



101st Annual Research Report

Rice Research Station

Crowley, Louisiana
2009

LSU AgCenter
Research & Extension

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101st Annual Research Report

RICE RESEARCH STATION

Crowley, Louisiana

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Louisiana Cooperative Extension Service
Paul D. Coreil, Vice Chancellor and Director

Southwest Region/Rice Research Station
Steve D. Linscombe, Regional Director/Resident Coordinator

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INTRODUCTION

Research at the Rice Research Station, Crowley, Louisiana, is conducted by scientists with the LSU AgCenter's Louisiana Agricultural Experiment Station. The 2009 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 2009 are presented in this report representing the 101st 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 2009. 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 2009.

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 2009 are listed.

MONTHLY RAINFALL DATA
RICE RESEARCH STATION - CROWLEY, LA
2009

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	YEAR TOTAL
1												.09	
2		.45								.60		1.40	
3				.60				2.72					
4	.01				1.34					.01			
5	.03									2.39		.38	
6	.10											.40	
7	1.78						4.20	.04		.01		.05	
8							.16	.07		.04		1.23	
9							.10	.02		.02		.05	
10								.21	.42	.92	.06		
11	.38	.08							1.26	.15			
12	.01				.06				.23	.30		1.27	
13		.08	.35	.95	.35				.71	.37		.01	
14		.45	1.33						.98	.88		.01	
15		.56	.68						.23	.43		.61	
16		.09	1.77							2.15		1.28	
17			.04		.21		.33		.05		.23	.09	
18	.18			1.94			.18	.04				1.03	
19		.07		5.50			.14	.38					
20								.04					
21							.01	.16			.06		
22		.14					.30	.47		.43	1.92		
23							.02		.60	1.76			
24							.34		.94			.08	
25					.12							.33	
26			1.77							.02			
27			2.10				.05			.89			
28	.90		.23	1.16									
29	.04							.15		.49			
30						1.56		.02			.42	.09	
31							.03			2.83		1.11	
MONTH TOTAL	3.43	1.92	8.27	10.15	2.08	1.56	5.86	4.32	5.42	14.69	2.69	9.51	69.90
2008	6.30	4.19	5.66	2.10	5.71	4.96	1.64	5.75	8.67	0.64	2.71	4.16	52.49

RICE BREEDING

GENETIC IMPROVEMENT OF RICE FOR LOUISIANA PRODUCTION[1]

S.D. Linscombe, X.Y. Sha, S.B. Blanche, K.F. Bearb, R.R. Dilly, Jr., B.W. Theunissen,
S.J. Theunissen, B.J. Henry, H.L. Hoffpauir, and L.E. Leonards

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.

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 2009 rice breeding nursery included more than 107,000 breeding rows, 5,700 F_1 transplant populations, and 500 space planted F_2 populations. About 500 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 five off-station locations.

The preliminary yield testing program evaluated over 1,000 lines (mainly of F_5 and F_6 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.

[1] This research is supported in part by funding provided by rice producers through the Louisiana Rice Research Board.

COOPERATIVE UNIFORM REGIONAL RICE NURSERY

The Uniform Regional Rice Nursery (URRN) 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 over multiple environments.

The 2009 URRN test included 200 experimental lines and varieties planted in six states. A randomized complete block design was applied, with three replications for Groups 1 to 4 and two replications for Groups 5 to 7. Seeding rates were 90 lb/A for varieties and 30 lb/A for hybrids.

The 2009 URRN results from the Rice Research Station will be reported. All plots were drill seeded on March 23. All Groups were harvested on August 4. The URRN was also ratooned and harvested on October 21. Tests were conducted using standard agronomic practices (except that no fungicides were applied). Tables 1 to 7 show grain (main and ratoon crop) and milling yields and agronomic performance (seedling vigor, days to 50% heading, plant height, and lodging percentage) of entries in the 2009 URRN at the Rice Research Station.

Table 1. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 1, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
018	CL151	CL151	4	76	35	10330	1672	12002	64.3	70.3
008	0802008	CCDR/CLR 11	4	74	33	10207	1729	11936	62.5	71.3
005	0902005	9502008-A/DREW//CLR 20	4	73	35	9947	1772	11719	65.6	71.6
002	0802091	CFX-18//CCDR/9770532 DH2	4	75	36	9165	2201	11366	66.9	71.3
010	0701124	DREW/UA99-167	4	69	37	9508	1806	11314	62.8	69.9
011	0902011	9502008-A/DREW//CLR 20 (XC 011)	3	71	35	9688	1588	11277	63.9	71.1
020	CTHL	CATAHOULA	4	75	33	8882	1879	10761	60.8	71.3
006	0803190	CPRS/CCDR	4	76	34	9056	1547	10603	63.9	69.7
007	0601108	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS	3	77	37	8381	2025	10406	62.4	70.2
014	0804154	RSMT/KATY	5	76	31	7723	2631	10354	62.3	70.7
001	0701087	GP13416/KATY//PI 312777	4	76	40	9323	980	10303	62.8	69.7
012	0803147	LCSN/LGRU	4	75	33	8087	2033	10121	60.3	70.6
019	9903092	PRESIDIO (PRSD)	4	72	34	7214	2843	10057	65.1	70.4
003	0803003	(LGRU/LSCN)RU9801111/(RU8803072/(KATY//GFMT/ PCOS))RU9803092	5	76	34	7896	1927	9823	61.7	69.8
013	0801102	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	78	35	8696	1117	9812	63.7	69.9
017	SPRN	SPRING	3	69	39	7313	2477	9790	50.8	67.9
015	0804114	RSMT//RXMT/IR36	4	75	36	7233	1621	8854	56.1	67.0
009	0803009	CPRS/LGRU	6	78	33	6880	1828	8707	66.3	70.2
004	0701102	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/3/ LBNT/STBN//NWBT	4	76	33	6596	1827	8423	58.4	69.1
016	0704191	GFMT/TBNT/LA110	6	78	30	6402	1936	8337	65.7	71.0
CV			15.2	0.8	4.7	10.5			3.5	1.7
LSD			1.0	1.0	2.7	1459			4.5	2.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 2, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
022	0802022	AC1398	4	76	38	11075	1816	12891	62.0	70.7
034	0902034	TACAURI//KBNT/LCSN/3/0502022	5	74	35	10258	2315	12573	59.6	71.7
038	NPTN	NEPTUNE	3	81	33	9106	2365	11471	66.3	70.6
031	0802031	CCDR/0502085	3	75	35	9698	1643	11341	64.3	72.1
037	JPTR	JUPITER	5	82	35	8501	2749	11250	65.2	68.9
027	0801096	FRNS/5/LBNT/9902//NWBT/3/KATY/NWBT/4/LGRU	3	77	40	10132	1003	11135	60.7	71.3
024	0801024	VSNTLM1/L201/PNRZ/3/MARS/TBNT…	4	82	34	9066	1843	10909	67.6	70.7
029	0903029	LGRU/LCSN//CF4-85	4	79	40	9253	1289	10542	61.5	69.6
025	0802140	CPRS//L-205/DLLA	3	78	40	8616	1787	10403	65.7	70.5
023	0803023	(LGRU/LSCN)RU9801111/(RU8803072/(KATY//GFMT/ PCOS))RU9803092	5	77	39	8663	1707	10370	59.1	70.8
039	0404191	BOWMAN	4	75	36	9136	1161	10297	58.3	71.5
028	0902028	9502008//AR 1188/CCDR/3/0302005	5	72	36	8673	1531	10204	57.8	69.6
035	0804196	LMNT//TBNT/LA110…	5	79	35	8338	1775	10113	62.6	72.0
021	0801173	RU9901127/GP-2	6	78	31	8647	1207	9854	64.8	70.1
030	0801030	CYBT/LM1	6	76	34	9119	658	9777	56.7	71.4
040	FRNS	FRANCIS	4	77	40	9167	436	9603	57.2	71.1
036	0704100	IR36/8603006	4	80	41	7795	1777	9572	64.3	72.2
032	0703190	CCDR/L202	5	76	36	8085	1376	9461	63.0	72.0
026	0803092	CCDR/LQ275a	4	82	37	8296	1060	9356	54.4	71.4
033	0704122	IR36/8603006	5	80	39	7216	1525	8740	66.1	72.0
CV			11.6	0.9	3.7	7.0			2.5	1.1
LSD			0.8	1.1	2.3	1034			3.2	1.6

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 3, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
051	0802051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	5	79	38	10316	1892	12208	66.5	72.2
048	0702085	AR 1188/CCDR//9502008/LGRU	4	76	36	9855	1217	11072	63.3	71.7
050	0601170	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/LGRU/MILL	4	78	41	9890	1008	10898	56.0	69.5
058	CHNR	CHENIERE	4	78	36	9620	1240	10860	66.0	72.3
056	TMPL	TEMPLETON	4	78	42	9053	1777	10830	65.8	71.1
054	0804083	RSMT//RXMT/IR36	4	78	38	9251	1388	10639	59.0	68.2
060	CL171 AR	CL171 AR	4	80	40	8645	1816	10461	66.4	72.4
049	0703144	CPRS/CCDR	4	76	36	9153	1290	10443	64.9	72.2
059	CCDR	COCODRIE	4	76	34	9120	1293	10413	64.9	72.1
057	9404036	PRISCILLA	5	78	38	8156	2017	10173	53.7	69.3
046	0703147	CPRS/CCDR	4	77	37	9151	1006	10157	61.3	71.1
042	0902042	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	3	80	38	8864	1239	10103	64.9	72.0
047	0801145	CCDR/ZHE 733//WC 285	5	82	35	7684	2308	9992	52.0	68.4
041	0901041	UA99-153/TOX 4136-38-2	6	81	43	9192	610	9801	50.2	69.4
045	0902045	CHENIERE//CFX 29/CCDR	3	80	35	7385	2101	9486	67.0	72.4
055	0804122	L202//TBNT/BLMT	5	77	37	7679	1799	9479	62.2	69.9
044	0901044	RU9901133/DREW//SPRN	5	70	32	7909	1509	9418	62.2	72.2
043	0903043	CF4-69/CCDR	6	82	39	7191	2225	9416	64.5	70.8
052	0703181	CPRS/CCDR	4	77	38	7783	1472	9254	64.0	69.8
053	0804191	CPRS//NWBT/KATY	6	77	32	7216	1304	8521	66.3	72.0
CV			11.3	0.9	3.7	6.3			1.6	1.0
LSD			0.8	1.1	2.3	896			2.1	1.5

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 4, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
062	0702068	9502065/3/MERC//MERC/…	4	79	36	10317	1384	11701	66.1	71.3
065	0702162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	4	80	36	9468	2031	11499	67.0	71.5
064	JES	JES	6	82	38	9067	1957	11024	62.8	69.0
071	0902071	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	77	35	9939	1065	11004	62.0	68.5
076	0801076	LGRU//KATY/STBN/5/NWBT/KATY//RA73/LMNT/4/…	4	81	41	9066	1762	10828	57.4	71.1
068	0902068	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	78	32	9514	1029	10543	65.9	71.3
070	0701070	LGRU//KATY/STBN/5/NWBT/KATY//RA73/LMNT/4/LBNT/…	4	79	40	8754	1550	10304	65.4	72.1
080	WLLS	WELLS	4	77	40	8987	1177	10163	56.2	71.4
079	CYBT	CYBONNET (CYBT)	4	77	35	8329	1678	10007	65.4	71.8
069	0903069	LGRU/LCSN//CF4-85	5	79	40	8676	1147	9823	59.0	69.6
078	0703184	L201/SABR	4	77	38	7757	1840	9598	62.2	70.1
066	0803066	PNTL/(JCTO/PNTL)0028A4	5	78	37	7423	1926	9349	66.0	69.0
072	0503126	((NWBT/RU8303181)/RSMT))TX7144/MDSN	3	81	36	8193	980	9173	61.6	71.3
073	0704197	IR36/8603006	4	81	40	7634	1448	9083	64.7	72.3
061	0901061	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/3/…	4	77	36	8106	940	9045	58.9	70.3
077	0904077	CFX-18(CL161)/PSCL	5	80	41	7800	909	8709	52.0	70.2
074	0704154	GFMT/TBNT/LA110	6	80	32	6267	2055	8322	62.0	70.4
075	0903075	JEFF/CPRS//CPRS	6	81	36	6674	740	7414	63.2	71.2
063	0803063	CPRS/LGRU	6	80	35	5712	1358	7071	65.7	72.0
067	0801067	P97Y228/PI 560265//STG97F5-01-004	6	78	25	5263	923	6186	62.9	69.0
CV			12.9	1.2	4.3	6.8			4.3	0.8
LSD			1.0	1.5	2.6	914			5.6	1.2

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 5, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
103	0902103	FRANCIS/CLR 13	4	78	34	9738	2434	12172	67.2	72.5
112	0902112	9302065/3/CFX-29/AR 1142/LA 2031	3	76	35	10039	1576	11614	68.5	71.9
088	0902088	9502008-A//AR1188/CCDR/3/…	4	77	34	10073	1445	11519	64.4	71.0
082	0902082	BNGL/CL161	3	80	38	10012	1494	11506	69.0	72.4
093	0801093	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS/6/RU9201179	5	76	38	9439	1908	11347	60.4	72.0
097	0902097	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	4	77	33	9942	1339	11281	67.7	72.2
085	0902085	9502008/3/MBLE//LMNT/20001-5/4/…	3	77	34	9665	1512	11178	63.6	70.2
109	0902109	9502008/3/MBLE//LMNT/20001-5/…	4	77	35	9547	1275	10822	67.7	72.4
081	0801081	LGRU//KATY/STBN/3/LGRU	5	74	40	8972	1807	10779	54.7	70.4
094	0902094	CPRS/KBNT//WELLS CFX 18	4	79	35	8877	1837	10714	67.8	72.0
117	CCDR	COCODRIE	4	75	33	8938	1748	10686	65.2	72.1
108	0801108	KATY/NWBT//L201/7402003/3/WLLS/4/FRNS	4	78	35	8655	1935	10590	59.6	70.4
116	0803116	SABR/CCDR	4	75	42	8763	1815	10578	65.5	72.2
106	0902106	CPRS/3/CFX 29//AR 1142/LA 2031	4	77	35	8835	1683	10519	67.7	72.4
099	0801099	CYBT/UA99-94//UA99-126	5	78	37	9314	954	10268	61.1	70.1
091	0902091	9302065/3/CFX-29/AR 1142/LA 2031	4	79	37	8932	1202	10134	66.6	71.8
100	0904100	CFX-18(CL161)/PSCL	5	78	34	8834	1287	10121	65.6	71.0
115	0902115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4	77	36	9427	648	10074	67.8	72.4
119	M206	M206	4	67	39	7764	2261	10025	64.8	67.6
105	0801105	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	5	78	35	8369	1609	9978	59.7	70.2
111	0901111	RU9901133/DREW//RU0101093	5	69	34	7780	1961	9741	65.3	71.1
110	0903110	CF4-69/CCDR	5	79	37	7424	2191	9615	66.3	71.1
087	0801087	19991516/6/BASMATI-370/KATY/4/VSNTLM//L201/9NRZ/3/KATY/5/CPRS	4	77	36	7841	1724	9565	59.8	70.9
120	TRNS	TRENASSE	4	72	37	9022	533	9555	61.3	68.3
083	0904083	RSMT//RXMT/IR36	4	74	37	7994	1040	9035	63.0	69.7
096	0901096	3334-2-1120-1	5	77	38	7772	1234	9007	64.9	70.9
107	0803107	LGRU/LSCN/CF4-85	5	79	36	7330	1663	8993	60.1	70.1
095	0103184	(CPRS/PELDE)/JEFF	6	80	34	7475	1377	8853	65.5	70.6

Continued.

Table 5. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
102	0901102	RU9901133/DREW//RU0101093	5	70	32	6582	2194	8776	61.0	70.4
101	0903101	JEFF/CPRS//CPRS	6	81	32	7199	1553	8752	62.8	70.9
090	0801090	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/3/LBNT/STBN//NWBT	5	75	35	6691	2030	8722	58.4	70.1
092	0903092	CPRS/9901081	5	76	34	7262	1286	8549	63.7	71.2
089	0803089	CCDR/LQ275a	5	83	35	6919	1488	8407	58.3	71.2
114	0904114	GFMT/RXMT//IR36	5	79	34	6785	1337	8121	63.7	71.8
118	0003009	Hidalgo	4	72	36	6806	1290	8096	63.1	70.6
086	0903086	SABR/CCDR	4	79	38	6791	919	7710	67.4	71.5
104	0903104	(JEFF//JEFF/O. RUFIPOGON)219_2-9	6	73	31	6022	1517	7539	55.3	68.9
113	0803113	SABR/CCDR	4	77	35	5180	1972	7152	66.0	71.5
084	0801084	RU9901133/PI 560239//CYBT	6	77	33	6519	632	7150	61.0	69.2
098	0803098	SABR/CCDR	5	78	34	5898	578	6476	65.0	72.0
CV			12.1	1.0	4.2	8.2			3.2	0.9
LSD			1.1	1.6	3.0	1351			4.1	1.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 6. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 6, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
139	GP-2	GP-2	5	93	50	9678	3577	13255	56.2	67.7
152	0902152	9502008/LGRU/3/CPRS//82CAY21/TBNT	5	75	33	9909	1452	11361	64.7	70.6
160	TGRT	TAGGART	4	80	41	9614	1278	10891	57.6	72.2
148	0701148	IRGA409/RXMT/5/BRAZ/TBNT/3/164986-4/NV66//NTAI/4/BNGL	4	77	42	9357	1446	10803	57.5	70.6
143	0902143	LGRU/CLR 11	4	79	36	8792	1874	10666	66.9	71.9
140	0902140	9502008-A/DREW//AC101/DREW	5	76	36	9109	1382	10491	65.2	72.2
153	0803153	CPRS/CCDR	5	75	34	8998	1423	10421	65.6	71.5
142	0801142	KBNT/Q36194	4	79	42	9912	475	10387	60.9	71.0
141	0903141	CPRS/9901081	5	76	37	8537	1691	10228	64.7	72.2
130	0801130	YACU 9/ZHE 733//WC 292	7	80	41	7969	2241	10210	57.4	69.9
134	0902134	CCDR/3/CPRS/KBNT//9502008-A	4	76	35	8626	1483	10109	64.5	71.3
159	0103123	SABINE	5	77	35	8678	1340	10018	67.3	71.7
129	0803129	LGRU/LSCN/CF4-85	5	80	39	8840	1158	9997	60.9	71.3
155	0902155	CHENIERE/LMNT	4	76	37	8258	1644	9902	65.6	72.5
137	0902137	CCDR//CCDR/JEFF	4	75	36	8562	1264	9827	64.7	71.6
123	0903123	CPRS/NWBT//KATY/3/CCDR	5	76	36	7965	1842	9807	64.5	71.3
124	0801124	MDRK/PI 312777//JING 185-7	5	82	31	7918	1755	9673	69.1	71.3
156	0904156	CPRS/JKSN	4	75	34	8469	1036	9505	66.5	71.2
121	0901121	RU9901133/DREW//RU0101093	6	74	33	8310	1187	9498	59.9	69.7
128	0902128	AC110/AC638	4	75	33	7813	1615	9428	65.8	71.8
125	0902125	CCDR/3/9502008-A//AR1188/CCDR	4	75	35	8667	724	9391	65.4	71.9
126	0803126	LGRU/LSCN/CF4-85	4	79	40	8497	872	9369	60.9	70.6
131	0902131	CCDR//9502008//AR1188/CCDR	4	73	34	8212	1136	9349	65.7	71.6
158	JZMN	JAZZMAN	4	81	38	7676	1595	9271	67.5	72.0
144	0803144	CCDR/L202	5	75	33	7369	1793	9163	66.6	72.4
133	0801133	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	76	39	8576	526	9102	64.2	72.2

Continued.

Table 6. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
127	0801127	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/3/…	5	76	36	8343	725	9068	61.2	70.2
147	0903147	CCDR/L202	5	74	32	7247	1709	8955	66.8	70.5
136	0801136	MDRK/LM 1	6	86	33	7721	1169	8890	63.2	68.7
154	0904154	GFMT/RXMT//IR36	6	77	33	6892	1890	8782	62.8	71.1
132	0703132	(DLMT/(LMNT*3/JSMN))/((CPRS/PELDE)/JEFF)	5	80	36	7451	1307	8758	66.1	71.1
145	0901145	RU9901133/JEFF	5	77	33	7261	1491	8752	60.4	71.1
157	0904157	LMNT//TBNT/LA110…	5	79	34	7375	1340	8714	64.9	72.1
150	0903150	(JEFF//JEFF/O. RUFIPOGON)43_1-2	6	79	29	7819	877	8697	63.6	71.8
149	0802149	9502008//KATY/9902207X2/3/JSMN/…	5	76	33	6864	1831	8695	67.4	71.2
146	0902146	AC1172	4	74	35	7052	1601	8653	67.0	72.2
122	0904122	COLUMBIA2/BENGAL	6	78	33	7616	667	8284	52.8	69.9
151	0901151	RU9901133/JEFF	7	79	33	6156	1740	7896	63.4	70.1
138	0903138	CCDR/L202	5	75	35	6807	874	7681	63.7	71.1
135	0703110	(DF5-68)99:5526/TX8946	4	78	37	6688	558	7246	68.5	72.1
C V			10.7	1.1	4.3	7.0			4.7	1.3
LSD			1.0	1.8	3.1	1151			6.1	1.8

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 7. Grain and milling yields and agronomic performance of entries in the 2009 Uniform Regional Rice Nursery, Group 7, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
183	0902183	CFX-18//CCDR/9770532 DH2	4	76	37	9565	1758	11323	68.2	72.3
195	0902195	CPRS/KBNT//CFX 29	4	76	36	8973	2313	11286	67.8	72.6
177	0902177	TACAURI/3/CPRS//82CAY21/TBNT/4/…	5	75	34	9240	1893	11133	66.7	71.3
189	0902189	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4	77	36	9295	1378	10673	68.1	72.3
199	0603075	RONDO	5	90	44	8937	1703	10640	64.5	70.0
180	0902180	CCDR/CFX-18	4	78	37	9377	1255	10632	65.5	70.3
186	0904186	CFX-18(CL161)/PSCL	5	77	38	8735	1855	10591	66.0	72.0
171	0902171	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	76	34	9304	1168	10472	67.5	71.8
162	0902162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	4	80	32	8706	1713	10419	60.9	72.5
178	0803178	LGRU/LSCN/CF4-85	5	81	40	8797	1338	10135	63.6	71.7
176	0801176	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	78	40	9103	554	9657	62.0	71.8
165	0902165	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	77	33	8431	1203	9634	68.0	71.9
174	0902174	902207x2/LGRU//CHENIERE	4	78	34	8421	1074	9495	67.8	72.5
185	0801185	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	79	39	9243	222	9465	65.3	72.2
192	0902192	CCDR/CFX 18	4	77	35	8410	997	9407	68.1	72.3
181	0803181	CPRS/CCDR	4	77	35	8179	1181	9360	65.8	71.7
168	0902168	BNGL/4/9502065/3/MERC//MERC	4	77	31	8484	807	9291	49.9	70.2
169	0803169	LGRU/LSCN/CF4-85	5	78	38	7895	1374	9269	66.4	70.9
191	0904191	RSMT/KATY	5	79	37	8353	894	9247	61.4	71.3
194	0904194	RSMT/RXMT/IR36	4	79	35	8078	1136	9214	66.2	72.0
175	0903175	CCDR/L202	5	76	36	7816	1301	9117	66.6	71.9
198	0904198	RSMT/KATY	4	75	34	6831	2168	8999	65.8	71.3
161	0801161	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	78	40	8397	569	8966	64.4	72.1
166	0103104	TEXMONT/TEQING	5	78	32	6962	1815	8777	66.5	72.3
163	0903163	SABR/CCDR	4	80	43	7452	1306	8758	66.7	71.5
172	0803172	CPRS/CCDR	5	77	35	7310	1360	8670	66.2	71.8

Continued.

Table 7. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
187	0903187	Carolina Gold/IR64//IR65610-24-3-6-3-2-3	7	85	50	7913	551	8464	50.9	69.0
182	0801182	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	79	39	7853	601	8454	65.7	72.5
197	0904197	RSMT/KATY	5	76	37	7294	1104	8398	65.1	71.9
190	0903190	CPRS/CCDR	5	79	36	7441	900	8341	65.4	72.1
200	FRNS	FRANCIS	4	76	39	7936	318	8255	57.0	71.9
196	0904196	RSMT//RXMT/IR36	5	75	32	7071	1115	8186	66.4	70.8
167	0801167	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW	4	77	39	7706	442	8148	64.8	72.2
184	0903184	CPRS/CCDR	5	79	34	7343	789	8132	64.5	71.6
193	0904193	RSMT/KATY	4	77	35	7272	851	8123	65.1	72.3
179	0901179	RU9901133/JEFF	7	78	33	6120	1672	7792	61.5	70.8
188	0901188	RU0101093/STG00F5-07-007	7	74	31	5806	1415	7221	58.7	70.7
173	0901173	RU0101093/STG00F5-07-007	7	76	31	5512	1417	6929	63.8	71.1
164	0901164	RU9901133/DREW//RU0101093	7	70	27	4816	1418	6234	54.6	70.6
170	0801170	97Y228/PI 560265//STG97F5-01-004	7	77	28	3851	1393	5244	55.1	66.4
CV			12.5	1.3	3.7	9.9			3.9	0.8
LSD			1.1	2.0	2.7	1563			5.0	1.2

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

COMMERCIAL-ADVANCED YIELD TRIALS

The Commercial-Advanced yield 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 study is to evaluate the adaptation and stability of entries for several important characteristics. Data evaluated includes grain yield, whole and total milling percentages, seedling vigor, maturity, plant height, lodging resistance, ratoon crop potential, and resistance to sheath blight, bacterial panicle blight, rotten neck blast, and narrow brown leaf spot diseases. Entries include commercial varieties, hybrids and advanced experimental lines.

Test locations in 2009 included the Rice Research Station at Crowley (RRS) and four on-farm test sites in Evangeline, Vermilion, Jefferson Davis, and Richland parishes. Each location represents a different environment and allows researchers to evaluate entries with different planting dates, soil types, climatic conditions, management systems, disease pressure, and numerous other variables.

Standard agronomic procedures (except that no fungicides were applied) were used at each individual location. Sixty entries were tested in a randomized complete block design with three replications at all locations and plots were 4.66 x 16 ft. Varieties were drill seeded at 90 lb/A. Dr. Don Groth and the Rice Pathology Project provided the sheath blight, rotten neck blast, bacterial panicle blight, and narrow brown leaf spot disease ratings at some locations. The Rice Research Station location was also ratooned.

Planting dates were: RRS, March 23; Evangeline, May 3; Vermilion, March 11; Jefferson Davis, March 5; and Richland, April 23. Harvest dates were: RRS, August 4 (ratoon, October 21); Evangeline, September 3; Vermilion, July 30; Jefferson Davis, July 29; and Richland, September 1. Results from these tests are shown in Tables 2 to 5.

Table 1. Entry number, pedigree, grain type, and source information for entries in the Commercial-Advanced Trial, 2009.

Entry	Pedigree	Grain Type†	Source‡
201	CL131	L	LAES
202	CL161	L	LAES
203	CL151	L	LAES
204	CL171	L	AAES
205	XC011	L	LAES
206	XL723	L	RiceTec
207	CLXL729	L	RiceTec
208	CLXL745	L	RiceTec
209	TRENASSE	L	LAES
210	BOWMAN	L	MAFES
244	COCODRIE	L	LAES
212	CHENIERE	L	LAES
213	CYPRESS	L	LAES
214	WELLS	L	AAES
215	JUPITER	M	LAES
216	BENGAL	M	LAES
217	PRESIDIO	L	TAES/USDA
218	DELLROSE	L(A)	LAES
219	CATAHOULA	L	LAES
220	NEPTUNE	M	LAES
221	DREW/IRGA417	L	AAES
222	TEMPLETON	L	AAES
223	TAGGART	L	ASDA

Continued.

Table 1. Continued.

Entry	Pedigree	Grain Type†	Source‡
224	CFX-18//CCDR/9770532 DH2	L	LAES
225	9502008-A/DREW//CLR 20	L	LAES
226	CCDR/CLR 11	L	LAES
227	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX29/CCDR	L	LAES
228	CHENIERE//CFX 29/CCDR	L	LAES
229	AR 1188/CCDR//9502008/LGRU	L	LAES
230	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	L	LAES
231	BNGL/CL 161	M	LAES
232	TACAURI/3/CPRS//82CAY21/TBNT/4/…	L	LAES
233	9502008-A//AR1188/CCDR/3/…	L	LAES
234	9302065/3/CFX-29/AR 1142/LA 2031	L	LAES
235	CPRS/KBNT//WELLS CFX 18	L	LAES
236	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	L	LAES
237	FRANCIS/CLR 13	L	LAES
238	CPRS/3/CFX 29//AR 1142/LA 2031	L	LAES
239	9502008/3/MBLE//LMNT/20001-5/…	L	LAES
240	9302065/3/CFX-29/AR 1142/LA 2031	L	LAES
241	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	L	LAES
242	LGRU/CLR 11	L	LAES
243	9502008/LGRU/3/CPRS//82CAY21/TBNT	L	LAES
244	CHENIERE/LMNT	L	LAES
245	902207x2/LGRU//CHENIERE	L	LAES
246	AC1398	L	LAES
247	CPRS//L-205/DLLA	L(A)	LAES
248	9502008//AR 1188/CCDR/3/0302005	L	LAES
249	CCDR/0502085	L	LAES
250	TACAURI//KBNT/LCSN/3/0502022	L	LAES
251	CCDR/3/9502008-A//AR1188/CCDR	L	LAES
252	AC110/AC638	L	LAES
253	CCDR//9502008//AR1188/CCDR	L	LAES
254	AC1172	L	LAES
255	9502008//KATY/9902207X2/3/JSMN/…	L	LAES
256	9502065/3/MERC//MERC/…	M	LAES
257	BNGL//MERC/RICO/3/MERC/RICO//BNGL	M	LAES
258	ORIN/3/MERC/CAM9/MARS/4/BNGL	M	LAES
259	ORIN/3/MERC/CAM9/MARS/4/BNGL	M	LAES
260	BNGL//MERC/RICO/3/MERC/RICO//BNGL	M	LAES

† L = Long grain AND M = Medium grain, (A = Aromatic).

‡ 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; MAFES, Delta Research and Extension Center, Mississippi Agricultural and Forestry Experiment Station; TAES, USDA, Texas A&M Research and Education Center, Texas Agricultural Experiment Station, U.S. Department of Agriculture.

Table 2. Grain and milling yields and agronomic performance of entries in the 2009 Commercial-Advanced Yield Trial, Evangeline Parish, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	WHOLE	TOTAL
208	CLXL745	CLXL745	6	75	48	10530	63.1	72.5
207	CLXL729	CLXL729	6	81	47	10503	59.1	70.3
206	XL723	XL723	6	77	46	9958	59.0	72.3
257	RU 0702162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	5	82	37	8515	61.8	67.9
215	JPTR	JUPITER	6	83	36	8439	64.4	69.7
256	RU 0702068	9502065/3/MERC//MERC/…	5	80	36	8276	66.8	71.6
258	RU 0902068	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	80	34	8225	66.0	70.8
237	RU 0902103	FRANCIS/CLR 13	5	80	38	8132	58.8	71.4
260	RU 0902162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	4	82	34	8079	67.3	72.4
216	BNGL	BENGAL	4	81	38	7990	64.7	69.4
230	RU 0802051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	5	84	41	7979	60.8	69.3
209	TRNS	TRENASSE	6	76	40	7931	59.1	69.7
236	RU 0902097	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	5	81	36	7930	63.5	71.7
243	RU 0902152	9502008/LGRU/3/CPRS//82CAY21/TBNT	5	77	38	7930	58.1	68.4
231	RU 0902082	BNGL/CL161	4	80	40	7909	66.8	72.4
259	RU 0902071	ORIN/3/MERC/CAM9/MARS/4/BNGL	5	79	36	7786	64.6	69.6
203	CL151	CL151	4	80	40	7758	64.9	72.5
232	RU 0902085	9502008/3/MBLE//LMNT/20001-5/4/…	4	78	39	7724	58.5	70.1
238	RU 0902106	CPRS/3/CFX 29//AR 1142/LA 2031	5	80	39	7706	59.4	68.0
250	RU 0902034	TACAURI//KBNT/LCSN/3/0502022	5	80	35	7684	61.4	71.5
205	XC 011	XC 011	4	78	41	7679	62.5	71.4
233	RU 0902088	9502008-A//AR1188/CCDR/3/…	4	78	39	7678	57.8	70.0
245	RU 0902174	902207x2/LGRU//CHENIERE	5	83	37	7652	63.8	72.5
234	RU 0902091	9302065/3/CFX-29/AR 1142/LA 2031	5	84	40	7528	62.7	71.5
241	RU 0902115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	5	79	36	7522	64.3	72.1
227	RU 0902042	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	5	81	38	7461	61.5	70.3
235	RU 0902094	CPRS/KBNT//WELLS CFX 18	5	82	39	7460	64.6	72.0
239	RU 0902109	9502008/3/MBLE//LMNT/20001-5/…	5	82	38	7429	64.8	72.1
220	NPTN	NEPTUNE	4	84	34	7425	64.3	68.7
240	RU 0902112	9302065/3/CFX-29/AR 1142/LA 2031	5	79	37	7348	63.3	71.7
214	WELLS	WELLS	5	87	41	7347	54.1	68.9
219	CTHL	CATAHOULA	5	83	38	7339	60.4	71.1
201	CL131	CL131	5	81	33	7314	65.2	72.0
224	RU 0802091	CFX-18//CCDR/9770532 DH2	5	79	39	7271	63.5	72.3
247	RU 0802140	CPRS//L-205/DLLA	4	84	38	7234	63.1	70.2
222	TMTL	TEMPLETON (AR 1182)	5	86	41	7217	67.1	72.5
253	RU 0902131	CCDR//9502008//AR1188/CCDR	5	81	38	7171	58.6	70.1

Continued.

Table 2. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	WHOLE	TOTAL
202	CL161	CL161	5	83	37	7106	67.1	72.2
217	PSDO	PRESIDIO	5	79	36	7103	64.1	72.5
226	RU 0802008	CCDR/CLR 11	5	77	36	7060	59.3	71.2
244	RU 0902155	CHENIERE/LMNT	5	80	38	7051	63.5	70.6
225	RU 0902005	9502008-A/DREW//CLR 20	4	76	39	7023	62.4	71.8
223	TGRT	TAGGART (AR 1188)	6	87	43	6992	48.7	67.3
229	RU 0702085	AR 1188/CCDR//9502008/LGRU	5	82	39	6962	59.2	69.9
204	CL171	CL171	5	82	38	6924	65.5	72.0
228	RU 0902045	CHENIERE//CFX 29/CCDR	5	84	35	6906	62.3	70.5
249	RU 0802031	CCDR/0502085	5	79	37	6860	62.1	72.3
212	CHNR	CHENIERE	6	85	37	6850	68.5	72.5
254	RU 0902146	AC1172	6	75	35	6824	60.2	71.4
242	RU 0902143	LGRU/CLR 11	5	81	36	6673	62.2	70.5
251	RU 0902125	CCDR/3/9502008-A//AR1188/CCDR	5	80	35	6629	58.6	69.9
246	RU 0802022	AC1398	6	82	40	6479	59.3	69.7
255	RU 0802149	9502008//KATY/9902207X2/3/JSMN/…	4	81	34	6356	63.2	70.6
213	CPRS	CYPRESS	5	86	39	6343	56.2	69.1
252	RU 0902128	AC110/AC638	5	82	37	6232	60.5	71.0
248	RU 0902028	9502008//AR 1188/CCDR/3/0302005	6	78	36	6095	59.6	69.1
210	BWMN	BOWMAN	5	89	35	5835	62.7	71.0
211	CCDR	COCODRIE	6	83	37	5584	61.0	70.5
218	DLRS	DELLROSE	6	83	35	5563	68.6	72.5
221	RU 0701124	DREW/IRGA417	4	65	40	4970	51.7	67.0
CV			11.9	2.8	5.1	10.5	3.8	1.9
LSD			1.1	4.4	3.8	1575	4.6	2.6

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields, agronomic performance, and disease resistance of entries in the 2009 Commercial-Advanced Yield Trial, Vermilion Parish, LA.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD	WHOLE	TOTAL	SB[1]
208	CLXL745	CLXL745	85	38	10787	62.5	72.5	7
207	CLXL729	CLXL729	87	39	9910	60.1	72.0	6
206	XL723	XL723	86	40	9274	61.5	72.5	7
233	RU 0902088	9502008-A//AR1188/CCDR/3/…	88	35	9105	67.5	72.5	8
232	RU 0902085	9502008/3/MBLE//LMNT/20001-5/4/…	87	35	8993	65.0	72.5	8
230	RU 0802051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	89	36	8916	64.9	72.2	8
246	RU 0802022	AC1398	88	35	8911	66.0	72.5	7
226	RU 0802008	CCDR/CLR 11	85	34	8816	63.7	72.5	8
224	RU 0802091	CFX-18//CCDR/9770532 DH2	87	36	8812	66.1	72.5	8
215	JPTR	JUPITER	91	35	8765	65.8	70.5	7
231	RU 0902082	BNGL/CL161	91	36	8739	70.1	72.4	7
260	RU 0902162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	92	35	8733	66.4	72.3	6
240	RU 0902112	9302065/3/CFX-29/AR 1142/LA 2031	87	37	8724	66.9	72.5	8
220	NPTN	NEPTUNE	92	33	8714	67.3	71.7	6
256	RU 0702068	9502065/3/MERC//MERC/…	89	36	8673	68.2	72.0	7
203	CL151	CL151	89	36	8644	64.7	72.4	7
257	RU 0702162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	91	36	8608	66.6	71.8	7
249	RU 0802031	CCDR/0502085	87	35	8598	65.1	72.5	8
239	RU 0902109	9502008/3/MBLE//LMNT/20001-5/…	89	35	8546	67.7	72.5	7
219	CTHL	CATAHOULA	88	35	8538	64.1	72.5	7
223	TGRT	TAGGART (AR 1188)	91	41	8489	57.1	72.2	7
251	RU 0902125	CCDR/3/9502008-A//AR1188/CCDR	88	34	8475	61.2	72.0	8
212	CHNR	CHENIERE	88	35	8447	69.2	72.5	7
229	RU 0702085	AR 1188/CCDR//9502008/LGRU	88	35	8419	64.8	72.5	7
254	RU 0902146	AC1172	85	37	8232	65.3	72.5	8
205	XC 011	XC 011	83	35	8223	64.8	71.6	8
238	RU 0902106	CPRS/3/CFX 29//AR 1142/LA 2031	88	36	8196	68.9	72.5	8
216	BNGL	BENGAL	92	33	8194	67.4	72.1	7
248	RU 0902028	9502008//AR 1188/CCDR/3/0302005	83	36	8154	64.2	72.2	8
211	CCDR	COCODRIE	87	33	8129	64.2	72.5	7
214	WELLS	WELLS	89	37	8121	59.4	72.5	6
259	RU 0902071	ORIN/3/MERC/CAM9/MARS/4/BNGL	89	33	8066	64.7	70.8	7

Continued.

Table 3. Continued.

ENT	SOURCE	PEDIGREE	HDT	HTE	YIELD	WHOLE	TOTAL	SB[1]
245	RU 0902174	902207x2/LGRU//CHENIERE	91	36	8044	65.5	72.5	8
209	TRNS	TRENASSE	83	34	7993	64.4	72.0	7
237	RU 0902103	FRANCIS/CLR 13	90	37	7978	64.9	72.5	7
222	TMTL	TEMPLETON (AR 1182)	90	39	7977	63.5	71.6	7
234	RU 0902091	9302065/3/CFX-29/AR 1142/LA 2031	91	36	7957	62.2	71.6	8
221	RU 0701124	DREW/IRGA417	83	35	7940	56.8	70.8	7
252	RU 0902128	AC110/AC638	87	34	7925	65.3	72.5	8
253	RU 0902131	CCDR//9502008//AR1188/CCDR	88	35	7910	64.7	72.5	8
244	RU 0902155	CHENIERE/LMNT	87	36	7910	66.8	72.5	7
201	CL131	CL131	88	33	7895	63.4	72.1	8
247	RU 0802140	CPRS//L-205/DLLA	91	38	7854	66.7	72.4	7
250	RU 0902034	TACAURI//KBNT/LCSN/3/0502022	85	34	7831	60.2	72.3	8
243	RU 0902152	9502008/LGRU/3/CPRS//82CAY21/TBNT	85	33	7830	63.1	71.8	8
227	RU 0902042	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	90	37	7806	60.7	72.3	8
202	CL161	CL161	90	36	7657	63.0	71.4	8
241	RU 0902115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	89	36	7618	68.0	72.5	7
242	RU 0902143	LGRU/CLR 11	90	35	7601	66.6	72.5	8
235	RU 0902094	CPRS/KBNT//WELLS CFX 18	89	33	7593	66.0	72.5	7
258	RU 0902068	ORIN/3/MERC/CAM9/MARS/4/BNGL	90	33	7544	66.3	71.0	7
210	BWMN	BOWMAN	86	35	7536	61.6	72.5	8
236	RU 0902097	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	88	32	7534	64.7	72.5	8
213	CPRS	CYPRESS	89	32	7458	67.7	72.5	8
225	RU 0902005	9502008-A/DREW//CLR 20	82	33	7423	65.3	72.5	7
255	RU 0802149	9502008//KATY/9902207X2/3/JSMN/…	87	32	7320	66.7	72.5	8
204	CL171	CL171	91	37	7124	63.6	72.5	7
217	PSDO	PRESIDIO	87	35	6989	66.2	72.5	7
228	RU 0902045	CHENIERE//CFX 29/CCDR	90	38	6773	65.9	72.5	7
218	DLRS	DELLROSE	90	37	5614	65.0	72.2	6
CV			1.1	5.5	8.3	3.0	1.3	8.3
LSD			1.6	3.1	1110	3.9	1.9	1.0

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor. SB = Sheath blight.

Table 4. Grain and milling yields, agronomic performance, and disease resistance of entries in the 2009 Commercial-Advanced Yield Trial, Jefferson Davis Parish, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	WHOLE	TOTAL	SB[1,2]	LS[1,2]	BLST[1,2]	CERCOSP.[1,2]
208	CLXL745	CLXL745	5	95	39	10076	67.8	72.5	6	1	0	0
207	CLXL729	CLXL729	5	97	38	9607	60.3	70.1	6	0	0	0
215	JPTR	JUPITER	6	98	33	8821	70.4	72.5	6	1	0	0
206	XL723	XL723	5	94	37	8575	63.0	71.5	6	2	1	1
203	CL151	CL151	4	95	34	8390	66.3	72.1	7	4	5	4
260	RU 0902162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	5	98	31	8120	69.3	72.5	5	2	1	0
256	RU 0702068	9502065/3/MERC//MERC/…	5	97	31	8011	71.3	72.5	6	3	1	0
212	CHNR	CHENIERE	5	95	31	7795	69.9	72.5	7	3	5	3
223	TGRT	TAGGART (AR 1188)	4	97	36	7772	61.3	70.4	5	2	2	1
231	RU 0902082	BNGL/CL161	5	97	33	7688	71.8	72.5	6	4	2	1
237	RU 0902103	FRANCIS/CLR 13	4	96	32	7630	65.7	71.4	7	4	4	1
259	RU 0902071	ORIN/3/MERC/CAM9/MARS/4/BNGL	5	96	32	7621	69.4	72.5	6	4	2	1
258	RU 0902068	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	97	29	7549	68.8	71.2	6	3	2	1
230	RU 0802051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	5	96	34	7468	66.0	70.8	7	5	4	3
257	RU 0702162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	5	98	31	7421	67.9	72.5	6	2	0	0
234	RU 0902091	9302065/3/CFX-29/AR 1142/LA 2031	4	95	30	7349	64.0	72.0	8	6	4	3
246	RU 0802022	AC1398	5	92	32	7303	65.8	71.7	7	3	4	5
222	TMTL	TEMPLETON (AR 1182)	4	97	34	7173	67.0	72.5	6	3	2	2
245	RU 0902174	902207x2/LGRU//CHENIERE	4	96	32	7142	67.7	72.5	8	3	4	2
201	CL131	CL131	5	95	30	7054	69.7	72.5	8	4	3	4
254	RU 0902146	AC1172	5	92	28	7032	63.8	72.0	8	5	5	6
216	BNGL	BENGAL	4	98	30	7015	72.7	72.5	6	2	3	0
214	WELLS	WELLS	3	97	36	6868	66.4	72.4	5	1	3	1
240	RU 0902112	9302065/3/CFX-29/AR 1142/LA 2031	4	92	30	6821	68.3	72.5	8	4	6	5
244	RU 0902155	CHENIERE/LMNT	4	93	31	6783	67.6	72.5	7	6	2	3
238	RU 0902106	CPRS/3/CFX 29//AR 1142/LA 2031	4	93	32	6777	66.5	71.8	8	5	4	4
204	CL171	CL171	5	95	34	6748	67.6	72.5	7	5	3	4
232	RU 0902085	9502008/3/MBLE//LMNT/20001-5/4/…	4	94	32	6708	66.7	72.5	8	3	5	5
224	RU 0802091	CFX-18//CCDR/9770532 DH2	4	92	32	6676	65.3	69.7	8	3	4	4
235	RU 0902094	CPRS/KBNT//WELLS CFX 18	5	95	31	6652	67.0	71.8	7	4	4	3
228	RU 0902045	CHENIERE//CFX 29/CCDR	5	96	33	6645	69.0	72.5	7	5	3	2
210	BWMN	BOWMAN	5	95	31	6643	67.3	72.5	8	1	4	1
233	RU 0902088	9502008-A//AR1188/CCDR/3/…	4	94	32	6639	65.8	72.0	8	5	4	4

Continued.

Table 4. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	WHOLE	TOTAL	SB[1,2]	LS[1,2]	BLST[1,2]	CERCOSP.[1,2]
229	RU 0702085	AR 1188/CCDR//9502008/LGRU	5	96	30	6542	66.7	72.2	6	3	4	4
241	RU 0902115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4	94	31	6542	70.8	72.5	8	4	5	3
205	XC 011	XC 011	4	90	32	6508	68.4	72.5	8	5	4	4
225	RU 0902005	9502008-A/DREW//CLR 20	4	90	31	6482	67.4	72.5	8	5	4	5
236	RU 0902097	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	4	95	30	6482	65.5	72.3	8	5	5	3
202	CL161	CL161	4	96	33	6408	68.5	72.1	8	4	4	4
239	RU 0902109	9502008/3/MBLE//LMNT/20001-5/…	4	95	30	6390	69.5	72.5	8	4	4	4
249	RU 0802031	CCDR/0502085	5	92	30	6339	66.9	72.1	7	2	4	4
227	RU 0902042	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX29/CCDR	4	96	34	6331	67.5	72.5	8	5	4	5
226	RU 0802008	CCDR/CLR 11	5	91	30	6266	64.7	72.5	8	4	5	4
247	RU 0802140	CPRS//L-205/DLLA	4	97	33	6242	69.0	72.0	7	3	3	3
220	NPTN	NEPTUNE	5	98	29	6233	69.7	72.5	6	1	1	0
209	TRNS	TRENASSE	5	90	32	6178	67.6	72.0	8	1	3	1
219	CTHL	CATAHOULA	4	94	30	6102	61.0	72.1	8	3	4	1
251	RU 0902125	CCDR/3/9502008-A//AR1188/CCDR	5	94	29	6038	65.6	72.5	8	3	3	3
243	RU 0902152	9502008/LGRU/3/CPRS//82CAY21/TBNT	5	89	27	6031	59.7	71.9	7	2	4	2
213	CPRS	CYPRESS	4	97	30	6020	68.0	72.1	7	3	3	4
255	RU 0802149	9502008//KATY/9902207X2/3/JSMN/…	5	94	29	5943	67.6	72.5	7	1	2	4
253	RU 0902131	CCDR//9502008//AR1188/CCDR	4	92	31	5854	67.9	72.5	8	2	3	4
250	RU 0902034	TACAURI//KBNT/LCSN/3/0502022	5	92	30	5713	60.7	71.4	8	3	5	4
221	RU 0701124	DREW/IRGA417	5	90	33	5697	63.6	71.2	6	1	1	0
217	PSDO	PRESIDIO	4	92	30	5604	65.3	72.3	6	4	4	1
211	CCDR	COCODRIE	4	95	30	5598	68.5	72.5	8	3	5	4
242	RU 0902143	LGRU/CLR 11	5	96	30	5471	66.1	72.2	8	2	5	1
218	DLRS	DELLROSE	6	96	31	5250	70.7	72.5	6	4	2	2
252	RU 0902128	AC110/AC638	5	94	30	5089	66.8	72.5	8	4	4	4
248	RU 0902028	9502008//AR 1188/CCDR/3/0302005	4	90	30	4792	65.2	71.7	9	3	3	5
CV			11.6	1.2	4.3	8.4	3.3	1.9	6.5	31.7	29.7	29.2
LSD			0.9	1.8	2.2	928	4.5	2.8	0.8	1.7	1.2	1.5

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[2] Abbreviations: SB=sheath blight, LS=leaf smut, BLST = blast, CERCOSP=Cercospora.

Table 5. Grain and milling yields and agronomic performance of entries in the 2009 Commercial-Advanced Yield Trial, Rice Research Station, Crowley, LA.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
224	RU 0802091	CFX-18//CCDR/9770532 DH2	4	76	36	8095	2158	10252	67.8	72.1
257	RU 0702162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	3	79	38	8272	1808	10080	71.6	72.5
260	RU 0902162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	4	80	34	8432	1648	10080	69.1	72.5
246	RU 0802022	AC1398	4	75	35	7684	2393	10077	68.1	72.1
243	RU 0902152	9502008/LGRU/3/CPRS//82CAY21/TBNT	4	75	33	7443	2560	10003	64.6	71.0
231	RU 0902082	BNGL/CL161	4	82	38	8479	1383	9862	71.3	72.5
203	CL151	CL151	4	77	37	8471	1343	9814	65.3	72.0
256	RU 0702068	9502065/3/MERC//MERC/…	4	79	36	8359	1414	9773	70.4	72.5
237	RU 0902103	FRANCIS/CLR 13	4	79	36	8059	1647	9706	69.7	72.5
235	RU 0902094	CPRS/KBNT//WELLS CFX 18	5	78	35	7557	2142	9698	69.6	72.2
205	XC 011	XC 011	4	73	37	7747	1914	9661	66.1	71.6
233	RU 0902088	9502008-A//AR1188/CCDR/3/…	3	77	36	8460	1146	9606	67.9	72.1
209	TRNS	TRENASSE	5	72	36	7713	1764	9477	59.3	69.9
234	RU 0902091	9302065/3/CFX-29/AR 1142/LA 2031	4	79	37	7539	1931	9470	65.7	72.5
222	TMTL	TEMPLETON (AR 1182)	4	79	40	7489	1900	9389	68.2	72.5
244	RU 0902155	CHENIERE/LMNT	4	75	36	7256	2128	9384	70.0	72.5
250	RU 0902034	TACAURI//KBNT/LCSN/3/0502022	6	74	35	7492	1864	9356	62.3	72.5
215	JPTR	JUPITER	5	82	34	6673	2658	9331	68.6	71.1
255	RU 0802149	9502008//KATY/9902207X2/3/JSMN/…	4	75	34	7177	2143	9320	66.3	71.6
220	NPTN	NEPTUNE	4	81	31	6903	2405	9309	69.4	72.5
225	RU 0902005	9502008-A/DREW//CLR 20	4	74	35	7513	1795	9308	63.5	72.5
239	RU 0902109	9502008/3/MBLE//LMNT/20001-5/…	4	78	35	8125	1121	9246	68.6	72.2
230	RU 0802051	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	4	77	37	7259	1949	9208	69.2	72.5
259	RU 0902071	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	78	35	8162	1032	9195	68.5	71.3
241	RU 0902115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4	78	34	6998	2119	9117	71.9	72.5
207	CLXL729	CLXL729	4	75	41	7971	1142	9112	62.3	71.4
242	RU 0902143	LGRU/CLR 11	4	78	33	7144	1946	9090	69.1	72.5
229	RU 0702085	AR 1188/CCDR//9502008/LGRU	4	75	34	7720	1357	9078	66.6	71.5
204	CL171	CL171	4	79	38	6923	2154	9077	68.0	72.5
238	RU 0902106	CPRS/3/CFX 29//AR 1142/LA 2031	3	77	36	7462	1606	9069	68.5	72.5
252	RU 0902128	AC110/AC638	4	75	34	6986	2076	9062	67.9	72.5

Continued.

Table 5. Continued.

ENT	SOURCE	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
217	PSDO	PRESIDIO	4	73	35	6207	2851	9058	66.9	72.2
226	RU 0802008	CCDR/CLR 11	4	75	34	7139	1882	9021	67.6	72.2
236	RU 0902097	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	4	78	33	7864	1116	8980	68.8	72.5
247	RU 0802140	CPRS//L-205/DLLA	4	78	38	7227	1693	8920	68.7	71.8
212	CHNR	CHENIERE	5	77	33	7430	1474	8904	68.2	72.5
227	RU 0902042	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	3	79	37	7640	1211	8851	68.1	72.5
221	RU 0701124	DREW/IRGA417	3	70	37	7064	1774	8838	64.6	71.1
249	RU 0802031	CCDR/0502085	4	75	34	7293	1509	8802	66.0	72.1
202	CL161	CL161	4	79	37	7116	1589	8705	67.3	71.7
258	RU 0902068	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	79	33	7631	1050	8680	70.4	72.5
240	RU 0902112	9302065/3/CFX-29/AR 1142/LA 2031	4	76	35	7666	997	8663	68.7	72.5
223	TRGT	TAGGART (AR 1188)	4	80	43	7154	1490	8644	59.0	72.2
201	CL131	CL131	4	76	32	7071	1548	8618	67.3	72.1
213	CPRS	CYPRESS	4	78	35	7064	1441	8505	68.0	71.7
245	RU 0902174	902207x2/LGRU//CHENIERE	4	79	35	7629	853	8482	68.3	72.5
232	RU 0902085	9502008/3/MBLE//LMNT/20001-5/4/…	3	77	36	7744	738	8482	66.5	72.5
216	BNGL	BENGAL	4	80	34	7484	931	8415	71.5	72.5
211	CCDR	COCODRIE	4	76	33	6929	1448	8377	67.3	72.5
214	WELLS	WELLS	4	76	39	6909	1448	8357	66.1	72.5
219	CTHL	CATAHOULA	4	75	34	6432	1784	8216	65.8	72.5
210	BWMN	BOWMAN	4	74	35	6915	1265	8180	67.0	72.1
251	RU 0902125	CCDR/3/9502008-A//AR1188/CCDR	5	75	35	6785	1240	8025	66.1	72.5
206	XL723	XL723	5	74	41	6912	1075	7987	62.3	72.2
228	RU 0902045	CHENIERE//CFX 29/CCDR	4	80	35	5963	2022	7985	68.2	72.5
218	DLRS	DELLROSE	6	78	37	5130	2811	7941	65.4	72.5
253	RU 0902131	CCDR//9502008//AR1188/CCDR	4	74	34	6566	1334	7900	68.7	72.5
254	RU 0902146	AC1172	5	73	35	6349	1263	7612	67.4	72.0
248	RU 0902028	9502008//AR 1188/CCDR/3/0302005	5	73	36	5671	1345	7017	65.8	71.7
208	CLXL745	CLXL745	5	73	42	5600	385	5985	62.1	71.7
CV			13.4	0.9	4.1	9.0			2.8	0.5
LSD			0.9	1.2	2.4	1067			3.7	0.8

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

PRELIMINARY YIELD TRIALS

The preliminary yield trials consist primarily of promising breeding nursery material that is ready to be tested in replicated (PY) or non-replicated (SP) 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 and ratoon crops, whole and total milling percentages, and disease resistance.

These tests were conducted using standard agronomic practices (except that no fungicide was applied) at the Rice Research Station in Crowley, Louisiana. A randomized complete block design was used for the replicated PY trials, and a completely randomized design was used for the non-replicated SP trials to arrange the test entries. Plots were 4.66 x 16 ft and two replications were used in the PY trials only. Varieties were drill seeded at 90 lb/A on March 9 and harvested on July 27-28. These tests were also ratooned and harvested on October 19-23.

Trial	Group	Entry No.	Type
PY	1	501-525	Long grain
PY	2	526-550	Long grain
PY	3	551-575	Long grain
PY	4	576-600	Long grain
PY	5	601-625	Long grain
PY	6	626-650	Long grain
PY	7	651-675	Long grain
PY	8	676-700	Long grain
PY	9	701-725	Long grain
PY	10	726-750	Medium grain
PY	11	751-775	Medium grain
SP	1	1-100	Long grain
SP	2	101-300	Long grain and Specialty
SP	3	301-375	Medium grain

PY Groups 1 to 4 and SP Group 1 will be presented in Tables 1 to 5 in this section. In the "Development of Improved Long-Grain and Special Purpose Rice Varieties for Louisiana" section, PY Groups 5 to 9 and SP Group 2 are presented. In the "Medium-Grain Rice Breeding" section, PY Groups 10 to 11 and SP Group 3 are presented.

Table 1. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, Group 1, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
521	TACAURI/3/CPRS//82CAY21/TBNT/4/MCR03-2771	5	83	33	10767	2066	12833	62.6	71.3
514	TRNS//9502008-A/DREW	5	82	33	10103	2570	12674	66.2	71.5
522	TACAURI/3/CPRS//82CAY21/TBNT/4/MCR03-2771	6	83	32	9688	2088	11776	62.6	71.4
511	CPRS//82CAY21/TBNT/3/9502008-A/DREW	6	81	31	9184	1919	11103	65.6	72.5
506	DREW/LMNT	6	85	37	8016	2794	10810	62.6	71.7
505	SABER/KBNT	6	83	32	8619	1934	10553	63.4	70.8
509	CPRS//82CAY21/TBNT/3/CCDR	7	83	32	7915	2619	10534	63.9	71.3
510	CPRS//82CAY21/TBNT/3/9502008//KATY/…	7	85	32	9319	1181	10499	60.4	72.1
518	CPRS/3/9502008-A//AR 1188/CCDR	5	85	34	8869	1480	10349	61.9	71.6
502	95020083CPRS//82CAY21/TBNT/4/CPRS//…	5	83	33	9045	1210	10255	63.6	71.6
519	CPRS//CCDR/JEFF	5	86	33	8107	1574	9681	66.8	72.0
508	CPRS//82CAY21/TBNT/3/9502008-A/AR 1121	6	84	32	7309	2313	9622	63.6	69.4
516	CPRS/3/NWBT/KATY//9902207X2	4	83	32	8629	970	9599	64.2	72.3
507	CPRS/4/9502008/3/CPRS//82CYA21/TBNT	5	84	32	8090	1418	9509	63.3	71.4
517	CPRS/3/9502008-A//AR 1188/CCDR	5	85	33	8164	1203	9367	66.9	72.1
520	CPRS//CCDR/JEFF	5	85	31	7827	1451	9278	62.6	70.4
523	CCDR/4/CPRS/3/MBLE//LMNT/…/5/9302065	6	84	31	7609	1445	9054	62.4	71.8
503	95020083CPRS//82CAY21/TBNT/4/CPRS//…	6	85	32	7987	924	8911	64.3	70.4
525	CATAHOULA	6	85	31	6848	1675	8523	55.9	72.3
524	CCDR/4/CPRS/3/MBLE//LMNT/…/5/KATY/CPRS//…	5	85	31	7048	1085	8133	64.3	71.2
515	CCDR/3/NWBT/KATY//9902207X2	6	85	34	6955	1018	7973	63.9	70.9
513	CHENIERE/3/CCDR//AR 1142/LA 2031	6	90	32	6169	1299	7468	64.9	72.3
504	9502008//KATY/9902207x2/3/MBLE//…	5	88	30	4657	2557	7214	64.3	71.0
512	CPRS//82CAY21/TBNT/3/9502008-A/DREW	6	84	30	6334	769	7103	63.7	72.0
501	CCDR/MBLE	6	90	31	4913	1364	6277	66.9	72.3
CV		10.9	1.4	2.9	8.2			3.0	1.0
LSD		1.2	2.4	2.0	1235			3.9	1.5

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, Group 2, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
540	9502008/3/MBLE//LMNT/20001-5/4/CCDR/…	5	83	32	7703	1299	9002	64.8	71.3
538	9502008/3/MBLE//LMNT/20001-5/4/9502008-A/...	5	83	32	7849	1143	8992	61.9	71.1
543	CCDR/JEFF//CCDR/JEFF	5	84	31	7930	886	8816	63.2	71.9
527	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CCDR	5	85	33	7519	1182	8701	64.6	72.4
544	CCDR/JEFF//CCDR/JEFF	5	85	31	7754	922	8676	62.4	71.5
533	9502008/3/MBLE//LMNT/20001-5/4/…	5	84	31	7297	1330	8627	61.2	70.6
536	9502008/3/MBLE//LMNT/20001-5/4/CCDR/JEFF	5	84	32	7457	1044	8501	60.2	71.3
537	9502008/3/MBLE//LMNT/20001-5/4/9502008-A/...	5	82	31	7367	1008	8375	62.8	71.0
526	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CCDR	5	85	33	7090	1072	8161	63.9	71.7
529	9502008/3/MBLE//LMNT/20001-5/4/CCDR/JEFF	5	84	32	6998	1135	8133	61.8	71.8
534	9502008/3/MBLE//LMNT/20001-5/4/CCDR	6	86	34	6757	1262	8020	65.8	72.1
541	9502008/3/MBLE//LMNT/20001-5/4/9502008-A//…	5	84	31	7160	784	7944	61.8	71.3
546	CCDR/JEFF//CCDR/JEFF	5	85	32	7026	864	7890	62.3	71.2
545	CCDR/JEFF//CCDR/JEFF	5	83	31	7078	792	7870	62.7	71.7
535	9502008/3/MBLE//LMNT/20001-5/4/CCDR/JEFF	5	84	31	6739	1068	7807	59.9	70.3
531	9502008/3/MBLE//LMNT/20001-5/4/…	5	84	31	6329	1438	7767	58.0	71.5
542	CCDR/JEFF//CCDR/JEFF	5	85	31	6741	922	7663	62.0	71.1
528	CCDR/4/CPRS/3/MBLE//LMNT/…/5/LGRU	6	84	33	6548	1048	7596	64.6	72.0
539	9502008/3/MBLE//LMNT/20001-5/4/CCDR/…	5	83	31	6632	938	7571	62.7	70.8
530	9502008/3/MBLE//LMNT/20001-5/4/CCDR/JEFF	6	84	31	6303	1019	7322	62.4	71.1
549	CCDR/JEFF//9502008-A/DREW	5	84	29	6383	912	7296	60.8	71.4
548	CCDR/JEFF//9502008-A/DREW	6	83	31	6489	779	7268	64.2	72.3
532	9502008/3/MBLE//LMNT/20001-5/4/…	5	84	30	5908	1172	7080	61.9	72.2
550	COCODRIE	6	84	32	5349	938	6287	63.8	72.3
547	CCDR/JEFF//9502008-A/DREW	6	84	29	5559	423	5981	60.3	71.1
CV		10.2	1.1	3.6	6.3			2.9	1.0
LSD		1.1	1.8	2.4	889			3.8	1.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, Group 3, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
560	CHNR/4/TACAURI/3/CPRS//82CAY21/TBNT	6	87	34	7903	1890	9793	61.2	70.8
571	CHNR/3/CPRS/KBNT//9502008-A	5	85	30	7336	2308	9644	66.8	71.8
559	CHNR//9502008-A/DREW	5	83	33	8049	1472	9521	65.7	72.1
563	CHNR/3/9502008//KATY/902207X2	6	87	34	7533	1727	9260	67.4	72.5
553	CCDR/JEFF//CHNR	6	90	33	7741	1405	9146	66.0	72.3
552	CCDR/JEFF/4/9502008/3/MBLE//LMNT/20001-5	5	84	33	8026	1016	9042	62.2	70.9
565	CHNR/3/9502008//KATY/902207X2	6	88	31	7160	1793	8952	66.9	72.3
575	CHENIERE	5	88	34	7521	1403	8924	66.1	72.3
557	NWBT/KATY//9902207x2/4/TACAURI/3/CPRS//...	5	84	31	7824	1097	8922	60.9	70.7
554	CCDR/JEFF/3/9502008-A//AR 1188/CCDR	6	85	32	7707	1013	8720	64.2	71.7
561	CHNR/3/9502008-A//AR 1188/CCDR	5	82	32	7741	935	8676	61.5	72.3
567	CHNR/9302065	6	87	33	6715	1884	8598	64.9	72.3
564	CHNR/3/9502008//KATY/902207X2	6	87	33	6885	1682	8566	67.5	72.2
555	CCDR/JEFF/3/9502008-A//AR 1188/CCDR	5	84	33	7514	1018	8532	63.7	71.8
573	CHNR/3/9502008-A//AR 1188/CCDR	6	90	31	7038	1463	8501	65.1	72.1
558	CHNR/3/9502008-A//AR 1188/CCDR	5	84	33	7459	1017	8476	63.8	72.2
568	CHNR/3/9502008-A//AR 1188/CCDR	5	87	31	6965	1448	8413	67.1	72.4
569	CHNR/3/9502008-A//AR 1188/CCDR	6	86	33	6946	1375	8321	63.9	72.5
556	CCDR/JEFF//0043752/0047277	5	84	32	7449	869	8317	64.0	71.7
574	9502008-A/DREW//CCDR/JEFF	5	85	32	7311	891	8201	64.5	71.8
572	CHNR//CCDR/JEFF	5	84	31	7123	898	8021	58.6	71.1
562	CHNR/3/9502008-A//AR 1188/CCDR	6	80	32	7122	830	7952	62.6	71.9
566	CHNR/9302065	6	91	33	6019	1882	7901	62.8	71.4
551	CCDR/JEFF//9502008-A/DREW	5	84	32	6890	773	7662	62.6	71.0
570	CHNR/3/9502008-A//AR 1142/MBLE	5	82	31	6025	1041	7066	63.8	71.9
CV		6.8	2.0	3.2	8.1			1.6	0.6
LSD		0.7	3.5	2.1	1210			2.1	0.9

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, Group 4, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
597	CCDR/JEFF//CHNR	5	84	33	8201	1185	9386	65.4	72.4
591	DREW/CCDR/3/9502008-A//AR 1188/CCDR	5	84	33	8042	1122	9164	64.5	72.1
588	DREW/CCDR//CCDR/JEFF	5	84	31	7435	1522	8957	64.4	72.4
600	AR 1188/CCDR//9502008/LGRU	4	87	33	6870	2031	8901	63.2	70.8
585	9502008-A//AR 1142/MBLE/3/NWBT/KATY//…	4	80	32	7550	1247	8797	62.7	71.6
584	9502008-A//AR 1142/MBLE/3/NWBT/KATY//…	5	82	31	7388	1175	8564	63.0	71.5
579	9502008//KATY/902207x2/3/0047272/0046181	5	86	33	7158	1384	8541	67.1	72.2
592	CCDR//LGRU/LCSN/3/CPRS/KBNT//9502008-A	4	82	31	6998	1452	8450	65.0	72.1
596	9502008-A//AR 1188/CCDR/3/CCDR/LGRU/LCSN	5	83	32	7361	1084	8446	57.6	71.2
590	DREW/CCDR//9502008-A/DREW	5	85	33	7124	1314	8437	65.0	71.9
587	TACAURI//KBNT/LCSN/3/9502008-A//AR 1188/…	5	88	32	6001	2424	8425	62.8	72.0
589	DREW/CCDR//9502008-A/DREW	5	83	34	7096	1292	8388	64.3	71.8
578	9502008-A//AR 1188/CCDR/3/CCDR/LGRU/LCSN	5	84	34	6909	1425	8334	61.1	72.0
599	WELLS//9502008-A/DREW	5	85	30	6381	1905	8285	56.6	70.7
593	KATY/CPRS//JKSN/3/AR 1188/CCDR/4/CCDR//...	6	83	32	7261	953	8214	64.7	71.8
576	9502008-A/DREW//AC111DH3/AC468DH2	5	83	32	6583	1499	8082	65.1	71.6
586	9502008-A//AR 1142/MBLE/3/CCDR/LGRU/LCSN	5	84	32	6850	1100	7950	56.9	71.7
577	9502008-A//AR 1188/CCDR/3/CCDR/JEFF	5	85	30	7071	674	7746	62.3	69.7
581	9502008-A/DREW//CCDR	5	84	32	6339	1274	7613	65.4	71.8
598	CCDR/JEFF//9502008-A/DREW	5	85	33	6618	981	7599	62.3	71.7
580	9502008-A/DREW//CCDR	5	82	31	6044	1484	7528	62.6	71.9
595	9502008-A//AR 1188/CCDR/3/9502008-A//...	5	83	31	6520	762	7281	63.8	71.7
594	9502008-A//AR 1188/CCDR/3/9502008-A//...	5	83	31	6355	542	6897	63.6	71.4
582	9502008-A/DREW//CCDR	5	84	30	5115	1705	6820	63.2	72.3
583	9502008-A/DREW//CCDR	5	82	32	5418	1090	6508	64.3	71.5
CV		10.8	1.3	4.6	9.4			4.0	1.0
LSD		1.1	2.3	3.0	1330			5.2	1.5

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2009 Single-Plot Grain Yield Trial, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
09SP 039	CPRS/KBNT//9502008-A/3/TRNS	6	84	37	8119	2473	10592	64.9	72.5
09SP 005	9502008/LGRU/3/CPRS//82CAY21/TBNT	5	87	31	9020	1377	10398	64.5	71.6
09SP 049	9502008/3/MBLE//LMNT/20001-5/4/…	4	85	32	8424	1541	9965	65.9	72.5
09SP 054	9502008/3/MBLE//LMNT/20001-5/4/CCDR/…	4	86	33	8140	1821	9961	64.6	71.9
09SP 020	CPRS//82CAY21/TBNT/3/9502008-A/AR 1121	6	83	31	7403	2226	9630	51.2	68.7
09SP 052	9502008/3/MBLE//LMNT/20001-5/4/CCDR	4	84	31	8476	1147	9623	65.7	72.5
09SP 051	9502008/3/MBLE//LMNT/20001-5/4/CCDR	4	85	33	8185	1351	9535	61.2	71.2
09SP 004	9502008/LGRU//CCDR	5	85	33	7667	1868	9535	65.6	71.8
09SP 035	TRNS//CCDR/JEFF	5	82	33	7503	1962	9465	63.5	70.1
09SP 030	9502008//KATY/902207X2/3/MILL	4	84	33	7874	1568	9442	66.6	72.2
09SP 002	TACAURI/3/CPRS//82CAY21/TBNT/4/CPRS//…	5	83	32	7885	1532	9417	61.4	70.2
09SP 053	9502008/3/MBLE//LMNT/20001-5/4/…	4	85	33	7809	1565	9374	67.0	72.4
09SP 055	9502008/3/MBLE//LMNT/20001-5/4/9502008-A//…	4	85	30	7621	1750	9370	66.0	72.1
09SP 040	CPRS/3/NWBT/KATY//9902207X2	4	83	31	7939	1385	9325	66.1	72.4
09SP 100	AR 1188/CCDR//9502008/LGRU	4	85	35	7682	1638	9320	65.0	70.9
09SP 034	TRNS//9502008-A/DREW	5	85	31	7444	1762	9206	65.8	72.3
09SP 090	DREW/CCDR/3/9502008-A//AR 1188/CCDR	5	85	33	7617	1567	9184	67.3	72.4
09SP 048	CCDR/4/CPRS/3/MBLE//LMNT/…/5/LGRU	4	84	32	8024	1137	9161	65.3	72.5
09SP 083	9502008-A/DREW/4/TACAURI/3/CPRS//…	5	84	35	7023	2104	9127	55.0	70.6
09SP 047	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CCDR	4	84	34	7684	1381	9065	67.0	72.2
09SP 021	CPRS//82CAY21/TBNT/3/CCDR	6	84	31	7190	1655	8845	59.5	70.2

Continued.

Table 5. Continued.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
09SP 056	CCDR/JEFF//CCDR/JEFF	4	82	34	7493	1288	8781	64.8	72.3
09SP 061	CCDR/JEFF/3/9502008-A//AR 1188/CCDR	4	84	35	7779	1002	8780	64.9	71.5
09SP 057	CCDR/JEFF//CCDR/JEFF	4	83	35	7475	1244	8719	64.0	71.6
09SP 038	CCDR//CCDR/9770532 DH2	5	84	32	7021	1644	8665	63.8	72.4
09SP 075	CHENIERE	4	88	33	6547	2078	8625	67.0	72.4
09SP 046	CCDR/4/CPRS/3/MBLE//LMNT/…/5/9302065	4	84	31	6491	2056	8547	67.9	72.4
09SP 012	KATY/CPRS//NWBT/…/3/9502008/4/CCDR	4	85	33	6530	1971	8500	66.3	71.6
09SP 018	CPRS/4/9502008/3/MBLE//LMNT/20001-5	4	87	32	7227	1268	8495	67.4	72.2
09SP 099	KATY/CPRS//JKSN/3/AR 1188/CCDR/4/0043752/..	6	85	33	7551	934	8485	66.4	72.0
09SP 097	9502008-A//AR 1188/CCDR/3/9502008-A/DREW	5	85	34	7137	1339	8477	66.0	72.1
09SP 098	CCDR/JEFF//CCDR	5	85	35	7364	1080	8444	66.5	72.4
09SP 064	NWBT/KATY//9902207x2/4/TACAURI/3/CPRS//...	4	83	33	6703	1731	8434	63.2	71.8
09SP 042	CPRS//9502008-A/DREW	5	85	30	6116	2303	8419	65.7	72.3
09SP 096	9502008-A//AR 1188/CCDR/3/9502008-A//...	5	84	31	7048	1370	8417	65.5	72.1
09SP 033	LGRU/WELLS//LMNT	5	89	31	6158	2253	8411	51.8	70.9
09SP 063	CCDR/JEFF//0043752/0047277	4	85	33	7173	1221	8394	64.0	71.8
09SP 011	902207x2/LGRU//JKSN	6	91	31	6201	2180	8380	59.0	70.7
09SP 059	CCDR/JEFF/4/9502008/3/MBLE//LMNT/20001-5	4	83	33	7096	1270	8366	63.2	72.0
09SP 001	95020083CPRS//82CAY21/TBNT/3/L201//TBNT/…	5	84	35	7436	873	8309	65.8	71.7
09SP 045	CPRS//CCDR/JEFF	5	85	30	6957	1347	8304	62.9	72.4
09SP 041	CPRS/3/9502008-A//AR 1188/CCDR	5	85	32	6757	1500	8258	64.9	71.2

Continued.

