in more than 185,000 acres of aquaculture ponds using baited wire-mesh traps that are lifted three to six days a week beginning as early as November and continuing through May to July of the following year. Traps are typically baited with manufactured formulated bait in warmer weather, but because formulated baits are inferior at cooler water temperatures (less than 70°F), fresh-frozen cut fish is used. Fish for crawfish bait has become expensive, costing twice that of commercially formulated bait, and fish baits are frequently in short supply. In some cases, half of the annual crawfish harvesting effort occurs during cool-water periods (December through late March), and with availability and price issues with fish, as well as the need to transport and store fish baits in a frozen state, fish baits have become problematic for the crawfish industry. Development of an effective, economical cool-water formulated crawfish bait will address not only some of the cost and handling/storage issues with fish baits, but also will help conserve the fishery for many of these species.

Few studies have attempted to identify effective attractants for capturing crawfish. Some studies compared behavioral (feeding) responses of crawfish in the lab with various dietary items, chemical extracts, and other potential attractants. With the exception of one field study employing short trap-soak intervals (less than 80 minutes) at 64°F, all trials outside of this research unit were conducted at water temperatures greater than 70°F. Studies with marine crustaceans, such as lobsters, crabs, and shrimp, have observed that amino acids and related biochemical compounds tend to elicit chemo-attraction responses and may act as feeding stimulants. However, detection does not necessarily equal attraction, and an induced feeding response may not equate to attraction over some distance to elicit entry of crawfish into a baited trap.

All previous efforts in this lab to develop an effective protocol for testing potential attractants in the laboratory have failed. The response of crawfish to field-proven attractants in a controlled laboratory environment, even at optimum temperatures with acclimated and/or starved captive stock, proved inconsistent and unpredictable. Therefore, the best method for testing potential baits and attractants for their effectiveness in attracting crawfish to traps is to employ those baits in standard industry traps under conventional crawfish aquaculture environments.

While there are formulated feeds developed for other aquatic animals, only a few have been tested as potential attractants for crawfish. Some fish feeds are designed to float and most existing feeds are pelleted with dies smaller than the 0.75-inch mesh size of crawfish traps, so methods must be developed to contain and/or prevent small diameter feed pellets from floating for those to be tested for their propensity to attract crawfish to traps. Thus, this study was undertaken to provide a preliminary evaluation of some existing proprietary formations for their effectiveness as crawfish attractants, but only after devising methods to confine the material while not rendering it inaccessible to crawfish in the trap.

**Test Sites:** A commercial crawfish pond in Acadia Parish, located east of Crowley, LA, and an experimental pond at the Rice Research Station. Crawfish population density was relatively high in the commercial pond, and crawfish density was relatively low in the experimental pond. Trials 1 and 2 (cool water bait trials) and trial 3 (warm water bait trial) each consisted of harvesting components at both locations. Thus, each trial generated results from both a high and low crawfish density environment simultaneously.

**Crawfish Production Scenario:** Rice-crawfish field rotational practice.

**Trap Type:** Industry standard 3-funnel pyramid traps that were equipped with bait retention wells constructed of 0.75-inch plastic hexagon mesh. Bait wells extended above the water line and were used to position the bait in the center of the trap.

**Baits:** Several proprietary baits, in dry pelleted or semi-moist form, were tested in this study and baits constituted the experimental treatments. Some of the experimental baits were tested in both cool and warm water conditions. Cut pogy (menhaden) was used as the industry standard (control treatment), and traps without bait were used as a negative control in all trials. A commercially available manufactured bait (Southern Pride, Purina Mills, Shreveport, LA) was also used in each trial for comparison.

**Cool Water Experimental Baits:** Because of their proprietary formulation, these are simply referred to as baits #1, #2, #3, and #4.

**Warm Water Experimental Baits:** Baits #1, #2, and #3 from the cool water trials were tested later in the season as potential warm water attractants.

**Product Forms – Cool Weather Trials:** Because experimental baits #1 - 4 were small in diameter and some were neutrally buoyant, baits were confined in 1.25- x 5.5-inch mesh PVC tubes (¼-inch mesh opening) with solid end caps so that they could be placed and maintained within the crawfish trap, and remain submerged. Mesh openings allowed limited contact by crawfish within the trap. Control baits (cut fish and Purina cubes) were placed in tubes also to maintain consistency of the experimental protocol. An adjustment was made for trial 2 regarding the large pellet size (about 1 inch in diameter) of the Purina bait. Swelling of the cube upon inundation caused a pressure fit inside the tube, decreasing surface area available to crawfish and making it difficult for crawfish to access the bait. Thus, the pellet was broken into several large portions prior to placement inside the tubes during trial 2 to more closely resemble the surface area and access of other test baits.

**Product Forms – Warm Water Trial:** Due to minor logistical problems and possible limitations with the PVC tubes, baits for the warm water trial were incorporated instead in a proven gelatin-based matrix that holds the product together, while allowing crawfish full access and consumption at will. A lab-grade beef gelatin (Sigma-Aldrich, St. Louis, MO), 250 bloom, 40-mm mesh, was used to form the matrix when activated with water heated to 103°F. These bait blocks were applied to the trap as single units. To maintain consistency among treatments, the Purina bait cubes were crumbled and incorporated into the gelatin matrix also. However, the fish bait was used conventionally (as cut sections of fish).

**Bait Quantity:** All baits were used at 100 g of attractant (wet weight basis) for trial 1. An adjustment was made for trial 2, whereby the quantity of cut fish per trap was increased to 185 g per trap to compensate for the soft nature of the fish and its rapid disappearance by a high population of crawfish in the high density pond.

**Trap Soak Duration:** Approximately 24 hr.

**Dates:** Trial 1 = March 7 – 13, 2013; Trial 2 = March 15 – 20, 2013; Trial 3 = May 7 – 14, 2013.

**Experimental Design:** Traps were placed in a cordoned-off section of both the commercial and experimental ponds and were isolated from other ongoing harvesting activities. All traps were placed in a row within designated trapping lanes and spaced at approximately 50 ft intervals. Bait order was randomly assigned for each trial with the exception that no replicates of the same treatment were placed in successive order.

**Replicates:** A single trap-set or soak constituted a replicate for each bait treatment per trial, and replications were achieved over several days. There were 16 replications per treatment for trial 1, 8 replications for trial 2, and 14 replications per treatment for trial 3.

**Parameters:** Crawfish catch per unit effort, by numbers of crawfish and weight of crawfish per trap; average weight of individual crawfish.

**Support:** Cargill, U.S. Aquaculture, Franklinton, LA.



**Comments:** For both the cool and warm water trials, all baits exhibited some degree of attractability for crawfish. Results of the cool water trials are presented in Tables 1 – 4. In comparing results of trial 1 to that of trial 2, it is apparent that the whole Purina cube inside the tube was limiting catch. When the same weight of bait was provided in the form of broken pieces during trial 2, the catch was substantially increased. Broken Purina pellets in the high density pond captured 51% more crawfish on average and 59% more by weight than whole Purina inside the tube. In the low density pond, broken Purina pellets resulted in 10% greater number of crawfish captured and 23% greater weight per trap.

Likewise, it appears that in the high density pond, the quantity of fish was limited in trial 1, and thus, catch was lower as a result. This was clearly a result of the high population density of crawfish and the soft nature of the cut pogy (menhaden). Crawfish were probably consuming much of the soft, fleshy portions of the bait early on during the 24-hr soak, and while skin and bony portions remained, the attractability of the bait was most likely compromised after the most succulent portions were gone. The limitation of 100 g of fish was not as apparent in the low density pond. This amount of fish captured approximately 30-40% more crawfish than the next best bait. The limitations with Purina and cut fish (controls) in trial 1, especially for the high density pond, made it difficult to assess the relative value of the experimental baits in that trial.

Results from trial 2 clearly provide better relative comparisons among the various baits. While the magnitude of the catch and the average weight of crawfish captured differed considerably between the high density and low density ponds, the relative rankings of the various baits were very similar. It appears that baits #2 and #3 were superior to experimental baits #1 and #4, and baits #2 and #3 were on par with Purina when the Purina pellet was not confined by swelling in the tube. The best experimental baits (#2 and #3) caught approximately 41-68% of that with cut fish when the quantity of fish was not limited (trial 2). The broken Purina pellets captured 62% of the number of crawfish as did cut fish in trial 2. Overall, it appears that baits #1 and #4 were similar, and baits #2 and #3 were similar with baits #2 and #3 being slightly superior in terms of a crawfish attractant.

Results of the warm water trial are presented in Table 5. It should be noted that the experimental baits, as well as one treatment of the Purina bait, were presented to the trap in the form of a bait block (Figure 1). The baits were incorporated into a gelatin matrix that has previously proven successful for evaluating attractants to crawfish. Catch results with Purina as intact pellet cubes and as crumbles within the gelatin block were virtually identical; thus, illustrating the acceptability of the gelatin matrix as a medium for testing attractants. Each gelatin bait block showed signs of consumption, but approximately 50% of the original volume remained after 24 hr. Because so much of the bait block remained after the 24-hr soak, bait quantity was not likely a limiting factor, and differences in catch were most likely due to bait (or attractant) quality.

In the low density pond, while cut fish may have exhibited a slight edge for attracting crawfish, Purina, bait #2, and bait #3 were nearly identical in amount of crawfish caught. Catch with experimental bait #1 was much less. In the high density pond, cut fish was associated with a lower catch than some baits, possibly as a result of premature depletion. Very little flesh remained on the bones in some cases after 24 hr. Purina appears to have had a definitive advantage over the experimental baits in the high density pond. Catch with bait #2 was slightly higher than with bait #3, and the catch with bait #3 was higher than with bait #1. Overall, while there may have been some slight differences among the experimental baits in warm water, there is little evidence to suggest that the experimental baits would be more effective than Purina, or in some cases cut fish.

In conclusion, a similar trend of relative effectiveness was observed for the experimental baits in cool water for both the high and low density pond environments. Baits #2 and #3 were consistently better than baits #1 and #4. However, baits #2 or #3 were not substantially better than the Purina formulation under cool water conditions and lacked the catch efficiency of cut fish when appropriate amounts of fish were used. Baits #2 and #3 were consistently better than bait #1 in warm water conditions as well, but Purina may have had a slight advantage over experimental baits #2 and #3 in that trial. Thus, while there appears to be no advantage of any of the experimental baits over fish, there appears to be no large disadvantage for baits #2 and #3, when compared to Purina under either cool or warm water conditions. Further tests are necessary for more detailed comparisons of baits under a wide array of environmental conditions in earthen crawfish ponds.

**Table 1.** Crawfish catch per trap (by number and by weight, lb) and average individual weight (g) for Cargill experimental baits in the high density pond, trial 1. Data represents mean of 16 replications per treatment. Average water temperature during trial 1 was 55.5 (range = 47.5-63.5°F).

Bait	No. CF per Trap	Wt. CF per Trap	Avg. Individual Wt.
No Bait	4.7	0.18	17.3
Whole Purina	16.1	0.59	16.7
#1	17.2	0.66	17.3
#4	19.6	0.78	18.0
100 g Cut Fish	23.9	1.02	19.4
#2	29.1	1.10	17.0
#3	29.6	1.15	17.5

**Table 2.** Crawfish catch per trap (by number and by weight, lb) and average individual weight (g) for Cargill experimental baits in the high density pond, trial 2. Data represents mean of 8 replications per treatment. Average water temperature during trial 2 was 61.5 (range = 54.0-69.0°F).

Bait	No. CF per Trap	Wt. CF per Trap	Avg. Individual Wt.
No Bait	4.3	0.16	17.3
#1	14.1	0.52	17.0
Whole Purina	15.3	0.56	16.8
#4	17.3	0.71	18.7
#2	21.9	0.84	17.4
#3	22.5	0.82	16.6
Broken Purina	23.1	0.89	17.4
185 g Cut Fish	34.5	1.43	18.8

**Table 3.** Crawfish catch per trap (by number and by weight, lb) and average individual weight (g) for Cargill experimental baits in the low density pond, trial 1. Data represents mean of 16 replications per treatment. Average water temperature during trial 1 was 58.3 (range = 52.0-64.5°F).

Bait	No. CF per Trap	Wt. CF per Trap	Avg. Individual Wt.
No Bait	2.4	0.16	29.0
#1	3.2	0.27	37.7
Whole Purina	4.1	0.34	37.1
#4	4.4	0.34	35.8
#2	4.8	0.36	34.0
#3	5.3	0.45	38.4
100 g Cut Fish	8.1	0.67	35.8

**Table 4.** Crawfish catch per trap (by number and by weight, lb) and average individual weight (g) for Cargill experimental baits in the low density pond, trial 2. Data represents mean of 8 replications per treatment. Average water temperature during trial 2 was 63.0 (range = 56.0-70.0°F).

Bait	No. CF per Trap	Wt. CF per Trap	Avg. Individual Wt.
No Bait	2.9	0.20	28.4
#4	5.3	0.44	38.3
Whole Purina	6.0	0.47	36.4
#1	6.1	0.50	37.2
Broken Purina	6.6	0.58	41.0
#3	6.6	0.64	45.5
#2	7.1	0.63	41.4
185 g Cut Fish	8.5	0.93	48.5



**Table 5.** Average catch results, in number of crawfish and pounds of crawfish captured per trap, for the experimental bait trial in warm water. Average minimum water temperature was 70.9 and average maximum was 83.3°F. Average weight of individual crawfish captured is also presented. Results are presented for tests in both a low and high population density pond (n=14 trap sets per treatment per pond type).

<b>Treatment 1*</b>	<b>Avg. No. per Trap</b>	<b>Avg. lb per Trap</b>	<b>Avg. Wt. (g)</b>
<b><i>Low Population Density Pond</i></b>			
No Bait	2.0	0.11	24.3
#1 in Gelatin	2.6	0.15	26.2
Purina Pellet	3.6	0.25	32.0
Purina in Gelatin	3.8	0.24	28.5
#2 in Gelatin	3.9	0.25	28.6
#3 in Gelatin	3.9	0.25	28.0
Cut Fish	4.1	0.31	34.2
<b><i>High Population Density Pond</i></b>			
No Bait	4.6	0.13	14.2
#1 in Gelatin	31.3	0.95	15.2
#3 in Gelatin	45.5	1.15	13.3
Cut Fish	48.5	1.36	14.5
#2 in Gelatin	51.6	1.33	13.4
Purina in Gelatin	73.9	2.16	14.8
Purina Pellet	78.7	2.19	14.6

\* Cargill experimental baits are marked #1, #2, and #3 and are of a proprietary formulation.



**Figure 1.** Photos of experimental bait blocks #1, #2, #3, and Purina crumbles within the gelatin block; from left to right and top to bottom.

# EFFICIENCY OF THE BAITED TRAP IN HARVESTING CRAWFISH

W.R. McClain and J.J. Sonnier

## INTRODUCTION

The sole method of harvesting crawfish from aquaculture ponds in the Southern U.S. is with the baited wire-mesh trap. The standard trap currently in use today is the 3-funnel, pyramid-shape trap constructed of PVC-coated 0.75 inch or 0.875 inch square mesh welded wire. In general, the most efficient trap density is 10-20 traps per acre, utilizing a 3- or 4-day per week harvest schedule. Optimum trap density is primarily based on crawfish population, with the higher trap densities recommended for the higher population densities.

Efficacy of the baited trap is dependent on a number of variables, such as crawfish density, bait type, trap soak interval, and environmental factors. However, the efficiency for which the standard trapping protocol can remove harvest size crawfish from a population has not been thoroughly examined. In a limited number of studies utilizing mature individuals that were captured, marked, and released, less than 50% of those marked individuals were retrieved over time with continuous harvesting efforts. The loss of markings from molting should have been eliminated or greatly reduced with the use of mature, non-molting individuals, and natural mortality was accounted for in one study and shown to be low. Thus, it appears that the baited trap is relatively inefficient at capturing crawfish in forage-based production ponds.

It is known that not all crawfish that enter baited traps remain in the trap until emptied. Crawfish do escape. However, little is known of how effective baited traps can be in attracting and retaining crawfish, even within the sphere of influence of the attractant. Furthermore, the sphere of influence of the bait for a given set of pond conditions is basically unknown. Therefore, this study was initiated to better document the daily catch efficiency of the baited trap under conditions, whereby populations of harvest-size crawfish were confined in relative close proximity to the baited trap in simulated pond environments. A set of outdoor mesocosms were used and contained crawfish populations at three densities.

**Experimental Units:** Six 12-ft diameter x 5-ft tall ( $10.5 \text{ m}^2$  bottom surface area) outdoor fiberglass pools with 6 inches (15.2 cm) of soil and a planted rice crop served as crawfish habitat mesocosms and were utilized as experimental units.

**Water Source:** Ground water that was aerated and filtered prior to discharge into tanks. Water levels in tanks were maintained at approximately 1 ft deep.

**Forage Crop:** Rice (variety Caffey).

**Crawfish:** Red swamp crawfish (*Procambarus clarkii*) were captured from nearby experimental ponds and randomly stocked into tanks within two hours of capture.

**Crawfish Stocking Rate:** Stocking density was the treatment factor, which consisted of a low rate (52 per tank), medium rate (103 per tank), and high rate (206 per tank).

**Experimental Design:** Completely randomized design with two replicated mesocosms per treatment.

**Experimental Treatments:** Low ( $5/\text{m}^2$ ), medium ( $10/\text{m}^2$ ), and high ( $20/\text{m}^2$ ) population density of crawfish.

**Supplemental Aeration:** A Sweetwater® regenerative blower provided supplemental aeration via four shop-build diffusers (3-inch PVC pipe, 1 ft long) per tank. Aeration was provided continuously for the duration of the 5-day study.

**Dissolved Oxygen:** Dissolved oxygen was not monitored, but was assumed to be adequate as a result of the profuse aeration.

**Temperature Monitoring:** Water temperature was recorded every four hours by temperature data-loggers (Hobo®, 104 Onset Computers, Pocasset, MA, model TEMP) randomly placed in two tanks. Mean daily (24 hr) temperatures averaged 87.2°F (range 80.1 to 91.0°F).

**Crawfish Harvest:** Crawfish were harvested with one baited pyramid wire-mesh trap per tank placed near the center of the tank. This is equivalent to 385 traps/A. Trapping occurred each night for four days and consisted of a 16-hr soak per day. Catch results for each of the first three days of harvest were enumerated and individual sex noted and captured crawfish were returned to the tank. On the fourth day of harvest, catch results were noted per tank, but crawfish were not returned to the tank.

**Bait:** Southern Pride pelleted crawfish bait was used at approximately one-third pound per trap per day. Fresh bait was used daily. Bait residual was present after the 16-hr soak for each set.

**Termination:** Following trap lifts on the last day, tanks were drained and all remaining crawfish retrieved.

**Study Duration:** June 3-7, 2013.

**Parameters:** Number and sex of crawfish at stocking, termination, and by trap harvests.

**Comments:** While this study was conducted in somewhat unnatural conditions, it does provide some insight into the inefficiencies of trap harvesting crawfish with current commercial gear and methods. Survival of crawfish within the tanks over the course of four days was good – averaging over 90% (Table 1). Daily harvest data are reported in Table 2.

To account for mortality due to handling and stress, an adjusted population density was used as the basis for determining efficiency of trap harvesting (Table 3). Rather than calculate harvest efficiency based on initial density of crawfish, an average harvestable density estimate was used based on the mean of the total number of crawfish stocked and total retrieved for each tank.

The percent retrieval rate for traps among harvest days was very similar (Table 4), although slightly lower on day 4. The overall retrieval rate was surprisingly similar among density treatments (Table 4), with an overall average of about 17%. Although the number of crawfish per trap was greater for the higher densities, the catch as determined by percentage of the harvestable population was nearly the same regardless of population density. This suggests that trapping efficiency is little affected by the population density of a pond.

Trap catch as a percentage of the adjusted population density was lower on day 4 for all densities. This may be due to cumulative effect of mortalities for each tank, or possibly a result of lower water temperatures (Table 5).

It is unclear how trap catch efficiencies in this study compare with the percentage of the harvestable populations captured by baited traps under typical commercial pond culture conditions. However, it is likely that catch efficiencies in ponds are much lower. Because the crawfish of this study were confined in a very small space, and the trap density was effectively 385 traps per acre as compared to a trap density of 10 to 20 per acre in commercial ponds, it is likely that a much higher percentage of the population was retrieved by traps in this study than would be typically retrieved per trap under pond culture. Thus, it can be inferred that baited wire-mesh traps are reliably inefficient at removing crawfish from the harvestable population in ponds.

**Table 1.** Number of live crawfish stocked and retrieved at draining and proportion of crawfish composed of males.

Tank#	Trt. (No.)	Initial Stocking		Total Retrieved		Retrieval % of Stocked	
		No. Stocked	% Males	No. Retrieved	% Males	% Retrieval	% Males
5	Low (52)	52	65.4	52	65.4	100	100
6	Low (52)	52	65.4	49	69.4	94.2	100
3	Med (103)	103	66.0	92	65.2	89.3	88.2
10	Med (103)	103	66.0	96	66.7	93.2	94.1
4	High (206)	206	66.0	189	65.6	91.7	91.2
9	High (206)	206	43.2	189	43.9	91.7	93.3

**Table 2.** Number of total crawfish (and number of males) harvested for each consecutive day of the harvest.  
Harvested crawfish for days 1 through 3 were enumerated and returned to the population.

Tank#	Trt. (No.)	Harvest Day 1		Harvest Day 2		Harvest Day 3		Harvest Day 4	
		Total	No. Males	Total	No. Males	Total	No. Males	Total	No. Males
5	Low (52)	9	6	7	4	7	5	6	6
6	Low (52)	10	10	9	5	15	12	7	3
3	Med (103)	8	6	13	11	25	18	14	13
10	Med (103)	25	21	17	14	20	13	6	6
4	High (206)	40	32	40	29	35	26	19	14
9	High (206)	38	19	35	16	33	16	21	8

**Table 3.** Average harvestable crawfish population density based on mean number of total crawfish (and males) stocked and retrieved, and average number (and percentage) of males trap harvested.

Tank#	Trt. (No.)	Avg. Harvestable Density	Avg. Harvestable No. Males	Avg. No. Males Trap Harvested	% of Males Trap Harvested
5	Low (52)	52	34	5.3	15.4
6	Low (52)	51	34	7.5	22.1
3	Med (103)	98	64	12.0	18.8
10	Med (103)	100	66	13.5	20.5
4	High (206)	198	130	25.3	19.4
9	High (206)	198	86	14.8	17.2
Mean % of males trap harvested from the adjusted population of males.					<b>18.9</b>

**Table 4.** Daily crawfish catch as a percentage of adjusted harvestable population and mean percent daily catch by day and by treatment, regardless of sex.

Tank#	Trt. (No.)	Day 1	Day 2	Day 3	Day 4	Treatment Average
5	Low (52)	17.3	13.5	13.5	11.5	
6	Low (52)	19.8	17.8	29.7	13.9	
Low Avg.		<b>18.6</b>	<b>15.7</b>	<b>21.6</b>	<b>12.7</b>	<b>17.1</b>
3	Med (103)	8.2	13.3	25.6	14.4	
10	Med (103)	25.1	17.1	20.1	6.0	
Med Avg.		<b>16.7</b>	<b>15.2</b>	<b>22.9</b>	<b>10.2</b>	<b>16.2</b>
4	High (206)	20.3	20.3	17.7	9.6	
9	High (206)	19.2	17.7	16.7	10.6	
High Avg.		<b>19.8</b>	<b>19.0</b>	<b>17.2</b>	<b>10.1</b>	<b>16.5</b>
<b>Daily Average</b>		<b>18.3</b>	<b>16.6</b>	<b>20.6</b>	<b>11.0</b>	<b>Overall = 16.6</b>

**Table 5.** Daily minimum, maximum, and average water temperatures (°F) and overall averages during the trial.

	Day 1	Day 2	Day 3	Day 4	Overall Average
Minimum	80.2	83.7	81.6	74.6	80.0
Maximum	101.0	100.2	92.5	91.7	96.4
<b>Average</b>	<b>89.2</b>	<b>91.0</b>	<b>86.0</b>	<b>80.1</b>	<b>86.6</b>

# EFFICACY OF THE SHORT-TERM SALT WATER BATH IN PURGING CRAWFISH

W.R. McClain and J.J. Sonnier

## INTRODUCTION

Live crawfish comprise most of the final sales to consumers in Louisiana and surrounding states, and as in many parts of the world, crawfish consumption is generally associated with social occasions. Live crawfish are transported and sold in plastic, open-mesh, vegetable-type sacks weighing 30-40 pounds each. Crawfish are typically boiled (or steamed) with spicy seasonings and served hot, often in outdoor venues. Many outdoor cooking rigs can accommodate an entire sack of crawfish, and some cooks will often empty the sack of crawfish directly into the pot, perhaps after a cursory wash. Others will first empty the sack of live crawfish into a tub of water for a more thorough wash. Many households will routinely add one to two pounds of salt in the wash water with the intent of “purging” the intestinal tract before cooking. This practice is based largely on hearsay or tradition, often passed down from generations.

When the exoskeleton of a cooked crawfish is removed (“peeled”) from the abdomen prior to consumption, the full, dark-colored intestine of an unpurged crawfish conspicuously contrasts with the light colored meat, and can be unappealing to some. If the hindgut is ruptured during the peeling process, exposing fecal material and contaminating the meat, this can be particularly offensive to many. Effective purging mitigates this unappealing aspect of crawfish consumption by eliminating or greatly reducing the amount of digesta present in the gut. Commercial purging, when employed, confines freshly harvested crawfish in water or humid environments for one or two days without food prior to further sales. This process is very effective at reducing the volume of material in the hindgut. Yet, the practice of commercial depuration is not widely used in the high volume crawfish industry in Louisiana due to the associated time and costs involved. The efficacy of a short-term salt water bath in reducing the size of the gut has not been thoroughly tested; still, people continue to employ it and advocates continue to recommend it. The internet is replete with instructions for using a short-term salt water bath to purge crawfish, often with reference to increased mortality when soaking crawfish too long in the hyper-saline solution.

Therefore, this study was designed to obtain more definitive data regarding the effectiveness of the common salt water bath in cleansing the hindgut of digesta. A second objective was to investigate the effects of short-term exposure of the salt water bath on crawfish mortality.