Table 5. Continued.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
09SP 050	COCODRIE	5	85	34	7146	1101	8247	66.5	72.5
09SP 077	9502008//KATY/902207x2/3/MBLE	5	85	31	6336	1864	8200	63.9	71.2
09SP 060	CCDR/JEFF//CHNR	4	84	32	6854	1330	8184	65.2	72.1
09SP 095	9502008-A//AR 1188/CCDR/3/9502008-A//...	5	83	34	7086	1061	8147	62.5	70.3
09SP 013	KATY/CPRS//NWBT/…/3/9502008/4/CCDR	5	87	33	6017	2125	8142	64.3	71.5
09SP 071	CHNR//CCDR/9770532 DH2	4	88	33	6963	1173	8135	67.8	72.4
09SP 093	AC110DH2/AC108DH2//9502008-A/DREW	6	81	32	6331	1660	7990	63.8	71.9
09SP 068	CHNR/3/NWBT/KATY//9902207X2	5	84	36	6986	946	7932	63.0	71.9
09SP 032	9502008-A/DREW//FRANCIS	4	83	33	6418	1447	7865	57.0	71.6
09SP 092	CCDR//LGRU/LCSN/3/CPRS/KBNT//9502008-A	5	85	31	5909	1884	7793	64.0	72.4
09SP 062	CCDR/JEFF/3/9502008-A//AR 1188/CCDR	4	83	34	6934	831	7764	64.7	71.0
09SP 003	CHENIERE/3/CPRS//82CAY21/TBNT	6	91	30	7002	744	7747	68.0	72.4
09SP 067	CHNR/4/9502008/3/MBLR//LMNT/20001-5	4	82	34	6431	1288	7719	66.1	72.0
09SP 009	AR 1121/3/CPRS//82CAY21/TBNT/4/CCDR	4	84	31	6398	1316	7714	65.8	72.3
09SP 089	DREW/CCDR//9502008-A/DREW	4	84	33	6384	1309	7693	66.3	72.3
09SP 078	9502008//KATY/902207x2/3/CCDR	5	83	31	6607	1086	7692	65.9	71.3
09SP 074	9502008-A//AR 1188/CCDR/3/CCDR/JEFF	5	84	33	6503	1153	7656	64.1	70.3
09SP 023	CPRS//82CAY21/TBNT/3/9502008-A/DREW	7	88	30	6772	874	7646	66.5	72.3
09SP 031	9502008//KATY/902207X2/3/CHENIERE	4	85	33	6675	932	7607	66.2	72.3
09SP 006	9502008-A/DREW//9502008/AR 1121	5	84	33	6348	1249	7597	62.2	71.1
09SP 015	9502008//KATY/902207X2/3/…	4	84	34	6331	1187	7518	68.0	72.2

Continued.

Table 5. Continued.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
09SP 079	9502008//KATY/902207x2/3/0047272/0046181	4	85	32	6433	1084	7517	66.3	71.8
09SP 066	CHNR/3/9502008-A//AR 1142/MBLE	4	83	32	6200	1267	7467	65.5	72.4
09SP 025	CATAHOULA	5	84	31	5497	1957	7454	61.9	72.4
09SP 070	CHNR//9502008-A/DREW	5	84	33	5922	1528	7451	65.7	72.3
09SP 076	9502008-A//AR 1188/CCDR/4/TACAURI/3/…	5	84	32	5680	1662	7343	63.9	70.8
09SP 065	CHNR/3/9502008-A//AR 1188/CCDR	5	85	34	6000	1293	7293	66.1	72.5
09SP 088	DREW/CCDR/4/TACAURI/3/CPRS//82CAY21/TBNT	5	90	29	4888	2401	7288	65.2	71.3
09SP 043	CPRS/3/CCDR/LGRU/LCSN	6	85	31	5448	1807	7255	65.7	71.8
09SP 073	9502008-A/DREW//CCDR/JEFF	5	85	31	6133	1034	7167	65.6	71.9
09SP 019	CPRS/9302065	5	92	30	5600	1505	7106	63.5	71.9
09SP 010	AR 1121/3/CPRS//82CAY21/TBNT/4/9502008-A/…	5	85	31	5422	1662	7084	63.7	71.6
09SP 017	DREW/LMNT	6	88	33	4669	2377	7046	62.7	70.8
09SP 085	9502008-A//AR 1142/MBLE/3/NWBT/KATY//…	5	84	31	5416	1541	6957	62.8	71.4
09SP 082	9502008-A/DREW//CCDR	5	83	31	5648	1271	6919	63.1	72.5
09SP 044	CPRS/3/CCDR/LGRU/LCSN	5	86	29	5018	1885	6903	65.2	71.6
09SP 007	TACAURI/3/CPRS//82CAY21/TBNT/4/MBLE	6	84	31	5859	1037	6896	59.4	71.6
09SP 024	NWBT/KATY//9902207X2/3/RT 7015	5	84	31	5653	1209	6862	60.5	69.8
09SP 069	CHNR/3/NWBT/KATY//9902207X2	5	89	32	5511	1305	6816	64.4	71.9
09SP 037	CCDR/CHNR	5	84	32	5668	1147	6815	62.8	70.1
09SP 016	CCDR/4/KATY/CPRA//NWBT/…/3/CPRS/KBNT	5	88	33	5160	1607	6767	67.0	72.0

Continued.

Table 5. Continued.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
09SP 094	9502008-A//AR 1188/CCDR/3/9502008-A//...	5	83	33	5984	723	6707	56.1	70.6
09SP 081	9502008-A/DREW//CCDR/JEFF	5	83	31	5388	1300	6688	59.9	71.7
09SP 091	DREW/CCDR/3/9502008-A//AR 1188/CCDR	5	87	28	5374	1231	6605	63.1	72.3
09SP 029	TACAURI/4/CPRS//82CAY21/TBNT/3/AR 1179	5	84	30	4211	2275	6486	65.3	71.6
09SP 058	CCDR/JEFF//9502008-A/DREW	5	83	28	5610	847	6457	56.2	70.8
09SP 026	NWBT/KATY//9902207X2/3/MBLE	5	81	33	5394	986	6380	61.8	71.9
09SP 036	9302065//9502008-A/DREW	4	92	28	4276	1844	6120	59.1	71.8
09SP 008	9502008/CPRS//MBLE	6	89	31	5569	496	6066	62.5	70.8
09SP 084	9502008-A//AR 1142/MBLE/3/CCDR/JEFF	6	83	28	5011	1016	6028	63.7	72.2
09SP 072	CHNR/3/CCDR//LGRU/LCSN	5	84	34	3864	2119	5983	67.9	72.1
09SP 080	9502008-A/DREW//CCDR/JEFF	5	85	30	4513	1450	5962	61.6	72.1
09SP 014	9502008//KATY/9902207x2/3/9502008/CPRS	6	88	32	4840	982	5822	68.7	72.3
09SP 028	CHENIERE/3/CCDR//AR 1142/LA 2031	6	84	30	4826	928	5754	62.4	72.3
09SP 027	CHENIERE/4/9502008/3/CPRS//82CAY21/TBNT	6	88	32	3754	1534	5289	66.4	71.7
09SP 086	9502008-A//AR 1142/MBLE/3/AC110DH3.0043752	5	82	29	4284	923	5207	57.5	71.4
09SP 022	CPRS//82CAY21/TBNT/3/9502008-A/DREW	6	82	28	3922	979	4901	66.0	71.5
09SP 087	9502008-A/DREW//9502008-A/DREW	6	90	30	2653	2039	4693	66.1	70.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

CLEARFIELD EXPERIMENTAL LINES

S.D. Linscombe, S.B. Blanche, X.Y. Sha, K.F. Bearb, B.W. Theunissen,
S.J. Theunissen, R.R. Dilly Jr., B.J. Henry, and H.L. Hoffpauir

The Clearfield technology allows for a broad-spectrum application of Newpath (*imazethapyr*) herbicide to be used in a program to selectively eliminate red rice in a commercial rice field. The Rice Breeding Project at the LSU AgCenter's Rice Research Station (RRS) has been actively involved in the development of new Clearfield lines that combine a high level of herbicide resistance, high yield potential, and good agronomic characteristics. Due to the limitations of both mutation and backcross breeding, conventional pedigree breeding has continued to be the primary method for the development of new Clearfield rice varieties. Crosses are continuously made to combine the high level of *imazethapyr* resistance of CL161 and its derived experimental lines with high yield potential of conventional long-grain varieties or lines. On- and off-station (in-farm) trials were conducted to evaluate these lines in a typical breeding trial for yield, milling, and agronomic performance. These trials were also treated with the herbicide Newpath to evaluate resistance levels. In each of the trials, *imazethapyr* was applied at a rate of 0.126 lb ai/A at emergence after drill seeding, then again at the 3- to 4-leaf stage.

In 2009, Clearfield preliminary yield tests were conducted. These included 300 experimental lines and checks. The CLPYs were seeded on March 23 and harvested on August 3. These tests were also ratooned and harvested on October 21. Grain (first and ratoon crop) and milling yields, as well as agronomic performance data, are presented in Tables 1 to 12.

Table 1. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 1, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
002	CPRS//82CAY21/TBNT/3/CFX 29//…	4	74	35	10410	2836	13246	66.3	71.4
010	TACAURI/3/CPRS//82CAY21/TBNT/…	4	78	37	10725	2066	12791	67.6	72.5
003	CPRS/9502008-A//CFX 26/WELLS	3	78	36	10377	2218	12595	67.8	72.3
005	CPRS/KBNT//WELLS CFX 18	4	76	33	10304	2186	12490	65.8	71.6
004	CPRS/9502008-A//CFX 29/CCDR	4	78	35	9653	2797	12451	66.1	72.3
009	TACAURI/3/CPRS//82CAY21/TBNT/…	4	76	34	10376	1930	12306	66.5	72.5
012	JEFF/3/CFX 29//AR 1142/LA 2031	5	77	34	10007	2100	12107	67.1	71.7
014	0043676/AC105DH3//CFX 29	4	76	33	9505	2532	12038	67.9	72.2
011	CPRS//82CAY21/TBNT/3/CFX 29//…	5	76	32	10195	1839	12034	65.2	71.7
008	MBLE//CFX 26/WELLS	6	77	29	9139	2883	12023	69.0	72.4
023	9502008-A/DREW//CFX 26/WELLS	6	76	35	10031	1931	11963	66.4	72.4
020	9502008-A/DREW//WELLS/CFX 18	4	75	37	10081	1808	11889	67.1	72.5
019	9502008-A/DREW//WELLS/CFX 18	4	75	36	9953	1908	11862	67.7	71.8
001	CPRS//CFX 29/CCDR	4	78	38	9232	2560	11792	69.7	72.5
024	9502008-A/DREW//CFX 26/WELLS	5	78	35	10114	1531	11645	66.3	72.2
017	9502008-A/DREW//CFX 29	4	77	34	9367	2117	11484	68.9	72.4
016	9502008-A/DREW//CFX 29	5	78	36	9661	1737	11399	67.0	72.4
025	CL131	5	77	34	9534	1807	11342	66.6	72.0
007	MBLE//CFX 26/WELLS	5	76	33	8877	2363	11240	67.7	72.3
018	9502008-A/DREW//CFX 29	4	78	35	9526	1530	11056	68.0	72.1
006	KATY/CPRS//NWBT/…/3/CPRS/…	4	79	35	9845	1092	10937	66.9	72.2
013	9302065/CFX 18	5	79	34	8879	1935	10814	67.1	72.0
021	9502008-A/DREW//CFX 29/CCDR	5	76	34	9236	1491	10727	67.2	72.1
022	9502008-A/DREW//CFX 29/CCDR	5	79	36	9015	1435	10450	68.6	72.4
015	9502008-A//AR1188/CCDR/3/CFX 18	5	75	34	9132	1249	10380	66.9	71.3
CV		17.1	0.9	3.6	4.5			1.6	0.8
LSD		1.5	1.4	2.6	903			2.2	1.2

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 2, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
049	CPRS/KBNT//WELLS CFX 18	6	77	36	10491	2188	12679	67.4	72.5
027	9502008-A/DREW//CFX 29//AR 1142/LA 2031	4	74	37	10409	2103	12513	65.1	71.2
050	CL151	4	78	38	10829	1608	12437	66.8	72.4
041	CPRS//82CAY21/TBNT/3/CFX 26/WELLS	5	76	36	10246	2152	12399	66.1	72.5
028	9502008-A/DREW//CFX 26/WELLS	4	77	35	10203	2150	12353	67.6	72.3
048	CPRS/9502008-A/3/CFX 29//AR 1142/LA 2031	4	79	37	10363	1845	12208	66.6	72.2
035	CFX-29//AR1142/LA2031/3/DREW/JEFF//CFX 18	4	76	36	10138	2049	12187	65.9	72.6
040	CPRS//82CAY21/TBNT/3/CFX 26/WELLS	4	77	36	10264	1911	12176	67.3	72.5
026	9502008-A/DREW//CFX 26/WELLS	4	77	34	10126	1925	12051	67.6	72.9
046	CPRS/9502008-A/3/CFX 29//AR 1142/LA 2031	3	79	36	10863	1167	12030	66.7	73.1
036	CFX-29//AR1142/LA2031/3/DREW/JEFF//CFX 18	5	77	37	9776	2211	11988	65.6	71.8
031	9502008-A/DREW//CFX 29	4	75	35	9793	2084	11877	67.1	72.2
030	9502008-A/DREW//CFX 29	4	75	36	10142	1732	11873	65.8	71.8
044	CPRS/9502008-A//CFX 26/WELLS	5	78	37	10164	1533	11697	66.0	72.4
045	CPRS/9502008-A//CFX 26/WELLS	4	79	38	10221	1411	11632	68.0	72.5
042	CPRS//82CAY21/TBNT/3/AR1179/4/CFX 26/WELLS	4	78	34	9493	2112	11605	66.7	72.4
037	CH1/3/CPRS//82CAY21/TBNT/4/CFX 26/WELLS	6	76	34	8843	2669	11513	67.8	72.4
047	CPRS/9502008-A/3/CFX 29//AR 1142/LA 2031	4	78	38	9683	1819	11502	67.6	72.4
043	CPRS//82CAY21/TBNT/3/AR1179/4/CFX 29/CCDR	4	76	37	9838	1553	11391	67.0	72.2
029	9502008-A/DREW//CFX 26/WELLS	5	78	32	8768	2342	11110	67.8	71.8
039	CPRS//CFX 26/WELLS	5	77	36	9202	1878	11080	68.8	72.4
032	CCDR//CFX 26/WELLS	5	77	31	9312	1611	10922	67.3	72.6
033	CCDR//WELLS/CFX 18	6	76	33	8678	1885	10563	65.8	72.0
034	CCDR//CFX 26/WELLS	5	77	33	8553	1877	10430	67.1	72.3
038	CHENIERE//CFX 29/CCDR	5	78	34	7436	2444	9881	69.8	72.3
CV		14.9	0.9	5.4	4.1			1.8	0.7
LSD		1.3	1.4	4.0	820			2.5	1.0

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 3, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
072	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	4	77	35	10748	2424	13172	67.8	73.3
052	CPRS/KBNT//CFX 29	5	77	34	10018	2759	12777	68.3	71.9
065	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX 18	5	77	35	10474	1879	12354	65.2	72.1
073	9502008/3/MBLE//LMNT/20001-5/4/CFX-26/…	5	77	36	10352	1924	12276	68.3	72.4
064	SABER//CFX 26/WELLS	4	75	36	10059	2168	12226	66.5	70.4
054	CPRS/KBNT//CFX 29/CCDR	4	78	36	10215	1928	12143	66.1	71.3
061	LMNT//CFX 29/CCDR	4	76	35	9575	2463	12038	63.3	69.8
053	CPRS/KBNT//CFX 29/CCDR	4	79	37	10025	2010	12035	68.2	72.5
071	9502008/3/MBLE//LMNT/20001-5/4/CL131	5	76	34	10363	1652	12015	65.2	71.8
055	DREW/3/CPRS//82CAY21/TBNT/4/CFX 18	4	77	32	9482	2482	11963	67.0	71.1
068	CPRS/3/DREW/JEFF//CFX-18	4	76	33	9994	1938	11932	65.4	70.6
069	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-24	6	78	30	9773	2114	11887	62.2	69.6
070	9502008/3/MBLE//LMNT/20001-5/4/CL131	4	79	32	9729	2093	11823	65.8	71.9
060	LMNT//CFX 26/WELLS	4	77	32	9151	2478	11629	67.4	72.5
062	LMNT/CFX 29	5	78	37	8770	2823	11593	67.1	71.8
066	CL131/CFX-29	4	77	35	9938	1574	11512	65.4	70.8
063	LMNT/CFX 29	3	78	38	9439	1907	11346	67.1	71.8
051	CPRS/KBNT//CFX 29//AR 1142/LA 2031	5	76	35	9806	1512	11318	64.2	70.8
056	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	4	78	37	9774	1497	11271	66.2	72.2
074	9502008/3/MBLE//LMNT/20001-5/4/CFX-26/…	4	78	37	9521	1698	11219	66.9	72.1
075	CL161	4	79	38	8990	1718	10708	68.0	72.1
067	CCDR/5/AR 1179/3/CPRS//…/4/CFX-18	3	77	32	8995	1677	10671	66.5	72.4
059	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	5	79	36	8715	1861	10576	68.9	72.5
057	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/…	5	78	34	7588	2942	10530	65.6	71.7
058	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	4	79	34	8178	2113	10291	67.0	72.2
CV		15.8	0.7	3.9	5.5			2.7	1.6
LSD		1.3	1.0	2.8	1090			3.7	2.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 4. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 4, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
099	9502008-A/DREW//CLR 20	5	77	38	10698	2154	12852	66.8	71.4
076	9502008/3/MBLE//LMNT/20001-5/4/WELLS/…	4	78	34	10467	1863	12330	67.4	72.0
086	NWBT/KATY//9902207x2/5/AR 1179/3/CPRS//…	4	76	34	9897	2421	12318	63.8	70.7
083	CFX-29//AR 1142/LA 2031/3/MBLE//TQNG/…	5	77	35	10168	2122	12290	66.9	72.1
077	CCDR/JEFF/5/AR 1179/3/CPRS//…/4/CFX-18	4	76	34	9913	2337	12250	62.8	70.0
088	AR 1179/3/CPRS//…/4/CFX-18/5/DREW/JEFF//…	4	77	36	10593	1377	11971	62.2	71.8
096	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	5	77	34	10270	1665	11935	64.6	71.6
095	CPRS/CLR 11	5	78	35	9594	2264	11858	67.6	71.8
091	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4	76	34	9196	2580	11776	67.9	72.1
079	NWBT/KATY//9902207x2/3/DREW//JEFF/CFX-18	4	77	36	10021	1728	11749	62.5	69.6
081	CCDR//LGRU/LCSN/3/CFX-26	5	77	31	9006	2737	11743	61.4	70.6
082	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CFX-18//…	5	75	35	8898	2723	11621	65.4	71.6
089	AHRENT//WELLS/CFX 18	5	77	34	9714	1878	11592	65.3	71.5
085	CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2	4	76	33	10135	1305	11439	66.4	72.3
100	CL171	5	79	39	9343	2083	11426	65.4	72.1
080	CHNR/3/CFX-29//AR 1142/LA 2031	4	77	33	9470	1808	11278	65.1	71.5
084	9502008/3/MBLE//LMNT/20001-5/4/WELLS/CFX-18	4	75	32	9251	2013	11264	65.6	71.4
092	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	3	76	30	8357	2813	11169	66.6	72.1
094	KBNT/CLR 9	6	78	30	8229	2810	11039	66.5	71.6
090	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	5	77	37	9369	1294	10663	66.5	71.4
093	9302065/CLR 7	4	79	31	8152	2415	10567	66.7	71.7
078	NWBT/KATY//9902207x2/3/DREW//JEFF/CFX-18	4	75	39	9443	1035	10477	60.4	70.1
087	NWBT/KATY//9902207x2/5/AR 1179/3/CPRS//…	5	76	35	9042	1343	10385	63.9	71.1
097	CCDR/98PIM0151//MBLE	6	79	31	7250	2213	9462	67.6	71.6
098	CCDR/98PIM0151/4/AR 1121/3/CPRS//82CAY21/…	6	79	34	7570	1770	9340	65.6	71.6
CV		17.1	0.9	3.4	4.4			2.3	1.3
LSD		1.6	1.5	2.4	840			3.1	1.9

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 5. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 5, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
102	KATY/CPRS//NWBT/…/3/9502008/4/CLR 6	4	78	40	10852	2148	13000	68.1	72.4
125	XC 011	4	74	36	10586	2111	12696	65.1	72.1
104	CFX-189502008-A/TACAURI	5	77	33	9732	2642	12374	63.2	71.4
123	CPRS/3/CFX-18//CCDR/9770532 DH2	4	77	33	9979	2330	12309	66.8	71.5
112	CCDR/3/CFX-29//AR 1142/LA 2031	5	75	34	10207	2091	12298	62.8	69.8
110	CL131//WELLS/CFX-18	5	78	34	10133	2084	12217	64.1	72.1
114	CCDR/3/DREW/JEFF//CFX-18	4	77	32	9696	2365	12061	65.8	71.6
121	CPRS/CFX-26	4	79	35	9298	2525	11823	67.2	71.8
115	CCDR/3/DREW/JEFF//CFX-18	5	80	35	8993	2792	11785	66.8	72.2
119	CCDR//WELLS/CFX-18	5	77	34	9229	2502	11730	63.9	71.5
111	CL131//WELLS/CFX-18	4	77	35	9677	2017	11694	63.8	71.2
122	CPRS/3/CFX-18//CCDR/9770532 DH2	5	78	34	9447	2146	11593	65.2	71.4
101	9502008-A/TACAURI//CLR 5	5	79	37	9798	1641	11439	67.1	72.0
103	KATY/CPRS//NWBT/…/3/9502008/4/CLR 6	4	81	34	9019	2399	11417	66.3	71.9
108	CL131/3/CFX-29//AR 1142/LA 2031	5	80	30	9537	1849	11386	63.6	71.9
120	CCDR//WELLS/CFX-18	5	77	35	8809	2572	11382	66.2	71.6
109	CL131/3/CFX-29//AR 1142/LA 2031	4	79	31	9513	1851	11364	64.6	71.5
107	CPRS/KBNT//CFX 18	5	81	36	9477	1871	11348	67.1	71.7
117	CCDR/CFX-29	5	77	33	9259	1954	11212	64.2	71.3
113	CCDR/3/DREW/JEFF//CFX-18	4	77	35	9732	1354	11086	65.1	71.4
116	CCDR/3/DREW/JEFF//CFX-18	4	75	33	8764	2293	11057	66.5	71.7
124	CPRS/3/CFX-18//CCDR/9770532 DH2	5	81	31	8517	2373	10889	67.4	71.5
118	CCDR/CFX-29	6	80	33	8291	2395	10687	66.9	71.6
106	CPRS/KBNT//WELLS CFX 18	6	78	29	8886	1674	10560	58.8	70.4
105	9302065/CFX 18	5	82	31	8448	1994	10443	66.7	71.8
CV		12.1	0.8	4.1	4.6			2.1	1.3
LSD		1.1	1.2	3.0	899			2.8	2.0

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 6. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 6, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
128	TACAURI/3/CPRS//82CAY21/TBNT/4/WELLS/CFX-18	4	76	36	10299	2739	13038	65.1	72.3
126	TACAURI/3/CPRS//82CAY21/TBNT/4/CL131	5	77	35	10266	2535	12802	66.1	72.2
134	NWBT/KATY//9902207x2/3/CFX-18//…	5	76	35	10719	2006	12725	65.7	71.3
137	NWBT/KATY//9902207x2/3/CFX-18//…	5	78	36	10206	1931	12137	65.5	71.9
146	9502008-A/DREW//WELLS/CFX-18	4	71	33	9301	2825	12126	63.7	71.4
133	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	4	78	35	9753	2352	12104	66.0	71.7
148	9502008-A/DREW/5/AR 1179/3/CPRS//…/4/CFX-18	5	76	36	10013	2063	12076	66.4	71.3
140	NWBT/KATY//9902207x2/3/WELLS/CFX-18	5	76	36	10297	1732	12029	64.4	71.3
145	9502008-A/DREW//WELLS/CFX-18	5	75	33	9561	2459	12020	66.1	71.9
136	NWBT/KATY//9902207x2/3/CFX-18//…	3	75	35	9988	2009	11997	65.9	72.0
135	NWBT/KATY//9902207x2/3/CFX-18//…	4	78	37	9657	2323	11980	67.3	71.9
144	9502008-A/DREW//WELLS/CFX-18	5	73	35	9227	2536	11763	64.4	70.0
127	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-29//…	5	77	32	9498	2240	11738	66.2	71.9
131	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	4	78	34	9491	2179	11670	65.1	72.1
132	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	4	77	33	9540	2071	11612	64.9	71.2
139	NWBT/KATY//9902207x2/3/WELLS/CFX-18	5	76	36	9421	2117	11538	65.6	72.2
138	NWBT/KATY//9902207x2/3/CFX-24	4	77	33	8947	2291	11238	67.7	72.1
130	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	5	78	32	8649	2505	11154	67.1	72.4
143	9502008-A/DREW//WELLS/CFX-18	5	76	37	9180	1903	11084	66.8	72.4
147	9502008-A/DREW/5/AR 1179/3/CPRS//…/4/CFX-18	6	75	33	8836	2133	10969	63.7	71.5
129	9502008/3/MBLE//LMNT/20001-5/4/CFX-18//…	5	77	33	9035	1868	10904	66.5	71.9
150	XC 065	6	78	36	8612	2270	10882	69.3	71.4
142	9502008-A/DREW//CFX-24	4	77	35	9017	1858	10875	65.6	71.9
141	9502008-A/DREW//CFX-24	5	78	33	8036	2380	10416	69.2	72.3
149	9502008-A/DREW/5/AR 1179/3/CPRS//…/4/CFX-18	6	77	32	7731	2591	10321	66.4	72.2
CV		16.3	0.9	3.8	5.5			2.1	1.2
LSD		1.5	1.4	2.7	1061			2.9	1.8

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 7. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 7, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
155	9502008-A//AR 1188/CCDR/3/CFX-18//CCDR/…	5	77	34	9490	2529	12019	66.4	71.9
162	9502008//KATY/902207x2/3/WELLS/CFX-18	5	77	34	9757	2099	11856	65.4	71.6
164	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	4	78	36	9772	2006	11778	69.6	72.5
153	9502008-A//AR 1188/CCDR/3/DREW/JEFF/CFX-18	4	75	33	10201	1424	11625	66.9	72.0
154	9502008-A//AR 1188/CCDR/3/DREW/JEFF/CFX-18	5	77	34	9482	2132	11614	65.8	71.1
152	9502008-A//AR 1188/CCDR/3/DREW/JEFF/CFX-18	5	77	37	9648	1903	11551	64.5	71.2
156	9502008//KATY/902207x2/3/CL131	4	78	32	9835	1651	11485	67.0	71.6
169	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	4	77	33	9243	1989	11232	65.2	72.5
175	CL131	5	76	33	9287	1929	11217	63.9	71.2
167	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	5	78	36	9029	2152	11181	68.1	72.4
161	9502008//KATY/902207x2/3/WELLS/CFX-18	4	77	37	9241	1914	11155	63.7	71.4
158	9502008//KATY/902207x2/3/CL131	5	78	35	9481	1670	11151	66.6	71.6
157	9502008//KATY/902207x2/3/CL131	5	78	32	9248	1808	11056	67.6	72.0
163	9502008//KATY/902207x2/3/WELLS/CFX-18	5	78	33	8896	2082	10978	67.3	71.6
151	9502008-A//AR 1188/CCDR/3/DREW/JEFF/CFX-18	5	76	38	9534	1314	10848	65.3	71.5
171	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	5	78	32	8754	1927	10681	63.4	70.6
173	9502008-A/DREW//CFX-24	6	78	34	7922	2756	10679	66.9	71.2
160	9502008//KATY/902207x2/3/WELLS/CFX-18	5	77	35	8879	1674	10553	68.4	72.2
172	9502008-A/DREW//CFX-24	6	77	32	8026	2477	10503	64.0	71.1
170	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	5	74	35	8858	1636	10494	64.1	70.0
165	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	5	76	35	8028	2245	10273	64.5	71.3
174	9502008-A/DREW//CFX-24	5	75	33	8256	2013	10269	64.9	71.1
159	9502008//KATY/902207x2/3/CL131	5	77	31	8445	1792	10236	64.0	71.8
166	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	4	76	35	8092	2122	10214	67.1	72.0
168	9502008//KATY/902207x2/3/DREW/JEFF//CFX-18	5	76	35	8526	1382	9908	68.0	72.2
CV		10.2	0.7	4.0	5.5			2.2	0.8
LSD		1.0	1.1	2.8	1016			3.0	1.2

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 8. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 8, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
197	9502008-A//AR 1188/CCDR/3/WELLS/CFX-18	6	76	31	7748	1881	9628	64.6	71.3
178	9502008-A/DREW//CL131	6	77	32	8509	1523	10032	67.1	72.2
177	9502008-A/DREW//CL131	6	80	33	8079	2134	10213	66.7	71.6
180	9502008-A/DREW//CL131	5	76	31	7992	2387	10379	65.2	72.2
176	9502008-A/DREW//CFX-24	5	80	34	8199	2183	10382	67.6	71.5
184	9502008-A//AR 1142/MBLE/3/WELLS/CFX-18	5	76	34	8786	1653	10439	62.4	70.4
179	9502008-A/DREW//CL131	5	76	31	8369	2097	10467	66.0	72.3
188	TACAURI//KBNT/LCSN/3/WELLS/CFX-18	4	76	33	8782	1791	10574	62.6	70.9
198	9502008-A//AR 1188/CCDR/3/WELLS/CFX-18	5	77	33	8383	2276	10659	67.7	72.1
196	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CFX-18//…	4	78	32	8552	2133	10685	65.9	71.5
182	9502008-A//AR 1142/MBLE/3/WELLS/CFX-18	4	77	35	9212	1511	10723	62.7	71.3
195	CCDR/4/CPRS/3/MBLE//LMNT/…/5/CFX-18//…	6	78	32	8791	2099	10890	66.9	71.9
181	9502008-A/DREW//CL131	4	77	33	8891	2254	11145	67.1	72.2
186	9502008-A//AR 1142/MBLE/5/AR 1179/3/CPRS//…	5	77	32	8948	2202	11150	64.8	71.8
183	9502008-A//AR 1142/MBLE/3/WELLS/CFX-18	4	75	33	9325	1839	11165	63.8	71.0
193	CCDR/4/CPRS/3/MBLE//LMNT/…/5/WELLS/CFX-18	5	77	33	9258	2006	11263	65.5	71.6
199	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	5	77	33	9051	2228	11279	65.0	71.8
187	9502008-A//AR 1142/MBLE/5/AR 1179/3/CPRS//…	5	77	30	9204	2216	11420	63.8	71.3
191	CCDR//LGRU/LCSN/5/AR 1179/3/CPRS//…/4/CFX-18	5	80	33	9084	2430	11514	63.6	72.2
200	CL151	5	77	36	9694	1857	11551	64.6	71.7
190	CCDR/9770532DH2/3/CFX-18//CCDR/9770532 DH2	5	76	33	9199	2536	11735	64.8	71.8
185	9502008-A//AR 1142/MBLE/5/AR 1179/3/CPRS//…	5	77	32	9725	2147	11872	62.1	71.3
189	CCDR/9770532DH2/5/AR 1179/3/CPRS//…/4/CFX-18	4	77	32	10169	2033	12202	65.2	72.3
194	CCDR/4/CPRS/3/MBLE//LMNT/…/5/WELLS/CFX-18	5	77	35	9468	2854	12322	67.6	72.4
192	CCDR//LGRU/LCSN/5/AR 1179/3/CPRS//…/4/CFX-18	5	76	31	10163	2272	12434	64.1	72.3
CV		13.0	1.2	4.5	6.1			2.4	0.6
LSD		1.3	2.0	3.0	1128			3.2	0.8

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 9. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 9, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
211	CFX-18//CCDR/9770532 DH2/3/CFX-26	4	76	34	9065	3163	12229	68.6	72.1
206	CFX-18//CCDR/9770532 DH2/3/CL131	4	78	33	9842	2264	12106	65.6	71.4
212	CFX-18//CCDR/9770532 DH2/3/WELLS/CFX-18	5	77	37	9616	2477	12094	66.0	71.9
202	CFX-18//CCDR/9770532 DH2/3/CFX-29//AR 1142/…	4	80	38	9622	2462	12085	68.9	72.3
222	CFX-29//AR 1142/LA 2031/3/CFX-18//CCDR/…	4	78	34	9093	2946	12039	68.3	72.3
207	CFX-18//CCDR/9770532 DH2/3/CL131	4	76	34	9714	2292	12005	66.5	71.1
220	CFX-29//AR 1142/LA 2031/3/CL131	5	77	34	9758	2180	11938	66.7	72.2
225	CL161	5	80	37	9535	2084	11619	68.3	72.1
204	CFX-18//CCDR/9770532 DH2/3/CFX-18//CCDR/…	4	81	36	9412	2207	11619	66.9	72.4
201	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	5	79	37	9623	1968	11591	66.8	72.0
218	CFX-29//AR 1142/LA 2031/3/DREW/CFX-18	5	81	33	9260	2320	11580	68.6	72.1
209	CFX-18//CCDR/9770532 DH2/3/CFX-26	5	77	32	9226	2319	11545	67.8	72.1
217	CFX-29//AR 1142/LA 2031/3/DREW/CFX-18	5	80	35	9196	2267	11462	67.9	72.1
221	CFX-29//AR 1142/LA 2031/3/CL131	5	80	34	9061	2323	11384	68.4	72.3
203	CFX-18//CCDR/9770532 DH2/3/CFX-26/9702128	4	79	35	9227	2154	11381	68.1	72.2
213	DREW/JEFF//CFX-18/3/TRNS	6	77	31	9278	2072	11350	66.9	71.4
205	CFX-18//CCDR/9770532 DH2/3/CL131	5	80	33	8921	2385	11306	66.4	71.5
216	CFX-29//AR 1142/LA 2031/3/DREW/CFX-18	5	81	34	8098	3169	11268	68.9	72.4
208	CFX-18//CCDR/9770532 DH2/3/9502008//KATY/…	6	80	36	8704	2479	11183	67.9	72.0
224	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	5	77	33	8688	2425	11113	68.2	72.3
219	CFX-29//AR 1142/LA 2031/3/CL131	6	77	29	8821	2273	11094	63.5	71.6
215	DREW/JEFF//CFX-18/3/WELLS/CFX-18	5	80	32	8713	2257	10970	68.2	71.8
210	CFX-18//CCDR/9770532 DH2/3/CFX-26	4	77	31	8120	2820	10940	67.3	71.5
223	CFX-29//AR 1142/LA 2031/3/CFX-18//CCDR/…	4	77	33	8999	1918	10917	66.5	72.1
214	DREW/JEFF//CFX-18/3/WELLS/CFX-18	5	81	34	8495	2403	10898	68.3	72.0
CV		12.1	1.8	5.0	5.0			2.0	0.4
LSD		1.1	3.0	3.4	928			2.1	0.7

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 10. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 10, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
246	TRNS/CL131	5	77	34	10341	2392	12733	62.8	70.5
243	CFX-18//CCDR/9770532 DH2/4/9502008/3/..	4	78	36	9908	2202	12110	66.6	71.9
236	DREW/JEFF//CFX-18/3/TRNS	5	77	33	9640	2213	11853	63.9	72.4
226	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	4	77	37	9636	2122	11758	66.4	72.1
240	CFX-18//CCDR/9770532 DH2/3/CFX-18//CCDR/…	4	77	34	9319	2374	11693	66.0	71.7
227	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	4	79	35	9383	2142	11525	67.6	72.1
233	CFX-29//AR 1142/LA 2031/5/AR 1179/3/CPRS//…	5	78	31	9328	2182	11510	66.1	72.2
248	CL131/TRNS	4	78	31	8352	3123	11475	67.0	72.5
250	CL171	4	78	36	9201	2188	11389	67.6	72.5
229	CFX-29//AR 1142/LA 2031/3/CFX-26	4	81	34	8856	2453	11309	68.1	72.4
249	CHENIERE//CFX-26/9702028	5	76	33	9576	1707	11284	65.1	72.0
245	DREW/JEFF//CFX-18/3/CFX-18/CCDR/…	4	78	32	8607	2630	11238	67.4	72.0
242	CFX-18//CCDR/9770532 DH2/4/9502008/3/..	4	77	37	8921	2114	11035	67.6	71.8
244	DREW/JEFF//CFX-18/3/CFX-18/CCDR/…	4	78	30	8479	2513	10992	66.8	72.1
230	CFX-29//AR 1142/LA 2031/3/CFX-26	4	80	35	8777	2202	10979	68.8	72.1
235	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	5	78	32	8404	2566	10970	67.1	72.5
228	CFX-29//AR 1142/LA 2031/3/CFX-26	4	82	37	8810	2047	10857	66.9	71.9
241	CFX-18//CCDR/9770532 DH2/3/DREW/JEFF//...	3	79	31	8591	2259	10850	66.2	71.0
231	CFX-29//AR 1142/LA 2031/3/CFX-269702128	4	82	37	8217	2528	10745	68.5	72.4
234	CFX-29//AR 1142/LA 2031/3/WELLS/CFX-18	5	79	33	7751	2981	10732	67.0	72.5
247	CL131//CCDR/9502008-A	5	79	31	8600	2077	10677	65.2	71.9
237	WELLS/CFX-18//WELLS/CFX-18	5	82	35	8392	2147	10539	67.4	71.9
232	CFX-29//AR 1142/LA 2031/3/CFX-269702128	5	81	37	7980	2482	10462	66.7	72.0
239	CFX-18//CCDR/9770532 DH2/3/CFX-18//CCDR/…	5	81	30	7906	2450	10356	66.2	72.5
238	WELLS/CFX-18//WELLS/CFX-18	5	80	34	7813	2302	10115	67.4	72.0
CV		13.9	1.2	4.5	4.4			2.1	0.6
LSD		1.2	2.0	3.1	793			2.9	0.9

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 11. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 11, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
275	XC 011	3	74	34	10149	2248	12396	63.3	70.3
267	CFX-26/9702128/3/CFX-29//AR 1142/LA 2031	5	76	34	10030	2350	12381	61.3	69.1
264	CLPY 003 (CL006)//CFX-26/9702128	4	77	31	9414	2896	12310	62.3	70.0
261	9502008-A//AR 1188/CCDR/3/CFX-29/CCDR	4	77	34	9828	2391	12218	63.7	71.0
270	CFX-18//CCDR/9770532 DH2/3/9502008-A//…	4	75	33	9655	2537	12192	62.6	69.9
266	CFX-26/9702128/3/9502008-A//AR 1188/CCDR	5	77	34	9820	2355	12175	62.7	70.5
258	CCDR/LGRU//CFX-29/CCDR	5	77	32	9748	2070	11819	60.6	70.5
262	9502008-A//AR 1188/CCDR/3/WELLS/CFX-18	4	75	33	9916	1790	11706	61.3	70.0
265	CFX-26/9702128//DREW/CFX-18	5	76	32	9628	2061	11689	62.4	69.3
263	CLPY 003 (CL006)//CFX-26/9702128	5	75	30	9644	1959	11602	62.1	69.4
271	CFX-18//CCDR/9770532 DH2/3/CFX-29//…	4	77	33	9662	1864	11526	63.2	69.9
260	KATY/CPRS//JKSN/3/AR 1188/CCDR/4/CFX-18//..	4	75	32	9391	1972	11363	62.3	69.9
255	CCDR/9502008-A/3/CFX-18//CCDR/9770532 DH2	4	76	34	9472	1874	11346	63.5	70.3
253	CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2	4	77	33	9485	1817	11302	63.6	70.3
252	CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2	4	77	36	9424	1741	11165	64.5	70.5
256	CCDR/9502008-A//CFX-29/CCDR	5	78	35	9426	1719	11146	63.0	70.2
273	CFX-29/CCDR//WELLS/CFX-18	4	78	34	9344	1794	11138	63.8	70.4
268	WELLS/CFX-18//CCDR/9502008-A	4	78	31	9350	1525	10875	61.2	70.2
257	CCDR/LGRU/3/CFX-18//CCDR/9770532 DH2	4	76	35	9223	1616	10839	62.4	69.0
274	WELLS/CFX-18//CCDR/JEFF	5	73	31	8252	2475	10727	61.5	69.9
254	CCDR/9502008-A/3/CFX-18//CPRS/KBNT	6	79	34	8249	2287	10536	63.0	69.4
259	CPRS/KBNT//9502008-A/3/CFX-29/CCDR	5	76	34	8556	1972	10528	60.7	70.3
269	9502008/3/CPRS//82CAY21/…/4/CFX-18/…	5	77	33	8669	1691	10360	65.9	71.0
251	CHENIERE//WELLS/CFX-18	5	79	34	8571	1688	10259	66.5	71.7
272	DREW/CFX-18//CFX-29/CCDR	5	77	34	8602	1562	10163	63.5	69.7
CV		17.2	1.1	4.0	4.5			2.1	0.9
LSD		1.5	1.7	2.7	857			2.7	1.4

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 12. Grain and milling yields and agronomic performance of entries in the 2009 Preliminary Yield Trial, CLPY Group 12, Crowley, LA.

ENT	PEDIGREE	VIG[1]	HDT	HTE	YIELD	RATOON	TOTAL YIELD	WHOLE	TOTAL
294	CFX-18//CCDR/9770532 DH2/3/CFX-29//AR 1142/LA 2031	5	76	32	10245	1869	12114	67.6	72.5
300	CL151	4	79	36	10466	1612	12079	64.4	71.3
293	9502008/3/CPRS//82CAY21/…/4/CFX-18/5/WELLS/CFX-18	4	75	31	9846	1897	11743	62.2	71.0
298	9502008/AR1121//CFX 29//…	3	75	33	9440	2175	11615	63.4	70.6
287	9502008-A/DREW//IMI 261-177	5	77	35	9838	1775	11613	64.5	71.3
284	CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2	5	77	34	9559	2007	11566	65.5	71.3
278	CFX-24/98IM2251//CFX-26/9702128	5	78	34	9483	1998	11481	61.4	69.0
289	9502008-A//AR 1188/CCDR/3/CFX-29/CCDR	6	77	33	9120	2305	11424	61.7	72.3
297	9502008/AR1121//CFX 29//…	5	75	32	9047	2292	11339	63.2	71.0
292	WELLS/CFX-18//CCDR/9502008-A	4	76	32	9632	1691	11324	60.9	71.1
288	9502008-A//AR 1188/CCDR/3/WELLS/CFX-18	4	75	32	9364	1879	11243	62.2	69.4
290	IMI 261-177//WELLS/CFX-18	4	77	35	9312	1868	11180	65.3	71.1
285	CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2	4	76	32	9270	1797	11067	63.7	70.5
283	CHENIERE//WELLS/CFX-18	6	78	35	9610	1410	11020	63.4	71.1
277	WELLS/CFX-18//CCDR/JEFF	5	79	38	9495	1449	10945	67.6	72.1
276	WELLS/CFX-18//CCDR/JEFF	5	73	31	9144	1791	10935	64.0	70.2
286	CCDR/9502008-A/3/CFX-18//CPRS/KBNT	5	76	31	9267	1648	10915	65.7	71.0
291	CFX-26/9702128//DREW/CFX-18	5	78	34	9148	1637	10785	67.2	72.3
280	CFX-18//CCDR/9770532 DH2/3/CCDR/JEFF	4	76	33	9336	1319	10655	63.7	70.6
295	9502008/3/MBLE//LMNT/20001-5/…	5	77	34	9273	1342	10615	64.8	70.8
282	CFX-18//CPRS/KBNT/3/CFX-29//AR 1142/LA 2031	5	78	31	9406	1161	10567	65.2	70.9
299	9502008-A/DREW//CFX 29/CCDR	5	76	35	9188	1345	10532	65.8	71.5
296	9502008/AR1121//CFX 29//…	5	74	30	8217	2278	10494	65.0	70.5
279	CFX-18//CCDR/9770532 DH2/3/WELLS	4	80	35	8562	1904	10466	66.8	71.5
281	CFX-18//CCDR/9770532 DH2/3/DREW/CFX-18	5	80	32	8430	1735	10164	64.7	71.4
CV		12.1	1.6	4.3	4.9			2.2	0.8
LSD		1.1	2.5	3.0	925			3.0	1.2

[1] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

MEDIUM-GRAIN RICE BREEDING

S.B. Blanche, S.D. Linscombe, X.Y. Sha, R.R. Dilly, Jr., K.F. Bearb,
B.T. Theunissen, S.J. Theunissen, H.L. Hoffpauir, and B.J. Henry

The objectives of the medium-grain rice breeding project are to develop improved medium-grain rice varieties using traditional and modern breeding techniques. Key goals of the program are to increase yield potential, disease resistance, and milling quality and to select large, bold grain types with good cooking characteristics. Other traits of interest include short plant stature, lodging resistance, earliness, and stable grain and milling yields.

The medium-grain breeding project made 65 unique cross combinations to accomplish the goals of the program. Other activities in 2009 included 60 transplanted F_1 populations and 60 space-planted F_2 populations. The 2009 medium-grain rice breeding nursery included over 12,000 progeny rows from F_3 (early) to F_8 (advanced) generations.

Eight advanced medium-grain experimental lines (entries 062, 065, 068, 071, 162, 165, 168, and 171) were tested in the 2009 Uniform Regional Rice Nursery (URN). The yield, milling, and agronomic performance of these lines are presented in the URN tables (Groups 4 and 7). Five of these lines were tested in the Commercial-Advanced Yield Trial (CA) at six locations throughout the Louisiana rice-growing regions, and these data are presented in the CA tables.

There were 125 advanced medium-grain lines tested in the preliminary yield testing program in 2009. The preliminary yield trials consist primarily of outstanding breeding nursery material that is ready for testing in replicated (PY) or non-replicated (SP) 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, grain yield, and whole and total milling percentages.

Standard agronomic practices were used for the preliminary yield tests except that no fungicide was applied. Tests were conducted at the Rice Research Station at Crowley, LA, and plot size was 4.66 x 16 ft. Plots were seeded at a rate of 100 lb/A. This test was drill seeded on March 9 and harvested on August 3. Milling samples were taken from each plot at harvest maturity (18 to 20% moisture). Tables 1 to 3 presented in this section report only on the medium-grain entries in the replicated and single-plot preliminary yield test.

Table 1. Grain and milling yields, agronomic performance, and disease ratings of entries in the 2009 Preliminary Yield Trial, Group 1, Crowley, LA.

Entry	Pedigree	Vigor[†]	Days to 50% Heading	Plant Height (inches)	Grain Yield (lb/A @ 12%)	Milling Yield (%) Whole	Milling Yield (%) Total
747	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/…	1.0	88	32	9762	67.9	71.2
730	LFTE/BNGL	2.5	90	34	9002	68.9	73.3
746	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/…	1.5	87	33	9000	66.1	70.2
728	BNGL/SHORT RICO/4/9502065/3/…	2.0	89	34	8533	68.9	72.8
732	MARS//M201/MARS/5/STRN//MERC/…	2.0	90	34	8107	71.4	73.7
738	ORIN/3/MERC/CAM9/MARS/4/BNGL	3.5	93	35	8042	69.6	72.8
742	BNGL//MERC/RICO/3/EARL	2.0	93	35	8027	72.3	74.1
750	JPTR	2.0	92	35	7924	67.7	70.7
733	BNGL//MERC/RICO/3/EARL	2.5	93	34	7841	70.9	75.4
739	ORIN/3/MERC/CAM9/MARS/4/BNGL	3.0	93	34	7812	66.8	72.0
737	ORIN//MERC/RICO//…/3/BNGL/RICO	2.5	91	34	7725	69.0	71.9
735	MDRK/EARL	2.5	94	33	7482	69.3	73.1
729	MARS/4/9502065/3/MERC//MERC	2.5	92	33	7459	70.4	73.6
748	RICO/5/LFTE/4/KATY/CPRS/3/LMNT	2.5	87	33	7447	70.1	72.8
740	BNGL/RICO//EARL	3.0	91	33	7186	70.0	74.3
745	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/MARS	3.0	94	33	7135	68.6	73.6
731	BNGL//MERC/RICO/3/EARL	3.0	93	33	7129	71.4	74.0
741	ORIN/BNGL//EARL	1.5	92	33	6910	69.8	73.4
736	ORIN/3/MERC/CAM9/MARS/4/BNGL	3.5	91	33	6906	69.9	74.9
726	BNGL/SHORT RICO//LFTE	3.0	90	34	6778	67.4	72.5
727	BNGL/SHORT RICO//MERC	3.5	90	36	6535	70.2	73.6
749	MEDARK/LFTE	3.0	86	33	6319	62.1	67.6
743	BNGL/RICO	3.0	88	31	6113	69.9	73.2
744	BNGL//MERC/RICO/3/STRN	2.5	92	31	6054	71.4	73.5
734	BNGL/3/BNGL//MERC/RICO	3.5	93	33	5989	69.1	73.9
c.v. %		31.2	1.2	2.1	9.9	1.8	0.9
$LSD_{0.05}$		1.6	2.2	3.7	1539	2.6	1.3

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 2. Grain and milling yields, agronomic performance, and disease ratings[†] of entries in the 2009 Preliminary Yield Trial, Group 2, Crowley, LA.

Entry	Pedigree	Vigor[†]	Days to 50% Heading	Plant Height (inches)	Grain Yield (lb/A @ 12%)	Milling Yield (%)	
						Whole	Total
761	BNGL/9502065//EARL	2.5	90	36	9353	71.8	74.6
751	LFTE/4/KATY/CPRS/3/CPRS/LMNT/6/…	2	90	36	8661	69.4	72.75
760	ORIN/3/MERC/CAM9/MARS/4/BNGL	2.5	88	33	8408	68.4	73.75
758	ORIN/3/MERC/CAM9/MARS/4/BNGL	1.5	91	32	8246	72.4	74.65
752	BNGL//MERC/RICO/3/EARL	1.5	93	34	8009	68.2	73.15
765	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	91	32	7373	70.7	73.85
757	BNGL/4/9502065/3/MERC//MERC	3.5	93	35	7143	68.3	73.9
771	BNGL/4/ORIN//MERC/RICO/3/9502065	2	94	32	7139	68.2	73.2
756	BNGL/KOKOHUROSE	2	95	37	7099	68.8	73.65
767	MERC/RICO//MERC/3/MERC/LMNT//…/4/BNGL//TDCN/LMNT	3.5	92	33	7095	71.6	74.2
755	EARL/4/ORIN//MERC/RICO/3/9502065	2.5	92	34	7026	72.1	74.2
754	ORIN//MERC/RICO/3/MARS//M201/…	2	91	30	7016	65.8	71.2
766	MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202	3	93	29	6999	65.5	74.7
753	ORIN//MERC/RICO/3/MARS//M201/…	2	91	30	6963	71.3	74.3
764	MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202	2	93	30	6905	69.7	74.65
759	BNGL//MERC/RICO/4/EARL/3/CPRS/…	2.5	94	31	6856	71.4	74.55
763	MERC/RICO//MERC/3/MERC/LMNT//…/4/BNGL//TDCN/LMNT	3	90	33	6509	71.7	75.4
774	ORIN/3/MERC/CAM9/MARS/4/BNGL	2.5	94	32	6022	71.5	75.3
769	EARL/4/9502065/3/MERC/RICO//BNGL	3	94	32	5882	70.8	74.8
772	MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202	3.5	93	32	5877	68.6	74.55
775	NPTN	3	95	31	5649	68.4	73.8
762	MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202	2	92	34	5500	70.5	72.8
773	9865216DH2//BNGL/SHORT RICO	3.5	92	32	5363	63.2	68.75
770	MARS/4/ORIN//MERC/RICO/3/MARS//…	4	92	31	4402	69	72.6
768	BNGL/MARS	4.5	96	31	4215	70.7	73.35
c.v. %		26.4	0.9	1.5	8.6	1.9	0.9
$LSD_{0.05}$		1.5	1.8	2.6	1205	2.7	1.4

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

Table 3. Grain and milling yields, agronomic performance, and disease ratings† of entries in the 2009 Single-Plot Medium Grain Yield Trial, Crowley, LA.

Entry	Pedigree	Vigor†	Days to 50% Heading	Plant Height (inches)	Grain Yield (lb/A @ 12%)	Milling Yield (%) Whole	Milling Yield (%) Total
SP325	JPTR	1	93	91	9593	66.8	70.9
SP320	BNGL//MERC/RICO/3/EARL	1	91	90	9225	66.1	70.2
SP327	9502065/AB 869/6/MARS//M201/MARS/5/…	1	89	84	9011	70.7	74.5
SP334	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	93	90	8847	69.5	73.0
SP349	EARL/RICO	2	88	95	8824	66.4	70.5
SP346	BNGL/SHORT RICO/4/9502065/3/…	3	92	87	8659	69.9	72.7
SP347	BNGL/SHORT RICO/4/9502065/3/…	3	94	84	8646	70.0	72.6
SP348	BNGL/SHORT RICO//LFTE	2	90	95	8550	67.9	73.4
SP355	RICO/BNGL	3	94	88	8436	65.5	71.7
SP361	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/…	1	85	85	8388	70.2	73.2
SP335	ORIN/3/MERC/CAM9/MARS/4/BNGL	2	92	91	8363	70.4	73.3
SP362	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/…	1	87	88	8214	69.6	73.4
SP313	9902028/3/BNGL//MERC/RICO	2	89	86	8144	69.6	72.8
SP310	9502065/3/BNGL//MERC/RICO/5/LFTE/4/…	3	90	86	8067	67.7	70.0
SP352	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/MARS	2	88	89	8063	66.7	73.1
SP317	BNGL//MERC/RICO/3/EARL	1	93	75	7965	65.8	72.8
SP369	MEDARK/4/9502065/3/BNGL//MERC/RICO	2	87	98	7957	68.9	71.9
SP336	ORIN/3/MERC/CAM9/MARS/4/BNGL	2	93	81	7883	66.9	71.9
SP330	ORIN/3/MERC/CAM9/MARS/4/BNGL	2	91	86	7878	68.8	72.6
SP332	ORIN//MERC/RICO//…/3/BNGL/RICO	3	90	85	7775	67.2	70.9
SP307	9902028/3/BNGL//MERC/RICO	2	88	78	7773	67.3	70.4
SP315	BNGL//MERC/RICO/3/EARL	3	92	89	7721	67.4	71.1
SP374	EARL/4/BNGL/3S/SMARS/MARS//MARS	3	92	78	7635	68.0	73.3
SP340	9502065/3/BNGL//MERC/RICO/5/LFTE/4/…	1	92	95	7629	69.3	73.7
SP343	MDRK/EARL	2	95	95	7617	69.4	73.7
SP359	BNGL/SHORT RICO//MERC	3	94	85	7568	62.8	70.9
SP319	BNGL//MERC/RICO/3/EARL	3	92	85	7536	70.9	72.9
SP301	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	92	91	7480	64.0	74.7
SP337	ORIN/3/MERC/CAM9/MARS/4/BNGL	4	95	88	7470	64.2	73.6
SP344	BNGL/FRAN	3	91	87	7409	70.2	73.3
SP360	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/…	3	87	93	7369	68.1	72.7
SP350	NPTN	2	91	84	7367	67.1	72.8
SP333	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	89	83	7362	68.8	72.3
SP339	9865216DH2/4/ORIN//…	3	87	88	7320	66.3	70.8
SP353	LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/MARS	2	88	82	7291	66.7	71.9
SP326	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	92	84	7258	69.7	73.7
SP331	BNGL/3/ORIN//MERC/RICO//…	3	91	83	7256	67.4	72.1
SP323	ORIN/3/MERC/CAM9/MARS/4/BNGL	2	94	84	7230	67.2	70.6

Continued.

Table 3. Continued.

Entry	Pedigree	Vigor†	Days to 50% Heading	Plant Height (inches)	Grain Yield (lb/A @ 12%)	Milling Yield (%) Whole	Milling Yield (%) Total
SP338	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	92	74	7204	67.9	73.6
SP358	BNGL//MERC/RICO/4/EARL/3/CPRS/…	3	88	88	7197	70.8	74.8
SP314	BNGL//MERC/RICO/3/EARL	3	91	85	7191	67.6	71.1
SP371	MEDARK//BNGL/FRAN	3	91	91	7182	68.8	71.6
SP303	9502065/3/BNGL//MERC/RICO/5/LFTE/4/…	3	94	81	7181	69.3	74.5
SP311	LFTE/4/KATY/CPRS/3/CPRS/LMNT/6/…	2	90	78	7154	65.6	68.8
SP312	MERC/RICO//MERC/3/MERC/LMNT//…/4/BNGL//TDCN/LMNT	3	92	86	7133	65.2	70.0
SP308	ORIN/3/MERC/CAM9/MARS/4/BNGL	1	90	80	7025	63.0	68.2
SP306	LFTE//GP-2/LFTE/3/EARL	3	89	85	6989	65.2	69.3
SP345	9865216DH2/4/9502065/3/BNGL//…	3	90	78	6975	66.9	70.6
SP318	EARL/GFMT	3	87	88	6897	70.3	72.7
SP357	9865216DH2//BNGL/SHORT RICO	3	88	79	6848	68.0	71.4
SP342	MDRK/EARL	2	94	86	6838	67.1	72.8
SP324	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	91	81	6807	66.8	71.5
SP309	ORIN/3/MERC/CAM9/MARS/4/BNGL	1	91	82	6761	63.2	68.6
SP329	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	92	83	6749	67.4	72.0
SP304	BNGL/MEDARK	4	94	76	6705	69.5	74.1
SP328	BNGL/4/9502065/3/MERC//MERC	1	91	82	6689	69.3	72.1
SP316	BNGL//MERC/RICO/3/EARL	3	94	72	6576	65.0	72.1
SP365	ORIN/BNGL/EARL	2	93	91	6545	65.9	72.4
SP322	ORIN/3/MERC/CAM9/MARS/4/BNGL	3	95	83	6488	66.5	71.0
SP321	9502065/3/MERC//MERC/4/BNGL	4	89	87	6476	59.2	71.8
SP372	MEDARK//BNGL/FRAN	3	92	89	6465	70.1	72.9
SP351	EARL//BNGL/SHORT RICO	2	95	92	6440	69.8	72.5
SP375	BNGL	2	94	85	6439	71.2	74.5
SP370	MEDARK/4/9502065/3/BNGL//MERC/RICO	3	91	80	6291	69.2	72.2
SP364	MEDARK/LFTE	2	89	78	6249	68.6	72.0
SP366	BNGL/4/ORIN//MERC/RICO/3/9602134	3	91	82	6229	71.5	73.9
SP363	MEDARK/LFTE	2	89	72	5957	67.5	72.6
SP367	BNGL/4/9502065/3/BNGL//MERC/RICO	3	90	79	5912	67.7	72.4
SP302	LFTE/KOKOHUROSE	3	91	85	5804	73.0	75.7
SP368	BNGL/4/9502065/3/BNGL//MERC/RICO	4	94	87	5459	68.3	72.0
SP305	BNGL/SHORT RICO//BNGL	3	94	83	5386	59.9	66.2
SP356	9865216DH2//BNGL/SHORT RICO	3	89	75	5296	62.6	70.6
SP354	RICO/BNGL	3	95	71	5278	63.2	72.4
SP373	ORIN/MEDARK	4	94	82	5263	68.2	73.8
SP341	ORIN/BNGL//EARL	4	94	76	4120	65.9	71.6

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

DEVELOPMENT OF IMPROVED LONG-GRAIN AND SPECIAL PURPOSE RICE VARIETIES FOR LOUISIANA

X.Y. Sha, S.D. Linscombe, S.J. Theunissen, and B.J. Henry

This state project is aimed at developing superior conventional long-grain rice varieties with emphasis on yield potential, quality (milling, cooking, and processing), disease resistance, lodging resistance, seedling vigor, and early maturity. The other objective is to develop specialty rice varieties adapted to Louisiana and southern U.S. environmental conditions with superior cooking, agronomic, milling, and specific qualities, such as aroma and kernel elongation. Major emphasis is being placed on breeding for Jasmine-, Basmati-, and Della-type long-grain rice.

Field tests in 2009 included 265 transplanted F_1s (187 long-grain, 71 specialty, and 7 mapping crosses for Dr. Jong Ham of the Department of Plant Pathology and Crop Physiology, LSU), 253 space-planted F_2 populations (151 long-grain, 67 specialty, 17 BCF_2, and 18 marker-assisted selection F_2 populations that were grown from F_2 seeds pooled from 84 original F_1s according to their pedigrees), and 36,000 progeny rows (30,000 long-grain and 6,000 specialty) ranging from F_3 to F_8. Out of these rows, 865 rows were bulk-harvested for the further evaluation (795 long-grain and 70 specialty), and 3,024 rows were chosen for re-selection in 2010. A total of 241 new crosses were made in 2009, which included 190 long-grain and 51 specialty, and 5 additional Clearfield Jasmine rice backcrosses. Preliminary yield trials (120 replicated and 192 single-plot) included 312 breeding lines. Yield, milling, and agronomic performance of those lines are shown in Tables 1 to 7. Ten advanced long-grain (entries 022, 028, 031, 034, 125, 128, 131 134, 137, and 140,) and three specialty (entries 025, 146, and 149) were tested in the Uniform Regional Rice Nursery (URN). Most of these lines also were tested in statewide multi-location commercial advanced (CA) yield trials. Test results of these lines are presented in Table 8. The agronomic performance of these advanced lines compared with other conventional lines can be found in Tables 1 to 12 of the first section of this chapter. A separate advanced yield (AY) trial of 40 long-grain and 10 specialty experimental lines was carried out at the Rice Research Station, while the latter was tested at Jefferson Davis Parish also. Test results of the AY trial were listed in Tables 9 and 10. DNA marker-assisted selection was conducted on BC_1F_1 plants for aroma, amylose content, and gelatinization temperature in collaboration with Dr. Jim Oard of the School of Plant, Environmental and Soil Sciences of LSU.

The 2009 Puerto Rico winter nursery included 3,400 progeny rows of both long-grain and specialty types. Most of these were F_3s for generation advancement purposes.

A new early-maturing semidwarf Jasmine-type line (LA0802149) has shown good grain and milling yields and also possesses typical Jasmine specialty attributes and very strong aroma. A total of 500 panicle rows were grown at the Puerto Rico winter nursery for increase purposes. LA0802140, a Della-type aromatic long-grain line, has exhibited very good yield potential, milling and grain quality, as well as a strong aroma very similar to Della. The conventional long-grain line LA0802022 also has displayed the outstanding yields and good milling quality in 2009. These two promising lines will be increased by growing headrows for potential varietal releases.

Table 1. Agronomic and milling performance of 2009 Preliminary Yield Test (replicated), Group 9, long-grain entries. Rice Research Station, Crowley, LA.

					Yield (lb/A)			Milling (%)	
Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Main	2nd	Total	Head	Total
601	CCDR//CCDR/JEFF	3.5	83	85	7700	1032	8733	61.1	73.9
602	CCDR//CCDR/JEFF	3.5	85	86	7537	1260	8797	63.0	73.6
603	CPRS/3/CPRS/KBNT//9502008	3	81	84	6450	2364	8815	64.5	73.1
604	AC1081	4	86	87	9150	1980	11129	63.7	69.9
605	AC1415	3	84	85	9567	1483	11050	62.4	67.4
606	9502008//AR 1188/CCDR/3/0502165	3	82	85	7814	1360	9174	64.7	72.9
607	0402022/3/9502008//AR1142/MBLE	3	82	84	6935	1111	8046	58.8	72.6
608	NWBT/KATY//9902207x2/3/0302005	3	84	85	7906	2033	9939	60.1	69.8
609	AC1403	3	86	86	9506	2037	11543	65.1	69.9
610	0402022/3/9502008//AR1142/MBLE	4	83	85	6767	607	7374	57.8	71.4
611	0402022/3/9502008//AR1142/MBLE	3.5	83	85	7725	1580	9305	57.1	73.4
612	CCDR/JEFF/3/9502008//AR1142/MBLE	3	87	87	7702	1176	8878	62.8	74.0
613	CPRS//CCDR/JEFF	3.5	89	88	6637	1885	8523	62.3	73.2
614	AC1012/AC110	3	85	86	7007	1743	8750	67.1	72.9
615	CCDR//CCDR/JEFF	3.5	84	86	8238	1040	9278	62.0	71.4
616	CPRS//CCDR/JEFF	3	80	84	8367	1335	9702	61.8	69.1
617	AC920	3.5	82	85	6397	2273	8671	68.5	73.5
618	CPRS/3/9502008//AR1188/CCDR	3	84	86	8121	1592	9713	64.5	69.7
619	0402022/3/9502008//AR1188/CCDR	4	83	86	7228	1176	8404	62.7	72.3
620	CCDR/0502094	3	83	85	7282	1220	8503	64.8	73.7
621	9502008//AR 1188/CCDR/3/0402097	3	82	84	7224	985	8209	63.5	72.6
622	CCDR/9770532DH2	3.5	82	85	6799	1119	7918	64.5	72.9
623	CCDR//CCDR/JEFF	3.5	84	86	6720	1136	7856	59.7	73.3
624	AC1019	3.5	85	86	5824	2768	8592	64.7	73.9
625	Cocodrie	3.5	85	86	7031	1298	8329	64.5	74.2
c.v.%		13.3	1.3	2.7	7.8	10.8	6.7	3.2	1.0
$LSD_{0.05}$		0.9	2.2	4.5	1212	336	1240	4.2	1.4

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 2. Agronomic and milling performance of 2009 Preliminary Yield Test (replicated), Group 10, long-grain entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A) Main	Yield (lb/A) 2nd	Yield (lb/A) Total	Milling (%) Head	Milling (%) Total
626	CPRS//CCDR/JEFF	3	85	86	6920	1771	8691	67.7	73.7
627	0402022/3/CPRS/KBNT//9502008	3	85	86	7268	2043	9311	63.3	73.0
628	AC1081	3	82	85	9387	1928	11316	59.8	69.1
629	AC1073	3	84	86	9055	1197	10252	65.5	68.9
630	AC1075	3	86	86	9162	1891	11053	62.5	68.4
631	AC1072	4	87	87	8630	2079	10708	64.5	69.4
632	AC1406	4	87	88	8665	2160	10825	66.9	71.9
633	CCDR/4/9502008/3/MBLE//LMNT/LSBR-5	4	85	86	6807	1876	8683	65.7	74.0
634	CPRS//9502008/DREW	3.5	89	88	5868	2371	8239	63.9	73.9
635	TACAURI//KBNT/LCSN/3/0402097	4	85	86	6607	1089	7697	63.6	74.6
636	DREW/CCDR//CCDR	4	83	86	8129	2184	10314	62.9	69.3
637	0402042//9502008/DREW	4	85	87	7042	1815	8856	67.7	74.1
638	CCDR/JEFF//CCDR	4	84	86	6849	1293	8142	63.1	72.9
639	WELLS/0402128	4	82	85	6159	2129	8288	58.9	73.9
640	AC110/AC638	3	90	88	8688	2117	10805	66.1	71.1
641	CCDR/JEFF/3/9502008//AR1142/MBLE	4	86	87	5726	1740	7466	53.2	72.0
642	0502174/0402128	4	85	86	5930	979	6909	66.4	74.7
643	CCDR/AC1048	4	84	86	9589	2134	11722	62.5	68.6
644	9502008-A//AR 1188/CCDR/3/RU0602128	3.5	83	85	7416	1335	8751	60.1	72.7
645	CPRS/3/NWBT/KATY//9902207X2	3	83	85	6842	1509	8351	65.3	73.6
646	CPRS/3/NWBT/KATY//9902207X2	3	85	86	7049	1601	8650	64.9	74.1
647	CPRS//9502008/DREW	4	87	88	5992	2544	8536	67.4	73.7
648	0402022/3/CPRS/KBNT//9502008	4	81	85	6482	1233	7715	60.3	72.5
649	0402022/3/9502008//AR1188/CCDR	3.5	82	85	7198	1326	8525	66.4	72.7
650	Cheniere	3	87	87	7332	1902	9234	68.0	76.3
c.v.%		10.4	0.7	2.6	6.0	8.7	5.7	2.5	0.9
$LSD_{0.05}$		0.8	1.2	4.5	917	319	1073	3.2	1.3

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 3. Agronomic and milling performance of 2009 Preliminary Yield Test (replicated), Group 11, long-grain entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
651	0402022/3/9502008//AR1188/CCDR	3	87	87	7752	1592	9344	63.4	73.8
652	0402022/0502094	3	84	85	7617	938	8555	66.6	73.0
653	0402022/3/9502008//AR1142/MBLE	3	84	86	7940	1604	9544	59.6	69.9
654	0402022/3/9502008//AR1142/MBLE	3.5	81	84	7777	1389	9166	62.1	72.0
655	CCDR/JEFF/3/9502008//AR1142/MBLE	3.5	84	86	7057	1275	8331	61.5	74.2
656	CCDR/JEFF/3/9502008//AR1142/MBLE	3	82	85	6722	1023	7745	64.1	72.6
657	CCDR/JEFF/3/9502008//AR1142/MBLE	3	83	85	7991	1017	9008	63.4	73.9
658	NWBT/KATY//9902207x2/3/0302005	3	85	86	7011	2411	9421	57.9	73.3
659	9502008//AR 1188/CCDR/3/0302005	3.5	85	86	5622	2162	7785	58.2	73.4
660	9502008//AR 1188/CCDR/3/0302005	3	83	85	8007	2214	10221	61.3	70.1
661	9502008//AR 1188/CCDR/3/0302005	3.5	84	86	7192	1489	8681	61.8	72.4
662	9502008//AR 1188/CCDR/3/0302005	3	83	85	6429	1636	8066	63.4	73.5
663	9502008//AR 1188/CCDR/3/0502165	4	88	88	5217	1775	6992	65.3	74.1
664	9502008//KATY/902207x2/3/0402068	3	85	86	6740	1639	8379	68.8	74.1
665	9502008//KATY/902207x2/3/0402082	3	86	86	7235	1601	8836	64.6	74.4
666	9502008//KATY/902207x2/3/0402082	3	85	86	7030	1225	8255	66.2	73.9
667	9502008/DREW/3/0502103	3	82	84	6166	1227	7393	61.4	73.3
668	TACAURI//KBNT/LCSN/3/0402097	5	90	89	4398	1693	6090	57.5	72.9
669	DREW/CCDR//9302065	3.5	89	88	6378	1498	7876	66.4	74.3
670	DREW/CCDR//CCDR	3.5	86	87	6649	1602	8251	68.5	74.8
671	DREW/CCDR//CCDR	3.5	85	86	6047	1913	7960	69.9	75.1
672	DREW/CCDR//CCDR/JEFF	3.5	82	85	6031	1256	7286	62.9	73.7
673	DREW/CCDR//9502008/DREW	3	81	84	6943	1405	8348	65.2	73.0
674	9502008//AR 1188/CCDR/3/CCDR	3	86	87	7486	1244	8730	66.2	74.6
675	Trenasse	4.5	83	86	7862	1663	9526	64.2	71.7
c.v.%		12.7	1.1	3.3	11.3	9.2	9.9	3.9	0.6
$LSD_{0.05}$		0.9	1.8	5.8	1595	291	1719	5.1	0.9

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 4. Agronomic and milling performance of 2009 Preliminary Yield Test (replicated), Group 12, long-grain entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
676	9502008//AR 1188/CCDR/3/CCDR	3	85	86	7990	1176	9167	62.1	70.3
677	9502008//AR 1188/CCDR/3/CCDR	3	85	86	7956	1493	9449	62.4	68.6
678	9502008//AR 1188/CCDR/3/CCDR	3	83	85	8493	1301	9794	64.1	68.5
679	9502008//AR 1188/CCDR/3/0402097	4	86	87	6462	1315	7777	64.7	73.5
680	9502008//AR 1188/CCDR/3/0402097	3.5	86	87	6232	969	7201	61.7	74.3
681	CCDR/JEFF//MBLE	3.5	80	84	5155	959	6114	64.6	72.8
682	CCDR/JEFF//CCDR	3	83	85	7245	1356	8601	65.3	73.3
683	CCDR/JEFF//0402022	3	82	85	7236	1557	8793	63.8	73.1
684	CCDR/JEFF//0402022	3	85	86	7357	1436	8793	62.4	73.3
685	CCDR/JEFF//0402022	3	82	84	7070	1292	8361	62.8	73.5
686	CCDR/JEFF//0402022	3	82	85	7622	1600	9222	63.4	72.5
687	CCDR/JEFF//0402022	3	86	87	7009	1818	8826	63.5	74.3
688	WELLS/CCDR	4	80	84	6617	2017	8634	62.3	73.5
689	WELLS/CCDR	4	88	88	4520	2346	6866	53.6	73.1
690	AC110/AC919	3	87	87	6111	2070	8181	66.4	73.5
691	AC110/AC919	3.5	83	85	4982	1772	6754	65.9	72.9
692	9502008//KATY/902207x2/3/CCDR	4	84	86	6512	1075	7587	66.8	74.2
693	9502008//KATY/902207x2/3/0402068	3.5	83	85	6999	1324	8323	65.7	73.6
694	9502008//KATY/902207x2/3/0402082	3.5	84	86	7541	1737	9278	66.8	74.4
695	LGRU/CCDR	4	83	85	5863	2102	7966	62.4	73.7
696	LGRU/CCDR	4	86	87	7093	2222	9315	64.2	74.2
697	LGRU//CCDR/JEFF	4	85	86	5619	2326	7945	57.3	73.0
698	CCDR//CCDR/JEFF	3	86	86	7603	1733	9336	63.9	74.1
699	CCDR/AC627	3.5	85	86	9484	2240	11724	64.4	68.8
700	CL151	3.5	88	88	10297	2408	12705	64.3	74.2
c.v.%		11.1	1.2	4.2	9.1	11.9	8.4	4.3	0.9
$LSD_{0.05}$		0.8	2.1	7.3	1318	410	1508	5.6	1.4

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 5. Agronomic and milling performance of 2009 Preliminary Yield Test (replicated), Group 13, specialty entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
701	CPRS//L-205/DLLA	4	90	89	5561	2193	7754	65.5	72.8
702	AC1073	3	84	85	9699	565	10264	66.0	70.1
703	ALAN//JKSN/KDM 105	4	89	89	9278	1301	10579	65.0	73.0
704	CCDR/3/JSMN/DLLA//LEAH/DLLA	4	88	88	5486	909	6395	70.1	73.5
705	DLMT/CALMATI	4	83	85	7087	2244	9331	53.7	68.9
706	9502008/CPRS/3/JSMN/DLLA//LEAH/DLLA	4	89	89	5364	1907	7271	65.8	71.9
707	KATY/CPRS//NWBT/…/3/9502008/4/KBNT//KLMT/…	3	89	88	7367	2870	10237	67.6	74.2
708	JSMN/DLLA//96SP287/3/CPRS/DREW	3.5	90	89	5201	1825	7026	69.9	73.5
709	JSMN/DLLA//96SP287/3/CPRS//82CAY21/TBNT/3/…	3.5	90	89	4768	1100	5868	66.2	71.8
710	JSMN/DLLA//96SP287/4/KATY/CPRS//NWBT/…	3	80	84	4132	1865	5997	64.5	71.9
711	JSMN/DLLA//96SP287/4/DLLAx2/LMNT*2/3/DMSI/…	3	93	90	6296	2119	8415	66.3	73.0
712	DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//…	4	92	90	3566	795	4361	59.9	70.8
713	DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//…	3	90	89	5760	2142	7902	69.3	73.3
714	DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//…	4	92	90	3898	1882	5780	48.3	70.4
715	DLMT/5/DLMT 8462…/4/DMSI	4	83	86	7415	2044	9459	51.2	69.3
716	DLMT/5/DLMT 8462…/4/DMSI	3.5	83	85	7602	2858	10460	65.6	73.3
717	DLMT/5/DLMT 8462…/4/DMSI	3.5	83	85	6070	2623	8693	66.7	73.3
718	9502008-A/DREW/5/DLMT 8462…/3/DMSI	3.5	80	84	7713	2633	10346	64.6	74.8
719	96 INT/AR 1188/4/CPRS//L201/7402003/3/…	4	90	89	4635	1937	6572	64.3	71.5
720	CPRS//L201/7402003/3/BASMATI SUF AID PAK/4/…	4	85	87	4940	2339	7279	69.4	73.8
721	CPRS//L201/7402003/3/BASMATI SUF AID PAK/4/A-201	3	84	85	6135	2123	8258	57.1	66.7
722	CPRS/LGRU//97KDM X2-5/3/JSMN/DLLA/LLEAH/DLLA	4	83	86	4032	1809	5842	66.1	71.9
723	96 INT/AR 1188//DLRS	4	86	87	6137	3069	9206	64.1	73.7
724	A-301/KATY/3/JSMN/DLLA//LEAH/DLLA	3.5	90	89	5540	2887	8427	67.1	72.2
725	Catahoula	3.5	83	85	6936	2181	9117	60.8	74.3
c.v.%		10.5	1.0	2.9	9.7	10.3	7.9	2.5	0.5
$LSD_{0.05}$		0.8	1.8	5.0	1202	427	1309	3.3	0.8

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 6. Agronomic and milling performance of 2009 Preliminary Yield Test, single plot (SP), long-grain entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
09SP101	0402022/0502094	4	84	85	8308	1222	9529	65.9	72.7
09SP102	9502008//AR 1188/CCDR/3/CCDR	4	85	88	8209	1148	9358	62.9	74.5
09SP103	CPRS//CCDR/JEFF	4	84	85	8208	1644	9853	68.1	73.6
09SP104	0402022/0502094	4	82	85	8761	1230	9991	66.0	73.4
09SP105	DREW/CCDR//9502008/DREW	4	85	81	8364	2337	10701	69.1	75.4
09SP106	AC1290	4	83	79	8313	1735	10048	67.0	73.3
09SP107	0402022/3/9502008//AR1142/MBLE	4	81	78	8222	1459	9681	66.2	74.2
09SP108	0402022/0502094	4	81	81	8049	1299	9348	67.0	74.1
09SP109	CPRS//CCDR/JEFF	3	85	85	8197	1847	10044	65.1	74.5
09SP110	CPRS//9502008/DREW	4	85	84	7051	2066	9117	60.6	74.2
09SP111	CCDR/0502085	3	83	88	9125	1279	10403	65.8	71.2
09SP112	CCDR/0502085	4	84	84	8587	1232	9819	66.2	74.2
09SP113	0402022/3/9502008//AR1142/MBLE	4	82	83	8985	1505	10490	65.4	72.8
09SP114	DREW/CCDR//0302005	5	85	82	6273	2232	8505	63.6	74.4
09SP115	DREW/CCDR//CCDR	4	85	78	7086	2049	9134	64.5	74.9
09SP116	AC1281	4	82	85	8162	1834	9996	67.8	73.9
09SP117	AC1076	5	84	87	9505	1925	11429	66.0	71.0
09SP118	AC1073	4	78	75	8527	916	9443	68.7	74.2
09SP119	AC1365	5	84	85	9540	2141	11681	65.5	70.8
09SP120	AC1401	4	85	86	10115	1790	11905	64.6	69.8
09SP121	AC1075	5	86	92	9822	2319	12141	63.6	70.5
09SP122	AC1075	4	86	90	7983	2615	10598	65.8	72.6
09SP123	AC1399	4	89	85	9643	1866	11510	64.3	71.4
09SP124	AC1399	5	85	83	8964	2211	11175	69.5	74.3
09SP125	LA2031 (RU0802031)	4	84	82	7750	1879	9629	68.4	74.4
09SP126	AC1072	5	88	83	7750	3289	11039	65.4	72.5
09SP127	AC1400	4	87	88	7404	2142	9545	70.1	74.2
09SP128	AC1336	4	89	83	8871	2391	11262	68.8	74.8
09SP129	AC1336	4	88	80	9189	2535	11725	67.6	70.7
09SP130	AC1336	4	87	83	9083	2498	11581	67.3	70.2
09SP131	AC1398	4	89	86	10359	2703	13062	70.4	74.8
09SP132	AC 1401	4	82	85	9129	1782	10911	68.6	71.7
09SP133	CPRS/KBNT//9502008/3/9502008/DREW	4	83	82	6741	2126	8867	61.1	73.3

Continued.

Table 6. Continued.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
09SP134	CPRS//9502008/DREW	4	87	82	6553	1461	8015	60.7	74.3
09SP135	0402022/3/CPRS/KBNT//9502008	4	87	79	6472	1934	8407	68.6	74.3
09SP137	9502008//AR 1188/CCDR/3/0302005	4	87	83	6290	2357	8647	59.0	73.8
09SP138	0402022/3/9502008//AR1142/MBLE	3	85	85	7190	1733	8923	60.6	73.3
09SP139	CCDR/JEFF/3/9502008//AR1142/MBLE	4	83	85	7190	1361	8551	64.2	72.3
09SP140	CCDR/JEFF/3/9502008//AR1142/MBLE	4	84	85	8341	1319	9660	65.9	73.8
09SP141	NWBT/KATY//9902207x2/3/0302005	4	82	85	6410	2663	9073	63.9	73.6
09SP142	9502008/DREW/3/0402097	4	81	79	7067	2088	9156	63.6	73.9
09SP143	TACAURI//KBNT/LCSN/3/0402097	4	84	80	5888	1512	7400	63.7	74.2
09SP144	DREW/CCDR//9302065	4	89	80	6783	1487	8270	69.8	75.2
09SP145	DREW/CCDR//9302065	4	88	81	5627	1036	6663	67.8	75.1
09SP146	DREW/CCDR//CCDR	4	81	80	6812	1608	8420	69.6	74.8
09SP147	DREW/CCDR//CCDR	5	83	81	7359	1560	8919	68.3	74.2
09SP148	DREW/CCDR//0302005	4	85	83	5823	2547	8370	66.4	74.5
09SP149	0502171/9302065	5	86	78	6551	1423	7973	69.2	74.8
09SP150	LA2131 (RU0802131)	4	81	82	9182	1653	10835	70.7	75.3
09SP151	WELLS/CCDR	3	84	79	7457	2522	9979	63.6	73.7
09SP152	WELLS//CCDR/JEFF	4	87	80	5695	2087	7782	48.0	72.9
09SP153	WELLS//CCDR/JEFF	4	90	86	6000	2691	8690	58.1	73.7
09SP154	WELLS/0402128	4	80	87	7556	1030	8586	64.4	75.1
09SP155	AC1012/AC110	4	81	71	5480	1183	6663	68.9	73.7
09SP156	AC919/PRESIDO	4	85	83	5549	3244	8793	66.4	72.1
09SP157	AC110/AC638	4	82	82	7057	1983	9040	68.1	73.6
09SP158	CCDR//CCDR/JEFF	4	83	86	8712	1756	10469	67.7	74.0
09SP159	0402022/3/9502008//AR1142/MBLE	4	84	82	8222	2019	10240	64.3	74.9
09SP160	0402022/3/9502008//AR1142/MBLE	4	84	81	7526	1010	8536	62.7	71.7
09SP161	0402022/3/9502008//AR1142/MBLE	4	83	85	7731	706	8436	63.3	73.3
09SP162	CCDR/JEFF/3/9502008//AR1142/MBLE	4	83	89	7703	1719	9422	62.6	74.0
09SP163	CCDR/JEFF//0402128	4	82	86	6682	1139	7820	60.4	72.6
09SP164	CCDR/JEFF//0402128	4	84	84	7021	1419	8440	65.5	73.4
09SP165	9502008//AR 1188/CCDR/3/0502165	4	86	85	6015	1571	7586	68.3	73.8
09SP166	9502008//AR 1142/MBLE/3/0502091	4	84	79	6038	1490	7528	63.3	74.4
09SP167	CCDR//LGRU/LCSN	4	84	84	6587	1137	7724	67.8	74.7
09SP168	CCDR/AC1048	4	85	92	9158	2616	11774	68.3	71.8

Continued.

Table 6. Continued.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
09SP169	CCDR/AC1048	4	84	91	8848	2421	11269	65.9	73.5
09SP170	CCDR/JEFF//JAF4DH3	4	84	79	6674	2756	9430	69.2	73.8
09SP171	CCDR/JEFF//RU0601004	4	85	77	7403	1313	8716	64.5	74.0
09SP172	CCDR/LGRU//AC101/DREW	4	84	88	7220	1581	8801	67.6	73.9
09SP174	FRANCIS/9302065	4	86	78	6107	1821	7928	67.6	74.6
09SP175	LA2134 (RU0802134)	4	85	85	7969	2054	10023	66.5	74.8
09SP176	AC1012/AC110	4	84	81	6358	2575	8933	70.3	74.4
09SP177	CCDR/4/9502008/3/MBLE//LMNT/LSBR-5	4	85	82	7129	1973	9102	67.6	74.9
09SP178	CPRS/4/TACAURI/3/CPRS//L202/TBNT	4	84	86	8035	1384	9419	63.9	73.5
09SP179	CPRS//CCDR/JEFF	4	84	83	5404	2057	7461	65.9	73.1
09SP180	CPRS/3/NWBT/KATY//9902207X2	3	82	86	8418	2086	10505	64.1	73.0
09SP181	CPRS/3/NWBT/KATY//9902207X2	4	82	83	8121	1987	10108	69.4	74.5
09SP182	CPRS/3/NWBT/KATY//9902207X2	4	83	81	8794	2391	11185	69.3	74.4
09SP183	CPRS//9502008/DREW	4	85	84	8500	2381	10881	68.0	73.7
09SP184	CPRS//9502008/DREW	4	83	78	7271	1815	9086	66.3	72.9
09SP185	CPRS//9502008/DREW	3	84	85	6560	1892	8452	64.3	74.4
09SP186	CPRS//9502008/DREW	3	83	84	6899	2190	9089	65.4	74.0
09SP187	CPRS//9502008/DREW	4	82	83	7110	2183	9293	65.3	73.4
09SP188	CPRS//9502008/DREW	4	85	81	7566	2430	9997	67.9	74.2
09SP189	CPRS/3/TACAURI//KBNT/LCSN	4	84	78	6307	2622	8929	66.8	74.0
09SP190	CPRS//CCDR/JEFF	4	82	85	6919	1517	8436	64.6	73.2
09SP191	CPRS/WELLS	4	89	80	5852	2065	7917	61.4	72.9
09SP192	0402022/3/CPRS/KBNT//9502008	4	84	82	7056	2148	9204	66.0	73.2
09SP193	0402022/3/CPRS/KBNT//9502008	3	84	84	8350	2206	10555	67.4	73.9
09SP194	0402022/0502094	4	83	88	8716	1621	10338	66.1	74.3
09SP195	0402022/3/9502008//AR1142/MBLE	4	82	76	7151	1702	8853	64.5	72.6
09SP196	0402022/3/9502008//AR1142/MBLE	4	82	82	8742	1629	10370	65.1	73.2
09SP197	0402022/3/9502008//AR1142/MBLE	4	85	84	7498	1793	9292	56.7	72.1
09SP198	0402022/3/9502008//AR1142/MBLE	4	82	76	6948	1237	8185	63.2	72.9
09SP199	CCDR/JEFF/3/9502008//AR1142/MBLE	4	83	83	7659	864	8523	59.3	73.9
09SP200	LA2028 (RU0802028)	4	85	94	10033	1738	11772	65.6	74.5
09SP201	CCDR/JEFF/3/9502008//AR1142/MBLE	3	82	87	9895	1213	11108	64.4	70.2
09SP202	CCDR/JEFF/3/9502008//AR1142/MBLE	4	84	83	8983	1106	10089	62.1	74.1

Continued.

Table 6. Continued.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
09SP203	CCDR/JEFF/3/9502008//AR1142/MBLE	4	84	88	8618	1142	9761	63.7	74.3
09SP204	CCDR/JEFF/3/9502008//AR1142/MBLE	4	82	86	9117	1362	10479	63.4	68.3
09SP205	CCDR/JEFF//0402128	3	82	86	9513	1308	10821	61.6	68.8
09SP206	NWBT/KATY//9902207x2/3/0302005	4	80	81	7974	1994	9968	65.0	72.9
09SP207	NWBT/KATY//9902207x2/3/0302005	5	78	90	7430	2218	9647	60.5	72.9
09SP208	NWBT/KATY//9902207x2/3/0302005	4	78	85	7901	2335	10236	65.3	72.5
09SP209	9502008//AR 1188/CCDR/3/0302005	4	79	80	9027	2510	11538	62.0	69.5
09SP211	9502008//AR 1188/CCDR/3/0502165	4	85	84	7479	1821	9299	63.0	74.3
09SP212	9502008//AR 1188/CCDR/3/0502165	4	83	76	6618	1427	8046	66.7	73.9
09SP213	9502008//AR 1188/CCDR/3/0502165	4	81	87	7800	1592	9392	64.0	73.4
09SP214	9502008//KATY/902207x2/3/MBLE	4	77	77	5730	1841	7570	68.6	73.8
09SP215	9502008//KATY/902207x2/3/CCDR	4	82	80	7464	1261	8725	68.9	73.6
09SP216	9502008//KATY/902207x2/3/CCDR	3	82	85	8321	1651	9972	68.1	73.7
09SP217	9502008//KATY/902207x2/3/CCDR	4	85	87	7671	1452	9123	70.1	75.1
09SP218	9502008//KATY/902207x2/3/0402082	4	79	85	8283	2626	10908	67.3	74.4
09SP219	9502008//KATY/902207x2/3/0402082	4	80	84	7955	2170	10126	62.9	74.3
09SP220	9502008//KATY/902207x2/3/0402082	4	81	85	9286	2311	11596	66.6	70.6
09SP221	9502008//KATY/902207x2/3/0402088	4	84	92	7980	2087	10066	66.8	74.2
09SP222	9502008//KATY/902207x2/3/0402088	4	83	85	7326	1364	8690	67.6	73.1
09SP223	9502008/DREW/3/0402097	4	81	88	8473	1526	10000	69.1	75.2
09SP224	9502008/DREW/3/0402097	4	82	91	8520	1676	10196	68.1	74.4
09SP225	Cocodrie	4	84	85	8368	1825	10193	68.0	75.6
09SP226	9502008/DREW/3/0402097	3	78	78	6412	1574	7986	66.9	74.7
09SP227	9502008/DREW/3/0402097	4	84	91	8664	2271	10935	60.3	74.1
09SP228	9502008/DREW/3/0502103	3	81	88	8267	1410	9677	64.4	73.5
09SP229	9502008/DREW/3/0502103	4	81	85	7542	1574	9116	63.4	73.6
09SP230	9502008/DREW/3/0502103	4	78	80	7834	2465	10299	64.8	73.2
09SP231	9502008/DREW/3/0502103	4	79	81	7767	2230	9997	63.6	73.3
09SP232	9502008//AR 1142/MBLE/3/0502091	4	78	82	7443	1342	8785	63.5	71.9
09SP233	9502008//AR 1142/MBLE/3/0502165	4	79	83	8415	1948	10363	62.5	72.0
09SP234	0502171/9302065	3	83	82	6897	2257	9154	69.5	74.5
09SP235	9502008//AR 1188/CCDR/3/CCDR	4	84	89	7745	1183	8928	65.5	73.4
09SP236	9502008//AR 1188/CCDR/3/CCDR	4	84	89	8457	1339	9796	67.1	74.5
09SP237	9502008//AR 1188/CCDR/3/CCDR	4	83	83	7603	1213	8816	65.8	73.3
09SP238	9502008//AR 1188/CCDR/3/0402097	4	83	89	8867	1250	10117	66.9	74.0

Continued.

Table 6. Continued.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A) Main	2nd	Total	Milling (%) Head	Total
09SP239	CCDR/JEFF//MBLE	4	83	92	4377	1072	5448	66.7	73.8
09SP240	CCDR/JEFF//MBLE	4	78	74	6246	1209	7455	64.9	74.0
09SP241	CCDR/JEFF//0402022	4	84	85	8505	1825	10330	63.0	74.2
09SP242	WELLS/CCDR	4	82	86	8996	2081	11077	65.4	69.7
09SP243	CCDR/RU0402085	4	84	90	8829	1243	10071	69.4	73.6
09SP244	CCDR/LGRU/3/9502008-A//AR 1188/CCDR	4	83	91	8216	1397	9613	68.1	74.6
09SP245	CCDR/4/9502008/3/MBLE//LMNT/LSBR-5	3	81	83	8001	1302	9303	66.6	73.0
09SP246	CCDR//CCDR/JEFF	4	82	85	7110	1556	8666	67.7	74.0
09SP248	CPRS//CCDR/JEFF	3	85	90	7931	1627	9558	65.9	73.9
09SP249	0402022/3/CPRS/KBNT//9502008	4	85	86	7862	2024	9886	67.2	73.6
09SP250	CL151	4	87	97	11208	2227	13435	66.4	74.2
09SP251	0402022/0502094	3	82	89	9594	1273	10867	61.8	67.3
09SP252	CCDR/JEFF//0402128	4	85	89	8422	1152	9574	63.4	74.2
09SP253	CCDR/JEFF//0402128	4	83	90	7424	1228	8652	65.3	74.0
09SP254	9502008//KATY/902207x2/3/CCDR	4	84	86	6978	1124	8102	66.2	73.1
09SP255	9502008//KATY/902207x2/3/CCDR	4	85	90	7675	1233	8908	71.1	75.2
09SP256	9502008//KATY/902207x2/3/0402082	4	82	88	7240	1826	9066	65.8	73.8
09SP257	9502008/DREW/3/0502103	4	82	87	7576	1510	9086	63.0	73.6
09SP258	9502008//AR 1142/MBLE/3/0502165	4	84	87	8177	1482	9659	64.1	74.2
09SP259	LGRU/CCDR	4	85	89	7047	2016	9064	64.9	74.7
09SP260	CCDR//CCDR/JEFF	4	84	88	8290	1484	9774	66.7	73.8
09SP261	CCDR/3/9502008-A//AR 1188/CCDR	3	84	87	8982	1577	10560	64.3	75.3
09SP262	CCDR/3/CPRS/KBNT//9502008-A	4	81	87	6907	1176	8083	65.3	73.4
09SP263	CCDR/AC1048	4	82	88	8961	1617	10578	67.9	72.8
09SP264	CCDR/AC627	4	84	87	8803	2097	10900	67.3	73.1
09SP265	CCDR/RU0601004	4	82	84	8592	1759	10351	67.3	74.5
09SP266	CCDR/4/L201//TBNT/BLMT/3/CPRS	3	82	88	8157	1868	10025	66.4	73.5
09SP267	CPRS/KBNT//9502008-A/3/9901081/CCDR	4	85	87	7855	2292	10147	61.4	73.8
09SP268	CPRS/KBNT//9502008-A	3	82	88	9958	2760	12718	64.0	69.3
09SP269	CCDR/JEFF//RU0601004	4	83	86	8823	2312	11135	68.5	75.1
09SP270	9502008-A//AR 1188/CCDR/3/CCDR/JEFF	4	81	87	9529	1952	11481	65.9	70.7
09SP271	9502008-A//AR 1188/CCDR/3/WELLS/ZHE733	4	79	89	7798	2008	9806	64.6	73.2
09SP272	KATY/CPRS//JKSN/3/AR 1188/CCDR/4/AC1094	3	80	88	11119	2436	13555	70.2	72.7
09SP273	KATY/CPRS//JKSN/3/AR 1188/CCDR/4/AC627	4	82	90	10842	2135	12977	65.9	71.0
09SP275	CL131	4	87	77	9314	2406	11720	69.8	74.8

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 7. Agronomic and milling performance of 2009 Preliminary Yield Test, Single Plot (SP), specialty entries. Rice Research Station, Crowley, LA.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A) Main	Yield (lb/A) 2^{nd}	Yield (lb/A) Total	Milling (%) Head	Milling (%) Total
09SP274	AC262//A-201	4	82	90	8019	2185	10203	65.5	73.4
09SP276	AC262/4/DMSI/…	5	83	82	6719	2018	8737	70.8	74.3
09SP277	NCHS/A-201	5	84	85	6284	2831	9116	68.6	70.4
09SP278	A-301/KATY/4/DLLAx2/LMNT*2/3/DMSI/DLLAx2//…	4	87	87	7210	2842	10052	63.4	73.3
09SP279	NWBT/KATY//9902207x2/3/JSMN/DLLA//LEAH/DLLA	4	83	87	6455	2052	8507	64.4	73.1
09SP280	9502008/AR 1121/3/KBNT//DLMT/B8462T3-710	4	84	89	8721	2891	11611	65.0	70.4
09SP281	JSMN/DLLA//96SP287/3/CPRS/DREW	5	84	83	5052	2426	7477	70.3	73.8
09SP282	JSMN/DLLA//96SP287/4/DLLAx2/LMNT*2/3/DMSI/…	3	91	95	6762	2602	9365	60.3	72.6
09SP283	JSMN/DLLA//96SP287/4/DLLAx2/LMNT*2/3/DMSI/…	4	90	90	6656	2011	8666	65.7	72.1
09SP284	DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//…	4	91	97	6971	2112	9083	66.7	73.2
09SP285	DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//…	4	92	94	4814	3029	7844	66.3	72.1
09SP286	DLMT/01SP 283	4	84	90	8682	1904	10586	54.3	65.6
09SP287	DLMT/5/DLMT 8462…/4/DMSI	4	85	88	7888	2661	10549	64.7	71.3
09SP288	DLMT 8462…/4/DMSI/5/A-201	3	78	81	7387	3252	10639	62.9	73.1
09SP289	DLMT 8462…/4/DMSI/5/A-201	4	80	88	8930	2540	11471	68.7	74.0
09SP290	A-301/KATY//01SP 283	3	78	90	9453	2974	12426	54.2	67.1
09SP291	JZMN//A-301/KATY	4	84	81	4558	2080	6638	68.2	73.5
09SP292	CPRS//L201/7402003/3/BASMATI SUF AID PAK/4/…	4	83	87	6809	2384	9194	69.1	73.2
09SP293	DLMT//A-301/KATY	4	83	83	6585	2314	8898	67.2	74.5
09SP294	JZMN//JSMN/DLLA	5	85	87	7405	2150	9555	60.6	69.1
09SP295	JZMN//DLRS	5	90	87	5625	2411	8036	65.9	73.9
09SP296	9502008-A/DREW//A-301/KATY	4	82	82	7467	2360	9827	60.0	68.6
09SP297	9502008-A/DREW//A-301/KATY	3	84	86	8490	2565	11055	61.0	72.9
09SP298	A-301/KATY//DLMT	3	82	87	7809	2188	9998	69.1	73.8
09SP299	JZMN/4/CPRS//L201/7402003/3/…	4	90	90	7536	1672	9209	67.1	73.5
09SP300	Jazzman	3	91	93	7156	1878	9034	67.1	73.0

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 8. Yield, milling, and agronomic performance of long-grain and specialty entries of the Advanced Yield trial (AY) tested at Rice Research Station, Crowley, LA. 2009.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
001	AC1094	3.3	76	81	7999	1446	9446	68.2	70.7
002	CPRS//L-205/DLLA	4.3	77	77	6158	1085	7242	66.8	70.5
003	00HB126/PI 457917//CCDR	4.0	76	89	6831	1653	8484	56.4	69.6
004	LBLE/L201//MBLE/3/BSMT PAK372A/4/…	4.3	77	79	7285	1295	8580	66.0	71.0
005	CCDR/3/JSMN/DLLA//LEAH/DLLA	4.3	76	88	5235	893	6128	65.5	68.9
006	00HB126/PI 457917//CCDR	4.0	77	94	6136	1714	7850	58.7	70.3
007	JSMN/DLLA//96SP287/3/CPRS/DREW	5.0	75	90	5498	2519	8017	66.0	71.6
008	DLMT/CALMATI	4.3	74	82	6619	1789	8408	58.4	70.8
009	NCHS//JSMN/DLLA	4.0	76	84	6209	1306	7515	65.2	68.8
010	Jazzman	3.7	81	93	6578	1099	7677	68.7	70.5
011	AC918	3.3	76	77	5935	1631	7566	64.6	69.2
012	AC1218	3.3	77	78	7241	701	7942	66.9	69.3
013	AC1365	4.0	75	83	7536	1674	9210	65.3	69.0
014	AC1415	4.0	77	81	7765	1958	9722	66.9	69.5
015	AC110/AC919	3.0	75	83	6854	2481	9335	67.7	71.6
016	CCDR/0502094	3.3	76	84	7402	1287	8689	65.5	70.3
017	CPRS/3/CPRS/KBNT//9502008	3.0	75	79	6722	898	7620	63.3	70.1
018	AC1075	3.3	76	87	7857	1800	9657	64.6	68.3
019	CCDR//CCDR/JEFF	3.0	76	87	7752	832	8584	64.5	70.0
020	AC 1402	3.3	77	77	7514	1337	8852	66.8	70.2
021	CCDR/0502085	3.3	76	86	7625	1546	9171	64.0	69.7
022	DREW/CCDR//CCDR/JEFF	3.0	75	87	7296	1580	8876	66.1	69.9
023	CCDR/JEFF//CCDR	3.0	76	87	7312	879	8191	64.4	68.3
024	AC1399	3.3	77	86	8135	1610	9745	68.0	72.0
025	CPRS/3/CPRS/KBNT//9502008	3.0	76	89	7614	1190	8804	66.5	70.6
026	CPRS/3/NWBT/KATY//9902207X2	3.0	76	82	7053	1280	8333	67.6	70.3
027	CCDR/JEFF/3/9502008//AR1142/MBLE	3.0	75	87	7491	975	8466	63.4	69.9
028	DREW/CCDR//9502008/DREW	3.0	76	89	7942	902	8844	66.8	70.1
029	AC1400	4.3	75	81	6820	1845	8665	65.5	71.0
030	CCDR//9502008/LGRU	3.0	76	92	7631	1009	8641	65.1	69.4
031	CCDR//9502008/LGRU	3.3	76	94	7822	1004	8826	67.3	71.5
032	CPRS//9502008/DREW	3.0	75	87	6739	1381	8119	65.6	71.5
033	CCDR//9502008//AR1188/CCDR	3.3	75	86	6364	977	7342	67.3	72.0

Continued.

Table 8. Continued.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A) Main	2nd	Total	Milling (%) Head	Total
034	AC1019	4.0	75	81	6499	2177	8675	67.1	70.4
035	AC919/PRESIDO	3.0	75	85	6592	2611	9203	68.1	71.2
037	AC1081	4.0	76	86	7248	1473	8722	67.0	71.1
038	AC1415	3.0	76	86	7714	1624	9338	67.2	69.7
039	AC1415	3.3	76	85	7492	1545	9037	66.1	69.2
040	AC1293	3.0	75	88	6748	1505	8253	64.5	69.0
041	CCDR/3/CPRS/KBNT//9502008-A	3.7	76	87	7547	1445	8992	64.6	68.3
042	CCDR/3/CPRS/KBNT//9502008-A	3.7	76	88	7357	1434	8792	64.2	69.3
043	CCDR/3/CPRS/KBNT//9502008-A	3.0	76	88	7890	1122	9012	63.6	67.6
044	CCDR/3/9502008-A//AR1188/CCDR	4.0	76	86	7553	1287	8840	63.4	67.2
045	CCDR/3/9502008-A//AR1188/CCDR	3.7	76	86	7086	973	8059	64.9	67.8
046	CCDR/3/9502008-A//AR1188/CCDR	3.7	76	88	7520	1204	8724	66.7	69.8
047	CCDR/RU0602128	4.0	77	88	7395	1517	8911	63.8	68.0
048	CCDR/RU0602128	4.0	76	90	7347	1197	8544	66.2	70.3
049	CCDR/RU0602137	4.0	76	87	6996	1264	8260	65.2	70.5
050	Catahoula	3.3	76	90	7403	1442	8845	65.4	72.3
c.v.%		11.3	0.8	4.1	4.7	18.1	5.0	3.3	2.3
$LSD_{0.05}$		0.6	1.0	5.7	545	422	699	4.3	3.2

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 9. Yield, milling, and agronomic performance of specialty entries of the Advanced Yield trial (AY) tested at Fenton, JeffersonDavis Parish, LA. 2009.

Entry	Pedigree	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
					Main	2nd	Total	Head	Total
001	AC1094	5.0	95	73	8289	2217	10506	67.4	72.8
002	CPRS//L-205/DLLA	5.7	96	84	6259	1742	8001	67.9	73.7
003	00HB126/PI 457917//CCDR	5.0	97	80	6340	2368	8708	65.1	72.6
004	LBLE/L201//MBLE/3/BSMT PAK372A/4/…	5.3	98	75	6580	1983	8564	68.5	74.0
005	CCDR/3/JSMN/DLLA//LEAH/DLLA	4.7	98	80	6147	1413	7560	65.5	71.9
006	00HB126/PI 457917//CCDR	5.0	97	79	6844	2331	9175	66.3	73.7
007	JSMN/DLLA//96SP287/3/CPRS/DREW	5.0	95	80	5613	1911	7524	68.5	73.0
008	DLMT/CALMATI	4.7	91	70	5589	1246	6835	64.6	73.5
009	NCHS//JSMN/DLLA	5.7	97	80	4657	1483	6140	65.7	71.1
010	Jazzman	4.3	100	74	7691	1300	8991	66.4	72.7
c.v.%		7.7	1.0	8.3	8.4	16.1	8.1	1.4	0.5
$LSD_{0.05}$		0.7	1.7	11.0	925	498	1139	2.2	0.8

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 10. Average yield, milling, and agronomic performance of 8 experimental long-grain, 2 specialty lines, and 5 check varieties in the Uniform Regional Rice Nursery (URN) and Commercial Advanced (CA) trials at five Louisiana locations (Crowley, Mowata, Fenton, Lake Arthur, and Richland), 2009.

Entry	Entry	Pedigree	Grain Type	Vigor*	Days to 50% Heading	Plant Height (cm)	Yield (lb/A)			Milling (%)	
							Main	2nd	Total	Head	Total
246	RU0802022	AC1398	Long	4.3	82	92	8594	1936	10531	64.2	71.3
247	RU0802140	CPRS//L-205/DLLA	Della	3.9	86	96	7555	1843	9398	66.6	71.4
248	RU0902028	9502008//AR1188/CCDR/3/0302005	Long	4.9	79	90	7296	1331	8627	62.5	70.8
249	RU0802031	CCDR/0502085	Long	4.2	82	88	8040	1611	9651	64.9	72.3
250	RU0902034	TACAURI//KBNT/LCSN/3/0502022	Long	5.2	81	87	8202	1820	10022	60.8	71.9
251	RU0902125	CCDR/3/9502008-A//AR1188/CCDR	Long	4.8	82	87	7698	1147	8845	63.4	71.8
252	RU0902128	AC110/AC638	Long	4.6	83	87	7077	1677	8754	65.3	72.1
253	RU0902131	CCDR//9502008//AR1188/CCDR	Long	4.2	82	89	7409	1262	8671	65.1	71.9
254	RU0902146	AC1172	Long	4.9	80	87	7352	1399	8750	64.7	72.0
255	RU0802149	9502008//KATY/9902207X2/3/JSMN/…	Jasmine	4.3	83	85	7135	1839	8974	66.2	71.7
209	Trenasse		Long	5.0	79	91	8066	1237	9303	62.3	70.4
211	Cocodrie		Long	4.5	83	87	7390	1367	8756	65.2	72.2
212	Cheniere		Long	4.8	85	89	8295	1433	9729	68.4	72.9
218	Dellrose		Della	5.8	87	92	5856	2467	8323	67.4	72.7
219	Catahoula		Long	4.3	83	88	7663	1801	9464	62.4	72.0

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

DEVELOPMENT OF HYBRID RICE FOR LOUISIANA

W. Li, X. Sha, S. Linscombe, D. Groth, J. Oard, S. Theunissen, and B. Henry

INTRODUCTION

Rice is one of the three most important cereal crops and the world's No. 1 food crop. It is planted on 147 million hectares worldwide or about 11% of the world's arable land. Rice is also one of the most important commodity crops in Louisiana. Hybrid rice is the commercial rice crop grown out of F_1 seeds of crosses between two genetically different inbred parents. Because of its hybrid vigor (heterosis), hybrid rice can have a 15% or more yield advantage over the best inbred variety grown under similar conditions. It can promote farmers' productivity and competitiveness, open new seed industries, and help attain food security. Research goals of the newly established Hybrid Rice program at LSU AgCenter's Rice Research Station (RRS) include: 1) Development of and identification of male sterile lines (cytoplasmic A or environmental sensitive S) and restorer (R) lines adapted to the southern U.S. environmental conditions; 2) Identification of elite cross combinations through extensive test-crossing; 3) Exploration of the feasibility of economical hybrid seed production; and 4) Development of a marker-assisted selection scheme involving identification and development of molecular markers for sterility/fertility traits, as well as the use of anther culture to expedite the breeding process.

MATERIALS AND METHODS

A number of critical hybrid rice germplasm lines were introduced from the Rice Research Institute, Guangxi Agricultural Academy in Nanning, China. Southern long-grain cultivars CL111, CL131, CL151, CL161, Catahoula, Cocodrie, Cypress, Cheniere, Trenasse, Wells, Francis, and an additional 75 advanced lines were included. Test crosses between Chinese lines and U.S. genotypes and among the Chinese lines were produced and evaluated.

All introduced germplasm were planted in the greenhouse under quarantine for performance evaluation and seed multiplication. Planting date was January 26, 2009, and harvest date was May 12. The resulting seeds and 42 test crosses were first germinated in the greenhouse, and the seedlings were later transplanted into the field with a 10-inch space between rows and a 6-inch space between plants. Proper water and fertilizer management were applied to achieve the maximum yield. Weeds and rice water weevil were controlled by applying herbicides and insecticides. However, no fungicide was used. Data were collected on several sterility/fertility and agronomic traits, which included pollen sterility, yield, maturity, plant height, tillering ability, spikelets per panicle, seed setting rate, and rice quality. Harvest was manually conducted.

RESULTS

The preliminary results confirmed the complete abortive-type sterility on Chinese male sterile lines under both greenhouse and field conditions in Crowley, Louisiana. Several test crosses were found to have good yield potential, good disease resistance, good plant type, and suitable maturity. They may become potential hybrids for commercial production (Table 1). Some of the introduced hybrid rice germplasm lines appear to be compatible with elite Louisiana long-grain genotypes. They may become the foundation for hybrid rice development and production in Louisiana. But, challenges still exist, which include lack of locally adapted germplasm that could be directly utilized in hybrid rice development and production, poor grain quality, and late maturity of current candidate hybrids, and the development of a completely new seed production system.

Table 1. Yield and agronomic characteristics of the tested varieties in the hybrid yield trial. Rice Research Station, Crowley, LA., 2009.

Entries	Grain type	Seeding date	Maturity (days)	Plant height (cm)	Yield (lb/A)	Milling (%) (head/total rice)	Seed setting (%)	1000-Grain weight (g)	Alkali spread value (1-7)*	Amylose content (%)
LAH10	M	May 15	115	118	13,663	68/73	95.6	24.8	6.0	15.4
LAH12	L	May 15	116	119	14,561	67/75	96.5	22.0	7.0	14.0
LAH09	L	May 15	110	110	10,020	12/73	76.0	22.0	4.0	21.5
LAH19	L	May 15	118	120	14,772	62/73	71.7	23.7	4.0	14.0
LAH20	M	May 15	115	121	13,146	68/73	94.6	26.4	6.5	17.2
LAH21	M	May 15	116	123	16,402	63/73	92.8	27.2	6.5	21.2
LAH22	M	May 15	119	118	12,021	66/72	89.1	28.7	6.5	22.7
LAH23	M	May 15	116	119	14,359	67/72	87.4	26.8	5.0	23.0
LAH30	L	May 15	112	111	10,452	64/74	75.3	22.5	5.0	25.2
LAH32	L	May 15	115	106	10,502	67/74	76.8	25.1	4.0	22.8
LAH34	L	May 15	120	113	13,167	68/73	71.4	22.9	5.0	23.4
LAH35	L	May 15	120	110	12,222	66/74	80.0	21.6	4.0	23.1
LAH43	L	May 15	116	119	12,738	60/72	84.3	25.5	6.5	15.9
XL723	L	May 15	110	113	10,010	51/73	76.1	23.7	4.0	19.4
CLXL729	L	May 15	110	112	10,270	65/73	82.9	22.8	4.0	17.1
Bengal	M	May 15	115	95	6,899	68/73	73.9	26.2	6.0	14.1
CL161	L	May 15	115	106	8,122	64/72	80.1	22.3	4.0	23.5

*Alkali spread value was an estimate of gelatinization temperature (Gel Temp) of milled rice, scores of 1-3, 4-5, and 6-7 are equivalent to high-, intermediate-, and low-Gel Temp, respectively.

RICE GENETICS AND GERMPLASM DEVELOPMENT

J.H. Oard, D.E. Groth, S.D. Linscombe, X. Sha, W. Li, S. Ordonez, and J. Silva

SUMMARY

1) Hybrid rice germplasm adapted to Louisiana conditions was developed from crosses between Philippine, Chinese, and Louisiana lines.

2) DNA marker technology was used to assist Dr. Sha in rapid selection and advancement of elite lines for special purpose rice. Three markers associated with aroma, amylose content, and gelatinization temperature were used, along with plant type to identify elite inbreds, backcrosses, and segregating populations.

3) DNA markers for sheath blight and high grain milling yields were identified by the RiceCAP Project. Access to the markers will be made available to the public via the RiceCAP website.

4) Several sheath blight-tolerant lines with good agronomic traits were developed and made available to the LSU Breeding Project.

Development of Adapted Inbred Lines for Hybrid Rice in Louisiana

The third year for development of hybrid rice for Louisiana was completed in 2009. A total of 181 hybridizations were made using 10 cms, maintainer, and restorer lines from The Philippines and China that were crossed to seven Louisiana varieties. In addition, 37 backcrosses were made with evaluation of progeny from all crosses carried out in field plots at the Rice Research Station. Several selections with improved agronomic traits were identified that will be evaluated and used for additional crosses in 2010.

Development of new hybrids for Louisiana involves field evaluation of numerous testcross progeny requiring extensive inputs in labor, time, money, and field plot space. To increase efficiency, a pilot study using Dr. Li's Chinese hybrid germplasm has identified potential DNA markers than can distinguish restorer from maintainer lines. This technology should reduce input costs and facilitate rapid development of new inbred lines used to create elite Louisiana hybrids. Further testing of the markers will be carried out in 2010 with germplasm developed by Drs. Oard, Sha, and Li.

Marker-Assisted Selection and Advancement of Elite Lines for Special Purpose Rice

DNA marker technology facilitated rapid identification and subsequent advancement of elite special purpose lines from Dr. Sha's breeding program. For this project, a total of 500 lines were evaluated by markers for desired gelatinization temperature and aroma characteristics. In addition, 10 F_2 populations and 25 BC_1F_1 hybrids were screened for specific marker profiles. This technology resulted in rapid selection of a true breeding line (RU0802022) for aroma and gel temp that was also the top entry for first-crop grain yield (11,075 lb/A) in the 2009 URN trial. It is estimated that use of marker technology accelerated development of RU0802022 by approximately two years vs. conventional methods. Additional marker work will be carried out in 2010.

Identification of DNA Markers for Sheath Blight Resistance and High Head Rice Yields

The RiceCAP Project identified DNA markers associated with sheath blight resistance and head rice. RiceCAP developed and evaluated four mapping populations for sheath blight under field and greenhouse conditions during 4 years, including the SB5 mapping population in 2008. Additional studies in 2009 expanded the list of candidate molecular markers involved with these two important traits. For example, new research has increased the number of candidate markers for sheath blight to seven that are located on five different chromosomes. These markers will be evaluated in 2010 with known sources of sheath blight resistance and susceptibility for validation; and if successful, this technology will also be used to assess additional sheath blight material developed within the AgCenter.

DNA markers for high head rice yields were also identified by the RiceCAP project. The MY2 mapping population was derived from a cross of Cypress, a Louisiana variety known for high head rice yields across different harvest moistures and LaGrue, an Arkansas variety with inconsistent head rice yields in different environments. Additional studies in 2009 revealed a total of 13 candidate markers for high head rice yields. One marker was associated with a gene for percent amylose content, and the same marker pointed to a known gene for heading date. These results are consistent with the facts that these two genes are located very close to each other at the top of chromosome 6 and that heading date and amylose content affect head rice yields in Louisiana.

The advent of new technology was also exploited by the RiceCAP Project in 2009. The DNA sequence of 13 U.S. varieties and adapted lines was determined. Three Louisiana varieties (Cypress, Bengal, and Cocodrie) and one sheath blight line (MCR010277) were included for analysis. Results to date show extensive DNA variation between varieties. For example, a total of 1.3 million differences in DNA sequence were found between the varieties Cypress and LaGrue that were used as parents for the MY2 mapping population. This new technology should increase our ability to identify those agronomic genes that impact the Louisiana rice industry. A database containing the sequence of the 13 varieties and lines will be posted online in 2010 for public access and review.

Development of Sheath Blight-Resistant Germplasm by Traditional Genetic Approaches

During 2009, a total of 130 F_1 crosses from multiple resistance sources were completed. More than 30 F_2 to F_6 families were screened in inoculated plots. A total of 40 lines with sheath blight ratings ≤ 5 and good agronomic traits was identified, and 22 selections were used for crossing and made available to the LSU Breeding Program. All selected material will be grown and crossed with adapted Louisiana varieties and lines in 2010. Certain selected lines will also be screened for presence of sheath blight DNA markers described above.

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

H.S. Utomo and S.D. Linscombe

Marker-assisted breeding (MAB) at the Rice Research Station continues to focus on important traits such as disease resistance, protein content, and other quality traits. Incorporation of traits through their linked-DNA markers is being conducted in parallel to a breeding effort to obtain high yielding potential with acceptable grain quality, disease resistance, optimum plant maturity and height, as well as optimum performance under target growing regions. Several marker-assisted selection (MAS) methods have been conducted in the last three years to determine their relative efficiency. In these studies, well characterized DNA markers for blast-resistant traits that have been studied extensively (i.e. *Pi-ta*^{2}, *Pi-b, Pi-k*^{h}) were used to evaluate the methods and used to help develop the most effective marker integration method. Performance of elite lines from MAS was promising in terms of their yield potential and other important agronomic traits. Second-year data were collected in 2009, and the field performance of pyramided Pi-ta^2/Pi-b lines is presented in Table 1. Data collected were based on the average value of five replicated rows. Table 2 is the second year field performance of pyramided lines carrying a different combination of blast genes *Pi-ta*^{2} and *Pi-k*^{h}. Data were based on the average of five replicated rows.

Marker-assisted backcrossing (MABC) is a useful technique to conduct rapid introgression of specific traits. Models to introgress multiple traits have been reviewed rather extensively in the literature. Two models of rapid introgression using Louisiana breeding lines were studied. To facilitate rapid recovery of recurrent genomic background, 125 SSR markers specific to each recurrent parent were used during the backcrossing. Elite backcross lines carrying *Pi-ta*^{2}, *Pi-b*, and *Pi-kh* genes (*mbCCDR-1* and *mbCPRS-1*) were evaluated in replicated row trials in 2008. Second year data were collected in 2009 (Table 3). In addition to regular MABC, anther culture was applied on BC_1 families to rapidly produce homozygous lines among families that carry the pyramided genes. The two top lines (*mbCCDRdh* and *mbCPRSdh*) were evaluated in 2008. Table 4 shows the field performance of these lines in the 2009 growing season.

One of the potential major contributions of MAB is to acquire various beneficial genes that are currently not present in the U.S. germplasm. Two MABC models currently being studied will provide a guideline on how to efficiently capture these beneficial genes. The methods are developed based on microsatellite markers. With the advancement of single nucleotide polymorphism (SNP) technology, much denser markers will be available that will provide a more sensitive tool to surgically integrate the target genes within the target genome. High density markers will also help fine tune the recovery of recurrent genomic regions that have associations with quality traits and local adaptation. Some of these beneficial genes include the genes that code for iron content, drought tolerance, salt tolerance (*salT*; *qST1*, *qST3*), cold tolerance at the seedling stage (RM561-RM341, on chromosome 2), and grain weight (*qgw3.1*; on chromosome 3). The introgression methods that are being developed for these traits will eventually be used to streamline the introgression of various traits that have potential applications and economical values to the rice industry and also as a means to widen the genetic base of U.S. rice germplasm. Rice accessions from the mini-core collection (representing rice diversity in the world) are being evaluated for their potential use to improve Louisiana breeding lines. A list of mini-core genotypes being evaluated is presented in Table 5. In addition to yield components, traits associated with grain nutritional quality will be evaluated among these genotypes.

Predicting the performance of a genotype being developed is another potential application of marker-based selections. Specific crosses made will be used in genomic selections. This method is a direct opposite of the QTL approach where molecular markers are used for predicting performance without QTL mapping at all. Genome-wide selection will eliminate the need to know the number of QTLs and their locations. It focuses on genetic improvement of qualitative traits by fitting all markers used in the analysis as random effects in a linear model. Trait values can be predicted from a weighted index. Computer simulations have shown that genome-wide selections are very effective for QTLs with low heritability such as yield components that are also controlled by complex traits (many QTLs).

Table 1. 2009 Field performance of pyramided Pi-ta^2/Pi-b lines.

No.	Plant ID	Blast genes	Grain type[§]	Vigor[¶]	Plant height (cm)	Heading date	Panicle length (cm)	Panicle weight (g)	Row yield (g)
1	08F3973	Pi-ta^2,Pi-b	L	2.3	75	83	25.4	6.55	556
2	08F3722	Pi-ta^2,Pi-b	L	4.3	74	82	24.3	7.77	489
3	08F4791	Pi-ta^2,Pi-b	L	3.6	79	82	29.2	5.06	569
4	08F4912	Pi-ta^2,Pi-b	L	3.7	79	85	24.3	7.34	599
5	08F5134	Pi-ta^2,Pi-b	L	3.1	83	85	28.9	6.56	598
6	08F5403	Pi-ta^2,Pi-b	L	4.4	80	86	25.1	6.30	486
7	08F4754	Pi-ta^2,Pi-b	L	3.4	81	82	34.4	5.94	567
8	08F4376	Pi-ta^2,Pi-b	L	5.2	77	80	29.3	7.47	556
9	08F3455	Pi-ta^2,Pi-b	L	4.4	74	89	33.9	5.98	578
10	08F4411	Pi-ta^2,Pi-b	L	3.5	86	79	29.3	7.80	587
11	08F7622	Pi-ta^2,Pi-b	L	3.2	79	82	30.9	4.95	599
12	08F5711	Pi-ta^2,Pi-b	L	3.2	81	79	29.5	4.75	586
13	08F7722	Pi-ta^2,Pi-b	L	2.6	74	82	27.4	4.65	488
14	08F4672	Pi-ta^2,Pi-b	L	3.4	77	84	28.6	6.89	498
15	08F5384	Pi-ta^2,Pi-b	L	3.5	83	82	29.7	4.54	544
16	08F7175	Pi-ta^2,Pi-b	L	2.6	84	80	22.3	4.97	578
17	08F5825	Pi-ta^2,Pi-b	L	2.3	88	86	24.9	6.99	596
18	08F1245	Pi-ta^2,Pi-b	L	3.3	81	83	23.6	4.79	495
19	08F7754	Pi-ta^2,Pi-b	L	2.6	83	85	29.9	5.95	459
20	08F7199	Pi-ta^2,Pi-b	L	2.4	82	79	35.6	4.98	579
21	CCDR		L	3.2	94	83	29.8	5.92	554

[§]L= long grain; [¶]Subjective rating (1= excellent, 9=poor).

Table 2. 2009 Field performance of pyramided Pi-ta^2/Pi-kh rice lines.

Plant ID	Blast genes	Grain type§	Vigor¶	Plant height (cm)	Heading date§	Panicle length (cm)	Panicle weight (g)	Row yield (g)
08F5112	Pi-ta^2, Pi-kh	L	3.4	96	87	30.3	5.88	486
08F5151	Pi-ta^2, Pi-kh	L	3.1	87	85	28.5	4.62	491
08F5333	Pi-ta^2, Pi-kh	L	4.1	89	84	26.1	5.91	556
08F2822	Pi-ta^2, Pi-kh	L	5.3	95	83	27.5	4.90	443
08F3851	Pi-ta^2, Pi-kh	L	4.3	91	86	25.2	5.55	579
08F5483	Pi-ta^2, Pi-kh	L	4.4	92	87	29.1	5.98	541
08F5842	Pi-ta^2, Pi-kh	L	4.7	94	86	28.4	5.08	553
08F4812	Pi-ta^2, Pi-kh	L	3.1	92	84	24.1	6.51	409
08F3672	Pi-ta^2, Pi-kh	L	3.6	97	87	32.4	5.77	520
08F4803	Pi-ta^2, Pi-kh	L	3.6	88	84	25.4	5.56	499
08F5392	Pi-ta^2, Pi-kh	L	3.5	82	87	27.2	5.67	576
08F4783	Pi-ta^2, Pi-kh	L	3.8	90	84	28.9	5.90	563
CCDR		L	4.1	95	83	28.2	5.32	499

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

Table 3. 2009 Field performance of marker-assisted backcrossing to pyramid Pi-ta^2, Pi-b, and Pi-kh genes into the recurrent parental lines Cocodrie and Cypress.

	Allele Compost. (%)	Grain Type[§]	Vigor[¶]	Days to 50% Heading	Plant Height (cm)	Row Yield (g)
mbCCDR-1	44(C);28(L);10(S);13(K)	L	2.9	86	94	456
mbCPRS-1	49(C);22(L);11(S);18(K)	L	3.5	82	96	382
CCDR ck		L	3.6	83	99	441
CPRS ck		L	3.7	87	93	395
C.V. (%)			6.9	2.0	4.6	11.9
LSD (0.05)			0.8	4.4	3.6	25.1

[§]L= long grain; [¶]Subjective rating (1= excellent, 9=poor).

Table 4. 2009 Field performance of double haploid lines carrying Pi-ta^2, Pi-b, and Pi-kh genes.

	Allele compt. (%)[†]	Grain type[§]	Vigor[¶]	Days to 50% heading	Plant height (cm)	Row yield (g)
mbCCDRdh	38(C);28(L);25(S);9(K)	L	3.3	86	96	459
mbCPRSdh	46(CP);26(L);16(S);12(K)	L	4.1	85	95	391
CCDR ck		L	3.9	83	93	452
CPRS ck		L	4.1	86	95	389
C.V. (%)			7.7	2.1	4.4	11.03
LSD (0.05)			0.9	4.3	3.5	20.2

[†]C=Cocodrie, L=Lemont, S=Saber, K=Katy, and CP=Cypress; [§]L= long grain; [¶]Subjective rating (1= excellent, 9=poor).

Table 5. Mini-core rice accessions from the United States Department of Agriculture (USDA) that are being evaluated for their potential use to improve Louisiana germplasm.

GSOR	Name	ACNO	GSOR	Name	ACNO	GSOR	Name	ACNO
310007	Karang Serang	2490	310489	Chun 118-33	400398	310958	2	256340
310015	Mayang Khang	7155	310494	WW 8/2290	400672	310965	Vary Tarva Osla	268003
310020	E B Gopher	9032	310503	Manga Kely 694	400780	310984	CSORNUJ	282173
310023	RD 218	9049	310510	BLUE STICK	402789	310990	R 67	282768
310039	C 5560	9723	310515	Nam Dawk Mai	403289	310997	Lusitano	291539
310045	Leah	9979	310519	Guyane 1	403422	310998	WC 4443	291608
310052	Quinimpol	12153	310546	Mahsuri	408406	311016	IR 238	321183
310080	Taichu Mochi 59	154464	310566	INIAP 7	420960	311046	IARI 6621	353722
310087	WC 2811	155990	310588	Onu B	430397	311074	Mitak	373786
310100	Ao Chiu 2 Hao	160700	310598	Red	430936	311078	Gazan	373939
310102	Criollo Chivacoa 2	161567	310615	Dichroa Alef Uslkij	431210	311100	ARC 6578	373403
310111	Bombilla	168946	310630	BKN 6987-68-14	431499	311105	Hsin Hsing Pai Ku	389069
310131	Secano do Brazil	199553	310632	IR 4482-5-3-9-5	432578	311111	99216	389863
310134	Berlin	202864	310645	Moroberekan	434632	311113	Shui Ya Jien	389923
310144	British Honduras Creole	220214	310670	Kubanets 508	439683	311117	Tranoeup Beykher	389933
310156	Sel. No. 388	223612	310687	IR 9660-48-1-1-2	464597	311123	10340	391214
310161	Shimizu Mochi	226204	310693	Bakiella 1	493131	311140	AKP 4	392605
310196	81B/25	263813	310702	Jumli dhan	549224	311141	Sornavari	392637
310200	Chin Chin	264242	310703	N-2703	549253	311151	TD 70	393070
310204	Italica Carolina	265110	310714	TCHAMPA	584564	311153	IR 2061-214-2-3	399748
310210	Krasnodarskij 424	266122	310715	Phudugey	584566	311167	Tainung 45	400607
310211	Pergonil 15	267996	310723	WIR 3039	584624	311173	Manga 629	400771
310219	Red Khosha Cerma	277414	310724	Ak Tokhum	584625	311180	Sapundali Local	402673
310220	Safut Khosha	277415	310747	Bhim Dhan	596818	311181	Tauli	402689
310226	NORIN 11	281630	310757	RP2151-173-1-8	596941	311185	Bombon	402794
310238	R 75	282769	310767	HB-6-2	602606	311188	Dara	402983
310241	UZ ROSZ M38	291430	310773	ECIA76-S89-1	602654	311206	79	406073
310301	H57-3-1	346827	310777	WC 3532	37215	311236	B805D-MR-16-8-3	417820
310317	IARI 6626	353723	310779	GPNO 1106	2169	311249	Tono Brea 439	430254
310337	Khao Phoi	373232	310788	Toga	67153	311255	Saraya	430339
310338	Khao Luang	373249	310791	Kin Shan Zim	7404	311258	Botika S/R	430387
310345	J.P. 5	373761	310799	Ragasu	154435	311266	CO 13	430740
310348	C 8429	373771	310801	Tobura	154481	311269	Shimla Early	430979
310351	Warrangal Culture 1252	373795	310802	Tamanishiki	154531	311278	Montakcl	431092
310354	Padi Pohon Batu	373816	310809	Yong Chal Byo	157385	311281	A 152	431128
310381	NC 1/536	385826	310814	Grassy	8913	311284	La Plata Gena F.A.	431172

Continued.

Table 5. Continued.

GSOR	Name	ACNO	GSOR	Name	ACNO	GSOR	Name	ACNO
310397	Chacareiro Uruguay	388427	311532	Egyptian Wild Type	182254	311734	ARC 10633	373536
310399	Doble Carolina	388436	311537	A 5	245694	311735	Simpor	373798
310415	Ai Chueh Ta Pai Ku	389037	311539	C.B. II	352687	311736	Coppocina	373899
310420	Thang 10	389234	311544	Gallawa	373340	311739	FUJISAKA 5	388917
310428	Sipirasikkam	389876	311545	Ittikulama	373341	311741	SOC NAU	389150
310440	TJ	391218	311547	Karayal	373347	311744	Heo Trang	389267
310442	PD 46	391264	311554	Srav Prapay	389960	311745	Wong Chim	389360
310446	Acheh	391691	311561	Nang Bang Bentre	392768	311748	Bogarigbeli	391280
310471	PATNAI 6	392694	311563	DNJ 179	393112	311751	Magoti	391904
310475	K8C-263-3	392813	311572	DJ 24	403082	311765	Pa Boup	418207
310480	Djimoron	393180	311573	DJ 102	403114	311769	Pakkali	431310
310481	Anandi	393292	311576	DNJ 121	403214	311775	THAVALU	439024
310846	Kao Chio Lin Chou	12492	311586	Santhi 990	430909	311779	WC 10253	469300
310849	Pan Ju	160530	311592	UZ ROS 7-13	431204	311781	Krachek Chap	473562
310861	Niwahutaw Mochi	162113	311596	SL 22-620	433799	311787	KrasnodarskiJ 3352	584632
310879	6360	177224	311600	Jyanak	434614	311788	Embrapa 1200	585042
310883	Somewake	184506	311603	TOg 7025	450353	311790	WAB462-10-3-1	602637
310887	Buphopa	198134	311606	Dhan	549215	311792	Cypress	561734
310901	Juppa	208452	311613	Spin Mere	127076	311793	IR64	497682
310906	Ardito	215478	311620	Romeno	189460	311794	M202	494105
310910	Taino 38	215970	311635	Amane	373335	311795	Nipponbare	514663
310932	17-9-4	226313	311642	Tia Bura	590404	311692	TOg 7257	450513
310945	Dular	240638	311643	Padi Tarab Arab	590425	311693	TOg 7267	450521
310950	Nanton NO. 131	245071	311644	P 35	346371	311694	HG 24	548068
311710	Lua Chua Chan	54344	311698	NSGC 5935	590422	311695	NSGC 5944	590413
311713	Sereno	214077	311699	A100943-R	450521	TOg 7267	450521	450521
311725	A 36-3	281914	311702	W 1193	548068	HG 24	548068	548068
311727	Nahng Sawn	285074	311703	NSGC 5953	590413	NSGC 5944	590413	590413
311327	Gasym Hany	439669	311483	4484	615022	311669	JP 5	412811
311383	Darmali	584555	311484	4595	615033	311677	Karabaschak	439674
311385	Kaukkyi Ani	584567	311491	YOU-1 B	615192	311684	Hi Muke	584620
311393	Celiaj	584629	311497	Chunjiangzao NO. 1	615198	311685	WIR 911	597033
311417	CNTLR80076-44-1-1-1	596902	311654	Carolino 164	392630	311688	GPNO 25912	269630
311423	IR 58614-B-B-8-2	596990	311656	Aswina 330	392677	311689	TOg 7102	450365
311435	CM1, Haipong	608431	311667	HKG 98	403469	311690	TOg 7135	450396
311466	Kechengnuo NO. 4	614989	311668	Daudzai Field Mix	412790	311691	TOg 7161a	450421
311703	NSGC 5953	590413	311727	Nahng Sawn	285074	450513	TOg 7257	450513

RICE NUTRITION ENHANCEMENT PROJECT: HIGH PROTEIN LINE DEVELOPMENT AND GRAIN NUTRITIONAL QUALITY

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

INTRODUCTION AND METHODOLOGIES

During the 2009 planting season, a total of 2,000 new putative high protein lines that were developed from Louisiana cultivars and breeding lines was planted in the field in replicated tests. The field was fertilized using 110 lb N/A urea in split applications. The plots were flood irrigated and occasionally drained for weed control purposes. Conventional rice herbicides were used to control weeds. Seed was hand harvested, threshed, dried to 12% moisture content, and stored. A finely ground sample of seed weighing approximately 200 mg was used to determine total crude protein content for each line evaluated. Total crude protein content of the newly developed lines was determined using high temperature digestion of samples at 850° to 1200°C using the N Combustion Analyzer.

Crude protein content as high as 15.26% was found among new entries derived from the cultivar Cocodrie. The highest protein content found among new entries derived from the cultivar Cypress was 14.9%. Typical protein contents in varieties Cocodrie and Cypress are between 7 to 8.5%. A total of 249 lines was developed from Cypress with protein contents ranging from 9.5 to 14.9%. Six lines have crude protein contents of 13.5-14.4%; 14 lines, 12.5-13.4%; 101 lines, 11.5-12.4%; 105 lines, 10.5-11.4%; and 23 lines, 9.5-10.4%. More than 400 new lines developed from Cocodrie have crude protein contents between 9.5 and 15.2%. Among these, five lines have protein contents of 13.5-15.2%; 10 lines, 12.5-13.3%; 41 lines, 11.5-12.4%; 81 lines, 10.5-11.4%; 139 lines, 9.5-10.4%; and 197 lines, 7.0-9.4%.

RESULTS

A total of 474 new lines was developed in Group 1 from the major rice variety Cocodrie (CCDR). Based on replicated data, the total crude protein content of 474 newly developed lines are as follows. Five lines showed a total crude protein content of 13.5-15.2%; 10 lines, 12.5-13.3%; 41 lines, 11.5-12.4%; 81 lines, 10.5-11.4%; 139 lines, 9.5-10.4%; and 197 lines, 7.0-9.4%. Lines with protein content of more than 9.5% will be advanced in 2010 field tests.

Table 1. Protein content of newly developed lines from the variety Cocodrie. Total crude protein content (TCPC) was determined using the Leco TrueSpec® CN Combustion Analyzer. Values are based on three replicates using brown rice harvested from the field.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)	ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
1	CCDR09138001	11.13	38	CCDR 0914841	10.09
2	CCDR 091380010	11.78	39	CCDR 0914851	8.51
3	CCDR 091380011	10.63	40	CCDR 0914861	8.93
4	CCDR 091380013	11.36	41	CCDR 0914871	9.42
5	CCDR 091380015	10.86	42	CCDR 0914881	8.31
6	CCDR 09138002	11.94	43	CCDR 0914891	7.64
7	CCDR 09138002	11.13	44	CCDR 0914911	8.17
8	CCDR 09138003	11.62	45	CCDR 0914921	9.26
9	CCDR 09138004	10.74	46	CCDR 0915011	8.55
10	CCDR 09138005	10.99	47	CCDR 0915021	8.91
11	CCDR 09138006	11.35	48	CCDR 0915031	8.89
12	CCDR 09138008	11.00	49	CCDR 0915071	9.33
13	CCDR 09138009	10.70	50	CCDR 0915081	9.02
14	CCDR 0913801	15.21	51	CCDR 0915091	8.42
15	CCDR 09138010	12.47	52	CCDR 09152001	11.03
16	CCDR 091380102	12.66	53	CCDR 091520010	12.02
17	CCDR 09138011	13.64	54	CCDR 09152002	11.49
18	CCDR 09138012	13.21	55	CCDR 09152003	11.95
19	CCDR 09138013	11.53	56	CCDR 09152004	11.05
20	CCDR 09138014	10.55	57	CCDR 09152005	11.57
21	CCDR 09138015	10.75	58	CCDR 09152006	11.56
22	CCDR 09138016	11.47	59	CCDR 09152007	12.42
23	CCDR 09138017	11.69	60	CCDR 09152008	10.34
24	CCDR 09138018	12.53	61	CCDR 09152009	11.08
25	CCDR 09138019	11.46	62	CCDR 0915261	8.47
26	CCDR 0913802	10.93	63	CCDR 0915271	8.86
27	CCDR 0913803	9.59	64	CCDR 0915281	9.32
28	CCDR 0913804	10.79	65	CCDR 0915321	9.11
29	CCDR 0913805	13.26	66	CCDR 0915331	10.99
30	CCDR 0913806	10.70	67	CCDR 0915341	9.10
31	CCDR 0913808	9.35	68	CCDR 0915541	9.78
32	CCDR 0913809	12.03	69	CCDR 0915551	9.72
33	CCDR 0914801	9.83	70	CCDR 0915561	9.92
34	CCDR 0914802	10.13	71	CCDR 0915571	12.60
35	CCDR 0914811	10.70	72	CCDR 0915581	10.04
36	CCDR 0914821	11.23	73	CCDR 0915641	7.91
37	CCDR 0914831	10.44	74	CCDR 0915651	10.99

Continued.

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
75	CCDR 0915661	10.88
76	CCDR 0915701	11.59
77	CCDR 09157011	10.19
78	CCDR 09157012	11.55
79	CCDR 09157013	10.26
80	CCDR 09157014	10.12
81	CCDR 09157015	10.55
82	CCDR 09157016	8.83
83	CCDR 09157017	9.92
84	CCDR 09157018	10.85
85	CCDR 09157019	12.38
86	CCDR 09157025	11.82
87	CCDR 0915703	10.20
88	CCDR 09157031	10.03
89	CCDR 09157031	9.48
90	CCDR 09157032	8.98
91	CCDR 09157033	11.26
92	CCDR 09157034	10.10
93	CCDR 09157035	9.38
94	CCDR 09157036	9.76
95	CCDR 09157037	8.15
96	CCDR 09157038	9.65
97	CCDR 09157039	9.37
98	CCDR 09157040	9.66
99	CCDR 09157041	9.64
100	CCDR 09157042	10.61
101	CCDR 09157044	9.82
102	CCDR 09157045	11.95
103	CCDR 09157046	9.59
104	CCDR 09157047	11.86
105	CCDR 09157048	13.06
106	CCDR 09157049	8.99
107	CCDR 0915705	11.65
108	CCDR 09157050	10.20
109	CCDR 09157051	10.81
110	CCDR 09157052	10.37
111	CCDR 09157053	9.00
112	CCDR 09157054	10.16
113	CCDR 09157055	11.61
114	CCDR 09157056	10.10
115	CCDR 09157057	10.58
116	CCDR 09157058	8.91
117	CCDR 09157059	10.00
118	CCDR 091570p43	11.61
119	CCDR 09157115	11.90
120	CCDR 09157116	8.78
121	CCDR 09157117	9.47
122	CCDR 09157118	9.10
123	CCDR 09157119	9.62
124	CCDR 09157120	9.68
125	CCDR 09157121	9.36
126	CCDR 09157122	12.76
127	CCDR 09157123	11.91
128	CCDR 09157124	11.27
129	CCDR 09157125	11.98
130	CCDR 09157126	9.28
131	CCDR 09157127	9.67
132	CCDR 09157128	8.76
133	CCDR 09157129	10.95
134	CCDR 09157130	9.34
135	CCDR 09157132	11.58
136	CCDR 09157133	10.98
137	CCDR 09157134	10.61
138	CCDR 09157135	9.17
139	CCDR 09157136	11.06
140	CCDR 09157137	9.35
141	CCDR 09157138	10.71
142	CCDR 09157139	9.01
143	CCDR 09157140	15.26
144	CCDR 09157140	10.33
145	CCDR 09157141	12.45
146	CCDR 09157141	10.70
147	CCDR 09157142	11.41
148	CCDR 09157142	10.81
149	CCDR 09157143	10.42
150	CCDR 09157143	9.82
151	CCDR 09157144	12.74
152	CCDR 09157144	10.05

Continued.

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
153	CCDR 09157145	10.96
154	CCDR 09157145	8.94
155	CCDR 09157146	10.91
156	CCDR 09157146	9.91
157	CCDR 09157147	10.70
158	CCDR 09157147	8.36
159	CCDR 09157148	10.30
160	CCDR 09157148	9.96
161	CCDR 09157149	11.37
162	CCDR 09157149	10.07
163	CCDR 0915715	11.52
164	CCDR 09157150	10.88
165	CCDR 09157151	10.01
166	CCDR 09157152	9.03
167	CCDR 09157153	9.35
168	CCDR 09157154	13.34
169	CCDR 09157155	12.23
170	CCDR 09157156	10.96
171	CCDR 09157157	8.97
172	CCDR 09157158	9.92
173	CCDR 09157159	9.16
174	CCDR 0915721	10.47
175	CCDR 09157215	10.85
176	CCDR 09157216	10.08
177	CCDR 09157217	8.94
178	CCDR 09157218	10.19
179	CCDR 09157219	8.51
180	CCDR 0915722	9.72
181	CCDR 0915723	11.53
182	CCDR 0915724	9.97
183	CCDR 09157240	11.39
184	CCDR 09157241	11.12
185	CCDR 09157243	12.69
186	CCDR 09157244	8.78
187	CCDR 09157245	10.58
188	CCDR 09157248	11.86
189	CCDR 09157249	10.45
190	CCDR 0915725	9.99
191	CCDR 09157250	12.30

Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
192	CCDR 09157251	9.66
193	CCDR 09157252	8.99
194	CCDR 09157253	10.67
195	CCDR 09157254	8.38
196	CCDR 09157255	11.88
197	CCDR 09157256	8.68
198	CCDR 09157257	13.52
199	CCDR 09157258	9.10
200	CCDR 09158001	10.32
201	CCDR 091580010	9.97
202	CCDR 09158002	10.12
203	CCDR 09158003	10.18
204	CCDR 09158004	9.88
205	CCDR 09158006	9.53
206	CCDR 09158007	10.80
207	CCDR 09158008	9.65
208	CCDR 09158009	10.20
209	CCDR 0915801	10.68
210	CCDR 0915801	8.90
211	CCDR 09158010	9.26
212	CCDR 09158011	8.92
213	CCDR 09158012	10.46
214	CCDR 09158013	9.38
215	CCDR 09158014	8.81
216	CCDR 09158015	8.60
217	CCDR 09158016	11.74
218	CCDR 09158017	11.40
219	CCDR 09158018	14.39
220	CCDR 09158019	11.70
221	CCDR 0915802	9.82
222	CCDR 09158020	9.50
223	CCDR 0915803	9.55
224	CCDR 0915804	9.48
225	CCDR 0915806	9.89
226	CCDR 0915807	10.10
227	CCDR 0915808	10.58
228	CCDR 0915809	11.57
229	CCDR 091580b05	9.92
230	CCDR 0915871	8.95

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
231	CCDR 0915881	8.53
232	CCDR 0916271	10.04
233	CCDR 0916272	10.55
234	CCDR 0916273	8.75
235	CCDR 0916274	9.72
236	CCDR 0916281	11.06
237	CCDR 0916283	10.79
238	CCDR 0916284	10.29
239	CCDR 0916284	9.60
240	CCDR 0916291	11.55
241	CCDR 0916292	10.06
242	CCDR 0916293	9.18
243	CCDR 0916294	9.98
244	CCDR 0916295	10.67
245	CCDR 0916361	9.35
246	CCDR 0916371	8.07
247	CCDR 0916381	7.50
248	CCDR 0916401	9.23
249	CCDR 0916491	8.53
250	CCDR 0916511	9.82
251	CCDR 0916741	9.87
252	CCDR 0916751	10.98
253	CCDR 0916761	10.20
254	CCDR 0916771	8.81
255	CCDR 0916781	8.43
256	CCDR 0916791	9.97
257	CCDR 09168001	9.55
258	CCDR 091680010	10.18
259	CCDR 09168002	9.33
260	CCDR 09168004	9.48
261	CCDR 09168005	10.18
262	CCDR 09168006	9.69
263	CCDR 09168007	9.47
264	CCDR 09168008	10.20
265	CCDR 09168009	10.37
266	CCDR 0916801	8.49
267	CCDR 0916801	8.26
268	CCDR 0916931	8.86
269	CCDR 0916941	10.61

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
270	CCDR 0916951	9.53
271	CCDR 0917031	8.85
272	CCDR 0917032	9.04
273	CCDR 0917033	9.65
274	CCDR 0917034	9.94
275	CCDR 0917035	10.18
276	CCDR 0917044	10.48
277	CCDR 0917045	10.03
278	CCDR 0917051	11.21
279	CCDR 0917052	11.27
280	CCDR 0917053	10.30
281	CCDR 0917054	9.68
282	CCDR 0917055	10.15
283	CCDR 0917056	11.48
284	CCDR 0917122	9.29
285	CCDR 0917123	8.35
286	CCDR 0917131	10.27
287	CCDR 0917132	9.91
288	CCDR 0917133	8.97
289	CCDR 0917134	8.63
290	CCDR 0917135	8.19
291	CCDR 0917136	8.47
292	CCDR 0917141	9.59
293	CCDR 0917142	10.57
294	CCDR 0917142	9.40
295	CCDR 0917143	8.85
296	CCDR 0917144	8.38
297	CCDR 0917145	9.23
298	CCDR 0917221	8.88
299	CCDR 0917231	7.86
300	CCDR 0917241	9.70
301	CCDR 0917371	8.96
302	CCDR 0917381	9.09
303	CCDR 0917391	11.01
304	CCDR 0917441	9.35
305	CCDR 0917451	9.58
306	CCDR 0917461	8.03
307	CCDR 0917631	8.76
308	CCDR 0917641	8.19

Continued.