**Test Site:** Louisiana State University Agricultural Center’s Rice Research Station, Crowley, Louisiana.

**Crawfish:** Red swamp crawfish (*Procambarus clarkii*) were used for this study and were produced at the Rice Research Station.

**Harvest Method:** Crawfish were harvested from the simulated commercial pond using baited wire mesh traps after a 24-hr trap soak. Portions of crawfish harvested on three dates were used for three of four post-harvest experimental treatments, and crawfish harvested one day earlier and immediately placed in an aerated immersion type purging system were utilized at each test date for the fourth treatment.

**Treatments:** Harvested crawfish were subjected to four post-harvest treatments to simulate different preparation methods for cooking. These were (1) crawfish that were not washed (controls), (2) crawfish that were washed with salted water, (3) crawfish that were washed in freshwater without the addition of salt, and (4) crawfish that were subjected to immersion purging for 24 hr. On each of three dates, a portion (about 30 pounds) of crawfish harvested that day was placed in a tub containing 10 gallons of salted ground water and allowed to soak for 10 minutes. A similar portion of crawfish was placed in a second tub containing 10 gallons of water and 1.625 pounds of non-iodized table salt, and allowed to soak for 10 minutes. A third portion of the daily harvest consisted of non-washed individuals. The fourth group consisted of crawfish harvested the previous day and purged for 24 hr in an aerated vat without access to feed.

**Test Dates:** April 23, May 14, and May 21, 2013.

**Experimental Protocol:** Following each washing, with and without salt, all crawfish were closely examined and number of mortality noted. Samples of live crawfish were collected at each test date from each wash treatment as well as from the non-washed group and from those purged for 24 hr, and were frozen (-18°C) for later determination of hindgut content weight. The samples consisted of 24 random crawfish, representing equal number of males and females and mature and immature individuals. The remaining crawfish from each wash treatment were sacked and immediately placed in humid refrigerated storage (6 – 8°C) for assessment of mortality after 72 hr.

**Dissection:** The frozen crawfish specimens were thawed after 24 hr, weighed after blotting by paper towel to remove excess water, and dissected. The abdomen was separated from the cephalothorax, carefully severing the hindgut at its junction to the midgut, with the hindgut remaining attached to the abdomen. The abdomen, with protruding hindgut, was centered over a pre-weighed aluminum pan, and contents of the hindgut were collected in the pan by flushing the gut with 3 ml of distilled water dispensed from a small syringe through the anus. Abdominal muscle was then extracted. Gut contents and abdominal muscle were pooled by sex and maturity (n=6 crawfish per pool), and dry weight recorded after drying overnight at 75°C.

**Hindgut Content Data:** Because individual crawfish size varied, dry hindgut content weight was computed as a percent of whole wet crawfish weight and dry abdominal muscle weight.

**Parameters:** Hindgut content weight, crawfish mortality during the wash, crawfish mortality during refrigerated storage.

**Comments:** The amount of hindgut content (dry weight basis) in crawfish prepared for cooking via the different methods varied within and among treatments. Freshly harvested, non washed specimens contain the greatest amount of content, expressed both as percentage of whole wet crawfish weight (0.17 %) and as percentage of dry abdominal weight (4.6%), although the differences were not always significant from other treatments (Table 1). The lowest mean gut content percentage was observed in 24 hr purged crawfish. Regardless of whether gut contents were compared based on whole wet weight or dry abdomen basis (0.07 and 1.9%, respectively), mean hindgut content weight of fully purged crawfish were significantly lower, approximately 60% less than that of crawfish that were not washed. These purged gut content percentages were very similar to a previous purging study. Washed crawfish, with or without salt, resulted in 17 to 26% less gut content weight than non-wash specimens. Salt provided no significant advantage in this study despite the numerous claims that continue to be made to the contrary (Figure 1).

Immersing farm-raised crawfish in a water bath prior to cooking, even for as little as ten minutes, aids in removing mud and debris from the exterior of the animal as evident from the immediate increase in turbidity of the wash water. Crawfish that are crowded, but free to move about in the water bath may aid in loosening of material from the exoskeleton by light abrasion with one another. The results of this study also suggest that a water bath may aid in lessening the amount of content contained in the hindgut by a small percentage. However, a short term water bath (with or without salt) will not provide the degree of gut evacuation that commercial purging procedures can. It is doubtful that a longer duration of the simple water bath, with or without salt, will yield substantially different results, without increasing mortality from hypoxia.

To address the question posed by some regarding the effect of salt in a water bath on crawfish mortality, death was assessed immediately after the bath and then again after 72 hr under refrigerated storage. Very few deaths (< 1%) were observed immediately after the water bath, and these may have been simply due to handling. While mortality was typically low (< 5%) after 72 hr of refrigerated storage (Table 2), more deaths were observed in association with the salt water bath than the freshwater bath. While mortality was relatively high (13%) for the salt treatment on one date, the treatment average was less than 7%. Mortalities of trap-harvested crawfish under refrigerated storage of less than 7% are not considered to be excessive based on other studies. Nonetheless, average 72 hr mortality was approximately three fold for those crawfish subjected to the salt water bath (6.2%) compared with those bathed in freshwater (1.9%).

The effects of longer term storage of crawfish cleaned with salt water may be a moot point because in nearly all cases, crawfish are cleaned this way shortly before cooking. The home consumer will likely not store live crawfish after cleaning, and the retail or restaurant trade, which typically receives live crawfish chilled, will likely keep the animals in a chilled condition until cleaning immediately prior to cooking.

In conclusion, preparing crawfish for cooking by immersion in a water bath, with or without salt, for 10 minutes will provide some degree of cleansing, although the proportion of gut contents in cooked crawfish may not be discernible from crawfish that were not subjected to washing. There is no evidence from this study that the use of salt in cleansing crawfish was beneficial, but results suggest that a salt water bath could contribute to increased mortality if washed crawfish were subjected to refrigerated storage for several days prior to cooking. Conventional purging for 12 hr or longer is the only known way to significantly reduce the size of the hindgut in cooked crawfish.

**Table 1.** Mean ( $\pm$ standard deviation) dry hindgut content weight as a percent of whole wet crawfish weight and dry abdominal muscle weight. Means followed by the same superscript within a column were not significantly different ( $P > 0.05$ ). N = 12 pools of 6 crawfish per pool per treatment.

Treatment	Based on whole wet weight	Based on dry abdomen weight
No Wash	0.166 (0.05) <sup>A</sup>	4.56 (1.08) <sup>A</sup>
Washed with Salt <sup>1</sup>	0.138 (0.05) <sup>AB</sup>	3.89 (1.39) <sup>A</sup>
Washed without Salt <sup>1</sup>	0.123 (0.04) <sup>B</sup>	3.63 (1.20) <sup>A</sup>
24 hr Purged <sup>1</sup>	0.066 (0.04) <sup>C</sup>	1.94 (1.00) <sup>B</sup>

<sup>1</sup> Hindgut content weight for crawfish in the Washed with Salt, Washed without Salt, and Purged treatments represents a reduction from crawfish in the No wash treatment of 16.7, 25.7, and 60.3 % based on whole wet weight, and 14.8, 20.6, and 57.4 % based on dry abdomen weight, respectively.

**Table 2.** Mean percent crawfish mortality immediately following a 10-minute wash and following a 72-hr period in refrigerated storage.

Date	Treatment	Following the Wash	Following 72 h in Cooler
4/23/2013	Washed with Salt	0	2.61
	Washed without Salt	0	1.62
5/14/2013	Washed with Salt	0.56	3.17
	Washed without Salt	0.77	1.03
5/21/2013	Washed with Salt	0.28	12.86
	Washed without Salt	0.29	2.95
<b>Overall Mean Mortality</b>			
	Washed with Salt	0.28	6.21
	Washed without Salt	0.35	1.87



**Figure 1.** Samples of wash water after crawfish were soaked for 10 minutes. Beaker on the left contains wash water from the salt water bath and beaker on right contains wash water from the freshwater bath.

# RICE DISEASE CONTROL RESEARCH

## RICE DISEASE CONTROL STUDIES, 2013

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Rice diseases pose a major threat to rice production. Disease severity ranges from undetected damage to the complete destruction of a crop. Extensive systematic yield and quality loss estimates due to rice diseases have not been developed, but losses range from a trace to total crop loss, depending on the inoculum density, pathogen aggressiveness, environmental conditions, cultivar susceptibility, and interaction with other cultural parameters. Loss estimates also are difficult to estimate because of a lack of data on the numerous diseases affecting rice, hidden underground damage associated with root diseases, and little qualitative information on distribution and severity in commercial fields. There is no doubt that rice diseases cause significant economic yield and quality reductions and cost farmers millions of dollars each year from reduced productivity and costs of control. Damages that can occur include thin stands, poor plant vigor, poor nutrient utilization, reduced yield, reduced quality, plant death, lodging, and harvest problems. Specific damages that can occur include necrosis of tissues, chlorosis, wilting, and deformation of plant parts. Rice diseases are caused by the interaction between a susceptible plant, a virulent pathogen, and a favorable environment. Understanding this relationship allows the development and selection of the best management program, which must be adjusted to current environmental conditions. Each disease has its own cycle, and control practices are only effective at certain stages when the pathogen is susceptible and before irrevocable damage occurs.

Although production has not been eliminated from any areas due to rice diseases, there have been shifts in acreage from one area to another. An excellent example of this was the shift of most of the medium-grain rice from Louisiana to Arkansas due to severe blast development on the cultivar Bengal in Louisiana that does not occur in the less favorable environment of Arkansas. Seed and seedling diseases often cause poor stands, and at times, replant situations. Toxins have not been a major problem with rice grain quality, but fungal toxins have been detected in some rice grain.

Diseases occur in all rice growing regions of the world. In the United States, disease pressure is higher in the mid-south growing region than the arid California production area, although California has had significantly more disease pressure recently with the introduction of blast in 1997 and the introduction of bakanae in 1999. The U.S. is fortunate that it does not have any of the devastating viral diseases that occur in most other production areas of the world. Also, the U.S. has a limited number of nematode and bacterial diseases compared with most of the world production areas. Unfortunately, there are enough fungal diseases that increase production costs and reduce yields and quality to limit the economic return U.S. farmers receive for their crop.

The objective of these studies is to develop effective economical rice disease management practices. These include disease resistance, cultural management, and chemical control.

Table 1. List of fungicides tested in 2013.

	<b>Common Name</b>	<b>Company</b>
Quadris 2.08 SC	Azoxystrobin	Syngenta
Stratego 2.08 EC	Trifloxystrobin/Propiconazole	Bayer
GEM 500 SC	Trifloxystrobin	Bayer
Quilt 1.66 SC	Azoxystrobin/Propiconazole	Syngenta
Sercadis	Xemium	BASF
Tilt 3.6 EC	Propiconazole	Syngenta
Quilt Xcel 2.2SC	Azoxystrobin/Propiconazole	Syngenta



## 2013 DN 1 and DN 2 Trials

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** Various, 100 lb/A

**Plot Size:** 1 row x 6 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with two to four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A, and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** None

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** N/A

**Application Dates:** N/A

**Disease Ratings:** August 7-9

**Drained:** July 24

**Harvest:** N/A

**Results:** See Tables 2-9

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.

### 2013 DN 3 and DN 4 Trials

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** Various, 100 lb/A

**Plot Size:** 1 row x 6 ft

**Planting Method/Date:** Drill-seeded, May 7

**Fertilization:** Preplant 0-48-48+6 Zn, September 25; Preflood 160-0-0, June 4

**Experimental Design:** Randomized complete block design with two to four replications

**Water Management:** Flushed, May 27; Flooded June 5; Drained, August 19

**Herbicides:** Propanil 3 qt/A, May 20; Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, June 4

**Insecticides:** Dermacor seed treatment

**Fungicides:** None

**Inoculation Dates:** N/A

**Application Equipment:** N/A

**Application Dates:** N/A

**Disease Ratings:** August 26-27

**Drained:** August 19

**Harvest:** N/A

**Results:** See Tables 2-9

**Comments:** Blast and bacterial panicle blight were moderately severe; narrow brown leaf spot (*Cercospora*) was light in severity.

Table 2. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), bacterial panicle blight (BPB), and narrow brown leaf spot (NBLs) at the Rice Research Station, Crowley, LA. 2013. (Variety Trial).

Pest Name Rating Date Rating Type	SB August 7 0-9	RNB August 26 0-9	BPB August 26 0-9	NBLs August 26 0-9
Trt. Treatment No. Name				
1 Antonio	5.8d-h	5.0cde	4.8fg	2.2a-d
2 Bengal	5.4Fgh	6.0cd	6.2b-g	0.2g
3 Caffey	5.4Fgh	3.4ef	4.6g	0.0g
4 Catahoula	7.4Ab	1.4gh	5.0efg	0.4fg
5 Cheniere	6.2c-g	4.2def	4.6g	0.4fg
6 CL111	7.4Ab	5.2cde	6.8a-e	3.2a
7 CL131	7.4Ab	4.0def	6.6a-f	3.0ab
8 CL151	6.8a-d	6.8bc	6.0b-g	1.2d-g
9 CL152	6.4b-f	5.0cde	4.6g	0.8efg
10 CL161	7.6A	4.2def	6.8a-e	1.4d-g
11 CL261	6.4b-f	5.4cde	7.4abc	0.4fg
12 CLXL729	5.6e-h	0.0h	1.8h	0.0g
13 CLXL745	5.2Gh	0.0h	2.6h	0.0g
14 XL753	4.8Hi	0.0h	2.2h	0.0g
15 Colorado	6.6a-e	7.6b	6.2b-g	2.8abc
16 Cocodrie	7.0Abc	3.4ef	5.8c-g	0.6efg
17 Cypress	7.2Abc	3.4ef	7.0a-d	0.8efg
18 Della-2	6.4b-f	0.0h	5.2d-g	1.0d-g
19 Jazzman	5.6e-h	0.0h	7.2abc	1.8c-f
20 Jazzman-2	6.4b-f	0.0h	8.0a	1.0d-g
21 Jupiter	5.2Gh	0.6h	4.8fg	0.2g
22 LH10	3.8Jk	0.0h	1.6h	0.0g
23 Mermentau	6.6a-e	5.4cde	5.2d-g	1.2d-g
24 Neptune	5.2Gh	0.4h	4.8fg	0.0g
25 Roy J	4.2Ij	4.6def	5.6c-g	0.0g
26 Taggart	4.8Hi	2.8fg	5.8c-g	0.0g
27 XL723	5.6e-h	1.0h	2.4h	0.0g
28 LA2065	5.4Fgh	1.0h	6.2b-g	0.6efg
29 LA2068	5.6e-h	1.4gh	5.6c-g	0.6efg
30 LA2025	5.6e-h	0.8h	7.6ab	1.4d-g
31 LM1	5.4Fgh	4.4def	2.6h	0.2g
32 M202	6.6a-e	9.0a	4.6g	2.0b-e
33 Purple	3.2K	0.0h	0.0i	0.0g
LSD (P=.05)	0.64	1.27	1.04	0.83
Standard Deviation	0.51	1.02	0.83	0.66
CV	8.62	34.77	16.56	79.58
Replicate F	2.553	1.242	0.924	0.298
Replicate Prob(F)	0.0421	0.2963	0.4524	0.8785
Treatment F	21.743	32.733	27.055	10.082
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 3. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013.  
(URN Group I).

Character Rated	SB	RNB	BPB
Rating Date	August 7	August 26	August 26
Rating Unit	0-9	0-9	0-9
Trt Treatment			
No. Name			
1 RU9901096/ZHE 733	5.3ef	3.3c-f	7.0A
2 CPRS/KBNT//9502008-A/5/KATY/CPRS//NWB/.../3/...	6.8a-d	0.0g	5.3Ab
3 CF4-69/CCDR	6.8a-d	0.0g	5.8Ab
4 BRAZ/TBNT/3/164986-4/NV66//NTAI/4/BNGL/5/RU9201176/4/LBNT/...	6.5a-e	0.0g	6.0Ab
5 CCDR/JEFF//CFX-26/9702128	7.5a	4.8bc	5.0B
6 CPRS/CCDR	5.5def	2.0f	6.8Ab
7 LGRU//KATY/STBN/3/LGRU	5.8c-f	4.0cd	5.3Ab
8 TRNS/CL131	7.5a	4.3cd	5.3Ab
9 CPRS/9901081	6.0b-f	3.0def	7.0A
10 TMPL/ RU0401164	5.0f	4.5bcd	5.5Ab
11 DREW/CFX-18/3/CPRS/KBNT//CFX 18	6.0b-f	2.5ef	5.3Ab
12 LCSN/LGRU	7.0abc	0.0g	6.5Ab
13 811S/378R	5.5def	0.0g	3.5C
14 RSMT//3/MARS/NWRX//TBNT	6.3a-f	4.5bcd	6.8Ab
15 CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	6.8a-d	3.8cde	5.5Ab
16 CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	7.3ab	4.3cd	6.3Ab
17 CL111	7.3ab	6.0a	7.0A
18 CL151	6.5a-e	6.3a	6.3Ab
19 PRESIDIO	6.0b-f	4.5bcd	5.3Ab
20 MERMENTAU	6.3a-f	5.8ab	5.3Ab
LSD (P=.05)	0.83	0.96	1.05
Standard Deviation	0.59	0.68	0.74
CV	9.27	21.57	12.79
Replicate F	0.899	1.962	0.445
Replicate Prob(F)	0.4474	0.1300	0.7220
Treatment F	6.320	39.563	5.706
Treatment Prob(F)	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 4. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013.  
(URN Group II).

Character Rated	SB	RNB	BPB
Rating Date	August 8	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
21 M206/STG99F5-07-118//JPTR	5.3c-f	0.0e	4.0D
22 CCCR/AC919	7.8A	5.3bc	4.8Bcd
23 FRANCIS/SHU121-1655	4.8Ef	3.0d	4.5Cd
24 RU0301041/STG01L-37-069	3.8F	4.0cd	5.3a-d
25 JZMN/08CLR004//JZMN	6.0a-e	1.0e	6.5ab
26 SABR/CCDR	5.0Def	0.0e	4.5cd
27 JPTR/RU0401136//STG05AC-05-029	6.8a-d	4.5bcd	5.0bcd
28 KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//...	6.8a-d	0.0e	5.8a-d
29 CPRS/CCDR	6.3a-e	4.0cd	6.3abc
30 M206/STG02PR-01-109//JPTR	5.5b-e	0.0e	7.0a
31 9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	7.3Ab	3.0d	6.5ab
32 CCCR/L202	7.0Abc	7.0a	5.5a-d
33 CFX-18(CL161)/RSMT/3/MARS/NWRX//TBNT	6.8a-d	4.3bcd	4.8bcd
34 CPRS/KBNT//9502008-A	7.3Ab	0.0e	5.0bcd
35 8603006//3/MARS/NWRX//TBNT	6.8a-d	5.8ab	6.5ab
36 CFX-18(CL161)/PSCL	7.0Abc	4.8bcd	5.5a-d
37 JUPITER	5.8b-e	0.0e	4.3d
38 WELLS	5.0Def	3.5d	5.5a-d
39 CL162	6.8a-d	6.8a	5.8a-d
40 FRANCIS	6.0a-e	6.8a	6.5ab
LSD (P=.05)	1.10	1.12	1.05
Standard Deviation	0.78	0.79	0.74
CV	12.65	25.01	13.63
Replicate F	1.173	0.291	1.585
Replicate Prob(F)	0.3279	0.8319	0.2029
Treatment F	6.946	41.145	5.470
Treatment Prob(F)	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 5. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013. (URN Group III).

Character Rated	SB	RNB	BPB
Rating Date	August 9	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
41 STG05IMI-02-028/STG03L-10-047	6.5abc	2.8abc	4.8b-e
42 9602097/.../JAF4/.../6/CCDR/.../7/JAF4/8/FRANCIS/CLR 13	7.3a	2.5abc	6.0Abc
43 CPRS/CCDR	7.0a	3.5ab	4.5Cde
44 STG05IMI-02-021/STG05IMI-03-002	6.8ab	3.5ab	4.3De
45 9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6.8ab	0.0c	6.5A
46 CPRS/CCDR	4.8bcd	0.8bc	5.0a-e
47 STG01L-64-105/SPRN	4.5cd	0.0c	5.0a-e
48 CL131/TRNS	7.5a	0.0c	5.0a-e
49 CCDR/L202	6.5abc	1.0abc	4.3De
50 STG03L-50-045/RU0401164	4.3d	0.0c	5.3a-e
51 TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18/5/CL131	6.0a-d	2.5abc	4.8b-e
52 CPRS/CCDR	6.0a-d	4.0ab	6.0Abc
53 248CO13E-1	7.5a	4.3a	6.3Ab
54 248CO13E-1	7.3a	4.0ab	5.3a-e
55 CPRS//NWBTKATY	6.8ab	2.8abc	5.8a-d
56 TAGGART	4.8bcd	3.3ab	5.8a-d
57 REX	5.3a-d	1.3abc	5.5a-e
58 CHENIERE	5.8a-d	3.8ab	4.0E
59 COCODRIE	7.3a	1.0abc	4.8b-e
60 CL181 AR	6.5abc	2.8abc	6.5A
LSD (P=.05)	1.28	1.83	0.89
Standard Deviation	0.91	1.30	0.63
CV	14.53	59.65	11.94
Replicate F	0.583	1.594	0.933
Replicate Prob(F)	0.6283	0.2008	0.4308
Treatment F	5.270	5.489	5.826
Treatment Prob(F)	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 6. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013. (URN Group IV).

Character Rated	SB	RNB	BPB
Rating Date	August 9	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
61 TMPL/ RU0401164	4.0De	4.0bc	5.3bcd
62 CPRS/KBNT//9502008-A/3/CFX-18//CCDR/9770532 DH2	7.3A	5.8a	5.3bcd
63 CPRS/CCDR	6.6Ab	1.0ef	5.5bc
64 JES	5.3b-e	0.0f	3.0ef
65 NEPTUNE//BNGL/CL161	6.5Ab	0.0f	5.0bcd
66 SABR/CCDR	6.8Ab	0.0f	6.0abc
67 STG03L-16-028/STG03L-63-107	5.0b-e	0.0f	5.8abc
68 NEPTUNE//BNGL/CL161	5.8a-d	1.3ef	5.0bcd
69 WELLS/RONDO	5.0b-e	0.0f	3.5de
70 STG03L-16-028/STG03L-63-107	4.5Cde	0.0f	6.8ab
71 LAH10	3.8E	0.0f	2.0f
72 CPRS/NWBT//KATY/3/CCDR	6.3Abc	5.3ab	5.3bcd
73 CFX-18(CL161)/0004054	6.3Abc	2.8cd	7.3a
74 LMNT//TBNT/LA110	6.5Ab	5.8a	4.3cde
75 CPRS/CCDR	6.3Abc	3.3cd	5.0bcd
76 RU0301041/STG01L-37-069	3.5E	2.3de	6.0abc
77 RSMT//8203035/GCHW	6.3Abc	3.5cd	6.3abc
78 L201/SABR	4.5Cde	0.0f	4.8cd
79 ROY J	4.5Cde	4.3abc	4.3cde
80 CAFFEY	4.5Cde	0.0f	4.5cde
LSD (P=.05)	1.13	1.18	1.13
Standard Deviation	0.80	0.83	0.80
CV	14.7	42.74	15.87
Replicate F	0.286	2.591	1.179
Replicate Prob(F)	0.8356	0.0616	0.3257
Treatment F	7.908	27.182	9.720
Treatment Prob(F)	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 7. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB), at the Rice Research Station, Crowley, LA. 2013. (URN Group V).

Character Rated	SB	RNB	BPB
Rating Date	August 9	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
81 STG05IMI-02-028/STG03L-10-047	5.5ab	1.5de	4.5ab
82 9502008-A/DREW/3/NWBT/KATY//9902207x2/4/DREW/CLR 13	7.0ab	4.5bcd	7.5a
83 RSMT/KATY	5.0ab	4.5bcd	4.5ab
84 STG03AC-37-042(FRAN AC LINE)/RU0801076...	6.0ab	5.5b	4.0ab
85 9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	7.0ab	0.0e	6.0ab
86 CCCR/L202	6.5ab	4.5bcd	5.5ab
87 RU0801076/6/WLLS/5/LGRU//LMNT/RA73/3/LGRU/4/LGRU	5.0ab	0.0e	5.5ab
88 KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/...	6.0ab	3.5bcd	5.5ab
89 CPRS/CCDR	7.0ab	0.0e	4.5ab
90 RONDO/FRANCIS	5.5ab	0.0e	4.0ab
91 CL131/3/CPRS/KBNT//9502008-A	6.5ab	1.5de	5.0ab
92 LD 183-3/JASMINE 85	4.0b	0.0e	3.5b
93 LGRU//IRGA409/RXMT/3/CYBT/7/FRNS/6/LBNT/9902/3/DAWN/9695//...	6.0ab	4.0bcd	5.5ab
94 9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7.5a	0.0e	4.5ab
95 SIERRA/DELTABELLE	7.5a	2.0cde	4.5ab
96 STG05-IMI-02-055/STG05-IMI-01-113	6.5ab	4.0bcd	4.5ab
97 KATY/CPRS//NWBT/.../3/9502008/4/CLR 9/5/KATY/CPRS//NWBT/.../	7.0ab	0.0e	6.0ab
98 CPRS/NWBT//KATY/3/CCDR	6.5ab	4.0bcd	6.5ab
99 LGRU//LMNT/RA73/3/LGRU/4/LGRU/5/LGRU/6/RNS3/5/IR36M4/4/L201/...	6.5ab	4.0bcd	6.0ab
100 248CO13E-1	5.5ab	0.0e	6.0ab
101 RONDO/SABINE	5.5ab	5.0bc	4.0ab
102 RU0801076/FRNS ANTER CULTURE LINE	5.0ab	5.0bc	5.0ab
103 9502008-A/DREW//CLR 20/3/9502008-A/DREW//CLR 20	7.0ab	6.0b	6.5ab
104 ?/SIERRA (cross name changed)	5.0ab	5.0bc	4.5ab
105 STG04P-13-015/STG04L-28-085	6.0ab	4.0bcd	6.0ab
106 DREW/CFX-18/3/CFX-18//CCDR/9770532 DH2	6.5ab	1.5de	4.5ab
107 RONDO/FRANCIS	5.5ab	0.0e	7.0ab
108 STG01P-18-011/ RU9701151	4.0b	0.0e	6.5ab
109 CL131/CHENIERE	6.5ab	0.0e	4.5ab
110 SIERRA/DELTABELLE	7.0ab	4.0bcd	3.5b
111 STG03L-50-045/RU0401164	5.0ab	4.5bcd	7.0ab
112 CFX-18//CCDR/9770532 DH2/3/CPRS/KBNT//9502008-A	6.5ab	0.0e	7.0ab
113 CPRS/CCDR	7.5a	0.0e	5.0ab
114 CFX-18(CL 161)/0004054	4.5ab	0.0e	7.5a
115 9502008-A/TACAURI//CLR 5/3/DREW/CFX-18	7.0ab	4.5bcd	5.0ab
116 CCCR/L202	4.0b	5.0bc	4.5ab
117 JAZZMAN 2	5.0ab	0.0e	7.0ab
118 CL 142 AR	6.0ab	4.0bcd	5.5ab
119 M206	6.0ab	8.0a	5.5ab
120 CL261	6.0ab	4.5bcd	6.5ab
LSD (P=.05)	1.86	1.85	1.86
Standard Deviation	0.92	0.92	0.92
CV	15.36	35.04	17.09
Replicate F	1.788	3.356	0.940
Replicate Prob(F)	0.1889	0.0746	0.3383
Treatment F	2.258	13.078	2.867
Treatment Prob(F)	0.0063	0.0001	0.0007

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.



Table 8. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013.  
(URN Group VI).

Character Rated	SB	RNB	BPB
Rating Date	August 9	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
121 M206/STG03AC-25-109//RU0401127	4.5bc	0.0d	6.5Abc
122 IR36/8603006	7.0ab	3.5bc	6.0a-d
123 CPRS/CCDR	5.5abc	3.5bc	5.5a-d
124 STG02P-02-072/RU0502137//STG03F5-04-002	5.5abc	4.0bc	4.5b-e
125 LAH25	4.0bc	0.0d	2.0E
126 DELTABELLE//LGRU/LCSN/CF4-85	5.5abc	3.0c	4.5b-e
127 TMPL/ RU0401164	4.5bc	0.0d	7.0Ab
128 07PY823/07PY824	5.5abc	0.0d	7.0Ab
129 CPRS/CCDR	6.0abc	0.0d	4.0b-e
130 M206/STG03AC-21-047//JPTR	6.0abc	0.0d	3.5Cde
131 CCCR/JEFF/3/CPRS/KBNT//9502008-A	4.5bc	0.0d	6.5Abc
132 CPRS/9901081	6.5abc	4.0bc	5.5a-d
133 M206/STG03AC-25-109//RU0401127	5.0abc	0.0d	8.0A
134 CPRS/KBNT//9502008-A/3/CCDR	5.5abc	0.0d	6.0a-d
135 CCCR/L202	5.0abc	3.5bc	3.5Cde
136 STG05-IMI-02-055/STG05-IMI-01-113	4.5bc	4.5bc	4.0b-e
137 DREW//CHENIERE/LMNT	4.5bc	0.0d	5.5a-d
138 IR64/IR 1321-12	4.0bc	0.0d	3.0De
139 STG03L-50-045/RU0401164	4.0bc	0.0d	6.0a-d
140 DREW//CHENIERE/LMNT	5.0abc	0.0d	6.0a-d
141 CPRS/CCDR	6.0abc	0.0d	6.0a-d
142 STG05L-45-056/STG05IMI-02-055	7.0ab	5.5ab	4.0b-e
143 TRNS//CCDR/9502008-A	5.0abc	0.0d	7.0Ab
144 CCCR/L202			
145 FRANCIS/8_13(IR140//KATY/JASMINE 85)	6.5abc	6.5a	6.0a-d
146 TRNS//CCDR/9502008-A	4.5bc	5.0abc	6.0a-d
147 FRAN/WELLS	4.5bc	5.0abc	5.0a-e
148 8_2(KATY/IR140//JASMINE 85/RONDO)	5.0abc	0.0d	3.5Cde
149 CPRS/KBNT//9502008-A /3/CCDR/JEFF	7.0ab	3.5bc	7.0Ab
150 (MARS/CM101)/(LBNT_WX/RU8703190)	8.0a	5.5ab	4.0b-e
151 STG05-IMI-02-055/CL142-AR	5.0abc	1.5d	6.0a-d
152 9502008-A/DREW/3/NWBT/KATY//9902207x2/4/NWBT/ KATY//...	7.0ab	0.0d	4.5b-e
153 IR64/IR 1321-12	4.0bc	0.0d	4.0b-e
154 8804032/KATY	7.0ab	0.0d	5.5a-d
155 BNGL/9502065	3.5c	0.0d	3.5Cde
156 IR36/8603006	5.0abc	4.5bc	5.5a-d
157 8804032/KATY	7.0ab	3.5bc	7.0Ab
158 DELLA-2	5.5abc	0.0d	6.0a-d
159 ANTONIO	6.0abc	0.0d	5.0a-e
160 TEMPLETON	4.5bc	0.0d	5.5a-d
LSD (P=.05)	1.72	1.18	1.79
Standard Deviation	0.85	0.58	0.89
CV	15.75	34.13	16.85
Replicate F	1.437	1.855	1.968
Replicate Prob(F)	0.2381	0.1813	0.1687
Treatment F	3.284	28.645	4.603
Treatment Prob(F)	0.0002	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Table 9. Disease reaction of various rice varieties and experimental lines to sheath blight (SB), rotten neck blast (RNB), and bacterial panicle blight (BPB) at the Rice Research Station, Crowley, LA. 2013. (URN Group VII).

Character Rated	SB	RNB	BPB
Rating Date	August 9	August 27	August 27
Rating Type	0-9	0-9	0-9
Trt Treatment			
No. Name			
161 LGRU//IRGA409/RXMT/3/CYBT	5.5a-d	0.0f	7.0Ab
162 CL131/CHENIERE	7.0ab	0.0f	6.5Abc
163 CPRS/SABR	6.0a-d	5.0cd	3.5b-e
164 811S/352R	5.0a-d	0.0f	4.0a-e
165 CL131//DREW/CLR 13	6.5abc	3.0de	4.5a-e
166 CPRS/NWBT//KATY/3/CCDR	6.0a-d	0.0f	7.0Ab
167 341A/367R	5.5a-d	0.0f	2.5De
168 9502008-A/DREW/3/NWBT/KATY//9902207x2/4/CFX-18//CCDR/...	5.5a-d	3.5de	5.0a-e
169 SABR/CCDR	6.0a-d	0.0f	4.0a-e
170 811S/377R	4.5bcd	0.0f	4.5a-e
171 CL131/CHENIERE	7.5a	3.0de	5.5a-e
172 CPRS/NWBT//KATY/3/CCDR	5.5a-d	4.0de	4.5a-e
173 811S/376R	6.0a-d	0.0f	3.0Cde
174 CL131/CHENIERE	5.5a-d	0.0f	6.0a-d
175 AC110DH2/AC108DH2//CHEN	6.5abc	4.0de	5.0a-e
176 805S/352R	4.0cd	0.0f	2.5De
177 9502008-A/DREW//CLR 20/3/CPRS/KBNT//WELLS CFX 18	6.0a-d	3.5de	7.5A
178 RU0001081/LEMONT	6.5abc	4.5cd	6.0a-d
179 873A/190R	3.5d	0.0f	2.0E
180 9502008/3/MBLE//LMNT/20001-5/4/.../5/KATY/CPRS//NWBT/...	5.0a-d	0.0f	6.5Abc
181 043752/0047277/CHEN	5.0a-d	4.5cd	6.0a-d
182 341A/377R	3.5d	0.0f	2.0E
183 9502008-A/DREW//CLR 20/4/CPRS/KBNT//9502008-A	6.5abc	4.0de	5.5a-e
184 FRAN/LQ39a	5.0a-d	2.0ef	5.0a-e
185 810-1S/188R	4.0cd	0.0f	2.0E
186 COCODRIE/PRISCILLA	6.0a-d	4.5cd	5.0a-e
187 9502008//KATY/902207x2	6.5abc	5.5bcd	6.0a-d
188 LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS/6/19951166	5.0a-d	4.5cd	6.0a-d
189 BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/9502065/3/MERC//...	6.0a-d	0.0f	3.5b-e
190 CPRS/NWBT//KATY/3/CCDR	7.5a	5.5bcd	4.0a-e
191 RSMT/RXMT/IR36	6.5abc	7.0ab	4.0a-e
192 BNGL//MERC/RICO/3/MERC/RICO//BNGL/4/BNGL/CFX18	6.0a-d	0.0f	7.5A
193 RSMT/RXMT/IR36	6.0a-d	7.5a	4.5a-e
194 RSMT/RXMT/IR36	6.5abc	6.5abc	3.5b-e
195 RICO//PY 678/CL161	5.5a-d	3.5de	4.0a-e
196 MBLE//82CAY21/LMNT	7.0ab	4.5cd	5.5a-e
197 CHENIERE/PRESIDO	6.5abc	4.5cd	4.0a-e
198 CPRS/3/L201//TBNT/BLMT	4.0cd	0.0f	2.5De
199 RONDO	5.0a-d	0.0f	3.5b-e
200 CL152	6.0a-d	4.0de	4.5a-e
LSD (P=.05)	1.43	1.37	2.05
Standard Deviation	0.71	0.68	1.01
CV	12.43	27.5	21.83
Replicate F	0.025	1.335	1.475
Replicate Prob(F)	0.8751	0.2549	0.2318
Treatment F	3.987	26.241	4.576
Treatment Prob(F)	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## 2013 AY, CLPY, and PY Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** Various, 100 lb/A

**Plot Size:** 1 row x 6 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with two to four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** None

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** N/A

**Application Dates:** N/A

**Disease Ratings:** August 28-30

**Drained:** July 24

**Harvest:** N/A

**Results:** See Breeding section.

**Comments:** Sheath blight severity was high. Blast and bacterial panicle blight were moderately severe.

## 2013 Variety by Fungicide Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** CL152 and CL161, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various (Sercadis, Stratego, Tilt, Quadris, Quilt Xcel, and untreated check)

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3-tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
June 17	Boot	08:30	84 F	4 mph	80%	50%	Moderate
June 24	Heading	08:30	84 F	5 mph	75%	10%	Moderate

**Disease Ratings:** July 29

**Drained:** July 24

**Harvest:** August 6

**Results:** See Table 10

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.

Table 10. Effect of varietal resistance and fungicide application on sheath blight and blast development and rice yield and milling. Rice Research Station, Crowley, LA. 2013.

Description							SB	SB	Yield	Head	Total
Rating Date							July 29	July 29	August 12	September 7	September 7
Rating Unit							0-9	%	lb/A	%	%
Trt	Treatment	Form	Form	Form	Rate	Growth					
No.	Type	Name	Conc	Unit	Type	Rate	Unit	Stage			
1		CL161									
		FUNG Unsprayed									
2		CL161									
		FUNG Quilt Xcel	2.2LB/GAL	SC		21fl oz/A	B				
3		CL161									
		FUNG Sercadis	4LB/GAL	F		4.5fl oz/A	B				
4		CL161									
		FUNG Sercadis	4LB/GAL	F		4.5fl oz/A	B & H				
5		CL161									
		FUNG Quadris	4LB/GAL	SC		12fl oz/A	B				
6		CL161									
		FUNG Stratego	2.08LB/GAL	EC		19fl oz/A	B				
7		CL161									
		FUNG Tilt	3.6LB/GAL	EC		10fl oz/A	B				
8		CL161									
		FUNG Quadris	4LB/GAL	SC		12fl oz/A	B & H				
9		CL152									
		FUNG Unsprayed									
10		CL152									
		FUNG Quilt Xcel	2.2LB/GAL	SC		21fl oz/A	B				
11		CL152									
		FUNG Sercadis	4LB/GAL	F		4.5fl oz/A	B				
12		CL152									
		FUNG Sercadis	4LB/GAL	F		4.5fl oz/A	B & H				
13		CL152									
		FUNG Quadris	4LB/GAL	SC		12fl oz/A	B				
14		CL152									
		FUNG Stratego	2.08LB/GAL	EC		19fl oz/A	B				
15		CL152									
		FUNG Tilt	3.6LB/GAL	EC		10fl oz/A	B				
16		CL152									
		FUNG Quadris	4LB/GAL	SC		12fl oz/A	B & H				
LSD (P=.05)							1.02	14.5	537.6	1196.89	0.87
Standard Deviation							0.81	11.4	425.0	837.54	0.61
CV							15.51	23.97	4.43	489.06	0.84
Replicate F							1.990	4.979	1.202	1.000	2.479
Replicate Prob(F)							0.1075	0.0016	0.3195	0.4015	0.0732
Treatment F							4.999	6.238	2.437	1.000	1.186
Treatment Prob(F)							0.0001	0.0001	0.0076	0.4717	0.3169

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Jefferson Davis Variety by Fungicide Trial

**Location:** Jimmy Hoppe Farm, Fenton, LA, Jefferson Davis Parish

**Soil Type:** Crowley silt loam

**Variety/Seed Rate:** CL152 and CL161, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, March 7

**Fertilization:** Preplant 20-60-60, March 7; Preflood 120-0-0, April 29

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, March 21; Flooded, April 30; Drained, July 24

**Herbicides:** Tank-Mix RiceShot 3.5 qt/A + Londax 1.5 oz/A + Permit 1 oz/A, April 16  
Tank-Mix Clincher 25 oz/A + Crop Oil 1 qt/A, June 4

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various (Quadris, Quilt Xcel, Tilt, Stratego, Sercadis, and untreated check)

**Inoculation Dates:** All natural inoculums

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
June 14	Boot	10:30	90 F	3 mph	76%	70%	Slight
June 27	Heading	10:30	88 F	5 mph	74%	40%	Slight

**Disease Ratings:** July 26

**Drained:** July 24

**Harvest:** August 7

**Results:** See Table 11

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.

Table 11. Effect of varietal resistance and fungicide application on sheath blight development and rice yield and milling. Jimmy Hoppe Farm, Fenton, LA. 2013.

Description Rating Date Rating Type							SB July 26 0-9	NBLS July 26 0-9	LS July 26 0-9	Yield August 7 lb/A	Head August 22 %	Total August 22 %
Trt No.	Treatment Type	Form Name	Form Conc	Form Unit	Form Type	Rate Rate Unit	Growth Stage					
1	CL161 FUNG Unsprayed							4.8a	3.3a	2.8a	9910a	70.7A
2	CL161 FUNG Quilt Xcel		2.2LB/GAL	SC		21fl oz/A B		3.8b	1.8bcd	1.3b	9954a	70.8A
3	CL161 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A B		3.3bc	2.0a-d	0.8b	9704a	70.1A
4	CL161 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A B & H		2.5c	1.3cd	0.5b	10060a	70.9A
5	CL161 FUNG Quadris		4LB/GAL	SC		12fl oz/A B		3.0bc	2.5abc	1.5ab	9927a	70.6A
6	CL161 FUNG Stratego		2.08LB/GAL	EC		19fl oz/A B		3.8b	1.8bcd	1.5ab	10297a	70.3A
7	CL161 FUNG Tilt		3.6LB/GAL	EC		10fl oz/A B		3.5bc	2.0a-d	1.5ab	10385a	70.8A
8	CL161 FUNG Quadris		4LB/GAL	SC		12fl oz/A B & H		2.5c	2.0a-d	1.3b	10156a	70.2A
9	CL152 FUNG Unsprayed							3.5bc	2.8ab	2.8a	10632a	70.6A
10	CL152 FUNG Quilt Xcel		2.2LB/GAL	SC		21fl oz/A B		2.5c	1.0d	0.8b	10666a	69.9A
11	CL152 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A B		2.3c	0.8d	0.0b	10244a	62.5a
12	CL152 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A B & H		2.5c	1.5bcd	0.8b	10275a	63.3a
13	CL152 FUNG Quadris		4LB/GAL	SC		12fl oz/A B		2.3c	1.8bcd	1.0b	9974a	64.6a
14	CL152 FUNG Stratego		2.08LB/GAL	EC		19fl oz/A B		3.3bc	1.3cd	1.0b	10068a	64.8a
15	CL152 FUNG Tilt		3.6LB/GAL	EC		10fl oz/A B		3.5bc	1.3cd	0.8b	10028a	63.9a
16	CL152 FUNG Quadris		4LB/GAL	SC		12fl oz/A B & H		2.3c	2.0a-d	1.3b	10400a	64.0a
LSD (P=.05)								0.73	0.85	0.90	707.4	2.38
Standard Deviation								0.51	0.59	0.63	332.0	1.12
CV								16.69	33.01	52.5	3.27	1.74
Replicate F								1.596	0.874	2.337	1.859	2.620
Replicate Prob(F)								0.2036	0.4618	0.0863	0.1929	0.1264
Treatment F								7.851	4.854	5.282	1.286	1.075
Treatment Prob(F)								0.0001	0.0001	0.0001	0.3162	0.4452
												0.6881

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Variety by Fungicide – Yield Loss Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** CL151, CL152, Caffey, Catahoula, and Mermentau, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various (Sercadis, Quadris, and untreated check)

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<u>Growth Stage</u>	<u>Time</u>	<u>Temp</u>	<u>Wind</u>	<u>RH</u>	<u>Clouds</u>	<u>Dew</u>
June 13	Boot	08:00	82 F	4 mph	79%	10%	Moderate

**Disease Ratings:** July 29

**Drained:** July 24

**Harvest:** August 6

**Results:** See Table 12

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.



Table 12. Effect of varietal resistance and fungicide application on sheath blight and blast development and rice yield and milling. Rice Research Station, Crowley, LA. 2013.

Description Rating Date Rating Type								SB July 29 0-9	SB July 29 %	Yield August 6 lb/A	Head September 9 %	Total September 9 %
Trt No.	Treatment Type	Form Name	Form Conc	Form Unit	Form Type	Rate RateUnit	Growth Stage					
1	CL151 FUNG Uninocuated							5.0bcd	30.2c-f	11391 ab	61.4a	69.2a
2	CL151 FUNG Unsprayed							6.0abc	44.6bc	11043 a-d	60.2a	68.6a
3	CL151 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A	B	4.6b-e	30.8c-f	10645 a-d	59.6a	68.5a
4	CL151 FUNG Quadris		4LB/GAL	SC		12fl oz/A	B	3.4de	15.6ef	11648 a	60.8a	69.2a
5	CL152 FUNG Uninocuated							5.0bcd	28.6c-f	10110 cde	62.5a	69.6a
6	CL152 FUNG Unsprayed							6.0abc	52.0ab	9882 de	62.8a	70.1a
7	CL152 FUNG Sercadis		4LB/GAL	F		4.5fl oz/A	B	5.8abc	45.0bc	9443 e	61.6a	68.8a
8	CL152 FUNG Quadris		4LB/GAL	SC		12fl oz/A	B	4.0cde	22.2def	9894 de	62.5a	69.5a
9	Mermantau FUNG Uninocuated							4.0cde	18.0ef	10846 a-d	62.6a	70.2a
10	Mermantau FUNG Unsprayed							6.2ab	42.8bcd	10568 a-d	62.2a	69.6a
11	Mermantau FUNG Sercadis		4LB/GAL	F		4.5fl oz/A	B	5.0bcd	33.0b-e	10985 a-d	61.9a	69.7a
12	Mermantau FUNG Quadris		4LB/GAL	SC		12fl oz/A	B	3.6de	18.0ef	11311 abc	62.6a	69.8a
13	Caffey FUNG Uninocuated							3.2de	11.8ef	11161 abc	61.5a	67.9a
14	Caffey FUNG Unsprayed							4.6b-e	32.0b-f	11327 abc	61.9a	68.2a
15	Caffey FUNG Sercadis		4LB/GAL	F		4.5fl oz/A	B	2.8e	12.6ef	10924 a-d	61.5a	68.0a
16	Caffey FUNG Quadris		4LB/GAL	SC		12fl oz/A	B	2.8e	10.0f	11491 ab	62.0a	67.9a
17	Catahoula FUNG Uninocuated							4.8bcd	32.4b-e	10619 a-d	60.7a	69.9a
18	Catahoula FUNG Unsprayed							7.0a	64.8a	10151 cde	60.7a	69.7a
19	Catahoula FUNG Sercadis		4LB/GAL	F		4.5fl oz/A	B	5.8abc	41.4bcd	10319 b-e	62.0a	70.2a
20	Catahoula FUNG Quadris		4LB/GAL	SC		12fl oz/A	B	4.4b-e	23.2def	11211 abc	62.3a	70.4a
LSD (P=.05)								1.17	13.05	704.3	2.53	1.4646
Standard Deviation								0.92	10.32	556.8	1.79	1.0356
CV								19.66	33.88	5.18	2.9	1.49
Replicate F								1.376	1.192	8.128	41.633	66.175
Replicate Prob(F)								0.2502	0.3213	0.0001	0.0001	0.0001
Treatment F								8.345	10.089	6.099	0.951	2.529
Treatment Prob(F)								0.0001	0.0001	0.0001	0.5275	0.0036

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Sheath Blight Fungicide Trial (SB2-B)

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** CL111, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3-tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
June 10	Early Boot	11:00	87 F	2 mph	79%	80%	Slight
June 19	Boot	11:00	81 F	2 mph	85%	100%	Heavy

**Disease Ratings:** July 26

**Drained:** July 24

**Harvest:** August 6

**Results:** See Table 13

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.

Table 13. Effect of fungicide application on sheath blight and blast development and rice yield and milling.  
Rice Research Station, Crowley, LA. 2013.

Description							SB	SB	Weight	Head	Total
Rating Date							July 26	July 26	August 9	August 20	August 20
Rating Type							Severity	Infest	Yield	MILWHO	MILTOT
Rating Unit							0-9	%	lb/A	%	%
Trt	Treatment	Form	Form	Form	Rate	Growth					
No.	Type	Name	Conc	Unit	Type	Rate	Unit	Stage			
1		Untreated									
		Ck									

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

### 2013 Sheath Blight Fungicide Trial (SB3-B)

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** Mermentau, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, March 15

**Fertilization:** Preplant 0-66-66+8 Zn, September 25; Preflood 150-0-0, May 7; Topdress 46-0-0, June 3

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, March 25; Flooded, May 8; Drained, July 24

**Herbicides:** Tank-Mix Propanil 4 qt/A, Londax 1 oz/A and Permit ½ oz/A, April 18  
Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, May 6

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various

**Inoculation Dates:** *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 29

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
June 10	Early Boot	11:00	87 F	2 mph	79%	80%	Slight
June 18	Boot	08:30	83 F	5 mph	80%	30%	Moderate

**Disease Ratings:** July 26

**Drained:** July 24

**Harvest:** August 6

**Results:** See Table 14

**Comments:** Sheath blight was moderate in severity. No other significant diseases developed.

Table 14. Effect of fungicide application on sheath blight and blast development and rice yield and milling.  
Rice Research Station, Crowley, LA. 2013.

Description							SB	SB	Weight	Head	Total
Rating Date							July 26	July 26	August 9	August 21	August 21
Rating Type							Severity	Infest	Yield	MILWHO	MILTOT
Rating Unit							0-9	%	lb/A	%	%
Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate Unit	Growth Stage					
1	Unsprayed ck						6.8a	78.5a	10035b	63.6a	70.4A
2	Convoy	3.8LB/GAL	EC		23.6fl oz/A B		6.0ab	60.3b	10575ab	64.7a	70.7A
3	Convoy	3.8LB/GAL	EC		33.7fl oz/A B		5.5b	45.5bc	10732ab	65.1a	71.0A
4	Convoy	3.8LB/GAL	EC		13fl oz/A B		5.3b	44.0bc	10694ab	65.2a	70.6A
	Quadris	2.08LB/GAL	SC		12fl oz/A B						
	Bumper	3.6LB/GAL	EC		6fl oz/A B						
5	Artisan	3.6LB/GAL	SC		42.7fl oz/A B		5.0b	44.3bc	10629ab	64.2a	70.7A
6	Convoy	3.8LB/GAL	EC		13fl oz/A B		5.5b	50.3bc	11034a	64.8a	70.8A
	Stratego	2.08LB/GAL	EC		19fl oz/A B						
7	Convoy	3.8LB/GAL	EC		23.6fl oz/A EB		4.3c	35.3c	10956a	64.7a	71.2A
	Convoy	3.8LB/GAL	EC		23.6fl oz/A B						
8	Quilt Xcel	2.2LB/GAL	SE		21fl oz/A B		5.3b	42.3bc	11033a	63.8a	70.4A
9	Stratego	2.08LB/GAL	EC		19fl oz/A B		6.0ab	56.5bc	10703ab	64.9a	71.1A
10	Sercadis	2.47LB/GAL	SC		6.8fl oz/A B		5.3b	43.5bc	10697ab	65.4a	70.9A
LSD (P=.05)							0.70	14.27	539.4	1.60	0.85
Standard Deviation							0.48	9.83	371.8	1.10	0.58
CV							8.81	19.65	3.47	1.71	0.82
Replicate F							2.116	3.277	2.122	9.167	1.787
Replicate Prob(F)							0.1216	0.0362	0.1209	0.0002	0.1734
Treatment F							7.757	6.294	2.415	1.147	0.865
Treatment Prob(F)							0.0001	0.0001	0.0370	0.3663	0.5663

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Blast Management Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** CL151, CL152, CL261, Caffey, Catahoula, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, May 7

**Fertilization:** Preplant 0-48-48+6 Zn, September 25; Preflood 160-0-0, June 4

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, May 27; Flooded June 5; Drained, August 19

**Herbicides:** Propanil 3 qt/A, May 20; Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, June 4

**Insecticides:** Dermacor seed treatment

**Fungicides:** Gem and untreated check

**Inoculation Dates:** Natural inoculum

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3-tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
July 15	Boot	15:00	81 F	1 mph	82%	100%	Slight
July 29	Heading	09:00	89 F	1 mph	74%	30%	Mod.

**Disease Ratings:** August 19

**Drained:** August 19

**Harvest:** September 3

**Results:** See Table 15

**Comments:** Blast was moderate in severity. No other significant diseases developed.

Table 15. Effect of varietal resistance and fungicide application on sheath blight and blast development and rice yield and milling. Rice Research Station, Crowley, LA. 2013.