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
309	CCDR 0917651	8.83
310	CCDR 0917781	9.48
311	CCDR 0917791	8.30
312	CCDR 09178001	9.40
313	CCDR 091780010	9.51
314	CCDR 09178002	9.11
315	CCDR 09178003	9.47
316	CCDR 09178004	9.11
317	CCDR 09178005	9.24
318	CCDR 09178006	9.42
319	CCDR 09178007	9.45
320	CCDR 09178008	9.05
321	CCDR 09178009	9.25
322	CCDR 0917801	10.01
323	CCDR 0917801	8.74
324	CCDR 09178010	10.28
325	CCDR 09178011	11.16
326	CCDR 09178012	10.83
327	CCDR 09178013	10.30
328	CCDR 09178014	10.86
329	CCDR 09178015	8.21
330	CCDR 09178016	8.08
331	CCDR 09178017	10.28
332	CCDR 09178018	10.06
333	CCDR 09178019	10.90
334	CCDR 0917802	9.59
335	CCDR 09178020	9.60
336	CCDR 0917803	8.56
337	CCDR 0917804	9.71
338	CCDR 0917805	8.99
339	CCDR 0917806	8.89
340	CCDR 0917807	9.46
341	CCDR 0917808	10.19
342	CCDR 0917809	9.18
343	CCDR 0917821	9.05
344	CCDR 0917831	9.13
345	CCDR 0917841	10.46
346	CCDR 0917972	11.93
347	CCDR 0917973	8.90

Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
348	CCDR 0917981	10.21
349	CCDR 0917982	11.46
350	CCDR 0917983	9.70
351	CCDR 0917984	9.74
352	CCDR 0917985	12.34
353	CCDR 0917991	12.18
354	CCDR 0917992	11.31
355	CCDR 0917993	10.73
356	CCDR 0917994	10.34
357	CCDR 0917995	11.00
358	CCDR 0918011	9.55
359	CCDR 0918021	10.36
360	CCDR 0918031	10.01
361	CCDR 0918101	10.07
362	CCDR 0918111	7.93
363	CCDR 0918121	9.21
364	CCDR 0918131	9.26
365	CCDR 0918201	10.73
366	CCDR 0918731	10.45
367	CCDR 0918811	10.94
368	CCDR 0918821	9.37
369	CCDR 0918921	8.94
370	CCDR 0918931	9.12
371	CCDR 0918941	9.79
372	CCDR 0918951	9.80
373	CCDR 0918961	10.00
374	CCDR 0918971	9.64
375	CCDR 0919201	10.30
376	CCDR 0919221	10.27
377	CCDR 0919231	8.14
378	CCDR 0919461	9.42
379	CCDR 0919471	9.08
380	CCDR 0919481	8.19
381	CCDR 0919581	9.33
382	CCDR 0919591	9.63
383	CCDR 0919651	9.57
384	CCDR 0919661	9.28
385	CCDR 0919681	8.84
386	CCDR 0919682	8.21

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
387	CCDR 0919683	8.18
388	CCDR 0919684	7.37
389	CCDR 0919685	8.45
390	CCDR 0919686	8.73
391	CCDR 0919687	9.00
392	CCDR 0919691	11.58
393	CCDR 09196910	10.20
394	CCDR 09196911	7.94
395	CCDR 0919692	8.34
396	CCDR 0919693	8.46
397	CCDR 0919694	8.60
398	CCDR 0919695	9.55
399	CCDR 0919696	9.04
400	CCDR 0919697	8.21
401	CCDR 0919698	10.38
402	CCDR 0919699	7.92
403	CCDR 0919701	8.41
404	CCDR 09197010	9.26
405	CCDR 09197011	9.11
406	CCDR 0919702	8.87
407	CCDR 0919703	8.27
408	CCDR 0919704	8.31
409	CCDR 0919705	10.84
410	CCDR 0919706	8.73
411	CCDR 0919707	9.80
412	CCDR 0919708	9.37
413	CCDR 0919709	9.55
414	CCDR 09197112	9.27
415	CCDR 09197115	8.94
416	CCDR 09197116	9.81
417	CCDR 09197117	11.31
418	CCDR 09197120	9.65
419	CCDR 09197211	9.84
420	CCDR 09197212	9.28
421	CCDR 09197214	12.31
422	CCDR 09197216	9.49
423	CCDR 09197218	11.38
424	CCDR 09197312	9.19
425	CCDR 09197315	9.67
426	CCDR 09197316	10.03
427	CCDR 09197317	8.73
428	CCDR 09197319	9.90
429	CCDR 09197410	10.32
430	CCDR 0919742	7.51
431	CCDR 0919743	7.66
432	CCDR 0919744	9.84
433	CCDR 0919745	7.27
434	CCDR 0919746	8.12
435	CCDR 0919747	9.42
436	CCDR 0919748	8.88
437	CCDR 0919749	8.52
438	CCDR 0919751	8.31
439	CCDR 09197511	7.35
440	CCDR 0919752	9.25
441	CCDR 0919753	7.59
442	CCDR 0919754	7.50
443	CCDR 0919755	7.33
444	CCDR 0919756	8.48
445	CCDR 0919757	7.75
446	CCDR 0919758	8.12
447	CCDR 0919759	7.70
448	CCDR 0919761	8.60
449	CCDR 09197610	8.39
450	CCDR 0919762	8.26
451	CCDR 0919763	9.63
452	CCDR 0919764	7.65
453	CCDR 0919765	7.30
454	CCDR 0919766	7.71
455	CCDR 0919767	9.08
456	CCDR 0919768	7.89
457	CCDR 0919769	8.03
458	CCDR 0919801	7.03
459	CCDR 09198010	7.96
460	CCDR 09198011	11.28
461	CCDR 09198012	9.48
462	CCDR 09198013	8.44
463	CCDR 09198014	10.33
464	CCDR 09198015	7.80

Continued.

Table 1. Continued.

ENTRY	COCODRIE-DERIVED LINES	TCPC % (w/w)
465	CCDR 09198016	9.82
466	CCDR 0919802	8.90
467	CCDR 0919803	9.40
468	CCDR 0919804	8.01
469	CCDR 0919805	8.29
470	CCDR 0919807	8.48
471	CCDR 0919808	9.03
472	CCDR 0919809	7.62
473	CCDR 0919821	9.78
474	CCDR 0968003	9.89

A total of 249 lines developed from Cypress have protein contents ranging from 9.5 to 14.9%. The total crude protein contents of these lines are shown in Table 2. Data based on three replicates using brown rice harvested from the field. Among these lines, six have crude protein contents of 13.5-14.4%, 14 lines have 12.5-13.4%, 101 lines have 11.5-12.4%, 105 lines have 10.5-11.4, and 23 lines have 9.5 and 10.4%.

Table 2. Protein contents of high protein lines developed from Cypress (CPRS). Total crude protein content was determined using the Leco TrueSpec® CN Combustion Analyzer. Values are based on three replicates using brown rice harvested from the field.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
1	CPRS09RP1101	11.584
2	CPRS09RP1105	10.148
3	CPRS09RP1107	9.8262
4	CPRS09RP1108	10.93
5	CPRS09RP1110	9.5933
6	CPRS09RP1111	10.859
7	CPRS09RP1113	9.8368
8	CPRS09RP1114	10.142
9	CPRS09RP1116	10.408
10	CPRS09RP1117	11.016
11	CPRS09RP1118	11.729
12	CPRS09RP1120	10.424
13	CPRS09RP1122	14.922
14	CPRS09RP11221	11.398
15	CPRS09RP112210	10.744
16	CPRS09RP112211	11.67
17	CPRS09RP11222	11.41
18	CPRS09RP11223	11.182
19	CPRS09RP11224	11.27
20	CPRS09RP11225	11.307
21	CPRS09RP11226	10.97
22	CPRS09RP11227	11.259
23	CPRS09RP11228	11.472
24	CPRS09RP11229	11.528
25	CPRS09RP1123	12.294
26	CPRS09RP1124	10.978
27	CPRS09RP1125	10.641
28	CPRS09RP119	11.032
29	CPRS09RP1211	11.479
30	CPRS09RP12110	11.885
31	CPRS09RP12111	11.852
32	CPRS09RP1212	11.532
33	CPRS09RP1213	11.475
34	CPRS09RP1213	12.08
35	CPRS09RP1214	11.204
36	CPRS09RP1214	11.814
37	CPRS09RP1215	11.456
38	CPRS09RP1215	11.355
39	CPRS09RP1216	11.646
40	CPRS09RP1216	12.038
41	CPRS09RP1217	11.696
42	CPRS09RP1218	11.446
43	CPRS09RP1218	11.449
44	CPRS09RP1219	11.456

Continued.

Table 2. Continued.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
45	CPRS09RP1219	12.102
46	CPRS09RP170	11.981
47	CPRS09RP171	10.752
48	CPRS09RP172	9.9874
49	CPRS09RP175	10.739
50	CPRS09RP176	10.405
51	CPRS09RP177	10.198
52	CPRS09RP178	11.06
53	CPRS09RP183	11.767
54	CPRS09RP185	9.8897
55	CPRS09RP195	10.976
56	CPRS09RP197	11.879
57	CPRS09RP2100	11.273
58	CPRS09RP2101	11.088
59	CPRS09RP2102	10.906
60	CPRS09RP2103	11.859
61	CPRS09RP2104	12.413
62	CPRS09RP2105	11.995
63	CPRS09RP2106	10.906
64	CPRS09RP2107	10.877
65	CPRS09RP2108	10.851
66	CPRS09RP2109	11.526
67	CPRS09RP211	12.059
68	CPRS09RP2110	12.305
69	CPRS09RP2110	11.973
70	CPRS09RP2111	12.423
71	CPRS09RP2111	11.265
72	CPRS09RP2112	10.422
73	CPRS09RP2113	10.987
74	CPRS09RP2114	11.212
75	CPRS09RP2115	10.507
76	CPRS09RP2117	11.425
77	CPRS09RP2118	12.131
78	CPRS09RP2119	11.279
79	CPRS09RP212	12.126
80	CPRS09RP2120	11.009
81	CPRS09RP2123	11.173
82	CPRS09RP2124	11.332
83	CPRS09RP2125	10.315

Continued.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
84	CPRS09RP213	12.068
85	CPRS09RP214	12.204
86	CPRS09RP215	12.263
87	CPRS09RP216	12.153
88	CPRS09RP217	12.066
89	CPRS09RP2171	12.395
90	CPRS09RP21710	13.391
91	CPRS09RP21711	12.409
92	CPRS09RP21712	12.786
93	CPRS09RP2172	12.611
94	CPRS09RP2173	12.333
95	CPRS09RP2174	12.702
96	CPRS09RP2175	12.214
97	CPRS09RP2176	12.633
98	CPRS09RP2177	12.359
99	CPRS09RP2178	12.927
100	CPRS09RP2179	12.05
101	CPRS09RP218	12.057
102	CPRS09RP219	11.68
103	CPRS09RP231	12.066
104	CPRS09RP238	12.01
105	CPRS09RP239	12.125
106	CPRS09RP240	12.272
107	CPRS09RP241	10.97
108	CPRS09RP242	11.008
109	CPRS09RP243	11.66
110	CPRS09RP244	11.35
111	CPRS09RP245	11.189
112	CPRS09RP246	11.279
113	CPRS09RP247	11.798
114	CPRS09RP249	11.575
115	CPRS09RP250	10.83
116	CPRS09RP251	11.036
117	CPRS09RP252	11.618
118	CPRS09RP253	11.352
119	CPRS09RP254	11.8
120	CPRS09RP255	11.404
121	CPRS09RP256	11.633
122	CPRS09RP257	12.234

Table 2. Continued.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
123	CPRS09RP258	11.69
124	CPRS09RP259	11.875
125	CPRS09RP26	13.162
126	CPRS09RP260	10.902
127	CPRS09RP262	11.07
128	CPRS09RP263	9.998
129	CPRS09RP264	11.349
130	CPRS09RP265	10.822
131	CPRS09RP266	11.571
132	CPRS09RP267	11.485
133	CPRS09RP268	10.428
134	CPRS09RP269	11.261
135	CPRS09RP270	11.064
136	CPRS09RP271	12.784
137	CPRS09RP2711	11.841
138	CPRS09RP27110	12.164
139	CPRS09RP27111	12.471
140	CPRS09RP27112	12.349
141	CPRS09RP2712	12.011
142	CPRS09RP2713	12.218
143	CPRS09RP2714	11.87
144	CPRS09RP2715	12.367
145	CPRS09RP2716	12.403
146	CPRS09RP2717	12.068
147	CPRS09RP2718	12.176
148	CPRS09RP2719	12.116
149	CPRS09RP272	12.145
150	CPRS09RP273	11.385
151	CPRS09RP274	11.415
152	CPRS09RP276	12.243
153	CPRS09RP277	12.312
154	CPRS09RP278	11.538
155	CPRS09RP279	11.786
156	CPRS09RP280	11.572
157	CPRS09RP282	12.527
158	CPRS09RP283	11.736
159	CPRS09RP284	11.208
160	CPRS09RP285	11.237
161	CPRS09RP286	10.948

Continued.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
162	CPRS09RP288	11.812
163	CPRS09RP289	11.332
164	CPRS09RP290	11.312
165	CPRS09RP291	11.853
166	CPRS09RP293	11.347
167	CPRS09RP295	11.037
168	CPRS09RP296	11.429
169	CPRS09RP297	11.645
170	CPRS09RP299	11.212
171	CPRS09RP310	11.239
172	CPRS09RP3101	10.469
173	CPRS09RP3102	10.415
174	CPRS09RP3103	10.873
175	CPRS09RP3104	10.914
176	CPRS09RP3105	11.732
177	CPRS09RP3106	11.72
178	CPRS09RP311	11.23
179	CPRS09RP312	11.869
180	CPRS09RP3121	10.865
181	CPRS09RP3122	11.418
182	CPRS09RP313	10.978
183	CPRS09RP314	11.377
184	CPRS09RP315	10.994
185	CPRS09RP316	11.126
186	CPRS09RP317	11.219
187	CPRS09RP318	10.414
188	CPRS09RP320	11.065
189	CPRS09RP321	10.451
190	CPRS09RP326	11.185
191	CPRS09RP327	11.789
192	CPRS09RP328	13.272
193	CPRS09RP333	13.122
194	CPRS09RP334	11.334
195	CPRS09RP335	11.575
196	CPRS09RP336	11.508
197	CPRS09RP337	11.313
198	CPRS09RP340	12.271
199	CPRS09RP341	10.794
200	CPRS09RP342	12.697

Table 2. Continued.

ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)	ENTRY	CYPRESS-DERIVED LINES	TCPC % (w/w)
201	CPRS09RP343	12.433	226	CPRS09RP371	11.163
202	CPRS09RP344	10.997	227	CPRS09RP372	10.907
203	CPRS09RP346	11.426	228	CPRS09RP373	11.064
204	CPRS09RP347	11.018	229	CPRS09RP374	11.376
205	CPRS09RP349	11.475	230	CPRS09RP377	10.78
206	CPRS09RP350	11.478	231	CPRS09RP378	12.598
207	CPRS09RP351	13.085	232	CPRS09RP379	12.119
208	CPRS09RP352	12.223	233	CPRS09RP380	11.622
209	CPRS09RP353	12.364	234	CPRS09RP3811	12.218
210	CPRS09RP355	11.205	235	CPRS09RP38110	12.108
211	CPRS09RP356	10.271	236	CPRS09RP38111	12.084
212	CPRS09RP357	10.872	237	CPRS09RP3812	12.495
213	CPRS09RP358	10.421	238	CPRS09RP3813	12.027
214	CPRS09RP359	12.304	239	CPRS09RP3814	12.316
215	CPRS09RP36	11.45	240	CPRS09RP3815	13.172
216	CPRS09RP360	12.019	241	CPRS09RP3816	12.699
217	CPRS09RP361	11.177	242	CPRS09RP3817	12.771
218	CPRS09RP362	11.616	243	CPRS09RP3818	12.827
219	CPRS09RP363	11.57	244	CPRS09RP3819	12.575
220	CPRS09RP366	10.543	245	CPRS09RP384	10.933
221	CPRS09RP367	12.531	246	CPRS09RP385	11.967
222	CPRS09RP368	11.933	247	CPRS09RP386	11.258
223	CPRS09RP369	12.174	248	CPRS09RP387	10.752
224	CPRS09RP37	10.995	249	CPRS09RP39	10.42
225	CPRS09RP370	11.128			

Amino acid profiles for nine selected high protein lines are presented in Tables 3 and 4. Percent increase for essential amino acid content is presented in Table 5, while those for the non-essential amino acid are in Table 6. The lysine biosynthetic branch is strongly regulated by a feedback inhibition loop in which lysine inhibits the activity of dihydrodipicolinate synthase (DHDPS), the first enzyme specifically committed to lysine biosynthesis. Research from tobacco plants showed that the mutated DHDPS gene caused the enzyme to be insensitive to lysine and triggered lysine overproduction.

Table 3. Essential amino acid profile for nine selected high protein lines derived from varieties Cypress, Cocodrie, and Wells.

ENTRY[¶]	Threonine[¶]	Valine[¶¶]	Methionine[¶]	Isoleucine[¶]	Leucine[¶¶]	Phenylalanine[¶]	Lysine[¶¶]
CCDR091380	2.7	4.3	2	2.9	6.1	4.1	2.9
CPRS09RP147	3.1	5.1	1.9	3.6	7.8	5.2	3.1
CCDR0913801	3.4	5.7	2	3.9	8.4	5.7	3.5
CCDR09138011	3.4	5.5	2.4	3.7	7.9	5.4	3.6
CCDR09157048	2.9	4.8	1.8	3.3	7.2	4.9	2.9
CCDR09157154	3	4.8	2.1	3.3	7.2	4.8	2.9
CCDR09157257	4.3	7	2.7	4.8	10.3	7.1	4.3
CCDR0915802	2.7	4.3	1.8	2.9	6.2	4.2	2.8
WELLS09128	3.8	5.6	2.5	4.3	9.1	5.8	3.7
CCDR	2.3	3.7	1.6	2.5	5.3	3.6	2.4
CPRS	2.4	3.6	1.9	2.8	5.6	3.6	2.7
Wells	2.5	3.8	2.0	2.9	5.8	3.7	2.7
MIN	2.3	3.6	1.6	2.5	5.3	3.6	2.4
MAX	4.3	7	2.7	4.8	10.3	7.1	4.3
STDEV	0.60	1.00	0.32	0.68	1.53	1.07	0.54

[¶] CCDR = Cocodrie-derived lines, CPRS = Cypress-derived line, and WELLS = Wells-derived lines.
[¶¶] Essential amino acid (mg amino acid/gram of product) across selected lines.

Table 4. Non-essential amino acid profile for nine selected high protein lines derived from varieties Cypress, Cocodrie, and Wells.

Selected Lines[¶]	Aspartic acid[¶¶]	Serine[¶¶]	Glutamic acid[¶¶]	Proline[¶¶]	Glycine[¶¶]	Alanine[¶¶]	Tyrocine[¶¶]	Histidine[¶¶]	Arginine[¶¶]
CCDR091380	7	3.4	13.3	3.1	3.2	4	3.7	**1.9**	7
CPRS09RP147	8.2	4	16.3	3.7	3.7	4.7	4.2	2.2	8.1
CCDR0913801	9.1	4.4	17.7	4.1	4.1	5.1	4.8	2.4	9.1
CCDR09138011	9	4.2	17.2	4	4	5	4.8	2.4	9.2
CCDR09157048	7.8	3.8	15.4	3.5	3.4	4.4	4.1	2.1	7.7
CCDR09157154	7.7	3.7	15.1	3.5	3.4	4.4	4	2	7.5
CCDR09157257	11.5	5.5	22.2	5	5	6.2	6.3	3	11.5
CCDR0915802	6.9	3.4	13.4	3.1	3.1	3.9	3.7	1.8	6.9
WELLS09128	10.4	3.6	19.3	4.4	4.4	5.5	4.5	2.7	8.7
CCDR	5.9	2.7	11.2	2.7	2.7	3.4	2.8	1.6	5.7
CPRS	6.1	3.2	11.5	2.8	2.9	3.5	3	1.8	5.7
Wells	6.6	3.2	11.9	2.9	3.0	3.7	3.6	1.9	6.2
MAX	11.50	5.50	22.20	5.00	5.00	6.20	6.30	3.00	11.50
MIN	7.00	3.40	13.30	3.10	3.20	4.00	3.70	1.90	7.00
STDEV	1.91	0.84	3.73	0.78	0.77	0.95	1.07	0.46	1.91

[¶] CCDR = Cocodrie-derived lines, CPRS = Cypress-derived line, and WELLS = Wells-derived lines.
[¶¶] Essential amino acid (mg amino acid/gram of product) across selected lines.

Table 5. Improvement in essential amino acid profile for nine selected high protein lines compared with varieties Cypress, Cocodrie, and Wells.

Selected Lines[¶]	THR (T)[¶¶]	VAL (V)[¶¶]	MET (M)[¶¶]	ILE (I)[¶¶]	LEU (L)[¶¶]	PHE (F)[¶¶]	LYS (K)[¶¶]
CCDR091380	17.39	16.22	25.00	16.00	15.09	13.89	20.83
CPRS09RP147	34.78	37.84	18.75	44.00	47.17	44.44	29.17
CCDR0913801	47.83	54.05	25.00	56.00	58.49	58.33	45.83
CCDR09138011	47.83	48.65	50.00	48.00	49.06	50.00	50.00
CCDR09157048	26.09	29.73	12.50	32.00	35.85	36.11	20.83
CCDR09157154	30.43	29.73	31.25	32.00	35.85	33.33	20.83
CCDR09157257	86.96	89.19	68.75	92.00	94.34	97.22	79.17
CCDR0915802	17.39	16.22	12.50	16.00	16.98	16.67	16.67
WELLS09128	52.00	51.35	56.25	72.00	71.70	61.11	54.17

[¶] CCDR = Cocodrie-derived lines, CPRS = Cypress-derived line, and WELLS = Wells-derived lines.
[¶¶] Improvement in non-essential amino acid (%) across selected lines compared with variety Cypress, Cocodrie, or Wells.

Table 6. Improvement in non-essential amino acid profile for nine selected high protein lines compared with varieties Cypress, Cocodrie, and Wells.

Selected Lines[¶]	Aspartic acid[¶¶]	Serine[¶¶]	Glutamic acid[¶¶]	Proline[¶¶]	Glycine[¶¶]	Alanine[¶¶]	Tyrocine[¶¶]	Histidine[¶¶]	Arginine[¶¶]
CCDR091380	18.64	25.93	18.75	14.81	18.52	17.65	32.14	18.75	22.81
CPRS09RP147	38.98	40.63	44.35	35.71	34.48	37.14	46.67	33.33	42.11
CCDR0913801	54.24	62.96	58.04	51.85	51.85	50.00	71.43	50.00	59.65
CCDR09138011	52.54	55.56	53.57	48.15	48.15	47.06	71.43	50.00	61.40
CCDR09157048	32.20	18.75	33.91	25.00	17.24	25.71	36.67	16.67	35.09
CCDR09157154	30.51	37.04	34.82	29.63	25.93	29.41	42.86	25.00	31.58
CCDR09157257	94.92	103.70	98.21	85.19	85.19	82.35	125.00	87.50	101.75
CCDR0915802	16.95	25.93	19.64	14.81	14.81	14.71	32.14	12.50	21.05
WELLS09128	57.58	12.50	62.18	51.72	46.67	48.65	25.00	42.11	40.32

[¶] CCDR = Cocodrie-derived lines, CPRS = Cypress-derived line, and WELLS = Wells-derived lines.
[¶¶] Improvement in non-essential amino acid (%) across selected lines compared with variety Cypress, Cocodrie, or Wells.

RICE AGRONOMY[1]

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

INTRODUCTION

The following three sections of the report document 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 multiple Louisiana rice production areas. Rice nutrition studies were conducted in Acadia Parish at the Rice Research Station and on cooperator farms located in Acadia, Vermilion, and Richland parishes. Cultural management studies were conducted at the Rice Research Station North and South units.

We would like to express our sincere appreciation to the following off-station cooperators for their assistance in conducting this research. Our efforts would not be successful without their support:

Lounsberry Farms – Vermilion Parish
Elliot Colvin – Richland Parish
Dennis and Bubba Leonards – Acadia Parish
Christian Richard – Vermilion Parish

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.

[1] This research was supported in part by funds provided by rice producers through the Louisiana Rice Research Board.

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

Abbreviation	Explanation
A	Acre
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^2	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^o angle) and 5 = lodged to ground (90^o angle)
K	Potassium
Main	First rice crop; crop growth stage prior to first harvest
Mg	Magnesium
Na	Sodium
NA	Information not available/applicable
oz/A	Ounces product per acre
P	Phosphorus
PD	Panicle differentiation
PI	Panicle initiation
pl/m^2	Plant densities measures 14 days after seeding emergence by counting the main-stem numbers in a randomly selected area of 1 m^2 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
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
Herbicides				
	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
	RiceBeaux	Propanil + Thiobencarb		Riceco 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
Insecticides				
	Dermacor	Rynaxypyr		DuPont
	Karate Z	Cyhalothrin	2.08 lb	Syngenta
	Mustang Max	Zeta-cypermethrin	0.8	FMC Corp.
		Methyl Parathion	4 lb	Cheminova
Fungicides				
	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 NUTRITION RESEARCH

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

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 uptake efficiency. Environmental influences also impact the N rate needed to produce optimum yields. Theses include such factors as soil type, weather, and 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) and Richland (RP) parishes. The soils at RRS, VP, and RP are classified as Crowley silt loam, Kaplan silt loam, and Perry clay, respectively. Nine single preflood N rates (0, 30, 60, 90, 120, 150, 180, 210, and 270 lb/A) and 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 are all determined. Ratoon data are 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 the Rice Varieties and Management Tips 2010, LAES publication number 2270. Electronic copies of this publication can be accessed from the LSU AgCenter Website: (http://www.lsuagcenter.com). Eight conventional rice varieties, one experimental rice line, and one hybrid were evaluated for their response to nitrogen in 2009.

At the VP site, all variety by N trials were drill seeded into a conventionally tilled seedbed on March 11 and were harvested on August 11. The soil at this site is classified as a Kaplan silt loam. This site traditionally has a higher disease pressure and generally is less responsive to N fertilization compared with other sites. Statistically, optimum grain yields at the VP were obtained after applying 120 lb N/A for 'Catahoula,' 'Neptune,' 'CL111,' and 'Templeton,' and 60 lb N/A for 'Jazzman,' 'CL151,' 'CL171,' 'Bowman,' and 'Taggart.'

At the RP site, all variety by N trials were drill seeded in a spring stale seedbed on April 23 and were harvested on August 26. The soil is classified as a Perry clay. Optimum grain yields at RP were 90 lb/A for Neptune, CL111, Bowman, and Taggart; 60 lb/A for CL151; 120 lb/A for Catahoula; 150 lb/A for Jazzman; and 180 lb/A for CL171 and Templeton. The hybrid 'Arize' was optimized at 90 lb N/A.

At the RRS, most variety by N trials were compromised due to herbicide drift. Report summary tables of these trails are included in this report as a record of the work done.

Ratoon Rice Fertility Experiments

A trial was conducted to evaluate the response of Cocodrie and CL151 ratoon yields to various N sources and rates. Nitrogen sources included urea, ammonium sulfate (AS), and a 1:1 N based blend of urea and AS. Rates of N were 45, 90, and 135 lb/A. Analysis of variance results (data not shown) indicated that a significant ratoon yield response to N source was not observed. However, a significant ratoon yield response ($P = 0.005$) was seen for N rate. Ratoon grain yield means for the 45, 90, and 135 lb/A N rates were 2138, 2509, and 2431 lb/A, respectively (LSD = 268 lb/A). Yields were optimized at an N rate of 90 lb/A. A significant variety response was also observed ($P < 0.001$). Overall mean yields across N rates for Cocodrie and CL151 were 1910 and 3008, respectively (LSD = 229 lb/A).

A trial was initiated in 2008 to evaluate the ratoon yield response of Catahoula and Neptune to various rates of N. Six post harvest rates of N (0, 30, 60, 90, 120, and 150 lb/A) were evaluated. All plots received 150 lb/A prior to permanent flood establishment in the first crop. Analysis of variance indicated that ratoon yields of Neptune (3,060 lb/A) were statistically similar to Cheniere (2,747 lb/A; data not shown). Ratoon yields were highly variable between replications (CV = 34.3), therefore, optimum N rates were not determined from this dataset.

A trial was initiated to evaluate the effectiveness of Agrotain-treated urea compared with untreated urea in ratoon rice production. Two N sources (Agrotain-treated urea and urea) and six N rates (0, 30, 60, 90, 120, and 150 lb/A) were evaluated in the trial. First crop rice was fertilized with urea at rate of 150 lb N/A after harvest. Cheniere was the rice variety grown. Ratoon yield variation was high between replications (CV = 29). Nonetheless, optimal N rate for the Agrotain-treated urea and untreated urea was 90 and 120 lb/A, respectively.

Other Fertility Experiments

A fertility trial was conducted to evaluate the effectiveness of integrating supplemental foliar fertilization using Biagro products Nutri-Phite Ultra and Nutri-Phite Sulfone Ultra. Nutri-Phite Ultra contained 3% N, 20% P_2O_5, 7% K_2O, 0%S, and 0.5% EDTA chelated Mn and Zn. Nutri-Phite Sulfone Ultra contained 10% N, 20% P_2O_5, 0% K_2O, 15% S, and < 1% Fe, Mn, Mo, and Zn. The supplemental fertilization program called for 32 and 64 oz/A Nutri-Phite Ultra applied foliarly at the 2- to 4-leaf and flowering stages of growth, respectively, and 3 lb/A Nutri-Phite Sulfone Ultra at boot. The trial was conducted in RP using Cheniere rice drill seeded into a Perry clay soil. Urea N was applied preflood at a rate of 150 lb/A. Rice grain yields were similar between the check (10,356 lb/A) and the supplemental Biagro fertilization program (10,374 lb/A). The additional foliar fertilization did not improve rice grain yields.

A season-long N uptake trial was conducted in 2009. The trial evaluated three cultivars (Catahoula, Neptune, and XL723). Nitrogen fertilizer was applied at a rate of 150 lb/A using a single preflood application or split using 100 lb/A preflood and 50 lb/A at the panicle differentiation stage of growth. In addition, a check plot was included to evaluate N uptake when inorganic N fertilization is not used. Plant tissue samples were taken 1 day prior to permanent flood establishment and continued two times a week until 50% heading was reached. Preliminary data are included in this report; however, a complete summary and analysis of this data will be conducted at a later date.

Evaluation of spectral reflectance, a nondestructive measurement, to evaluate midseason N needs was evaluated for a third and final year. Thirteen combinations of N rate and timing were used in the evaluation. Separate trials evaluated the cultivars Cocodrie, XL723, and Wells. Yield results are summarized in this report; however, reflectance data will be summarized and reported at a later time.

A zinc (Zn) fertility trial was conducted at the Leonards Farm in Acadia Parish in 2009. Initial soil test results indicated a Zn concentration of 1 ppm (Mehlich3) at the location. Average pH was 7.9. This trial consisted of five Zn rates (0, 5, 10, 15, and 20 lb/A) and two N sources (urea vs. ammonium sulfate). The Zn source was zinc sulfate, which was surface broadcast at planting. Ammonium sulfate (AS; 21-0-0-24) fertilizer was surface broadcast at planting to all plots at a rate of 100 lb/A. The AS provided 21 lb N/A as a starter N fertilizer and also provided 24 lb of SO_4-S. Leaf samples were taken just prior to permanent flood establishment and again at 50% heading. A yield response to N source was not observed. Yield was optimized at a rate of 15 lb Zn/A using both urea and AS.

A similar Zn trial was conducted in VP on the Richard Farm. The soil at this site was a Kaplan silt loam. Soil test Zn, as determined by the Mehlich3 soil test extraction, was 2.0 ppm. Soil pH at the site was 6.8. The rice variety used in the trial was CL151. Yield was not improved with the application of Zn.

Rice Variety by Nitrogen Experiments at the Rice Research Station

Experiment number	09-CM-01 to 09-CM-09
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Conventional
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	1.32
pH	6.95
Extractable nutrients ppm	Ca-1,286; Cu-1.66; Mg-215; P-21; K-61; Na-79.8; S-14.9; Zn-6.93
Crop/Variety	Rice / See Data Sheet
Planting method/date	Drill seeded / March 23
Seeding rate/depth	40 seeds/ft^2 / .5 inches
Emergence date	April 4
Harvest date	August 13
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	240 lb/A 0-24-24-2.8, March 23
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	August 3
Pest management	
Herbicides	1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 1. Determine the agronomic response of drill-seeded Catahoula (302082) to nitrogen fertilizer rate and time of application (3.1). Evaluate Greenseeker technology. Evaluate N soil test. Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description											Tissue		Tissue	
Part Rated											Abvgrd		Abvgrd	
Rating Date							8/12/09		8/13/09					
Rating Type					50% Head		Height		Yield		Biomass		Biomass	
Rating Unit					days		in		lb/A		dry wt (g)		dry wt (g)	
Sample Size, Unit											3 ft		3 ft	
Collection Basis, Unit											1 row		1 row	
Crop Stage Majority					Main		Main		Main		PD		50%head	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	101	bcd	25	g	3272	f	26	d	83	e
2	UREA	30	lb ai/A	4-5 leaf	100	de	28	def	5659	e	56	c	146	d
3	UREA	60	lb ai/A	4-5 leaf	100	de	27	fg	6194	e	59	bc	231	ab
4	UREA	90	lb ai/A	4-5 leaf	101	de	30	c-f	7075	d	72	ab	233	ab
5	UREA	120	lb ai/A	4-5 leaf	101	b-e	31	bcd	8005	bc	71	ab	218	b
6	UREA	150	lb ai/A	4-5 leaf	102	ab	32	abc	8646	ab	63	abc	241	ab
7	UREA	180	lb ai/A	4-5 leaf	102	ab	32	abc	8480	ab	72	ab	157	cd
8	UREA	210	lb ai/A	4-5 leaf	103	a	33	ab	8113	abc	69	abc	245	ab
9	Urea	270	lb ai/A	4-5 leaf	102	ab	34	a	8809	a	74	a	206	bcd
10	UREA	45	lb ai/A	4-5 leaf	100	e	29	def	5684	e	59	bc	191	bcd
	UREA	45	lb ai/A	PD										
11	UREA	75	lb ai/A	4-5 leaf	100	de	28	def	7440	cd	70	abc	220	b
	UREA	45	lb ai/A	PD										
12	UREA	105	lb ai/A	4-5 leaf	101	bcd	30	cde	7413	cd	73	ab	208	bc
	UREA	45	lb ai/A	PD										
13	UREA	135	lb ai/A	4-5 leaf	102	abc	30	cde	8438	ab	72	ab	246	ab
	UREA	45	lb ai/A	PD										
14	UREA	75	lb ai/A	4-5 leaf	100	de	28	d-g	7265	d	63	abc	283	a
	SBNR-UREA	0	lb ai/A	PD										
15	UREA	105	lb ai/A	4-5 leaf	101	cde	28	efg	7510	cd	74	a	213	bc
	SBNR-UREA	0	lb ai/A	PD										
LSD (P=.05)					2		3		737		14		60	
Standard Deviation					1		2		441		10		42	
CV					1.0		5.9		6.1		15.6		20.3	

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

Table 2. Determine the agronomic response of drill-seeded Neptune to nitrogen fertilizer rate and time of application (4.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description											Tissue		Tissue	
Rating Type					50% Head		Height		Yield		Biomass		Biomass	
Rating Unit					days		in		lb/A		dry (g)		dry (g)	
Crop Stage Majority					Main		Main		Main		PD		50%head	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	112	a	23	b	1998	f	31	f	78	f
2	UREA	60	lb ai/A	4-5 leaf	109	a	26	ab	3686	e	86	cd	194	de
3	UREA	90	lb ai/A	4-5 leaf	111	a	28	a	4966	bcd	76	de	193	de
4	UREA	120	lb ai/A	4-5 leaf	111	a	28	a	4831	b-e	107	a	219	bcd
5	UREA	150	lb ai/A	4-5 leaf	108	a	28	ab	5779	ab	100	abc	240	abc
6	UREA	180	lb ai/A	4-5 leaf	108	a	28	a	6378	a	109	a	256	ab
7	UREA	210	lb ai/A	4-5 leaf	111	a	30	a	5528	abc	92	bc	231	bcd
8	UREA	270	lb ai/A	4-5 leaf	108	a	29	a	6645	a	106	ab	275	a
9	UREA	45	lb ai/A	4-5 leaf	110	a	26	ab	3932	de	68	e	193	de
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	111	a	26	ab	4402	cde	88	cd	176	e
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	107	a	28	a	5792	ab	85	cd	201	cde
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	110	a	29	a	6204	a	90	cd	271	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					6		4		1195		15		39	
Standard Deviation					3		3		706		9		23	
CV					3		10		14		10		11	

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

Table 3. Determine the agronomic response of drill-seeded XC011 to nitrogen fertilizer rate and time of application (1.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Description									PD		50% HD		Yield	
Rating Date													8/13/2009	
Rating Type					50% Head		Height		Bio Mass		Bio Mass			
Rating Unit					days		in		g		g		lb/A	
Sample Size, Unit									3 ft		3 ft			
Collection Basis, Unit									1 row		1 row			
Crop Stage Majority					Main		Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	93	f	28	e	45	c	100	b	2984	e
2	UREA	60	lb ai/A	4-5 leaf	96	de	33	c	92	ab			6565	cd
3	UREA	90	lb ai/A	4-5 leaf	98	bcd	32	cd	102	a			6531	cd
4	UREA	120	lb ai/A	4-5 leaf	98	cd	34	abc	106	a	247	a	8473	ab
5	UREA	150	lb ai/A	4-5 leaf	99	abc	36	ab	100	a			8356	ab
6	UREA	180	lb ai/A	4-5 leaf	100	abc	33	bc	106	a			8726	a
7	UREA	210	lb ai/A	4-5 leaf	101	a	36	ab	107	a			7833	abc
8	UREA	270	lb ai/A	4-5 leaf	100	ab	37	a	106	a			8890	a
9	UREA	45	lb ai/A	4-5 leaf	94	ef	29	de	72	b			6003	d
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	97	d	33	bc	88	ab			7355	bcd
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	98	cd	34	abc	100	a			8334	ab
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	98	bcd	34	abc	97	a			8810	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					2		3		21		16		1353	
Standard Deviation					1		2		12		7		937	
CV					1		6		13		4		13	

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

Table 4. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (3.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Rating Type					50% Head		Height		Yield		Biomass		Biomass	
Rating Unit					days		in		lb/A		g		g	
Crop Stage Majority					Main		Main		Main		PD		50% head	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	100	b	28	d	4242	f	43	e	119	d
2	UREA	60	lb ai/A	4-5 leaf	100	b	34	c	7368	de	87	bcd	205	c
3	UREA	90	lb ai/A	4-5 leaf	100	b	32	c	7552	cd	97	abc	232	bc
4	UREA	120	lb ai/A	4-5 leaf	101	ab	33	c	8240	bcd	109	abc	270	abc
5	UREA	150	lb ai/A	4-5 leaf	101	ab	37	a	9690	a	112	ab	292	ab
6	UREA	180	lb ai/A	4-5 leaf	101	ab	37	a	9964	a	98	abc	277	ab
7	UREA	210	lb ai/A	4-5 leaf	103	a	37	ab	9935	a	101	abc	257	abc
8	UREA	270	lb ai/A	4-5 leaf	103	a	37	a	9691	a	116	a	251	abc
9	UREA	45	lb ai/A	4-5 leaf	100	b	33	c	6415	e	65	de	237	bc
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	100	b	32	c	8005	bcd	85	cd	230	bc
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	100	b	34	bc	8390	bc	97	abc	313	a
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	101	ab	35	abc	8721	b	93	abc	294	ab
	UREA	45	lb ai/A	PD										
LSD (P=.05)					2		3		968		27		66	
Standard Deviation					2		2		572		16		46	
CV					2		5		7		17		19	

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

Table 5. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (3.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice	
Description											Tissue	
Rating Type					50% Head		Height		Yield		Biomass	
Rating Unit					days		in		lb/A		(dry) g	
Sample Size, Unit											3 ft	
Collection Basis, Unit											1 row	
Crop Stage Majority					Main		Main		Main		PD	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	103	abc	28	f	2466	d	41	e
2	UREA	60	lb ai/A	4-5 leaf	102	c	32	de	5290	c	96	cd
3	UREA	90	lb ai/A	4-5 leaf	102	bc	34	cd	5518	bc	113	abc
4	UREA	120	lb ai/A	4-5 leaf	103	bc	35	bcd	6395	ab	118	ab
5	UREA	150	lb ai/A	4-5 leaf	103	abc	35	cd	6926	a	118	ab
6	UREA	180	lb ai/A	4-5 leaf	105	a	36	abc	7080	a	127	a
7	UREA	210	lb ai/A	4-5 leaf	105	a	38	ab	6930	a	123	a
8	UREA	270	lb ai/A	4-5 leaf	104	ab	38	a	7326	a	117	ab
9	UREA	45	lb ai/A	4-5 leaf	102	c	31	ef	4939	c	83	d
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	102	c	34	cd	5662	bc	98	bcd
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	102	c	34	cd	6397	ab	107	abc
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	103	bc	35	bcd	7257	a	119	a
	UREA	45	lb ai/A	PD								
LSD (P=.05)					2		3		1008		21	
Standard Deviation					1		2		698		12	
CV					1		5		12		12	

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

Table 6. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (2.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice	
Description											PD	
Rating Type					50% Head		Height		Yield		Bio Mass	
Rating Unit					days		in		lb/A		g	
Sample Size, Unit											3 ft	
Collection Basis, Unit											1 row	
Crop Stage Majority					Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	101	b	27	d	2826	b	36	f
2	UREA	60	lb ai/A	4-5 leaf	100	b	30	bcd	5382	a	79	de
3	UREA	90	lb ai/A	4-5 leaf	100	b	32	abc	5720	a	91	bcd
4	UREA	120	lb ai/A	4-5 leaf	103	ab	32	abc	6209	a	112	ab
5	UREA	150	lb ai/A	4-5 leaf	105	a	32	abc	6193	a	96	bcd
6	UREA	180	lb ai/A	4-5 leaf	106	a	32	abc	5428	a	121	a
7	UREA	210	lb ai/A	4-5 leaf	103	ab	35	a	6500	a	102	abc
8	UREA	270	lb ai/A	4-5 leaf	103	ab	33	ab	5765	a	121	a
9	UREA	45	lb ai/A	4-5 leaf	103	ab	29	cd	5355	a	69	e
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	99	b	31	a-d	6264	a	86	cde
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	103	ab	30	bcd	5324	a	107	abc
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	103	ab	32	abc	6197	a	99	a-d
	UREA	45	lb ai/A	PD								
LSD (P=.05)					5		4		1354		22	
Standard Deviation					3		2		938		13	
CV					3		7		17		14	

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

Table 7. Determine the agronomic response of drill-seeded Templeton (0401182AR) to nitrogen fertilizer rate and time of application (2.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice	
Description											PD	
Rating Type					50% Head		Height		Yield		Bio Mass	
Rating Unit					days		in		lb/A		g	
Sample Size, Unit											3 ft	
Collection Basis, Unit											1 row	
Crop Stage Majority					Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	102	cd	31	c	2013	f	32	d
2	UREA	60	lb ai/A	4-5 leaf	102	d	32	bc	4896	e	82	b
3	UREA	90	lb ai/A	4-5 leaf	102	cd	34	abc	5706	de	98	ab
4	UREA	120	lb ai/A	4-5 leaf	103	bcd	35	abc	6205	cd	96	ab
5	UREA	150	lb ai/A	4-5 leaf	104	abc	36	abc	7012	abc	102	ab
6	UREA	180	lb ai/A	4-5 leaf	105	a	33	abc	7343	ab	96	ab
7	UREA	210	lb ai/A	4-5 leaf	105	a	39	a	7307	ab	106	a
8	UREA	270	lb ai/A	4-5 leaf	105	ab	37	ab	7914	a	103	ab
9	UREA	45	lb ai/A	4-5 leaf	102	d	30	c	5107	e	59	c
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	103	cd	33	bc	5677	de	83	ab
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	103	cd	33	abc	6856	bc	83	ab
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	104	abc	38	ab	7538	ab	90	ab
	UREA	45	lb ai/A	PD								
LSD (P=.05)					2		6		1022		24	
Standard Deviation					1		3		708		14	
CV					1		10		12		16	

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

Table 8. Determine the agronomic response of drill-seeded Taggart to nitrogen fertilizer rate and time of application (1.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice	
Description											PD	
Rating Type					50% Head		Height		Yield		Bio Mass	
Rating Unit					days		in		lb/A		g	
Sample Size, Unit											3 ft	
Collection Basis, Unit											1 row	
Crop Stage Majority					Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	103	bc	28	b	1988	f	28	d
2	UREA	60	lb ai/A	4-5 leaf	102	cd	35	b	5572	e	62	c
3	UREA	90	lb ai/A	4-5 leaf	103	bc	38	b	6564	de	80	abc
4	UREA	120	lb ai/A	4-5 leaf	102	bcd	40	b	7988	bc	80	abc
5	UREA	150	lb ai/A	4-5 leaf	104	ab	40	b	8384	bc	90	ab
6	UREA	180	lb ai/A	4-5 leaf	106	a	41	b	8665	ab	98	a
7	UREA	210	lb ai/A	4-5 leaf	105	a	39	b	8493	ab	94	a
8	UREA	270	lb ai/A	4-5 leaf	106	a	42	b	9738	a	96	a
9	UREA	45	lb ai/A	4-5 leaf	100	d	35	b	6041	de	70	bc
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	102	cd	35	b	6616	de	92	ab
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	104	ab	38	b	7150	cd	80	abc
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	104	abc	159	a	8713	ab	91	ab
	UREA	45	lb ai/A	PD								
LSD (P=.05)					2		100		1252		23	
Standard Deviation					2		59		867		14	
CV					1		124		12		17	

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

Rice Variety by Nitrogen Experiments at Vermilion Parish

Experiment number	09-VP-01 to 09-VP-09
Site and design	
Location/Cooperator	Vermilion Parish / Kent Lounsberry
Tillage type	Conventional
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	Kaplan silt loam
% organic matter	1.51
pH	4.87
Extractable nutrients ppm	Ca-642; Cu-.998; Mg-109; P-44; K-107; Na-41.6; S-12.1; Zn-4.48
Crop/Variety	Rice / See Data Sheet
Planting method/date	Drill seeded / March 11
Seeding rate/depth	40 seeds/ft^2 / .5 inches
Emergence date	March 20
Harvest date	July 30
Ratoon Harvest date	October 20
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	155 lb/A 0-24-24-2.8, March 11; 90 lb N/A 46-0-0, August 10
Water management	
Flush	Rain
Flood	May 6
Drain	July 15
Ratoon flood	August 11
Ratoon drain	September 29
Pest management	
Herbicides	1 gal/A Propanil + 1 oz/A Permit + 1 oz/A Londax, April 8 1 gal/A RiceBeaux + 1.5oz/A Londax + .5 oz/A Permit, May 4 20 oz/A Clincher, June 2 1 qt/A Basagran, August 10
Insecticides	4 oz/A Mustang Max, June 20
Fungicides	19 oz/A Stratego, June 22

Table 9. Determine the agronomic response of drill-seeded Catahoula to nitrogen fertilizer rate and time of application (2.2). Nitrogen soil test evaluation. Vermilion Parish.

Crop Name					Rice		Rice		Rice				Rice		Rice		Rice	
Rating Date							7/21/09		6/25/09				7/30/09		10/20/09			
Rating Type					50% Head		Height		Biomass		N		Yield		Yield		Yield	
Rating Unit					days		in		(dry) g		%		lb/A		lb/A		lb/A	
Sample Size, Unit									3 ft									
Collection Basis, Unit									1 row									
Crop Stage Majority					Main		Main		50% HD		Head		Main		Ratoon		Total	
Trt No.	Trt. Name	Rate	Rate Unit	Growth Stage														
1	UREA	0	lb ai/A	4-5 leaf	102	g	31	e	153	e	1.0	f	5750	e	2283	abc	8034	d
2	UREA	60	lb ai/A	4-5 leaf	105	ef	34	cd	174	de	1.3	de	7906	d	2348	abc	10254	c
3	UREA	90	lb ai/A	4-5 leaf	106	de	36	bcd	229	a	1.3	def	8798	bcd	2366	abc	11164	abc
4	UREA	120	lb ai/A	4-5 leaf	107	cd	36	bc	227	a	1.4	de	9182	abc	2298	abc	11480	ab
5	UREA	150	lb ai/A	4-5 leaf	108	bc	36	bcd	190	bcd	1.7	bc	8902	a-d	2257	bc	11159	abc
6	UREA	180	lb ai/A	4-5 leaf	109	ab	36	bc	217	abc	2.0	b	9397	ab	2074	c	11471	ab
7	UREA	210	lb ai/A	4-5 leaf	109	b	39	a	221	ab	2.1	ab	8988	abc	2102	c	11090	abc
8	UREA	270	lb ai/A	4-5 leaf	111	a	39	a	203	a-d	2.4	a	9605	ab	2072	c	11676	ab
9	UREA	45	lb ai/A	4-5 leaf	103	f	34	d	192	bcd	1.1	ef	8379	cd	2597	a	10976	bc
	UREA	45	lb ai/A	PD														
10	UREA	75	lb ai/A	4-5 leaf	105	de	35	bcd	213	abc	1.3	de	9393	ab	2485	ab	11878	ab
	UREA	45	lb ai/A	PD														
11	UREA	105	lb ai/A	4-5 leaf	106	de	36	bcd	217	abc	1.2	def	9849	a	2339	abc	12189	a
	UREA	45	lb ai/A	PD														
12	UREA	135	lb ai/A	4-5 leaf	107	cd	37	ab	188	cd	1.5	cd	9559	ab	2298	abc	11857	ab
	UREA	45	lb ai/A	PD														
LSD (P=.05)					2		2		32		0.3		1010		339		1159	
Standard Deviation					1		1		22		0.2		699		235		803	
CV					1		4		11		14.7		8		10		7	

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

Table 10. Determine the agronomic response of drill-seeded Jazzman to nitrogen fertilizer rate and time of application (2.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date						7/21/2009			7/30/2009		
Rating Type					50% Head	Height	Lodge	Lodge	Yield	Yield	Yield
Rating Unit					days	in	% plot	rate	lb/A	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	109 cd	31 f	.	.	5659 b	2060 a	7719 d
2	UREA	60	lb ai/A	4-5 leaf	112 abc	35 e	.	.	7200 a	1945 ab	9145 abc
3	UREA	90	lb ai/A	4-5 leaf	111 bc	37 cd	.	.	7409 a	1789 ab	9198 abc
4	UREA	120	lb ai/A	4-5 leaf	112 abc	36 de	.	.	7236 a	1733 bc	8969 abc
5	UREA	150	lb ai/A	4-5 leaf	112 ab	39 bc	.	.	7078 a	1484 cd	8562 bcd
6	UREA	180	lb ai/A	4-5 leaf	113 ab	39 b	.	.	7154 a	1261 de	8414 cd
7	UREA	210	lb ai/A	4-5 leaf	113 ab	42 a	15 a	3 a	8268 a	1019 ef	9212 abc
8	UREA	270	lb ai/A	4-5 leaf	114 a	42 a	57 a	4 a		799 f	
9	UREA	45	lb ai/A	4-5 leaf	108 d	35 e	.	.	7286 a	1687 bc	8973 abc
	UREA	45	lb ai/A	PD			.	.			
10	UREA	75	lb ai/A	4-5 leaf	111 bc	36 de	.	.	7640 a	1729 bc	9370 abc
	UREA	45	lb ai/A	PD			.	.			
11	UREA	105	lb ai/A	4-5 leaf	111 bc	37 cd	.	.	8048 a	1660 bc	9708 ab
	UREA	45	lb ai/A	PD			.	.			
12	UREA	135	lb ai/A	4-5 leaf	111 bc	38 bc	.	.	8061 a	1753 bc	9814 a
	UREA	45	lb ai/A	PD			.	.			
LSD (P=.05)					3	2	95	4	1201	293	1173
Standard Deviation					2	1	27	1	829	203	810
CV					2	3	75	32	11	13	9

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

Table 11. Determine the agronomic response of drill-seeded Neptune to nitrogen fertilizer rate and time of application (4.2). Vermilion Parish.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Rating Date					7/21/2009				7/30/2009					
Rating Type					Height		50% Head		Yield		Yield		Yield	
Rating Unit					in		days		lb/A		lb/A		lb/A	
Crop Stage Majority					Main		Main		Main		Ratoon		Total	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	UREA	0	lb ai/A	4-5 leaf	28	g	110	e	5159	d	2463	d	7622	d
2	UREA	60	lb ai/A	4-5 leaf	31	ef	110	e	7198	c	2775	a-d	9973	c
3	UREA	90	lb ai/A	4-5 leaf	32	de	111	de	7437	bc	2641	a-d	10078	bc
4	UREA	120	lb ai/A	4-5 leaf	34	bc	111	de	7791	abc	2729	a-d	10519	abc
5	UREA	150	lb ai/A	4-5 leaf	33	bcd	112	bc	8147	abc	2739	a-d	10887	abc
6	UREA	180	lb ai/A	4-5 leaf	34	b	112	ab	8036	abc	2925	a	10960	abc
7	UREA	210	lb ai/A	4-5 leaf	36	a	113	ab	8066	abc	2883	ab	10949	abc
8	UREA	270	lb ai/A	4-5 leaf	34	bc	113	a	8420	ab	2859	abc	11279	a
9	UREA	45	lb ai/A	4-5 leaf	29	fg	111	de	7426	bc	2560	bcd	9986	c
	UREA	45	lb ai/A	PD										
10	UREA	75	lb ai/A	4-5 leaf	32	cd	110	e	8001	abc	2547	cd	10548	abc
	UREA	45	lb ai/A	PD										
11	UREA	105	lb ai/A	4-5 leaf	33	bcd	111	de	8536	a	2667	a-d	11203	ab
	UREA	45	lb ai/A	PD										
12	UREA	135	lb ai/A	4-5 leaf	33	bcd	111	cd	8445	ab	2808	abc	11253	a
	UREA	45	lb ai/A	PD										
LSD (P=.05)					2		1		1069		328		1171	
Standard Deviation					1		1		740		227		811	
CV					3		0		10		8		8	

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

Table 12. Determine the agronomic response of drill-seeded XC011 to nitrogen fertilizer rate and time of application (1.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date					7/21/2009				7/30/2009		
Rating Type					Height	50% Head	Lodge	Lodge	Yield	Yield	Yield
Rating Unit					in	days	% plot	rate	lb/A	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	32 b	95 g			8040 e	2109 ab	10149 d
2	UREA	60	lb ai/A	4-5 leaf	37 a	98 f			9498 abc	2310 a	11808 abc
3	UREA	90	lb ai/A	4-5 leaf	36 a	100 de	15 e	2 b	8874 b-e	2251 a	11125 bcd
4	UREA	120	lb ai/A	4-5 leaf	37 a	100 cde	53 bcd	3 a	9413 a-d	2221 ab	11634 abc
5	UREA	150	lb ai/A	4-5 leaf	36 a	102 bcd	60 abc	4 a	8996 b-e	1882 b	10879 cd
6	UREA	180	lb ai/A	4-5 leaf	37 a	102 abc	80 ab	3 a	8733 cde	2311 a	11044 cd
7	UREA	210	lb ai/A	4-5 leaf	39 a	103 ab	90 a	4 a	8310 de	2411 a	10721 cd
8	UREA	270	lb ai/A	4-5 leaf	36 a	104 a	87 ab	4 a	8884 b-e	2226 ab	11110 bcd
9	UREA	45	lb ai/A	4-5 leaf	39 a	99 ef	20 de	3 ab	9867 ab	2425 a	12292 ab
	UREA	45	lb ai/A	PD							
10	UREA	75	lb ai/A	4-5 leaf	38 a	100 de	20 de	2 b	10275 a	2350 a	12625 a
	UREA	45	lb ai/A	PD							
11	UREA	105	lb ai/A	4-5 leaf	38 a	102 bcd	37 cde	3 ab	9712 abc	2077 ab	11788 abc
	UREA	45	lb ai/A	PD							
12	UREA	135	lb ai/A	4-5 leaf	38 a	102 abc	83 ab	4 a	9558 abc	2112 ab	11670 abc
	UREA	45	lb ai/A	PD							
LSD (P=.05)					3	2	35	1	1126	361	1247
Standard Deviation					2	1	20	1	780	250	864
CV					5	1	36	19	8	11	8

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

Table 13. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (3.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date						7/21/2009	7/30/2009	7/30/2009	7/30/2009	10/20/2009	
Rating Type					50% Head	Height	Lodge	Lodge	Yield	Yield	Yield
Rating Unit					days	In	% plot	rate	lb/A	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	100 f	34 d			8950 c	2612 ab	11562 bcd
2	UREA	60	lb ai/A	4-5 leaf	103 e	36 cd			9885 ab	2285 abc	12170 abc
3	UREA	90	lb ai/A	4-5 leaf	104 d	37 abc			9882 ab	2496 ab	12378 ab
4	UREA	120	lb ai/A	4-5 leaf	106 c	38 abc	20 b	3 ab	9474 abc	2601 ab	12075 abc
5	UREA	150	lb ai/A	4-5 leaf	106 bc	37 abc	23 b	4 ab	8926 c	2262 abc	11188 cde
6	UREA	180	lb ai/A	4-5 leaf	107 b	37 abc	60 a	3 ab	9268 bc	2844 a	12112 abc
7	UREA	210	lb ai/A	4-5 leaf	110 a	39 a	75 a	4 a	9025 c	1978 bc	11003 de
8	UREA	270	lb ai/A	4-5 leaf	110 a	38 ab	73 a	4 a	8878 c	1606 c	10483 E
9	UREA	45	lb ai/A	4-5 leaf	103 e	37 bc			10005 ab	2573 ab	12578 ab
	UREA	45	lb ai/A	PD							
10	UREA	75	lb ai/A	4-5 leaf	104 d	38 abc	5 b	2 b	10204 a	2416 ab	12620 a
	UREA	45	lb ai/A	PD							
11	UREA	105	lb ai/A	4-5 leaf	104 d	37 abc			10215 a	2466 ab	12682 a
	UREA	45	lb ai/A	PD							
12	UREA	135	lb ai/A	4-5 leaf	106 bc	37 bc	15 b	3 ab	10041 ab	2249 abc	12290 ab
	UREA	45	lb ai/A	PD							
LSD (P=.05)					1	2	29	2	789	762	1042
Standard Deviation					1	1	13	1	546	528	722
CV					1	3	33	24	6	22	6

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

Table 14. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (3.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice
Description						Tip of panicle			
Rating Date						7/21/2009	7/30/2009	7/30/2009	7/30/2009
Rating Type					50% Head	Height	Lodge	Lodge	Yield
Rating Unit					days	in	% plot	rate	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage					
1	UREA	0	lb ai/A	4-5 leaf	103 f	33 e	.	.	7182 f
2	UREA	60	lb ai/A	4-5 leaf	106 e	36 d	.	.	8297 abc
3	UREA	90	lb ai/A	4-5 leaf	108 d	39 a-d	.	.	8189 bcd
4	UREA	120	lb ai/A	4-5 leaf	111 b	39 a-d	.	.	8301 abc
5	UREA	150	lb ai/A	4-5 leaf	111 b	39 bcd	.	.	8174 bcd
6	UREA	180	lb ai/A	4-5 leaf	113 a	39 a-d	.	.	7767 cde
7	UREA	210	lb ai/A	4-5 leaf	113 a	42 a	.	.	7674 def
8	UREA	270	lb ai/A	4-5 leaf	113 a	41 ab	30	3	7362 ef
9	UREA	45	lb ai/A	4-5 leaf	106 e	37 cd	.	.	8831 a
	UREA	45	lb ai/A	PD					
10	UREA	75	lb ai/A	4-5 leaf	107 de	40 abc	.	.	8787 a
	UREA	45	lb ai/A	PD					
11	UREA	105	lb ai/A	4-5 leaf	109 c	40 abc	.	.	8716 ab
	UREA	45	lb ai/A	PD					
12	UREA	135	lb ai/A	4-5 leaf	111 b	39 bcd	.	.	8404 ab
	UREA	45	lb ai/A	PD					
LSD (P=.05)					1	3	.	.	568
Standard Deviation					1	2	.	.	393
CV					1	5	.	.	5

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

Table 15. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (2.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date					7/30/2009		7/21/2009	7/30/2009	7/30/2009		
Rating Type					Yield	50% Head	Height	Lodge	Lodge	Yield	Yield
Rating Unit					lb/A	days	in	% plot	rate	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	6201 f	104 g	33 c	.	.	2100 ab	8301 e
2	UREA	60	lb ai/A	4-5 leaf	8167 abc	105 efg	34 bc	.	.	2363 a	10529 a
3	UREA	90	lb ai/A	4-5 leaf	8136 abc	106 def	38 a	.	.	2204 ab	10340 ab
4	UREA	120	lb ai/A	4-5 leaf	8151 abc	107 cd	36 ab	.	.	2013 ab	10163 abc
5	UREA	150	lb ai/A	4-5 leaf	7561 cde	108 b	37 ab	.	.	1850 b	9411 bcd
6	UREA	180	lb ai/A	4-5 leaf	7089 e	111 a	36 abc	.	.	2126 ab	9215 cde
7	UREA	210	lb ai/A	4-5 leaf	7283 de	111 a	38 a	.	.	1773 b	9056 de
8	UREA	270	lb ai/A	4-5 leaf	7167 e	111 a	38 ab	10	3	1878 b	9046 de
9	UREA	45	lb ai/A	4-5 leaf	8065 bcd	105 fg	36 abc	.	.	2210 ab	10275 ab
	UREA	45	lb ai/A	PD							
10	UREA	75	lb ai/A	4-5 leaf	8588 ab	106 def	36 abc	.	.	2134 ab	10722 a
	UREA	45	lb ai/A	PD							
11	UREA	105	lb ai/A	4-5 leaf	8546 ab	106 cde	37 ab	.	.	1907 b	10454 a
	UREA	45	lb ai/A	PD							
12	UREA	135	lb ai/A	4-5 leaf	8930 a	108 bc	36 abc	.	.	1927 ab	10857 a
	UREA	45	lb ai/A	PD							
LSD (P=.05)					821	2	3	.	.	447	967
Standard Deviation					569	1	2	.	.	310	670
CV					7	1	6	.	.	15	7

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

Table 16. Determine the agronomic response of drill-seeded Templeton (0401182AR) to nitrogen fertilizer rate and time of application (2.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date					7/30/2009		7/21/2009	7/30/2009	7/30/2009	10/20/2009	
Rating Type					Yield	50% Head	Height	Lodge	Lodge	Yield	Yield
Rating Unit					lb/A	days	in	% plot	rate	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	4958 d	106 g	33 e	.	.	3169 ab	8128 c
2	UREA	60	lb ai/A	4-5 leaf	6511 bc	111 f	38 d	.	.	2923 abc	9434 ab
3	UREA	90	lb ai/A	4-5 leaf	6568 bc	112 de	39 cd	.	.	2832 cde	9399 abc
4	UREA	120	lb ai/A	4-5 leaf	6865 abc	112 cd	38 cd	.	.	2757 cde	9622 ab
5	UREA	150	lb ai/A	4-5 leaf	6886 abc	113 b	41 ab	.	.	2674 c-f	9561 ab
6	UREA	180	lb ai/A	4-5 leaf	6824 abc	114 ab	42 ab	.	.	2568 ef	9392 abc
7	UREA	210	lb ai/A	4-5 leaf	7390 ab	114 a	42 a	.	.	2411 f	9800 ab
8	UREA	270	lb ai/A	4-5 leaf	6766 abc	115 a	41 ab	40	4	2445 f	9211 bc
9	UREA	45	lb ai/A	4-5 leaf	6203 c	110 f	34 e	.	.	3189 a	9392 abc
	UREA	45	lb ai/A	PD							
10	UREA	75	lb ai/A	4-5 leaf	7135 abc	111 ef	38 cd	.	.	2856 cde	9991 ab
	UREA	45	lb ai/A	PD							
11	UREA	105	lb ai/A	4-5 leaf	7348 abc	112 d	40 bcd	.	.	2582 def	9930 ab
	UREA	45	lb ai/A	PD							
12	UREA	135	lb ai/A	4-5 leaf	7770 a	113 bc	40 bc	.	.	2880 bcd	10649 a
	UREA	45	lb ai/A	PD							
LSD (P=.05)					1149	1	2			306	1278
Standard Deviation					796	1	1			212	885
CV					12	1	3			8	9

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

Table 17. Determine the agronomic response of drill-seeded Taggart to nitrogen fertilizer rate and time of application (1.2). Vermilion Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Rating Date						7/21/2009	7/30/2009	7/30/2009	7/30/2009	10/20/2009	
Rating Type					50% Head	Height	Lodge	Lodge	Yield	Yield	Yield
Rating Unit					days	in	% plot	rate	lb/A	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Main	Main	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	4-5 leaf	107 f	36 h	.	.	6302 ef	2631 ab	2808 abc
2	UREA	60	lb ai/A	4-5 leaf	110 e	40 fg	.	.	7210 a-f	2555 abc	2735 abc
3	UREA	90	lb ai/A	4-5 leaf	112 cde	42 efg	.	.	7359 a-e	2709 ab	2891 ab
4	UREA	120	lb ai/A	4-5 leaf	113 bcd	44 b-e	.	.	7716 a-d	2858 a	3041 a
5	UREA	150	lb ai/A	4-5 leaf	113 bc	45 bcd	.	.	6948 b-f	2443 bc	2626 bc
6	UREA	180	lb ai/A	4-5 leaf	115 b	45 bc	.	.	6762 c-f	2663 ab	2847 ab
7	UREA	210	lb ai/A	4-5 leaf	117 a	49 a	5	4	6461 def	2616 abc	2803 abc
8	UREA	270	lb ai/A	4-5 leaf	117 a	46 b	35	4.5	5977 f	2319 c	2506 c
9	UREA	45	lb ai/A	4-5 leaf	108 f	40 g	.	.	7962 abc	2522 bc	2700 bc
	UREA	45	lb ai/A	PD			.	.			
10	UREA	75	lb ai/A	4-5 leaf	111 de	42 def	.	.	8242 a	2556 abc	2737 abc
	UREA	45	lb ai/A	PD			.	.			
11	UREA	105	lb ai/A	4-5 leaf	112 cde	42 efg	.	.	8010 abc	2499 bc	2681 bc
	UREA	45	lb ai/A	PD			.	.			
12	UREA	135	lb ai/A	4-5 leaf	113 bcd	44 cde	.	.	8147 ab	2505 bc	2688 bc
	UREA	45	lb ai/A	PD			.	.			
LSD (P=.05)					2	2	.	.	1262	306	306
Standard Deviation					2	1	.	.	874	212	212
CV					1	3	.	.	12	8	8

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

Rice Variety by Nitrogen Experiments at Richland Parish

Experiment number	: 09-RP-01 to 09-RP-09
Site and design	:
Location/Cooperator	: Richland Parish / Elliot Colvin
Tillage type	: Spring 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	: Perry Clay
% organic matter	: 1.99
pH	: 7.6
Extractable nutrients ppm	: Ca-3,265; Cu-2.59; Mg-665; P-6.7; K-213; Na-72.5; S-22.8; Zn-1.8
Crop/Variety	: Rice / See Data Sheet
Planting method/date	: Drill seeded / April 23
Seeding rate/depth	: 40 seeds/ft^2 / 1.0-1.5 inches
Emergence date	: May 1
Harvest date	: August 26
Seed treatment/cwt	: Dithane (fungicide), 114 g
	Release (gibberellic acid), 10 g
	Zinche (40.5% Zn), 236 ml
Fertilization	: 2 tons/A of chicken litter was applied in February
Water management	:
Flush	: Rain
Flood	: June 2
Drain	: August 15
Pest management	:
Herbicides	: 1 qt/A Roundup + .75 oz/A Permit, April 24
	1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 20
	3 qt/A RiceBeaux + .75 oz/A Londax + .5 oz/A Permit, June 2
Insecticides	: 2 oz/A Karate, June 12
Fungicides	: 16 oz/A Stratego + .33 lb/A Methyl, July 18

Table 18. Determine the agronomic response of drill-seeded Catahoula (302082) to nitrogen fertilizer rate and time of application (3.3). Evaluate greenseeker technology. Nitrogen soil test evaluation. Richland Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice			
Description								Tissue	Tissue	Tissue	Tissue	Grain
Part Rated								Abvgrd	Abvgrd	Abvgrd	Abvgrd	
Rating Date						8/26/09	8/26/09					
Rating Type					50% Head	Height	Yield	Biomass	Biomass			
Rating Unit					days	in	lb/A	dry wt (g)	dry wt (g)	%N	%N	%N
Sample Size, Unit								3 ft	3 ft			
Collection Basis, Unit								1 row	1 row			
Crop Stage Majority					Main	Main	Main	PD	50%head	PD	HD	Harvest
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	91 f	31 f	6062 e	48 c	149 c	1.3 d	0.9 f	1.1 c
2	UREA	60	lb ai/A	4-5 leaf	96 de	35 cde	8243 bcd	103 ab	216 b	1.7 cd	1.1 ef	1.1 bc
3	UREA	90	lb ai/A	4-5 leaf	97 b-e	34 de	8149 cd	96 ab	256 a	1.7 cd	1.2 de	1.1 bc
4	UREA	120	lb ai/A	4-5 leaf	97 bcd	37 ab	8987 a	101 ab	251 ab	2.1 abc	1.5 bc	1.2 abc
5	UREA	150	lb ai/A	4-5 leaf	98 bc	37 ab	8825 ab	100 ab	254 ab	2.5 ab	1.4 bcd	1.3 a
6	UREA	180	lb ai/A	4-5 leaf	99 ab	38 a	8870 ab	115 a	272 a	2.5 ab	1.4 bc	1.3 a
7	UREA	210	lb ai/A	4-5 leaf	101 a	37 ab	8358 a-d	100 ab	271 a	2.6 ab	1.6 b	1.3 a
8	UREA	270	lb ai/A	4-5 leaf	101 a	38 a	7963 d	112 a	257 a	2.7 a	1.9 a	1.3 a
9	UREA	45	lb ai/A	4-5 leaf	94 e	33 e	7926 d	81 b	232 ab	1.9 cd	1.1 ef	1.1 bc
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	96 cde	34 de	8838 ab	93 ab	272 a	1.9 c	1.2 de	1.1 bc
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	99 abc	36 bcd	8878 ab	103 ab	265 a	1.8 cd	1.3 cd	1.1 c
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	97 bcd	37 abc	8833 ab	108 ab	261 a	2.5 ab	1.4 bc	1.2 ab
	UREA	45	lb ai/A	PD								
13	UREA	75	lb ai/A	4-5 leaf	94 e	35 cde	8874 ab	92 ab	270 a	1.8 cd	1.2 de	1.2 abc
	SBNR-UREA	0	lb ai/A	PD								
14	UREA	105	lb ai/A	4-5 leaf	99 ab	36 abc	8765 abc	96 ab	236 ab	2.1 bc	1.3 cde	1.2 ab
	SBNR-UREA	0	lb ai/A	PD								
LSD (P=.05)					3	2	653	29	40	0.6	0.2	0.1
Standard Deviation					2	1	457	20	28	0.4	0.1	0.1
CV					2	3	5	21	11	19.2	11.2	7.4

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

Table 19. Determine the agronomic response of drill-seeded Jazzman to nitrogen fertilizer rate and time of application (2.3). Richland Parish.

Crop Name					Rice		Rice		Rice	Rice	Rice	
Rating Date							8/26/2009		8/26/2009	8/26/2009	9/1/2009	
Rating Type					50% Head		Height		Lodge	Lodge	Yield	
Rating Unit					days		in		% plot	rate	lb/A	
Crop Stage Majority					Main		Main		Main	Main	Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	95	g	33	e	.	.	6982	f
2	UREA	60	lb ai/A	4-5 leaf	96	fg	37	bc	.	.	8324	e
3	UREA	90	lb ai/A	4-5 leaf	97	efg	38	bc	.	.	8916	d
4	UREA	120	lb ai/A	4-5 leaf	100	b-e	39	b	.	.	9105	cd
5	UREA	150	lb ai/A	4-5 leaf	99	b-e	39	bc	.	.	9429	abc
6	UREA	180	lb ai/A	4-5 leaf	101	ab	39	b	.	.	9635	ab
7	UREA	210	lb ai/A	4-5 leaf	101	bc	41	a	50	2.5	9362	bc
8	UREA	270	lb ai/A	4-5 leaf	104	a	42	a	30	3	9218	bcd
9	UREA	45	lb ai/A	4-5 leaf	96	fg	35	d	.	.	9016	cd
	UREA	45	lb ai/A	PD					.	.		
10	UREA	75	lb ai/A	4-5 leaf	98	def	37	cd	.	.	9236	bcd
	UREA	45	lb ai/A	PD					.	.		
11	UREA	105	lb ai/A	4-5 leaf	98	c-f	39	bc	.		9814	a
	UREA	45	lb ai/A	PD					.	.		
12	UREA	135	lb ai/A	4-5 leaf	100	bcd	41	a	.	.	9609	ab
	UREA	45	lb ai/A	PD					.	.		
LSD (P=.05)					3		2		.	.	431	
Standard Deviation					2		1		.	.	299	
CV					2		3		.	.	3	

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

Table 20. Determine the agronomic response of drill-seeded Neptune to nitrogen fertilizer rate and time of application (4.3). Richland Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue	Tissue	Grain
Part Rated								Abvgrd	Abvgrd	Abvgrd	Abvgrd	
Rating Date						8/26/2009						
Rating Type					50% Head	Height	Yield	Biomass	Biomass			
Rating Unit					days	in	lb/A	dry wt (g)	dry wt (g)	%N	%N	%N
Sample Size, Unit								3 ft	3 ft			
Collection Basis, Unit								1 row	1 row			
Crop Stage Majority					Main	Main	Main	PD	50%head	PD	HD	Harvest
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	94 f	29 ab	8555 d	58 e	160 d	1.4 f	1.0 g	1.0 g
2	UREA	60	lb ai/A	4-5 leaf	95 e	32 ab	9843 c	94 cd	236 bc	1.6 ef	1.2 efg	1.0 fg
3	UREA	90	lb ai/A	4-5 leaf	97 d	34 ab	10980 ab	93 cd	219 c	1.8 cde	1.1 fg	1.1 def
4	UREA	120	lb ai/A	4-5 leaf	99 bc	35 a	11362 ab	96 cd	278 ab	2.1 c	1.2 def	1.1 cde
5	UREA	150	lb ai/A	4-5 leaf	100 bc	34 ab	11421 ab	111 bcd	239 bc	2.0 cd	1.3 cde	1.1 def
6	UREA	180	lb ai/A	4-5 leaf	99 bc	35 a	11677 a	122 ab	294 a	2.4 b	1.5 bc	1.1 bc
7	UREA	210	lb ai/A	4-5 leaf	100 b	25 b	11578 a	123 ab	251 abc	2.7 a	1.6 ab	1.2 ab
8	UREA	270	lb ai/A	4-5 leaf	102 a	37 a	11282 ab	138 a	279 ab	2.8 a	1.7 a	1.2 a
9	UREA	45	lb ai/A	4-5 leaf	95 ef	33 ab	10770 b	93 cd	219 c	1.6 ef	1.2 ef	1.1 cde
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	96 de	33 ab	11189 ab	91 d	227 c	1.8 de	1.2 def	1.0 efg
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	98 c	33 ab	11591 a	93 cd	253 abc	1.7 e	1.4 cd	1.1 def
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	99 bc	35 a	11515 ab	114 bc	257 abc	2.4 b	1.3 cde	1.1 cd
	UREA	45	lb ai/A	PD								
LSD (P=.05)					1	10	770	23	51	0.3	0.2	0.1
Standard Deviation					1	6	533	16	35	0.2	0.1	0.0
CV					1	17	5	16	14	10.1	9.8	4.2

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

Table 21. Determine the agronomic response of drill-seeded XC011 to nitrogen fertilizer rate and time of application (1.3). Richland Parish.

Crop Name					Rice		Rice		Rice	
Rating Date							8/26/2009		8/26/2009	
Rating Type					50% Head		Height		Yield	
Rating Unit					days		in		lb/A	
Crop Stage Majority					Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage						
1	UREA	0	lb ai/A	4-5 leaf	87	f	34	d	6899	c
2	UREA	60	lb ai/A	4-5 leaf	92	de	38	bc	9041	b
3	UREA	90	lb ai/A	4-5 leaf	93	cd	38	c	9562	ab
4	UREA	120	lb ai/A	4-5 leaf	93	cd	38	bc	9394	ab
5	UREA	150	lb ai/A	4-5 leaf	96	b	40	ab	9431	ab
6	UREA	180	lb ai/A	4-5 leaf	98	a	41	a	9423	ab
7	UREA	210	lb ai/A	4-5 leaf	97	a	41	a	9377	ab
8	UREA	270	lb ai/A	4-5 leaf	99	a	40	ab	9392	ab
9	UREA	45	lb ai/A	4-5 leaf	90	e	38	bc	9367	ab
	UREA	45	lb ai/A	PD						
10	UREA	75	lb ai/A	4-5 leaf	93	cd	37	c	9630	a
	UREA	45	lb ai/A	PD						
11	UREA	105	lb ai/A	4-5 leaf	94	c	38	bc	9722	a
	UREA	45	lb ai/A	PD						
12	UREA	135	lb ai/A	4-5 leaf	96	b	40	ab	9803	a
	UREA	45	lb ai/A	PD						
LSD (P=.05)					2		2		536	
Standard Deviation					1		1		371	
CV					1		3		4	

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

Table 22. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (3.3). Richland Parish.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue	Tissue	Grain
Part Rated								Abvgrd	Abvgrd	Abvgrd	Abvgrd	
Rating Date						8/26/2009	8/26/2009					
Rating Type					50% Head	Height	Yield	Biomass	Biomass			
Rating Unit					days	in	lb/A	dry wt (g)	dry wt (g)	%N	%N	%N
Sample Size, Unit								3 ft	3 ft			
Collection Basis, Unit								1 row	1 row			
Crop Stage Majority					Main	Main	Main	PD	50%head	PD	HD	Harvest
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage								
1	UREA	0	lb ai/A	4-5 leaf	89 i	31 h	7576 b	51 c	192 b	1.4 g	0.9 g	1.0 g
2	UREA	60	lb ai/A	4-5 leaf	92 gh	36 de	9601 a	104 ab	252 a	1.6 fg	1.1 fg	1.0 fg
3	UREA	90	lb ai/A	4-5 leaf	93 efg	34 fg	9788 a	99 ab	281 a	1.9 def	1.1 efg	1.0 efg
4	UREA	120	lb ai/A	4-5 leaf	94 ef	35 def	10144 a	101 ab	262 a	2.0 c-f	1.2 de	1.1 def
5	UREA	150	lb ai/A	4-5 leaf	96 bcd	37 cd	10140 a	105 ab	275 a	2.1 cd	1.4 cd	1.1 de
6	UREA	180	lb ai/A	4-5 leaf	97 bc	38 bc	9852 a	94 ab	294 a	2.3 bc	1.5 bc	1.2 bc
7	UREA	210	lb ai/A	4-5 leaf	98 ab	39 ab	10192 a	105 ab	295 a	2.6 ab	1.6 b	1.2 ab
8	UREA	270	lb ai/A	4-5 leaf	99 a	39 a	9745 a	110 a	275 a	2.9 a	1.8 a	1.3 a
9	UREA	45	lb ai/A	4-5 leaf	92 h	35 efg	10043 a	86 b	260 a	1.7 efg	1.0 fg	1.0 efg
	UREA	45	lb ai/A	PD								
10	UREA	75	lb ai/A	4-5 leaf	93 fgh	33 g	10154 a	98 ab	250 a	2.0 c-f	1.1 ef	1.0 efg
	UREA	45	lb ai/A	PD								
11	UREA	105	lb ai/A	4-5 leaf	95 de	34 fg	9962 a	83 b	281 a	1.7 d-g	1.2 de	1.1 def
	UREA	45	lb ai/A	PD								
12	UREA	135	lb ai/A	4-5 leaf	96 cd	38 abc	10182 a	115 a	275 a	2.1 cde	1.3 cd	1.1 cd
	UREA	45	lb ai/A	PD								
LSD (P=.05)					2	2	621	24	51	0.4	0.2	0.1
Standard Deviation					1	1	430	17	35	0.3	0.1	0.1
CV					1	3	4	17	13	13.8	10.2	4.8

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

Table 23. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (3.3). Richland Parish.

Crop Name					Rice		Rice		Rice	
Rating Date							8/26/2009		9/1/2009	
Rating Type					50% Head		Height		Yield	
Rating Unit					days		in		lb/A	
Crop Stage Majority					Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage						
1	UREA	0	lb ai/A	4-5 leaf	96	e	34	g	5999	f
2	UREA	60	lb ai/A	4-5 leaf	97	e	37	ef	7387	e
3	UREA	90	lb ai/A	4-5 leaf	99	d	37	f	8064	cde
4	UREA	120	lb ai/A	4-5 leaf	100	d	39	bcd	8091	bcd
5	UREA	150	lb ai/A	4-5 leaf	102	bc	40	ab	7811	de
6	UREA	180	lb ai/A	4-5 leaf	102	bc	40	abc	8240	a-d
7	UREA	210	lb ai/A	4-5 leaf	103	ab	41	a	8205	a-d
8	UREA	270	lb ai/A	4-5 leaf	104	a	41	a	7893	cde
9	UREA	45	lb ai/A	4-5 leaf	99	d	38	def	8753	ab
	UREA	45	lb ai/A	PD						
10	UREA	75	lb ai/A	4-5 leaf	100	d	38	de	8794	a
	UREA	45	lb ai/A	PD						
11	UREA	105	lb ai/A	4-5 leaf	102	c	39	cde	8758	ab
	UREA	45	lb ai/A	PD						
12	UREA	135	lb ai/A	4-5 leaf	102	bc	40	ab	8529	abc
	UREA	45	lb ai/A	PD						
LSD (P=.05)					2		2		678	
Standard Deviation					1		1		470	
CV					1		2		6	

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

Table 24. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (2.3). Richland Parish.

Crop Name					Rice	Rice	Rice
Rating Date						8/26/2009	
Rating Type					50% Head	Height	Yield
Rating Unit					days	in	lb/A
Crop Stage Majority					Main	Main	Main
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage			
1	UREA	0	lb ai/A	4-5 leaf	101 f	35 f	7813 d
2	UREA	60	lb ai/A	4-5 leaf	103 de	37 de	9378 c
3	UREA	90	lb ai/A	4-5 leaf	102 ef	38 cde	10525 ab
4	UREA	120	lb ai/A	4-5 leaf	104 cd	39 bcd	10191 abc
5	UREA	150	lb ai/A	4-5 leaf	105 bc	39 bc	10375 ab
6	UREA	180	lb ai/A	4-5 leaf	106 ab	41 ab	10358 ab
7	UREA	210	lb ai/A	4-5 leaf	105 bc	41 ab	10654 ab
8	UREA	270	lb ai/A	4-5 leaf	107 a	42 a	10031 bc
9	UREA	45	lb ai/A	4-5 leaf	101 f	36 ef	10264 ab
	UREA	45	lb ai/A	PD			
10	UREA	75	lb ai/A	4-5 leaf	103 de	38 cde	10652 ab
	UREA	45	lb ai/A	PD			
11	UREA	105	lb ai/A	4-5 leaf	104 c	38 cde	10659 ab
	UREA	45	lb ai/A	PD			
12	UREA	135	lb ai/A	4-5 leaf	105 bc	41 ab	10874 a
	UREA	45	lb ai/A	PD			
LSD (P=.05)					1	2	829
Standard Deviation					1	1	574
CV					1	3	6

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

Table 25. Determine the agronomic response of drill-seeded Templeton (0401182AR) to nitrogen fertilizer rate and time of application (2.3). Richland Parish.

Crop Name					Rice		Rice		Rice	
Rating Date							8/26/2009			
Rating Type					50% Head		Height		Yield	
Rating Unit					days		in		lb/A	
Crop Stage Majority					Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage						
1	UREA	0	lb ai/A	4-5 leaf	100	e	34	f	6621	f
2	UREA	60	lb ai/A	4-5 leaf	101	de	38	e	8306	e
3	UREA	90	lb ai/A	4-5 leaf	102	de	39	cde	9065	cd
4	UREA	120	lb ai/A	4-5 leaf	103	cd	39	cde	9030	cd
5	UREA	150	lb ai/A	4-5 leaf	105	abc	41	bcd	9002	cd
6	UREA	180	lb ai/A	4-5 leaf	106	ab	41	abc	9503	abc
7	UREA	210	lb ai/A	4-5 leaf	106	a	43	ab	9084	bcd
8	UREA	270	lb ai/A	4-5 leaf	106	a	44	a	9016	cd
9	UREA	45	lb ai/A	4-5 leaf	101	e	38	de	8908	d
	UREA	45	lb ai/A	PD						
10	UREA	75	lb ai/A	4-5 leaf	101	e	39	cde	9606	ab
	UREA	45	lb ai/A	PD						
11	UREA	105	lb ai/A	4-5 leaf	104	bc	39	cde	9643	a
	UREA	45	lb ai/A	PD						
12	UREA	135	lb ai/A	4-5 leaf	105	abc	41	abc	8851	d
	UREA	45	lb ai/A	PD						
LSD (P=.05)					2		3		537	
Standard Deviation					1		2		372	
CV					1		4		4	

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

Table 26. Determine the agronomic response of drill-seeded Taggart to nitrogen fertilizer rate and time of application (1.3). Richland Parish.

Crop Name					Rice		Rice		Rice	
Rating Date							8/26/2009		9/1/2009	
Rating Type					50% Head		Height		Yield	
Rating Unit					days		in		lb/A	
Crop Stage Majority					Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage						
1	UREA	0	lb ai/A	4-5 leaf	99	f	33	g	7366	e
2	UREA	60	lb ai/A	4-5 leaf	100	def	38	f	9179	c
3	UREA	90	lb ai/A	4-5 leaf	100	def	41	de	9871	ab
4	UREA	120	lb ai/A	4-5 leaf	102	c-f	41	cde	9534	abc
5	UREA	150	lb ai/A	4-5 leaf	103	bcd	42	cd	9443	bc
6	UREA	180	lb ai/A	4-5 leaf	104	abc	45	b	8992	cd
7	UREA	210	lb ai/A	4-5 leaf	105	ab	47	a	9066	c
8	UREA	270	lb ai/A	4-5 leaf	106	a	47	a	8493	d
9	UREA	45	lb ai/A	4-5 leaf	99	ef	40	ef	9823	ab
	UREA	45	lb ai/A	PD						
10	UREA	75	lb ai/A	4-5 leaf	100	def	41	cde	10028	a
	UREA	45	lb ai/A	PD						
11	UREA	105	lb ai/A	4-5 leaf	102	c-f	43	bc	9789	ab
	UREA	45	lb ai/A	PD						
12	UREA	135	lb ai/A	4-5 leaf	102	b-e	43	bc	9806	ab
	UREA	45	lb ai/A	PD						
LSD (P=.05)					3		2		554	
Standard Deviation					2		1		384	
CV					2		3		4	

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

Evaluation of Arize Hybrid Response to N Rates and Timing of Application

Experiment number ....: 09-RP-11 & 09-RP-12

Site and design ....:
- **Location/Cooperator** ....: Richland Parish / Elliot Colvin
- **Tillage type**..................................: Spring 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 ....: Perry Clay
- **% organic matter**........................: 1.99
- **pH**...: 7.6
- **Extractable nutrients** ppm..........: Ca-3,265; Cu-2.59; Mg-665; P-6.7; K-213; Na-72.5; S-22.8; Zn-1.8

Crop/Variety ....: Rice / Arize
- **Planting method/date** ....: Drill seeded / April 23
- **Seeding rate/depth**......................: 14 seeds/ft^2 / 1.0 -1.5 inches
- **Emergence date**...........................: May 1
- **Harvest date** ....: September 8

Seed treatment/cwt ....: Dithane (fungicide), 114 g
Release (gibberellic acid), 10 g
Zinche (40.5% Zn), 236 ml

Fertilization..: 2 tons/A of chicken litter was applied in February

Water management ....:
- **Flush** ....: Rain
- **Flood** ....: June 2
- **Drain**...: August 15

Pest management...............................:
- **Herbicides**....................................: 1 qt/A Roundup + .75 oz/A Permit, April 24
1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 20
3 qt/A RiceBeaux + .75 oz/A Londax + .5 oz/A Permit, June 2
- **Insecticides** ....: 2 oz/A Karate, June 12
- **Fungicides** ....: 16 oz/A Stratego + .33 lb/A Methyl, July 18

Table 27. Evaluation the response of Arize to N rate and time of application (3.1). Richland Parish.

Crop Name					Rice		Rice		Rice		Rice		Rice	
Rating Data Type					50% Head		Height		Lodge		Lodge		Yield	
Rating Unit					days		in		% plot		rate		lb/A	
Rating Date							8/26/2009		8/26/2009		8/26/2009		9/9/2009	
Crop Stage					Main		Main		Main		Main		Main	
Trt No.	Treatment Name	Rate	Rate Unit	Grow Stg										
1	0 lb N/A	0	lb ai/A	PF	101	c	40	c	90	a	2	a	9188	d
	30 lb N/A	30	lb ai/A	HD										
2	30 lb N/A	30	lb ai/A	PF	104	abc	43	b	90	a	2	b	10467	c
	30 lb N/A	30	lb ai/A	HD										
3	60 lb N/A	60	lb ai/A	PF	102	bc	43	b	90	a	2	b	11578	a
	30 lb N/A	30	lb ai/A	HD										
4	90 lb N/A	90	lb ai/A	PF	104	abc	46	a	90	a	2	b	10690	bc
	30 lb N/A	30	lb ai/A	HD										
5	120 lb N/A	120	lb ai/A	PF	106	ab	44	ab	90	a	2	b	11427	ab
	30 lb N/A	30	lb ai/A	HD										
6	150 lb N/A	150	lb ai/A	PF	107	a	46	a	90	a	2	b	11553	a
	30 lb N/A	30	lb ai/A	HD										
7	60 lb N/A	60	lb ai/A	PF	104	abc	42	b	90	a	2	b	10868	abc
	60 lb N/A	60	lb ai/A	PD										
8	90 lb N/A	90	lb ai/A	PF	106	ab	44	ab	90	a	2	b	11551	a
	60 lb N/A	60	lb ai/A	PD										
LSD (P=.05)					4		2		0		0		839	
Standard Deviation					3		2		0		0		569	
CV					2		4		0		9		5	

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

Table 28. Evaluation of Arize hybrid response to N rates and timing of application (1.1). Official Bayer N rates. Richland Parish.

Crop Name				Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue			
Part Rated								Abvgrd	Abvgrd			
Rating Date					8/26/09	8/26/09	8/26/09			9/8/09		
Rating Type				50% Head	Height	Lodge	Lodge	Biomass	Biomass	Yield	Milling	Milling
Rating Unit				days	in	% plot	rate	dry wt (g)	dry wt (g)	lb/A	whole	total
Sample Size, Unit								3 ft	3 ft		g	g
Collection Basis, Unit								1 row	1 row		100 g	100 g
Crop Stage Majority				Main	Main	Main	Main	PD	50%head	Main	Main	Main
Trt No.	Treatment Name	Growth Stage	Appl Description									
1	UTC			101 c	40 c	90 a	2 a	57 c	214 b	9965 c	55 c	72 b
2	36.8 lb N/A	4-5 leaf	80 lb urea PF/ 70 lb Urea HD	104 ab	42 abc	90 a	2 a	64 bc	310 a	11511 b	59 b	72 b
	32.2 lb N/A	LateBoot	(69 lb N total)									
3	55.2 lb N/A	4-5 leaf	120 lb urea PF/ 70 lb Urea HD	103 b	41 bc	88 a	1 b	87 ab	303 a	12356 ab	60 b	72 b
	32.2 lb N/A	LateBoot	(87.4 lb N total)									
4	73.6 lb N/A	4-5 leaf	160 lb urea PF/ 70 lb Urea HD	105 ab	44 a	88 a	2 ab	94 a	286 ab	12860 a	62 ab	72 ab
	32.2 lb N/A	LateBoot	(105.8 lb N/A total)									
5	92 lb N/A	4-5 leaf	200 lb urea PF /70 lb Urea HD	105 a	43 ab	88 a	2 ab	100 a	295 a	12959 a	62 a	73 a
	32.2 lb N/A	LateBoot	(1124.2 lb N/A total)									
LSD (P=.05)				2	2	5	1	25	75	1084	2	1
Standard Deviation				1	1	3	0	16	48	704	2	1
CV				1	3	3	26	20	17	6	3	1

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

Evaluation of Biagro Products Nutri-Phite Ultra and Nutri-Phite Sulfone Ultra for Use in Rice Production

Experiment number	09-RP-13
Site and design	
Location/Cooperator	Richland Parish / Elliot Colvin
Tillage type	Spring 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	Perry Clay
% organic matter	1.99
pH	7.6
Extractable nutrients ppm	Ca-3,265; Cu-2.59; Mg-665; P-6.7; K-213; Na-72.5; S-22.8; Zn-1.8
Crop/Variety	Rice / Cheniere
Planting method/date	Drill seeded / April 23
Seeding rate/depth	33 seeds/ft^2 / 1.0 -1.5 inches
Emergence date	May 1
Harvest date	September 1
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	2 tons/A of chicken litter was applied in February 150 lb N/A 46-0-0, June 2
Water management	
Flush	Rain
Flood	June 2
Drain	August 15
Pest management	
Herbicides	1 qt/A Roundup + .75 oz/A Permit, April 24 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 20 3 qt/A RiceBeaux + .75 oz/A Londax + .5 oz/A Permit, June 2
Insecticides	2 oz/A Karate, June 12
Fungicides	16 oz/A Stratego + .33 lb/A Methyl, July 18

Table 29. Evaluation of Biagro products Nutri-Phite Ultra and Nutri-Phite Sulfone Ultra for use in rice production (3.1). Richland Parish.

Crop Name					Rice	Rice	Rice
Rating Date						8/26/2009	9/1/2009
Rating Type					50% Head	Height	Yield
Rating Unit					days	in	lb/A
Crop Stage Majority					Main	Main	Main
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage			
1	UTC				96 b	38 a	10356 a
2	Nutri-Phite Ultra	32	fl oz/A	2-4 leaf	97 a	39 a	10374 a
	Nutri-Phite Sulfone Ultra	3	lb/A	Flag leaf			
	Nutri-Phite Ultra	64	fl oz/A	Flowering			
LSD (P=.05)					0	3	364
Standard Deviation					0	1	162
CV					0	3	2

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

Determine the Effect of N Source, Rate, and Variety on Ratoon Yields

Experiment number	09-CM-23
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Conventional
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	1.30
pH	7.26
Extractable nutrients ppm	Ca-1,289; Cu-1.74; Mg-234; P-9.4; K-57; Na-90.9; S-15.2; Zn-6.05
Crop/Variety	Rice / Cocodrie and CL151
Planting method/date	Drill seeded / March 23
Seeding rate/depth	33 seeds/ft^2 / .5 inches
Emergence date	April 4
Harvest date	August 5
Ratoon Harvest date	October 26
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	240 lb/A 0-24-24-2.8, March 23 150 lb N/A 46-0-0, May 11
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	July 21
Ratoon flood	August 7
Ratoon drain	October 14
Pest management	
Herbicides	1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 30. Determine the effect of N source, rate, and variety (CL151 and Cocodrie) on ratoon yields (1.1). Rice Research Station.

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Rating Type					50% Head		Height		Yield		50% Head		Yield		Yield	
Rating Unit					days		in		lb/A		days		lb/A		lb/A	
Crop Stage Majority					Main		Main		Main		Ratoon		Ratoon		Total	
Trt No.	Treatment Name	Rate	Rate Unit	Source												
1	Rate Cocodrie	45	lb ai/A	Urea	98	b	31	ef	8779	a	40	a	1575	gh	10115	h
2	Rate Cocodrie	90	lb ai/A	Urea	98	b	32	c-f	9224	a	40	a	1932	fg	11129	e-h
3	Rate Cocodrie	135	lb ai/A	Urea	98	b	31	def	8643	a	33	b	2391	cde	10979	fgh
4	Rate Cocodrie	45	lb ai/A	Amm Sulf.	98	b	33	a-f	8839	a	40	a	1512	h	10314	gh
5	Rate Cocodrie	90	lb ai/A	Amm Sulf.	98	b	32	b-f	9738	a	41	a	1929	fg	11651	b-f
6	Rate Cocodrie	135	lb ai/A	Amm Sulf.	98	b	30	f	8846	a	41	a	2132	def	11040	fgh
7	Rate Cocodrie	45	lb ai/A	Blend	98	b	33	a-f	9285	a	40	a	1460	h	10884	fgh
8	Rate Cocodrie	90	lb ai/A	Blend	98	b	32	b-f	9107	a	40	a	2063	ef	11247	d-h
9	Rate Cocodrie	135	lb ai/A	Blend	98	b	34	a-e	9142	a	42	a	2193	def	11438	c-g
10	Rate CL151	45	lb ai/A	Urea	100	a	34	a-e	9836	a	42	a	2485	cd	12398	a-d
11	Rate CL151	90	lb ai/A	Urea	100	a	35	a	9517	a	43	a	2927	ab	12646	abc
12	Rate CL151	135	lb ai/A	Urea	100	a	34	abc	9498	a	43	a	3287	a	12872	ab
13	Rate CL151	45	lb ai/A	Amm Sulf.	100	a	34	a-e	8991	a	39	a	3184	a	12102	a-f
14	Rate CL151	90	lb ai/A	Amm Sulf.	100	a	34	abc	9227	a	42	a	3126	a	12429	a-d
15	Rate CL151	135	lb ai/A	Amm Sulf.	100	a	34	a-d	9703	a	42	a	3191	a	12955	a
16	Rate CL151	45	lb ai/A	Blend	100	a	34	a-d	8896	a	41	a	2615	bc	11485	c-g
17	Rate CL151	90	lb ai/A	Blend	100	a	35	ab	9424	a	42	a	3077	a	12581	abc
18	Rate CL151	135	lb ai/A	Blend	100	a	32	b-f	9009	a	43	a	3177	a	12300	a-e
LSD (P=.05)							3.0		1239		5		409		1224	
Standard Deviation							1.8		743		3.6		289		734	
CV							5.4		8.1		8.8		11.8		6.3	

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

Ratoon Response of Rice Varieties to Nitrogen Fertilizer Rates

Experiment number	: 09-CM-24
Site and design	:
Location/Cooperator	: Rice Research Station (Crowley Main)
Tillage type	: Conventional
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	: 1.30
pH	: 7.26
Extractable nutrients ppm	: Ca-1,289; Cu-1.74; Mg-234; P-9.4; K-57; Na-90.9; S-15.2; Zn-6.05
Crop/Variety	: Rice / Catahoula and Neptune
Planting method/date	: Drill seeded / March 23
Seeding rate/depth	: 33 seeds/ft^2 / .5 inches
Emergence date	: April 5
Harvest date	: August 6
Ratoon Harvest date	: October 26
Seed treatment/cwt	: Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	: 240 lb/A 0-24-24-2.8, March 23 150 lb N/A 46-0-0, May 11 90 lb N/A 46-0-0, August 6
Water management	:
Flush	: April 2, April 6
Flood	: May 12
Drain	: July 21
Ratoon flood	: August 7
Ratoon drain	: October 14
Pest management	:
Herbicides	: 1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	: 2.5 oz/cwt Dermacor seed treatment
Fungicides	: 19 oz/A Stratego, June 22

Table 31. Ratoon response of rice varieties to nitrogen fertilizer rates (1.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice
Rating Type					50% Head	Height	Yield	50% Head	Yield	Yield
Rating Unit					days	in	lb/A	days	lb/A	lb/A
Crop Stage Majority					Main	Main	Main	Ratoon	Ratoon	Total
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage						
1	Catahoula 0 lb/A	0	lb ai/A	Postharv	100 ab	30 ab	8796 a	39 a	3226 abc	12022 ab
2	Catahoula 30 lb/A	30	lb ai/A	Postharv	100 ab	32 a	7986 a	38 a	2441 bc	10427 ab
3	Catahoula 60 lb/A	60	lb ai/A	Postharv	100 ab	30 ab	8115 a	38 a	2127 bc	10241 ab
4	Catahoula 90 lb/A	90	lb ai/A	Postharv	99 b	32 a	7861 a	40 a	2000 c	9861 b
5	Catahoula 120 lb/A	120	lb ai/A	Postharv	100 ab	32 a	8341 a	40 a	4303 a	12644 a
6	Catahoula 150 lb/A	150	lb ai/A	Postharv	100 ab	30 ab	8443 a	39 a	2381 bc	10824 ab
7	Neptune 0 lb/A	0	lb ai/A	Postharv	101 ab	30 ab	8107 a	38 a	3143 abc	11250 ab
8	Neptune 30 lb/A	30	lb ai/A	Postharv	99 ab	33 a	8718 a	40 a	2782 abc	11500 ab
9	Neptune 60 lb/A	60	lb ai/A	Postharv	100 ab	34 a	8144 a	39 a	2632 abc	10775 ab
10	Neptune 90 lb/A	90	lb ai/A	Postharv	101 a	26 b	7997 a	38 a	2797 abc	10794 ab
11	Neptune 120 lb/A	120	lb ai/A	Postharv	100 ab	32 a	8605 a	39 a	3720 ab	12325 ab
12	Neptune 150 lb/A	150	lb ai/A	Postharv	100 ab	31 ab	8360 a	38 a	3289 abc	11649 ab
LSD (P=.05)					1.8	5.0	1423.7	2.4	1685.8	2544.6
Standard Deviation					1.3	3.0	840.7	1.6	995.5	1502.7
CV					1.3	9.6	10.1	4.3	34.3	13.4

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

Evaluation and Comparison of the Agronomic Response of the Ratoon Rice Crop to Post-Harvest N Application Source and Rate

Experiment number	: 09-CM-26
Site and design	:
Location/Cooperator	: Rice Research Station (Crowley Main)
Tillage type	: Conventional
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	: 1.30
pH	: 7.26
Extractable nutrients ppm	: Ca-1,289; Cu-1.74; Mg-234; P-9.4; K-57; Na-90.9; S-15.2; Zn-6.05
Crop/Variety	: Rice / Cheniere
Planting method/date	: Drill seeded / March 23
Seeding rate/depth	: 33 seeds/ft^2 / .5 inches
Emergence date	: April 5
Harvest date	: August 5
Ratoon Harvest date	: October 26
Seed treatment/cwt	: Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	: 240 lb/A 0-24-24-2.8, March 23 150 lb N/A 46-0-0, May 11
Water management	:
Flush	: April 2, April 6
Flood	: May 12
Drain	: July 21
Ratoon flood	: August 7
Ratoon drain	: October 14
Pest management	:
Herbicides	: 1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	: 2.5 oz/cwt Dermacor seed treatment
Fungicides	: 19 oz/A Stratego, June 22

Table 32. Evaluation and comparison of the agronomic response of the ratoon rice crop to post-harvest N application source and rate (2.1). Rice Research Station.

Crop Name			Rice		Rice		Rice		Rice		Rice		Rice	
Rating Type			50% Head		Height		Yield		50% Head		Yield		Yield	
Rating Unit			days		in		lb/A		days		lb/A		lb/A	
Crop Stage Majority			Main		Main		Main		Ratoon		Ratoon		Total	
Trt No.	Treatment Name	Growth Stage												
1	Agrotain-urea 0 lb/A	PostHarv	99	a	34	a	8552	ab	46	a	654	e	9205	a
2	Agrotain-urea 30 lb/A	PostHarv	99	a	33	a	9213	a	46	a	1040	de	10253	a
3	Agrotain-urea 60 lb/A	PostHarv	99	a	33	a	9087	a	46	a	898	de	9984	a
4	Agrotain-urea 90 lb/A	PostHarv	99	a	32	ab	8165	ab	46	a	1318	a-d	9483	a
5	Agrotain-urea 120 lb/A	PostHarv	99	a	33	a	8778	ab	48	a	1224	bcd	10002	a
6	Agrotain-urea 150 lb/A	PostHarv	99	a	34	a	8388	ab	45	a	1765	ab	10153	a
7	Urea 0 lb/A	PostHarv	99	a	33	a	8777	ab	43	a	605	e	9382	a
8	Urea 30 lb/A	PostHarv	99	a	34	a	8482	ab	47	a	870	de	9353	a
9	Urea 60 lb/A	PostHarv	99	a	34	a	8084	ab	47	a	1126	cde	9210	a
10	Urea 90 lb/A	PostHarv	99	a	33	a	8950	a	48	a	896	de	9846	a
11	Urea 120 lb/A	PostHarv	99	a	32	ab	7495	b	47	a	1801	a	9296	a
12	Urea 150 lb/A	PostHarv	99	a	30	b	7972	ab	47	a	1622	abc	9594	a
LSD (P=.05)					2		1405		7		561		1080	
Standard Deviation					1		830		5		331		638	
CV					3.8		9.8		10.3		28.8		6.6	

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

Evaluation of Nondestructive Measurements to Determine Midseason N Needs for Commercial Rice

Experiment number	: 09-CM-10 & 09-CM-11
Site and design	:
Location/Cooperator	: Rice Research Station (Crowley Main)
Tillage type	: Conventional
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	: 1.32
pH	: 6.95
Extractable nutrients ppm..........	: Ca-1,286; Cu-1.66; Mg-215; P-21; K-61; Na-79.8; S-14.9; Zn-6.93
Crop/Variety	: Rice / Cocodrie
Planting method/date	: Drill seeded / March 23
Seeding rate/depth	: 40 seeds/ft^2 / .5 inches
Emergence date	: April 6
Harvest date	: August 12
Seed treatment/cwt	: Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	: 240 lb/A 0-24-24-2.8, March 24
Water management	:
Flush	: April 2, April 6
Flood	: May 12
Drain	: August 3
Pest management	:
Herbicides	: 1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	: 2.5 oz/cwt Dermacor seed treatment
Fungicides	: 19 oz/A Stratego, June 22

Table 33. Evaluation of nondestructive measurements to determine midseason N needs for Cocodrie rice (3.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue N	Tissue N
Rating Date						8/12/2009	8/12/2009				
Rating Type					50% Head	Height	Yield	Biomass	Biomass	%	%
Rating Unit					days	in	lb/A	dry (g)	dry (g)		
Sample Size, Unit								3 ft	3 ft		
Collection Basis, Unit								1 row	1 row		
Crop Stage Majority					Main	Main	Main	PD	50% Head	PD	50%Head
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	3-4-leaf	95 de	29 f	4462 g	44 d	100 g	1.0 d	0.8 d
	UREA	0	lb ai/A	PD							
2	UREA	0	lb ai/A	3-4-leaf	94 e	29 f	4770 g		116 fg		1.0 a-d
	UREA	60	lb ai/A	PD							
3	UREA	30	lb ai/A	3-4-leaf	96 cde	30 def	6367 f	73 c	166 ef	1.3 cd	1.0 bcd
	UREA	0	lb ai/A	PD							
4	UREA	30	lb ai/A	3-4-leaf	96 bcd	30 ef	6441 f		183 de		0.8 d
	UREA	60	lb ai/A	PD							
5	UREA	60	lb ai/A	3-4-leaf	97 a-d	32 cde	7672 e	98 b	218 cde	1.4 c	0.9 cd
	UREA	0	lb ai/A	PD							
6	UREA	60	lb ai/A	3-4-leaf	96 bcd	32 bcd	8545 de		251 c		1.1 abc
	UREA	60	lb ai/A	PD							
7	UREA	90	lb ai/A	3-4-leaf	98 abc	32 bcd	9353 bcd	104 ab	256 bc	1.7 b	1.2 ab
	UREA	0	lb ai/A	PD							
8	UREA	90	lb ai/A	3-4-leaf	98 abc	33 bc	8913 cd		231 cd		1.1 abc
	UREA	60	lb ai/A	PD							
9	UREA	120	lb ai/A	3-4-leaf	99 ab	33 bc	9740 abc	113 a	271 abc	2.0 ab	1.2 ab
	UREA	0	lb ai/A	PD							
10	UREA	120	lb ai/A	3-4-leaf	96 bcd	33 bc	10109 ab		231 cd		1.2 ab
	UREA	60	lb ai/A	PD							
11	UREA	150	lb ai/A	3-4-leaf	99 a	36 a	10341 a	103 ab	313 ab	2.1 a	1.2 ab
	UREA	0	lb ai/A	PD							
12	UREA	150	lb ai/A	3-4-leaf	99 a	34 ab	10349 a		325 a		1.2 a
	UREA	60	lb ai/A	PD							
LSD (P=.05)					2	2	916	11	58	0.3	0.2
Standard Deviation					2	1	634	7	40	0.2	0.2
CV					2	4	8	8	18	13.3	15.8

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

Table 34. Evaluation of nondestructive measurements to determine midseason N needs for Wells rice (3.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue N	Tissue N
Rating Date						8/12/2009	8/12/2009				
Rating Type					50% Head	Height	Yield	Biomass	Biomass		
Rating Unit					days	in		dry (g)	dry (g)	%	%
Sample Size, Unit								3 ft	3 ft		
Collection Basis, Unit								1 row	1 row		
Crop Stage Majority					Main	Main		PD	50% head	PD	50% Head
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	3-4 leaf	98 c	28 f	3280 e	42 d	102 ef	1.1 e	0.9 bcd
	UREA	0	lb ai/A	PD							
2	UREA	0	lb ai/A	3-4 leaf	98 c	30 ef	4014 e		72 f		1.0 bcd
	UREA	60	lb ai/A	PD							
3	UREA	30	lb ai/A	3-4 leaf	99 bc	31 de	4595 e	70 c	121 e	1.3 d	0.9 bcd
	UREA	0	lb ai/A	PD							
4	UREA	30	lb ai/A	3-4 leaf	98 c	36 bc	6128 d		161 d		0.9 cd
	UREA	60	lb ai/A	PD							
5	UREA	60	lb ai/A	3-4 leaf	98 c	33 cd	6548 d	82 bc	185 cd	1.3 cd	0.9 bcd
	UREA	0	lb ai/A	PD							
6	UREA	60	lb ai/A	3-4 leaf	98 c	35 bc	7222 cd		186 bcd		1.0 a-d
	UREA	60	lb ai/A	PD							
7	UREA	90	lb ai/A	3-4 leaf	98 c	36 abc	8047 bc	89 b	206 abc	1.5 c	0.8 d
	UREA	0	lb ai/A	PD							
8	UREA	90	lb ai/A	3-4 leaf	99 bc	36 bc	8266 abc		210 abc		1.0 bcd
	UREA	60	lb ai/A	PD							
9	UREA	120	lb ai/A	3-4 leaf	100 ab	36 abc	9341 ab	114 a	227 a	1.8 b	0.9 cd
	UREA	0	lb ai/A	PD							
10	UREA	120	lb ai/A	3-4 leaf	102 a	38 ab	8838 ab		237 a		1.2 a
	UREA	60	lb ai/A	PD							
11	UREA	150	lb ai/A	3-4 leaf	102 a	37 ab	8824 ab	115 a	230 a	2.0 a	1.1 abc
	UREA	0	lb ai/A	PD							
12	UREA	150	lb ai/A	3-4 leaf	102 a	39 a	9674 a		221 ab		1.1 ab
	UREA	60	lb ai/A	PD							
LSD (P=.05)					2	3	1418	17	35	0.19	0.23
Standard Deviation					1	2	837	12	24	0.13	0.16
CV					1	5	12	14	14	8.65	15.97

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

Evaluation of Nondestructive Measurements to Determine Midseason N Needs for Hybrid Rice

Experiment number	09-CM-12
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Conventional
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	1.32
pH	6.95
Extractable nutrients ppm	Ca-1,286; Cu-1.66; Mg-215; P-21; K-61; Na-79.8; S-14.9; Zn-6.93
Crop/Variety	Rice / XL723
Planting method/date	Drill seeded / March 23
Seeding rate/depth	14 seeds/ft^2 / .5 inches
Emergence date	April 6
Harvest date	August 12
Seed treatment/cwt	Apron XL, Maxim 4FS, Gibberellic Acid, Zinc, Dynasty
Fertilization	240 lb/A 0-24-24-2.8, March 24
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	August 3
Pest management	
Herbicides	1 gal/A Propanil + 1.5 pt/A Basagran, April 17
	1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11
	20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 35. Evaluation of nondestructive measurements to determine midseason N needs for XL723 rice (2.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue N	Tissue N
Rating Date						8/12/2009	8/12/2009				
Rating Type					50% Head	Height	Yield	Biomass	Biomass	N	N
Rating Unit					days	in	lb/A	dry (g)	dry (g)	%	%
Sample Size, Unit								3 ft	3 ft		
Collection Basis, Unit								1 row	1 row		
Crop Stage Majority					Main	Main	Main	PD	50% head	PD	50% Head
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage							
1	UREA	0	lb ai/A	3-4 leaf	92 d	33 cd	4598 f	40 c	92 d	1.1 d	1.0 bcd
	UREA	0	lb ai/A	PD							
2	UREA	0	lb ai/A	3-4 leaf	94 cd	32 d	5274 f		91 d		1.1 bc
	UREA	60	lb ai/A	PD							
3	UREA	30	lb ai/A	3-4 leaf	94 cd	34 bcd	6993 e	72 b	138 cd	1.2 cd	0.9 d
	UREA	0	lb ai/A	PD							
4	UREA	30	lb ai/A	3-4 leaf	94 cd	38 abc	7836 de		137 cd		1.0 cd
	UREA	60	lb ai/A	PD							
5	UREA	60	lb ai/A	3-4 leaf	94 c	39 a	8800 cd	92 ab	154 bc	1.3 c	0.8 d
	UREA	0	lb ai/A	PD							
6	UREA	60	lb ai/A	3-4 leaf	95 bc	39 a	8917 c		179 bc		1.0 bcd
	UREA	60	lb ai/A	PD							
7	UREA	90	lb ai/A	3-4 leaf	96 ab	38 ab	9776 bc	103 a	184 bc	1.6 b	1.0 cd
	UREA	0	lb ai/A	PD							
8	UREA	90	lb ai/A	3-4 leaf	97 a	38 ab	9762 bc		182 bc		1.2 b
	UREA	60	lb ai/A	PD							
9	UREA	120	lb ai/A	3-4 leaf	97 a	43 a	10752 ab	109 a	191 abc	1.9 a	1.2 bc
	UREA	0	lb ai/A	PD							
10	UREA	120	lb ai/A	3-4 leaf	96 ab	41 a	11055 a		204 ab		1.2 b
	UREA	60	lb ai/A	PD							
11	UREA	150	lb ai/A	3-4 leaf	97 a	40 a	11562 a	113 a	239 a	2.0 a	1.2 b
	UREA	0	lb ai/A	PD							
12	UREA	150	lb ai/A	3-4 leaf	97 a	41 a	10952 a		190 abc		1.5 a
	UREA	60	lb ai/A	PD							
LSD (P=.05)					2	5	1040	23	54	0.2	0.2
Standard Deviation					1	3	720	15	37	0.1	0.1
CV					1	8	8	17	23	7.4	13.0

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

Nitrogen Uptake Modeling Study

Experiment number	09-CM-30
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Conventional
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	1.320
pH	6.95
Extractable nutrients ppm	Ca-1,286; Cu-1.66; Mg-215; P-21; K-61; Na-79.8; S-14.9; Zn-6.93
Crop/Variety	Rice / Catahoula, Neptune, XL723
Planting method/date	Drill seeded / March 24
Seeding rate/depth	33 seeds/ft^2 / .5 inches
Emergence date	April 6
Harvest date	August 13
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	240 lb/A 0-24-24-2.8, March 24
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	August 3
Pest management	
Herbicides	1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 36. Nitrogen uptake modeling study (1.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description								Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Part Rated								Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd
Rating Date								5/11/09	5/14/09	5/18/09	5/21/09	5/25/09	5/28/09	6/1/09
Rating Type					50% HD	Height	Yield	N	N	N	N	N	N	N
Rating Unit					days	in	lb/A	%	%	%	%	%	%	%
Crop Stage Majority					Main	Main	Main							
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage										
1	Catahoula				99 d	30 bcd	6301 bc	3.0 ab	4.5 a	4.0 a	3.9 a	3.5 a	3.1 a	2.3 abc
	150 SPF	150	lb/A	4-5 leaf										
2	Catahoula				97 d	31 abc	6442 b	3.1 ab	4.3 ab	4.0 a	3.9 a	3.6 a	2.9 a	2.3 abc
	150 split	100	lb/A	4-5 leaf										
	150 split	50	lb ai/A	PD										
3	Catahoula				95 d	27 cde	2546 e	2.8 b	3.5 c	2.2 b	2.0 b	1.8 b	1.5 b	1.4 d
	0 lb N/A	0	lb/A	4-5										
4	Neptune				110 ab	26 de	5082 cd	2.8 b	4.1 b	4.0 a	4.0 a	3.4 a	3.0 a	2.0 bcd
	150 SPF	150	lb/A	4-5 leaf										
5	Neptune				107 bc	27 cde	4545 d	2.8 b	4.1 b	4.0 a	4.0 a	3.2 a	3.0 a	2.3 abc
	150 split	100	lb/A	4-5 leaf										
	150 split	50	lb ai/A	PD										
6	Neptune				113 a	23 e	1587 e	2.9 ab	3.4 c	2.3 b	2.2 b	1.9 b	1.7 b	1.5 d
	0 lb N/A	0	lb/A	4-5										
7	XL723				98 d	35 a	9655 a	3.3 a	4.6 a	4.1 a	3.9 a	3.6 a	3.2 a	2.8 a
	150 SPF	150	lb/A	4-5 leaf										
8	XL723				101 cd	32 ab	8519 a	3.3 a	4.5 a	4.2 a	3.8 a	3.4 a	3.0 a	2.5 ab
	150 split	100	lb/A	4-5 leaf										
	150 split	50	lb ai/A	PD										
9	XL723				100 d	27 de	3977 d	3.2 ab	3.9 b	2.5 b	2.3 b	2.0 b	1.7 b	1.8 cd
	0 lb N/A	0	lb/A	4-5										
LSD (P=.05)					6	4	1262	0.5	0.4	0.3	0.4	0.4	0.4	0.7
Standard Deviation					4	3	729	0.3	0.2	0.2	0.2	0.2	0.2	0.4
CV					3	9	13	8.7	5.2	5.0	6.1	7.0	8.5	18.0

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

Table 36. Continued.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description					Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Part Rated					Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd	Abvgrd
Rating Date					6/4/09	6/8/09	6/11/09	6/15/09	6/18/09	6/22/09	6/25/09	6/29/09	7/2/09	7/6/09	7/9/09
Rating Type					N	N	N	N	N	N	N	N	N	N	N
Rating Unit					%	%	%	%	%	%	%	%	%	%	%
Crop Stage Majority															
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage											
1	Catahoula				1.5 b	2.7 a	2.2 a	1.7 bc	1.8 abc	1.3 bc	1.2 abc	1.1 abc	1.2 ab	1.2 bc	
	150 SPF	150	lb/A	4-5 leaf											
2	Catahoula				1.3 b	2.3 b	2.0 ab	1.7 bc	1.6 c	1.3 bc	1.1 bc	1.0 bc	1.0 b	1.1 bcd	
	150 split	100	lb/A	4-5 leaf											
	150 split	50	lb ai/A	PD											
3	Catahoula				0.8 c	1.3 c	1.2 d	1.2 d	1.1 e	1.0 d	1.0 c	1.0 c	0.9 b	0.9 e	
	0 lb N/A	0	lb/A	4-5											
4	Neptune				1.5 b	2.7 a	2.4 a	2.0 ab	1.9 a	1.8 a	1.4 ab	1.3 ab	1.3 a	1.3 ab	1.2 a
	150 SPF	150	lb/A	4-5 leaf											
5	Neptune				1.3 b	2.2 b	2.1 ab	1.7 bc	1.6 bc	1.4 b	1.4 a	1.1 abc	1.1 ab	1.1 b-e	1.0 b
	150 split	100	lb/A	4-5 leaf											
	150 split	50	lb ai/A	PD											
6	Neptune				0.8 c	1.4 c	1.3 cd	1.2 cd	1.2 de	1.2 cd	1.2 abc	1.4 a	1.2 ab	1.1 b-e	1.0 ab
	0 lb N/A	0	lb/A	4-5											
7	XL723				1.7 a	2.9 a	2.3 a	2.3 a	1.8 ab	1.4 bc	1.2 abc	1.3 abc	1.1 ab	1.4 a	
	150 SPF	150	lb/A	4-5 leaf											
8	XL723				1.4 b	2.2 b	2.1 ab	1.7 bc	1.6 bc	1.2 cd	1.3 ab	1.0 bc	1.1 ab	1.0 cde	
	150 split	100	lb/A	4-5 leaf											
	150 split	50	lb ai/A	PD											
9	XL723				0.9 c	1.4 c	1.8 bc	1.2 cd	1.3 d	1.2 bcd	1.0 c	1.1 bc	1.0 ab	0.9 de	
	0 lb N/A	0	lb/A	4-5											
LSD (P=.05)					0.2	0.3	0.4	0.5	0.2	0.3	0.3	0.3	0.3	0.2	0.2
Standard Deviation					0.1	0.2	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.1
CV					11.0	9.4	13.0	17.8	6.8	12.3	13.5	15.9	15.9	12.1	6.8

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

Evaluation of Zinc Fertilization and N Source on Rice Yield and Nutrient Uptake (Leonards Farm)

Experiment number ....: 09-DL-01

Site and design ....:
- **Location/Cooperator** ....: Acadia Parish/Dennis Leonards
- **Tillage type** ....: Spring 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** ....: 1.67
- **pH** ....: 7.89
- **Extractable nutrients** ppm..........:
  - **Mehlich 3** ....: Ca-2,453; Cu-1.56; Mg-360; P-32; K-80; Na-129; S-11.1; Zn-.986
  - **DTPA** ....: Cu-0.662; Fe-49.71; Mn-6.99; Zn-0.522
  - **Total Carbon %** ....: 0.986
  - **Total Nitrogen %** ....: 0.101

Crop/Variety ....: Rice / Jupiter
- **Planting method/date** ....: Drill seeded / April 16
- **Seeding rate/depth** ....: 33 seeds/ft^2 / .5 inches
- **Emergence date** ....: April 26
- **Harvest date** ....: September 3

Seed treatment/cwt ....: Dithane (fungicide), 114 g
Release (gibberellic acid), 10 g

Fertilization ....: See treatment sheet

Water management ....:
- **Flush** ....: April 25, May 10
- **Flood** ....: May 21
- **Drain** ....: August 22

Pest management ....:
- **Herbicides** ....: 1 oz/A Permit, April 16
  1 gal/A Propanil + .66 oz/A Londax + .5 oz/A Permit, May 21
- **Insecticides** ....: None
- **Fungicides** ....: 21 oz/A Quilt + 4 oz/A Quadris, July 6

Table 37. Evaluation of zinc fertilization and N source on rice yield and nutrient uptake (Leonards Farm).

Crop Name						Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description						4-Leaf	4-Leaf	Tillering				Tissue	Tissue
Part Rated												Abvgrd	Abvgrd
Rating Date						5/20/09	5/20/09	6/4/09		9/3/2009	9/3/09	6/4/09	
Rating Type						Stand Ct	Height	Height	50% Head	Height	Yield	Biomass	Biomass
Rating Unit						number	cm	cm	days	in	lb/A	dry wt (g)	dry wt (g)
Sample Size, Unit						3 ft						3 ft	1 ft
Collection Basis, Unit						1 row						1 row	1 row
Crop Stage Majority						Main	Main	Main	Main	Main	Main	Tiller	50% Head
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Desc.								
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	31.5 ab	14 d	14 e			217 e	2.05 e	
	21-0-0	150	lb ai/A	3-4 leaf									
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	28 ab	16.3 ab	23 cd	109 bc	30 b	4152 c	4.95 cd	92 ab
	21-0-0	150	lb ai/A	3-4 leaf									
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	25.3 b	16.3 ab	25 a-d	106 de	31 ab	4606 bc	5.58 bcd	97 a
	21-0-0	150	lb ai/A	3-4 leaf									
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	29.5 ab	16.3 ab	26.8 ab	108 cd	33 a	5295 ab	7.53 abc	133 a
	21-0-0	150	lb ai/A	3-4 leaf									
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	25.3 b	15.8 abc	27 a	105 e	33 a	5911 a	8.38 a	94 a
	21-0-0	150	lb ai/A	3-4 leaf									
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	29.3 ab	15.3 bc	12.3 e			402 e	2 e	
	46-0-0	150	lb ai/A	ATPLAN									
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	29 ab	15 cd	22.5 d	114 a	26 c	2663 d	3.48 de	53 b
	46-0-0	150	lb ai/A	ATPLAN									
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	25.8 b	15.8 abc	25.3 abc	110 b	31 ab	4396 c	5.83 a-d	113 a
	46-0-0	150	lb ai/A	ATPLAN									
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	34.5 a	16 abc	24.3 bcd	109 bc	31 ab	5336 ab	8.08 ab	92 ab
	46-0-0	150	lb ai/A	ATPLAN									
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	29.8 ab	16.5 a	24.3 bcd	110 b	32 ab	5402 ab	7.18 abc	113 a
	46-0-0	150	lb ai/A	ATPLAN									
LSD (P=.05)						8.23	1.05	2.74	2.00	2.48	873.30	2.61	41.40
Standard Deviation						5.67	0.72	1.89	1.40	1.69	600.70	1.80	23.60
CV						19.70	4.60	8.42	1.24	5.50	15.65	32.71	24.04

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

Table 37. Continued

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice	
Description						---Tissue Samples---											
Part Rated						Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd	
Rating Date						---6/4/2009---											
Rating Type						Al		B		Ca		Cu		Fe		Mg	
Rating Unit						ppm		ppm		%		ppm		ppm		%	
Crop Stage Majority						---Tillering---											
Trt No.	Trt. Name	Rate	Rate Unit	Growth Stage	Appl Descript.												
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	1098	a	14.4	b	1.05	b	38.0	a	1836	a	0.354	a
	21-0-0	150	lb ai/A	3-4 leaf													
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	406	b	8.9	d	0.59	cd	37.8	a	797	b	0.272	cd
	21-0-0	150	lb ai/A	3-4 leaf													
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	399	b	8.0	de	0.45	d	50.8	a	555	b	0.233	e
	21-0-0	150	lb ai/A	3-4 leaf													
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	304	b	7.4	e	0.46	d	49.1	a	517	b	0.242	de
	21-0-0	150	lb ai/A	3-4 leaf													
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	289	b	7.3	e	0.40	d	46.3	a	469	b	0.235	e
	21-0-0	150	lb ai/A	3-4 leaf													
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	1346	a	15.9	a	1.39	a	33.6	a	2148	a	0.381	a
	46-0-0	150	lb ai/A	ATPLAN													
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	529	b	10.9	c	0.71	c	43.2	a	954	b	0.308	b
	46-0-0	150	lb ai/A	ATPLAN													
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	280	b	8.9	d	0.53	cd	38.3	a	489	b	0.273	c
	46-0-0	150	lb ai/A	ATPLAN													
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	239	b	8.0	de	0.47	d	48.2	a	383	b	0.275	c
	46-0-0	150	lb ai/A	ATPLAN													
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	302	b	8.4	de	0.52	cd	49.5	a	514	b	0.273	c
	46-0-0	150	lb ai/A	ATPLAN													
LSD (P=.05)						313.3		1.35		0.231		17.2		615.5		0.030	
Standard Deviation						215.9		0.93		0.159		11.8		424.2		0.021	
CV						41.6		9.47		24.190		27.2		49.0		7.320	

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

Table 37. Continued.

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice	
Description						Tissue Samples											
Part Rated						Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd	
Rating Date						6/4/2009											
Rating Type						Mn		P		K		Na		S		Zn	
Rating Unit						ppm		%		%		ppm		%		ppm	
Crop Stage Majority						Tillering											
Trt No.	Trt. Name	Rate	Rate Unit	Growth Stage	Appl Descript.												
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	124	b	0.273	a	1.30	c	1477	b	0.315	a	24.8	d
	21-0-0	150	lb ai/A	3-4 leaf													
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	81	cd	0.151	cde	1.89	b	770	cd	0.276	b	34.1	bcd
	21-0-0	150	lb ai/A	3-4 leaf													
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	57	d	0.160	bc	2.34	a	661	cd	0.274	b	50.6	a
	21-0-0	150	lb ai/A	3-4 leaf													
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	71	cd	0.144	c-f	2.26	a	538	d	0.270	bc	52.1	a
	21-0-0	150	lb ai/A	3-4 leaf													
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	60	d	0.153	cd	2.33	a	507	d	0.274	b	52.5	a
	21-0-0	150	lb ai/A	3-4 leaf													
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	165	a	0.185	b	0.83	d	2208	a	0.241	d	25.6	cd
	46-0-0	150	lb ai/A	ATPLAN													
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	90	c	0.127	def	1.45	c	1390	b	0.242	d	35.7	bcd
	46-0-0	150	lb ai/A	ATPLAN													
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	60	d	0.123	ef	1.78	b	799	cd	0.252	cd	36.5	bc
	46-0-0	150	lb ai/A	ATPLAN													
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	59	d	0.127	def	1.98	b	845	cd	0.259	bcd	41.6	ab
	46-0-0	150	lb ai/A	ATPLAN													
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	62	d	0.118	f	1.83	b	1010	c	0.249	d	45.2	ab
	46-0-0	150	lb ai/A	ATPLAN													
LSD (P=.05)						25.1		0.029		0.274		376.4		0.019		11.74	
Standard Deviation						17.3		0.020		0.189		259.4		0.013		8.09	
CV						20.8		13.020		10.490		25.4		5.010		20.29	

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

Table 37. Continued.

Crop Name					Rice		Rice		Rice		Rice		Rice		Rice	
Description					-----------------------------------Tissue Samples----------------------------------											
Part Rated					Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd	
Rating Date					-------------------------------------7/28/2009-----------------------------------											
Rating Type					Al		B		Ca		Co		Fe		Mg	
Rating Unit					ppm		Ppm		%		ppm		ppm		%	
Crop Stage Majority					------------------------------------50% Head------------------------------------											
Trt No.	Trt. Name	Rate	Rate Unit	Growth Stage	Appl Descript.											
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc											
	21-0-0	150	lb ai/A	3-4 leaf												
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	152	a	5.19	bcd	0.237	a	1.68	a	229	ab	0.160 c
	21-0-0	150	lb ai/A	3-4 leaf												
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	121	a	5.07	cd	0.230	a	2.05	a	209	ab	0.173 bc
	21-0-0	150	lb ai/A	3-4 leaf												
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	41	a	5.88	abc	0.270	a	2.31	a	106	b	0.187 abc
	21-0-0	150	lb ai/A	3-4 leaf												
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	136	a	4.98	d	0.253	a	1.99	a	254	ab	0.180 bc
	21-0-0	150	lb ai/A	3-4 leaf												
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc											
	46-0-0	150	lb ai/A	ATPLAN												
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	113	a	6.08	a	0.283	a	1.75	a	169	ab	0.217 a
	46-0-0	150	lb ai/A	ATPLAN												
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	135	a	5.47	a-d	0.240	a	2.16	a	175	ab	0.200 ab
	46-0-0	150	lb ai/A	ATPLAN												
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	180	a	6.04	ab	0.287	a	2.13	a	276	a	0.203 ab
	46-0-0	150	lb ai/A	ATPLAN												
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	119	a	5.18	bcd	0.233	a	1.96	a	183	ab	0.197 ab
	46-0-0	150	lb ai/A	ATPLAN												
LSD (P=.05)					152.501		0.858		0.078		0.693		151.806		0.034	
Standard Deviation					87.074		0.490		0.045		0.396		86.678		0.019	
CV					69.770		8.930		17.590		19.740		43.300		10.090	

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

Table 37. Continued

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice
Description						Tissue Samples										
Part Rated						Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd
Rating Date						7/28/2009										
Rating Type						Mn		P		K		Na		S		Zn
Rating Unit						ppm		%		%		ppm		%		ppm
Crop Stage Majority						50% Head										
Trt No.	Trt. Name	Rate	Rate Unit	Growth Stage	Appl Descript.											
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc											
	21-0-0	150	lb ai/A	3-4 leaf												
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	398	ab	0.250	a	1.26	a	1884	ab	0.100	b	9.34 c
	21-0-0	150	lb ai/A	3-4 leaf												
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	498	ab	0.260	a	1.30	a	1953	ab	0.107	ab	13.80 abc
	21-0-0	150	lb ai/A	3-4 leaf												
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	325	b	0.257	a	1.46	a	680	b	0.120	ab	17.59 ab
	21-0-0	150	lb ai/A	3-4 leaf												
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	588	a	0.253	a	1.33	a	1708	ab	0.103	b	19.61 a
	21-0-0	150	lb ai/A	3-4 leaf												
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc											
	46-0-0	150	lb ai/A	ATPLAN												
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	425	ab	0.243	a	1.31	a	2531	a	0.120	ab	7.37 c
	46-0-0	150	lb ai/A	ATPLAN												
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	391	ab	0.260	a	1.39	a	2330	a	0.117	ab	10.73 bc
	46-0-0	150	lb ai/A	ATPLAN												
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	466	ab	0.263	a	1.32	a	2264	a	0.130	a	13.59 abc
	46-0-0	150	lb ai/A	ATPLAN												
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	409	ab	0.253	a	1.35	a	2607	a	0.110	ab	11.32 bc
	46-0-0	150	lb ai/A	ATPLAN												
LSD (P=.05)						204.112		0.037		0.273		1518.991		0.026		7.011
Standard Deviation						116.543		0.021		0.156		867.308		0.015		4.003
CV						26.640		8.260		11.630		43.480		12.900		30.990

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

Determine the Influence of Zinc Fertilization and N Source on Rice Yields and Uptake in Rice (Richard Farm)

Experiment number	: 09-CR-01
Site and design	:
Location/Cooperator	: Vermilion Parish / Christian Richard
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	: Kaplan silt loam
% organic matter	: 1.99
pH	: 6.78
Extractable nutrients ppm..........	: Ca-1,735; Cu-2.19; Mg-484; P-17; K-85; Na-115; S-18; Zn-2.0
Crop/Variety	: Rice / CL151
Planting method/date	: Drill seeded / April 7
Seeding rate/depth	: 33 seeds/ft^2 / .5 inches
Emergence date	: April 17
Harvest date	: August 11
Seed treatment/cwt	: Dithane (fungicide), 114 g Release (gibberellic acid), 10 g
Fertilization	: See treatment sheet
Water management	:
Flush	: Rain
Flood	: May 7
Drain	: July 20
Pest management	:
Herbicides	: 4 oz/A Newpath + 1 gal/A RiceBeaux, April 17 6 oz/A Newpath, May 6
Insecticides	: None
Fungicides	: None

Table 38. Determine the influence of zinc fertilization and N source on rice yields and uptake in rice (Richard Farm).

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice	
Crop Variety						CL151		CL151		CL151		CL151		CL151		CL151	
Description						1 tiller		1 tiller								Tissue	
Rating Date						5/6/2009		5/6/2009				7/30/2009		8/11/2009		7/28/2009	
Rating Type						Stand count		Height		50% Head		Height		Yield		Biomass	
Rating Unit						number		cm		days		in		lb/A		(dry) g	
Sample Size, Unit						3 ft										1 ft	
Collection Basis, Unit						1 row										1 row	
Crop Stage Majority						Main		Main		Main		Main		Main		50% Head	
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Desc.												
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	18	a	19.3	ab	86	ab	38	a	8862	cd	181.5	a
	21-0-0	150	lb ai/A	3-4 leaf													
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	23.8	a	20.3	ab	85	b	38	a	8750	cd	154.3	a
	21-0-0	150	lb ai/A	3-4 leaf													
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	22.5	a	21	a	85	b	39	a	8932	bcd	185.3	a
	21-0-0	150	lb ai/A	3-4 leaf													
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	16	a	19.3	ab	85	b	39	a	8550	d	185.3	a
	21-0-0	150	lb ai/A	3-4 leaf													
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	20.5	a	18.8	b	86	ab	38	a	9107	bcd	176.5	a
	21-0-0	150	lb ai/A	3-4 leaf													
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	16.5	a	18.8	b	86	a	38	a	9218	a-d	177.5	a
	46-0-0	150	lb ai/A	ATPLAN													
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	21	a	20	ab	86	a	39	a	9684	ab	223.3	a
	46-0-0	150	lb ai/A	ATPLAN													
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	17	a	20.8	ab	86	ab	40	a	10000	a	176.8	a
	46-0-0	150	lb ai/A	ATPLAN													
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	23.8	a	20	ab	86	a	40	a	9698	ab	231.1	a
	46-0-0	150	lb ai/A	ATPLAN													
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	18.8	a	20	ab	86	a	38	a	9524	abc	170.5	a
	46-0-0	150	lb ai/A	ATPLAN													
LSD (P=.05)						8.16		2.12		0.6		2.95		786		79.12	
Standard Deviation						5.62		1.46		0.4		1.72		458.2		46.12	
CV						28.43		7.37		0.5		4.44		4.96		24.77	

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

Table 38. Continued.

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice	
Crop Variety						CL151		CL151		CL151		CL151		CL151		CL151	
Description						--------------------------------------Tissue Samples----------------------------------											
Part Rated						Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd	
Rating Date						---7/28/2009--------------------------------------											
Rating Type						Al		B		Ca		Co		Fe		Mg	
Rating Unit						ppm		ppm		%		ppm		ppm		%	
Crop Stage Majority						---50% Head--------------------------------------											
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Descript.												
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	172.68	ab	6.40	a	0.33	a	1.73	ab	332.81	a	0.21	ab
	21-0-0	150	lb ai/A	3-4 leaf													
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	81.76	b	5.31	ab	0.29	abc	1.26	b	158.48	a	0.20	ab
	21-0-0	150	lb ai/A	3-4 leaf													
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	86.87	b	5.30	ab	0.30	abc	1.50	b	173.49	a	0.21	ab
	21-0-0	150	lb ai/A	3-4 leaf													
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	224.44	ab	6.02	ab	0.32	ab	1.07	b	420.45	a	0.21	ab
	21-0-0	150	lb ai/A	3-4 leaf													
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	307.88	ab	5.17	b	0.24	c	1.71	ab	532.41	a	0.18	b
	21-0-0	150	lb ai/A	3-4 leaf													
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	731.55	a	5.78	ab	0.27	bc	3.11	a	631.92	a	0.23	a
	46-0-0	150	lb ai/A	ATPLAN													
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	70.81	b	5.33	ab	0.26	c	1.55	ab	144.93	a	0.23	a
	46-0-0	150	lb ai/A	ATPLAN													
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	205.70	ab	5.78	ab	0.28	abc	1.85	ab	457.23	a	0.23	a
	46-0-0	150	lb ai/A	ATPLAN													
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	137.03	ab	5.51	ab	0.30	abc	1.49	b	218.00	a	0.23	a
	46-0-0	150	lb ai/A	ATPLAN													
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	196.69	ab	5.30	ab	0.26	bc	1.45	b	447.37	a	0.21	ab
	46-0-0	150	lb ai/A	ATPLAN													
LSD (P=.05)						600.65		1.11		0.06		1.61		491.31		0.04	
Standard Deviation						350.14		0.65		0.04		0.94		286.40		0.02	
CV						158.05		11.60		12.60		55.97		81.43		11.58	

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

Table 38. Continued.

Crop Name						Rice		Rice		Rice		Rice		Rice		Rice	
Crop Variety						CL151		CL151		CL151		CL151		CL151		CL151	
Description						---Tissue Samples---											
Part Rated						Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd		Abvgrd	
Rating Date						---7/28/2009---											
Rating Type						Mn		P		K		Na		S		Zn	
Rating Unit						ppm		%		%		ppm		%		ppm	
Crop Stage Majority						---50% Head---											
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Appl Desc.												
1	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	491.19	ab	0.12	abc	1.58	a	3673.85	ab	0.06	ab	18.02	bc
	21-0-0	150	lb ai/A	3-4 leaf													
2	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	372.48	b	0.13	abc	1.48	a	3133.85	ab	0.06	b	17.27	c
	21-0-0	150	lb ai/A	3-4 leaf													
3	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	448.00	ab	0.11	bc	1.75	a	2311.58	b	0.06	b	21.45	abc
	21-0-0	150	lb ai/A	3-4 leaf													
4	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	471.73	ab	0.15	ab	1.46	a	3303.02	ab	0.06	ab	18.21	bc
	21-0-0	150	lb ai/A	3-4 leaf													
5	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	415.43	ab	0.15	ab	1.46	a	3659.52	ab	0.06	b	24.34	a
	21-0-0	150	lb ai/A	3-4 leaf													
6	Zn Sulfate	0	lb ai/A	ATPLAN	Zinc	674.09	a	0.14	abc	1.54	a	5413.83	a	0.07	ab	21.71	abc
	46-0-0	150	lb ai/A	ATPLAN													
7	Zn Sulfate	5	lb ai/A	ATPLAN	Zinc	330.83	b	0.14	abc	1.45	a	4360.46	ab	0.07	ab	21.66	abc
	46-0-0	150	lb ai/A	ATPLAN													
8	Zn Sulfate	10	lb ai/A	ATPLAN	Zinc	445.38	ab	0.16	a	1.55	a	4556.07	ab	0.07	a	23.93	a
	46-0-0	150	lb ai/A	ATPLAN													
9	Zn Sulfate	15	lb ai/A	ATPLAN	Zinc	373.43	b	0.11	c	1.74	a	3793.25	ab	0.06	ab	22.93	ab
	46-0-0	150	lb ai/A	ATPLAN													
10	Zn Sulfate	20	lb ai/A	ATPLAN	Zinc	493.86	ab	0.14	abc	1.48	a	4652.58	ab	0.06	ab	22.23	abc
	46-0-0	150	lb ai/A	ATPLAN													
LSD (P=.05)						284.81		0.04		0.32		3003.43		0.01		5.00	
Standard Deviation						166.03		0.02		0.19		1750.80		0.01		2.91	
CV						36.76		16.82		11.95		45.06		13.45		13.76	

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

CULTURAL MANAGEMENT RESEARCH

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

Cultural Management Research

A crop rotation study was established in 2005 at the Rice Research Station South Unit. Rice rotations included in the study were: rice-rice, rice-soybean, rice-grain sorghum, and rice-fallow. Two tillage systems, no-till and conventional till, were also included in the study. Rice grain yields during the initial year of the study were not significantly different for tillage or rotation systems (data not shown). Rice was grown in all rotations in the fifth year (2009) of the trial. Rice yield was significantly higher in the no-till (5,397 lb/A) compared with the conventional tillage system (4,985 lb/A). Yields were also significantly higher in the rice-fallow rotation (5,693 lb/A) compared with the rice-rice (5,015 lb/A), rice-soybean (4,837 lb/A), and rice-sorghum (5,217 lb/A) rotations. Spring and fall soil bulk density (P_d), organic matter (OM), and total carbon (C) were not altered by the tillage or rice rotation system.

A trial was initiated in 2009 to gather preliminary data on the effects of tillage and seeding system cultural management practices on surface water quality discharge and nutrient use efficiency from rice fields. Two rice seeding (drill-seeded delayed flood and water-seeded pinpoint flood) and two tillage (conventional and fall-stale seedbed) cultural management systems were evaluated for a total of four seeding-by-tillage system combinations. A completely randomized design with two replications of each tillage-by-seeding system combination was used. A large plot size with a width of 14 m and a length of 128 m (approximately 0.18 ha) was used to better simulate sediment discharge levels of commercial rice fields. Each plot was separated with an individual levee and had an independent water inlet and drainage. Fertilizer phosphorus (P) and potassium (K) fertilizers were applied at a rate of 60 lb/A for each field and were incorporated prior to seeding for the conventional tillage system and surface broadcast immediately after seeding on the stale seedbed tillage system. Nitrogen (N) fertilizer was applied at a rate of 138 lb/A. In the drill-seeded, delayed flood systems, 92 lb N/A was applied immediately before permanent flood establishment and was followed with 46 lb N/A at midseason. In the water-seeded system, N was split between the brief draining period between seeding and permanent flood establishment and midseason. Water discharge was collected at the drainage outlet after each field discharge event. Year-end concentrations of total solids in field discharge water were significantly higher in the drill-seeded delayed flood systems. In the delayed flood systems, three additional runoff events occurred during the year compared with the water-seeded systems, which contributed to the additional total solids loss. Yearly NO_3-N losses were similar among all systems evaluated; however, NO_2-N yearly totals in the drill-seeded system exceed those in the water-seeded systems. Yearly totals for total-P concentrations in discharge water were greater in the fall-stale seedbed system, which was surface applied at planting compared with the conventional tillage system where the P was preplant incorporated. Grain yield was improved in the drill-seeded system compared with the water-seeded systems.

Two trials were initiated in 2008 and continued in 2009 to determine if differences in optimal N rate occur when rice is planted into a conventional compared with a stale seedbed tillage system using a large range of preflood N rates. The first trial evaluated Neptune, a medium-grain variety, while the second evaluated Catahoula, a long-grain variety. Nine N rates (0, 30, 60, 90, 120, 150, 180, 210, and 240 lb/A) were evaluated in each trial. All N was applied as urea 1 day prior to permanent flood establishment. A significant tillage-by-N rate effect was not observed in the Catahoula trial. Nitrogen was optimized at the 150 lb/A rate when all data were pooled (data not shown) in the Catahoula trial. The tillage system did not affect yield components or milling when data were pooled across N rates in the Catahoula trial. A significant tillage-by-N rate effect was not observed for Jupiter. Optimum N rate was determined at the 180 lb/A rate when data were pooled across tillage system (data not shown).

Two trials were initiated in 2009 to evaluate the effects of tillage system selection on optimum seeding rates of Catahoula and Neptune rice. Two tillage systems (conventional and fall stale seedbed) and five seeding rates (5, 10, 20, 30, 40, and 50 seed/ft^2) were used in the study. A significant (P = 0.08) tillage system by seeding rate interaction was observed for grain yield in the Catahoula trial. Yield was optimized at a seeding rate of 20 seed/ft^2 in the conventional tillage system and 50 seed/ft^2 in the stale seedbed system. Yield was optimized in both the stale seedbed and conventional tillage systems at a seeding rate of 20 seed/ft^2 in the Neptune trial.

Evaluation of the Optimum Preflood N Rate for Rice as Affected by Tillage System Choice

Experiment number	: 09-CM-17 to 09-CM-19
Site and design	:
Location/Cooperator	: Rice Research Station (Crowley Main)
Tillage type	: Fall Stale vs. Conventional
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	: 1.23
pH	: 6.91
Extractable nutrients ppm	: Ca-1,171; Cu-1.66; Mg-221; P-10.7; K-56; Na-86.4; S-14.0; Zn-6.10
Crop/Variety	: Rice / See Data Sheet
Planting method/date	: Drill seeded / March 23
Seeding rate/depth	: 33 seeds /ft^2 / Stale, .5 inches; Conventional, .75 inches
Emergence date	: Conventional, April 3; Stale, April 5
Harvest date	: August 5
Seed treatment/cwt	: Dithane (fungicide), 114 g
	Release (gibberellic acid), 10 g
	Zinche (40.5% Zn), 236 ml
Fertilization	: 240 lb/A 0-24-24-2.8, March 23
Water management	:
Flush	: April 2, April 6
Flood	: May 12
Drain	: July 21
Pest management	:
Herbicides	: 1 qt/A Glyphosate + 1 qt/A 2-4,D, January 23
	1 qt/A Glyphosate, March 23
	1 gal/A Propanil + 1.5 pt/A Basagran, April 17
	1 oz/A Permit, May 1
	1 gal/A Propanil + 1.5 pt/A Basagran, April 17
	1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11
	20 oz/A Clincher, June 15
Insecticides	: 2.5 oz/cwt Dermacor seed treatment
Fungicides	: 19 oz/A Stratego, June 22

Table 1. Evaluation of the optimum preflood N rate for Catahoula rice as affected by tillage system choice (2.1). Rice Research Station.