Description								RNB	Weight	Head	Total
Rating Date								August 19	September 5	September 17	September 17
Rating Type								Infest	Yield	Milling	Milling
Rating Unit								%	lb/A	%	%
Trt	Treatment	Form	Form	Form	Rate	Growth					
No.	Type	Name	Conc	Unit	Type	Rate	Unit	Stage			
1	Catahoula										
	FUNG Unsprayed							1.0def	7565c-f	52.5cde	69.2ab
2	Catahoula							1.0def	8165cde	54.0bcd	69.5a
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	H					
3	Catahoula							1.6def	8464bcd	51.0de	69.6a
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	B & H					
4	Caffery							0.9def	8717bcd	59.1abc	67.4abc
	FUNG Unsprayed										
5	Caffery							0.6ef	9643ab	55.5a-d	65.5cd
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	H					
6	Caffery							0.7ef	9943a	58.7abc	67.4abc
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	B & H					
7	CL152							4.0cd	6978ef	47.8e	64.4d
	FUNG Unsprayed										
8	CL152							2.2def	7792c-f	56.9a-d	67.6abc
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	H					
9	CL152							0.4f	7600c-f	53.6bcd	66.7bcd
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	B & H					
10	Cheniere							19.3ab	7950c-f	54.1bcd	68.0abc
	FUNG Unsprayed										
11	Cheniere							3.4cde	8622bcd	52.7cde	66.2cd
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	H					
12	Cheniere							2.1def	8977abc	55.1a-d	66.7bcd
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	B & H					
13	CL261							26.7a	6519f	57.3a-d	66.6bcd
	FUNG Unsprayed										
14	CL261							12.7ab	7391def	61.1a	67.5abc
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	H					
15	CL261							8.0bc	7944c-f	59.6ab	67.6abc
	FUNG GEM	4.17LBA/GAL	SC		4.7fl oz/A	B & H					
LSD (P=.05)								0.29t	909.5	4.0	1.5
Standard Deviation								0.21t	636.4	2.8	1.10
CV								34.17	7.81	5.08	1.65
Replicate F								2.983	2.350	10.4	2.0
Replicate Prob(F)								0.0419	0.0861	0.0001	0.1165
Treatment F								16.680	8.633	6.547	6.513
Treatment Prob(F)								0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Blast 1 Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** M202, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, May 7

**Fertilization:** Preplant 0-48-48+6 Zn, September 25; Preflood 160-0-0, June 4

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, May 27; Flooded June 5; Drained, August 19

**Herbicides:** Propanil 3 qt/A, May 20; Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, June 4

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various (Beam, Gem, Quadris, Quilt Excel, Stratego and untreated check)

**Inoculation Dates:** Natural inoculum

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3-tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
July 16	Boot	10:30	85 F	4 mph	76%	75%	Slight
July 22	Heading	09:00	86 F	6 mph	75%	70%	Mod.

**Disease Ratings:** August 15

**Drained:** August 19

**Harvest:** September 3

**Results:** See Table 16

**Comments:** Blast was severe in severity. Plant stands were erratic. No other significant diseases developed.



Table 16. Effect of fungicide application on blast development and rice yield and milling. Rice Research Station, Crowley, LA. 2013.

Description							RNB	Yield	Head	Total
Rating Date							August 15	September 4	September 11	September 11
Rating Type							%	lb/A	%	%
Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Unit	Growth Stage				
1	Untreated Check						94.0a	3367b	46.1a	64.8a
2	Stratego	2.08LB/GAL	SC		19fl oz/A	H	63.8b	4534ab	46.6a	64.6a
3	Stratego	2.08LB/GAL	SC		19fl oz/A	B	29.5f	5483a	49.6a	65.8a
	Stratego	2.08LB/GAL	SC		19fl oz/A	H				
4	Stratego	2.08LB/GAL	SC		19fl oz/A	H	40.3c-f	4331ab	43.8a	64.8a
	GEM	4.17LB/GAL	SC		2fl oz/A	H				
5	Quadris	2.08LB/GAL	SC		12fl oz/A	H	42.8c-f	4220ab	43.7a	65.3a
6	Quadris	2.08LB/GAL	SC		12fl oz/A	B	43.0c-f	5271a	49.1a	66.2a
	Quadris	2.08LB/GAL	SC		12fl oz/A	H				
7	Beam	75%W/W	WP		8.5oz wt/A	H	53.0b-e	4808ab	46.9a	65.1a
8	Beam	75%W/W	WP		4.25oz wt/A	B	48.8b-f	4738ab	46.8a	65.3a
	Beam	75%W/W	WP		4.25oz wt/A	H				
9	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	H	59.0bc	4882ab	46.0a	65.6a
10	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	B	33.0ef	4782ab	47.2a	65.0a
	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	H				
11	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	B	33.3ef	5526a	48.0a	65.0a
	Quadris	2.08LB/GAL	SC		12fl oz/A	H				
12	Beam	75%W/W	WP		6oz wt/A	H	53.8bcd	4789ab	47.6a	66.0a
13	GEM	4.17LB/GAL	SC		4.7fl oz/A	H	47.0b-f	5336a	48.1a	66.1a
14	GEM	4.17LB/GAL	SC		4.7fl oz/A	B	36.5def	5603a	48.0a	65.6a
	GEM	4.17LB/GAL	SC		4.7fl oz/A	H				
LSD (P=.05)							12.36	0.1t	5.58	1.67
Standard Deviation							8.65	0.1t	3.90	1.17
CV							17.88	1.95	8.31	1.79
Replicate F							0.656	0.359	3.194	6.941
Replicate Prob(F)							0.5843	0.7831	0.0339	0.0007
Treatment F							14.684	2.670	0.766	0.778
Treatment Prob(F)							0.0001	0.0089	0.6892	0.6773

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

## 2013 Blast 2 Trial

**Location:** Rice Research Station, Crowley, LA

**Soil Type:** Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 /kg)

**Variety/Seed Rate:** CL151, 100 lb/A

**Plot Size:** 4 x 16 ft

**Planting Method/Date:** Drill-seeded, May 7

**Fertilization:** Preplant 0-48-48+6 Zn, September 25; Preflood 160-0-0, June 4

**Experimental Design:** Randomized complete block design with four replications

**Water Management:** Flushed, May 27; Flooded June 5; Drained, August 19

**Herbicides:** Propanil 3 qt/A, May 20; Tank-Mix RiceBeaux 3 qt/A and Acumen EC 2.4 pt/A, June 4

**Insecticides:** Dermacor seed treatment

**Fungicides:** Various (Beam, Gem, Quadris, Quilt Excel, Stratego, and untreated check)

**Inoculation Dates:** Natural inoculum

**Application Equipment:** CO<sub>2</sub> backpack sprayer, 3-tip (TJ8002) hand wand, 20 gal/A

<b><u>Application Dates:</u></b>	<b><u>Growth Stage</u></b>	<b><u>Time</u></b>	<b><u>Temp</u></b>	<b><u>Wind</u></b>	<b><u>RH</u></b>	<b><u>Clouds</u></b>	<b><u>Dew</u></b>
July 18	Boot	08:30	84 F	1 mph	74%	10%	Mod.
July 29	Heading	10:00	89 F	2 mph	74%	35%	Slight

**Disease Ratings:** August 18

**Drained:** August 19

**Harvest:** September 3

**Results:** See Table 17

**Comments:** Blast was moderate in severity. No other significant diseases developed.

Table 17. Effect of fungicide application on blast development and rice yield and milling. Rice Research Station, Crowley, LA. 2013.

Description Rating Date Rating Type							RNB August 18 %	Yield September 3 lb/A	Head September 13 %	Total September 13 %
Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Growth Unit Stage				
1	Untreated Check						35.9a	6898a	58.6a	68.8a
2	Stratego	2.08LB/GAL	SC		19fl oz/A	H	17.1b	7165a	58.2a	68.6a
3	Stratego	2.08LB/GAL	SC		19fl oz/A	B	9.9b	7753a	60.0a	68.9a
	Stratego	2.08LB/GAL	SC		19fl oz/A	H				
4	Stratego	2.08LB/GAL	SC		19fl oz/A	H	12.3b	7875a	60.0a	68.5a
	GEM	4.17LB/GAL	SC		2fl oz/A	H				
5	Quadris	2.08LB/GAL	SC		12fl oz/A	H	17.2b	7800a	58.5a	69.1a
6	Quadris	2.08LB/GAL	SC		12fl oz/A	B	16.2b	7848a	60.2a	69.1a
	Quadris	2.08LB/GAL	SC		12fl oz/A	H				
7	Beam	75%W/W	WP		8.5oz wt/A	H	11.5b	7727a	59.8a	69.1a
8	Beam	75%W/W	WP		4.25oz wt/A	B	10.5b	8110a	60.4a	69.6a
	Beam	75%W/W	WP		4.25oz wt/A	H				
9	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	H	13.8b	7729a	60.2a	69.2a
10	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	B	11.5b	7757a	60.3a	69.1a
	Quilt Excel	2.2LB/GAL	SC		21fl oz/a	H				
11	Quilt Excel	2.2LB/GAL	SC		21fl oz/A	B	14.1b	7507a	58.2a	68.2a
	Quadris	2.08LB/GAL	SC		12fl oz/A	H				
12	Beam	75%W/W	WP		6oz wt/A	H	15.3b	7233a	58.6a	68.6a
13	GEM	4.17LB/GAL	SC		4.7fl oz/A	H	8.6b	7658a	59.2a	69.1a
14	GEM	4.17LB/GAL	SC		4.7fl oz/a	B	7.6b	7750a	59.8a	68.7a
	GEM	4.17LB/GAL	SC		4.7fl oz/A	H				
LSD (P=.05)							1.11t	1038.9	2.77	1.34
Standard Deviation							0.78t	727.0	1.94	0.94
CV							20.59	9.53	3.26	1.36
Replicate F							0.303	2.975	1.143	0.988
Replicate Prob(F)							0.8233	0.0433	0.3439	0.4085
Treatment F							3.947	0.790	0.748	0.602
Treatment Prob(F)							0.0004	0.6654	0.7062	0.8371

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

# GENETIC MAPPING AND BREEDING OF RICE TO IMPROVE RICE DISEASE RESISTANCE TO BACTERIAL PANICLE BLIGHT AND SHEATH BLIGHT

J.H. Ham, B.K. Shrestha, H.S. Karki, S. Osti, and D.E. Groth

## Introduction

Significant economic losses caused by sheath blight (SB) and bacterial panicle blight (BPB) are recurring problems in rice production in Louisiana and other rice-growing states. There are few rice varieties showing strong resistance to these diseases as well as other commercial merits. Fungicide application for SB control is costly and fungicide-resistant isolates of the SB pathogen, *Rhizoctonia solani*, were recently found in Louisiana, indicating the potential limitation of fungicide usage for SB control. BPB is caused by the bacterial pathogens *Burkholderia glumae* and *B. gladioli*. An effective control method for this disease is not available in the U.S. Through this project, continuous efforts are being made to develop new disease-resistant rice varieties/lines and chemical/biological control methods for effectively controlling SB and BPB as well as other major rice diseases. Genetic and genomic studies of rice are also being studied for better understanding of the genetic backgrounds underpinning the broad-spectrum rice resistance to BPB and SB. The medium-grain variety, Jupiter, and the long-grain line, LM-1, are used as major genetic sources of disease resistance to BPB and SB in this project.

## Progress

For genetic mapping of the loci associated with the partial disease resistance to SB and BPB, Jupiter and LM-1 were crossed with the disease-susceptible varieties, Trenasse and Bengal. Four mapping populations from different cross combinations have been developed, and each mapping population contains 300 F<sub>6</sub> recombinant inbred lines (RILs). Among the four mapping populations developed, two mapping populations from Trenasse/Jupiter and LM-1/Bengal cross combinations have been examined for their phenotypes in disease resistance to SB and BPB as well as plant height, days to heading, flag leaf size, and panicle length/shape (Tables 1 and 2). Two hundred and fifty RILs of the mapping population from the Trenasse/Jupiter cross had been tested for their genotypes of 48 polymorphic simple sequence repeat (SSR) markers. Of the mapping population from the LM-1/Bengal cross, 70 RILs had been tested for their genotypes for 20 polymorphic SSR markers. Genetic linkage mapping based on the genotypic and phenotypic traits of the RILs is being conducted using the mapping software, MapMaker/QTL1.1.

For developing new disease-resistant lines, more than 3,000 progeny lines derived from various crosses between two resistant (Jupiter and LM-1) and three susceptible (Trenasse, Bengal, and Cocodrie) genotypes had been tested in terms of disease resistance to SB and BPB. At least 12 progeny lines have shown good disease resistance traits for SB and/or BPB for three consecutive years. Among these lines, LB-33, which is superior to both of its parents (LM-1 and Bengal) in disease resistance and yield, was sent to the Rice Research Station this year for analysis of its grains in terms of biochemical traits and quality. According to the analysis, the grains of LB-33 have 16.4% of apparent amylose content and show the 'Toro' cooking characteristics.

The whole genome sequence of Jupiter, Trenasse, Bengal, LM-1, and Lemont (the parent of LM-1) was obtained using a high-throughput sequencing technology and is being analyzed to design new molecular markers based on single nucleotide polymorphisms (SNPs) between parental genotypes for fine genetic mapping of the genes associated with the rice disease resistance. Week-old rice seedlings of Jupiter and LM-1 (partial resistant to BPB and SB), Trenasse and Bengal (susceptible to BPB and SB), and Lemont (the parental variety of LM-1) were used for preparation of DNA samples to be sequenced at the Virginia Bioinformatics Institute (VBI) Core Lab. About 40 million of the paired-end reads from each variety/line were obtained from the sequencing facility and processed for identification of candidate markers, using the software package, DNASTAR (Madison, WI). About 2 million of the single nucleotide polymorphisms (SNPs) were initially identified from the sequence analysis, and out of these SNPs, 685 non-synonymous and 603 synonymous SNPs were further screened.

All of the SNPs screened had read depths equal to or greater than 8 and minimum Q values of 20. For validation of these screened SNPs, 24 sets of allele-specific (AS) SNP primers (2 sets per chromosome) with PCR product ranges between 250-300 were designed using WebSNAPER. Each reaction of PCR contained 18 µl of sterilized ddH<sub>2</sub>O, 2.5 µl of 10X PCR buffer, 0.75 µl of 50mM MgCl<sub>2</sub>, 0.5 µl of 10mM dNTP mix, 1 µl of home-made *Taq* polymerase (~1.0U/µl), 1.25 µl of 10 µM forward and reverse primers, and 1 µl of ~50 ng/µl of genomic DNA. The

PCR program used was the initial denaturation (95°C, 3 min); 33 cycles of denaturation (95°C, 20 sec), annealing (70°C, 20 sec), and extension (72°C, 20 sec); and the final extension (72°C, 3 min).

In this validation test, 11 out of the 24 sets of AS SNP markers tested confirmed polymorphism between Jupiter and Trenasse. Of the remaining 13 AS SNP markers, six did not show polymorphism and seven did not yield PCR products. In addition to the SNP markers, microsatellite markers were also developed using the sequence data of Jupiter and Trenasse. Around 50,000 SSR motifs were identified from the sequence data of Trenasse and Jupiter, and they are being used to identify polymorphic SSR markers that can be used for genetic mapping of quantitative trait locus (QTL) associated with the disease resistance to BPB and SB in Jupiter.

Table 1. Phenotypic traits of the recombinant inbred lines (RILs) from Trenasse and Jupiter.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6001</b>	87.5	117	6.5	1.5	2	85.67	19.33	35.48	2
<b>TJF6002</b>	83	109.5	7	4.5	4.5	99.00	22.00	30.47	1
<b>TJF6003</b>	83	112	4	4.5	3	102.33	19.67	40.04	2
<b>TJF6004</b>	99.5	114	5.5	4	3	93.33	16.67	31.56	1
<b>TJF6005</b>	85	111.5	6.5	2.5	4.5	99.67	18.67	34.62	1
<b>TJF6006</b>	74	109	9	7.5	8.5	97.67	18.00	25.80	2
<b>TJF6007</b>	79	111.5	5.5	6	8	98.33	20.00	30.14	2
<b>TJF6008</b>	77.5	113.5	6	5.5	9	99.33	22.00	27.09	1
<b>TJF6009</b>	75.5	112	7	4	9	102.33	20.33	21.37	1
<b>TJF6010</b>	76	113.5	6.5	6	8.5	99.33	19.67	28.45	2
<b>TJF6011</b>	87	115.5	5.5	4.5	4	87.33	18.33	36.54	1
<b>TJF6012</b>	85	114	7	5.5	5.5	101.33	22.00	37.33	1
<b>TJF6013</b>	87	112	5	5	4	97.33	19.00	28.74	1
<b>TJF6014</b>	88	114	5.5	5	3	96.00	22.33	31.98	1
<b>TJF6015</b>	87.5	114	5.5	8	4.5	80.33	18.33	28.18	1
<b>TJF6016</b>	86	115.5	5.5	3.5	1.5	94.67	17.67	33.17	1
<b>TJF6017</b>	83	114	5	3	7.5	92.33	18.67	31.93	3
<b>TJF6018</b>	80	110	5	6.5	8.5	92.00	20.33	23.83	2
<b>TJF6019</b>	89.5	123.5	4	2	0	95.00	19.33	24.72	1
<b>TJF6020</b>	76	110	5.5	7	9	91.33	19.00	33.79	1
<b>TJF6021</b>	87	114	5.5	3	1	93.33	20.00	18.27	1
<b>TJF6022</b>	80	109.5	5.5	8	9	92.33	21.00	21.20	1
<b>TJF6023</b>	79	110	6	7	9	99.00	22.67	20.04	1
<b>TJF6024</b>	77.5	110	4.5	4	8.5	100.67	19.67	34.30	1
<b>TJF6025</b>	80	109	5	7	7	96.33	22.00	19.36	2
<b>TJF6026</b>	76	109	8	8	7.5	90.00	17.33	21.71	1
<b>TJF6027</b>	79	109	8	6.5	8.5	89.67	19.00	35.91	2
<b>TJF6028</b>	78	109	6	8	8.5	95.67	20.00	29.62	1
<b>TJF6029</b>	76	109.5	7	8.5	8.5	95.00	20.00	44.23	1
<b>TJF6030</b>	87	119.5	7	3	1.5	107.33	19.67	24.59	1
<b>TJF6031</b>	85.5	114	8	5.5	3	94.67	17.00	20.22	1
<b>TJF6032</b>	78.5	109.5	6.5	7.5	6.5	90.67	18.67	21.62	2
<b>TJF6033</b>	83	109.5	7	7	7.5	96.00	20.67	41.86	1
<b>TJF6034</b>	84.5	115.5	7.5	4.5	2.5	98.00	19.33	27.27	1
<b>TJF6035</b>	81	114	7	4.5	4.5	92.33	21.00	23.26	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6036</b>	81	110	7	5	6	102.67	20.67	24.99	1
<b>TJF6037</b>	84	109.5	6.5	4.5	5.5	105.33	20.67	24.09	1
<b>TJF6038</b>	87.5	117	5.5	5.5	1.5	88.00	19.67	33.07	1
<b>TJF6039</b>	76	109.5	7	3.5	6	97.33	20.00	33.39	2
<b>TJF6040</b>	87.5	112	5	5	1	89.67	18.67	28.42	1
<b>TJF6041</b>	85.5	118	8	1.5	5.5	94.33	18.33	26.40	1
<b>TJF6042</b>	76	114	8	7	8	90.00	21.00	25.53	1
<b>TJF6043</b>	76	109	8.5	8	8	100.33	18.33	23.30	1
<b>TJF6044</b>	87	119	6.5	2	2.5	93.33	20.00	31.21	1
<b>TJF6045</b>	86	114	7.5	5.5	5	102.33	19.67	33.44	1
<b>TJF6046</b>	83.5	114	7	7.5	5.5	87.67	18.33	35.45	1
<b>TJF6047</b>	88	115.5	6.5	2.5	2.5	91.33	20.33	36.33	1
<b>TJF6048</b>	76	109.5	7.5	8	8.5	90.67	20.00	30.57	1
<b>TJF6049</b>	76	112	5.5	5.5	8	83.67	20.33	30.42	1
<b>TJF6050</b>	78.5	109.5	6.5	5.5	9	92.67	21.67	29.95	2
<b>TJF6051</b>	79	114	6.5	6	7.5	96.33	17.67	35.07	1
<b>TJF6052</b>	75.5	109.5	5.5	8	8.5	100.00	21.00	23.58	1
<b>TJF6053</b>	79.5	109.5	7.5	8.5	7.5	96.00	20.33	27.95	1
<b>TJF6054</b>	78.5	113	7	7.5	6	99.67	22.00	34.48	2
<b>TJF6055</b>	79	110	6.5	5	6	87.67	18.33	28.09	1
<b>TJF6056</b>	83	117	6	4	5.5	89.33	20.67	29.26	1
<b>TJF6057</b>	88.5	124	7	5.5	1.5	79.67	17.33	36.89	1
<b>TJF6058</b>	86.5	119.5	5.5	4	1.5	82.33	19.33	26.40	1
<b>TJF6059</b>	78.5	107	5	5.5	6	94.00	18.67	32.57	3
<b>TJF6060</b>	78.5	115.5	6.5	4	6.5	92.33	19.33	34.16	1
<b>TJF6061</b>	75	109.5	6	8	7.5	90.67	18.33	29.22	1
<b>TJF6062</b>	79.5	117	6.5	3	8	95.00	21.67	34.89	1
<b>TJF6063</b>	87.5	120	5.5	4.5	2	95.33	19.67	35.61	2
<b>TJF6064</b>	78.5	112	6	6.5	9	84.67	19.33	30.58	1
<b>TJF6065</b>	76	110	6	8.5	9	91.00	20.33	39.38	1
<b>TJF6066</b>	76	114	8.5	7.5	7.5	75.00	16.00	28.80	3
<b>TJF6067</b>	79	112	7.5	6	5.5	92.67	16.67	28.70	3
<b>TJF6068</b>	86	114	5	5	4	95.33	19.00	52.86	2
<b>TJF6069</b>	84	114	5	6.5	4	95.33	19.00	49.23	1
<b>TJF6070</b>	76	115.5	4.5	3	8.5	106.33	22.33	47.06	2

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6071</b>	76	112	7	6.5	9	95.33	22.00	26.14	3
<b>TJF6072</b>	76	110	7	7.5	9	86.33	18.33	20.20	2
<b>TJF6073</b>	82	114	4.5	6.5	4.5	100.00	20.67	27.74	1
<b>TJF6074</b>	86	109.5	7	7	3.5	92.67	20.33	29.34	1
<b>TJF6075</b>	79	114	5	4	8	85.33	21.00	27.82	1
<b>TJF6076</b>	86.5	114	7	4	5.5	85.67	17.67	25.05	1
<b>TJF6077</b>	75	109	6.5	6.5	9	88.00	19.67	33.92	2
<b>TJF6078</b>	80	114	7	6.5	7	80.33	19.33	24.06	1
<b>TJF6079</b>	85.5	114	6.5	6.5	7	83.33	22.33	26.50	1
<b>TJF6080</b>	78.5	112	8.5	8.5	9	86.33	16.67	16.11	1
<b>TJF6081</b>	84.5	122	4	3.5	5.5	79.67	17.33	24.40	1
<b>TJF6082</b>	85.5	114	6.5	6	6.5	92.67	20.67	32.89	1
<b>TJF6083</b>	79	116.5	8	7	8	82.67	21.67	37.31	1
<b>TJF6084</b>	84.5	115.5	8	6.5	6	88.67	22.00	22.74	3
<b>TJF6085</b>	79	111.5	8.5	6	5.5	85.33	19.67	29.94	1
<b>TJF6086</b>	76	109	7	7.5	9	86.33	20.00	26.44	1
<b>TJF6087</b>	86	114	6	4.5	2.5	93.33	20.67	29.01	1
<b>TJF6088</b>	89	115	5.5	2.5	1	97.00	19.00	32.19	2
<b>TJF6089</b>	88	115	6.5	4	1.5	94.00	21.00	19.66	2
<b>TJF6090</b>	77	115	7	3.5	6.5	96.67	20.00	24.95	3
<b>TJF6091</b>	79	109.5	6.5	6.5	7.5	105.00	19.00	21.14	1
<b>TJF6092</b>	77.5	109.5	6	8	7	102.67	21.00	39.58	2
<b>TJF6093</b>	76	114	5.5	4.5	7	108.67	20.33	24.91	2
<b>TJF6094</b>	81	115	5	8	5.5	94.00	22.33	26.61	1
<b>TJF6095</b>	77	115	5.5	4.5	3.5	97.33	18.00	22.94	1
<b>TJF6096</b>	77.5	114	5.5	7.5	8	97.33	19.67	32.76	1
<b>TJF6097</b>	76	109	7	6	6.5	92.33	19.67	38.25	1
<b>TJF6098</b>	88.5	114	5.5	4	3	103.33	20.67	35.06	1
<b>TJF6099</b>	76	109	7	5.5	8	89.33	20.33	24.25	1
<b>TJF6100</b>	75	110	9	5	9	91.33	19.67	26.53	1
<b>TJF6101</b>	79	109	8	5	9	96.00	20.67	23.63	1
<b>TJF6102</b>	74.5	105	7.5	5.5	9	98.33	18.67	23.32	1
<b>TJF6103</b>	74	109	7	3.5	8.5	99.00	19.00	20.63	2
<b>TJF6104</b>	78	109	7.5	6.5	8	97.67	19.67	26.94	1
<b>TJF6105</b>	79.5	116	7	7	8	86.33	18.67	26.13	1

Continued.



Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6106</b>	82.5	112	5.5	4.5	7	88.67	19.00	30.11	1
<b>TJF6107</b>	80	114	6	5.5	7	89.67	19.00	27.04	1
<b>TJF6108</b>	80.5	110	6.5	6.5	6	88.33	19.67	37.18	1
<b>TJF6109</b>	89	114	6	3	1.5	96.00	19.33	42.36	1
<b>TJF6110</b>	79	114	6.5	4.5	7	105.33	21.33	16.80	2
<b>TJF6111</b>	88	114	5.5	2.5	2	96.00	20.33	49.14	1
<b>TJF6112</b>	79.5	109.5	7.5	3.5	8	103.00	19.67	32.04	2
<b>TJF6113</b>	89.5	116	8	3	3	96.33	17.00	32.89	1
<b>TJF6114</b>	86	114	8	4.5	5.5	94.67	18.67	47.65	1
<b>TJF6115</b>	79	114	8	7	9	97.00	21.00	21.19	1
<b>TJF6116</b>	79	109.5	7.5	2.5	5.5	96.00	18.00	24.45	2
<b>TJF6117</b>	86	116	9	3.5	5.5	88.67	17.00	35.30	1
<b>TJF6118</b>	77	112.5	9	4.5	8	95.33	20.33	26.29	1
<b>TJF6119</b>	74	109	6	7	7	94.00	22.00	20.73	2
<b>TJF6120</b>	87	112	6	7	3.5	87.33	18.33	38.42	1
<b>TJF6121</b>	87	114	8	2.5	5	81.00	16.67	25.27	1
<b>TJF6122</b>	78	109	8	8	8.5	91.67	20.00	22.95	1
<b>TJF6123</b>	76	112	7.5	3	8.5	90.67	20.33	23.81	3
<b>TJF6124</b>	88	114	7	3.5	8.5	108.33	19.67	23.71	3
<b>TJF6125</b>	79.5	110	8	8	9	90.00	21.33	35.70	1
<b>TJF6126</b>	86.5	116	7	2	3	96.00	18.33	31.00	1
<b>TJF6127</b>	81	110	9	4	5	96.33	16.67	24.08	1
<b>TJF6128</b>	88	118	6	1.5	1.5	100.00	18.00	29.77	1
<b>TJF6129</b>	79	112	4.5	6.5	9	88.67	19.67	36.88	1
<b>TJF6130</b>	79	112	7.5	2	6.5	100.67	20.00	24.32	2
<b>TJF6131</b>	85	116	6.5	3	8	95.00	17.00	28.88	1
<b>TJF6132</b>	76	109	8	8	8	109.67	20.00	23.57	1
<b>TJF6133</b>	83.5	110	7	7	7.5	90.67	19.00	25.25	1
<b>TJF6134</b>	83.5	115	7.5	7	5	97.67	21.00	27.94	1
<b>TJF6135</b>	76	109	7	8	8	100.67	17.33	27.48	1
<b>TJF6136</b>	74.5	109	7.5	8	8	105.00	21.00	31.70	2
<b>TJF6137</b>	86.5	123	6.5	3	4.5	96.33	18.67	37.93	1
<b>TJF6138</b>	86.5	114	7	3.5	3.5	109.33	22.00	41.22	1
<b>TJF6139</b>	76	109	6.5	7	7	89.67	20.00	26.19	1
<b>TJF6140</b>	83	110	6.5	7	8	96.67	19.33	37.57	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6141</b>	79	114	5.5	5.5	8.5	90.00	21.67	42.86	1
<b>TJF6142</b>	74	109	8	6	8.5	104.00	22.33	27.99	2
<b>TJF6143</b>	79	110	8	6.5	8.5	98.00	22.67	32.24	1
<b>TJF6144</b>	79	114	6.5	5.5	7	96.00	22.00	41.32	1
<b>TJF6145</b>	85	110	7	4.5	4	92.33	18.00	25.67	1
<b>TJF6146</b>	82.5	112	5.5	4.5	7.5	94.00	17.00	27.83	1
<b>TJF6147</b>	87	116	9	3.5	4.5	85.00	17.00	26.57	1
<b>TJF6148</b>	79	114	6.5	4	5	89.33	17.00	31.33	1
<b>TJF6149</b>	76	109.5	7	6	7.5	101.33	20.00	31.58	1
<b>TJF6150</b>	86.5	114	5.5	6.5	1.5	84.33	18.33	34.49	1
<b>TJF6151</b>	86	116	6.5	3.5	3.5	100.00	21.00	40.73	3
<b>TJF6152</b>	89	116	6.5	3	2.5	98.67	18.33	27.51	1
<b>TJF6153</b>	87	112	6.5	3.5	4	90.00	17.33	35.05	1
<b>TJF6154</b>	86	110	6	4.5	1.5	101.00	21.00	16.70	1
<b>TJF6155</b>	79	110	7	6	7	90.00	18.33	29.33	1
<b>TJF6156</b>	83	114	6	6	3	92.67	19.67	33.55	1
<b>TJF6157</b>	88	116	5	5.5	1.5	93.00	19.33	30.62	1
<b>TJF6158</b>	80	114	7	5.5	6.5	91.33	20.33	31.88	1
<b>TJF6159</b>	85.5	114	7.5	5.5	5	94.00	18.67	29.21	1
<b>TJF6160</b>	89	114	6.5	6.5	2.5	98.33	20.67	35.66	1
<b>TJF6161</b>	85	112	5.5	6.5	3	89.33	17.00	27.73	1
<b>TJF6162</b>	87.5	114	6.5	4	5.5	87.00	18.00	33.48	1
<b>TJF6163</b>	85.5	114	8.5	7.5	8	86.00	17.00	24.08	1
<b>TJF6164</b>	79	112	6.5	6	7.5	89.00	16.67	24.92	1
<b>TJF6165</b>	77	110	6.5	5	5.5	91.33	20.00	35.47	1
<b>TJF6166</b>	77	110	6	5.5	5	96.00	21.67	28.80	2
<b>TJF6167</b>	74	109.5	5	6.5	8	93.67	21.00	27.94	1
<b>TJF6168</b>	80	115	6	5	5.5	83.00	19.67	35.36	1
<b>TJF6169</b>	89	116	6.5	4.5	4	91.33	17.33	21.97	1
<b>TJF6170</b>	83.5	115	7	5	5	93.00	16.67	29.08	1
<b>TJF6171</b>	82.5	109	6.5	6	4.5	93.67	20.00	18.29	2
<b>TJF6172</b>	79	111.5	7	6	7.5	93.00	19.67	29.14	1
<b>TJF6173</b>	90	123	5.5	0.5	1	74.00	22.00	22.84	2
<b>TJF6174</b>	85.5	109.5	4	8	5.5	98.00	21.67	27.00	1
<b>TJF6175</b>	86.5	112	6	6.5	7.5	92.33	19.33	29.37	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6176</b>	87.5	116	7.5	7	3.5	103.67	20.67	28.00	1
<b>TJF6177</b>	80.5	111.5	7.5	8	8	102.00	19.67	35.73	1
<b>TJF6178</b>	82.5	116	7	6.5	8.5	110.67	18.33	36.14	1
<b>TJF6179</b>	86.5	114	5	5	3	101.67	17.33	37.65	1
<b>TJF6180</b>	79	111.5	5.5	5.5	7	105.00	20.67	42.10	1
<b>TJF6181</b>	86.5	119	6	5	2.5	91.67	20.33	32.89	1
<b>TJF6182</b>	76	111.5	5.5	6.5	9	101.33	20.00	31.17	2
<b>TJF6183</b>	76	115	7	5	7	87.00	19.67	30.74	1
<b>TJF6184</b>	89	116	7.5	5	2	97.67	18.33	26.52	1
<b>TJF6185</b>	85	115	6.5	2.5	3	104.67	21.67	25.17	2
<b>TJF6186</b>	85	112	7	5	4.5	97.33	18.33	26.07	1
<b>TJF6187</b>	77.5	107	9	7.5	8	94.67	18.00	23.54	2
<b>TJF6188</b>	86	116	7	4.5	7	94.67	21.00	35.63	1
<b>TJF6189</b>	85	111.5	6.5	8	6.5	100.67	20.00	22.97	1
<b>TJF6190</b>	86.5	114	6.5	5.5	5	96.33	17.33	36.49	1
<b>TJF6191</b>	74.5	105	8	7.5	8.5	106.67	20.00	29.36	1
<b>TJF6192</b>	86.5	114	7	7.5	2	89.67	17.67	23.71	1
<b>TJF6193</b>	86	112	6	8	2	100.00	18.67	26.44	1
<b>TJF6194</b>	87.5	116	7	4	2.5	96.33	19.33	26.93	1
<b>TJF6195</b>	79	111.5	7	5.5	5	100.67	20.67	30.75	2
<b>TJF6196</b>	79.5	109.5	6.5	4.5	6	97.67	21.67	25.14	1
<b>TJF6197</b>	77	110	8	7.5	9	94.33	19.00	26.03	1
<b>TJF6198</b>	83	115	8	4.5	7.5	91.67	18.67	32.58	1
<b>TJF6199</b>	87	115	5	5	4	98.67	19.33	35.11	1
<b>TJF6200</b>	87	112	9	5.5	4.5	90.33	19.00	35.39	1
<b>TJF6201</b>	81	114	9	5	8	84.67	17.33	29.51	1
<b>TJF6202</b>	74.5	109	9	8	9	92.33	17.67	26.10	1
<b>TJF6203</b>	79.5	114	6.5	7	5.5	95.00	19.00	30.54	1
<b>TJF6204</b>	87	114	6.5	2.5	2.5	107.33	19.67	33.07	1
<b>TJF6205</b>	79.5	109.5	6.5	7	7.5	99.00	20.00	34.64	1
<b>TJF6206</b>	86	115	5	3.5	4	102.67	18.33	28.05	1
<b>TJF6207</b>	86	115	5.5	3	3	100.00	20.00	27.42	2
<b>TJF6208</b>	87	114	7	3.5	2	95.00	17.00	32.90	1
<b>TJF6209</b>	78	107	8	8	8	94.00	19.00	29.08	1
<b>TJF6210</b>	86	112	6.5	6	7	91.00	19.67	25.00	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6211</b>	79	110	7.5	5	6	99.67	23.00	31.83	2
<b>TJF6212</b>	78	110	9	6.5	8.5	92.00	19.33	21.56	2
<b>TJF6213</b>	77	112	8	7.5	9	94.00	18.33	24.20	1
<b>TJF6214</b>	80.5	109	5.5	5.5	6.5	94.33	18.00	29.16	1
<b>TJF6215</b>	78	109	5	7	9	102.00	21.33	34.45	2
<b>TJF6216</b>	86	110	5.5	5.5	3	97.00	16.00	23.30	1
<b>TJF6217</b>	85	110	7	7	4	88.67	18.67	34.51	1
<b>TJF6218</b>	87.5	114	5	5	2.5	100.00	19.33	34.23	3
<b>TJF6219</b>	88	115	7.5	7.5	1.5	80.67	19.33	41.60	1
<b>TJF6220</b>	86.5	115	6	4.5	2	94.33	21.33	35.18	1
<b>TJF6221</b>	79	116	6	5	6.5	94.67	19.33	52.55	1
<b>TJF6222</b>	87	112	6	3.5	4.5	103.67	18.67	26.17	2
<b>TJF6223</b>	76	110	7	5.5	8.5	97.00	18.33	30.09	2
<b>TJF6224</b>	76	112	8	6	9	95.33	20.67	24.82	1
<b>TJF6225</b>	80.5	112	8	2.5	6.5	92.33	20.33	29.96	1
<b>TJF6226</b>	82	109	7	7	8	92.00	16.00	38.74	1
<b>TJF6227</b>	85	115	6.5	5	4	99.33	19.00	27.57	1
<b>TJF6228</b>	86.5	115	6	5	4	89.33	18.67	28.97	1
<b>TJF6229</b>	82	109.5	8	7	5.5	90.67	17.33	29.71	1
<b>TJF6230</b>	79.5	110	7	4	5.5	89.00	18.67	28.07	1
<b>TJF6231</b>	84.5	112	6	5	3.5	83.33	19.67	25.47	1
<b>TJF6232</b>	82	112	5.5	4.5	6	91.67	18.00	29.76	1
<b>TJF6233</b>	79	110	7.5	6.5	8	81.67	16.33	30.22	1
<b>TJF6234</b>	79	114	7.5	4.5	8	91.33	20.33	22.92	1
<b>TJF6235</b>	87	114	7.5	3.5	4	95.67	21.67	25.93	2
<b>TJF6236</b>	74.5	109	5	5.5	8	105.33	21.33	21.93	3
<b>TJF6237</b>	79.5	112.5	8	4.5	3.5	73.00	15.67	30.18	1
<b>TJF6238</b>	80	109.5	6.5	4.5	5	95.67	21.67	21.52	3
<b>TJF6239</b>	86	116	5	3	4.5	90.33	20.33	31.08	1
<b>TJF6240</b>	79	112	8	6.5	8.5	94.67	20.33	24.42	2
<b>TJF6241</b>	83.5	109	8	7	9	87.67	19.67	28.02	1
<b>TJF6242</b>	81	116	6	4	5.5	96.00	20.33	26.01	1
<b>TJF6243</b>	80	110	7	6.5	8.5	90.33	20.33	38.99	1
<b>TJF6244</b>	88	114	5.5	5	2.5	89.33	17.33	19.20	1
<b>TJF6245</b>	77.5	109.5	8	5	7	88.67	19.33	28.13	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6246</b>	88.5	114	6	5.5	3.5	92.00	20.00	35.52	1
<b>TJF6247</b>	79.5	109	7	5.5	8	87.67	20.33	30.03	1
<b>TJF6248</b>	85	109.5	9	7.5	8	79.33	17.00	21.97	1
<b>TJF6249</b>	86.5	114	5.5	4.5	4.5	84.67	20.00	32.07	1
<b>TJF6250</b>	79	109	8.5	4.5	6.5	92.33	20.33	23.67	1
<b>TJF6251</b>	79	110	5.5	5.5	7	92.33	18.33	22.04	1
<b>TJF6252</b>	83	114	6.5	3	5.5	92.00	19.00	34.38	1
<b>TJF6253</b>	81	110	8	5	4.5	87.67	18.67	20.21	1
<b>TJF6254</b>	87.5	119	5.5	5	3	82.00	16.33	34.49	1
<b>TJF6255</b>	80	110	7.5	8	9	86.67	18.33	21.15	1
<b>TJF6256</b>	87	116	7.5	4	3.5	90.33	19.00	23.90	1
<b>TJF6257</b>	79	112	8	4	9	87.67	20.67	24.21	1
<b>TJF6258</b>	79	109.5	8	3.5	9	88.67	19.33	23.78	1
<b>TJF6259</b>	86	116	7.5	4.5	4	90.00	21.33	18.55	1
<b>TJF6260</b>	87	113	8	3.5	2	95.33	17.00	15.49	1
<b>TJF6261</b>	79	112	7.5	5	6	84.67	20.33	29.86	1
<b>TJF6262</b>	83.5	110	7	7	4.5	78.00	16.67	34.67	1
<b>TJF6263</b>	86.5	114	7.5	3	4	96.00	19.00	40.42	1
<b>TJF6264</b>	75.5	109	8.5	6	9	103.00	19.33	32.95	1
<b>TJF6265</b>	86	112	5.5	5	2.5	104.33	19.00	36.32	1
<b>TJF6266</b>	86	112	4.5	4	4.5	91.33	21.00	27.78	1
<b>TJF6267</b>	86	111.5	7.5	4.5	6	91.67	17.00	38.37	1
<b>TJF6268</b>	86	112	7.5	5	4	86.00	17.67	21.61	1
<b>TJF6269</b>	76	114	7	5	6	96.33	19.67	29.63	1
<b>TJF6270</b>	74	109.5	6.5	7.5	8	94.33	20.67	29.28	1
<b>TJF6271</b>	85	110	8.5	4	7	90.67	20.00	32.20	1
<b>TJF6272</b>	80	109	8.5	6.5	7.5	98.00	16.33	20.11	1
<b>TJF6273</b>	87	114	5	5	3.5	97.00	19.33	30.28	1
<b>TJF6274</b>	86.5	114	6	5	4.5	97.00	19.00	24.90	1
<b>TJF6275</b>	79	109	8	7.5	8.5	94.00	17.00	28.99	1
<b>TJF6276</b>	75.5	105	8	8	8.5	90.67	16.67	24.97	1
<b>TJF6277</b>	77.5	109	8.5	6.5	9	87.00	14.67	26.91	1
<b>TJF6278</b>	87	114	5	4.5	4.5	92.33	22.00	27.73	1
<b>TJF6279</b>	78	109.5	5.5	6	9	93.67	16.67	23.66	1
<b>TJF6280</b>	78	109.5	6.5	6	8	87.67	20.33	27.43	1

Continued.

Table 1. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>	<b>Panicle type*, (2013)</b>
<b>TJF6281</b>	87	114	7.5	5	8.5	90.67	20.33	27.98	1
<b>TJF6282</b>	86	114	5.5	6.5	6.5	100.33	22.00	30.60	1
<b>TJF6283</b>	87	116	5.5	5.5	2.5	98.00	18.00	24.47	1
<b>TJF6284</b>	78	109	7.5	4	7.5	87.33	19.00	25.94	1
<b>TJF6285</b>	85	109	9	2.5	5.5	92.33	18.00	24.37	1
<b>TJF6286</b>	82.5	110	5.5	5.5	7.5	90.00	18.33	30.25	1
<b>TJF6287</b>	79	109.5	5	7	8.5	85.00	19.33	23.88	1
<b>TJF6288</b>	77	114	9	6.5	9	79.67	14.67	23.04	1
<b>TJF6289</b>	77.5	109.5	8	3	3.5	96.00	19.67	29.18	1
<b>TJF6290</b>	76	109.5	6.5	4.5	8.5	106.33	21.67	24.89	1
<b>TJF6291</b>	85.5	109.5	7.5	4.5	6.5	90.67	17.33	29.21	1
<b>TJF6292</b>	79.5	114	8	7.5	9	100.67	22.33	29.36	1
<b>TJF6293</b>	85.5	114	6.5	8	6	94.67	16.67	28.37	1
<b>TJF6294</b>	74	107.5	6	8	8.5	103.00	19.33	28.23	1
<b>TJF6295</b>	81	112	6.5	8.5	9	83.67	20.33	21.20	1
<b>TJF6296</b>	80	109.5	7	8	8.5	81.33	15.33	28.75	1
<b>TJF6297</b>	83	109.5	7.5	6.5	9	92.67	23.33	26.12	1
<b>TJF6298</b>	76	109	8	8	9	87.00	18.67	24.00	1
<b>TJF6299</b>	76	114	8	8	9	81.00	19.00	22.98	1
<b>TJF6300</b>	80	114	5	1	8.5	93.33	18.00	31.00	1
<b>Jupiter</b>	89	114	4.4	1.9	1.6	95.00	16.67	29.30	1
<b>Trenasse</b>	79	114	8.7	8.6	8.9	93.33	21.33	25.32	1

<sup>a, b</sup>: Percent symptomatic area of panicle (a) or sheath (b) with the following scale; 0 (no symptoms), 1 (1 to 10%), 2 (11 to 20%), 3 (21 to 30%), 4 (31 to 40%), 5 (41 to 50%), 6 (51 to 60%), 7 (61 to 70%), 8 (71 to 80%), and 9 (> 90%) .

\*: Panicle type (1 – compact, 2 – intermediate, and 3 – sparse)

Table 2. Phenotypic traits of the recombinant inbred lines (RILs) from Bengal and LM-1.

RILs	Days to heading (days), (2012)	Days to heading (days), (2013)	Disease score <sup>a</sup> BPB (2012)	Disease score <sup>a</sup> BPB (2013)	Disease score <sup>b</sup> SB (2012)	Plant height (cm), (2013)	Panicle length (cm), (2013)	Flag leaf size (cm <sup>2</sup> ), (2013)
LB_1	90	107.5	7	3	3.5	91.00	16.17	35.71
LB_2	90	112	7	4	6.5	95.00	22.00	27.87
LB_3	88	112	2	5	3.5	95.67	19.00	48.73
LB_4	87	113	5	6.5	5.5	89.33	19.50	27.58
LB_5	89	106	4.5	6.5	5	106.67	22.00	46.64
LB_6	89	114	8.5	3.5	8	85.00	21.00	39.49
LB_7	88	114	3	3.5	3.5	99.33	20.17	40.01
LB_8	88	115	5	4	7	95.33	23.17	36.33
LB_9	97.5	116	4	4.5	2.5	94.33	19.17	32.70
LB_10	92	111	6	4.5	4.5	97.00	20.83	37.21
LB_11	88	115	3.5	3	4	99.67	20.83	39.50
LB_12	93	115	2	4.5	3.5	99.33	19.33	35.68
LB_13	91.5	114	3	6	4	97.67	19.33	34.03
LB_14	94.5	114	3.5	2.5	4	98.33	22.83	52.21
LB_15	99.5	117	2	3.5	3	86.00	19.17	42.90
LB_16	95.5	116	4.5	2	7	92.33	18.33	37.89
LB_17	97.5	116	3	4.5	6	89.67	20.33	36.18
LB_18	96	113.5	2	2.5	4.5	104.67	23.33	52.17
LB_19	89.5	113	2.5	4.5	4.5	101.00	22.33	38.93
LB_20	86.5	112	5.5	3	8	90.00	21.00	41.76
LB_21	98	119	3	1	5.5	93.00	20.33	35.18
LB_22	94.5	116	5	6	6	89.67	18.67	36.56
LB_23	98.5	115	4	2.5	7.5	98.00	18.17	32.74
LB_24	94.5	110	3	3	6	101.00	20.33	39.82
LB_25	97.5	115.5	2.5	4.5	2	96.00	17.83	39.84
LB_26	94	111	3	2	4	96.00	22.83	41.99
LB_27	94.5	109	2.5	4.5	3.5	103.00	23.50	39.90
LB_28	98	110	5	3	7	102.33	20.00	52.81
LB_29	90	109	4.5	4.5	5.5	100.67	16.67	33.14
LB_30	95	114.5	5	5	5	91.33	21.33	33.73
LB_31	98	118	5	1	7.5	83.33	21.33	41.77
LB_32	95.5	116.5	4.5	6	7	97.67	19.50	41.91
LB_33	93	115	1.5	2	2	105.67	23.67	48.63
LB_34	95	115	3	2.5	2.5	98.67	24.00	38.16
LB_35	91.5	115	2	2.5	2	110.33	21.00	49.32

Continued.

Table 2. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>
<b>LB_36</b>	98.5	118	3	3.5	3.5	97.00	18.00	43.05
<b>LB_37</b>	91.5	108	6	5	9	86.00	16.67	27.88
<b>LB_38</b>	99	118	4	3	4	100.33	21.67	53.30
<b>LB_39</b>	97	112.5	3	1.5	8	88.00	20.33	39.03
<b>LB_40</b>	91.5	111	5.5	3.5	9	80.67	18.17	43.87
<b>LB_41</b>	92	112	4.5	3	5	93.67	21.33	37.62
<b>LB_42</b>	94	114.5	6	7	5.5	83.00	18.83	29.77
<b>LB_43</b>	86	119	2.5	3	5.5	82.33	16.67	36.67
<b>LB_44</b>	99.5	116	6	5	6.5	94.00	18.83	44.74
<b>LB_45</b>	94.5	113	4	4	4.5	98.00	20.67	39.78
<b>LB_46</b>	100	117.5	5	5	6	96.33	19.67	40.19
<b>LB_47</b>	100	114	3	3.5	4	98.00	19.50	37.40
<b>LB_48</b>	94.5	115	2	2.5	5	96.00	21.00	49.34
<b>LB_49</b>	96.5	113	5	2	5.5	98.00	20.67	32.83
<b>LB_50</b>	92	112	3.5	5.5	6	95.67	20.67	45.64
<b>LB_51</b>	92.5	112	3	4	4	97.67	22.33	47.57
<b>LB_52</b>	96.5	115	2	2.5	2	96.00	21.00	32.85
<b>LB_53</b>	93	115.5	2	3	6	101.67	22.00	38.97
<b>LB_54</b>	94.5	115	3.5	4.5	7	96.67	20.17	47.66
<b>LB_55</b>	98.5	117.5	3.5	3.5	6	82.00	15.67	30.06
<b>LB_56</b>	92.5	113	5	4	8	95.00	20.00	46.13
<b>LB_57</b>	94	114	3	3	3	104.33	21.00	40.27
<b>LB_58</b>	90	104	6.5	3.5	5	103.33	21.67	55.89
<b>LB_59</b>	95	113	3	3	2.5	91.67	18.17	34.47
<b>LB_60</b>	92	110	3.5	6.5	4.5	101.00	21.50	36.92
<b>LB_61</b>	93	110	4.5	3	2	93.33	15.67	31.93
<b>LB_62</b>	95	110	5.5	4.5	2.5	87.00	17.50	44.52
<b>LB_63</b>	90	109	4	1.5	2	99.00	21.67	49.74
<b>LB_64</b>	94.5	110	5	2	3.5	86.00	17.50	38.81
<b>LB_65</b>	94.5	112	4	4	6	84.33	18.33	40.19
<b>LB_66</b>	92	117	6	2.5	2	94.33	19.17	40.57
<b>LB_67</b>	94.5	110	3	2.5	4.5	78.00	18.17	39.95
<b>LB_68</b>	92.5	113	2	2	7.5	100.00	21.00	36.30
<b>LB_69</b>	100	115	2	2.5	2	95.00	21.33	43.33
<b>LB_70</b>	98.5	113	6	3	2.5	91.00	17.00	40.33

Continued.