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description				Tissue		Tissue	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Part Rated				Abvgrd		Abvgrd							
Rating Date			8/3/09		8/5/09		8/4/09	8/4/09	8/4/09	8/4/09	8/4/09	8/4/09	8/4/09
Rating Type		50% HD	Height	Biomass	Yield	N	WP Dry Wt.	Panicle #	Grain wt.	10 P wt.	10 P seed	Milling	Milling
Rating Unit		days	in	DryWt(g)	lb/A	%	grams	number	grams	grams	number	whole	total
Sample Size, Unit				3 ft			1 m	1 m	1 m	1 m	1 m	g	g
Collection Basis, Unit				1 row			2 row	2 row	2 row	2 row	2 row	100 g	100 g
Crop Stage Majority		Main	Main	50%head	Main	50%head	Main	Main	Main	Main	Main	Main	Main
Trt No.	Appl Description												
1	Conventional tillage 0 lb N/A preflood	95 fgh	29 fg	108 b	3100 i	0.71 h	288 h	98 d	118 i	20.7 d	886 g	39 e	73 f
2	Conventional tillage 30 lb N/A preflood	96 def	30 fg	139 b	5434 h	0.91 e-h	459 g	126.5 cd	203 gh	20.1 d	870 g	47 d	73 f
3	Conventional tillage 60 lb N/A preflood	95 ef	33 b-f	200 a	7341 g	0.80 gh	558 efg	130.5 bcd	280 ef	29.1 abc	1238 b-f	46 d	74 ef
4	Conventional tillage 90 lb N/A preflood	96 b-e	37 a	215 a	8919 ef	1.00 efg	712 a-d	148.5 abc	404 a-d	27.4 bcd	1202 b-g	55 bc	75 ab
5	Conventional tillage 120 lb N/A preflood	97 ab	32 def	237 a	9557 cde	1.33 bcd	686 bcd	147.5 abc	346 b-e	31.1 abc	1373 a-e	56 bc	75 a-d
6	Conventional tillage 150 lb N/A preflood	98 ab	34 a-e	212 a	9530 de	1.07 def	754 abc	159.5 abc	380 a-d	30.2 abc	1377 a-e	62 a	76 a
7	Conventional tillage 180 lb N/A preflood	98 a	34 a-e	202 a	9825 b-e	1.50 abc	800 ab	168.5 ab	416 ab	32.5 ab	1497 ab	64 a	76 ab
8	Conventional tillage 210 lb N/A preflood	98 a	33 c-f	216 a	9743 b-e	1.47 abc	809 a	163 abc	405 a-d	36.6 a	1644 a	62 a	75 a-d
9	Conventional tillage 240 lb N/A preflood	98 a	37 a	237 a	10584 a-d	1.72 a	739 abc	181 a	354 a-e	30.8 abc	1442 abc	63 a	75 bcd

Continued.

Table 1. Continued.

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description				Tissue		Tissue	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Part Rated				Abvgrd		Abvgrd							
Rating Date			8/3/09		8/5/09		8/4/09	8/4/09	8/4/09	8/4/09	8/4/09	8/4/09	8/4/09
Rating Type		50% HD	Height	Biomass	Yield	N	WP Dry Wt.	Panicle #	Grain wt.	10 P wt.	10 P seed	Milling	Milling
Rating Unit		days	in	DryWt(g)	lb/A	%	grams	number	grams	grams	number	whole	total
Sample Size, Unit				3 ft			1 m	1 m	1 m	1 m	1 m	g	g
Collection Basis, Unit				1 row			2 row	2 row	2 row	2 row	2 row	100 g	100 g
Crop Stage Majority		Main	Main	50%head	Main	50%head	Main	Main	Main	Main	Main	Main	Main
Trt No.	Appl Description												
10	Stale Seedbed 0 lb N/A preflood	94 h	27 g	117 b	3496 i	0.87 fgh	272 h	97 d	130 hi	21.3 d	911 fg	40 e	74 ef
11	Stale Seedbed 30 lb N/A preflood	94 gh	30 efg	140 b	5676 h	0.74 gh	506 fg	136.5 bcd	252 fg	25.0 bcd	1088 d-g	43 de	74 ef
12	Stale Seedbed 60 lb N/A preflood	95 efg	32 def	216 a	7470 g	0.91 e-h	596 def	133.5 bcd	332 de	24.6 cd	1059 efg	47 d	74 de
13	Stale Seedbed 90 lb N/A preflood	96 c-f	32 def	213 a	8207 fg	0.98 efg	653 cde	151.5 abc	337 cde	25.6 bcd	1131 c-g	53 c	75 a-d
14	Stale Seedbed 120 lb N/A preflood	97 a-d	33 b-f	206 a	9587 b-e	1.14 def	814 a	179 a	425 a	32.0 abc	1395 a-e	60 ab	75 ab
15	Stale Seedbed 150 lb N/A preflood	97 abc	35 a-d	217 a	10678 ab	1.15 de	783 ab	161 abc	411 abc	35.8 a	1617 a	63 a	75 abc
16	Stale Seedbed 180 lb N/A preflood	98 a	36 abc	247 a	10666 abc	1.27 cd	744 abc	169 ab	391 a-d	24.4 cd	1095 c-g	63 a	74 cde
17	Stale Seedbed 210 lb N/A preflood	98 ab	35 a-d	249 a	10390 a-d	1.57 ab	773 ab	162 abc	398 a-d	31.5 abc	1427 a-d	63 a	75 abc
18	Stale Seedbed 240 lb N/A preflood	98 a	37 ab	249 a	10972 a	1.69 a	769 abc	155.5 abc	407 a-d	32.4 ab	1505 ab	63 a	75 a-d
LSD (P=.05)		2	4	54	1111	0.3	119	41	77	7.8	347	6	1
Standard Deviation		1	2	38	666	0.2	56	19	36	3.7	165	3	0
CV		1.1	7.0	19.0	7.9	14.0	9	13	11	13.0	13	5	1

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

Table 2. Evaluation of the optimum preflood N rate for Neptune rice as affected by tillage system choice (2.1). Rice Research Station.

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description				Tissue		Tissue	Total N Uptake	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Part Rated				Abvgrd		Abvgrd	Abvgrd							
Rating Date								8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09
Rating Type		50% HD	Height	Biomass	Yield	N		WP Dry Wt.	Panicle #	Grain Wt.	10 P Wt.	10 P Seed	Milling	Milling
Rating Unit		days	in	drywt(g)	lb/A	Plant	lb/A	grams	number	grams	grams	number	whole	total
Sample Size, Unit				3 ft				1 m	1 m	1 m	1 m	1 m		
Collection Basis, Unit				1 row				2 row	2 row	2 row	2 row	2 row		
Crop Stage Majority		Main	Main	50%head	Main	50%head		Main	Main	Main	Main	Main	Main	Main
Trt No.	Appl Description													
1	Conventional tillage 0 lb N/A preflood	105 a	27 cde	94.5 f	3359 H	0.81 g	39 ij	325.5 f	92 f	143 e	21 def	872 efg	58 g	71 ef
2	Conventional tillage 30 lb N/A preflood	104 ab	26 de	140.2 e	5439 G	0.84 g	61 hij	402.9 def	104 ef	168 de	22 c-f	866 efg	62 ef	71 f
3	Conventional tillage 60 lb N/A preflood	102 ab	28 b-e	171.3 cde	6473 G	0.87 g	72 ghi	548.4 cd	124 c-f	254 cde	25 a-f	967 c-g	63 de	73 b-e
4	Conventional tillage 90 lb N/A preflood	102 ab	30 a-d	173.0 cde	8125 F	1.12 ef	101 efg	640.1 bc	148 b-f	270 bcd	26 a-f	1034 b-f	66 cd	73 a-d
5	Conventional tillage 120 lb N/A preflood	103 ab	29 a-d	204.2 bc	9380 De	1.29 cde	128 de	781 ab	175 a-d	379 ab	25 a-f	1072 b-e	68 abc	73 a-d
6	Conventional tillage 150 lb N/A preflood	101 b	31 ab	229.1 ab	9674 Cde	1.24 de	133 de	799 ab	171 a-d	397 a	29 ab	1200 ab	71 ab	74 a
7	Conventional tillage 180 lb N/A preflood	101 b	32 a	240.7 a	11060 Ab	1.48 bcd	171 abc	848.8 a	192 ab	422 a	28 ab	1172 abc	71 ab	74 a
8	Conventional tillage 210 lb N/A preflood	101 b	32 a	239.5 a	10660 Abc	1.51 bc	175 ab	768.3 ab	179 abc	424 a	29 ab	1197 ab	70 ab	74 a
9	Conventional tillage 240 lb N/A preflood	101 b	33 a	225.5 ab	10527 Abc	1.81 a	198 a	861.5 a	217 a	420 a	30 a	1342 a	71 a	74 a

Continued.

Table 2. Continued.

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description				Tissue		Tissue	Total N Uptake	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Part Rated				Abvgrd		Abvgrd	Abvgrd							
Rating Date								8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09
Rating Type		50% HD	Height	Biomass	Yield	N		WP Dry Wt.	Panicle #	Grain Wt.	10 P Wt.	10 P Seed	Milling	Milling
Rating Unit		days	in	drywt(g)	lb/A	plant	lb/A	grams	number	grams	grams	number	whole	total
Sample Size, Unit				3 ft				1 m	1 m	1 m	1 m	1 m		
Collection Basis, Unit				1 row				2 row	2 row	2 row	2 row	2 row		
Crop Stage Majority		Main	Main	50%head	Main	50%head		Main	Main	Main	Main	Main	Main	Main
Trt No.	Appl Description													
10	Stale Seedbed 0 lb N/A preflood	102 ab	24 e	90.5 f	2541 h	0.80 g	35 j	349.5 ef	111 def	144 e	21 ef	808 fg	62 ef	72 c-f
11	Stale Seedbed 30 lb N/A preflood	101 b	30 abc	162.3 de	5913 g	0.87 g	67 hij	485.6 c-f	129 b-f	217 cde	24 b-f	925 d-g	60 fg	72 def
12	Stale Seedbed 60 lb N/A preflood	101 b	27 cde	179.4 cd	6186 g	0.99 fg	84 fgh	526.8 cde	133 b-f	237 cde	20 f	804 g	60 efg	72 c-f
13	Stale Seedbed 90 lb N/A preflood	101 b	29 a-d	203.1 bc	8573 ef	0.99 fg	102 efg	621.3 bc	147 b-f	322 abc	27 abc	1050 b-e	67 bc	73 a-d
14	Stale Seedbed 120 lb N/A preflood	101 b	30 a-d	225.2 ab	9297 de	1.13 ef	117 def	769.4 ab	155 a-f	384 ab	26 a-e	1074 b-e	69 ab	73 a-d
15	Stale Seedbed 150 lb N/A preflood	101 b	31 ab	249.6 a	10270 bcd	1.19 ef	146 bcd	779.6 ab	161 a-e	396 a	27 abc	1131 a-d	70 ab	73 abc
16	Stale Seedbed 180 lb N/A preflood	101 b	32 a	217.5 ab	10603 abc	1.43 cd	139 cd	833 a	182 abc	408 a	24 b-f	1060 b-e	71 a	74 ab
17	Stale Seedbed 210 lb N/A preflood	101 b	30 abc	217.3 ab	11316 ab	1.77 a	184 a	759.6 ab	158 a-e	381 ab	29 ab	1242 ab	71 ab	74 ab
18	Stale Seedbed 240 lb N/A preflood	101 b	32 a	242.8 a	11466 a	1.68 ab	198 a	855 a	175 a-d	414 a	27 a-d	1141 a-d	71 ab	74 ab
LSD (P=.05)		3	4	35.0	1110	0.24	34	189.5	65	119	6	227	3	2
Standard Deviation		2	2	24.7	666	0.14	20	89.8	31	57	3	108	2	1
CV		2	8	12.7	8	11.92	17	13.5	20	18	10	10	2	1

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

Evaluation of the Interaction of Seeding Rate and Tillage System for Drill-Seeded Rice

Experiment number	09-CM-20 & 09-CM-21
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Fall Stale vs. Conventional
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	1.23
pH	6.91
Extractable nutrients ppm	Ca-1,171; Cu-1.66; Mg-221; P-10.7; K-56; Na-86.4; S-14.0; Zn-6.10
Crop/Variety	Rice / See Data Sheet
Planting method/date	Drill seeded / March 23
Seeding rate/depth	5, 10, 20, 30, 40, and 50 seeds/ft^2 / Stale, .5 inches; Conventional, .75 inches
Emergence date	Conventional, April 3; Stale, April 5
Harvest date	August 4
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	240 lb/A 0-24-24-2.8, March 23 150 lb N/A 46-0-0, May 11
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	July 21
Pest management	
Herbicides	1 qt/A Glyphosate + 1 qt/A 2-4,D, January 23 1 qt/A Glyphosate, March 23 1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 oz/A Permit, May 1 1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 3. Evaluation of the interaction of seeding rate and tillage system for drill-seeded Catahoula rice (2.1). Rice Research Station.

Crop Name		Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description						YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Rating Date						8/4/2009	8/4/2009	8/4/2009	8/4/2009	8/4/2009	8/4/2009	8/4/2009
Rating Type		Stand	50% Head	Height	Yield	WP Dry Wt.	Panicle #	Grain Wt.	10 P Wt.	10 P Seed	Milling	Milling
Rating Unit		count	days	in	lb/A	grams	number	grams	grams	number	whole	total
Sample Size, Unit		3 ft				1 m	1 m	1 m	1 m	1 m		
Collection Basis, Unit		1 row				2 row	2 row	2 row	2 row	2 row		
Crop Stage Majority		2-3 leaf	Main	Main	Main	Main	Main	Main	Main	Main	Main	Main
Trt No.	Appl Description											
1	Conventional tillage 5 seed/ft^2	7 fg	98 ab	34 a	5512 d	503 b	95 e	215 b	32 a	1501 a	58 bc	72 a
2	Conventional tillage 10 seed/ft^2	10 efg	97 cd	36 a	7942 c	670 ab	112 de	345 ab	34 a	1528 a	59 abc	73 a
3	Conventional tillage 20 seed/ft^2	16 de	97 cd	36 a	10082 ab	758 a	142 bcd	388 a	34 a	1580 a	62 a	68 a
4	Conventional tillage 30 seed/ft^2	26 c	97 bcd	34 a	10528 ab	748 a	154 abc	373 a	30 a	1416 a	62 ab	73 a
5	Conventional tillage 40 seed/ft^2	36 b	97 cd	34 a	10351 ab	710 ab	153 abc	370 a	27 a	1250 a	60 abc	67 a
6	Conventional tillage 50 seed/ft^2	44 a	97 cd	33 a	9306 bc	754 a	177 ab	387 a	30 a	1367 a	57 c	73 a
7	Stale Seedbed 5 seed/ft^2	4 g	99 a	34 a	5984 d	625 ab	110 de	352 ab	36 a	1624 a	58 abc	73 a
8	Stale Seedbed 10 seed/ft^2	12 ef	98 bc	35 a	7896 c	567 ab	87 e	290 ab	30 a	1411 a	59 abc	73 a
9	Stale Seedbed 20 seed/ft^2	19 cd	97 bcd	35 a	9260 bc	680 ab	119 cde	326 ab	30 a	1374 a	60 abc	72 a
10	Stale Seedbed 30 seed/ft^2	24 c	97 cd	35 a	9605 b	661 ab	114 de	345 ab	32 a	1436 a	59 abc	73 a
11	Stale Seedbed 40 seed/ft^2	36 b	96 d	33 a	9446 b	769 a	183 a	384 a	28 a	1318 a	60 abc	73 a
12	Stale Seedbed 50 seed/ft^2	34 b	97 bcd	34 a	11191 a	740 ab	173 ab	367 a	25 a	1165 a	60 abc	73 a
LSD (P=.05)		7	1	3	1479	237	38	141	12	533	4	8
Standard Deviation		5	1	2	873	108	17	64	5	242	2	3
CV		23	1	5	10	16	13	19	18	17	3	5

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

Table 4. Evaluation of the interaction of seeding rate and tillage system for drill-seeded Neptune rice (2.1). Rice Research Station.

Crop Name					Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice	Rice
Description					2-3 leaf				YldComp	YldComp	YldComp	YldComp	YldComp	YldComp	YldComp
Rating Date					4/22/09				8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09	8/13/09
Rating Type					Stand Cnt	50% HD	Height	Yield	WP Dry Wt.	Panicle #	Grain Wt.	10 P Wt.	10 P Seed	Milling	Milling
Rating Unit					number	days	in	lb/A	grams	number	grams	grams	number	whole	total
Sample Size, Unit					3 ft				1 m	1 m	1 m	1 m	1 m		
Collection Basis, Unit					1 row				2 row	2 row	2 row	2 row	2 row		
Crop Stage Majority					Main	Main	Main	Main	Main	Main	Main	Main	Main	Main	Main
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage											
1	Conventional tillage 5 seed/ft^2	12	lb/A	PREPLA ATPLAN	6 e	102 a	29 cde	5571 d	531 bc	102 c	238 d	34 ab	1478 ab	69 b	72 c
2	Conventional tillage 10 seed/ft^2	24	lb/A	PREPLA ATPLAN	9 e	102 abc	30 b-e	7321 c	694 abc	145 abc	360 a-d	33 abc	1411 abc	71 ab	73 abc
3	Conventional tillage 20 seed/ft^2	48	lb/A	PREPLA ATPLAN	21 d	102 abc	32 ab	8614 ab	771 a	154 ab	389 abc	34 a	1473 ab	69 b	72 bc
4	Conventional tillage 30 seed/ft^2	72	lb/A	PREPLA ATPLAN	29 c	101 abc	31 ab	8640 ab	800 a	179 a	410 ab	27 bcd	1167 cd	71 a	73 ab
5	Conventional tillage 40 seed/ft^2	96	lb/A	PREPLA ATPLAN	35 b	101 bc	28 de	9235 a	723 abc	157 ab	374 a-d	26 d	1107 d	70 ab	72 abc
6	Conventional tillage 50 seed/ft^2	120	lb/A	PREPLA ATPLAN	46 a	101 abc	33 a	9566 a	766 a	175 a	397 abc	27 cd	1181 cd	70 ab	72 abc
7	Stale seedbed 5 seed/ft^2	12	lb/A	PREPLA ATPLAN	5 e	102 abc	28 e	5846 d	514 c	99 c	262 cd	30 a-d	1314 a-d	70 ab	72 bc
8	Stale seedbed 10 seed/ft^2	24	lb/A	PREPLA ATPLAN	8 e	102 ab	30 b-e	7714 bc	588 abc	112 bc	302 bcd	34 a	1543 a	70 ab	72 abc
9	Stale seedbed 20 seed/ft^2	48	lb/A	PREPLA ATPLAN	17 d	101 c	31 abc	9710 a	725 abc	142 abc	394 abc	34 a	1494 ab	70 ab	72 abc
10	Stale seedbed 30 seed/ft^2	72	lb/A	PREPLA ATPLAN	22 d	101 c	30 b-e	9822 a	766 a	156 ab	464 a	29 a-d	1269 bcd	70 ab	73 abc
11	Stale seedbed 40 seed/ft^2	96	lb/A	PREPLA ATPLAN	34 bc	101 bc	30 bcd	9341 a	681 abc	163 a	338 a-d	27 bcd	1154 cd	70 ab	73 abc
12	Stale seedbed 50 seed/ft^2	120	lb/A	PREPLA ATPLAN	38 b	101 c	28 de	9269 a	740 ab	176 a	375 a-d	25 d	1070 d	72 a	73 a
LSD (P=.05)					5	1	2	1264	222	50	139	6	271	2	1
Standard Deviation					4	1	1	875	101	23	63	3	123	1	1
CV					17	1	4	10	15	15	18	9	9	1	1

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

Evaluation of DERMACOR(TM) X-100 for Control of Rice Water Weevil Using One Application Rate (1.75 oz) and Three Seeding Rates

Experiment number	09-CM-31
Site and design	
Location/Cooperator	Rice Research Station (Crowley Main)
Tillage type	Conventional
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	1.36
pH	7.40
Extractable nutrients ppm	Ca-1,362; Cu-1.71; Mg-208; P-22.6; K-55; Na-76.8; S-14.0; Zn-7.18
Crop/Variety	Rice / Neptune
Planting method/date	Drill seeded / March 24
Seeding rate/depth	23, 34, 46 seeds /ft^2 / .5 inches
Emergence date	April 7
Harvest date	August 14
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	240 lb/A 0-24-24-2.8, March 24; 150 lb N/A 46-0-0, May 11
Water management	
Flush	April 2, April 6
Flood	May 12
Drain	August 3
Pest management	
Herbicides	1 gal/A Propanil + 1.5 pt/A Basagran, April 17 1 gal/A RiceBeaux + 1 oz/A Londax + .5 oz/A Permit, May 11 20 oz/A Clincher, June 15
Insecticides	2.5 oz/cwt Dermacor seed treatment
Fungicides	19 oz/A Stratego, June 22

Table 5. Evaluation of DERMACOR(TM) X-100 for control of rice water weevil using one application rate (1.75 oz) and three seeding rates. Rice Research Station.

Crop Name					Rice						
Description					2-3 leaf	RRW Larvae					
Rating Date					4/23/2009						
Rating Type					Stand count	SML	MED	LRG	PUP	TOT	PLT
Rating Unit					number	------------Mean Count------------					
Sample Size, Unit					3 ft						
Collection Basis, Unit					1 row						
Trt No.	Treatment Name	Rate	Rate Unit	Appl Description							
1	Seeding rate	1009140	seeds/A		27.3 b	3.50 a	5.17 a	10.75 ab	0 b	25.89 a	2.33 b
	Dermacor	0	fl oz/cwt								
2	Seeding rate	1009140	seeds/A		25 b	0.33 b	0.08 b	0.25 c	0 b	0.89 b	2.33 b
	Dermacor	2.91667	fl oz/cwt	Rate @ 1.75 oz/A seed							
3	Seeding rate	1513710	seeds/A		30.5 ab	4.17 a	3.50 a	8.33 b	0 b	21.33 a	2.75 b
	Dermacor	0	fl oz/cwt								
4	Seeding rate	1513710	seeds/A		34.5 ab	0.08 b	0.00 b	0.58 c	0 b	0.89 b	4.50 a
	Dermacor	1.9444	fl oz/cwt	Rate @ 1.75 oz/A seed							
5	Seeding rate	2018280	seeds/A		28.8 ab	4.75 a	5.08 a	12.83 a	0.25 a	30.47 a	3.25 ab
	Dermacor	0	fl oz/cwt								
6	Seeding rate	2018280	seeds/A		37 a	0.33 b	0.33 b	0.50 c	0.08 ab	1.64 b	3.33 ab
	Dermacor	1.4583	fl oz/cwt	Rate @ 1.75 oz/A seed							
LSD (P=.05)					9.73	2.7552	2.6089	3.93676	0.20506	11.1545	1.29039
Standard Deviation					6.46	1.8284	1.7313	2.612586	0.13608	7.40255	0.85635
CV					21.18	83.32	73.33	47.14	244.95	54.76	27.77

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

Table 5. Continued.

Crop Name					Rice	Rice	Rice	Rice
Description								
Rating Date								
Rating Type					Height	50% Head	Height	Yield
Rating Unit					in	days	in	lb/A
Sample Size, Unit								
Collection Basis, Unit								
Trt No.	Treatment Name	Rate	Rate Unit	Appl Description				
1	Seeding rate	1009140	seeds/A		23.7 a	109 b	24 a	3869 b
	Dermacor	0	fl oz/cwt					
2	Seeding rate	1009140	seeds/A		24.3 a	111 a	24 a	4820 a
	Dermacor	2.91667	fl oz/cwt	Rate @ 1.75 oz/A seed				
3	Seeding rate	1513710	seeds/A		24.3 a	108 b	24 a	4507 ab
	Dermacor	0	fl oz/cwt					
4	Seeding rate	1513710	seeds/A		25.3 a	112 a	25 a	4663 a
	Dermacor	1.9444	fl oz/cwt	Rate @ 1.75 oz/A seed				
5	Seeding rate	2018280	seeds/A		25 a	111 a	25 a	3879 b
	Dermacor	0	fl oz/cwt					
6	Seeding rate	2018280	seeds/A		25 a	111 a	25 a	4577 ab
	Dermacor	1.4583	fl oz/cwt	Rate @ 1.75 oz/A seed				
LSD (P=.05)					3.33	1.85	3.33	739
Standard Deviation					1.83	1.02	1.83	490.4
CV					7.44	0.92	7.44	11.18

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

Evaluation of Nutrient Losses from Rice Fields under Four Common Tillage and Seeding Practice Combinations (Drill- and Water-Seeded Runoff)

Experiment number	Drill-Seeded Runoff
Site and design	
Location/Cooperator	Rice Research Station (South Unit) / Ernest Girouard
Tillage type	Fall Stale vs. Conventional
Experimental design	Randomized complete block
Number of reps	2
Plot size	.4 acres
Row width/rows per plot	8 in / NA
Soil type	Crowley silt loam
% organic matter	1.44
pH	6.7
Extractable nutrients ppm	Ca-1,130; Cu-1.71; Mg-238; P-9.7; K-75; Na-83; S-14; Zn-9.2
Crop/Variety	Rice / Catahoula
Planting method/date	Drill seeded / May 21
Seeding rate/depth	90 lb/A / .25 inches
Emergence date	NA
Harvest date	September 30
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	250 lb/A 0-24-24-2.8, May 18 92 lb N/A 46-0-0, June 22 46 lb N/A 46-0-0, July 20
Water management	
Flush	May 26, June 3, 9, and 15
Flood	June 23
Drain	September 8
Pest management	
Herbicides	12 oz/A Command + 1 oz/A Permit + 1% COC, June 2
Insecticides	None
Fungicides	None

Evaluation of Nutrient Losses from Rice Fields under Four Common Tillage and Seeding Practice Combinations

Experiment number	: Water-Seeded Runoff
Site and design	:
Location/Cooperator	: Rice Research Station (South Unit) / Ernest Girouard
Tillage type	: Fall Stale vs. Conventional
Experimental design	: Randomized complete block
Number of reps	: 2
Plot size	: .4 acres
Row width/rows per plot	: NA / NA
Soil type	: Crowley silt loam
% organic matter	: 1.44
pH	: 6.7
Extractable nutrients ppm	: Ca-1,130; Cu-1.71; Mg-238; P-9.7; K-75; Na-83; S-14; Zn-9.2
Crop/Variety	: Rice / Catahoula
Planting method/date	: Broadcast / May 27
Seeding rate/depth	: 105 lb/A / Surface
Emergence date	: NA
Harvest date	: September 30
Seed treatment/cwt	: Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	: 250 lb/A 0-24-24-2.8, May 18 92 lb N/A 46-0-0, June 2 46 lb N/A 46-0-0, July 20
Water management	:
Flush	: NA
Flood	: June 3
Drain	: September 8
Pest management	:
Herbicides	: 12 oz/A Command + 1 oz/A Permit + 1% COC, June 2
Insecticides	: None
Fungicides	: None

Table 6. Evaluation of nutrient losses from rice fields under four common tillage and seeding practice combinations. Rice Research Station.

Description		Total Solids													
Rating Date		5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type														Yr. Total	
Rating Unit		-------------------------mg/L-------------------------													
No.	Name														
1	Fall-stale Water Seeded	553	a							428	a	386	a	1367	b
2	Fall-stale Drill Seeded	530	a	715	a	746	a	482	a	440	a	375	ab	3287	a
3	Conventional Water Seeded	834	a							372	a	418	a	1624	b
4	Conventional Drill Seeded	537	a	504	a	641	a	475	a	364	a	330	b	2849	a
LSD (P=.05)		693		718		233		51		143		52		987	
Standard Deviation		218		57		18		4		45		16		310	
CV		36		9		3		1		11		4		14	

Description		Nitrate													
Rating Date		5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type														Yr. Total	
Rating Unit		----------------------------------NO_3-N mg------------------------------------													
No.	Name														
1	Fall-stale Water Seeded	0.01	b							0.22	a	0.03	a	0.25	a
2	Fall-stale Drill Seeded	0.04	ab	0.02	a	0.00	a	0.01	a	1.09	a	0.00	a	1.15	a
3	Conventional Water Seeded	0.10	a							0.52	a	0.00	a	0.62	a
4	Conventional Drill Seeded	0.05	ab	0.01	a	0.00	a	0.00	b	0.94	a	0.00	a	1.00	a
LSD (P=.05)		0.09		0.25		0.00		0.00		1.18		0.06		1.07	
Standard Deviation		0.03		0.02		0.00		0.00		0.37		0.02		0.34	
CV		56		200		0		0		54		283		45	

Continued.

Table 6. Continued.

Description	Nitrite													
Rating Date	5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type													Yr. Total	
Rating Unit	----------------------------------NO2-N mg----------------------------------													
No. Name														
1 Fall-stale Water Seeded	4.03	a							0.03	a	2.82	a	6.87	b
2 Fall-stale Drill Seeded	4.03	a	4.36	a	3.64	a	4.32	a	0.19	a	3.22	a	19.75	a
3 Conventional Water Seeded	4.16	a							0.04	a	3.29	a	7.49	b
4 Conventional Drill Seeded	4.02	a	3.70	a	3.38	a	3.88	a	0.14	a	3.15	a	18.26	a
LSD (P=.05)	0.20		5.65		0.70		4.13		0.19		0.56		1.55	
Standard Deviation	0.06		0.45		0.06		0.33		0.06		0.18		0.49	
CV	2		11		2		8		61		6		4	

Description	Chloride													
Rating Date	5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type													Yr. Total	
Rating Unit	----------------------------------mg/L----------------------------------													
No. Name														
1 Fall-stale Water Seeded	68	b							47	a	65	ab	180	b
2 Fall-stale Drill Seeded	69	b	64	a	68	a	62	a	44	a	55	b	362	a
3 Conventional Water Seeded	70	ab							83	a	73	a	225	b
4 Conventional Drill Seeded	72	a	68	a	70	a	62	a	96	a	56	b	424	a
LSD (P=.05)	3		15		15		18		62		13		70	
Standard Deviation	1		1		1		1		20		4		22	
CV	1		2		2		2		29		7		7	

Continued.

Table 6. Continued.

Description	Fluoride						
Rating Date	5/28/2009	6/4/2009	6/11/2009	6/17/2009	7/8/2009	9/10/2009	
Rating Type							Yr. Total
Rating Unit	---------------------------------mg/L----------------------------------						
No. Name							
1 Fall-stale Water Seeded	0.86 a				0.17 b	0.39 a	1.41 c
2 Fall-stale Drill Seeded	0.71 a	0.19 a	0.66 a	0.24 a	0.20 ab	0.38 a	2.37 b
3 Conventional Water Seeded	0.69 a				0.47 ab	0.41 a	1.56 c
4 Conventional Drill Seeded	0.81 a	0.40 a	0.68 a	0.24 a	0.86 a	0.35 a	3.33 a
LSD (P=.05)	0.27	2.16	1.65	0.57	0.67	0.19	0.8092
Standard Deviation	0.08	0.17	0.13	0.05	0.21	0.06	0.2543
CV	11	58	19	19	50	16	12

Description	Sulfate						
Rating Date	5/28/2009	6/4/2009	6/11/2009	6/17/2009	7/8/2009	9/10/2009	
Rating Type							Yr. Total
Rating Unit	---------------------------------mg/L----------------------------------						
No. Name							
1 Fall-stale Water Seeded	0.95 a				0.55 b	0.15 a	1.64 b
2 Fall-stale Drill Seeded	1.20 a	0.07 a	0.68 a	0.00 a	0.99 ab	0.01 b	2.93 a
3 Conventional Water Seeded	0.77 a				1.17 ab	0.03 ab	1.96 b
4 Conventional Drill Seeded	0.91 a	0.15 a	0.98 a	0.00 a	1.46 a	0.01 b	3.50 a
LSD (P=.05)	0.51	1.59	4.32	0.00	0.68	0.13	0.77
Standard Deviation	0.16	0.13	0.34	0.00	0.21	0.04	0.24
CV	17	116	41	0	21	85	10

Continued.

Table 6. Continued.

Description	Phosphate													
Rating Date	5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type													Yr. Total	
Rating Unit	----------------------------------mg/L----------------------------------													
No. Name														
1 Fall-stale Water Seeded	0.24	b							0.23	a	0.35	a	0.82	b
2 Fall-stale Drill Seeded	0.30	b	0.29	a	0.24	a	0.18	a	0.09	a	0.29	a	1.38	a
3 Conventional Water Seeded	0.67	a							0.06	a	0.24	a	0.97	b
4 Conventional Drill Seeded	0.68	a	0.23	a	0.18	a	0.17	a	0.08	a	0.24	a	1.57	a
LSD (P=.05)	0.17		0.83		0.25		0.76		0.21		0.14		0.30	
Standard Deviation	0.05		0.07		0.02		0.06		0.06		0.04		0.09	
CV	11		25		10		34		57		16		8	

Description	Total P													
Rating Date	5/28/2009		6/4/2009		6/11/2009		6/17/2009		7/8/2009		9/10/2009			
Rating Type													Yr. Total	
Rating Unit	----------------------------------mg P/L----------------------------------													
No. Name														
1 Fall-stale Water Seeded	0.90	a							0.39	a	0.26	a	1.54	a
2 Fall-stale Drill Seeded	0.66	ab	0.40	a	0.17	a	0.18	a	0.22	b	0.02	b	1.63	a
3 Conventional Water Seeded	0.39	bc							0.10	c	0.06	b	0.55	c
4 Conventional Drill Seeded	0.30	c	0.10	b	0.24	a	0.15	a	0.07	c	0.01	b	0.87	b
LSD (P=.05)	0.28		0.19		2.67		0.06		0.08		0.17		0.24	
Standard Deviation	0.09		0.02		0.21		0.01		0.03		0.05		0.07	
CV	16		6		102		3		14		62		6	

Continued.

Table 6. Continued.

Description	BOD-5						
Rating Date	5/28/2009	6/4/2009	6/11/2009	6/17/2009	7/8/2009	9/10/2009	
Rating Type							Yr. Total
Rating Unit	----------------------------------BOD5, mg----------------------------------						
No. Name							
1 Fall-stale Water Seeded	18.0 a				20.5 a	9.3 a	47.8 b
2 Fall-stale Drill Seeded	14.0 b	23.8 a	29.7 a	6.8 a	18.4 a	13.9 a	106.7 a
3 Conventional Water Seeded	7.8 c				18.1 a	9.6 a	35.6 b
4 Conventional Drill Seeded	9.1 c	8.6 b	13.5 a	5.0 a	20.8 a	6.2 a	63.3 b
LSD (P=.05)	3.9	14.8	138.3	3.6	10.1	10.4	38.4
Standard Deviation	1.2	1.2	10.9	0.3	3.2	3.3	12.1
CV	10	7	50	5	16	33	19

Table 7. Evaluation of nutrient losses from rice fields under four common tillage and seeding practice combinations (agronomic results). Rice Research Station.

Description	Height	Moist	Yield
Rating Date			
Rating Type			
Rating Unit	---(in)---	---(%)---	--(lb/A)--
No. Name			
1 Fall-stale Water Seeded	34 ab	35 a	2142 b
2 Fall-stale Drill Seeded	33 b	13 a	4266 a
3 Conventional Water Seeded	30 c	13 a	2403 b
4 Conventional Drill Seeded	35 a	14 a	3777 ab
LSD (P=.05)	1	28	1729
Standard Deviation	0	9	543
CV	1	47	17

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

Agronomic Results for the Main Effects of Tillage and Rotation for 2009

Experiment number	09-CS-20
Site and design	
Location/Cooperator	Rice Research Station (South Unit)
Tillage type	No-Till
Experimental design	Randomized complete block
Number of reps	4
Plot size	20 x 50 ft
Row width/rows per plot	8 in / 30
Soil type	Crowley silt loam
% organic matter	See data sheet
pH	See data sheet
Extractable nutrients ppm	See data sheet
Crop/Variety	Rice / Cheniere
Planting method/date	Drill seeded / May 14
Seeding rate/depth	33 seed/ft^2 / .75 inches
Emergence date	May 24
Harvest date	September 30
Seed treatment/cwt	Dithane (fungicide), 114 g Release (gibberellic acid), 10 g Zinche (40.5% Zn), 236 ml
Fertilization	250 lb/A 0-24-24-2.8, May 15 165 lb N/A 46-0-0, June 18
Water management	
Flush	May 19, June 3, and June 12
Flood	June 19
Drain	September 8
Pest management	
Herbicides	1 qt/A Glyphosate + 1 qt/A 2,4-D, January 23 1.5 qt/A Glyphosate, April 9 1.25 qt/A Glyphosate, May 14 1 gal/A RiceBeaux + .5 oz/A Permit + 1 oz/A Londax, June 10 1 gal/A Propanil + 10 oz/A Command + .5 lb/A Facet, June 18
Insecticides	None
Fungicides	None

Agronomic Results for the Main Effects of Tillage and Rotation for 2009

Experiment number ....: 09-CS-21

Site and design ....:
- **Location/Cooperator** ....: Rice Research Station (South Unit)
- **Tillage type**..................................: Conventional
- **Experimental design**...................: Randomized complete block
- **Number of reps** ....: 4
- **Plot size**..: 20 x 50 ft
- **Row width/rows per plot**............: 8 in / 30

Soil type ....: Crowley silt loam
- **% organic matter**........................: See data sheet
- **pH**...: See data sheet
- **Extractable nutrients** ppm..........: See data sheet

Crop/Variety ....: Rice / Cheniere
- **Planting method/date** ....: Drill seeded / May 14
- **Seeding rate/depth**......................: 33 seed/ft^2 / .75 inches
- **Emergence date**...........................: May 24
- **Harvest date** ....: September 30

Seed treatment/cwt ....: Dithane (fungicide), 114 g
Release (gibberellic acid), 10 g
Zinche (40.5% Zn), 236 ml

Fertilization ....: 250 lb/A 0-24-24-2.8, May 15
165 lb N/A 46-0-0, June 18

Water management ....:
- **Flush** ....: May 19, June 3, and 12
- **Flood** ....: June 19
- **Drain**..: September 8

Pest management ....:
- **Herbicides**....................................: 1 gal/A RiceBeaux + .5 oz/A Permit + 1 oz/A Londax, June 10
  1 gal/A Propanil +10 oz/A Command + .5 lb/A Facet, June 18
- **Insecticides** ....: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides** ....: None

Table 8. Agronomic results for the main effects of tillage and rotation for 2009.

	Plant Ht.		Lodging				50% Heading		Yield	
	in		% plot		1-5		days		lb/A	
Tillage										
Conventional	39	a	81	a	5	a	119	a	4985	b
No-Till	39	a	65	b	5	a	119	a	5397	a
Rotation										
Rice-Rice	38	b	86	a	5	a	119	a	5015	b
Rice-Fallow	40	a	45	c	5	a	119	a	5693	a
Rice-Soybean	39	ab	88	a	5	a	119	a	4837	b
Rice-Sorghum	40	a	72	b	5	a	119	a	5217	b

Table 9. Selected physical and chemical property results for the main effects of tillage and rotation in 2009.

	Total N		Total C		OM		P_d[†]		pH	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
	---%	---	---	---	---	---%	---g cm^{-3}---			
Tillage										
Conventional	.	0.125 b	.	1.31 a	1.87 a	2.198 a	1.52 a	1.35 a	6.8 b	6.8 a
No-Till	.	0.136 a	.	1.33 a	1.93 a	2.234 a	1.40 a	1.42 a	7.1 a	6.9 a
Rotation										
Rice-Rice	.	0.125 b	.	1.29 a	1.94 a	2.212 ab	1.43 a	1.35 a	7.3 a	7.1 a
Rice-Fallow	.	0.131 ab	.	1.29 a	1.86 a	2.144 b	1.43 a	1.40 a	6.9 b	6.9 b
Rice-Soybean	.	0.132 ab	.	1.31 a	1.87 a	2.198 ab	1.37 a	1.38 a	6.7 b	6.7 b
Rice-Sorghum	.	0.134 a	.	1.37 a	1.92 a	2.311 a	1.41 a	1.39 a	6.9 b	6.8 b

Means within each column followed by a different letter are significantly different at the $P = 0.05$ level of confidence as determined by the Duncan post hoc test.

[†] P_d is bulk density.

Table 10. Main effect results for Mehlich 3 extractable nutrients from a depth of 0 to 6 inches taken during the spring and fall of 2009.

	P				K				S				Ca			
	Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall	
	---------------------------mg kg^{-1}---------------------------------															
Tillage																
Conventional	72	a	61	a	118	a	108	a	9.9	a	7.1	a	1930	a	1687	a
No-Till	73	a	65	a	93	b	90	b	8.4	b	6.1	b	2002	a	1765	a
Rotation																
Rice-Rice	70	a	61	a	102	a	96	a	9.0	a	6.3	a	2017	a	1799	a
Rice-Fallow	68	a	62	a	108	a	99	a	9.4	a	6.9	a	1980	a	1745	a
Rice-Soybean	80	a	64	a	104	a	95	a	9.2	a	6.6	a	1932	a	1624	a
Rice-Sorghum	73	a	65	a	108	a	105	a	9.1	a	6.7	a	1937	a	1736	a

†Means within each column followed by a different letter are significantly different at the *P* = 0.05 level of confidence as determined by the Duncan post hoc test.

Table 11. Main effect results for Mehlich 3 extractable nutrients from a depth of 0 to 6 inches taken during the spring and fall of 2009.

	Mg				Na				Cu				Zn			
	Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall	
	---------------------------mg kg^{-1}---------------------------------															
Tillage																
Conventional	289	a	261	a	114	a	167	a	2.0	a	1.0	b	10.6	a	12.5	a
No-Till	231	b	223	b	93	b	110	b	2.1	a	1.3	a	10.7	a	11	a
Rotation																
Rice-Rice	270	a	260	a	125	a	157	a	2.0	a	1.2	ab	10.6	a	12.9	a
Rice-Fallow	270	a	242	ab	102	b	130	b	2.0	a	1.2	ab	9.6	a	10.4	a
Rice-Soybean	242	a	224	b	95	b	128	b	2.0	a	1.0	b	11.2	a	11.3	a
Rice-Sorghum	257	a	243	ab	92	b	139	ab	2.1	a	1.3	a	11.2	a	12.4	a

Means within each column followed by a different letter are significantly different at the *P* = 0.05 level of confidence as determined by the Duncan post hoc test.

ROTATIONAL CROP RESEARCH

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

INTRODUCTION

A trial was initiated in 2008 and replicated in 2009 to evaluate fungicide efficiency on various grain sorghum hybrids in southwest Louisiana. Four grain sorghum varieties (DG780B, TV93S72, DG758B, and P84G62) and three fungicide treatments (Headline @ 6 oz/A, Quilt @ 14 oz/A, Stratego @ 10 oz/A, and no fungicide) were evaluated. Leaf disease ratings (1 – 9; where 1 is fairly disease free and 9 is very high disease pressure) were taken near physiological maturity. A significant (P = 0.02) reduction in leaf disease over the check and Stratego was observed for the Headline treatment. When data were pooled across all hybrids, mean leaf scores were 0.5, 0.81, 0.94, and 1.06 for the Headline, Quilt, Stratego, and check treatments, respectively. Grain yields were not increased due to fungicide treatment over the non-treated plots when data was pooled across all hybrids. Sorghum hybrids P84G62 and TV93S72 produced significantly higher yields than the DG780B and DG758b hybrids.

A trial was conducted to evaluate two sweet sorghum varieties for their ratoon production potential and responsiveness to ratoon N fertilization. Varieties M-81E and Topper 76-6 were evaluated. The sweet sorghum first crop was fertilized with 90 lb N/A. Ratoon crop N was applied immediately after first crop harvest using urea. Variable ratoon rates of N were 0, 45, 90, and 135 lb/A. Fermentable solids produced from the ratoon crop ranged from 0.82 to 1.54 ton/A. A ratoon fermentable solid yield response to N fertilization was not observed when data were pooled across all varieties.

Separate variety trials were conducted for Group III, early and late Group IV, Group V, and Group VI soybeans. Data are not included in this text but can be found online at www.lsuagcenter.com. Soybean variety trials are conducted annually to evaluate the maturity group (Groups 3 – 6) and varietal response to the environmental and soil conditions in southwest Louisiana. In 2009, the varieties with the highest yield at the Rice Research Station location included HBK R3927 (Group III), Schillinger 495.RC (Group IV early), HBK R4924 (Group IV late), Terral TV55R15 (Group V), and HBK R7028 (Group VI).

Wheat varietal and experimental lines are evaluated annually. Sixty-four wheat entries, including released varieties and experimental lines, were tested in 2009. Current released varieties with the highest 2-year performance in southwest Louisiana include Dyna-Gro Baldwin (81.17 bu/A), AGS 2035 (77.6 bu/A), and Terral LA821 (77.5 bu/A).

Grain sorghum hybrids are evaluated annually for their yield response. Sixteen hybrids were evaluated in 2008. Highest yielding hybrids over the past two years include Dekalb DKS53-67 (5,776 lb/A) and Terral TV1050 (5,068 lb/A). Data are not included in this text but can be found online at www.lsuagcenter.com.

Evaluation of Multiple Fungicides on Grain Sorghum Disease Incidence and Yield

Experiment number	2009 GSFT
Site and design	
Location/Cooperator	Rice Research Station (South Farm)
Tillage type	Conventional
Experimental design	Randomized complete block
Number of reps	4
Plot size	10 x 30 ft
Row width/rows per plot	30 in / 4
Soil type	Crowley silt loam
% organic matter	NA
pH	NA
Extractable nutrients ppm	NA
Crop/Variety	Grain Sorghum / Multiple
Planting method/date	Drill seeded / April 8, 2009
Seeding rate/depth	Seeds/ft^2 / .33 in
Emergence date	April 19, 2009
Harvest date	August 10
Fertilization	250 lb/A 0-24-24-2.8, April 9 90 lb N/A 46-0-0, May 15
Water management	
Flush	NA
Flood	NA
Drain	NA
Pest management	
Herbicides	2 qt/A Atrazine, April 9 .75 lb/A Facet + 1 qt/A crop oil, May 28
Insecticides	.75 lb/A Acephate, June 15
Fungicides	See data sheet

Table 1. Evaluation of multiple fungicides on grain sorghum disease incidence and yield.

	50% Heading	Disease Rating		Height flag leaf	Height base of head	Height top of head	Head type[†]	Lodging	Damage bird / mold	Test Weight	Yield
	(days)	(1-9)	(% leaf)	--------------------(cm)-------------------			--(1-5)--	-----%-----	(lb/bu)		(bu/A)
Hybrid											
DG780B	74 a	0.63 b	6 a	78 a	82 a	101 ab	1.7 c	n/a	12 b	54 a	1823 b
P84G62	72 b	0.81 ab	8 a	81 a	82 a	105 a	2.9 a	n/a	19 a	55 a	2296 a
TV93S72	69 c	1.06 a	10 a	66 b	82 a	102 ab	2.4 b	n/a	18 a	55 a	2472 a
DG758B	72 b	0.81 ab	8 a	69 b	75 b	98 b	2.3 b	n/a	19 a	55 a	1775 b
Fungicide											
Headline 6oz	72 a	0.50 b	4 b	74 a	80 a	101 a	2.3 a	n/a	18 ab	55 a	2049 a
Quilt 14oz	72 a	0.81 ab	8 a	75 a	81 a	102 a	2.3 a	n/a	16 ab	55 a	2172 a
Stratego 10oz	72 a	0.94 a	9 a	73 a	80 a	101 a	2.3 a	n/a	14 b	54 a	2106 a
None	72 a	1.06 a	11 a	72 a	80 a	101 a	2.3 a	n/a	19 a	55 a	2040 a

Hybrid x Fungicide: All nonsignificant at α=0.05.

[†] Head ratings explain the "openness" of head. 1 is completely closed-tight head and 5 is very open.

Evaluation of Two Sweet Sorghum Varieties' Ratoon Crop Potential as Affected by Post Harvest N Fertilization

Experiment number	09-CS-10 (Sweet Sorghum)
Site and design	
Location/Cooperator	Rice Research Station (South Farm)
Tillage type	Conventional
Experimental design	Randomized complete block
Number of reps	4
Plot size	5 x 30 ft
Row width/rows per plot	30 in / 2
Soil type	Crowley silt loam
% organic matter	NA
pH	NA
Extractable nutrients ppm	NA
Crop/Variety	Sweet Sorghum / M-81E, Topper 76-6
Planting method/date	Drill seeded / April 8, 2009
Seeding rate/depth	1.5 lb/A / .33 in
Emergence date	April 19, 2009
Harvest date	August 24
Ratoon harvest	November 19
Fertilization	250 lb/A 0-24-24-2.8, April 9 90 lb N/A 46-0-0, May 15
Water management	
Flush	NA
Flood	NA
Drain	NA
Pest management	
Herbicides	2 qt/A Atrazine + 1.33 pt/A Dual Magnum II, April 9 .75 lb/A Facet + 1 qt/A Crop oil, May 28
Insecticides	.75 lb/A Acephate, June 15
Fungicides	None

Table 2. Evaluation of two sweet sorghum varieties' ratoon crop potential as affected by post harvest N fertilization (2.1). Rice Research Station.

Description			Stand Cnt	Stand Cnt	Stand Cnt	Stand Cnt	Tiller Potential
Rating Date			9/1/2009	9/1/2009	11/19/2009	11/19/2009	11/19/2009
Rating Type			flag-area	density	flag-area	density	tillers/plant
Rating Unit			plants	plants/A	plants	plants/A	
Sample Size, Unit			10 ft row		10 ft row		
Crop Stage Majority			@harvest	@harvest	@harvest	@harvest	@harvest
Crop Stage Scale			Main Crop	Main Crop	Ratoon	Ratoon	Ratoon
Trt No.	Treatment Name	Appl Description					
1	M-81E		26 a	44867 a	29 bc	51110 bc	3 ab
	Urea	0 lb N/A post harvest					
2	M-81E		25 a	43996 a	36 ab	62146 ab	9 ab
	Urea	45 lb N/A post harvest					
3	M-81E		28 a	49223 a	33 abc	58080 abc	4 ab
	Urea	90 lb N/A post harvest					
4	M-81E		28 a	48787 a	46 a	79570 a	14 a
	Urea	135 lb N/A post harvest					
5	Topper 76-6		23 a	40511 a	22 c	37752 c	-2 b
	Urea	0 lb N/A post harvest					
6	Topper 76-6		30 a	51836 a	24 bc	41818 bc	-7 b
	Urea	45 lb N/A post harvest					
7	Topper 76-6		25 a	43996 a	34 abc	58661 abc	6 ab
	Urea	90 lb N/A post harvest					
8	Topper 76-6		26 a	44867 a	25 bc	42979 bc	-3 b
	Urea	135 lb N/A post harvest					
LSD (P=.05)			9	15165	14	24385	16
Standard Deviation			6	10311	8	13923	9
CV			22	22	26	26	324

Continued.

Table 2. Continued.

Description			Biomass	Biomass	Biomass	Biomass	Height	Sol. Soilds	Ferm. Soilds[†]
Rating Date			11/19/2009	11/19/2009	11/19/2009	11/19/2009	11/19/2009	11/19/2009	11/19/2009
Rating Type			Total	Stalk	Total	Stalk		BRIX	Stalk
Rating Unit			lb	lb	tons/A	tons/A	in	w/w	ton/A
Sample Size, Unit			10 ft row	10 ft row					
Crop Stage Majority			@harvest	@harvest	@harvest	@harvest	@harvest	@harvest	@harvest
Crop Stage Scale			Ratoon	Ratoon	Ratoon	Ratoon	Ratoon	Ratoon	Ratoon
Trt No.	Treatment Name	Appl Description							
1	M-81E		14.2 b	10.0 b	12 b	9 b	96 ab	12.5 b	0.99 ab
	Urea	0 lb N/A post harvest							
2	M-81E		17.8 ab	12.7 ab	15 ab	11 ab	94 b	12.3 bc	1.23 ab
	Urea	45 lb N/A post harvest							
3	M-81E		18.0 ab	12.9 ab	16 ab	11 ab	102.3 a	11.57 bc	1.16 ab
	Urea	90 lb N/A post harvest							
4	M-81E		24.6 a	17.3 a	21 a	15 a	102 a	11.2 c	1.54 a
	Urea	135 lb N/A post harvest							
5	Topper 76-6		11.5 b	7.2 b	10 b	6 b	75.3 c	14.43 a	0.82 b
	Urea	0 lb N/A post harvest							
6	Topper 76-6		12.6 b	7.9 b	11 b	7 b	78 c	14.17 a	0.87 b
	Urea	45 lb N/A post harvest							
7	Topper 76-6		15.0 b	9.5 b	13 b	8 b	77.7 c	14.33 a	1.07 ab
	Urea	90 lb N/A post harvest							
8	Topper 76-6		13.5 b	8.7 b	12 b	8 b	76 c	15.07 a	1.03 ab
	Urea	135 lb N/A post harvest							
LSD (P=.05)			8.4	5.9	7	5	8	1.2	0.63
Standard Deviation			4.8	3.4	4	3	5	0.7	0.36
CV			30	31	30	31	5	5	33

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

† This is a rough estimate of fermentable solids determined by: stalk biomass*BRIX*0.90

First crop yield was not determined.

Multi-State, Multi-Location Inoculants Product Evaluation

Experiment number	: Multi-State, Multi-Location Inoculants Product Evaluation
Site and design	:
Location/Cooperator	: Rice Research Station (South Unit) / Dr. Ron Levy
Tillage type..................................	: Conventional
Experimental design...................	: Randomized complete block
Number of reps	: 4
Plot size..	: 5.33 ft x 25 ft
Row width/rows per plot............	: 16 in / 4
Soil type	: Crowley silt loam
% organic matter........................	: NA
pH...	: NA
Extractable nutrients ppm..........	: NA
Crop/Variety	: Soybeans / Multiple
Planting method/date	: Drill seeded / May 8
Seeding rate/depth......................	: 135,000 seeds/A / 1.25 inch
Emergence date...........................	: May 13
Harvest date	: October 8
Seed treatment/cwt	: See data sheet
Fertilization.......................................	: 250 lb/A 0-24-24-2.8, April 9
Water management	:
Flush	: NA
Flood	: NA
Drain...	: NA
Pest management...............................	:
Herbicides....................................	: 1.5 qt/A Glyphosate + .33 oz/A Classic + 1.5 lb/A Sprayable Ammonium Sulfate, May 27
	1.5 qt/A Glyphosate, July 15
	1.5 qt/A Glyphosate, August 5
Insecticides	: ¾ lb/A Acephate 90, June 15
Fungicides	: None

Table 3. Multi-state, multi-location inoculants product evaluation.

Rating Data Type		Stand count		Height		Height		Days to Maturity		Height		Yield	
Rating Unit		plant/ft		in		cm		days		in		bu/A	
Rating Date		6/18/2009		6/18/2009		6/18/2009				9/28/2009		10/8/2009	
Crop Stage		R3		R3		R3							
Entry No.	Entry Name												
1	CELL TECH APRONMAXX RTA	3.18	abc	9.3	a	23.5	ab	107	a	18.5	a	22	a-d
2	CELL TECH APRONMAXX RTA + MOLY	2.83	bc	9.1	a	23.0	ab	106	a	19.0	a	24	ab
3	OPTIMIZE APRONMAXX RTA	3.05	abc	9.3	a	23.5	ab	107	a	19.0	a	19	d
4	OPTIMIZE APRONMAXX RTA + MOLY	2.73	c	8.9	a	22.3	ab	107	a	18.8	a	25	a
5	LAUNCHER PRO APRONMAXX RTA	3.23	abc	9.5	a	24.0	ab	107	a	19.5	a	23	abc
6	LAUNCHER PRO APRONMAXX RTA + MOLY	3.28	abc	8.8	a	22.5	ab	107	a	19.5	a	22	a-d
7	LAUNCHER APRONMAXX RTA	3.18	abc	9.2	a	23.3	ab	107	a	18.5	a	23	abc
8	LAUNCHER APRONMAXX RTA + MOLY	3.18	abc	9.0	a	23.0	ab	107	a	18.3	a	25	ab
9	EXCALIBRE APRONMAXX RTA	3.08	abc	9.5	a	24.0	ab	107	a	19.5	a	20	cd
10	EXCALIBRE APRONMAXX RTA + MOLY	3.05	abc	9.1	a	23.3	ab	107	a	19.3	a	22	a-d
11	VAULT SP APRONMAXX RTA	3.50	a	9.6	a	24.3	ab	107	a	18.3	a	22	a-d
12	VAULT SP APRONMAXX RTA + MOLY	2.98	abc	9.6	a	24.5	a	107	a	19.3	a	23	abc
13	VAULT NP APRONMAXX RTA	3.45	ab	8.8	a	22.5	ab	107	a	18.3	a	21	bcd
14	VAULT NP APRONMAXX RTA + MOLY	2.93	abc	8.6	a	21.8	b	106	a	19.3	a	23	a-d
15	NTC + APRONMAXX	2.73	c	8.6	a	21.8	b	106	a	18.8	a	21	bcd
16	OPTIMIZE CRUISER MAX	3.13	abc	8.9	a	22.5	ab	107	a	20.0	a	22	a-d
LSD (P=.05)		0.628		1.0745		2.69		1		1.76		3.8397	
Standard Deviation		0.44		0.7519		1.88		0.7		1.23		2.6869	
CV		14.22		8.26		8.15		0.69		6.48		12.02	

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

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 162,000 cwt. of pedigreed stock of 43 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 conduct trade in registered and certified classes of pedigreed rice.

Foundation seed rice, the planting stock from which registered and certified seed are produced, is the farmer's link with the work of the plant breeder. It is the product of hybridization and 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 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 of 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 of the Louisiana Cooperative Extension Service, in cooperation with parish committees of the Seed Rice Growers Association, assist in the allocation of foundation seed rice. It is at the parish committee level that the allocation of seed acreage for 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 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 is 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 preflood 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 commences 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. Next, the grain is graded 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 other 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.

2009 ACTIVITIES

Of the 2,130 cwt. of foundation seed rice sold in 2009, the varieties and quantities were as follows: Catahoula, 573 cwt.; Neptune, 420 cwt.; Jazzman, 341 cwt.; Cocodrie, 311 cwt.; Cheniere, 204 cwt.; Jupiter, 97 cwt.; Pirogue, 72 cwt.; Dellrose, 45 cwt.; Cypress, 32 cwt.; Toro-2, 30 cwt.; and Della, 5 cwt.

The Rice Research Station's foundation seed crop in 2009 consisted of 11 acres of Neptune, 10 acres of Cheniere, 6 acres of Jazzman, 2.5 acres of Della, and 1 acre of Bengal.

Headrows of Catahoula, Neptune, Cheniere, Pirogue, Jazzman, Bengal, Della, and Ecrevisse 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, 2008-2009 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 averages across all experimental plots and management conditions.

Pond History: Ponds were fallow for a period of 10 months following the previous crawfish season of 2006 - 2007. Rice crops were planted in April 2008, and fields were stocked with brood crawfish at rate of 65 lb/A during May and June 2008. Supplemental stocking of hatchlings occurred in some ponds after pond flooding in the fall.

Soil Type: Crowley silt loam

Water Source: Ground water

Pond Area: Twelve 1-acre ponds

Forage Crops: Rice, variety Jupiter was drill seeded Apr 14, 2008, at 125 lb/A. Grain was harvested by rice combine on Aug 29, 2008, and a ratoon forage crop was managed for subsequent crawfish production.

Permanent Flood Date: Oct 1, 2008

Trap Type: 3-funnel pyramid trap (0.75-inch hexagon wire mesh)

Bait Used: Manufactured baits: *Early On* and *Southern Pride* (Purina Mills, Inc., St. Louis, MO); or fish baits (heron, gizzard shad, or menhaden).

Crawfish Harvest: 16 traps/A; 18 Feb - 12 June 2009, (784 total trap-sets/A).

Crawfish Grades: Harvested crawfish were subjected to a grader (passive, water type) and sorted into three size-grade categories as follows: “Large” - ≤ 15 count/lb, “Medium” - 16-21 count/lb, and “Small” - > 21 count/lb.

Table 1. Annual environmental conditions and crawfish production (averaged or totaled weekly). Rice Research Station, Crowley, LA. 2008-2009.

Weeks	**Soil Temp.[1] Min.**	**Soil Temp.[1] Max.**	**Air Temp. Min.**	**Air Temp. Max.**	**Water Temp. Min.**	**Water Temp. Max.**	**Avg. D.O.[2]**	**Total Rainfall[3]**	**Large Crawfish Count**	**Crawfish Harvest**	**Crawfish Size**	**Total Trapsets**
	-------------------------deg.F-------------------------						**(mg/L)**	**(inches)**	**(#/trap)**	**(lb/A)**	**(cnt/lb)**	**(#/A)**
June 1-7	80.4	88.3	74.3	91.6								
June 8-14	81.4	91.1	74.1	90.9				.42				
June 15-21	82.1	92.6	73.0	92.1				.48				
June 22-28	79.6	90.4	71.0	91.6				2.04				
June 29-July 5	78.4	88.9	70.4	89.3				.74				
July 6-12	80.0	90.9	73.6	91.1				.98				
July 13-19	82.7	91.4	73.0	93.0								
July 20-26	82.6	91.9	74.4	92.0				.38				
July 27-Aug 2	83.0	93.6	75.7	93.9				.84				
Aug 3-9	79.3	90.0	73.3	91.3				.99				
Aug 10-16	80.0	89.9	74.0	91.0				2.98				
Aug 17-23	78.4	85.7	73.4	87.1				.64				
Aug 24-30	79.9	87.6	73.1	91.9				.18				
Aug 31-Sept 6	77.7	84.6	72.9	86.9				5.55				
Sept 7-13	79.0	83.7	74.0	89.3								
Sept 14-20	74.9	79.3	66.7	80.9				2.80				
Sept 21-27	74.4	81.6	65.4	86.7				.26				
Sept 28-Oct 4	73.6	82.9	59.1	86.6	73.1	83.5						
Oct 5-11	72.4	81.0	60.9	85.0	69.6	81.2	.95	.38				
Oct 12-18	73.7	80.9	64.7	84.4	70.9	80.6	.75					
Oct 19-25	67.7	76.4	52.0	75.9	61.0	72.0	1.41					
Oct 26-Nov 1	62.0	72.4	42.0	73.4	54.5	67.1	1.88					
Nov 2-8	64.0	72.6	48.6	78.6	59.1	68.7	2.18	.50				
Nov 9-15	60.9	67.6	49.7	72.7	58.6	64.8	2.82	1.63				
Nov 16-22	52.7	61.9	37.0	63.0	50.1	58.0	4.19					
Nov 23-29	56.4	64.6	47.4	72.4	57.1	63.3		.32				
Nov 30-Dec 6	50.7	60.9	38.3	63.1	49.6	56.2	3.73	1.98				
Dec 7-13	48.3	56.7	35.1	60.9	47.4	55.2	5.16	1.12				
Dec 14-20	55.3	61.4	51.4	71.1	57.5	64.0	2.30					
Dec 21-27	58.0	63.6	50.3	67.9	55.3	62.8						

Continued.

Table 1. Continued.

Weeks	Soil Temp.[1] Min.	Soil Temp.[1] Max.	Air Temp. Min.	Air Temp. Max.	Water Temp. Min.	Water Temp. Max.	Avg. D.O.[2]	Total Rainfall[3]	Large Crawfish Count	Crawfish Harvest	Crawfish Size	Total Trapsets
	--------------------------deg.F--------------------------						(mg/L)	(inches)	(#/trap)	(lb/A)	(cnt/lb)	(#/A)
Dec 28-Jan 3	54.9	62.4	45.1	65.7	54.3	61.0		2.40				
Jan 4-10	59.1	64.0	49.9	69.1	58.2	63.9	2.45	2.28				
Jan 11-17	50.6	55.9	31.4	56.4	45.3	53.0	4.21	.36				
Jan 18-24	49.1	55.7	38.1	63.1	48.1	58.0	5.13					
Jan 25-31	52.9	58.4	39.9	61.4	50.3	60.4	2.67	.29				
Feb 1-7	49.6	56.6	37.4	61.1	49.0	58.7		.53				
Feb 8-14	57.3	63.0	53.6	74.7	60.3	68.4	2.19	.18				
Feb 15-21	58.1	63.4	45.4	65.1	55.9	64.6		.48	2.6	4.6	17.9	32
Feb 22-28	56.7	62.6	48.3	69.0	55.6	68.0	1.37	.13	3.1	2.8	17.6	16
Mar 1-7	55.6	62.9	41.7	66.7	52.8	66.3	1.96		5.0	9.5	16.9	32
Mar 8-14	63.1	68.9	55.9	75.4	62.8	71.7	.46	1.47	5.9	12.8	14.8	32
Mar 15-21	60.9	67.6	52.9	69.6	61.5	74.2		2.54	5.8	18.2	15.2	48
Mar 22-28	66.1	72.7	58.6	77.4	65.7	76.9	1.22	3.05	6.7	21.1	15.2	48
Mar 29-Apr 4	60.7	68.6	49.9	70.3	60.5	74.3		.88	7.6	23.7	15.4	48
Apr 5-11	60.7	69.1	50.9	74.0	60.7	77.4			4.9	14.9	15.7	48
Apr 12-18	64.3	71.9	56.0	76.1	65.2	78.4	1.29	.56	8.4	16.5	16.3	32
Apr 19-25	65.6	73.1	61.9	78.9	68.3	83.6	1.16	5.00	7.2	29.8	15.5	64
Apr 26-May 2	70.7	78.0	67.6	82.6	72.5	86.2	1.63	1.30	7.6	31.0	15.7	64
May 3-9	73.4	80.0	71.7	83.7	76.4	87.1		1.95	5.9	20.5	13.9	48
May 10-16	76.4	85.6	70.7	87.6	78.1	92.0			5.1	17.6	14.0	48
May 17-23	71.7	80.6	61.9	80.3	70.0	85.7		.20	6.8	23.2	14.0	48
May 24-30	75.4	83.1	66.4	85.4	76.3	90.8		.42	5.5	20.9	12.6	48
May 31-June 6	77.3	85.7	65.4	87.0	76.5	92.1		.27	5.4	28.8	12.0	64
June 7-13	80.0	89.4	70.9	90.6	79.6	95.0			4.6	24.6	12.0	64
								49.23		**320.3**		**784**

[1] Soil temperature was measured at a depth of 4 inches.
[2] Dissolved oxygen readings were taken about 8:00 a.m.
[3] Rainfall total is for one year only (June 1, 2008 - May 31, 2009) and does not include additional rainfall for the extended harvest period (June 2009).

EFFECT OF SUPPLEMENTAL STOCKING OF HATCHLINGS ON CRAWFISH YIELD

W.R. McClain and J.J. Sonnier

INTRODUCTION

Crawfish aquaculture in Louisiana relies solely on natural reproduction and recruitment from crawfish broodstock naturally present in the field at the time ponds are flooded in the fall. These broodstock emerge from summer burrows where they survive and complete reproduction during deliberate periods of dewatering during the summer. Crawfish pond water management coincides with the natural reproductive cycle of crawfish whereby ponds are reflooded about the same time that females with young are ready to emerge from the burrow. Brood female crawfish are naturally present in the field going into the summer draw-down period as a result of suitable habitat or a previous culture cycle, or they are intentionally introduced following rice planting to effect natural recruitment of young in a rice-crawfish rotational cropping strategy. Either way, crawfish broodstock survival and/or reproduction can be variable, depending on environmental and/or cultural conditions associated with the summer dry period –thus, resulting in highly variable and unpredictable yields. This is especially true for crawfish yields under a rice-crawfish field rotational approach where broodstock numbers and health may be variable going into the summer period.

The reliance on natural reproduction to population crawfish ponds often contributes to a great deal of uncertainty in yield and profits, but crawfish farming would probably be non-profitable if farmers relied solely on a hatchery component for populating ponds. Crawfish fecundity is relatively low when compared with most cultured finfish species, and therefore, the logistics necessary to house and spawn large numbers of crawfish would most likely necessitate prices that consumers would be unwilling to pay. Nonetheless, virtually no research has examined the effects of stocking of crawfish hatchlings on subsequent yields when that stocking supplements natural recruitment. Therefore, this study was undertaken to examine yield outcomes when crawfish ponds, in a rice-crawfish rotational management strategy, were stocked with additional hatchlings following pond flood-up in the fall.

Pond History: Ponds were fallow for 10 months following a previous crawfish season. Rice was planted in April 2008, and fields were stocked with brood crawfish following rice planting.

Soil Type: Crowley silt loam

Pond Area: Twelve 1-acre ponds

Forage Crop: Rice variety Jupiter was drill seeded at 125 lb/A on Apr 14, 2008. Grain was harvested on Aug 29, 2008, and the ratoon forage crop was managed for subsequent crawfish production.

Fertilizer: Main Crop: 8-24-24 at 250 lb/A at planting, 46-0-0 at 200 lb/A (topdress) on 28 May, 46-0-0 at 100 lb/A (topdress) on 20 June; Ratoon Crop: 46-0-0 at 100 lb/A (topdress) on Sept 16, 2008.

Herbicide: 1 gal/A Arrosolo on 8 May; 1 gal/A Arrosolo, 2/3 pt/A Grandslam, 12 oz/A Command, and 1 oz/A Permit on May 26

Insecticide: None on the main or ratoon crop.

Stocking Rate - Broodstock: Adult red swamp crawfish (*Procambarus clarkii*), along with a small percentage of sub-adults, were stocked into the growing rice crop May 30 – June 18 at 65 lb/A. They were obtained from an adjacent set of experimental ponds at the same location and stocked within 2 hours of capture.

Permanent Flood Date: Oct 1, 2008

Stocking - Hatchlings: Stocking rate of hatchlings constituted the treatments of this study. Treatments consisted of a **Low**, a **High**, and **0** supplemental stocking of hatchlings. Adult female crawfish were collected from experimental ponds about the same time and from the same source as broodstock used for stocking the ponds in early June. Females were held in a lab in artificial burrows until spawning occurred and hatchlings were free swimming, then hatchlings were counted and both hatchlings and the female mothers were released into ponds. These stocking occurred from Oct 7 until Dec 11, and the numbers stocked each week were proportionate to the desired final stocking density. For the most part, females with hatchlings clinging to the abdomen were released to simulate conditions of natural recruitment. Final density stocked was 0, 4.3, and 13.0 crawfish/m^2 for the **0**, **Low**, and **High** density treatments.

Counting: Hatchlings were counted by temporarily separating them from the female and placing them into a shallow (less than 1 cm deep) pool of water, taking a digital photo of the pool, and counting individuals from an enlarged photo on a computer screen at a later time. Hatchlings were subjected to the shallow pool only long enough for a photo to be taken then were reunited with the adult female in a larger volume of water.

Treatments: Consisted of supplemental stocking of hatchlings and their adult female at a **Low** (4.3 crawfish/m^2), **High** (13.0 crawfish/m^2), or **0** stocking rate. The **Low** and **High** treatments were replicated in three ponds each while the **0** treatment had six replicated ponds.

Samplers: Sampling consisted of employing four sampling gear: large-mesh traps, consisting of standard 0.75-inch square mesh pyramid traps; small-mesh traps, consisting of common 0.25-inch wire mesh minnow traps with 1.25-inch funnel openings at each end; long handle dip nets (15.5 x 8.5-inch opening, 3-mm mesh); and shop-built cylindrical drop sampling devices (0.5 m^2 bottom surface area). The drop sampler consisted of a metal cylinder that was rigged to slide up and down on three legs with a trigger that allowed the unit to be set in the up position with 50 feet of rope, whereby the unit could be placed in the pond some distance and triggered from the levee to prevent disturbing the crawfish during sampling. When dropped, the sampler formed an enclosure entrapping any crawfish that were captured within the interior of the cylinder. Water was pumped out and crawfish counted and sized.

Sampling Protocol: Sampling was undertaken monthly for 3 consecutive months (December, January, and February) after cessation of supplemental stocking and prior to initiation of routine harvesting. Replicated sampling efforts occurred each month with each gear. Six large- and six small-mesh traps in each pond were set along the pond margin, baited with manufactured baits, and checked (48-hr sets) monthly. Ten random dip-net sweeps per pond were made at the pond's margin two days each month. The drop samplers (one each in duplicate ponds per treatment) were operated in the afternoons (approximately 3:30 p.m.) twice per month. Crawfish catch, by size category, was noted for each sampling effort. Catches of dragonfly nymphs and sunfish (aquatic crawfish predators) were also recorded with each sampling device.

Size Categories during Sampling: Crawfish captured with each sampling gear were sorted into two size classes – those smaller than 8 cm and those larger than 8 cm in total length.

Feed: None

Trap Type and Density for Yield Determination: 3-funnel pyramid trap, constructed of ¾-inch square-mesh wire at 16 traps/A

Bait Used: Manufactured baits: *Early On* and *Southern Pride* (Purina Mills, Inc., St. Louis, MO); or fish baits (heron, gizzard shad, or menhaden). Bait type and amounts were consistent across all ponds and treatments on a daily basis.

Crawfish Harvest: Feb 18 - June 12, 2009, for a total of 49 baited trapping days (784 total trap-sets/A)

Crawfish Grades: Harvested crawfish were subjected to a grader (passive, water type) and sorted into three size-grade categories as follows: "Large" - <15 count/lb, "Medium" - 15-21 count/lb, and "Small" - > 21 count/lb

Experimental Design: Completely randomized but non-balanced design

Parameters: Crawfish (and aquatic predator) sample catches, crawfish harvest

Statistical Analysis: Analysis of variance with means separated by Duncan's multiple range test

Support: USDA Special Grants - Aquaculture

Comments: Perhaps the findings of this study pose more questions than it provides answers. The supplemental stocking of hatchlings, which simulated natural fall recruitment, generated substantial differences in total recruitment density in experimental production ponds. It was assumed that the actual natural recruitment from burrowed crawfish were similar among all experimental ponds. With additional simulated recruitment from the stocking of hatchlings (and their mothers), the recruitment density was increased substantially. The two rates of stocking increased recruitment density by 4.3 and 13.0 crawfish/m^2 over whatever natural recruitment may have been (Table 1). However, these additions to the pond population made little difference in total yield or average weight of crawfish harvested (Table 2). Yield, by weight, was not significantly increased, even at the highest density of supplemental stocking, although there was a slight increase in total number of crawfish harvested – but only at the high stocking rate. With no supplemental stocking, the average yield was 1.06 crawfish/m^2. The low stocking rate (4.3 crawfish/m^2) resulted in no additional yield, and the high rate (13 crawfish/m^2) resulted in only 0.36 (or 34%) more crawfish/m^2 than fields with no additional stocking. The increased numbers of crawfish harvested at the high stocking rate only resulted in a 23% increase in yield, by weight, over the non-stocked group because the average size of crawfish harvested was less for the High treatment (Table 2). Nonetheless, these differences were statistically non-significant.