Table 2. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>
<b>LB_71</b>	95	110	3	1	5	66.33	18.00	43.42
<b>LB_72</b>	99	118	5	2	5	83.33	20.33	38.94
<b>LB_73</b>	86	109	4	4	5	90.67	18.00	37.20
<b>LB_74</b>	88.5	112	3	2.5	5	88.67	21.83	38.77
<b>LB_75</b>	91	109	4	2	4	95.00	19.67	43.51
<b>LB_76</b>	92.5	112	1.5	2	3.5	91.33	19.33	41.13
<b>LB_77</b>	91.5	114	2	2	2	88.67	20.67	37.75
<b>LB_78</b>	94	115	2.5	3.5	7.5	92.33	19.67	38.46
<b>LB_79</b>	93	112	4	4.5	6.5	83.00	17.33	37.17
<b>LB_80</b>	93	116	5.5	4	3.5	89.67	19.00	32.57
<b>LB_81</b>	95.5	116	3	2.5	2	90.67	20.17	33.53
<b>LB_82</b>	97.5	116	5	1.5	2.5	94.67	19.67	40.64
<b>LB_83</b>	96.5	109	2.5	4	2	95.00	20.17	34.85
<b>LB_84</b>	97.5	118	2	3	4.5	98.67	23.33	50.34
<b>LB_85</b>	96.5	118	6.5	4	4.5	86.33	16.33	29.13
<b>LB_86</b>	95	113	4	5	4.5	91.67	20.33	42.56
<b>LB_87</b>	90.5	115	3.5	3.5	6.5	95.00	20.67	45.01
<b>LB_88</b>	90.5	109	3	2.5	7.5	92.67	19.17	37.81
<b>LB_89</b>	96.5	114	3.5	3.5	5.5	94.00	20.17	51.78
<b>LB_90</b>	85.5	112	6	2	8	93.00	18.33	41.11
<b>LB_91</b>	94.5	113	5	4	6	86.00	19.33	35.13
<b>LB_92</b>	92	116	3	1	6.5	102.67	22.67	31.74
<b>LB_93</b>	91.5	115	4	4	5	93.67	21.67	43.82
<b>LB_94</b>	92.5	116	5.5	3	8	93.33	17.00	42.31
<b>LB_95</b>	97	117	5.5	5.5	7.5	92.67	18.67	37.23
<b>LB_96</b>	91	117	6	5.5	8	82.00	19.00	40.73
<b>LB_97</b>	91.5	115	3	2.5	5	106.00	20.00	47.55
<b>LB_98</b>	90	114	3	3.5	4.5	96.33	20.00	31.76
<b>LB_99</b>	86	115	2.5	4.5	3.5	105.33	21.00	24.46
<b>LB_100</b>	93	116	4.5	2.5	3.5	103.33	21.33	46.70
<b>LB_101</b>	94.5	115	2	1	3	108.00	19.00	29.20
<b>LB_102</b>	93	115.5	4	5	7	84.00	17.67	33.13
<b>LB_103</b>	93	117	3	2	4	94.67	18.00	42.76
<b>LB_104</b>	87	114	2.5	7	6.5	83.67	19.33	40.58
<b>LB_105</b>	82	108.5	8	9	9	85.00	16.67	27.03

Continued.

Table 2. Continued.

RILs	Days to heading (days), (2012)	Days to heading (days), (2013)	Disease score <sup>a</sup> BPB (2012)	Disease score <sup>a</sup> BPB (2013)	Disease score <sup>b</sup> SB (2012)	Plant height (cm), (2013)	Panicle length (cm), (2013)	Flag leaf size (cm <sup>2</sup> ), (2013)
LB_106	96	111	3	2.5	6.5	95.00	25.00	40.26
LB_107	93	113	1.5	1.5	2.5	101.00	20.33	37.41
LB_108	97.5	116	3.5	1.5	4	84.67	16.67	32.00
LB_109	93	114	6	6	7	74.00	15.67	20.96
LB_110	92.5	117	3	3.5	4	83.33	18.67	38.13
LB_111	97	116	3.5	1.5	2	96.67	18.67	36.41
LB_112	91.5	115	4.5	3.5	6	90.00	16.67	38.94
LB_113	99.5	115	3	1.5	3.5	93.00	20.33	36.37
LB_114	95	113.5	7.5	4	5	101.67	19.33	35.80
LB_115	97.5	117	3	1	4.5	85.67	16.67	33.74
LB_116	95.5	115	4	1	4.5	90.33	20.33	34.42
LB_117	90.5	114	2.5	2.5	5	98.00	20.33	38.84
LB_118	98	111	5	3	3	100.00	21.00	37.91
LB_119	95	114	1.5	2.5	4.5	97.00	20.33	27.96
LB_120	92.5	112	6.5	4	3.5	100.33	21.33	38.72
LB_121	88	111	4.5	5.5	4.5	97.00	19.33	32.49
LB_122	93.5	118	4.5	4.5	4.5	93.00	18.00	33.71
LB_123	93.5	115	6	4.5	6	96.00	21.67	35.01
LB_124	94.5	114	4	3.5	7	86.67	19.67	40.95
LB_125	95	113	3	2.5	6	85.33	18.00	31.43
LB_126	98.5	115	2	1.5	1	96.67	22.33	47.97
LB_127	90.5	118	3	5	4	87.00	20.67	33.73
LB_128	92.5	113	3.5	3	2.5	98.00	24.00	46.24
LB_129	90.5	109	3.5	3.5	6	88.00	20.67	43.58
LB_130	86	109	3.5	4	3.5	97.67	22.67	34.42
LB_131	92	115	7	3.5	5.5	86.33	20.00	35.94
LB_132	98.5	118	2	3	2	91.00	19.67	35.27
LB_133	96.5	116	2	3	3.5	96.00	19.67	42.63
LB_134	94.5	116	4	4	4.5	91.00	22.00	46.18
LB_135	95.5	111	3	3.5	4.5	95.67	22.67	50.00
LB_136	94.5	112	2.5	3.5	7	90.33	18.67	44.79
LB_137	93	115	4.5	3	2	101.00	22.00	74.56
LB_138	97	115.5	3.5	2.5	3	102.00	21.67	43.39
LB_139	97	116	5	3	3	92.33	19.00	39.23
LB_140	97.5	114	3	2	4	100.33	20.67	51.42

Continued.

Table 2. Continued.

RILs	Days to heading (days), (2012)	Days to heading (days), (2013)	Disease score <sup>a</sup> BPB (2012)	Disease score <sup>a</sup> BPB (2013)	Disease score <sup>b</sup> SB (2012)	Plant height (cm), (2013)	Panicle length (cm), (2013)	Flag leaf size (cm <sup>2</sup> ), (2013)
LB_141	92	114.5	5	6	6.5	95.67	20.67	49.18
LB_142	98	117	2	2	2.5	101.00	19.67	42.69
LB_143	89	109	7	8	8.5	104.67	23.67	49.91
LB_144	98	118	3	1.5	5.5	89.67	18.00	35.39
LB_145	98	116	2	2.5	3.5	98.67	21.33	55.44
LB_146	94	118	3.5	2	5	96.33	21.33	44.82
LB_147	92	110	5.5	6	5	82.00	16.67	47.18
LB_148	93.5	117	3.5	2	6	97.67	23.00	48.26
LB_149	93	111	5	4.5	8	84.67	19.33	43.01
LB_150	98.5	119	2	4	3.5	90.00	18.67	41.48
LB_151	94	112	2.5	3.5	4.5	90.00	19.33	38.00
LB_152	95.5	113	7	4.5	5	90.67	21.00	41.95
LB_153	93	109	8.5	4	7.5	82.67	19.67	23.41
LB_154	99.5	118	3	6.5	2	88.67	18.00	39.31
LB_155	92	115	3	4.5	5	89.00	20.33	40.42
LB_156	95.5	116	2.5	4.5	5	94.00	22.67	40.96
LB_157	94.5	117.5	6	2	6	88.00	18.33	36.81
LB_158	96	114	3	3	3.5	86.00	20.33	38.18
LB_159	94	114	4	4	3.5	81.67	20.33	39.07
LB_160	99.5	117	3	2	2	97.00	21.00	40.13
LB_161	93.5	114	2.5	3	4	91.67	20.67	36.77
LB_162	97	121	3.5	5.5	4	87.33	19.33	32.24
LB_163	94.5	118	4	3.5	2.5	95.33	20.33	38.33
LB_164	95	113	4.5	5	4.5	91.67	18.33	41.22
LB_165	100	118	4	5	5	86.00	16.33	39.06
LB_166	94.5	118	2.5	3	3.5	98.33	20.33	32.10
LB_167	92.5	113	5	3.5	3	88.33	19.33	35.94
LB_168	94.5	113	6	2.5	7.5	91.33	19.33	35.88
LB_169	95.5	113	6.5	2.5	6	83.67	20.33	41.19
LB_170	94.5	116	4.5	4	3.5	90.00	19.00	38.23
LB_171	96	115	4	2.5	6	72.67	18.33	33.32
LB_172	97	116	4	4.5	2	96.33	17.33	31.02
LB_173	97.5	118	2	4	4.5	97.33	19.33	37.26
LB_174	98	115	2.5	4	4.5	87.67	22.33	38.51
LB_175	99	120	2	3.5	3	92.33	19.00	47.31

Continued.

Table 2. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>
<b>LB_176</b>	99.5	119	3	6	3	98.33	20.00	31.93
<b>LB_177</b>	86.5	117.5	4	2.5	5	96.67	18.67	36.73
<b>LB_178</b>	99	110	5	5	5.5	99.33	19.00	26.34
<b>LB_179</b>	98.5	122	2	1	3	77.33	17.00	31.99
<b>LB_180</b>	93	113	6.5	3.5	4	87.67	21.67	24.36
<b>LB_181</b>	93	115	4	2.5	5	97.00	18.00	39.26
<b>LB_182</b>	94	115	6	3.5	5	105.33	20.33	45.00
<b>LB_183</b>	90.5	110	2.5	3	4.5	100.67	23.67	41.33
<b>LB_184</b>	88	115	2	2	3.5	108.33	25.67	44.77
<b>LB_185</b>	92.5	113	5	6	6	95.67	19.67	41.91
<b>LB_186</b>	86	115	6	5	6	109.33	25.00	40.80
<b>LB_187</b>	89.5	114.5	4	3.5	5	106.67	18.33	52.68
<b>LB_188</b>	89.5	110	3	6.5	4	97.00	19.67	39.73
<b>LB_189</b>	91.5	115	3	3	5	96.67	20.67	52.60
<b>LB_190</b>	90.5	115	3	4	4.5	102.00	19.00	46.96
<b>LB_191</b>	87	115.5	2	3	2.5	106.33	22.67	39.38
<b>LB_192</b>	95	116	4	3.5	3	103.33	24.33	42.77
<b>LB_193</b>	92	114.5	1.5	2	3	101.67	20.33	46.87
<b>LB_194</b>	94.5	113	2.5	4	3	100.00	19.00	49.89
<b>LB_195</b>	88	112	3	2	4	92.33	21.33	43.89
<b>LB_196</b>	93	112	6	2.5	5	91.67	19.00	44.30
<b>LB_197</b>	85	109	4	5.5	6	101.00	21.67	48.22
<b>LB_198</b>	91	108	6	5.5	6.5	96.33	18.67	41.57
<b>LB_199</b>	96	110	3	3	3	106.00	21.67	54.19
<b>LB_200</b>	95	115	5.5	4	7	99.33	21.00	44.63
<b>LB_201</b>	96	110	3	3	5.5	84.67	16.00	26.11
<b>LB_202</b>	93.5	115	3.5	7	6.5	98.00	22.33	30.18
<b>LB_203</b>	91.5	113	3.5	2	5.5	110.00	21.00	37.93
<b>LB_204</b>	90.5	112	6.5	3.5	7	97.00	20.33	41.71
<b>LB_205</b>	90.5	111	6.5	5	8.5	94.67	20.00	33.87
<b>LB_206</b>	97.5	107	2	2	4	96.00	22.67	46.36
<b>LB_207</b>	89.5	115	7	6	7	100.00	21.00	55.72
<b>LB_208</b>	89.5	110	3.5	5.5	3	97.33	21.00	39.73
<b>LB_209</b>	88.5	111	3	4.5	7	92.33	18.33	37.89
<b>LB_210</b>	97	113.5	2	1.5	3	94.33	21.67	45.86

Continued.

Table 2. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>
<b>LB_211</b>	96	116	2.5	2	5.5	94.33	21.67	42.68
<b>LB_212</b>	94.5	118	4.5	4	6.5	87.00	19.33	50.64
<b>LB_213</b>	98	118	5	4	5.5	92.33	19.67	50.73
<b>LB_214</b>	96	118	2	1	3	104.33	21.33	55.87
<b>LB_215</b>	97	112	4	3	5	94.33	22.33	60.82
<b>LB_216</b>	98.5	116	2	2.5	3.5	99.67	22.67	59.99
<b>LB_217</b>	93	112	2	4	5	90.33	18.00	43.33
<b>LB_218</b>	93	115	3.5	2	4	94.67	19.67	50.55
<b>LB_219</b>	91	111	3.5	3	5	94.67	19.33	46.83
<b>LB_220</b>	97	113	2	3	3	99.67	22.67	61.14
<b>LB_221</b>	100	120	6.5	2.5	3	80.00	16.00	44.79
<b>LB_222</b>	99	115	5	2.5	4.5	93.00	19.33	48.02
<b>LB_223</b>	94.5	115	2	4.5	3.5	96.67	19.00	47.86
<b>LB_224</b>	96	115.5	4	3.5	4.5	79.33	18.67	40.61
<b>LB_225</b>	95.5	115	2	2	2.5	109.33	21.33	46.81
<b>LB_226</b>	83	105	7	8	10	91.67	20.33	29.16
<b>LB_227</b>	97	110	2	3	3.5	100.00	22.67	40.38
<b>LB_228</b>	86.5	115	2	4	3.5	93.00	21.33	38.02
<b>LB_229</b>	96	111	2	3.5	2.5	99.00	22.00	44.28
<b>LB_230</b>	97.5	115	4.5	3.5	4	91.67	16.33	40.83
<b>LB_231</b>	96.5	117	2.5	3.5	4	98.00	21.67	41.14
<b>LB_232</b>	92	113	4.5	1	5.5	92.00	22.00	44.26
<b>LB_233</b>	98.5	118	3	2.5	7	85.00	19.67	34.35
<b>LB_234</b>	95	114	2.5	5	3	101.67	22.00	37.46
<b>LB_235</b>	85	110	4.5	1.5	5	116.00	25.33	45.78
<b>LB_236</b>	96.5	116	2	2	3.5	100.00	22.33	46.43
<b>LB_237</b>	93	114	4.5	4.5	4	88.67	19.67	51.74
<b>LB_238</b>	97.5	115	2.5	2	0.5	98.67	19.67	46.82
<b>LB_239</b>	97	115	3	2.5	5	90.00	20.00	38.42
<b>LB_240</b>	95	115	2.5	4	6.5	79.67	23.67	38.69
<b>LB_241</b>	84	118	4.5	4	4.5	86.00	16.33	53.14
<b>LB_242</b>	93	111	5	4.5	4.5	78.67	16.00	41.27
<b>LB_243</b>	96	115	2	2.5	4.5	85.67	18.33	39.37
<b>LB_244</b>	94	112	2.5	3	4	88.33	18.00	32.88
<b>LB_245</b>	95	114	6.5	5.5	3	83.00	16.33	39.00

Continued.

Table 2. Continued.

<b>RILs</b>	<b>Days to heading (days), (2012)</b>	<b>Days to heading (days), (2013)</b>	<b>Disease score<sup>a</sup> BPB (2012)</b>	<b>Disease score<sup>a</sup> BPB (2013)</b>	<b>Disease score<sup>b</sup> SB (2012)</b>	<b>Plant height (cm), (2013)</b>	<b>Panicle length (cm), (2013)</b>	<b>Flag leaf size (cm<sup>2</sup>), (2013)</b>
<b>LB_246</b>	93.5	113	3.5	4	2.5	92.67	19.67	32.42
<b>LB_247</b>	95.5	115	3	2.5	4	95.67	21.33	32.79
<b>LB_248</b>	99	118	3.5	3.5	3	92.33	19.00	42.04
<b>LB_249</b>	92	116	4	4	5	87.67	19.67	39.46
<b>LB_250</b>	97.5	118	2.5	3.5	3	88.33	19.00	40.46
<b>LB_251</b>	95.5	110	4	4	2	91.67	19.67	40.84
<b>LB_252</b>	99	118	3	4	0	93.67	21.67	50.01
<b>LB_253</b>	91	115	6	5	7	95.67	18.67	36.04
<b>LB_254</b>	95	115	2.5	7	2	80.33	17.67	36.73
<b>LB_255</b>	93	115.5	6	4	6.5	85.33	20.67	36.28
<b>LB_256</b>	95.5	120	4.5	2	5.5	89.00	20.00	30.87
<b>LB_257</b>	93.5	115	2	3	2.5	92.33	19.33	38.49
<b>LB_258</b>	94.5	110	2	3	1.5	94.67	18.67	24.48
<b>LB_259</b>	89.5	111	7	2	7	79.67	17.33	41.70
<b>LB_260</b>	92.5	111	3	1.5	4.5	82.67	20.00	40.63
<b>LB_261</b>	87	111	4.5	4.5	5.5	94.33	19.67	53.58
<b>LB_262</b>	95.5	115.5	4	4	5	92.67	16.33	34.83
<b>LB_263</b>	96	118	3	3.5	5	91.33	21.00	34.99
<b>LB_264</b>	85	104.5	8	7	3	86.67	17.67	51.77
<b>LB_265</b>	93.5	114.5	4.5	3	6	96.00	19.33	39.39
<b>LB_266</b>	92.5	115	3	5	3	90.67	18.67	37.74
<b>LB_267</b>	97	115.5	2	4	3.5	94.67	20.33	39.04
<b>LB_268</b>	96	116	4	2	5.5	93.00	23.33	52.35
<b>LB_269</b>	94.5	114	4	2	7	94.67	20.00	40.06
<b>LB_270</b>	87	106	3.5	5	5	94.33	18.00	24.53
<b>LB_271</b>	86	107	3.5	3.5	6.5	100.33	18.00	38.38
<b>LB_272</b>	93.5	110	4	6	7.5	98.67	19.67	36.91
<b>LB_273</b>	94	116.5	5	3	8	96.67	20.33	36.49
<b>LB_274</b>	88	113.5	3	4	4	105.00	20.33	49.49
<b>LB_275</b>	97	116	2	4	4	101.33	22.67	50.96
<b>LB_276</b>	89	114	2	3	5	98.67	19.00	39.66
<b>LB_277</b>	93	116	4	3.5	4	91.67	16.00	44.56
<b>LB_278</b>	96	119	3	2.5	4.5	98.00	20.00	38.74
<b>LB_279</b>	96.5	116	3	6	4	104.67	19.67	35.76
<b>LB_280</b>	92	115	5	5.5	4	91.67	21.33	37.48

Continued.

Table 2. Continued.

RILs	Days to heading (days), (2012)	Days to heading (days), (2013)	Disease score <sup>a</sup> BPB (2012)	Disease score <sup>a</sup> BPB (2013)	Disease score <sup>b</sup> SB (2012)	Plant height (cm), (2013)	Panicle length (cm), (2013)	Flag leaf size (cm <sup>2</sup> ), (2013)
LB_281	91	113	3.5	5	3.5	89.00	21.67	39.71
LB_282	88.5	114	6	7	8	75.00	17.33	39.07
LB_283	89	108	6	4	7	103.00	21.00	29.68
LB_284	88.5	108	3	5	3.5	104.67	20.00	31.94
LB_285	92	109	2.5	5	3.5	90.67	20.00	40.72
LB_286	94	115	2	4	2	99.33	21.33	40.33
LB_287	90.5	109	2.5	4	5	90.00	21.33	27.79
LB_288	88.5	109	5.5	5	7	92.67	19.67	35.05
LB_289	89.5	114	3	2	3	89.00	19.00	39.69
LB_290	95	115	4	2.5	4.5	88.67	19.67	36.29
LB_291	94.5	115	3	3	4	92.67	21.67	41.12
LB_292	95	115	2	2	3.5	95.33	18.67	37.88
LB_293	92	106	8	4	6	105.33	23.00	34.57
LB_294	90.5	113	3	4.5	3.5	101.33	22.33	40.72
LB_295	93	112	3	4.5	4.5	103.00	21.67	45.07
LB_296	90	113	4.5	5.5	6	89.67	19.67	30.29
LB_297	93	114	4	6	3	95.00	19.00	54.86
LB_298	91.5	112	8	3	5	88.33	20.33	43.31
LB_299	95	115	2.5	5	3.5	87.67	19.67	37.61
LB_300	96	115	3	2.5	4	78.67	20.00	30.14
Bengal	93	115	6.6	5	5.6	89.67	18.00	43.77
LM-1	98	120	2.5	2.1	3.1	81.33	19.33	38.45

<sup>a, b</sup> Percent symptomatic area of panicle (a) or sheath (b) with the following scale; 0 (no symptoms), 1 (1 to 10%), 2 (11 to 20%), 3 (21 to 30%), 4 (31 to 40%), 5 (41 to 50%), 6 (51 to 60%), 7 (61 to 70%), 8 (71 to 80%), and 9 (> 90%).

# RICE INSECTS RESEARCH

## COMPARISON OF MALATHION, KARATE Z, AND FASTAC EC AGAINST RICE STINK BUG

B.D. Blackman, M.J. Stout, and M.J. Frey

The efficacies of label (1x) and high (1.7x) rates of Malathion 5EC (organophosphate, Drexel Chemical Company, Memphis, TN), and label rates of Karate Z (pyrethroid, A.I. lambda-cyhalothrin, Syngenta Crop Protection, Greensboro, NC) and Fastac EC (pyrethroid, A.I.  $\alpha$ -cypermethrin, BASF Crop Protection, Research Triangle Park, NC) were compared in small plot studies against the rice stink bug (RSB). Headed rice in the milk stage was treated and sampled for RSB adults and nymphs at varying time points.

**Location:** Rice Research Station, Crowley, LA

**Variety/Seeding Rate:** Cheniere / 60 lb/A

**Plot Size:** 5 x 18 ft

**Planting Method/Date:** Drill-seeded/March 18, 2013

**Fertilization/Weed Control:** Standard practices for drill-seeded rice

**Experimental Design:** Randomized complete block, five treatments, and four replicates

**Treatments:** August 14, 9 a.m.

1. Non-treated control
2. Karate Z foliar application, 0.04 lb ai/A (highest labeled rate)
3. Malathion 0.9 lb ai/A (highest labeled rate)
4. Malathion 1.5 lb ai/A
5. Fastac EC 0.02 lb ai/A

**Sampling:** Ten sweeps per plot covering the width of the plot using a 15-in diameter sweep net. Total number of adults and nymphs collected were recorded for each plot and time point.

**Sampling Dates:** Bugs were sampled at three time points after treatment: 2 HAT (hours after treatment), 2 DAT (days after treatment), and 5 DAT.

**Harvested:** NA

**Data Analysis:** Data were analyzed by mixed model ANOVA using PROC GLIMMX in SAS. Treatment and time were fixed effects, while experiment and block were random effects in the model. In addition, data from each sampling time point were analyzed separately using PROC GLIMMX with treatment as a fixed effect and block as random effect. Means were separated using Tukey's HSD.

Table 1. 2013. Rice stink bug nymphs per 10 sweeps in each treatment by sampling date. Mean  $\pm$  S.E.

Means in a column followed by the same letter(s) are not significantly different (LSD;  $P=0.05$ ).

Treatment	2 HAT	2 DAT	5 DAT
Untreated Control	6.25 $\pm$ 1.03a	5.50 $\pm$ 2.26a	2.25 $\pm$ 1.32a
Malathion, 0.9 lb ai/A	7.00 $\pm$ 2.27a	2.75 $\pm$ 0.75a	1.25 $\pm$ 1.25a
Malathion, 1.5 lb ai/A	0.50 $\pm$ 0.29b	1.00 $\pm$ 0.41b	0.25 $\pm$ 0.25a
Karate Z, 0.04 lb ai/A	0.25 $\pm$ 0.25b	1.25 $\pm$ 0.95b	0.50 $\pm$ 0.50a
Fastac EC, 0.02 lb ai/A	0.75 $\pm$ 0.48b	1.75 $\pm$ 1.75b	0.25 $\pm$ 0.25a



Table 2. 2013. Rice stink bug adults per 10 sweeps in each treatment by sampling date. Mean  $\pm$  S.E.

Means in a column followed by the same letter(s) are not significantly different (LSD;  $P=0.05$ ).

<b>Treatment</b>	<b>2 HAT</b>	<b>2 DAT</b>	<b>5 DAT</b>
<b>Untreated Control</b>	<b>9.50 <math>\pm</math> 3.52a</b>	<b>8.75 <math>\pm</math> 0.48a</b>	<b>3.00 <math>\pm</math> 1.68a</b>
<b>Malathion, 0.9 lb ai/A</b>	<b>10.00 <math>\pm</math> 4.74ab</b>	<b>5.25 <math>\pm</math> 0.85a</b>	<b>2.75 <math>\pm</math> 0.25a</b>
<b>Malathion, 1.5 lb ai/A</b>	<b>6.00 <math>\pm</math> 3.72bc</b>	<b>5.75 <math>\pm</math> 3.20ab</b>	<b>3.75 <math>\pm</math> 0.48a</b>
<b>Karate Z, 0.04 lb ai/A</b>	<b>0.00 <math>\pm</math> 0.00c</b>	<b>4.50 <math>\pm</math> 1.76b</b>	<b>5.75 <math>\pm</math> 1.65a</b>
<b>Fastac EC, 0.02 lb ai/A</b>	<b>3.25 <math>\pm</math> 2.02b</b>	<b>5.50 <math>\pm</math> 2.26ab</b>	<b>3.50 <math>\pm</math> 0.65a</b>

**Conclusion:** Significant reductions in densities of stink bug nymphs relative to control plots were observed in plots treated with Karate Z, Fastac EC, and the high (1.7x) rate of Malathion at 2 HAT and 2 DAT, but not at 5 DAT. Nymph densities in plots treated with malathion at the low rate were not significantly different from the control at any time point. For adults, densities in plots treated with the same three products showed a significant difference from controls at 2 HAT. Karate Z was the only treatment that resulted in a significant reduction in densities of adult RSB compared to the controls at 2 DAT. No treatments were significantly different from the control plots at 5 DAT for adults. Similar results were seen in tests run in 2012. Malathion was tested at a higher rate in 2013 because it was not effective at the labeled rate in 2012.

This test and tests performed in 2012 support the claim that malathion at the currently labeled rate of 0.9 lb ai/A is not effective at lowering RSB densities. Rice stink bugs (RSB) have not been shown to cause economic damage to rice beyond the hard dough stage. Thus, insecticides are not considered necessary for RSB control within the final two weeks of drying prior to harvest. Therefore, the seven day harvest interval for malathion is not a valid factor in continuing to include it in a RSB management program. Harvest intervals are 21 days for Karate Z and 14 days for Mustang Max and Tenchu 20SG. More importantly, these products have been shown to provide the longest residual control of RSB of any products currently labeled for RSB in rice.

# **RICE WEED MANAGEMENT**

## **WEED MANAGEMENT IN HERBICIDE RESISTANT/TOLERANT AND CONVENTIONAL RICE**

E.P. Webster, J.C. Fish, B.M. McKnight, and E. Bergeron

### **RESULTS**

Weed management studies were conducted at the Rice Research Station (RRS), Northeast Research Station (NERS), Macon Ridge Research Station (MRRS), and producer fields in Louisiana in 2013. The 67 studies were established with a total of 685 treatments and 2,736 research plots. These studies indicate that weed control in rice will continue to be more effective as new technologies and new herbicides become available to the producers.

#### **Competitiveness of and Indian Jointvetch**

A multiple year study was conducted in 2011, 2012, and 2013 to evaluate the competitiveness of Indian jointvetch with rice. The studies were conducted at the RRS and the NERS at St. Joseph. Densities of 3 to 15 plants/yard<sup>2</sup> were established. The low density represents 11 plants per plot and the high density is approximately 53 plants. The densities evaluated indicate that 3 plants/yard<sup>2</sup> of Indian jointvetch reduced rice yields. Visual observations indicate disease pressure was higher under the increased weed densities. This higher disease pressure may be due to preventing the fungicide from contacting the rice plants.

#### **Impact of Herbicide Timing on Broadleaf Weeds and Sedges**

Four studies were conducted in 2011, 2012, and 2013 at the RRS and NERS. Each trial included 16 broadleaf and/or sedge herbicides applied at early postemergence, mid-postemergence, late postemergence, and salvage. Command was applied as a preemergence application at 12.8 oz/A. Each application timing was a separate study. These studies evaluated the control of hemp sesbania, Indian jointvetch, yellow nutsedge, and rice flatsedge. Herbicides applied at the early postemergence timing allowed for re-infestation of the area by Indian jointvetch and other weeds. At the mid-postemergence timing, several herbicides controlled the weeds present and allowed the rice to maximize yields. The herbicides that performed at the mid-postemergence timing were Propanil, Halomax, Permit Plus, Londax, Facet, Regiment, League, Broadhead, Strada Pro, and Grasp Xtra. Weed control increased with all herbicides applied as a salvage application; however, Halomax, Grasp, Facet, Grandstand, and Grasp Xtra increased yields, compared with the nontreated, from 1,200-2,070 lb/A. Yields decreased as initial timing was delayed past the mid-postemergence timing. The mid-postemergence timing appeared to be the most consistent of all the studies in 2012 and 2013 from a weed control and yield standpoint.

#### **Managing Red Rice Outcrosses and Hybrid Rice Volunteers**

A long term study was established on a grower location in 2013 to evaluate the management of red rice outcrosses and/or hybrid volunteers. Five rotations were established, and will be evaluated on a yearly basis for four years. The rotations under evaluation are: 1) Roundup Ready soybean followed by (fb) Clearfield rice fb Roundup Ready soybean fb Clearfield rice; 2) Roundup Ready soybean fb Roundup Ready soybean fb Roundup Ready soybean fb Clearfield rice; 3) fallow fb herbicide-resistant rice fb Roundup Ready soybean fb Clearfield rice; 4) fallow fb herbicide-resistant rice fb Roundup Ready soybean fb Clearfield rice; 5) Clearfield rice fb Roundup Ready soybean fb herbicide-resistant rice fb Clearfield rice. A similar weed control program was used in the 2013 study as those used in the previous study. However, rotation 2 received glyphosate at 1 qt/A plus dimethenamid at 20 oz/A plus pyroxasulfone at 1.5 oz/A at the first trifoliate leaf stage. Prior to rice harvest and two weeks following soybean harvest, weedy rice plant counts were determined. The number of weedy rice plants for each rotation were: rotation 1-17.2 plants/m<sup>2</sup>; rotation 2-25.1 plants/m<sup>2</sup>; rotation 3-0.3 plants/m<sup>2</sup>; rotation 4-5.2 plants/m<sup>2</sup>; rotation 5-7.8 plants/m<sup>2</sup>. This research indicates that long term crop rotation, herbicide rotation, and employing different production practices can be used to manage weedy rice plants.

### **Sharpen as a Rice Herbicide**

This project has been evaluating Sharpen as postemergence herbicide in rice. Sharpen is currently labeled as a preplant burndown herbicide in rice with a 14 day preplant interval. Sharpen has similar activity to Aim and Blazer. It has excellent activity on hemp sesbania, Texasweed, and Indian jointvetch. Sharpen also has activity on rice flatsedge and several grass species. Sharpen is being evaluated at 1 and 2 oz/A. The adjuvant also plays an important role in the activity of this herbicide. The most consistent adjuvant is methylated seed oil (MSO); however, when applied at 2 oz/A plus MSO, moderate to severe crop injury can occur. Two rice tolerance trials were conducted in 2013 to evaluate the impact of Sharpen on Clearfield hybrid CLXL 745 and conventional hybrid XL 729. Sharpen at 1 oz/A resulted in injury of 10 to 20%; however, at 2 oz/A injury increased to above 30%. This injury was transient and by 2-3 weeks after treatment injury dropped below 15%. Sharpen has potential for use in our production system; however, this herbicide will need to be used with caution.

### **New Pre-package Mixtures**

This project continues to evaluate pre-package mixtures. FMC received a full label for Obey in 2014. This mix contains Command and quinclorac. Each one of these herbicides will be useful in our production system. Isagro has a pre-package mixture called Strada-Pro, which is a mixture of Strada plus Halomax. The addition of Halomax broadens the activity of Strada on nutsedge species. Isagro, also labeled Strada XT2, is a mix of Strada plus quinclorac. The highest rate that can be applied is 10.5 oz/A, which contains the equivalent of 2.1 oz/A of Strada and approximately 0.5 lb/A of the equivalent rate of Facet. Results from this year indicate that Strada Pro has an excellent fit in Louisiana rice production.

### **Evaluation of Experimental Herbicide – GWN 10235**

This project continues to evaluate several experimental herbicides. As previously discussed, several of the new products are pre-package mixtures of currently labeled rice herbicides. The most promising of these herbicides is an experimental compound from Gowan, GWN 10235. This herbicide needs water to be active. The herbicide has soil activity, but must be activated with establishment of a permanent flood within a few hours of application. The herbicide seems to be more consistent if a flood is present prior to application. This herbicide probably has the best activity on ducksalad of any product this project has evaluated. It has activity on sedges, grasses, and broadleaf weeds. Initial observations indicate activity on Amazon sprangletop. This herbicide may be available in 2014, but it is more likely to be labeled in 2015. This project evaluated four other experimental herbicides. One of the four products has good potential, but it has little to no activity on yellow nutsedge. A pre-package mix with Permit may be an option.

This is a summary of the research that was conducted in 2013. To see the complete weed management annual report, please go to:

<https://www.lsuagcenter.com/MCMS/RelatedFiles/%7B9CF8B5B7-6472-4816-A2E6-B5F272939C94%7D/2013-Annual-Report-%28Eric-Webster%29.pdf>

## **RICE PRODUCTION ECONOMICS RESEARCH IN 2013**

Michael E. Salassi

Rice enterprise production cost budget projections for 2013 were developed in the fall of 2012 for alternative rice production systems in Louisiana. A summary of the enterprise budgeting analysis for rice production systems in Southwest Louisiana are presented in Tables 1 and 2. Values presented represent rice break-even prices to cover direct (variable) and total estimated rice production costs per hundredweight and per barrel of rough rice produced for selected yield levels. Direct production costs include expenses for seed, fertilizer, chemicals, fuel, labor, repairs, custom charges, and interest on operating capital. Total specified expenses include direct expenses plus fixed costs on machinery and equipment. These values can also be interpreted as the break-even price or income per output unit required to cover total production costs. Tenant-operator situations shown in the tables were budgeted for each enterprise with a 70/30 share rent arrangement with the landlord/waterlord paying the irrigation pumping costs.

Rice production costs were estimated for the following types of rice production systems: water planted, drill planted, conventional variety, Clearfield variety, conventional tillage, stale seedbed, in rotation, and fallow land. Base yield level for Southwest Louisiana was 65.0 cwt/A (40.1 bbl/A) for water- and drill-planted rice. Variable production costs ranged from \$9.98 to \$11.37/cwt for water-planted rice and from \$9.11 to \$10.58/cwt for drill-planted rice at the base yield level of 65.0 cwt/A. Cost differences were influenced by use of conventional or herbicide-resistant variety, conventional versus stale seedbed tillage system, and rice production in rotation or on fallow land. Total projected rice production costs for 2013 ranged from \$10.98 to \$12.79/cwt for water-planted rice and from \$10.31 to \$11.69/cwt for drill-planted rice at the base yield level of 65.0 cwt/A.

The Projected 2013 Rice Farm Cash Flow Model was developed to assist producers in planning for the 2013 crop year. The model is an Excel spreadsheet that allows rice producers to enter projected acreage, yield, market price, and production cost data for 2013 to estimate net returns above variable production costs and to easily evaluate the impact of changing percent of base planted on net returns. The primary purpose of the model is to evaluate the impact on net returns above variable production costs for alternative rice rental arrangements and percent of base acreage planted. The model also includes entry cells for whole farm fixed expenses to estimate projected returns from rice production over all costs.

A two-year study conducted over the 2011 and 2012 crop years was analyzed and completed in 2013 for the purpose of determining the impact on rough rice milling yield and the resulting rough rice market price resulting from downed/lodged rice. The general purpose of this project is to develop estimates of milling yield and market price impacts of lodged rice which might be used to develop crop insurance products covering this harvest situation. Tests were conducted on the Rice Research Station as well as locations in Stuttgart, AR; Stoneville, MS; and Eagle Lake, TX. Samples were taken from lodged and standing rice for seven varieties (CL151, Jupiter, Wells, Cocodrie, Presidio, CLXL745, and LAH10) at the Rice Research Station. Three rice crop harvest condition treatments were evaluated: (a) lodged 5-7 days prior to field drainage, (b) lodged approximately one week prior to harvest, and (c) standing. Two planting dates were also evaluated: an early planting date and a later planting date. Milling tests were conducted on the samples taken and rough rice market prices were estimated based on milling yields. Results indicated significant reduction in whole grain milling yield for lodged rice, proportional to the length of time the plant was lodged prior to harvest. Average rough rice milling yield results over the two years of the study for the early planting date trials over all rice varieties and across all locations are shown in Table 3. Average rough rice milling yield results for the late planting date trials are shown in Table 4.

Evaluations were made of the estimated rice farm program payments, as well as the probability of a payment being made, for the primary House and Senate farm bills being considered during 2013. The House proposal consisted of the Revenue Loss Coverage Program (RLC) and the Price Loss Coverage Program (PLC), while the Senate proposal consisted of the Agricultural Risk Coverage Program (ARC) and the Adverse Market Payment Program (AMP). Economic analysis of these programs for rice production in Louisiana found that the market price based programs (AMP and PLC) provided better income support through price protection than the other programs based on average revenue (ARC and RLC). Simulation analysis results from the evaluation of these farm program options are shown in Table 5.

**Table 1. Rice Break-even Prices to Cover Variable Production Costs for Selected Yield Levels, Southwest Louisiana, 2013.**

Crop Description	Yield Level in Hundredweight per Acre				
	-10%	-5%	Base	+5%	+10%
	58.5	61.8	65.0	68.3	71.5
-----Dollars per Hundredweight-----					
<u>Southwest Louisiana:</u>					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	11.21	10.69	10.22	9.79	9.40
(ii) Stale Seedbed:					
- In Rotation	10.95	10.44	9.98	9.57	9.19
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:	12.49	11.90	11.37	10.88	10.45
- In Rotation					
	12.24	11.66	11.14	10.67	10.24
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	9.98	9.52	9.11	8.73	8.39
(b) Clearfield Variety:					
(i) Conventional Tillage:	10.25	9.77	9.35	8.96	8.61
- In Rotation					
(ii) Stale Seedbed:	11.20	10.67	10.20	9.78	9.39
- In Rotation					
	11.61	11.07	10.58	10.13	9.73
-----Dollars per Barrel-----					
<u>Southwest Louisiana:</u>					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	18.16	17.31	16.55	15.86	15.23
(ii) Stale Seedbed:					
- In Rotation	17.74	16.91	16.17	15.50	14.88
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:	20.23	19.27	18.41	17.63	16.92
- In Rotation					
	19.82	18.88	18.04	17.28	16.59
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	16.17	15.42	14.76	14.15	13.60
(b) Clearfield Variety:					
(i) Conventional Tillage:	16.60	15.83	15.14	14.52	13.95
- In Rotation					
(ii) Stale Seedbed:	18.14	17.29	16.53	15.58	15.21
- In Rotation					
	18.81	17.93	17.13	16.42	15.76

**Table 2. Rice Break-even Prices to Cover Total Specified Production Costs for Selected Yield Levels, Southwest Louisiana, 2013.**

Crop Description	Yield Level in Hundredweight per Acre				
	<u>-10%</u>	<u>-5%</u>	<u>Base</u>	<u>+5%</u>	<u>+10%</u>
	58.5	61.8	65.0	68.3	71.5
-----Dollars per Hundredweight-----					
<u>Southwest Louisiana:</u>					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	12.79	12.18	11.64	11.14	10.69
(ii) Stale Seedbed:					
- In Rotation	12.06	11.49	10.98	10.52	10.10
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	14.07	13.40	12.79	12.24	11.74
	13.35	12.71	12.14	11.62	11.15
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	11.31	10.78	10.31	9.88	9.48
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	11.52	10.98	10.50	10.06	9.66
(ii) Stale Seedbed:					
- In Rotation	12.37	11.78	11.26	10.78	10.35
	12.85	12.24	11.69	11.19	10.74
Yield Level in Barrels per Acre					
	<u>-10%</u>	<u>-5%</u>	<u>Base</u>	<u>+5%</u>	<u>+10%</u>
	36.1	38.1	40.1	42.1	44.1
-----Dollars per Barrel-----					
<u>Southwest Louisiana:</u>					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	20.72	19.74	18.85	18.05	17.32
(ii) Stale Seedbed:					
- In Rotation	19.54	18.62	17.79	17.04	16.36
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	22.80	21.71	20.72	19.83	19.03
	21.62	20.59	19.67	18.83	18.06
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation					
(ii) Stale Seedbed:					
- In Rotation	18.33	17.47	16.70	16.00	15.36
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	18.67	17.79	17.00	16.29	15.64
(ii) Stale Seedbed:					
- In Rotation	20.03	19.09	18.23	17.46	16.67
	20.81	19.82	18.93	18.13	17.40

**Table 3. Rough Rice Milling Yield Results, Early Planting Date, All Varieties, All Locations, 2011-2012.**

<b>Rice Crop Lodging Status</b>	<b><u>Average Milling Yield</u></b>			<b><u>Milling Yield Change</u></b>		
	Whole	Broken	Total	Whole	Broken	Total
	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>
Lodged Early	51.07	18.18	69.25	-3.96	+3.11	-0.85
Lodged Late	49.52	19.80	69.32	-5.51	+4.73	-0.78
Standing	55.03	15.07	70.10	--	--	--

**Table 4. Rough Rice Milling Yield Results, Late Planting Date, All Varieties, All Locations, 2011-2012.**

<b>Rice Crop Lodging Status</b>	<b><u>Average Milling Yield</u></b>			<b><u>Milling Yield Change</u></b>		
	Whole	Broken	Total	Whole	Broken	Total
	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>	<i>(lbs)</i>
Lodged Early	51.24	17.88	69.12	-3.81	+2.72	-1.09
Lodged Late	52.03	17.28	69.31	-3.02	+2.12	-0.90
Standing	55.05	15.16	70.21	--	--	--

**Table 5. Comparison Expected Rice Farm Program Payments for Alternative Rice Price Expectations -  
Previous 5-year, 8-year and 10-year rice market price histories.**

<b>Payment Amount &amp; Likelihood</b>	<b>ARC Program</b>	<b>RLC Program</b>	<b>AMP Program</b>	<b>PLC Program</b>
<u>Prev. 5-year price history</u>				
Avg. Exp. Payment	\$3.48	\$1.62	\$7.82	\$17.66
Likelihood of Payment	10.5%	6.2%	16.3%	31.0%
<u>Prev. 8-year price history</u>				
Avg. Exp. Payment	\$29.12	\$25.27	\$76.52	\$104.41
Likelihood of Payment	47.6%	40.1%	52.8%	64.7%
<u>Prev. 10-year price history</u>				
Avg. Exp. Payment	\$39.23	\$35.81	\$119.77	\$157.63
Likelihood of Payment	60.4%	52.3%	64.8%	74.5%

# **LOUISIANA RICE RESEARCH VERIFICATION PROGRAM - 2013**

J.K. Saichuk

## **Introduction**

The Louisiana Rice Research Verification Program (LRRVP) began in 1997 in three parishes: Allen, Calcasieu, and Jefferson Davis. In 1998, the program was funded and expanded to 10 parishes (Acadia, Avoyelles, Calcasieu, East Carroll, Evangeline, Jefferson Davis, Madison, Morehouse, St. Landry, and Vermilion). From 1999 to 2013, 118 fields had been included in the verification program. In 2013, the program included five fields (Figure 1).

The fields were visited on at least a weekly basis by a Specialist or County Agent. Production practice recommendations were made by the Specialist or Agent. These recommendations included, but were not limited to, fertilization, weed control, disease control, insect control, and water management to a limited degree. The fields were followed from planting to harvest.

Yield data were collected for each of the fields (Table 1). Yields of the first crop averaged 8,709 lb/A (193.5 bu/A or 53.8 bbl/A) at 12% moisture. Second crop was harvested in Jefferson Davis and St. Landry parishes, adding another 1,167 lb/A to the total, for a final average of 10,125 lb/A (225 bu/A or 62.5 bbl/A). This yield exceeded that of the parishes participating in the program by 2,027 lb/A.

Economic data continue to reveal large production cost differences between growers. It also is clear that more needs to be done to help farmers reduce production costs (Table 2). Water costs remain one of the most elusive to capture and are often underestimated by the grower.

The program continues to provide an accurate evaluation of current recommendations and insight into other areas of research. The educational value of the program to all concerned (farmers, researchers, and extension personnel) increases each year.

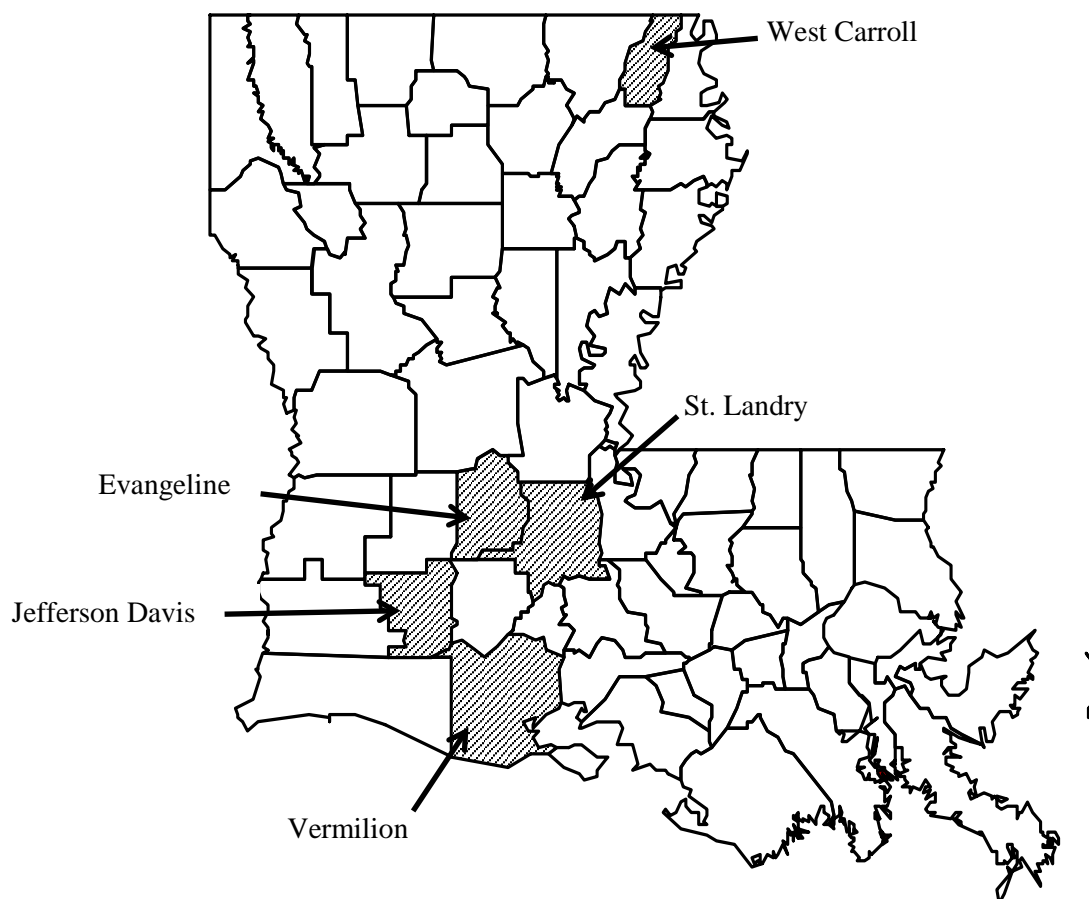
Budget reductions have reduced the number of experienced rice county agents and the scope of the verification program. In 2014, it is anticipated that the program will include five fields.

This is a summary of the Louisiana Rice Research Verification Program in 2013. To see the complete Verification Program report, please go to:

[http://www.lsuagcenter.com/en/crops\\_livestock/crops/rice/verification\\_program/](http://www.lsuagcenter.com/en/crops_livestock/crops/rice/verification_program/)



Figure 1. Verification Parishes in 2013.



**Table 1. Yields of Verification Fields in 2013.**

Parish	Acres	Variety	Cwt/A green	Bbl/A green	Bu/A green	Cwt/A dry	Bbl/A dry	Bu/A dry
Evangeline	38.0	CL111	87.67	54.1	194.8	83.68	51.7	186.0
Jefferson Davis <sup>2</sup>	39.3	CLXL729	108.00	66.7	240.0	105.41	65.1	234.2
St. Landry <sup>2</sup>	52.4	Catahoula	131.33	81.1	291.8	121.83	75.2	270.7
W. Carroll	34.5	CLXL756	114.68	70.8	254.8	105.82	65.3	235.2
Vermilion	17.3	Mermentau	63.06	38.9	140.1	58.98	36.4	131.1
<b>Average<sup>1</sup></b>	181.5		107.47	66.3	238.8	101.25	62.5	225.0

<sup>1</sup> Averages are weighted by acres.

<sup>2</sup> Includes second crop.

**Table 2. 2013 Louisiana Rice Research Verification Program Yield, Milling and Economic Summary.**

Parish	Variety	Yield @ 12% Moisture (cwt/A) <sup>1</sup>	Milling (% Whole / % Total)	Variable Costs (\$/A) <sup>2</sup>	Cost of Production (\$/cwt) <sup>2</sup>	Return on Variable Costs (\$/A) <sup>2,3</sup>
Evangeline	CL111	83.68	63.98/73.59	0 <sup>4</sup>	0 <sup>4</sup>	0 <sup>4</sup>
Jefferson Davis	CLXL729	105.41	54.49/72.15	\$859.96	\$8.16	\$816.06
St. Landry	Catahoula	121.83	64.00/70.00	\$482.79	\$3.96	\$1454.31
W. Carroll	CLXL756	105.82	43.41/70.80	\$540.46	\$5.11	\$1142.08
Vermilion	Mermentau	58.98	65.29/72.43	\$325.64	\$5.52	\$612.14

1 - Figure includes ratoon crop yield.

2 - Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transporting, drying, storing, or fixed costs.

3 - This value was obtained using a selling price of \$15.90 per cwt for long grain.

4 - Economic data were not collected from Evangeline.

**Table 3. Sixteen-Year Louisiana Rice Research Verification Summary.**

<b>1998 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia*	53.0	32.8	118.1	5,314
Avoyelles	32.5	42.9	154.4	6,950
Calcasieu*	60.0	34.1	122.8	5,524
East Carroll	33.9	41.1	148.0	6,658
Evangeline	33.0	42.9	154.4	6,950
Jefferson Davis*	61.8	37.3	134.3	6,043
Madison	36.6	39.0	140.4	6,318
Morehouse	63.0	33.8	121.7	5,476
St. Landry	37.1	38.2	137.5	6,188
Vermilion	16.7	29.4	105.8	4,763
<b>TOTALS</b>	<b>427.6</b>	<b>37.2</b>	<b>133.7</b>	<b>6,018</b>

\* Yields include second crop.

<b>1999 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia*	31.1	37.4	134.6	6,059
Avoyelles	32.5	46.6	167.8	7,549
Calcasieu	49.3	34.6	124.6	5,605
Catahoula	30.4	33.4	120.2	5,411
East Carroll	36.1	47.0	169.2	7,614
Evangeline	22.3	43.1	155.2	6,982
Jefferson Davis*	26.6	30.8	110.9	4,990
Madison	38.1	39.0	140.4	6,318
St. Landry	30.1	38.8	139.7	6,286
Vermilion	23.8	36.5	131.4	5,913
<b>TOTALS</b>	<b>320.3</b>	<b>38.7</b>	<b>139.4</b>	<b>6,273</b>

\* Yields include second crop.

**Table 3. Continued.**

<b>2000 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia	53.3	39.4	141.8	6,383
Avoyelles	63.2	36.7	132.1	5,945
Calcasieu	22.1	25.1	90.4	4,066
Catahoula	39.6	36.4	131.0	5,897
East Carroll	45.1	49.1	176.8	7,956
Evangeline	19.9	38.2	137.5	6,188
Jefferson Davis	30.6	26.7	96.1	4,325
Morehouse	27.7	28.3	101.9	4,585
St. Landry	70.7	39.2	141.1	6,350
Vermilion*	21.6	37.7	135.7	6,107
<b>TOTALS</b>	<b>393.8</b>	<b>35.7</b>	<b>128.4</b>	<b>5,780</b>

\* Yields include second crop.

<b>2001 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia*	60.6	50.8	182.9	8,230
Allen	41.6	35.1	126.4	5,686
Avoyelles	63.2	38.1	137.2	6,172
Calcasieu*	61.9	39.4	142.0	6,388
Concordia	79.6	36.1	130.1	5,853
Evangeline*	20.8	52.7	189.7	8,538
Jefferson Davis*	21.6	57.3	206.4	9,289
Richland	65.9	46.0	165.5	7,447
St. Landry*	40.6	51.1	184.0	8,282
Vermilion*	33.3	52.4	188.7	8,493
<b>TOTALS</b>	<b>489.1</b>	<b>45.9</b>	<b>165.3</b>	<b>7,438</b>

\* Yields include second crop.