The increase in crawfish numbers harvested of the High stocking treatment resulted from more crawfish in the smaller two grades (Table 3). No significant differences were noted for crawfish in the largest size grade. It has been well documented that as crawfish density increases, average size of crawfish at harvest usually decreases. In summary, from the almost 53,000 additional crawfish stocked into the ponds (High treatment) after fall flood-up, only 1,440 additional crawfish, on average, were harvested by season's end (Table 4). This represents a 2.7% recovery rate from those efforts. It is not clear why the recovery rate of supplemental stockings is so low. Sampling data reveal few differences among the supplemental stocking treatments and the non-stocked ponds (Table 5). Perhaps mortality is higher when crawfish hatchlings are handled and stocked, but this is not evident from observations with lab reared hatchlings. Mortality of hatchlings, from predators and cannibalism, may be naturally high in ponds, but without a good handle on actual recruitment density from natural burrow emergence, this cannot be easily accessed. The sample gear revealed relatively low numbers of dragonfly nymphs and sunfish (Table 6), perhaps two of the most common predators in aquaculture ponds.

Low apparent recovery of stocked hatchlings has been observed in other studies when fall stocking was intended either as a supplementary or primary recruitment method. High mortality from recruitment to harvest seems to be the norm, and it is possible that natural recruitment density is exceedingly high such that the percent increased in recruitment density with the supplemental stocking rates used in this study is fairly low when compared with natural recruitment density. This might be one explanation why the observed differences in yield were so minor even when the supplemental stocking rate appeared to be substantial. However, more research is needed to gain a better comprehension of population dynamics at this level.

Table 1. Average supplemental number (and density) of crawfish stocked into each 1-acre pond per treatment following pond flood-up in the fall. Rice Research Station, Crowley, LA. 2009.

Stocking Treatment	No. Replicated Ponds	No. Hatchlings	No. Adults	Total Crawfish	Density Stocked ($No./m^2$)
0-Stocked	6	0	0	0	0
Low	3	17,455	82	17,537	4.3
High	3	52,632	134	52,766	13.0

Table 2. Average annual yield of harvested crawfish by weight (lb/A) and number (No./A) and average individual size harvested. Values for yield (within column) with the same superscript were not significantly different (P > 0.05). Rice Research Station, Crowley, LA. 2009.

Stocking Treatment[1]	Yield by Weight (lb/A)	Yield by Number (No./A)	Density of Crawfish Harvested ($No./m^2$)	AverageIndividual Weight (g)	Average Count (No./lb)
0-Stocked	303.3^{A}	4306^{B}	1.06	31.9	14.2
Low	301.6^{A}	4267^{B}	1.05	31.9	14.2
High	372.9^{A}	5747^{A}	1.42	29.5	15.4

[1] Stocking treatments consisted of two replicated ponds.

Table 3. Yield, in crawfish numbers (No./A) and weight (lb/A) by size grade category. Values within columns with the same superscript were not significantly different (P > 0.05). Rice Research Station, Crowley, LA. 2009.

Stocking Treatment	Grade 1 (Large)		Grade 2 (Medium)		Grade 3 (Small)	
	Yield by Weight (lb/A)	Yield by Number (No./A)	Yield by Weight (lb/A)	Yield by Number (No./A)	Yield by Weight (lb/A)	Yield by Number (No./A)
0-Stocked	178.9^{A}	1971^{A}	83.2^{B}	1315^{B}	41.2^{B}	1020^{B}
Low	186.4^{A}	2066^{A}	75.3^{B}	1194^{B}	39.9^{B}	1007^{B}
High	196.1^{A}	2291^{A}	110.9^{A}	1793^{A}	65.8^{A}	1663^{A}

Table 4. Average increase in captured crawfish from supplementally stocked ponds when compared with numbers captured from ponds with no additional fall stocking, and percentage increase based on total numbers stocked in the fall stocking efforts. Rice Research Station, Crowley, LA. 2009.

Stocking Treatment	Increase in Crawfish Numbers (No./A)	Increase as a Percentage of Fall Stocking
Low	-39	-0.2%
High	1440	2.7%

Table 5. Average number of crawfish captured per sample effort prior to onset of routine harvesting efforts. Crawfish were sorted into two size classes – those smaller than and those larger than 8 cm total length. Number in parenthesis next to treatment label represents the number of sampler catches averaged to obtain the respective means. Rice Research Station, Crowley, LA. 2009.

Stocking Treatment	**December**		**January**		**February**	
	< 8 cm	**> 8 cm**	**< 8 cm**	**> 8 cm**	**< 8 cm**	**> 8 cm**
	Drop Sampler					
0-Stocked (4)	0.5	0	1.5	0	0.3	0.3
Low (4)	1.0	0	1.8	0.3	1.5	0
High (4)	0.3	0	1.5	0.5	4.5	0
	Dip-Net Sweeps					
0-Stocked (120)	0.1	0	0.5	0.03	0.3	0.2
Low (60)	0.1	0.02	0.4	0.03	0.2	0.2
High (60)	0.3	0	0.9	0.05	0.7	0.2
	Small-Mesh Trap					
0-Stocked (36)	5.0	1.6	4.6	2.6	1.0	3.1
Low (18)	2.4	0.8	4.3	2.2	1.6	2.7
High (18)	4.1	1.6	6.3	3.0	2.4	3.4
	Large-Mesh Traps					
0-Stocked (36)	1.1	3.7	0.2	3.9	0	3.8
Low (18)	0.2	5.8	0.2	3.2	0.1	3.6
High (18)	0.2	4.7	0	7.7	0	7.4

Table 6. Average number of dragonfly nymphs captured per sample effort with dip nets and small-mesh traps, and average number of sunfish caught per small-mesh trap set. Number in parenthesis next to treatment label represents the number of sampler catches averaged to obtain the respective means. Rice Research Station, Crowley, LA. 2009.

Stocking Treatment	**December**		**January**		**February**	
	Nymphs	**Fish**	**Nymphs**	**Fish**	**Nymphs**	**Fish**
	Dip-Net Sweeps					
0-Stocked (120)	0.1	-	0.2	-	0.1	-
Low (60)	0.4	-	0.2	-	0.2	-
High (60)	0.3	-	0.2	-	0.03	-
	Small-Mesh Trap					
0-Stocked (36)	0.03	0	0.2	0	0.2	0
Low (18)	0.2	0	0.1	0.1	0.1	0.1
High (18)	0.2	0	0.2	0	0.2	0

EFFECTS OF VARIOUS SIMULATED FACTORS ON CRAWFISH REPRODUCTION

W.R. McClain and J.J. Sonnier

INTRODUCTION

Crawfish farming in Louisiana does not rely on a hatchery component for populating grow-out ponds, unlike many aquaculture enterprises around the world. Rather, dependence is upon indigenous and/or supplemented broodstock to reproduce naturally in subsurface burrows as crawfish in the region have evolved to do. Without the reliance on natural reproduction, crawfish farming would probably be non-profitable. Yet, the dependence on natural reproduction as the sole means for recruitment, with little knowledge or control of the factors influencing outcomes, results in highly variable and unpredictable crops from year to year and from pond to pond and puts producers at a financial disadvantage. Low yields have a negative impact on cash flow and profits, and unpredictability clearly hinders management operations and marketing plans.

Although some recent limited research has focused on reproduction and recruitment in crawfish aquaculture, many informational gaps still exist. This is partly due to the inherent difficulty of investigating this complex biological function that naturally occurs in subsurface burrows and to an overwhelming number of biological, environmental, and cultural factors that can influence reproductive outcomes. The findings of one preliminary study suggest that short-term feeding prior to the reproductive phase may improve spawning success in some situations, but those situations are not well defined. Furthermore, it is unknown to what extent crawfish broodstock from a food-depleted environment can rebuild energy reserves after being stocked into a rice crop (food-replete environment), a common scenario when co-culturing rice and crawfish.

Previous research has definitively shown that crawfish cannot spawn in the absence of free water in the burrow, and a severe, prolonged drought during the summer burrow occupation is thought to negatively impact crawfish yields. However, little information exists as to the extent short-term drought conditions may impact crawfish reproduction within the burrow. Specifically, it is unknown whether drought conditions will simply delay spawning for those individuals that may be ready to spawn in the absence of a drought or will it adversely affect the ability of crawfish to successfully spawn subsequently. Moreover, the extent to which premature forced evacuations of crawfish from the burrow, such as during short-term flooding episodes, can impact subsequent spawning is unknown.

Some research has indicated that spawning date is associated with burrowing date, but this has not been determined definitively. Therefore, this study was undertaken to provide some preliminary or corroborating data regarding these key questions as they relate to crawfish aquaculture, with the intent to increase the basic knowledge and/or develop fundamentals from which to build much needed recommendations or management strategies.

Ponds: Crawfish for the feeding objective were obtained from a commercial crawfish pond in Acadia Parish, Louisiana, and crawfish for all other objectives in this study were obtained from the experimental ponds described in the 100th Annual Research Report (2008) entitled "*ASSESSMENT OF SAMPLING AND HARVEST YIELDS WHEN CRAWFISH PONDS ARE POPULATED ONLY BY STOCKING OF HATCHLINGS***.**" The experimental ponds were managed to simulate a typical rice/crawfish field rotational strategy.

Research Objectives: Examine broodstock spawning success when females in artificial burrows were (**A**) offered feed or extended grazing opportunity prior to placement in burrows, (**B**) exposed to periods without free standing water, (**C**) experienced interruptions of the burrow stay with forced movements into new burrows, and (**D**) captured and placed in burrows two weeks apart.

Crawfish Collection Dates: Objectives (**A**) May 21-23, (**B**) May 21-23, (**C**) May 13, (**D**) Apr 30 and May 14, and (**E**) June 23-27, 2008

Pond Drain Date: June 30, 2008

Feed: **Objective A**: A commercial sinking catfish feed (32% crude protein) was offered twice per week, at 40 lb/A, for 4 weeks prior to crawfish collection in the fed pond. No supplemental feed was offered in the other pond or for other objectives.

Crawfish: All crawfish collections consisted of red swamp crawfish (*Procambarus clarkii*). Only mature female crawfish were placed in artificial burrows.

Methods - Objective A: **C**rawfish were collected (via baited traps) from open waters of both fed and non-fed ponds just prior to pond draining. Mature females from the fed pond were immediately stocked into artificial burrows. Subsets from the non-fed pond were placed in enclosures (0.5 m^2 bottom surface area) to facilitate further grazing opportunity before being placed in artificial burrows. One subset of the non-fed crawfish was placed within enclosures placed randomly within a growing rice crop. The other subset was placed within enclosures in a low density crawfish pond to graze from existing resources. Additional crawfish (n=10) from both the fed and non-fed ponds were dissected and assessed for body condition. After 12 to 14 days of grazing, those female crawfish from the enclosures were placed in artificial burrows.

Enclosures: The cylindrical wire-mesh enclosures (31 inches in diameter by 18 inches tall) were constructed of 1/8-inch plastic-coated wire mesh and were equipped with a wire mesh bottom. They contained a solid aluminum strip of sheeting (3 inches wide) around the inside top perimeter to prevent escapement from crawfish climbing up the wire mesh. Each enclosure was stocked with three mature females and two mature males. The enclosures within the rice crop were placed in the field right after planting, and rice plants were allowed to grow up inside the cage. Cages placed into an existing low density crawfish pond were supplied with an ample supply of cut rice plants to serve as the detrital base.

Methods – Objectives B, C, and D: Mature crawfish were collected from baited traps and placed in a holding vat, at a 3:2 female:male ratio for 1 week. Female crawfish were then individually placed in artificial burrows.

Artificial Burrow System: Multiple half-gallon plastic containers (with lids) filled with 0.48 L of soil and a similar volume of aged pond water served to simulate conditions inside naturally constructed crawfish burrows. The containers were each stocked with a single female crawfish and housed in an environmentally controlled laboratory. Temperature in the lab was maintained at about 81°F to provide amenities and conditions approaching that of earthen burrows during the typical burrow occupation (reproductive period) of summer/early autumn.

Survival/Reproduction Assessment: Artificial burrows were inspected monthly, beginning in July, whereby each female crawfish was examined for survival and spawning.

Reproductive Parameters: Survival, spawning status, number of offspring, month spawned, month hatched, and body condition indices for select treatments.

Experimental Design: Completely randomized design was used for each treatment comparison.

Statistical Analysis: General Linear Model analysis, with means separated by Duncan's multiple range test.

Support: USDA Special Grants – Aquaculture

Conclusions: For Objective A (effects of feeding or grazing), the results are very interesting but may be misleading. Although supplemental feeding for 1 month prior to capture improved the percentage of crawfish spawning over the non-fed group by 25%, this increase was not statistically significant (Table 1). However, the result of providing non-fed crawfish the opportunity to graze in a new and improved environment for 2 weeks prior to the burrow occupation greatly improved the percentage of crawfish spawning over those that received supplemental feed with no additional grazing opportunity. Whether crawfish were confined to an existing low density crawfish pond or a newly planted rice field during the grazing period, those crawfish that were allowed to graze (albeit under confinement) had, on average, a 108% increase in spawning rate than non-fed crawfish that originated from the same pond. Fed crawfish or crawfish allowed to graze also had slightly higher numbers of offspring. It is unclear, however, if the increase in spawning rate was attributed to a nutritional advantage from grazing. Although a greater abundance of highly nutritious aquatic fauna in the grazing environments in comparison to the density populated ponds from which the crawfish originated may have contributed to an increased spawning rate, there could be another explanation. The 2-week grazing period may have provided a critical advantage for completion of mating in a greater number of the females, thus increasing the spawning rate. Nonetheless, whether the grazing opportunity provided a nutritional and/or mating advantage, the inference from a practical management standpoint may be that there appears to be an advantage for allowing crawfish broodstock to graze for a period after stocking rather than forcing burrowing by draining the field/pond shortly after stocking.

For Objective B (effects of dry periods during the burrow stay), the timing and duration of some dry periods (i.e., no free standing water in the simulated burrows) had a negative impact on the spawning results (Table 1). The percentage of crawfish to spawn was substantially reduced when the dry period lasted longer than 1 month. In comparison to the control group, which had free standing water during the entire burrow stay, spawning was reduced by 48% for those crawfish that experienced a 2-month consecutive period (August – September) of de-watering and by 88% for those experiencing 3 consecutive months of de-watering (August – October). No significant reduction in spawning was observed for those crawfish experiencing month-long dry spells for July to October. Even though mean spawning dates were mid September for the control, July, and August treatments, crawfish that experienced a month-long dry spell during the peak months for spawning seem to be able to delay spawning until free water was again present. No spawning occurred when water was absent from the spawning containers. While 33 to 64% of the spawns occurred after September for the control to August treatments, 94% of the spawning occurred in October for the September dry group, 100% in October for the August to September dry group, and 100% in November for the August to October dry group. In the October dry treatment group, only 38.5% of the spawning occurred in November, with the remainder occurring prior to the dry month. This suggests that crawfish have the ability to delay spawning once ovarian development is complete if conditions are not conducive to spawning.

In other findings, with the intentional interruption of crawfish in the burrow, such as when they were forced into a new, incomplete burrow, even up to six times within the normal duration of the summer burrow stay, rate of spawning was not significantly affected. If anything, spawning may have been delayed slightly if the interruption occurred about the time of full ovarian development, but this was not significantly illustrated in this dataset. Mortality was slightly higher for those interrupted the most. In addition, crawfish collected and placed in artificial burrows 2 weeks later under another objective spawned, on average, 12 days later, corroborating other data that indicate spawning dates trend to correspond with burrowing dates, such that the later in the season crawfish burrow the later they will usually spawn. Percentage of the crawfish to spawn was lower for the May 14 group, but the reason is unclear. Further observations are needed to determine if the results of this trial can be considered definitive trends, but in general, these findings are valuable in better understanding the reproductive nuances of crawfish reproduction in ponds.

Table 1. Mean results for several objectives regarding mortality and spawning of crawfish under simulated burrow conditions following various pre-burrowing treatments. For Objective A, Grazing 1 refers to enclosures placed in a low density crawfish pond and Grazing 2 refers to enclosures placed in a growing rice field. Values within columns, within objectives, with the same superscript were not significantly different ($P > 0.05$). Rice Research Station, Crowley, LA. 2009.

Treatment	No.[1]	Avg. Wt. (g)	% Mort.[2]	% Spawn[2]	Avg. Month[3] Spawned	Avg. No. of Young
Objective A: Effects of Supplemental Feeding or Additional Grazing Opportunity						
Fed	25	18.0	20.0^{A}	48.0^{B}	8.3^{C}	243^{AB}
Non-Fed	47	15.4	12.8^{A}	38.3^{B}	8.5^{BC}	188^{B}
Non-Fed + Grazing 1	23	18.9	4.3^{A}	82.6^{A}	8.6^{AB}	217^{AB}
Non-Fed + Grazing 2	43	20.2	4.7^{A}	76.7^{A}	8.9^{A}	280^{A}
Objective B: Effects of Timing and Duration of "Dry Periods" within the Burrow						
No Dry Period	35	46.6	17.1^{B}	40.0^{AB}	9.6^{B}	352^{A}
Jul Dry	35	46.1	8.6^{B}	37.1^{AB}	9.5^{B}	384^{A}
Aug Dry	35	44.5	17.1^{B}	51.4^{A}	9.4^{B}	515^{A}
Sep Dry[4]	36	42.2	16.7^{B}	47.2^{AB}	9.9^{B}	395^{A}
Oct Dry[4]	36	47.4	22.2^{B}	36.1^{AB}	9.6^{B}	461^{A}
Aug & Sep Dry	36	47.8	11.1^{B}	25.0^{BC}	10.0^{B}	335^{A}
Aug, Sep, & Oct Dry	35	50.4	20.0^{B}	5.7^{CD}	11.0^{A}	193^{A}
No Free Water	36	41.9	52.8^{A}	0.0^{D}	-	-
Objective C: Effects of Simulated Burrow Interruption						
Non-Interrupted	47	49.9	29.8^{B}	31.9^{A}	9.0^{A}	274^{A}
Interrupted 1 Time	47	44.5	25.5^{B}	40.4^{A}	9.1^{A}	120^{A}
Interrupted 3 Times	47	46.8	38.3^{AB}	25.5^{A}	9.1^{A}	132^{A}
Interrupted 6 Times	45	50.8	53.3^{A}	28.9^{A}	9.4^{A}	211^{A}
Objective D: Effects of Simulated Burrow Date						
Apr 30	110	44.8	17.3^{A}	51.8^{A}	8.7^{B}	196^{A}
May 14	79	50.6	16.5^{A}	29.1^{B}	9.1^{A}	139^{A}

[1] Adjusted for those crawfish that didn't survive the first week in artificial burrows due to handling/stress.
[2] Mortality and spawning percentages are based on number of crawfish dying or spawning through the last month of observed spawning activity.
[3] Based on numerical representation of the months, beginning with 1 for January.
[4] One individual (2.8%) in the September Dry group and eight individuals (22.2%) in the October Dry group spawned prior to their respective scheduled month-long period without free water in the burrows.

OBSERVATIONS FOR BURROW EXCAVATIONS PRIOR TO POND FLOOD-UP IN 2009

W.R. McClain and J.J. Sonnier

INTRODUCTION

Since crawfish aquaculture ponds are largely populated by natural recruitment from indigenous or intentionally stocked adults that are relegated to burrows during the summer months, yields and timing of the harvest is largely determined by survival and reproductive success of those females. Mature crawfish will mate in open water during the spring or early summer prior to entering the burrow, and spawning/hatching will often take place inside the burrow usually during August, September, and October. The number, health, and condition of broodstock going into the summer burrow period and the environmental conditions during the summer and after flood-up will dictate how successful reproduction and recruitment of young will be. Poor survival and/or reproduction of broodstock can result in too few young-of-the-year recruits, and excess recruitment can result in populations of small, sub-marketable crawfish. Timing of spawning and emergence from the burrow are also critical factors affecting successful recruitment and harvests. If spawning and burrow emergence occurs prior to pond filling, recruitment into the pond can be negatively impacted. If spawning and/or emergence occur after the optimum time for pond filling, valuable growing time during the warmer weeks of autumn will be lost.

Each of these factors can have an impact on overall yield and timing of the harvest, which can be critical in terms of profit potential. The biological and environmental factors that affect recruitment can change significantly from year to year and the impacts of these on yield and profits are often difficult to distinguish from various management-associated factors, such as flooding dates, water quality, food availability, and harvesting strategies. Therefore, this study was undertaken to ascertain the condition of broodstock in burrows immediately prior to pond flood-up in the fall. Burrows were monitored following the draining of experimental ponds previously in production as well as ponds in a rice-crawfish rotational strategy that were stocked (after rice planting) with broodstock taken from the source ponds prior to pond draining.

The source ponds remained fallow during the summer, with no irrigation, while rice was cultivated and harvested in the rotational ponds, which required a shallow flood for about 2 months during the rice production phase. Therefore, since broodstock in both scenarios were originally from the same source and both scenarios occurred in the same general location, differences in observations within the burrows would likely be attributed to differences between the two management practices.

Pond History: ***Source Ponds*** were in crawfish production during the fall/winter/spring of 2008-2009. Harvesting ceased on June 12 and ponds were drained on June 15, 2009. ***Rotational Ponds*** were in crawfish production during 2007-2008 and remained fallow until ponds were planted in rice on Apr 16, 2009.

Pond Area: Each set of ponds consisted of 12 contiguous 1-acre replicated ponds.

Forage Crop – Rotational Ponds: Rice (variety ‘Catahoula’) was broadcast seeded at 100 lb/A on Apr 16, 2009. Grain was harvested on Aug 14, 2009, and the ratoon forage crop was managed for crawfish production.

Fertilizer – Rotational Ponds: Main Crop: 8-24-24 at 250 lb/A at planting, 46-0-0 at 200 lb/A (topdress) on May 18, 46-0-0 at 100 lb/A (topdress) on June 10.

Herbicide – Rotational Ponds: 1 gal/A propanil on May 5; 20 oz/A Rice Star on May 19, and 24 oz/A on June 26.

Insecticide: None

Crawfish Stocking: Rotational ponds were stocked with broodstock that were trap-harvested from the source ponds and stocking (at 60 pounds crawfish/A) occurred from May 28, until June 10, 2009. Crawfish were dispersed into the flooded rice crop of the rotational ponds.

Source Pond Drain Date: June 15, 2009

Burrows Flagged: June 16 to July 13

Summer Pond Conditions: Source ponds remained fallow after pond draining. No irrigation was applied and the pond interior was plowed for weed control. The perimeter levees containing the flagged burrows, however, remained intact and were undisturbed except for weed control by herbicide (Roundup) application. Typical rice cultivation practices were implemented in the rotational ponds after crawfish stocking with the exception of insecticide application.

Rice Field Management: Rice crops (in Rotational fields) were drained on July 31, and rice was harvested on Aug 14, 2009. Ratoon rice crop was fertilized with 46-0-0 at 100 lb/A (topdress) on 19 Aug and shallow flood (4 inches) was maintained from Aug 21 to Sept 4, 2009.

Burrow Excavation: Excavation of flagged burrows occurred from Sept 17-19, 2009, and findings were noted and collated.

Parameters: Crawfish survival and spawning success, and burrow characteristics.

Statistical Analysis: Analysis of variance with means separated by Duncan's multiple range test.

Comments: Overall, 145 sealed crawfish burrows were identified and flagged in early summer from both sets of ponds. Excavation of flagged burrows occurred prior to establishment of the permanent flood in the rotational ponds. Some differences were noted at excavation between burrow for the two sites (Table 1). Of the burrows flagged, 12% from source ponds and 9% from the rotational ponds were already opened (unsealed) and crawfish were presumed to have emerged. Twelve percent of the flagged burrows from the source ponds and 6% from the rotational ponds were effectively too deep to complete the excavation and obtain useful information. In addition, 3% of burrows from the source ponds and 31% from the rotational set of ponds were filled with sediment and were not functioning as effective burrows. The primary cause for sedimentation is unknown but an examination of other data indicates that it may not simply be caused by dead or absent occupants. A higher percentage of burrows from the source ponds were found to be open at the time of excavation and a higher percentage contained dead crawfish, yet the percent of burrows filled with sediment was greatest in the rotational set of ponds. One explanation may lie with the loose, non-packed soil of the more recently constructed levees of the rotational ponds. All levees were made with a rice-field levee plow, but the older levees (source ponds) were much more compacted prior to crawfish burrowing. The propensity of sedimentation for the newly constructed levees may be explained by the loose soil and heavy rains. However, despite the greater number of burrows filled with sediment, the remaining burrows in the rotational set of ponds contained a higher percentage of live crawfish. Average burrow depth was similar for both sets of ponds, but burrows in the rotational ponds contained far greater amounts of free water inside the burrows, at least as was found in burrows containing live crawfish (Table 1). Greater volumes of water present at excavation may provide clues to the greater survival in that group of burrows.

Of the 57 burrows containing live mature females, approximately half had spawned by mid September. However, a far greater percentage had spawned in the rotational set of ponds (Table 2). While only 27% of females from the source ponds had spawned (and half of those had hatched young), 69% of surviving mature females from the rotational ponds had spawned by the date of excavation. Since the crawfish were ultimately from the same source and presumably represented the same age classes as they entered the burrow, the exact reason(s) for this differential in spawning percentage is not clear. One explanation may be that body condition or nutritional reserves was greater for crawfish that were transferred into the rice crop and allowed to forage in a food-rich environment before they burrowed. In previous research, increased spawning success was linked to increased nutrition and body condition prior to burrowing. Another explanation may be derived from an abundance of free water in the burrow. It has been found that crawfish cannot spawn without free water inside the burrow. Burrows excavated from the source ponds contained less water on average, which may have contributed to the lower rate of spawning. At the time of excavation, average water volume from burrows of crawfish that had spawned in the source ponds was 100 mL (range = 0 – 200 mL) while the average for burrows of spawned crawfish in the rotational ponds was 992 mL (range = 0 – 4000 mL). The lower volume of water in source pond burrows may be an indication that other burrows lacked sufficient free water for spawning to occur. Further research is needed to document summer management practices on spawning success in crawfish burrows.

Table 1. Characteristics for crawfish burrows identified in early summer and excavated prior to fall flooding. Burrows were monitored in the crawfish source ponds and in rotational ponds after stocking of broodstock in early summer. Values within columns with the same superscript were not significantly different ($P > 0.05$). Rice Research Station, Crowley, LA. 2009.

Pond	No.	Open (%)	Too Deep (%)	Full of Sediment (%)	With Live Crawfish[1] (%)	Burrow Depth (inches) [1]		Water Volume (mL) [1]	
						Dead	Live	Dead	Live
Source	68	11.8^{A}	12.1^{A}	3.3^{B}	45.1^{B}	24.3^{A}	33.4^{A}	43.8^{A}	90.9^{B}
Rotational	77	9.1^{A}	6.2^{A}	31.4^{A}	77.8^{A}	28.2^{A}	33.1^{A}	210.0^{A}	1042.9^{A}

[1] Includes only burrows that were fully excavated and does not include burrows that were open, too deep, or full of sediment at the time of excavation.

Table 2. Status of mature female crawfish and their offspring extracted from burrows in each pond type during the September excavations and mean water volume in burrows of spawned females. Values within columns with the same superscript were not significantly different ($P > 0.05$). Rice Research Station, Crowley, LA. 2009.

Pond	Number Burrows With Live Crawfish	Mature Females (%)	Spawned (%)	Hatched (%)	Avg (and Range) of Water Volume in Burrows of Spawned Individuals (mL)
Source	22	100	27.3^{B}	13.6^{A}	100 mL (0 – 200)^{B}
Rotational	35	100	68.6^{A}	22.9^{A}	992 mL (0 – 4,000)^{A}

EVALUATION OF A NEW MARKING TECHNIQUE FOR EXPERIMENTAL STUDIES WITH LIVE CRAWFISH

R.O. Ramalho, W.R. McClain, and J.J. Sonnier

INTRODUCTION

Crawfish research often requires that live animals be marked for later identification and tracking. For example, studies on some aspects of crawfish population dynamics rely on a technique called mark and recapture. Crawfish movement studies often require live crawfish to be marked and some harvesting or trap efficiency studies utilize marked individuals. There have been several marking methods used with crawfish. Clipping notches or punching holes in the tail fan, attaching tags to various parts of the body or underneath the exoskeleton in visible areas, and injecting ink or microchips are just some methods that have been used, but these are invasive techniques and can sometimes compromise the health and well being of the animal. Painting the exoskeleton, often with fingernail paint, or gluing markers on the exoskeleton are non-invasive techniques that work, but require a dried exoskeleton and often requires time for the paint or glue to dry before the animal can be released. This can be very time-consuming when large numbers of crawfish are involved.

The non-invasive marking methods are preferred in many cases because they do not usually harm the animal or disrupt the behavior or the animal's routine. The downside to external markings on crawfish, however, is that the mark is usually lost when the animal sheds its exoskeleton during molting. For short-term studies that are designed to track marked animals for a few hours or days or for use on mature animals that are not likely to molt again for a long duration, non-invasive external markings are satisfactory. For ease of identification and to minimize mistakes in data collection, external marks should be clearly visible to the researcher and the mark should be easily recognizable.

The objective of this study was to evaluate the effectiveness and applicability of a new external, non-invasive marking technique on crawfish for future use in field and laboratory experiments. A waterproof marker commonly used for underwater construction and maintenance was tested as a possible marker for use on live crawfish in aquaculture research. This marker is routinely applied underwater and requires no air drying period.

Test Site: Rice Research Station's South Unit.

Pond: One 1-acre experimental crawfish pond was used for this study. This pond, part of a series of ponds, was designed and managed to simulate a typical commercial rice-crawfish field rotational cropping strategy. Rice was planted in April of 2006, harvested in August, and the stubble was subsequently reflooded and managed for a crawfish crop.

Study Dates: March 26 – April 9, 2007

Enclosures: 24 cylindrical metal wire cages (31 inches in diameter by 18 inches tall) constructed of 1/8-inch plastic-coated wire mesh, with a 1-inch by 0.5-inch wire mesh bottom. The cages contained a solid aluminum strip of sheeting (3 inches wide) around the inside top perimeter to prevent escapement from crawfish climbing up the wire mesh. Each cage had a bottom surface area of 0.5 m^2, and crawfish placed in the cages had full access to the water column and sediments in the pond bottom. Two sets of 12 cages were placed in a line within the vegetated pond, each separated by about 3 feet. One set of cages was maintained with open-tops (open-top trial) and the other set consisted of cages that were covered with 0.25-inch square mesh coverings (closed-top trial).

Crawfish: For each trial, 72 mature red swamp crawfish (average 35.9 grams) were captured from adjacent research ponds and used as experimental individuals.

Markers: The experimental marker was a general-use permanent waterproof marker (Dykem®, BRITE-MARK®, ITW Dymon, Olathe, Kansas, USA) containing an oil-based ink. The comparison mark was made with common fingernail paint.

Treatments: Crawfish were randomly assigned to one of three marking treatments, with each treatment equally represented in every cage, and crawfish were placed in the cages at one of three densities (3, 6, or 9 crawfish per cage). The sex ratio in each cage was approximately 1:1 and each marker by density factor was replicated with four cages per trial. One third of the crawfish in each cage was not marked (control group), one third was marked on the carapace with the experimental marker, and one third was marked on the carapace with common fingernail paint.

Marking Technique: Crawfish were marked with either the Dykem marker or fingernail paint. In cases with fingernail paint, the carapace had to be cleaned and dried prior to marking and the fingernail paint took at least 5 to 10 minutes to thoroughly dry, whereas the Dykem marker was applied to the wet carapace without further preparation. A large round mark was applied to the dorsal side of the carapace.

Water Quality and Depth: Water depth was held at approximately 12 inches, pH was 8.32, average water temperature was 70.5^{o}F, and dissolved oxygen averaged 0.84 mg/L.

Observations: The cages were checked after 1, 4, 7, 10, and 14 days for the condition of crawfish and the condition/erosion of the mark was noted. Individuals were considered DEAD only when remains were found, otherwise absent crawfish were considered as being MISSING. Practical survival was determined, which took into account any dead and/or missing animals.

Statistical Analysis: Analysis was performed using SPPS version 14.0 software (SPSS 2005). Because data did not fulfill the assumptions of most parametric statistics, the non-parametric, Mann-Whitney and Kruskal Wallis tests, were used to compare differences between treatment means.

Comments: Crawfish mortality due to handling (first 24 hours) was 0 and 1.39% (1 individual) for the closed- and open-top cages, respectively. No additional mortality was observed for the open-top trial. At the end of the closed-top trial (14 days), only five crawfish where found dead. Overall average mortality (observed dead individuals) was less than 7% for all marking treatments, with the controls and those painted with fingernail paint averaging the highest mortality (6.94%) while those with the Dykem marker in the closed-top trial averaged 4.17% (Figure 1).

The open-top trial had an average survival of 58% and the closed-top trial ended with an average survival of 91.20% (Figure 2). An overall average of 40.74% (26 individuals) of the experimental crawfish was missing from the open-top cages, and only 2.78% (2 individuals) was missing from the covered-top cages by the trials' end. No indications of cannibalism were detected during the experimental trials but this cannot be ruled out completely.

It should be noted that both the Dykem mark and the fingernail mark showed no significant signs of erosion over the course of the trials, even at the higher density. The marks were in good condition, and only algae and dirt accumulation contributed to reduced brightness of the Dykem marks. Both marking techniques may be suitable for use in studies with crawfish or other crustaceans; however, crawfish marked with the Dykem permanent marker experienced the lowest mortality (less than 5% on average) and use of that marker proved to be much more convenient in terms of time and effort.

While bright color markings may improve recognition by researchers, the use of highly visible marks may have unintended consequences in some situations. Though not significant, crawfish with paint markings were recorded as missing in higher numbers than non-marked individuals in one trial. The higher percentage of missing crawfish in the open-top trial, an increase of approximately 38% in relation to the closed-top trial, could be a consequence of predation by birds or other predators. During the experiment, some crawfish predatory birds were seen standing on top of the cages but there was no way to determine the extent, if any, they had on the caged individuals. Another possible explanation for the increased percentage of missing crawfish in the open-top trial is that crawfish found a way to escape from the open-top cages. Two experimental (marked) crawfish were captured outside the cages in adjacent experimental ponds, indicating that some crawfish may have been able to escape from the cages, particularly the cages with open tops.

While the cause for the missing crawfish is not determinable, it is plausible that enhanced visual detection by predators due to the color and/or size/location of the marks may have contributed to increased predation in the confinement of the cages. In this experiment, the crawfish were marked with a large round mark on the top of the carapace. An alternative approach to avoid the risk of avian predators might be to mark the crawfish in a less visible location, such as on the side or underside. This confounding factor of increased predation may only be a problem in clear water or where dense vegetation is lacking.

In other trials where the Dykem marker was employed at the time, two marked females were excavated from burrows 131 and 150 days following their release in ponds. Although the marks were estimated to be 15 and 70% eroded (respectively), this demonstrates the resilience of the marks and illustrates that crawfish can resume their normal activities following marking.

In conclusion, the Dykem marker appears well suited to short-term mark-recapture studies with crawfish and also seems promising in mid/long term studies where the intermolt period is expected to be long. Furthermore, this technique may be well suited when there is the need for different mark combinations because the markers are available in 14 different colors, and several different marks or mark/color combinations can be easily created. This marker is xylene free, is very cheap, produces a durable mark, can be applied directly on wet or dry surfaces, and dries in 25 to 35 seconds.

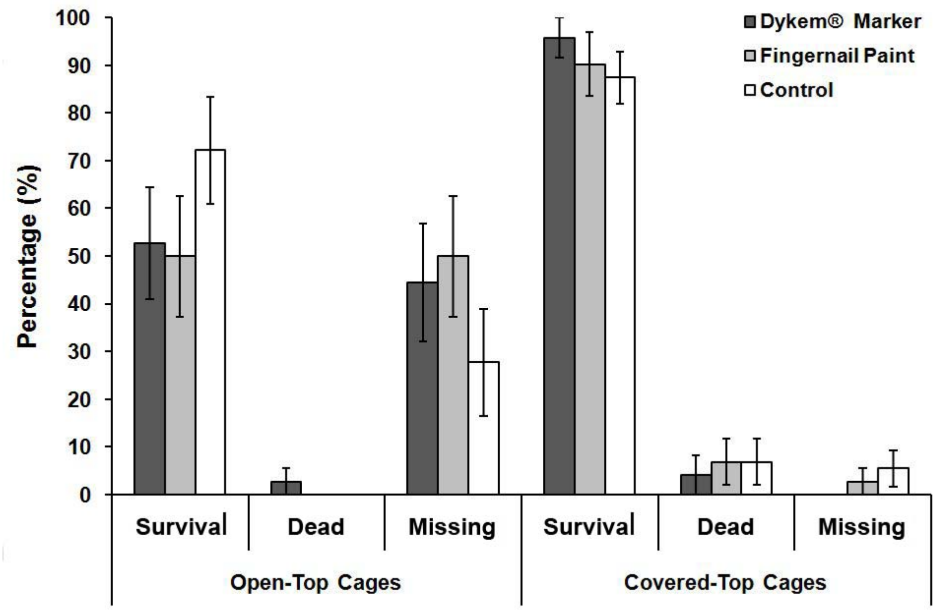


Figure 1. Average percentages of survival, dead and missing crawfish at the end of the 14-day experimental trials for both the open- and covered-top cages with each marking treatment. Vertical bars represent standard error. Rice Research Station, Crowley, LA. 2009.

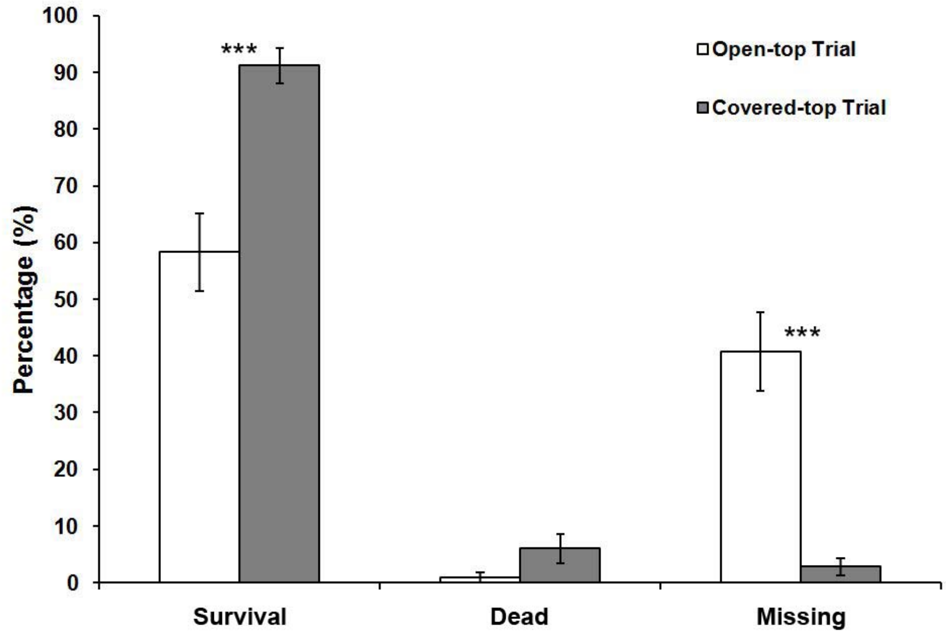


Figure 2. Overall average percentages (Sum of the marking treatments) of survival, dead and missing crawfish at the end of the 14-day experimental trials. Vertical bars represent standard error. *** indicates highly significant differences (p<0.001) within parameter group. Rice Research Station, Crowley, LA. 2009.

PRELIMINARY ASSESSMENTS OF CAPTURE RATE AND CRAWFISH MOVEMENT IN A COMMERCIAL CRAWFISH POND

R.O. Ramalho, W.R. McClain, and J.J. Sonnier

INTRODUCTION

Crawfish farmers rely solely on baited wire-mesh traps to harvest crawfish. Unlike seining with nets, which is a more effective and efficient means of harvesting foodfishes and baitfishes, crawfish farmers are relegated to the use of baited traps for several reasons: (1) thick stands of vegetation (i.e., cultivated food resource) in ponds impede seine harvesting; (2) harvestable crawfish are recruited in variable numbers into the trappable population over 4 to 6 months; (3) only large, hard-shelled crawfish are targeted for capture and traps are designed to select for size and prevent harvest of recently molted animals; and (4) baited traps are currently the only practical option in large and irregular shaped ponds that are dominant in the industry. The efficiency of baited traps to remove market size animals from the population is unknown, however. The standard square-mesh pyramid trap currently used in the crawfish aquaculture industry is the most efficient trap adopted to date, and research has shown that a trap density of 10 to 20 traps per acre, depending on crawfish population density, is usually the most cost efficient. Yet, the efficiency of which this type of system can capture marketable crawfish from a population of market size individuals has been poorly documented.

Notwithstanding, one management strategy to increase the average size of crawfish sold relies on the release of smaller crawfish back to the pond with hopes of recapturing them later at a larger, more valuable size. This theory assumes released crawfish will continue to grow and their recapture rate later, at a larger size, will justify the effort and expense. This strategy has increased in popularity in recent years with the increased demand by buyers for larger crawfish and fewer opportunities for markets willing to accept the smaller individuals.

Therefore, this study was initiated to gain some preliminary information regarding capture efficiency of baited traps using crawfish that were marked and released within a single pond, with their recapture rate documented over a short interval. A secondary objective under these efforts was to examine the dispersal and movement patterns of marked crawfish from the time they were released until their recapture.

Test Site: A commercial crawfish pond in Acadia Parish, southeast of Crowley, Louisiana.

Date: Last week of May 2007

Pond Description: The field was employed in a typical rice-crawfish field rotational strategy where a rice crop was realized in 2006, followed by a crawfish crop that was being harvested during the spring of 2007. The field was roughly U-shaped and approximately 28 acres in size (Figure 1).

Crawfish: A random sample of crawfish (470) captured on the day of release was marked and released (within 2 hours) as a group at the designated release site. Crawfish were released in the same pond they were captured in. All crawfish were red swamp crawfish (*Procambarus clarkii*) and consisted of 73 mature males (avg. wt. 21.6 g), 127 mature females (avg. wt. 22.4 g), 149 immature females (avg. wt. 15.6 g), and 121 immature males (avg. wt. 17.4 g).

Marking Technique: A general-use permanent waterproof marker (Dykem®, BRITE-MARK®, ITW Dymon, Olathe, Kansas, USA) was used to mark crawfish on the dorsal and lateral surfaces of the carapace with a large, bold white line. The mark started on one side of the carapace and ran across the top and down the other side such that marked animals could be easily spotted in a group of crawfish when captured no matter their orientation. The Dykem marker did not require a dry carapace and was quickly applied to each individual. This marker was previously determined to work well for such use in research.

Release Point: All marked crawfish were released at a designated point in the field, which was somewhat central to the two long axis of the pond (Figure 1).

Harvesting Protocol: Harvesting method employed was that typically used in commercial ponds. Traps were accessed via a hydraulically powered boat traveling down each lane of traps, and all traps were check, emptied, and rebaited on days 1, 2, 3, 4, and 6 following the release of marked crawfish.

Trap Density: 184 (3/4-inch square mesh) pyramid traps (about 6 traps/A) randomly distributed in parallel trapping lanes covering most of the field area (Figure 1).

Bait: Manufactured bait: Cajun World (Purina Mills, Inc., St. Louis, MO)

Data: Two persons examined the emptied catch from each trap and marked crawfish were collected and location of the catch was flagged. Crawfish gender, state of maturation, weight, and cephalothorax length was recorded. Distance and direction traveled from the release point to the capture location was noted and nominal rate of travel (meters/day) was calculated based on days since release.

Statistical Analysis: Data was subjected to ANOVA or MANOVA for determination of significant differences between sex/maturity groups, and rate of travel data was transformed and subjected to a logarithmic regression.

Comments: When marked crawfish (200 mature and 270 immature) were released at a central location in the 28-acre pond and all traps within the pond were subsequently run almost daily for 1 week, the results provided us some important data regarding the dispersal and capture rate of marketable size crawfish under commercial aquaculture conditions. Within the first 3 days of harvest after release of the marked crawfish, the recapture rate averaged 3.2% per day; after which, it decreased to only 1.2% per day (Table 1). Some percentage of the immature crawfish could be expected to molt after release and their recapture could go unnoticed. Indeed, the recapture percentage for immature crawfish over the 6-day period was substantially less than with matures (Table 2). However, at best, the rate of capture for mature (non-molting) crawfish totaled 20% (on average) over the course of 5 harvest days or 4% per day. When all marked crawfish are considered, the total recapture rate was only 11.5% (i.e., 54 marked crawfish recaptured) or 2.3% per day. Although natural mortality was not measured in this study, it was not expected to be great due to the care and considerations in handling/marking and short duration of the study. Therefore, based on this study, the preliminary data suggest that the capture rate for a population of market size crawfish will range between 2.3 and 4.0% per day, given the commercial conditions of culture (i.e., pond type, trap density, season, forage biomass, etc.) in this study.

Released crawfish dispersed in all directions based on the location of recaptured individuals. Marked crawfish were captured in all areas of the pond; and within 4 days, several individuals had been captured at the extreme most points of the pond. On average, those captured on Day 4 were found in traps 272 meters (or 297 yards) from the release point (Table 3). Average dispersion speed was 53.4 meters/day (minimum 3.2 meters/day; maximum 167.4 meters/day), and average nominal distance traveled until recapture was 134.8 meters (minimum 14.6; maximum 538.6). Figure 2 shows the great variability in distance captured from the release point and also depicts a general trend line for nominal rate of travel.

In conclusion, these results indicate that crawfish are very mobile and can spread quickly, utilizing large areas of suitable habitat. Also, based on the observed rate of capture in this study, it appears that baited traps are not as efficient as is often thought. Many farmers view baited traps as "magnets," attracting any crawfish that wander within a certain radius of the trap, but these results do not bear this out. With a capture rate of between 2.3 and 4% of the population of marked crawfish per day in this study and because some crawfish presumably passed baited traps before being captured, one can only conclude that trap harvesting is far less efficient than perceived by many.

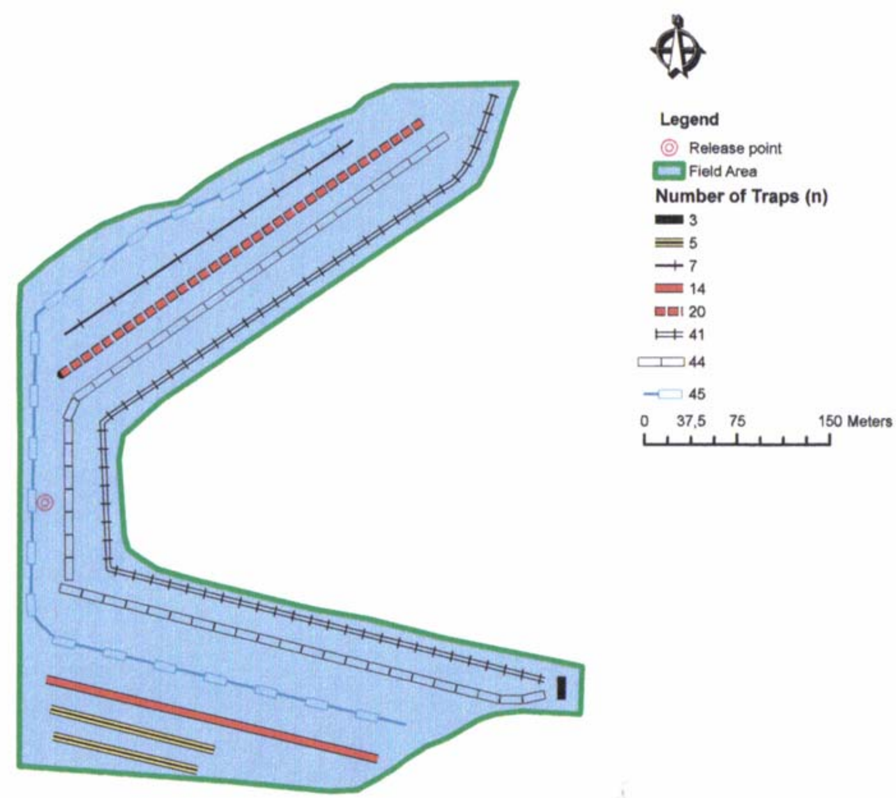


Figure 1. Representation of the shape and orientation of the commercial pond used for the mark/recapture study, and depiction of the number and placement of crawfish traps. The release site for marked crawfish is also depicted. Rice Research Station, Crowley, LA. 2009.

Table 1. Number (N) and percentage (%) of marked crawfish recaptured during the 6-day experimental period. Daily percentage of recaptures is based on adjusted numbers of marked crawfish remaining. [mM = mature males; mF = mature females; iM = immature males; iF = immature females] Rice Research Station, Crowley, LA. 2009.

Day	Adjusted Number of Marked Crawfish	Total Recaptured		mM		mF		iM		iF	
		N	%	N	%	N	%	N	%	N	%
1	470	15	3.19	4	5.48	9	7.09	1	0.83	1	0.67
2	455	14	3.08	3	4.35	8	6.78	3	2.50	0	0.00
3	441	15	3.40	3	4.55	7	6.36	1	0.85	4	2.70
4	426	6	1.41	1	1.59	4	3.88	1	0.86	0	0.00
6	420	4	0.95	1	1.61	0	0.00	3	2.61	0	0.00
Average (Total)	**---**	**(54)**	**11.5**	**(12)**	**22.2**	**(28)**	**51.9**	**(9)**	**17.7**	**(5)**	**9.3**

Table 2. Average weight (Wt.) and number (N) of released and recaptured crawfish, and percentage (%) recaptured by maturity/gender. [mM = mature males; mF = mature females; iM = immature males; iF = immature females] Rice Research Station, Crowley, LA. 2009.

Maturity/Gender	Released Individuals		Recaptured Individuals		Recapture Rate
	Wt. (g)	N	Wt. (g)	N	%
mM	21.64	73	24.29	12	16.44
mF	22.44	127	25.34	28	22.05
iM	17.35	121	21.33	9	7.44
iF	15.64	149	15.72	5	3.36
Average (Total)	**18.9**	**(470)**	**23.5**	**(54)**	**11.5**

Table 3. Average distance traveled in meters (m) and nominal rate of travel (m/day) based on location of captured marked crawfish in relation to release site. Data are arranged by days following release and maturity/gender of captured crawfish. [mM = mature males; mF = mature females; iM = immature males; iF = immature females; SE = standard error, a measure of variance]. Values with the same superscript in reference to distance traveled by day represents significant differences according to Tukey post-hoc test (*P*<0.05). Rice Research Station, Crowley, LA. 2009.

		Distance Traveled		Nominal Rate of Travel	
		m	SE	m/day	SE
Day	**1**	53.71 ^{a,b}	12.01	53.71	12.01
	2	95.43	19.86	47.71	9.93
	3	166.84 ^{a}	30.74	55.62	10.25
	4	272.19 ^{b}	65.50	68.05	16.38
	6	250.65	129.47	41.77	21.78
Average		**134.8**	**18.1**	**53.4**	**5.5**
Gender	**mM**	81.15	25.34	33.98	7.68
	mF	127.41	24.52	54.30	6.83
	iM	227.12	59.51	73.32	18.13
	iF	128.01	52.87	59.01	23,71
Average		**140.9**		**55.2**	

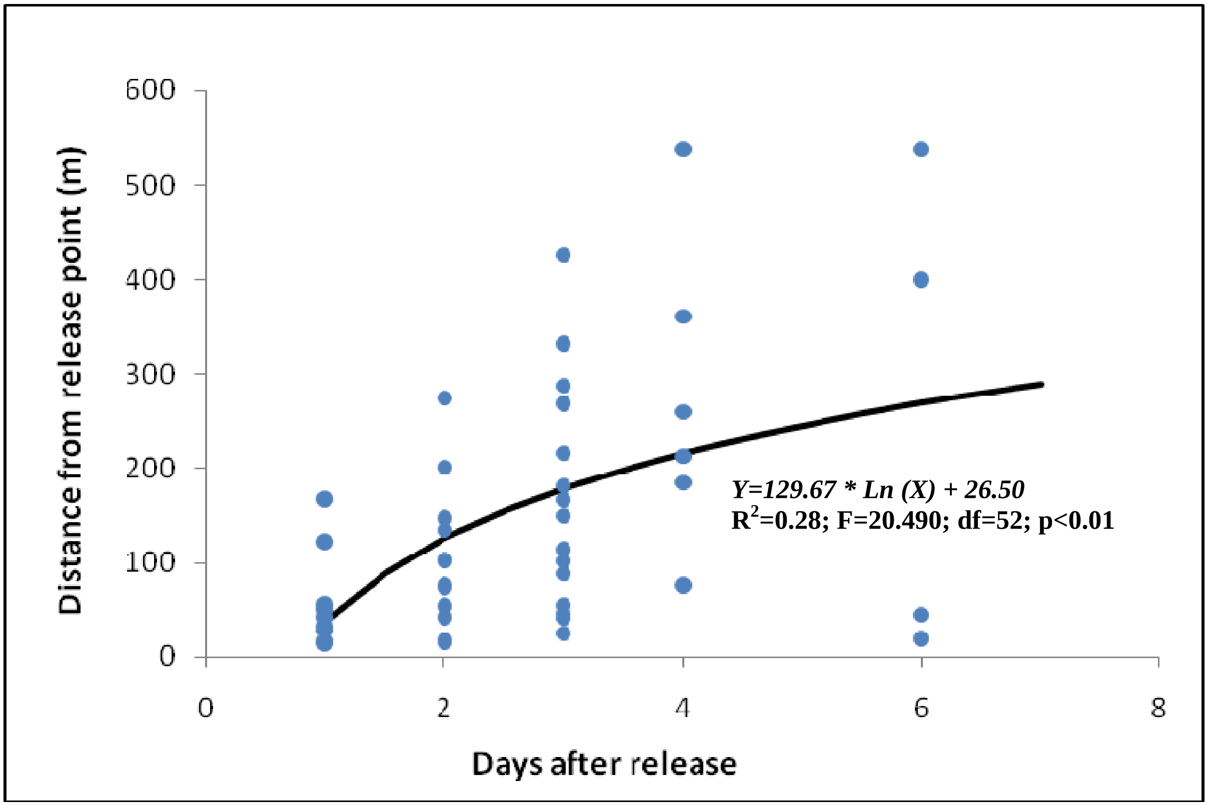


Figure 2. Individual values of nominal distance traveled until captured by day after release, with a line best fit to the data (by equation provided) to depict the general trend. Rice Research Station, Crowley, LA. 2009.

ASSESSMENTS OF CAPTURE RATE AND CRAWFISH MOVEMENT OVER TIME IN EXPERIMENTAL CRAWFISH PONDS

R.O. Ramalho, W.R. McClain, and J.J. Sonnier

INTRODUCTION

The sole method used for harvest of crawfish in aquaculture ponds is the baited wire-mesh trap. The standard trap currently in use today is the 3-funnel, pyramid-shape trap constructed of PVC-coated 3/4- or 7/8-inch square mesh welded wire. It general, the most efficient trap density in forage-based production systems is from 10 to 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.

The 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. The previous study "*Preliminary Assessments of Capture Rate and Crawfish Movement in a Commercial Crawfish Pond*" examined the capture rate of marked crawfish over a short (6-day) interval in a commercial crawfish pond. The objectives of this study were to provide some preliminary data for the harvest efficiency of marked crawfish in small experimental ponds over an extended period of time. Information will also be gleaned about crawfish movement patterns across leveed sections.

Test Site: Rice Research Station's South Unit

Study Dates: April 2 – June 26, 2007

Experimental Ponds: The system of earthen crawfish ponds, managed to simulate a typical commercial rice-crawfish field rotational cropping strategy, was composed of two sets of six contiguous 1-acre (surface area) experimental ponds separated by a water supply lateral that provided water by gravity flow to individual ponds (Figure 1). The ponds had a levee height of approximately 16 inches and base width of about 12 feet. Water depth in the ponds when filled did not exceed 12 inches. Each pond was fitted with inflow and outflow pipes of 8-inch diameter and all interior ends of inflow pipes were held off the pond bottom and near the water surface with a tension line to minimize free movement of crawfish between ponds and the supply lateral. Rice was planted in April of 2006, harvested in August, and the stubble was subsequently reflooded and managed for a crawfish crop.

Simultaneous Studies: These experimental ponds were used for simultaneous studies. Aside from this mark/recapture study, the other study was designed to examine sampling techniques and annual yield when ponds were stocked with hatchlings at predetermined densities rather than reliance on natural reproduction from indigenous broodstock. The stocking densities were designed to simulate two densities (approximately 3 and 7 crawfish/m^2) typically found in commercial ponds. The resulting density and yields of the hatchling stocking study were typical of a rice-crawfish strategy of production, albeit slightly lower than the industry mean in a normal year. Annual total yields ranged from 100 to 400 pounds/A and were poorly correlated with stocking density. Data was separately maintained for each respective study and the two studies were assumed to have little, if any, impact on one another. Subsequent descriptions and analysis in this report are related to the mark/recapture study only.

Water Quality: pH was 8.32, average water temperature was 70.5^{o}F, and dissolved oxygen averaged 0.84 mg/L.

Crawfish: For each mark and release event, crawfish were captured from the research ponds, marked, and released within 2 to 3 hours of their capture. All crawfish were red swamp crawfish (*Procambarus clarkii*) and only mature individuals were considered for this study.

Marking Technique: Crawfish were marked on the dorsal and lateral surfaces of the carapace with a long lasting waterproof marker (Dykem®, BRITE-MARK®, ITW Dymon, Olathe, Kansas, USA) using a combination of marker colors (e.g. yellow, red, white, and blue) and identifying marks (e.g. dots, circles, and stripes) such that each batch released could be identified as to release date and pond of release.

Release Events: Releases occurred in three random ponds (A-2, A-5, and B-1) (Figure 1) and all marked crawfish were released within the interior of a pond.

Trap Type and Density: 3-funnel pyramid trap constructed of ¾-inch square-mesh wire. Trap density generally consisted of 16 traps/A, with the exception that 22 traps/A were used in the central water supply lateral, and 9 additional trap-lifts occurred in the vicinity of the release in respective release ponds only and only after the first 24 hours. All other efforts were consistent across all ponds on each harvest day and all trap-lifts were accounted for in the cumulative harvest results.

Baits Used: Manufactured baits: Cajun World and Early On (Purina Mills, Inc., St. Louis, MO); Southern Pride (Country Acres Feed, Inc., Brentwood MO). Bait use was consistent across all ponds each day.

Harvesting Protocol: Harvesting method employed was consistent with commercial operations and consisted of 24- or 48-hr trap sets, 2 to 4 days per week. Harvests occurred in all 12 ponds and the lateral and the daily catch remained segregated for each pond. For each marked crawfish retrieved in a baited trap, the mark identifier and color were recorded for that day for that pond and later associated with date and pond of release. Weekly harvest schedules were consistent for each pond and the lateral, and thus, overall harvesting effort was generally the same across all ponds – varying only slightly as a result of the additional trap-lifts in release ponds 1 day after the release events and the higher trap density in the lateral.

Harvests in Lateral: Area of the central lateral was 0.9 acre and contained 20 traps (22 traps/A). Harvests proceeded in a similar manner in this area and captures of marked crawfish were recorded accordingly. For the purpose of this study, the lateral was treated as an adjacent pond to each and all other 1-acre ponds because of its contiguous proximity to the other ponds.

Treatments and Parameters: Treatments consisted of release dates and ponds. Parameters included recapture rates, locations, lapsed time after release, crawfish gender, and cumulative harvest efforts (i.e., total trap lifts) from release to recapture.

Statistical Analysis: Data were subjected to T-test when normality was verified or Mann-Whitney when data didn't meet the normality requirements for determination of significant differences between treatment groups.

Comments: Table 1 summarizes the crawfish release dates, number of marked crawfish released, total harvesting efforts (number of trap-lifts/A) in the release pond following each release, and the respective locations and number of marked crawfish recaptured within the system of ponds. At the end of the crawfish harvesting season, a total of 240 marked crawfish, out of the 489 released, or 49.1%, were recaptured. Recapture rates for individual releases ranged from 21 to 71%. The reason for this large range in recapture rate is unknown. Since release events occurred from Apr 2 to June 14 and all harvesting was suspended on June 26, this resulted in differential cumulative harvest efforts (i.e., total trap-lifts) for the various release events. However, there was no apparent trend in capture rate as related to cumulative harvest effort following release. Seemingly, recapture rate was independent of the intensity of harvest effort within this study – at least within the ranges of harvest effort examined in this study.

Regardless of the total harvest effort, on average, over half of the marked crawfish released were never captured during the study period. Few marked crawfish (n=13) were observed at pond draining and two were excavated from burrows (one female with hatchlings) several months later. Cause for the low capture rate was not determinable. A number of possible causes could contribute to low returns, including natural mortality, mortality from predators, migration from the ponds, attrition as a result of burrow occupations, or simply due to the inefficiencies of the passive system of trap harvesting.

Some evidence was provided by this study for possible migrations out of the pond. While 82.5% of those crawfish recaptured (or 39.9% of those released) were captured within the same pond that they were released into, 17.5% were captured outside of the release pond. Fifteen percent of those ultimately captured were caught in a pond adjacent to the release pond, and 2.5% were captured in two ponds over from the ponds in which they were released.

No marked crawfish were retrieved further than two ponds away, however. The most plausible explanation for crawfish captures outside of the release pond was that individuals simply exited the water and crossed over one or two levees to enter other ponds. Although crawfish could have moved from one pond to another via the central lateral by navigating through the water inflow pipes, this seems less likely because the pipe ends were raised and maintained at, or near the water surface, such that crawfish would have had to leave the pond bottom and enter the pipe near the water/air surface. If this was the most plausible means of crawfish movements, the majority of crawfish found outside of the pond of their release would not likely have been concentrated in adjacent ponds. Once in the lateral, crawfish would have been free to move into any pond some distance from their release location, and no crawfish were captured during this study more than two ponds over from where they were released. Therefore, over-land travel is the most likely means of crawfish migration from one pond to another – and this suggests that some may have exited the pond system via the perimeter levees as well. Exiting the water is a behavior that increases the risk of predation in crawfish, but crawfish have been known to exit large bodies of water, especially during the spring or early summer in Louisiana.

Little evidence exists for a large attrition of marked crawfish in the harvestable population as a result of burrowing. It has been observed that females occupy the majority of burrows constructed in the spring and summer around commercial crawfish ponds. However, the ratios of males to females in recaptured crawfish were similar in this study (Table 2) and differences were not significant (Mann-Whitney: $U=47$; $df=18$; $p>0.05$). This could be an indication that burrow occupation for females was probably not the major cause of low recovery rates.

Most of the crawfish recaptured were caught within the first week following release (39.7%, n=194) and these were captured with an average cumulative harvest effort of just 51 trap-lifts/A (Table 3). This result is very similar to that observed in the previous study "*Preliminary Assessments of Capture Rate and Crawfish Movement in a Commercial Crawfish Pond*," which examined the recapture rate of marked crawfish over a short (6-day) interval in a commercial crawfish pond. In that study, a total of 20% of the marked mature crawfish were captured within a week with a total of 36 cumulative trap-lifts per acre. In the current study, the proportion of crawfish recaptured decreased with time after release and no recaptures were made within the release pond after 4 weeks and only two marked individuals were captured in other ponds after 4 weeks (Table 3). These results indicate that at peak density of harvestable crawfish less than 0.8% of the population is captured with each trap-lift per acre and the efficiency decreases with decreasing density and/or time.

In conclusion, this study, although preliminary, has revealed some interesting and possibly important aspects of crawfish harvesting not revealed to date. First, it has shown that the current harvesting technique of baited wire-mesh traps may not be as effective as some have assumed. Under the conditions of this study, which were generally typical of commercial culture in Louisiana, the mark/recapture technique indicated that only about 50% of the population of harvestable crawfish was captured over time. Moreover, when considering crawfish captured solely within a given leveed area, albeit a small area (1 acre), only about 40% of the harvestable population was taken with baited traps. The implication of these observations is not good news for those crawfish producers that routinely release the smaller, less desirable, crawfish from the harvest with intentions of recapturing them later at a larger, more valuable, size for market. The low return or recapture rate may not be conducive for profits in some cases. Another important insight gleaned from these observations deals with the intrinsic dynamics associated with crawfish movements in and around crawfish ponds. These findings document to some extent the propensity for crawfish to move out of and into habitats, likely as a result of some over-ground travel. This emphasizes the potential for the red swamp crawfish to colonize suitable neighboring habitats, whether they are nearby crawfish ponds, flood-irrigated agricultural land, or sensitive ecological habitats. Additional research is warranted for the use of mark/recapture techniques in objectives dealing with crawfish aquaculture, as well as aspects relating to crawfish ecology.

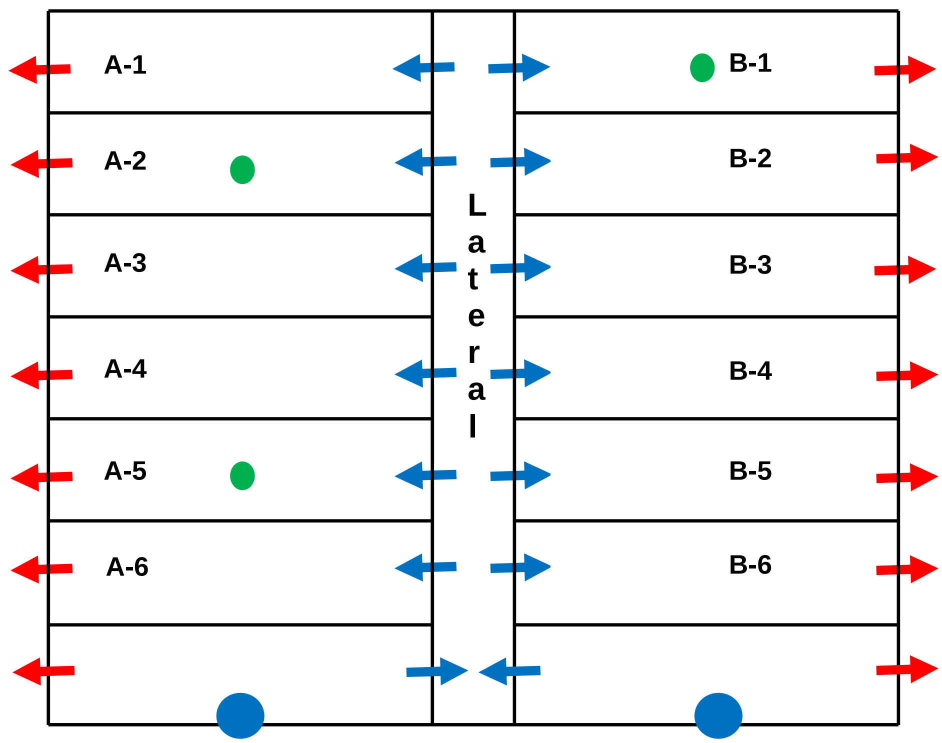


Figure 1. Schematic representation of the pond system where this study was conducted. All ponds (A-1 to A-6 and B-1 to B-6) were 1 acre in size (183 x 238 feet), and the central lateral area consisted on 0.89 acre (1171 x 33 feet). The two large circles represent fresh water inlets and arrows represent water flow direction into and out of ponds. Release locations are represented by the small circles in ponds B-1, A-2, and A-5.

Table 1. Summary of release and recaptures of marked crawfish and associated harvest effort (number of trap lifts/A) by release date. N.º = number of individuals; s.e = standard error. Rice Research Station, Crowley, LA. 2009.

Pond	Release Date	Total Crawfish Released N.º	Total Harvest Effort[1] Trap-lifts/A	Total Crawfish Recaptured		Crawfish Recaptured in Release Pond		Crawfish Recaptured in Adjacent Pond		Crawfish Recaptured Two Ponds Over	
				N.º	% by N.º	N.º	% by N.º	N.º	% by N.º	N.º	% by N.º
B-1	02 Apr	53	656	19	35.9	16	30.2	2	3.8	1	1.9
A-5	19 Apr	60	605	32	53.3	15	25.0	16	26.7	1	1.7
A-2	18 May	60	372	37	61.7	36	60.0	1	1.7	0	0
A-5	18 May	60	356	29	48.3	23	38.3	5	8.3	1	1.7
A-2	06 June	80	203	29	36.3	27	33.8	1	1.3	1	1.3
A-5	06 June	80	203	46	57.5	43	53.8	3	3.8	0	0
A-2	07 June	24	187	17	70.8	15	62.5	2	8.3	0	0
A-5	07 June	24	242	5	20.8	5	20.8	0	0	0	0
A-2	14 June	24	105	13	54.2	9	37.5	4	16.7	0	0
A-5	14 June	24	105	13	54.2	9	37.5	2	8.3	2	8.3
Total (Average)		**489**	**---**	**240**	**(49.3[a])**	**198**	**(39.9[a])**	**36**	**(7.9)**	**6**	**(1.5[a])**
% of Total Recaptured		**---**	**---**	**---**	**---**	**---**	**82.5[b]**	**---**	**15.0[b]**	**---**	**2.5[b]**
s.e.		---	---	---	4.61	---	4.52	---	2.60	---	0.80

[1] Total harvesting effort represents the cumulative trap-lifts within the pond of release following each release event.
[a] Represents average percentage of crawfish recaptured by pond category and in total, regardless of category.
[b] Represents percentage of total crawfish recaptured by pond category.

Table 2. Summary of recaptured crawfish by gender. N.º = number of individuals. Rice Research Station, Crowley, LA. 2009.

Gender	Total N.º of Crawfish Released	Total Crawfish Recaptured		Crawfish Recaptured in Release Pond		Crawfish Recaptured in Adjacent Pond		Crawfish Recaptured Two Ponds Over	
		N.º	%	N.º	%	N.º	%	N.º	%
Males	246	136	55.3	113	83.1	22	16.2	1	0.7
Females	243	104	42.8	85	81.7	14	13.5	5	4.8

Table 3. Recapture rates of marked crawfish in relation to time passed after release (in weeks). Average harvesting efforts (i.e., number of trap-lifts/A) were derived by averaging the total trapping effort respective of the number of weeks observed for each release event. N.º = number of crawfish; Cum = cumulative percentage. Rice Research Station, Crowley, LA. 2009

Weeks after Release	Applicable Number of Release Events	Average Harvesting Effort[1] (trap-lifts/A)	Crawfish Recaptured in Release Pond			Crawfish Recaptured in Adjacent Pond			Crawfish Recaptured Two Ponds Over		
			N.º	**%**	**Cum %**	**N.º**	**%**	**Cum %**	**N.º**	**%**	**Cum %**
1	10	51	167	34.2	34.2	25	5.1	5.1	2	0.4	0.4
2	10	99	28	5.7	39.9	9	1.8	7.0	1	0.2	0.6
3	8	151	2	0.4	40.3	1	0.2	7.2	1	0.2	0.8
4	4	179	1	0.2	40.5	0	0.0	7.2	1	0.2	1.0
5	4	237	0	0	40.5	0	0.0	7.2	0	0	1.0
6	4	284	0	0	40.5	1	0.2	7.4	0	0	1.0
7	2	323	0	0	40.5	0	0	7.4	0	0	1.0
8	2	378	0	0	40.5	0	0	7.4	0	0	1.0
9	*2*	*434*	*0*	*0*	*40.5*	*0*	*0*	*7.4*	*1*	*0.2*	*1.2*
10	2	498	0	0	40.5	0	0	7.4	0	0	1.2
11	1	554	0	0	40.5	0	0	7.4	0	0	1.2
12	1	618	0	0	40.5	0	0	7.4	0	0	1.2
Total	**---**	**---**	**198**	**40.5**	**---**	**36**	**7.4**	**---**	**6**	**1.2**	**---**

[1] Average harvesting effort represents the average number of trap-lifts across all fields by week after release.

RICE DISEASE CONTROL RESEARCH

RICE DISEASE CONTROL STUDIES, 2009[1]

D.E. Groth, C.W. Dischler, L.E. Leonards, and M.J. Frey

INTRODUCTION

Rice diseases pose a major threat to rice production. The two most important fungal diseases, sheath blight and blast, cause significant yield and quality reductions that cost farmers millions of dollars each year. Diseases caused by the fungus *Cercospora* have become major problems in recent years. Bacterial panicle blight is also a major rice disease, but fungicides have no activity against this disease. Disease resistance is the best control option, but often it is not available. Cultural control can reduce disease development but usually involves reducing inputs, especially nitrogen and seeding rates that can limit yield. As a result, rice farmers often rely on fungicides to control diseases. Several rice fungicides are available, but timing is critical for maximum return. Fungicide timing, rate, and efficiency trials have been conducted at the LSU AgCenter Rice Research Station and in Louisiana grower fields for a number of years. The studies demonstrated that fungicide timing was important in sheath blight, blast, and *Cercospora* control. Boot stage to heading appeared to be the best timing for *Cercospora* and sheath blight control. Earlier applications were not as effective or higher rates were needed to provide season-long control. Heading applications were effective. However, this allowed more sheath blight spread up the plant and one in two years *Cercospora* control was weak. Blast control was best when fungicides were applied at heading. Applications lost effectiveness when delayed by as little as 5 days after 50 to 70% heading for both sheath blight and blast. Fungicides also differed in their effectiveness against different diseases. Propiconazole was most effective against *Cercospora* but was weak against sheath blight and had no activity against blast when used alone. Azoxystrobin-containing fungicides were more effective against sheath blight than trifloxystrobin-containing fungicides. But trifloxystrobin fungicides were more effective against blast. Effective fungicide use must be based on the presence of damaging disease in a field and when it starts to develop. This is determined by knowing the varietal susceptibility, field disease history, weather conditions in your area, and most importantly by scouting for disease in the field multiple times during the growing season. If sheath blight and *Cercospora* are present in a field, boot applications would be best. Earlier applications would only be advisable if sheath blight started earlier and was causing significant damage before the boot growth stage. If blast is present, delaying fungicide application to heading would be best because blast can be more damaging than other diseases and heading applications can be effective against sheath blight. Most importantly, fungicides must be applied no later than when 50 to 70% of heads have emerged to maximize disease control and yields. Remember, if there is little or no disease, there is little or no loss.