**Table 3. Continued.**

<b>2002 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia*	38.4	49.8	179.3	8,068
Allen*	25.1	46.0	165.6	7,452
Avoyelles	37.4	49.9	179.6	8,084
Beauregard*	49.5	53.1	191.2	8,602
Calcasieu*	41.4	42.4	152.6	6,869
Concordia	67.6	48.2	173.5	7,808
Evangeline	42.0	37.6	135.4	6,091
Jefferson Davis*	31.7	45.0	162.0	7,290
Richland	35.8	42.1	151.5	6,819
St. Landry	32.7	48.8	175.7	7,906
Vermilion*	32.0	49.8	179.4	8,072
<b>TOTALS</b>	<b>433.6</b>	<b>46.6</b>	<b>167.8</b>	<b>7,551</b>

\* Yields include second crop.

<b>2003 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia	57.2	44.0	158.4	7,128
Allen*	35.7	46.1	166.0	7,469
Avoyelles	37.4	50.1	180.4	8,116
Beauregard*	45.7	48.7	175.2	7,884
Concordia	79.5	49.2	177.1	7,970
Evangeline*	48.4	44.5	160.2	7,209
Jefferson Davis*	52.9	28.7	103.3	4,649
Richland	40.2	44.7	160.8	7,234
St. Landry*	32.7	61.1	220.0	9,898
Vermilion*	33.0	40.0	144.0	6,480
<b>TOTALS</b>	<b>462.7</b>	<b>45.7</b>	<b>164.5</b>	<b>7,404</b>

\* Yields include second crop.

**Table 3. Continued.**

<b>2004 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Allen*	53.2	40.9	147.1	6,620
Avoyelles	33.3	32.8	118.0	5,307
Beauregard*	21.8	42.5	153.3	6,899
Concordia	82.3	36.0	130.0	5,843
East Carroll	54.8	45.8	165.0	7,427
Evangeline	30.7	34.8	125.2	5,638
Jefferson Davis*	42.3	38.5	138.6	6,237
Natchitoches	47.2	44.1	158.8	7,144
St. Landry*	60.1	65.1	234.3	10,543
Vermilion*	30.0	42.1	151.6	6,824
<b>TOTALS</b>	<b>455.7</b>	<b>42.3</b>	<b>152.2</b>	<b>6,848</b>

\* Yields include second crop.

<b>2005 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia	28.9	39.6	143.8	6,427
Allen	76.7	25.6	92.0	4,140
Avoyelles	32.1	35.9	129.3	5,819
Calcasieu	49.0	51.0	184.0	8,282
Concordia	60.5	43.0	156.0	7,003
East Carroll	30.4	47.9	172.7	7,771
Evangeline	30.0	37.1	133.6	6,014
Jefferson Davis	39.2	32.5	117.0	5,264
Natchitoches	30.0	43.3	156.0	7,022
Richland	47.4	49.2	177.2	7,974
St. Landry	61.7	47.5	170.9	7,689
Vermilion	52.8	40.9	147.3	6,631
<b>TOTALS</b>	<b>538.7</b>	<b>41.1</b>	<b>148.3</b>	<b>6,670</b>

**Table 3. Continued.**

<b>2006 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Avoyelles	41.8	43.0	155.0	6,972
Concordia	54.7	50.8	183.0	8,237
East Carroll	60.4	44.5	150.0	7,210
Evangeline	29.4	32.3	116.0	5,227
Jefferson Davis	21.5	43.8	157.8	6,000
St. Landry	40.9	36.8	132.5	5,962
Vermilion	29.6	37.0	133.3	7,100
West Carroll	50.1	53.1	191.2	8,603
<b>TOTALS</b>	<b>328.4</b>	<b>43.4</b>	<b>156.4</b>	<b>7,040</b>

<b>2007 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Avoyelles	40.9	56.7	204	9,187
Concordia	53.8	53.6	193	8,680
East Carroll	23.0	49.0	176	7,917
Evangeline – St. Landry	33.9	50.1	180	8,122
Jefferson Davis*	38.9	55.8	201	9,046
Vermilion*	36.6	46.0	166	7,451
West Carroll	40.2	45.4	164	7,356
<b>TOTALS</b>	<b>267.3</b>	<b>51.2</b>	<b>184</b>	<b>8,293</b>

\* Yields include second crop.

<b>2008 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Avoyelles	40.9	47	170	7,657
Calcasieu*	55.1	51	183	8,247
Concordia	54.7	44	160	7,178
Evangeline	46.4	42	152	6,840
Madison	41.5	51	182	8,208
Jefferson Davis*	37.7	52	189	8,481
St. Landry	60.2	48	173	7,801
Vermilion*	51.1	70	252	11,359
<b>TOTALS</b>	<b>387.6</b>	<b>51</b>	<b>183</b>	<b>8,228</b>

\* Yields include second crop.

**Table 3. Continued.**

<b>2009 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Acadia*	56.6	70.9	255.3	11,489
Avoyelles	28.6	50.7	182.5	8,214
Calcasieu*	41.7	58.1	209.3	9,418
Concordia	57.0	49.6	178.6	8,035
East Carroll	33.6	41.3	148.7	6,692
Evangeline*	22.5	61.7	222.2	9,999
Madison	29.0	50.4	181.5	8,168
St. Landry	49.4	49.3	177.5	7,987
Vermilion*	41.5	66.9	241.0	10,843
<b>TOTALS</b>	<b>359.9</b>	<b>56.0</b>	<b>201.7</b>	<b>9,078</b>

\*Yields include second crop

<b>2010 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Avoyelles	41.8	49.7	179.0	8,057
Jefferson Davis*	35.8	67.5	243.1	10,941
St. Landry	31.3	44.3	159.4	7,171
<b>TOTALS</b>	<b>108.9</b>	<b>54.0</b>	<b>194.4</b>	<b>8,750</b>

\*Yields include second crop.

<b>2011 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Allen	23.2	48.1	173.3	7,799
Cameron <sup>1</sup>	17.6	57.6	207.4	9,332 <sup>1</sup>
Madison	10.5 <sup>2</sup>	57.9	208.5	9,382
St. Landry	45.7	42.5	153.1	6,890
Vermilion	24.0	54.0	194.5	8,754
<b>TOTALS</b>	<b>121.0</b>	<b>49.4</b>	<b>177.9</b>	<b>8,005</b>

<sup>1</sup> Yields include second crop.

<sup>2</sup> Yield calculated on 10.5 acres, total field acres 73.4.



**Table 3. Continued.**

<b>2012 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Allen	30.7	45.6	164.2	7,391
Cameron <sup>1</sup>	35.7	42.3	152.4	6,858
Concordia	37.4	45.2	162.7	7,321
St. Landry <sup>1</sup>	44.1	64.9	233.6	10,510
Vermilion	16.5	44.1	158.6	7,137
<b>TOTALS</b>	<b>164.4</b>	<b>49.8</b>	<b>179.3</b>	<b>8,071</b>

<sup>1</sup> Yields include second crop.

<b>2013 Verification Acres and Yields</b>				
		<b>Yield @ 12% Moisture</b>		
<b>Parish</b>	<b>Acres</b>	<b>Barrels/A</b>	<b>Bushels/A</b>	<b>Pounds/A</b>
Evangeline	38.0	51.7	186.0	8,368
Jefferson Davis <sup>1</sup>	39.3	65.1	234.2	10,541
St. Landry <sup>1</sup>	52.4	75.2	270.7	12,183
Vermilion	17.3	36.4	131.1	5,898
W. Carroll	34.5	65.3	235.2	10,582
<b>TOTALS</b>	<b>181.5</b>	<b>62.5</b>	<b>225.0</b>	<b>10,125</b>

<sup>1</sup> Yields include second crop.

Verification Totals			Verification Parish Totals		
Year	Acres	Pounds/A	Acres	Pounds/A	Difference
1998	427.6	6,018	475,103	5,052	966
1999	320.3	6,273	444,015	5,502	771
2000	393.8	5,780	385,824	5,620	160
2001	489.1	7,438	412,286	5,794	1,644
2002	433.6	7,551	412,630	5,764	1,787
2003	462.7	7,404	327,843	5,843	1,561
2004	455.7	6,848	311,606	5,582	1,266
2005	538.7	6,670	402,759	6,165	505
2006	328.4	7,040	185,249	5,644	1,396
2007	267.3	8,293	183,357	6,501	1,792
2008	387.6	8,228	258,845	6,047	2,181
2009	359.9	9,078	246,793	6,715	2,363
2010	108.9	8,750	125,856	6,488	2,262
2011	121.0	8,005	110,236	6,175	1,830
2012	164.4	8,071	109,823	6,043	2,028
2013	181.5	10,125	202,366	7,524	2,602
<b>Totals</b>	<b>5,440.0</b>	<b>7,346</b>	<b>4,595,091</b>	<b>5,890</b>	<b>1,456</b>

# COASTAL PLANT PROJECT

## EVALUATION OF HERBICIDES AND THEIR APPLICATIONS IN SMOOTH CORDGRASS SEED PRODUCTION FIELDS

H.S. Utomo, I. Wenefrida, and E. Webster

Seed production fields of smooth cordgrass can be managed in various field conditions from more saline to freshwater environments similar to that of rice (*Oryza sativa*). Smooth cordgrass is the predominant species in coastal marshes. Although it can grow well in the freshwater, smooth cordgrass faces stiff competition from complex weeds composed of grass and broadleaf weeds when grown in this environment. Herbicide control, therefore, becomes necessary to reduce competition and help smooth cordgrass reach its production potential. Although there is no specific guide about herbicide usage on seed production fields of smooth cordgrass, methodologies already established for water seeded rice can be used as a model. A wide range of herbicides has been identified and formulated for their specificity in controlling these weeds from aquatic broadleaf weeds, sedges, and grass weeds. Quinclorac or thiobencarb, for example, are commonly used to control barnyard grass [*Echinochloa crus-galli* (L.) Beauv.], while aquatic broadleaf weeds and sedges are controlled by bensulfuron or imazosulfuron. Although, smooth cordgrass grows well in freshwater, it is less competitive against freshwater weed populations, such as ducksalad (*Heteranthera limosa*), spikerush (*Eleocharis* spp.), cattail (*Typha* spp.), and bulltongue arrowhead (*Sagittaria lancifolia*). These are major weeds that need to be controlled.

We have conducted studies to 1) determine the effects of 14 herbicides (commonly used in aquatic crop production fields) on smooth cordgrass seedlings, and 2) evaluate the applications of the herbicides penoxsulam and bensulfuron in controlling ducksalad and their effects on seed yield.

### Methodology

#### 1. Effects of 14 herbicides on smooth cordgrass seedlings:

Greenhouse studies were carried out to study herbicide tolerance at a seedling stage. For seedling studies, we used smooth cordgrass seeds of PolyC15 produced from random poly-crosses of 15 genetically distinctive parental lines selected from Louisiana smooth cordgrass populations. We planted the seeds in 53 x 30 cm plastic trays (10 g seed/tray with 2 kg of potting soil in each tray). The seeds were grown in the greenhouse at ~27°C with no supplemental light, drench-fertilized weekly using a soluble fertilizer mix of 100 mg L<sup>-1</sup> Peters Professional 20-20-20 (Scotts Miracle-Gro Co., Marysville, OH), and watered as needed to encourage proper plant growth. Smooth cordgrass seedlings were sprayed at the 3- to 5-leaf stage to evaluate 14 herbicides with concentrations as specified in the treatment in a completely randomized design, with a two-factor factorial consisting of herbicide and rate with five replications. We used a CO<sub>2</sub> backpack sprayer with 240 kPa of pressure and calibrated it to deliver 140 L ha<sup>-1</sup>. Crop oil at 1.25% (v/v) was added to all treatments except propanil. We evaluated crop injury visually 3, 5, 7, 15, and 30 days after treatment (DAT). Injury ratings were determined by comparing each treatment to the non-treated, using a scale from 0 to 100, where 0 = no injury or completely green and 100 = no green color. Seedling survival was determined based on the percentage of seedling mortality.

#### 2. Herbicides penoxsulam and bensulfuron on controlling ducksalad and their effects on seed yield:

We evaluated two herbicides, penoxsulam and bensulfuron, applied singly and sequentially for their effectiveness to control ducksalad, the major weed in smooth cordgrass seed production fields, and their effect on seed yield. The experiment was conducted in a randomized block design using a factorial treatment arrangement with two-factor factorial consisting of a predetermined application method and herbicide rate with four replications. One-gallon potted plants of equal growth stage and size (average of five stems and 55 cm of height) were used for field transplanting. The plants were transplanted to the field. The plot size was 1.2 x 6-m composed of five transplanted PolyC15 progenies. Following transplanting, the field was fertilized with 260 lb/A 24-60-60 (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O) and flooded immediately. At the time of herbicide applications, ducksalad had a range of growth from cotyledon to 5-leaf stage and in early bloom. When herbicide was applied at 1 month after treatment (MAT), the average height of transplants was 59 cm with averaged tillers of 5, at 3 MAT, the average height of transplants was

77 cm with averaged tillers of 8, and at 5 MAT, the average height of transplants was 96 cm with averaged tillers of 10. About 48 hr prior to each herbicide application, the water was drained. Permanent flood was established 7 DAT. Ducksalad densities were determined just prior to herbicide application by counting of the plants within a 1 m<sup>2</sup> quadrat. Weed control and crop injury were assessed at 4 weeks after treatment (WAT). Weed control was rated from 0 to 100 where 100 equaled weed death. Transplant (crop) injury was also rated from 0 (no injury or completely green) to 100 (no green color).

For sequential treatments, the values for both weed control and transplant injury were the average values of the last and previous treatment(s). For example, ducksalad control for penoxsulam (1,3) was the average value of ducksalad controls after penoxsulam spray at 1 and subsequent spray at 3 MAT in which each value was assessed 4 WAT. For the 2011 experiment, seeds were hand harvested from each plot. The harvested panicles containing mature seeds were stored in a 2°C cooler in a heavy duty plastic bag for two months, then threshed, cleaned to approximately 90% purity using Hege 3SA Seed Cleaner (Serial #199; Colwich, KS), and weighted out.

## Results

### 1. Seedling Tolerance

Seedlings of smooth cordgrass were highly sensitive to four herbicides: glyphosate, imazethapyr, fenoxaprop, and triclopyr. Application at 1.68 kg ai ha<sup>-1</sup> of glyphosate, 0.07 kg ai ha<sup>-1</sup> imazethapyr, 0.122 kg ai ha<sup>-1</sup> fenoxaprop, and 0.42 kg ai ha<sup>-1</sup> triclopyr caused high seedling mortality with respectively 0, 3, 5, and 7% seedling survival rates. Propanil application at 4.48 kg ai ha<sup>-1</sup> caused a 57% plant injury. At a higher concentration of 8.96 kg ai ha<sup>-1</sup>, the injury rate further increased to 77%. Compared with the five herbicides used above, thiobencarb was less toxic showing 22% plant injury for a lower rate application of 5.6 kg ai ha<sup>-1</sup> and 38% for a higher rate application of 11.2 kg ai ha<sup>-1</sup>. Smooth cordgrass seedlings showed tolerant to imazosulfuron, halosulfuron-methyl, and carfentrazone herbicides. When the lower rate was applied, no seedling injury was observed from the 0.105 kg ai ha<sup>-1</sup> halosulfuron spray and 0.0175 kg ai ha<sup>-1</sup> carfentrazone spray. An application of imazosulfuron at 0.315 kg ai ha<sup>-1</sup> caused 5% seedling injury. Although both halosulfuron and carfentrazone did not affect seedling survival rates, they caused slight visual injury (5 - 6%). At the higher rate, seedlings were slightly affected; 7% plant injury was observed from application of imazosulfuron at 0.63 kg ai ha<sup>-1</sup>, 5% for halosulfuron at 0.21 kg ai ha<sup>-1</sup>, and 6% carfentrazone at 0.035 kg ai ha<sup>-1</sup>. Smooth cordgrass seedlings were highly tolerant to the application of penoxsulam, quinclorac, orthosulfamuron, and bensulfuron. No visible injuries were observed with penoxsulam at 0.0525 kg ai ha<sup>-1</sup>, quinclorac at 0.84 kg ai ha<sup>-1</sup>, orthosulfamuron at 0.161 kg ai ha<sup>-1</sup>, bensulfuron at 126 kg ai ha<sup>-1</sup>, and pendimethalin at 1.848 kg ai ha<sup>-1</sup>. Even at a higher application rate (2x), these herbicides did not produce any visible injury, with a 100% seedling survival rate.

### 2. Duck Salad Control and Seed Yield

The field experiment showed that penoxsulam at a 0.0525 kg ai ha<sup>-1</sup> rate provided an average control of 79% for ducksalad in a single application (Penox-1); 87% in 2011 and 76% in 2012. Bensulfuron at 0.126 kg ai ha<sup>-1</sup> provided slightly lower percent average control of 74.4 (72% in 2011 and 77% in 2012) in Bensul-1 application. At higher rates, Penox-1 at 0.105 kg ai ha<sup>-1</sup> gave an average control of 90.5% (99% in 2011 and 82% in 2012), while Bensul-1 at 0.252 kg ai ha<sup>-1</sup> gave an average control of 81.5% (92% in 2011 and 71% in 2012). Regardless of the application methods, the lower rate of penoxsulam (0.0525 kg ai ha<sup>-1</sup>) gave an average control of 81.1%, while the higher rate (0.105 kg ai ha<sup>-1</sup>) gave an average control of 86.3% over a two year study. Bensulfuron at the lower rate (0.126 kg ai ha<sup>-1</sup>) gave an average control of 77.5% and 82.6% control for the higher rate (0.252 kg ai ha<sup>-1</sup>). Overall, average ducksalad control using penoxsulam was 83.75%, while bensulfuron gave 80% control. Both penoxsulam and bensulfuron control ducksalad effectively.

The field experiment indicated that the average yield of untreated smooth cordgrass control was 72.5 kg ha<sup>-1</sup> (67 kg ha<sup>-1</sup> in 2011 and 78 kg ha<sup>-1</sup>). The average yield of treated smooth cordgrass, regardless of the rates and application methods, in the two year study was 143.1 kg ha<sup>-1</sup>, a 97.4% increase. The yield was nearly doubled as a result of weed control using herbicides. A single application to control weeds at the beginning of transplant establishment, such as Penox-1 or Bensul-1, already showed positive impacts on yield; 23.4% increase for Penox-1 with 52.5 g ai ha<sup>-1</sup> rate, 44.1% for Penox-1 with a 105 g ai ha<sup>-1</sup> rate, 28.2% for Bensul-1 with a 126 g ai ha<sup>-1</sup> rate, and 33.1% for Bensul-1 with a 252 g ai ha<sup>-1</sup> rate. The longest weed control treatments (i.e. Penox-1,3,5 or Bensul-1,3,5)

produced the most favorable yield. The highest yield in 2011 was 190 kg ha<sup>-1</sup> obtained from Penox-1,3,5 with a 105 g ai ha<sup>-1</sup> rate. The highest yield in 2012 was 183 kg ha<sup>-1</sup> obtained from Bensul-1,3,5 with a 252 g ai ha<sup>-1</sup> rate. The highest yield averaged over two years was 181.5 kg ha<sup>-1</sup> obtained from Bensul-1,3,5 with a 126 g ai ha<sup>-1</sup> rate. Both penoxsulam and bensulfuron were very effective in controlling ducksalad and provided optimal yield. Other herbicides, such as pendimethalin and orthosulfamuron, that did not injure smooth cordgrass at the most vulnerable growth stage (seedling stage) provide the options to control a variety of target weeds if they become problematic in field production.

Table 1. Herbicide rates used in the studies.

Herbicide		Rate kg ai ha <sup>-1</sup>	
		1 X	2 X
1	Fenoxaprop-p-ethyl	0.122	0.244
2	Triclopyr	0.420	0.840
3	Thiobencarb	5.600	11.20
4	Penoxsulam	0.053	0.106
5	Imazosulfuron	0.315	0.630
6	Halosulfuron-methyl	0.105	0.210
7	Carfentrazone-ethyl	0.018	0.036
8	Bensulfuron	0.126	0.252
9	Pendimethalin	1.848	3.696
10	Orthosulfamuron	0.161	0.322
11	Imazethapyr	0.070	0.140
12	Glyphosate	1.680	3.360
13	Quinclorac	0.840	1.680
14	Propanil	4.480	8.960

## STATION PERSONNEL

### Steve D. Linscombe, Professor-----Resident Coordinator

Kimberly G. Guidry	Accounting Specialist I
Carol D. LeDoux	Administrative Program Specialist-A
Darlene M. Regan <sup>1</sup>	Administrative Coordinator IV
Donna L. Sonnier	Custodian I

### Donald E. Groth, Professor/Research Coordinator ----- Rice Pathology

Carl W. Dischler	Research Associate/Specialist
Marty J. Frey (25%)	Research Associate/Specialist
Laura L. Monte	Research Farm Assistant I

### Dustin L. Harrell, Associate Professor ----- Rice Agronomy/Rotational Crops

Jacob S. Fluitt	Research Associate/Specialist
James P. Leonards	Research Associate/Specialist
Ronald P. Regan	Research Associate/Specialist

### William J. Leonards, Jr., Research Associate/Coordinator/Manager ----- Farm Management

Nathan T. Breaux	Research Farm Assistant II
Brian D. Broussard	Research Farm Supervisor
Paul A. Miller	Research Farm Assistant II
Jimmy D. Pellerin	Research Farm Specialist II
Ronald J. Pellerin	Research Farm Manager I
Thomas J. Reed	Research Farm Specialist II

### Steve D. Linscombe, Professor ----- Rice Breeding

Karen F. Bearb	Research Associate/Coordinator
Raymond R. Dilly, Jr.	Research Associate/Specialist
Brandon J. Frey	Research Farm Specialist I
Herman L. Hoffpauir	Research Farm Specialist II
Brent W. Theunissen	Research Associate/Specialist
Richard E. Zaunbrecher	Research Associate/Specialist

### Mona M. Meche, Research Associate/Coordinator ----- Rice Anther Culture/Tissue Culture

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Jennifer D. Dartez	Research Farm Assistant II

### W. Ray McClain, Professor -----Aquaculture

John J. Sonnier	Research Farm Specialist II
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<sup>1</sup> Transferred 06/01/2013 to Southwest Region Office

<sup>2</sup> Appointed 01/02/2013

## STATION PERSONNEL (Continued)

<b>James H. Oard, Professor</b> -----	<b>Rice Breeding</b>
Blake J. Henry <sup>3</sup>	Research Farm Specialist II
John E. Richard <sup>4</sup>	Research Associate/Specialist
Weike Li	Visiting Professor
<b>John K. Saichuk, Professor</b> -----	<b>Rice Agronomy/Extension</b>
<b>Glenn J. Schexnayder, Research Farm Maintenance Manager</b> -----	<b>Maintenance Department</b>
Ted R. Trahan	Maintenance Repairer II
<b>Herry S. Utomo, Associate Professor</b> -----	<b>Marker-Assisted Selection Breeding/Biotechnology</b>
Lauren E. Ingalls <sup>5</sup>	Research Farm Specialist I
Gretchen M. Zaunbrecher	Research Associate/Specialist
<b>Ida Wenefrida, Assistant Professor/Research</b> -----	<b>Biotechnology</b>
<b>Lawrence M. White, III, Research Associate/Coordinator</b> -----	<b>Foundation Seed Rice</b>

## LSU AGCENTER CAMPUS PERSONNEL

LSU AgCenter personnel conducting research at the Rice Research Station include the following:

<b>Jong Hyun Ham</b> -----	<b>Rice Diseases</b>
Department of Plant Pathology and Crop Physiology	
<b>Clayton A. Hollier</b> -----	<b>Rice and Soybean Diseases</b>
Department of Plant Pathology and Crop Physiology	
<b>Michael E. Salassi</b> -----	<b>Economics</b>
Department of Agricultural Economics and Agribusiness	
<b>Michael J. Stout</b> -----	<b>Rice Insect Control</b>
Department of Entomology	
Marty J. Frey (75%) (Rice Research Station)	Research Associate/Specialist
<b>Eric P. Webster</b> -----	<b>Weed Control</b>
School of Plant, Environmental and Soil Sciences	
J. Caleb Fish	Research Associate
Benjamin M. McKnight <sup>6</sup>	Research Associate

<sup>3</sup> Separated 01/21/2013

<sup>4</sup> Separated 10/12/2013

<sup>5</sup> Appointed 01/02/2013

<sup>6</sup> Appointed 03/01/2013

## COOPERATING PERSONNEL

Cooperating personnel on research projects at the Rice Research Station include the following:

**Lucas Aviles-----Rice Breeding**

University of Puerto Rico Research & Extension Center  
Lajas, Puerto Rico

**Niranjan Baisakh -----Coastal Erosion Control**

School of Plant, Environmental and Soil Sciences  
Louisiana State University Agricultural Center

**Daniel Breaux -----Coastal Erosion Control**

Louisiana Department of Wildlife and Fisheries  
Southeast Louisiana Refuge, Lacombe, Louisiana

**Steve A. Harrison -----Wheat, Oats, and Coastal Erosion Control**

School of Plant, Environmental and Soil Sciences  
Louisiana State University Agricultural Center

**Manoch Kongchum -----Water Management and Greenhouse Gas**

School of Plant, Environmental and Soil Sciences  
Louisiana State University Agricultural Center

**Ronald J. Levy -----Soybeans**

Dean Lee Research and Extension Center  
Louisiana State University Agricultural Center

**Rick Mascagni -----Grain Sorghum**

Northeast Research Station  
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**Anthony Rivera -----Rice Breeding**

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**Cindy S. Steyer-----Coastal Erosion Control**

USDA-NRCS, Water Resources  
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**Prasanta Subudhi-----Coastal Erosion Control**

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**Brenda Tubaña -----Rice Fertilization**

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**Sonny Viator-----Sweet Sorghum**

Iberia Research Station  
Louisiana State University Agricultural Center

**E. Allen Wilson-----Bird Control**

USDA Animal Damage Control  
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**The LSU AgCenter and LSU provide equal opportunities in  
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