Rice disease resistance screening has been conducted for many years at the LSU AgCenter Rice Research Station and at off-station locations. Typically, it takes three years of data to accurately determine the resistance of a variety because of environmental differences, erratic disease development, and absence of some diseases in some years. This screening includes current varieties, potential releases, the Uniform Regional Rice Nursery, breeding lines in preliminary yield, single plot, and early generation populations. The primary diseases screened include sheath blight, bacterial panicle blight, blast, *Cercospora*, and several minor diseases. Screening for resistance is conducted in disease nurseries, which consist of rice planted in rows in the field, with each row being a different entry. Each entry is replicated two to four times and randomized within the experiment to increase accuracy and eliminate cross interference between rows. Sheath blight and bacterial panicle blight plots are inoculated to create severe and uniform disease development because these diseases do not spread extensively within the plots. All other diseases, including blast and *Cercospora*, which spread rapidly through wind-blown spores, depend on natural inoculum. Off-station trials depend on natural inoculum since inoculations are only done on station. All of the tests are culturally managed to favor disease. At maturity, rows are rated on 0-9 severity scales, where 0 indicates no disease development (immunity) to 9 that indicates maximum disease development possible (very susceptible). Data

[1] This research is supported in part by funds provided by rice producers through the Louisiana Rice Research Board and various agricultural chemical companies.

are analyzed and used by rice breeders in line advancement decisions and in varietal recommendations. In general, there is a high correlation between on- and off-station disease reactions. The disease resistance screening program has been successful over the years in maintaining disease resistance levels in released varieties and increasing resistance levels to certain diseases. Some of the sources of this resistance include current varieties, introduced foreign germplasm, and the USDA rice collection. One of the major difficulties in determining disease resistance levels is that the pathogen populations have multiple races or genetic types that have developed to overcome resistant varieties, making them susceptible. Determining which race or races to use is one of the most important decisions a plant pathologist makes. One way to overcome this is to allow the rice to be infected by the natural populations in an area. Even with all of this work, we do not always get a good indication of a variety's resistance level until it is planted in commercial fields. The problem with this is that a variety may be susceptible to a rare race that will become the most prevalent race when the variety becomes popular and is exposed to many different environments. Usually, this happens over time, and a variety stays resistant over several years. The end result of varietal resistance development is that every variety will become susceptible to diseases over time and screening for new resistant varieties will be a nonstop ongoing process.

2009 Varietal and URN Disease Resistance Evaluation (DN1, DN2)

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, 90 lb/A

Plot Size: 1 to 3, 6-foot rows

Planting Method/Date: Drill seeded, Mar 23

Fertilization: Preplant 20-60-60, Mar 23; preflood 100-0-0, May 1; topdress 46-0-0, May 27

Experimental Design: Randomized complete block design with two to four replications

Water Management: Flushed, Apr 2 and 6; flooded, May 4; drained, July 20

Herbicides: Tank mix-Propanil 4 qt + Prowl 2 pt, Apr 17; Arrosolo 5 qt, May 1

Insecticides: Dermacor seed treatment; Mustang Max 4 oz aerial application, May 3

Fungicides: None

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 26
*Burkholderia b*acterial panicle blight, various dates from Boot Split to Early Heading

Application Equipment: CO_2 backpack sprayer, 1 tip, hand wand

Application Dates:

Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
N/A						

Disease Ratings: Various, see tables.

Drained: July 20

Harvest: N/A

Results: See Tables 1-8

Comments: Sheath blight severity was high, bacterial panicle blight was moderate, and other diseases were light.

Table 1. Disease reaction of various varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), leaf blast (LfBlast), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (Variety Trial).

Character Rated		BPB1	SB	Lf Blast	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	7/24/09	9/8/09	9/8/09	9/10/09	9/10/09	9/10/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name								
1	Catahoula	4.3 b-f	7.8 ab	0.0 i	2.5 ghi	4.0 a-d	4.8 a	1.5 d-h	3.0 a-d
2	Cheniere	4.0 b-f	7.0 a-d	2.3 d-g	5.8 bcd	3.8 a-e	1.5 b-e	2.5 b-g	2.3 a-e
3	CL131	6.3 a	7.5 abc	0.0 i	2.5 ghi	5.3 abc	4.8 a	4.8 a	3.0 a-d
4	CL151	5.3 a-d	6.5 a-e	1.0 f-i	6.5 b	4.8 a-d	3.8 abc	3.8 abc	2.5 a-e
5	CL161	4.3 b-f	7.5 abc	0.3 i	3.5 e-i	3.8 a-e	1.8 b-e	2.8 a-f	2.5 a-e
6	CL171	5.3 a-d	6.3 a-e	2.8 b-e	4.8 b-f	4.5 a-d	2.3 a-e	3.0 a-e	1.8 cde
7	Cocodrie	5.3 a-d	7.3 a-d	0.0 i	5.3 b-e	4.8 a-d	3.8 abc	3.5 a-d	2.3 a-e
8	Cypress	5.8 ab	7.8 ab	2.0 d-h	4.3 c-g	6.0 a	1.5 b-e	2.3 c-h	2.8 a-d
9	Della	4.3 b-f	3.8 f	3.3 bcd	4.3 c-g	3.3 cde	1.8 b-e	0.0 h	4.8 a
10	Dellrose	3.0 e-i	6.5 a-e	2.5 c-f	5.8 bcd	3.3 cde	3.0 a-d	0.3 gh	3.3 a-d
11	Trenasse	5.3 a-d	7.5 abc	0.0 i	3.3 e-i	5.3 abc	1.3 cde	1.5 d-h	4.5 ab
12	Wells	5.3 a-d	4.8 ef	1.0 f-i	5.8 bcd	5.0 a-d	1.8 b-e	0.3 gh	1.8 cde
13	Bengal	4.3 b-f	4.8 ef	1.8 d-i	6.0 bcd	5.8 ab	2.0 a-e	0.8 fgh	1.5 cde
14	Jupiter	2.8 f-i	5.5 c-f	1.5 e-i	3.0 f-i	4.0 a-d	2.0 a-e	0.5 gh	3.3 a-d
15	Neptune	3.0 e-i	5.5 c-f	0.5 hi	2.0 i	4.3 a-d	0.8 de	0.3 gh	0.8 de
16	Pirogue	3.0 e-i	5.3 def	4.0 ab	5.3 b-e	3.3 cde	4.0 abc	0.5 gh	2.5 a-e
17	Sabine	4.8 a-e	8.0 a	0.8 ghi	6.0 bcd	5.0 a-d	1.5 b-e	4.3 abc	2.3 a-e
18	Bowman	5.5 abc	7.3 a-d	3.8 bc	6.3 bc	4.5 a-d	1.3 cde	1.5 d-h	1.3 cde
19	Presidio	4.8 a-e	6.5 a-e	0.0 i	5.8 bcd	4.8 a-d	3.0 a-d	0.3 gh	2.0 b-e
20	Templeton	4.8 a-e	5.3 def	0.0 i	0.8 j	5.0 a-d	2.3 a-e	1.3 e-h	2.8 a-d
21	Tagart	3.5 d-h	4.8 ef	0.3 i	4.0 d-h	3.0 cde	1.5 b-e	2.5 b-g	1.8 cde
22	Jazzman	5.0 a-d	5.0 ef	0.0 i	2.3 hi	5.0 a-d	0.3 de	4.3 abc	2.5 a-e
23	CL111	4.8 a-e	7.0 a-d	0.0 i	4.8 b-f	5.3 abc	4.8 a	4.5 ab	2.5 a-e
24	LMT-1	3.0 e-i	7.3 a-d	1.8 d-i	5.8 bcd	2.8 def	2.0 a-e	1.3 e-h	3.5 abc
25	JES	3.0 e-i	5.8 b-e	0.0 i	0.3 j	3.8 a-e	0.8 de	0.5 gh	1.5 cde
26	Rondo	2.0 hij	3.8 f	0.0 i	0.0 j	3.3 cde	0.0 e	0.3 gh	2.3 a-e
27	URN 048 2085	3.8 c-g	6.8 a-e	0.0 i	5.3 b-e	3.8 a-e	1.5 b-e	2.8 a-f	1.8 cde
28	URN 051 2051	5.0 a-d	7.8 ab	2.8 b-e	5.8 bcd	4.0 a-d	4.3 ab	3.8 abc	2.3 a-e
29	XL 723	1.3 j	5.8 b-e	0.0 i	0.0 j	0.8 g	0.0 e	0.0 h	2.8 a-d
30	CLXL 729	1.5 ij	6.3 a-e	0.0 i	0.3 j	1.8 efg	0.0 e	0.0 h	3.5 abc
31	CLXL 745	2.3 g-j	6.0 a-e	0.0 i	0.0 j	1.3 fg	0.8 de	0.0 h	3.8 abc
32	M202	4.0 b-f	6.5 a-e	5.0 a	8.0 a	3.5 b-e	2.5 a-e	4.3 abc	1.8 cde
33	Purple Marker	1.5 ij	2.0 g	0.0 i	0.3 j	1.0 g	0.0 e	0.0 h	0.0 e
LSD (P=.05)		1.01	1.10	1.01	1.24	1.27	1.57	1.27	1.41
Standard Deviation		0.72	0.79	0.72	0.88	0.90	1.12	0.90	1.00
CV		18.11	12.82	64.65	23.24	23.12	55.27	50.36	41.33
Replicate F		0.287	3.801	2.576	0.867	4.723	5.533	2.554	0.428
Replicate Prob(F)		0.8345	0.0127	0.0583	0.4613	0.0041	0.0015	0.0599	0.7337
Treatment F		13.655	12.368	15.676	27.606	8.451	6.655	12.871	3.779
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, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Disease reaction of various varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group I).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/9/09	9/9/09	9/15/09	9/15/09	9/15/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
1	GP13416/KATY//PI 312777	5.8 a-d	6.0 cde	6.5 a	6.0 abc	3.3 bcd	1.3 efg	0.5 b
2	CFX-18//CCDR/9770532 DH2	5.0 a-f	8.5 a	4.8 abc	5.5 abc	3.0 bcd	3.8 b	2.3 b
3	(LGRU/LSCN)RU9801111/(RU8803072/...	3.5 fg	6.5 b-e	2.0 d	4.0 bcd	3.3 bcd	1.8 def	1.5 b
4	91642//KATY/NWBT/5/RU9201176/4/KATY/......	6.8 a	5.8 de	2.8 cd	5.5 abc	4.8 ab	5.5 a	1.5 b
5	9502008-A/DREW//CLR 20	5.8 a-d	8.0 ab	3.3 bcd	5.8 abc	5.0 ab	3.8 b	1.5 b
6	CPRS/CCDR	5.5 a-e	7.3 a-d	4.8 abc	6.3 ab	4.0 abc	3.8 b	1.3 b
7	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS	5.5 a-e	5.8 de	3.0 cd	6.3 ab	1.0 d	0.3 g	1.5 b
8	CCDR/CLR 11	6.3 ab	8.0 ab	5.5 abc	5.8 abc	4.0 abc	3.5 b	2.3 b
9	CPRS/LGRU	5.8 a-d	6.8 a-e	1.8 d	5.3 abc	3.3 bcd	3.3 bc	2.0 b
10	DREW/UA99-167	2.5 g	4.0 f	1.0 d	2.3 d	1.3 d	1.0 fg	5.0 a
11	9502008-A/DREW//CLR 20 (XC 011)	5.0 a-f	7.8 abc	4.8 abc	5.5 abc	4.8 ab	4.0 b	2.0 b
12	LCSN/LGRU	5.3 a-f	7.3 a-d	2.8 cd	5.5 abc	2.0 cd	2.5 b-e	2.0 b
13	FRNS/6/LBNT/9902/3/DAWN/9695....	6.5 ab	6.5 b-e	5.8 abc	6.5 a	3.3 bcd	1.5 d-g	1.5 b
14	RSMT/KATY	4.8 b-f	7.0 a-e	5.0 abc	3.8 cd	4.3 abc	3.5 b	2.3 b
15	RSMT//RXMT/IR36	6.0 abc	5.8 de	6.0 ab	5.8 abc	5.3 ab	1.0 fg	0.8 b
16	GFMT/TBNT/LA110	4.3 c-f	7.8 abc	5.3 abc	4.0 bcd	3.3 bcd	2.5 b-e	2.0 b
17	SPRING	4.3 c-f	5.3 e	5.5 abc	6.0 abc	6.3 a	2.8 bcd	2.0 b
18	CL151	5.3 a-f	6.8 a-e	6.3 a	5.8 abc	4.8 ab	3.8 b	2.3 b
19	PRESIDIO (PRSD)	4.0 def	6.5 b-e	5.0 abc	4.3 bc	3.3 bcd	0.8 fg	0.8 b
20	CATAHOULA	3.8 efg	7.5 a-d	1.5 d	4.0 bcd	4.5 ab	2.0 c-f	2.3 b
LSD (P=.05)		1.11	1.08	1.74	1.26	1.37	0.92	1.14
Standard Deviation		0.78	0.77	1.23	0.89	0.97	0.65	0.80
CV		15.48	11.39	29.56	17.27	26.1	24.96	43.49
Replicate F		1.214	0.596	0.376	0.396	1.149	2.771	1.596
Replicate Prob(F)		0.3129	0.6199	0.7703	0.7562	0.3370	0.0497	0.2003
Treatment F		7.663	8.202	7.927	5.997	7.380	17.963	5.220
Treatment Prob(F)		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, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 3. Disease reaction of various varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group II).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/9/09	9/9/09	9/15/09	9/15/09	9/15/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
21	RU9901127/GP-2	4.3 a-d	5.8 b-f	0.5 d	7.0 a	2.8 bcd	1.5 efg	2.8 ab
22	AC1398	5.5 ab	7.3 a-d	2.3 c	5.3 a-d	2.3 bcd	3.3 bc	1.8 abc
23	(LGRU/LSCN)RU9801111/(RU8803072/...	4.0 a-d	6.5 a-f	0.0 d	3.8 bcd	2.8 bcd	1.3 efg	2.3 ab
24	VSNTLM1/L201/PNRZ/3/MARS/TBNT…	4.5 abc	4.8 f	5.0 b	5.8 abc	3.8 abc	1.0 efg	1.0 bc
25	CPRS//L-205/DLLA	5.5 ab	6.3 a-f	2.0 c	5.0 a-d	3.5 abc	3.5 bc	1.3 bc
26	CCDR/LQ275a	4.3 a-d	6.0 a-f	0.0 d	3.5 cd	1.8 cd	0.8 efg	2.0 abc
27	FRNS/5/LBNT/9902//NWBT/3/KATY/NWBT/4/LGRU	6.0 a	6.0 a-f	0.0 d	6.0 ab	3.3 a-d	1.5 efg	2.0 abc
28	9502008//AR 1188/CCDR/3/0302005	5.3 ab	8.0 a	5.3 ab	5.5 a-d	4.3 ab	5.0 a	2.0 abc
29	LGRU/LCSN//CF4-85	3.5 bcd	6.8 a-f	4.8 b	3.5 cd	2.0 bcd	3.3 bc	0.3 c
30	CYBT/LM1	5.5 ab	6.8 a-f	0.3 d	5.3 a-d	2.0 bcd	3.0 bcd	1.0 bc
31	CCDR/0502085	5.5 ab	7.5 abc	4.5 b	5.8 abc	3.3 a-d	3.8 b	2.0 abc
32	CCDR/L202	5.0 abc	7.5 abc	5.3 ab	5.3 a-d	2.3 bcd	3.0 bcd	2.3 ab
33	IR36/8603006	4.0 a-d	5.5 c-f	5.5 ab	4.0 bcd	5.0 a	1.8 def	2.3 ab
34	TACAURI//KBNT/LCSN/3/0502022	5.0 abc	7.8 ab	6.0 ab	4.0 bcd	2.0 bcd	2.3 cde	2.0 abc
35	LMNT//TBNT/LA110…	4.0 a-d	7.0 a-e	6.0 ab	4.3 bcd	2.8 bcd	1.0 efg	1.0 bc
36	IR36/8603006	3.5 bcd	5.3 def	5.5 ab	4.5 bcd	5.3 a	1.0 efg	2.8 ab
37	JUPITER	2.3 d	5.3 def	3.3 c	3.3 d	2.0 bcd	0.0 g	3.3 a
38	NEPTUNE	3.5 bcd	5.0 ef	2.5 c	3.8 bcd	2.5 bcd	0.8 efg	1.3 bc
39	BOWMAN	3.0 cd	7.5 abc	6.0 ab	3.5 cd	1.0 d	1.0 efg	1.5 abc
40	FRANCIS	5.8 ab	6.5 a-f	6.8 a	4.8 bcd	3.5 abc	0.3 fg	1.8 abc
LSD (P=.05)		1.27	1.24	1.08	1.29	1.35	0.98	1.10
Standard Deviation		0.90	0.87	0.76	0.91	0.96	0.69	0.78
CV		20.06	13.57	21.36	19.52	33.18	35.6	42.99
Replicate F		0.632	0.540	4.165	0.420	1.793	0.447	0.350
Replicate Prob(F)		0.5973	0.6566	0.0098	0.7390	0.1587	0.7205	0.7893
Treatment F		5.209	5.029	39.752	5.124	5.204	15.373	3.375
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002

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 varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group III).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/9/09	9/9/09	9/15/09	9/15/09	9/15/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
41	UA99-153/TOX 4136-38-2	2.25 d	5.8 c-f	0.5 c	3.3 de	0.8 e	0.8 cd	5.0 a
42	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR	5.00 ab	7.5 ab	4.8 a	4.8 b-e	4.0 abc	4.8 a	1.8 bc
43	CF4-69/CCDR	4.25 abc	6.8 a-d	4.3 a	3.8 cde	1.5 cde	3.3 ab	1.8 bc
44	RU9901133/DREW//SPRN	5.75 a	8.3 a	4.3 a	7.3 a	3.8 a-d	1.8 c	3.3 b
45	CHENIERE//CFX 29/CCDR	3.75 a-d	7.0 a-d	3.3 abc	4.3 b-e	1.8 cde	1.3 cd	1.5 bc
46	CPRS/CCDR	4.50 abc	7.0 a-d	2.8 abc	5.5 bc	2.3 b-e	3.3 ab	2.3 bc
47	CCDR/ZHE 733//WC 285	3.50 bcd	5.5 def	2.0 abc	6.0 b	1.3 de	0.0 d	2.3 bc
48	AR 1188/CCDR//9502008/LGRU	3.50 bcd	7.0 a-d	3.8 ab	3.8 cde	2.3 b-e	3.8 a	1.0 c
49	CPRS/CCDR	4.00 abc	7.3 abc	2.3 abc	4.0 b-e	3.3 b-e	3.5 a	2.0 bc
50	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/......	4.75 abc	4.8 f	2.0 abc	5.0 bcd	2.8 b-e	1.3 cd	2.8 bc
51	TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18	3.75 a-d	7.3 abc	5.3 a	3.0 e	4.5 ab	4.0 a	2.3 bc
52	CPRS/CCDR	4.75 abc	7.0 a-d	3.3 abc	5.3 bcd	3.3 b-e	3.3 ab	2.0 bc
53	CPRS//NWBT/KATY	5.00 ab	8.0 a	4.3 a	5.5 bc	3.8 a-d	4.8 a	1.8 bc
54	RSMT//RXMT/IR36	2.85 cd	6.3 b-e	5.3 a	5.0 bcd	5.8 a	1.8 c	2.5 bc
55	L202//TBNT/BLMT	5.50 ab	5.5 def	4.8 a	5.3 bcd	1.3 de	0.8 cd	2.3 bc
56	TEMPLETON	4.25 abc	5.0 ef	0.8 bc	4.3 b-e	3.0 b-e	1.5 c	2.8 bc
57	PRISCILLA	4.75 abc	5.8 c-f	4.3 a	5.3 bcd	1.8 cde	1.3 cd	2.0 bc
58	CHENIERE	4.50 abc	7.8 ab	5.0 a	4.8 b-e	2.3 b-e	2.0 bc	1.8 bc
59	COCODRIE	5.25 ab	8.3 a	5.3 a	5.0 bcd	3.3 b-e	3.3 ab	1.3 bc
60	CL 171 AR	5.00 ab	7.3 abc	4.3 a	5.8 bc	4.5 ab	4.3 a	1.8 bc
LSD (P=.05)		1.118	0.92	1.94	1.16	1.50	0.95	1.15
Standard Deviation		0.790	0.65	1.37	0.82	1.06	0.67	0.81
CV		18.2	9.61	38.08	16.96	37.29	26.68	37.09
Replicate F		0.829	2.652	3.530	1.419	0.726	1.215	1.133
Replicate Prob(F)		0.4835	0.0573	0.0204	0.2465	0.5408	0.3127	0.3434
Treatment F		5.004	10.568	4.543	6.020	6.048	18.593	4.354
Treatment Prob(F)		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, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 5. Disease reaction of various varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group IV).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/9/09	9/9/09	9/15/09	9/15/09	9/15/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
61	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/.	6.0 ab	7.0 abc	3.0 bcd	6.5 ab	4.5 ab	5.5 a	1.5 a
62	9502065/3/MERC//MERC/…	6.0 ab	6.0 abc	3.5 bc	7.3 a	4.3 ab	0.8 cd	1.3 a
63	CPRS/LGRU	5.3 abc	7.5 ab	3.0 bcd	5.0 bc	3.0 a-d	1.5 cd	1.5 a
64	JES	3.3 c	6.3 abc	0.8 e	4.5 bc	0.5 e	0.3 cd	2.5 a
65	BNGL//MERC/RICO/3/MERC/RICO//BNGL	4.5 abc	5.5 bc	4.0 bc	5.3 abc	3.0 a-d	1.5 cd	1.3 a
66	PNTL/(JCTO/PNTL)0028A4	3.8 abc	6.8 abc	6.8 a	4.0 c	5.0 a	0.5 cd	2.3 a
67	P97Y228/PI 560265//STG97F5-01-004	5.8 ab	5.5 bc	1.0 de	6.3 abc	1.8 cde	0.0 d	0.8 a
68	ORIN/3/MERC/CAM9/MARS/4/BNGL	5.0 abc	5.8 abc	4.8 abc	6.0 abc	4.5 ab	0.5 cd	0.5 a
69	LGRU/LCSN//CF4-85	3.5 bc	6.8 abc	4.3 bc	4.5 bc	1.8 cde	4.0 b	1.3 a
70	LGRU//KATY/STBN/5/NWBT/KATY//RA73/LMNT/..	5.8 ab	5.8 abc	4.0 bc	4.8 bc	2.0 cde	1.5 cd	1.5 a
71	ORIN/3/MERC/CAM9/MARS/4/BNGL	6.3 a	5.8 abc	3.8 bc	7.3 a	4.3 ab	1.0 cd	1.0 a
72	((NWBT/RU8303181)/RSMT))TX7144/MDSN	6.0 ab	6.8 abc	2.5 cde	4.8 bc	1.8 cde	0.3 cd	2.3 a
73	IR36/8603006	4.0 abc	5.5 bc	5.5 ab	5.5 abc	5.0 a	1.0 cd	2.5 a
74	GFMT/TBNT/LA110	4.3 abc	7.8 a	4.8 abc	5.0 bc	3.3 abc	2.0 c	1.8 a
75	JEFF/CPRS//CPRS	5.5 abc	7.0 abc	1.0 de	5.8 abc	2.0 cde	3.5 b	1.8 a
76	LGRU//KATY/STBN/5/NWBT/KATY//RA73/LMNT/..	4.8 abc	5.0 c	4.3 bc	4.5 bc	1.0 de	0.5 cd	1.5 a
77	CFX-18(CL 161)/PSCL	3.5 bc	5.8 abc	5.0 abc	4.3 bc	2.5 b-e	4.3 b	1.8 a
78	L201/SABR	3.8 abc	5.3 c	0.5 e	4.0 c	2.0 cde	0.5 cd	2.5 a
79	CYBONNET (CYBT)	5.8 ab	7.8 a	3.3 bc	5.8 abc	3.5 abc	3.8 b	1.8 a
80	WELLS	4.5 abc	5.8 abc	5.0 abc	5.8 abc	2.5 b-e	1.3 cd	2.3 a
LSD (P=.05)		1.39	1.20	1.51	1.27	1.25	1.03	1.22
Standard Deviation		0.98	0.85	1.07	0.90	0.88	0.73	0.86
CV		20.29	13.59	30.24	16.92	30.37	43.03	52.01
Replicate F		0.447	0.878	0.954	0.924	0.989	3.115	1.622
Replicate Prob(F)		0.7200	0.4578	0.4209	0.4350	0.4047	0.0331	0.1943
Treatment F		4.114	3.942	10.098	4.738	9.278	19.210	1.805
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0448

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 varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group V).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/21/09	7/24/09	9/9/09	9/9/09	9/16/09	9/16/09	9/16/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
81	LGRU//KATY/STBN/3/LGRU	2.5 e	5.5 bc	6.0 ab	3.5 cd	6.0 a	3.5 a-f	2.0 a
82	BNGL/CL 161	5.0 a-e	5.5 bc	5.0 a-d	6.0 ab	4.0 a-d	1.5 d-g	1.0 a
83	RSMT//RXMT/IR36	4.5 b-e	7.0 ab	6.0 ab	4.5 a-d	3.5 a-d	0.5 fg	2.5 a
84	RU9901133/PI 560239//CYBT	6.0 abc	6.5 abc	5.5 abc	6.0 ab	2.0 a-d	1.5 d-g	2.5 a
85	9502008/3/MBLE//LMNT/20001-5/4/…	5.5 a-d	8.0 a	6.0 ab	5.5 abc	3.5 a-d	4.5 a-d	2.5 a
86	SABR/CCDR	4.0 b-e	6.5 abc	0.0 e	3.0 d	1.0 cd	1.0 efg	1.5 a
87	19991516/6/BASMATI-370/KATY/4/VSNTLM//....	5.5 a-d	7.0 ab	5.5 abc	5.0 a-d	4.0 a-d	1.0 efg	0.5 a
88	9502008-A//AR1188/CCDR/3/…	5.0 a-e	8.0 a	4.5 a-d	5.0 a-d	4.5 abc	4.0 a-e	2.0 a
89	CCDR/LQ275a	4.0 b-e	4.5 c	0.0 e	4.5 a-d	1.0 cd	0.0 g	1.5 a
90	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/..	5.0 a-e	6.5 abc	4.5 a-d	5.5 abc	3.5 a-d	4.5 a-d	2.0 a
91	9302065/3/CFX-29/AR 1142/LA 2031	6.0 abc	6.5 abc	3.5 bcd	6.0 ab	5.5 ab	2.0 c-g	3.0 a
92	CPRS/9901081	4.0 b-e	7.0 ab	3.5 bcd	5.5 abc	2.0 a-d	1.5 d-g	1.0 a
93	LBNT/9902/3/DAWN/9695//STBN/4/LGRU/....	3.5 cde	6.5 abc	5.0 a-d	4.5 a-d	1.0 cd	0.5 fg	1.5 a
94	CPRS/KBNT//WELLS CFX 18	4.5 b-e	7.5 ab	5.5 abc	5.5 abc	4.0 a-d	2.5 b-g	1.5 a
95	(CPRS/PELDE)/JEFF	5.0 a-e	5.5 bc	4.5 a-d	5.5 abc	3.0 a-d	2.5 b-g	1.5 a
96	3334-2-1120-1	5.0 a-e	5.5 bc	6.0 ab	5.0 a-d	1.5 bcd	0.0 g	0.5 a
97	KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18	5.5 a-d	8.0 a	4.0 a-d	6.5 a	4.0 a-d	3.5 a-f	2.5 a
98	SABR/CCDR	4.5 b-e	8.0 a	4.0 a-d	4.5 a-d	0.0 d	0.5 fg	1.5 a
99	CYBT/UA99-94//UA99-126	4.0 b-e	7.0 ab	1.0 e	5.5 abc	0.5 cd	0.5 fg	4.5 a
100	CFX-18(CL 161)/PSCL	6.0 abc	7.0 ab	5.0 a-d	6.5 a	4.0 a-d	2.5 b-g	1.0 a
101	JEFF/CPRS//CPRS	5.5 a-d	7.5 ab	2.0 de	5.5 abc	3.5 a-d	4.0 a-e	1.0 a
102	RU9901133/DREW//RU0101093	4.0 b-e	7.0 ab	4.5 a-d	4.5 a-d	4.5 abc	2.0 c-g	2.0 a
103	FRANCIS/CLR 13	6.0 abc	7.0 ab	6.0 ab	6.5 a	6.0 a	1.0 efg	1.5 a
104	(JEFF//JEFF/O. RUFIPOGON)219_2-9	7.5 a	7.5 ab	5.0 a-d	6.5 a	1.0 cd	2.0 c-g	2.0 a
105	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/....	5.5 a-d	5.5 bc	4.5 a-d	6.0 ab	2.0 a-d	1.0 efg	2.0 a
106	CPRS/3/CFX 29//AR 1142/LA 2031	4.5 b-e	8.0 a	4.5 a-d	4.5 a-d	4.0 a-d	5.5 ab	1.0 a
107	LGRU/LSCN/CF4-85	3.0 de	7.0 ab	5.0 a-d	3.0 d	2.0 a-d	4.5 a-d	0.0 a
108	KATY/NWBT//L201/7402003/3/WLLS/4/FRNS	6.5 ab	5.5 bc	2.5 cde	6.0 ab	3.5 a-d	6.0 a	2.0 a
109	9502008/3/MBLE//LMNT/20001-5/…	4.5 b-e	8.0 a	4.5 a-d	5.0 a-d	3.5 a-d	3.5 a-f	2.5 a
110	CF4-69/CCDR	5.0 a-e	7.0 ab	1.0 e	4.5 a-d	2.5 a-d	2.5 b-g	2.0 a
111	RU9901133/DREW//RU0101093	3.5 cde	7.5 ab	5.5 abc	4.5 a-d	5.5 ab	4.0 a-e	2.0 a
112	9302065/3/CFX-29/AR 1142/LA 2031	6.5 ab	8.0 a	4.5 a-d	6.5 a	4.0 a-d	3.0 a-g	1.5 a
113	SABR/CCDR	6.0 abc	7.5 ab	2.5 cde	6.0 ab	0.5 cd	0.5 fg	2.0 a
114	GFMT/RXMT//IR36	4.0 b-e	6.5 abc	5.0 a-d	4.0 bcd	3.0 a-d	0.5 fg	1.5 a
115	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	4.5 b-e	8.0 a	5.0 a-d	5.5 abc	4.5 abc	2.5 b-g	1.0 a
116	SABR/CCDR	4.0 b-e	6.0 abc	0.0 e	5.0 a-d	1.0 cd	0.5 fg	3.5 a
117	COCODRIE	4.5 b-e	8.0 a	5.0 a-d	4.5 a-d	4.0 a-d	3.5 a-f	1.0 a
118	HIDALGO	4.5 b-e	7.5 ab	6.0 ab	4.0 bcd	3.0 a-d	5.0 abc	2.0 a
119	M206	3.0 de	5.5 bc	7.0 a	4.0 bcd	1.5 bcd	0.0 g	1.5 a
120	TRENASSE	4.0 b-e	7.5 ab	5.0 a-d	5.5 abc	1.0 cd	1.5 d-g	3.0 a
LSD (P=.05)		1.57	1.23	1.62	1.28	2.35	1.71	2.02
Standard Deviation		0.78	0.61	0.80	0.63	1.16	0.85	1.00
CV		16.21	8.82	18.91	12.32	39.09	37.24	55.86
Replicate F		0.021	0.305	1.238	1.129	0.924	0.000	0.614
Replicate Prob(F)		0.8862	0.5839	0.2727	0.2946	0.3423	1.0000	0.4379
Treatment F		3.742	4.830	9.960	4.421	3.828	7.784	1.437
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.1309

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 varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group VI).

Character Rated		BPB1	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/9/09	9/9/09	9/16/09	9/16/09	9/16/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
121	RU9901133/DREW//RU0101093	3.5 b-e	8.0 a	3.5 abc	4.0 abc	4.0 a-e	0.5 hi	2.0 abc
122	COLUMBIA2/BENGAL	5.5 a-d	7.0 abc	5.0 ab	6.5 a	1.0 cde	0.5 hi	3.0 abc
123	CPRS/NWBT//KATY/3/CCDR	5.0 a-d	8.0 a	6.0 a	4.0 abc	1.0 cde	2.5 d-h	0.5 c
124	MDRK/PI 312777//JING 185-7	5.5 a-d	4.5 def	0.0 c	6.5 a	3.0 a-e	0.0 i	0.5 c
125	CCDR/3/9502008-A//AR1188/CCDR	5.0 a-d	7.0 abc	4.5 ab	5.0 abc	2.0 a-e	3.0 c-g	2.0 abc
126	LGRU/LSCN/CF4-85	3.5 b-e	7.0 abc	4.5 ab	4.0 abc	3.5 a-e	5.0 abc	2.5 abc
127	91642//KATY/NWBT/5/RU9201176/4/KATY/NWBT/..	7.0 ab	7.0 abc	4.5 ab	6.5 a	6.0 a	6.0 a	2.0 abc
128	AC110/AC638	5.0 a-d	8.0 a	2.5 abc	4.0 abc	3.5 a-e	4.5 a-d	3.0 abc
129	LGRU/LSCN/CF4-85	3.5 b-e	7.0 abc	2.5 abc	3.0 c	2.5 a-e	4.5 a-d	1.5 abc
130	YACU 9/ZHE 733//WC 292	2.0 de	4.0 ef	1.5 bc	6.0 ab	1.0 cde	0.0 i	4.5 a
131	CCDR//9502008//AR1188/CCDR	4.5 a-e	6.5 a-d	4.5 ab	4.0 abc	4.5 a-d	3.0 c-g	1.0 bc
132	(DLMT/(LMNT*3/JSMN))/((CPRS/PELDE)/JEFF)	3.0 cde	7.0 abc	3.5 abc	3.0 c	2.5 a-e	0.5 hi	4.0 ab
133	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/4/......	6.0 abc	6.0 a-e	6.5 a	5.0 abc	5.5 ab	1.0 ghi	1.5 abc
134	CCDR/3/CPRS/KBNT//9502008-A	4.5 a-e	7.5 ab	4.5 ab	4.5 abc	3.5 a-e	4.5 a-d	1.5 abc
135	(DF5-68)99:5526/TX8946	4.0 b-e	4.5 def	5.5 ab	5.0 abc	1.5 b-e	1.0 ghi	1.5 abc
136	MDRK/LM 1	8.0 a	4.5 def	5.5 ab	6.5 a	2.5 a-e	0.5 hi	1.5 abc
137	CCDR//CCDR/JEFF	4.5 a-e	7.5 ab	4.5 ab	5.5 abc	2.5 a-e	3.0 c-g	1.0 bc
138	CCDR/L202	3.0 cde	7.5 ab	6.0 a	4.5 abc	1.5 b-e	2.5 d-h	1.5 abc
139	GP-2	1.0 e	3.0 f	0.0 c	3.0 c	0.0 e	0.0 i	3.0 abc
140	9502008-A/DREW//AC101/DREW	4.5 a-e	8.0 a	2.5 abc	3.5 bc	3.0 a-e	4.5 a-d	2.0 abc
141	CPRS/9901081	5.5 a-d	6.0 a-e	3.5 abc	5.5 abc	1.5 b-e	3.0 c-g	1.0 bc
142	KBNT/Q36194	5.5 a-d	5.0 cde	5.0 ab	6.0 ab	2.0 a-e	0.5 hi	0.5 c
143	LGRU/CLR 11	4.5 a-e	8.0 a	5.0 ab	4.5 abc	1.5 b-e	2.5 d-h	2.0 abc
144	CCDR/L202	3.5 b-e	7.5 ab	4.5 ab	3.5 bc	4.0 a-e	4.0 a-e	2.0 abc
145	RU9901133/JEFF	4.0 b-e	7.0 abc	4.5 ab	6.0 ab	3.5 a-e	0.5 hi	1.5 abc
146	AC1172	3.5 b-e	8.0 a	6.0 a	4.5 abc	6.0 a	5.5 ab	1.0 bc
147	CCDR/L202	4.0 b-e	8.0 a	4.5 ab	4.0 abc	2.0 a-e	4.0 a-e	2.0 abc
148	IRGA409/RXMT/5/BRAZ/TBNT/3/164986-4/NV66..	3.5 b-e	5.5 b-e	2.5 abc	5.0 abc	5.0 abc	3.0 c-g	1.0 bc
149	9502008//KATY/9902207X2/3/JSMN/…	4.5 a-e	7.5 ab	4.0 ab	6.0 ab	2.5 a-e	5.0 abc	2.0 abc
150	(JEFF//JEFF/O. RUFIPOGON)43_1-2	4.5 a-e	6.5 a-d	3.0 abc	5.0 abc	0.5 de	0.0 i	2.5 abc
151	RU9901133/JEFF	5.0 a-d	7.0 abc	5.0 ab	5.0 abc	2.0 a-e	0.5 hi	0.5 c
152	9502008/LGRU/3/CPRS//82CAY21/TBNT	4.0 b-e	8.0 a	5.0 ab	5.0 abc	1.5 b-e	1.5 f-i	2.5 abc
153	CPRS/CCDR	5.0 a-d	7.0 abc	3.5 abc	5.5 abc	1.5 b-e	3.5 b-f	3.0 abc
154	GFMT/RXMT//IR36	5.5 a-d	7.0 abc	5.0 ab	6.0 ab	2.5 a-e	1.0 ghi	1.0 bc
155	CHENIERE/LMNT	4.0 b-e	6.0 a-e	2.5 abc	4.5 abc	5.5 ab	4.5 a-d	1.5 abc
156	CPRS/JKSN	6.0 abc	7.5 ab	5.5 ab	5.0 abc	4.5 a-d	5.0 abc	0.5 c
157	LMNT//TBNT/LA110…	3.0 cde	7.5 ab	5.0 ab	3.5 bc	4.0 a-e	2.0 e-i	2.0 abc
158	JAZZMAN	4.0 b-e	4.5 def	3.5 abc	6.5 a	3.0 a-e	5.5 ab	2.5 abc
159	SABINE (SABN)	3.0 cde	8.0 a	5.5 ab	4.0 abc	2.0 a-e	5.5 ab	1.0 bc
160	TAGGART	4.0 b-e	5.0 cde	5.0 ab	4.5 abc	2.5 a-e	0.5 hi	2.0 abc
LSD (P=.05)		2.01	1.25	2.23	1.51	2.19	1.23	1.85
Standard Deviation		0.99	0.62	1.10	0.75	1.08	0.61	0.91
CV		22.72	9.31	26.67	15.49	38.68	23.33	50.75
Replicate F		0.455	0.130	0.832	1.091	1.066	0.034	0.539
Replicate Prob(F)		0.5038	0.7199	0.3674	0.3026	0.3083	0.8554	0.4672
Treatment F		3.314	9.311	3.727	3.947	3.886	20.603	2.083
Treatment Prob(F)		0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0122

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 varieties and experimental lines to bacterial panicle blight (BPB), sheath blight (SB), rotten neck blast (RNB), leaf smut (LSmut), Cercospora, and brown leaf spot (BS) at the Rice Research Station, Crowley, LA. 2009. (URN Group VII).

Character Rated		BPB	SB	RNB	BPB2	LSmut	Cercospora	BS
Rating Date		7/20/09	7/24/09	9/10/09	9/10/09	9/16/09	9/16/09	9/16/09
Rating Data Type		Severity	Severity	Severity	Severity	Severity	Severity	Severity
Rating Unit		0-9	0-9	0-9	0-9	0-9	0-9	0-9
Trt No.	Treatment Name							
161	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/....	5.0 a-d	5.0 c-f	2.0 efg	5.5 a-d	3.0 a-d	2.0 a-e	3.0 abc
162	BNGL//MERC/RICO/3/MERC/RICO//BNGL	6.0 abc	6.0 a-d	5.0 a-e	6.5 ab	5.0 abc	0.0 e	2.0 a-d
163	SABR/CCDR	3.5 cde	7.0 abc	1.5 fg	3.5 def	1.5 a-d	0.5 de	3.0 abc
164	RU9901133/DREW//RU0101093	7.0 a	5.5 b-e	6.0 abc	7.0 a	3.0 a-d	2.5 a-e	2.0 a-d
165	ORIN/3/MERC/CAM9/MARS/4/BNGL	5.0 a-d	6.5 a-d	3.5 b-g	6.5 ab	5.5 ab	0.5 de	1.5 a-d
166	TEXMONT/TEQING	7.0 a	7.0 abc	6.5 ab	6.0 abc	2.0 a-d	4.0 abc	2.5 a-d
167	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/..	5.5 a-d	5.0 c-f	6.0 abc	5.5 a-d	3.5 a-d	0.0 e	0.0 d
168	BNGL/4/9502065/3/MERC//MERC	3.5 cde	3.5 ef	3.0 c-g	5.0 a-e	5.5 ab	1.5 b-e	1.5 a-d
169	LGRU/LSCN/CF4-85	3.5 cde	6.5 a-d	5.5 a-d	4.0 c-f	3.0 a-d	4.5 ab	1.0 bcd
170	97Y228/PI 560265//STG97F5-01-004	6.0 abc	5.5 b-e	2.0 efg	6.5 ab	1.5 a-d	0.5 de	3.5 ab
171	ORIN/3/MERC/CAM9/MARS/4/BNGL	5.5 a-d	5.0 c-f	4.5 a-f	6.5 ab	4.0 a-d	0.5 de	0.0 d
172	CPRS/CCDR	4.0 bcd	6.5 a-d	2.0 efg	3.5 def	2.5 a-d	3.0 a-e	2.0 a-d
173	RU0101093/STG00F5-07-007	3.5 cde	8.0 a	3.0 c-g	4.5 b-f	1.0 bcd	1.0 cde	2.0 a-d
174	902207x2/LGRU//CHENIERE	6.0 abc	7.5 ab	6.5 ab	6.5 ab	4.5 a-d	2.5 a-e	1.0 bcd
175	CCDR/L202	3.5 cde	7.5 ab	4.5 a-f	4.0 c-f	2.0 a-d	4.0 abc	2.0 a-d
176	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/..	5.5 a-d	5.5 b-e	6.0 abc	6.0 abc	3.5 a-d	1.0 cde	2.0 a-d
177	TACAURI/3/CPRS//82CAY21/TBNT/4/…	6.0 abc	8.0 a	5.5 a-d	6.5 ab	3.5 a-d	4.0 abc	2.5 a-d
178	LGRU/LSCN/CF4-85	3.5 cde	5.5 b-e	4.5 a-f	3.0 ef	3.0 a-d	5.0 a	1.0 bcd
179	RU9901133/JEFF	5.5 a-d	6.0 a-d	5.5 a-d	5.5 a-d	1.0 bcd	0.5 de	2.0 a-d
180	CCDR/CFX-18	4.5 a-d	8.0 a	5.0 a-e	6.0 abc	3.0 a-d	4.0 abc	0.5 cd
181	CPRS/CCDR	4.0 bcd	7.5 ab	4.5 a-f	5.5 a-d	4.0 a-d	3.0 a-e	2.0 a-d
182	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/..	6.5 ab	4.5 def	6.5 ab	6.5 ab	3.0 a-d	1.0 cde	1.0 bcd
183	CFX-18//CCDR/9770532 DH2	5.0 a-d	8.0 a	5.0 a-e	5.0 a-e	2.5 a-d	3.5 a-d	1.0 bcd
184	CPRS/CCDR	5.0 a-d	6.5 a-d	2.5 d-g	4.0 c-f	3.0 a-d	3.0 a-e	1.0 bcd
185	FRNS/6/LBNT/9902/3/DAWN/9695//STBN/..	6.0 abc	6.5 a-d	6.0 abc	6.0 abc	3.5 a-d	0.5 de	1.5 a-d
186	CFX-18(CL 161)/PSCL	4.0 bcd	7.0 abc	5.0 a-e	5.0 a-e	3.0 a-d	2.0 a-e	1.5 a-d
187	Carolina Gold/IR64//IR65610-24-3-6-3-2-3	1.5 ef	3.5 ef	1.5 fg	3.0 ef	0.5 cd	0.0 e	4.0 a
188	RU0101093/STG00F5-07-007	6.5 ab	8.0 a	4.5 a-f	7.0 a	2.0 a-d	1.0 cde	1.5 a-d
189	KATY/CPRS//NWBT/…/3/9502008/4/CLR 9	5.0 a-d	8.0 a	5.0 a-e	5.5 a-d	4.0 a-d	3.5 a-d	0.5 cd
190	CPRS/CCDR	3.5 cde	8.0 a	3.5 b-g	3.0 ef	2.0 a-d	2.0 a-e	1.5 a-d
191	RSMT/KATY	3.0 de	5.0 c-f	6.5 ab	4.0 c-f	3.5 a-d	1.5 b-e	2.0 a-d
192	CCDR/CFX 18	5.5 a-d	8.0 a	6.0 abc	4.0 c-f	4.0 a-d	4.0 abc	1.0 bcd
193	RSMT/KATY	4.0 bcd	7.0 abc	6.0 abc	4.5 b-f	4.0 a-d	0.0 e	2.5 a-d
194	RSMT/RXMT/IR36	4.5 a-d	7.5 ab	7.0 a	4.5 b-f	6.0 a	1.5 b-e	1.0 bcd
195	CPRS/KBNT//CFX 29	5.0 a-d	7.0 abc	6.0 abc	6.0 abc	4.5 a-d	3.5 a-d	1.0 bcd
196	RSMT//RXMT/IR36	6.5 ab	7.0 abc	6.0 abc	5.5 a-d	4.5 a-d	1.0 cde	1.5 a-d
197	RSMT/KATY	4.5 a-d	7.0 abc	6.0 abc	5.5 a-d	5.0 abc	1.0 cde	1.0 bcd
198	RSMT/KATY	4.0 bcd	7.0 abc	6.5 ab	4.0 c-f	5.0 abc	2.0 a-e	2.0 a-d
199	RONDO	1.0 f	3.0 f	1.0 g	2.5 f	0.0 d	0.0 e	3.0 abc
200	FRANCIS	6.0 abc	6.0 a-d	7.0 a	5.5 a-d	2.5 a-d	0.5 de	1.5 a-d
LSD (P=.05)		1.35	1.28	1.69	1.30	2.46	1.85	1.49
Standard Deviation		0.67	0.63	0.84	0.64	1.22	0.92	0.74
CV		14.06	9.83	17.58	12.6	38.09	48.27	44.02
Replicate F		0.028	1.129	2.581	0.753	0.034	3.805	3.311
Replicate Prob(F)		0.8683	0.2946	0.1162	0.3909	0.8554	0.0583	0.0765
Treatment F		8.405	9.232	8.382	7.381	2.671	5.341	2.856
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001	0.0014	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.

2009 Varietal and URN Resistance Evaluation (DN3, DN4)

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, 90 lb/A

Plot Size: 1 – 3, 6-foot rows

Planting Method/Date: Drill seeded, May 18

Fertilization: Preplant 20-60-60, May 18; preflood 150-0-0, June 16; topdress 46-0-0, July 20

Experimental Design: Randomized complete block design with two to four replications

Water Management: Flushed, June 1; flooded, June 17; drained to induce blast, July 2; reflooded, July 8; drained, Aug 21

Herbicides: Rice Shot 4 qt, June 8; RiceBeaux 1 qt, June 15; Clincher 22 oz + Crop Oil 1 qt, June 2

Insecticides: Dermacor seed treatment; Mustang Max 4 oz, June 20

Fungicides: None

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, July 29
*Burkholderia b*acterial panicle blight, various dates from Boot Split to Early Heading

Application Equipment: CO_2 backpack sprayer, 1 tip, hand wand

Application Dates:

	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
N/A							

Disease Ratings: See tables 1-8.

Drained: Aug 21

Harvest: N/A

Results: See Tables 1-9

Comments: Blast was moderate in severity, and other diseases were light.

2009 Sheath Blight Fungicide Trial (SB1)

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: Cocodrie, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 23

Fertilization: Preplant 20-60-60, Mar 23; preflood 100-0-0, May 1; topdress 46-0-0, May 27

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 2 and Apr 6; flooded, May 4; drained, July 20

Herbicides: Tank mix-Propanil 4 qt + Prowl 2 pt, Apr 17; Arrosolo 5 qt, May 1

Insecticides: Dermacor seed treatment, Mustang Max 4 oz aerial application, May 3

Fungicides: Various

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 26

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 11	PD + 7	08:30	83 F	5 mph	75%	10%	mod.
June 18	Boot	09:30	89 F	4 mph	66%	60%	mod.

Disease Ratings: Sheath blight severity and infestation, July 22

Drained: July 20

Harvest: July 30

Results: See Table 9

Comments: Sheath blight severity was high with favorable weather patterns for disease development. No phytotoxicity was detected in any treatments. Yield levels were very high and significantly increased by all fungicide treatments. Milling was also very high but not affected significantly by fungicide treatments.

Table 9. Effect of various fungicides, rates, and timings on sheath blight (SB) development and yield of Cocodrie rice at the Rice Research Station, Crowley, LA, 2009.

Pest Name							SB	SB	Yield	Milling	Milling
Rating Date							7/22/09	7/22/09	7/30/09	9/10/09	9/10/09
Rating Type							Severity	Infestation	Yield	Total	Whole
Rating Unit							0-9	%	lb/A	%	%
Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage					
1	Quadris	2.08	LB/GAL	9.2	fl oz/A	B	4.5 b	26.8 c	9744 a	73.0 a	67.4 a
2	Untreated check						8.0 a	90.8 a	8082 b	73.0 a	66.8 a
3	Stratego	2.08	LB/GAL	19	fl oz/A	B	4.5 b	30.5 c	9768 a	72.9 a	67.5 a
4	Quilt	1.04	LB/GAL	28	fl oz/A	B	4.8 b	31.3 c	10000 a	72.7 a	67.2 a
5	Tilt	3.6	LB/GAL	10	fl oz/A	B	7.3 a	66.8 b	9319 a	72.4 a	66.6 a
6	Quilt Xcel	263.8	GA/L	17.5	fl oz/A	PD+7	4.8 b	31.8 c	9661 a	72.3 a	66.5 a
7	Quilt Xcel	263.8	GA/L	21	fl oz/A	PD+7	4.3 b	29.8 c	9681 a	73.0 a	67.9 a
8	Quilt Xcel	263.8	GA/L	21	fl oz/A	B	4.8 b	31.8 c	9812 a	73.0 a	67.5 a
LSD (P=.05)							1.26	15.97	625.3	0.87	1.5332
Standard Deviation							0.86	10.86	425.1	0.49	0.8754
CV							16.03	25.6	4.47	0.68	1.3
Replicate F							1.065	0.975	1.612	0.362	0.117
Replicate Prob (F)							0.3851	0.4232	0.2166	0.7029	0.8902
Treatment F							11.191	18.559	8.154	1.063	0.967
Treatment Prob (F)							0.0001	0.0001	0.0001	0.4342	0.4902

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.

2009 Sheath Blight Fungicide Trial (SB2)

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: Cocodrie, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 23

Fertilization: Preplant 20-60-60, Mar 23; preflood 100-0-0, May 1; topdress 46-0-0, May 27

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 2 and Apr 6; flooded, May 4; drained, July 20

Herbicides: Tank mix-Propanil 4 qt + Prowl 2 pt, Apr 17; Arrosolo 5 qt, May 1

Insecticides: Dermacor seed treatment; Mustang Max 4 oz aerial application, May 3

Fungicides: Various

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 26

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application/Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 11	PD + 7	09:15	86 F	6 mph	76%	10%	mod.
June 19	Boot	08:15	84 F	6 mph	74%	20%	mod.

Disease Ratings: Sheath blight severity and incidence, July 22

Drained: July 20

Harvest: July 30

Results: See Table 10

Comments: Sheath blight severity was very high. No significant phytotoxicity was detected. Most fungicides reduced sheath blight and increased grain yields. Milling was affected less.

Table 10. Effect of various fungicides, rates, and timings on sheath blight (SB) development and yield of Cocodrie rice at the Rice Research Station, Crowley, LA, 2009.

Pest Name Rating Date Rating Type Rating Unit Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage	SB 7/22/09 Severity 0-9	SB 7/22/09 Incidence %	Yield 7/30/09 Yield lb/A	Milling 9/1/09 Whole %	Milling 9/1/09 Total %
1	Unsprayed Check						7.88 a	85.5 a	7899 b	66.5 b	72.3 b
2	Stratego	250	GA/L	19	fl oz/A	B	4.75 c	37.0 b	9878 a	68.2 a	73.4 a
3	Quilt Quadris	200 250	GA/L GA/L	21 4	fl oz/A fl oz/A	B B	4.75 c	34.0 b	10005 a	68.2 a	73.2 a
4	Quadris	2.08	LB/GAL	9	fl oz/A	B	4.25 c	32.5 b	9497 a	68.0 a	73.3 a
5	Quadris	2.08	LB/GAL	4.5	fl oz/A	B	6.00 b	46.3 b	9624 a	66.3 b	72.7 b
6	Stratego	2.08	LB/GAL	16	fl oz/A	B	5.00 c	39.5 b	10138 a	67.8 a	73.4 a
LSD (P=.05)							0.809	10.28	744.2	0.9747	0.4487
Standard Deviation							0.537	6.82	493.9	0.5358	0.2467
CV							9.87	14.89	5.2	0.79	0.34
Replicate F							0.133	0.746	2.499	0.553	1.903
Replicate Prob(F)							0.9392	0.5411	0.0992	0.5920	0.1994
Treatment F							24.441	34.567	11.091	7.453	10.697
Treatment Prob(F)							0.0001	0.0001	0.0001	0.0037	0.0009

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 11. Effect of various fungicides, rates, and timings on sheath blight (SB) development and yield of CL131 rice at the Rice Research Station, Crowley, LA, 2009.

Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage	SB 8/13/09 Severity 0-9	SB 8/13/09 Incidence %	Yield 8/17/09 yield lb/A	Milling 9/9/09 Whole %	Milling 9/9/09 Total %
1	UNSPRAYED CHECK						8.0 a	94.5 a	7556 cd	62.7 a	73.3 a
2	STRATEGO	2.08	LB/GAL	19	fl oz/A	B	7.3 ab	72.8 abc	7892 bc	61.9 a	73.1 a
3	STRATEGO	2.08	LB/GAL	19	fl oz/A	B	6.0 bc	50.5 c	8460 ab	63.4 a	73.2 a
	GEM 500 SC	500	GA/L	2	fl oz/A	B					
4	GEM 500 SC	500	GA/L	4.7	fl oz/A	B	7.5 a	69.8 abc	8242 abc	62.3 a	73.0 a
5	QUADRIS	252	GA/L	9	fl oz/A	B	5.8 c	53.5 c	8561 ab	62.8 a	73.0 a
6	QUILT	200	GA/L	32	fl oz/A	B	7.5 a	83.0 ab	8009 abc	62.6 a	73.0 a
7	QUILT	200	GA/L	21	fl oz/A	B	5.8 c	56.8 c	8255 abc	63.5 a	73.1 a
	QUADRIS	252	GA/L	5.64	fl oz/A	B					
8	QUADRIS	250	GA/L	12	fl oz/A	B	6.0 bc	49.5 c	8782 a	63.7 a	73.1 a
9	QUILT	200	GA/L	14	fl oz/A	B	7.0 abc	68.5 bc	8385 ab	62.7 a	72.8 a
	QUADRIS	250	GA/L	4	fl oz/A	B					
10	TILT	3.6	LB/GAL	6	fl oz/A	B	8.0 a	93.8 a	7155 d	61.7 a	72.7 a
11	TILT	3.6	LB/GAL	8	fl oz/A	B	8.0 a	93.5 a	7245 d	62.4 a	72.6 a
12	TILT	3.6	LB/GAL	10	fl oz/A	B	8.0 a	92.0 a	6913 d	63.5 a	73.3 a
LSD (P=.05)							0.95	16.23	510.4	2.12	0.7166
Standard Deviation							0.66	11.24	353.5	1.25	0.4231
CV							9.28	15.36	4.44	2.0	0.58
Replicate F							0.048	0.634	1.377	3.255	8.496
Replicate Prob (F)							0.9856	0.5984	0.2668	0.0578	0.0018
Treatment F							8.154	10.101	11.806	0.807	0.737
Treatment Prob (F)							0.0001	0.0001	0.0001	0.6337	0.6937

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.

2009 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: CL151, Catahoula, Cheniere, Neptune, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 23

Fertilization: Preplant 20-60-60, Mar 23; preflood 100-0-0, May 1; topdress 46-0-0, May 27

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 2 and Apr 6; flooded, May 4; drained, July 20

Herbicides: Tank mix- Propanil 4 qt + Prowl 2 pt, Apr 17; Arrosolo 5 qt, May 1

Insecticides: Dermacor seed treatment; Mustang Max 4 oz aerial application, May 3

Fungicides: Various (Quilt, Quadris, Stratego, and untreated check)

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, May 26

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 15	Boot	08:30	84 F	3 mph	76%	50%	mod.

Disease Rating: Julye 23

Drained: July 20

Harvest: July 30

Results: See Table 12

Comments: Sheath blight severity was high, and other diseases were very light.

Table12. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Rice Research Station, Crowley, LA. 2009.

Pest Name							SB		SB		Yield		Milling		Mill	
Rating Date							7/23/09		7/23/09		7/30/09		9/7/09		9/7/09	
Rating Type							Severity		Incidence		Yield		Whole		Total	
Rating Unit							0-9		%		lb		%		%	
Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage										
1	CL151 Unsprayed						7.0	ab	81.4	b	10161	def	64.1	b	71.3	a
2	CL151 Quadris	2.08	LB/GAL	9	fl oz/A	B	3.6	e	21.8	e	11357	a	63.7	b	71.7	a
3	CL151 Quilt	1.04	LB/GAL	28	fl oz/A	B	3.2	e	18.6	e	11378	a	65.2	b	71.7	a
4	CL151 Stratego	2.08	LB/GAL	19	fl oz/A	B	3.2	e	20.2	e	11089	ab	64.8	b	72.2	a
5	Cheniere Unsprayed						7.0	ab	84.0	ab	9295	g	64.6	b	72.5	a
6	Cheniere Quadris	2.08	LB/GAL	9	fl oz/A	B	3.8	de	26.0	e	10928	abc	64.3	b	73.0	a
7	Cheniere Quilt	1.04	LB/GAL	28	fl oz/A	B	4.0	de	28.4	e	10750	a-d	65.8	b	73.2	a
8	Cheniere Stratego	2.08	LB/GAL	19	fl oz/A	B	4.0	de	27.6	e	10820	a-d	64.4	b	73.2	a
9	Catahoula Unsprayed						7.8	a	92.4	a	8505	h	58.3	d	72.4	a
10	Catahoula Quadris	2.08	LB/GAL	9	fl oz/A	B	5.0	cd	41.8	d	9936	f	59.4	cd	71.8	a
11	Catahoula Quilt	1.04	LB/GAL	28	fl oz/A	B	5.0	cd	44.4	d	9957	f	61.5	bcd	73.2	a
12	Catahoula Stratego	2.08	LB/GAL	19	fl oz/A	B	5.0	cd	44.4	d	10061	ef	62.7	bc	73.1	a
13	Neptune Unsprayed						6.0	bc	59.6	c	10372	c-f	71.5	a	73.3	a
14	Neptune Quadris	2.08	LB/GAL	9	fl oz/A	B	2.8	e	15.6	e	10733	a-d	69.5	a	71.8	a
15	Neptune Quilt	1.04	LB/GAL	28	fl oz/A	B	3.0	e	19.2	e	10833	a-d	69.4	a	71.9	a
16	Neptune Stratego	2.08	LB/GAL	19	fl oz/A	B	3.4	e	22.0	e	10614	b-e	70.2	a	72.3	a
LSD (P=.05)							0.83		8.68		454.6		2.72		1.63	
Standard Deviation							0.66		6.86		359.4		1.63		0.98	
CV							14.26		16.96		3.45		2.52		1.36	
Replicate F							2.555		4.825		4.154		0.091		0.291	
Replicate Prob(F)							0.0479		0.0019		0.0049		0.9132		0.7498	
Treatment F							29.041		69.631		22.352		15.498		1.451	
Treatment Prob(F)							0.0001		0.0001		0.0001		0.0001		0.1872	

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.

2009 Lake Arthur Variety by Fungicide Trial

Location: Errol Lounsberry Farm, Lake Arthur, LA, Vermilion Parish

Soil Type: Crowley silt loam

Variety/Seed Rate: CL151, Catahoula, Cheniere, Neptune, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 11

Fertilization: Preplant 20-60-60, Mar 11; Preflood 95-0-0, May 4

Experimental Design: Randomized complete block design with four replications

Water Management: Flooded, May 6; drained, July 16

Herbicides: Tank mix- Rice Shot 4 qt + Permit 1 oz + Londax 1 oz, Apr 8
Tank mix- RiceBeaux 4 qt + Londax 1.5 oz + Permit 0.5 oz, May 4
Clincher 20 oz + Crop Oil 1 qt, June 2

Insecticides: Dermacor seed treatment; Mustang Max 4 oz (rice stinkbugs), June 20

Fungicides: Various (Quilt, Quadris, Stratego, and untreated check)

Inoculation Dates: All natural inoculums

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 12	Boot	08:45	82 F	6 mph	76%	0%	mod.

Disease Ratings: Sheath blight severity and incidence, July 29

Drained: July 16

Harvest: July 31

Results: See Table 13

Comments: Sheath blight severity was high but erratically distributed in the plots. Yield potential was very high but not significantly affected by fungicide applications. Milling was also high and again not affected by fungicide application treatments.

Table 13. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Lounsberry Farm, Lake Arthur, LA, 2009.

Pest Name							SB	SB	Yield	Milling	Milling
Rating Date							7/28/09	7/28/09	7/31/09	8/12/09	8/12/09
Rating Type							Severity	Incidence	Yield	Whole	Total
Rating Unit							0-9	%	lb	%	%
Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage					
1	CL151 Unsprayed						7.4 ab	60.2 a-d	10460 ab	63.2 b	72.1 b-f
2	CL151 Quadris	2.08	LB/GAL	9	fl oz/A	B	5.4 d-g	34.2 e-h	10437 ab	64.1 b	72.4 b-f
3	CL151 Quilt	1.04	LB/GAL	28	fl oz/A	B	4.6 fgh	31.6 e-h	10628 a	63.3 b	72.1 b-f
4	CL151 Stratego	2.08	LB/GAL	19	fl oz/A	B	5.0 efg	31.8 e-h	10495 ab	63.3 b	72.0 c-f
5	Cheniere Unsprayed						7.0 abc	64.8 ab	9314 bc	65.7 ab	74.0 a
6	Cheniere Quadris	2.08	LB/GAL	9	fl oz/A	B	5.8 c-f	49.4 b-e	9347 bc	64.2 b	73.1 a-e
7	Cheniere Quilt	1.04	LB/GAL	28	fl oz/A	B	5.4 d-g	42.2 c-h	10053 abc	64.8 b	73.6 abc
8	Cheniere Stratego	2.08	LB/GAL	19	fl oz/A	B	6.2 cde	48.0 b-f	9527 abc	64.2 b	73.7 ab
9	Catahoula Unsprayed						7.6 a	72.8 a	9216 c	61.4 b	73.4 a-d
10	Catahoula Quadris	2.08	LB/GAL	9	fl oz/A	B	5.8 c-f	39.6 d-h	9770 abc	62.7 b	73.1 a-e
11	Catahoula Quilt	1.04	LB/GAL	28	fl oz/A	B	5.4 d-g	51.0 b-e	9866 abc	61.7 b	73.4 a-d
12	Catahoula Stratego	2.08	LB/GAL	19	fl oz/A	B	5.8 c-f	45.2 b-g	9927 abc	61.3 b	73.2 a-e
13	Neptune Unsprayed						6.4 bcd	61.2 abc	9994 abc	68.6 a	71.3 f
14	Neptune Quadris	2.08	LB/GAL	9	fl oz/A	B	3.8 h	24.0 gh	9836 abc	69.0 a	71.5 ef
15	Neptune Quilt	1.04	LB/GAL	28	fl oz/A	B	4.6 fgh	26.6 fgh	10114 abc	69.2 a	71.9 def
16	Neptune Stratego	2.08	LB/GAL	19	fl oz/A	B	4.2 gh	22.8 h	9671 abc	69.7 a	72.0 c-f
LSD (P=.05)							0.84	13.71	691.7	2.91	0.94
Standard Deviation							0.66	10.84	546.9	1.36	0.44
CV							11.72	24.59	5.51	2.11	0.61
Replicate F							3.462	3.092	4.618	1.459	1.266
Replicate Prob(F)							0.0131	0.0222	0.0026	0.2459	0.2783
Treatment F							13.645	9.900	3.224	8.698	7.404
Treatment Prob(F)							0.0001	0.0001	0.0006	0.0001	0.0002

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.

2009 Jeff Davis Variety by Fungicide Trial

Location: Jimmy Hoppe Farm, Fenton, LA, Jeff Davis Parish

Soil Type: Crowley silt loam

Variety/Seed Rate: CL151, Catahoula, Cheniere, Neptune, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 5

Fertilization: Preplant 20-60-60, Mar 5; preflood 95-0-0, Apr 22; topdress 78-0-0, May 19

Experimental Design: Randomized complete block design with four replications

Water Management: Flooded, Apr 24; drained, July 14

Herbicides: Tank mix-,Rice Shot 4 qt + Permit 1 oz, Mar 30
Tank mix- Arrosolo 5 qt + Londax 1 oz + Permit 0.5 oz, Apr 22

Insecticides: Dermacor seed treatment; Karate 2 oz (rice stinkbugs), June 26
2nd application - Karate 2 oz (rice stinkbugs), July 6

Fungicides: Various (Quilt, Quadris, Stratego, and untreated check)

Inoculation Dates: All natural inoculums

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 10	Boot	09:30	87 F	8 mph	82%	45%	light

Disease Ratings: July 23

Drained: July 14

Harvest: July 29

Results: See Table 14

Comments: Sheath blight severity was high, and blast severity was low.

Table 14. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Hoppe Farm, Fenton, LA. 2009.

Pest Name Rating Date Rating Type Rating Unit Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage	SB 7/23/09 Severity 0-9	SB 7/23/09 Incidence %	Total Yield lb	Milling 8/11/09 Whole %	Milling 8/11/09 Total %
1	CL151 Unsprayed						7.5 a	62.0 abc	9044.1 a-d	63.6 de	72.1 bc
2	CL151 Quadris	2.08	LB/GAL	9	fl oz/A	B	4.3 bcd	28.3 d	10067.7 a	63.8 de	71.9 c
3	CL151 Quilt	1.04	LB/GAL	28	fl oz/A	B	4.0 cd	35.3 bcd	10213.8 a	65.4 bcd	72.7 abc
4	CL151 Stratego	2.08	LB/GAL	19	fl oz/A	B	5.0 bcd	36.0 bcd	10197.4 a	65.0 b-e	72.4 abc
5	Cheniere Unsprayed						7.5 a	66.5 ab	8392.6 cde	62.1 de	72.7 abc
6	Cheniere Quadris	2.08	LB/GAL	9	fl oz/A	B	4.3 bcd	30.8 cd	8752.4 bcd	64.7 b-e	73.6 ab
7	Cheniere Quilt	1.04	LB/GAL	28	fl oz/A	B	5.8 bc	36.3 bcd	9130.3 a-d	65.1 b-e	74.0 a
8	Cheniere Stratego	2.08	LB/GAL	19	fl oz/A	B	5.3 bcd	41.5 bcd	9277.3 abc	64.9 b-e	73.8 a
9	Catahoula Unsprayed						8.0 a	82.3 a	7394.5 e	60.9 e	72.8 abc
10	Catahoula Quadris	2.08	LB/GAL	9	fl oz/A	B	4.3 bcd	23.0 d	8026.4 de	63.0 de	72.9 abc
11	Catahoula Quilt	1.04	LB/GAL	28	fl oz/A	B	5.0 bcd	38.0 bcd	8401.2 cde	61.9 de	72.8 abc
12	Catahoula Stratego	2.08	LB/GAL	19	fl oz/A	B	6.0 b	45.3 bcd	8227.3 cde	64.5 cde	73.7 a
13	Neptune Unsprayed						5.3 bcd	36.3 bcd	9063.5 a-d	68.1 abc	71.7 c
14	Neptune Quadris	2.08	LB/GAL	9	fl oz/A	B	4.0 cd	24.5 d	10067.1 a	68.9 a	71.4 c
15	Neptune Quilt	1.04	LB/GAL	28	fl oz/A	B	3.8 d	13.3 d	9384.7 abc	68.7 ab	71.8 c
16	Neptune Stratego	2.08	LB/GAL	19	fl oz/A	B	4.3 bcd	26.0 d	9620.1 ab	69.7 a	71.8 c
LSD (P=.05)							1.13	19.67	724.79	2.4792	0.9566
Standard Deviation							0.79	13.77	507.18	1.1634	0.4489
CV							15.06	35.24	5.59	1.79	0.62
Replicate F							2.067	0.944	12.149	0.293	0.181
Replicate Prob(F)							0.1180	0.4272	0.0001	0.5965	0.6766
Treatment F							11.947	6.645	11.020	10.236	6.678
Treatment Prob(F)							0.0001	0.0001	0.0001	0.0001	0.0003

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.

2009 Blast 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: M202, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, May 18

Fertilization: Preplant 20-60-60, May 18; preflood 150-0-0, June 16; topdress 46-0-0, July 20

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, June 1; flooded, June 17; drained to induce blast, July 2; reflooded, July 8; drained, Aug 21

Herbicides: Rice Shot 4 qt, June 8; RiceBeaux 1 qt, June 15; Clincher 22 oz + Crop Oil 1 qt, July 9

Insecticides: Dermacor seed treatment; Mustang Max 4 oz, June 20

Fungicides: Various

Inoculation Dates: *Rhizoctonia solani* culture grown on rice grain/hull mixture, July 29

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:

	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
July 23	B	09:00	81 F	3 mph	78%	80%	mod.
Aug 3	H	09:00	85 F	2 mph	85%	60%	mod.

Disease Ratings: Aug 24

Drained: Aug 21

Harvest: Aug 31

Results: See Table 15

Comments: Blast severity was extremely high. Some fungicides decreased rotten neck blast and increased yields. Milling was erratic.

Table 15. Effect of fungicide applications on blast development, yield, and milling of M202 rice. Rice Research Station, Crowley, LA. 2009.

Pest Name Rating Date Rating Type Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage	Blast 8/24/09 % Infestation	Yield 8/31/09 Yield	Milling 9/15/09 % Whole	Milling 9/15/09 % Total
1	Unsprayed Check						92.8 a	2436 a	52.0 a	67.3 a
2	Stratego	250	GA/L	19	fl oz/A	H	65.0 b	3290 a	57.9 a	68.4 a
3	QUILT	200	GA/L	21	fl oz/A	H	68.5 b	2705 a	54.8 a	67.1 a
3	QUADRIS	250	GA/L	9	fl oz/A	H				
4	QUADRIS	2.08	LB/GAL	9	fl oz/A	H	78.0 b	3519 a	58.8 a	69.2 a
5	QUADRIS	2.08	LB/GAL	4.5	fl oz/A	H	76.5 b	2644 a	58.3 a	69.1 a
LSD (P=.05)							9.56	1068.3	7.2087	2.3792
Standard Deviation							6.21	693.3	4.6786	1.5441
CV							8.15	23.75	8.29	2.26
Replicate F							1.286	0.640	2.716	1.700
Replicate Prob(F)							0.3239	0.6036	0.0914	0.2198
Treatment F							11.994	1.775	1.549	1.710
Treatment Prob(F)							0.0004	0.1988	0.2504	0.2123

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.

2009 Lake Arthur Fungicide Trial

Location: Errol Lounsberry Farm, Lake Arthur, LA, Vermilion Parish

Soil Type: Crowley silt loam

Variety/Seed Rate: Cheniere, 100 lb/A

Plot Size: 4 x 16 ft

Planting Method/Date: Drill seeded, Mar 11

Fertilization: Preplant 20-60-60, Mar 11; preflood 95-0-0, May 4

Experimental Design: Randomized complete block design with four replications

Water Management: Flooded, May 6; drained, July 16

Herbicides: Tank mix- Rice Shot 4 qt + Permit 1 oz + Londax 1 oz, Apr 8
Tank mix- RiceBeaux 4 qt + Londax 1.5 oz + Permit 0.5 oz, May 4
Clincher 20 oz + Crop Oil 1 qt, June 2

Insecticides: Dermacor seed treatment; Mustang Max 4 oz (rice stinkbugs), June 20

Fungicides: Various

Inoculation Dates: All natural inoculums

Application Equipment: CO_2 backpack sprayer, 3 tip (TJ8002) hand wand, 20 gal/A

Application Dates:	Growth Stage	Time	Temp	Wind	RH	Clouds	Dew
June 12	Boot	09:30	85 F	7 mph	70%	40%	light

Disease Ratings: Slight, June 12

Drained: July 16

Harvest: July 30

Results: See Table 16

Comments: Sheath blight was light to moderate and erratic.

Table 16. Effect of various fungicides, rates, and timings on sheath blight (SB) development and yield of Cocodrie rice at Lake Arthur, LA, 2009.

Pest Name							SB	SB	Yield	Milling	Milling
Rating Date							7/29/09	7/29/09	7/31/09	8/12/09	8/12/09
Rating Type							Severity	Incidence	Yield	%	%
Rating Unit							0-9	%	lb/A	Whole	Total
Trt No.	Treatment Name	Form Conc.	Form Unit	Rate	Rate Unit	Growth Stage					
1	Unsprayed check						8.0 a	76.0 a	10107 a	63.7 a	72.9 a
2	QUILT	1.04	LB/GAL	28	fl oz/A	B	5.6 bc	50.8 bc	10498 a	65.5 a	72.4 a
3	QUILT Xcel	263	GA/L	17.5	fl oz/A	B	5.4 bc	45.0 bc	10412 a	64.8 a	72.3 a
4	QUILT Xcel	263	GA/L	21	fl oz/A	B	4.6 c	33.4 c	10572 a	64.0 a	72.7 a
5	STRATEGO	250	GA/L	19	fl oz/A	B	6.4 b	55.8 b	10292 a	66.0 a	72.8 a
6	QUADRIS	2.08	LB/GAL	9	fl oz/A	B	5.8 b	49.4 bc	10243 a	64.7 a	73.3 a
LSD (P=.05)							0.84	13.76	375.7	5.5128	1.4095
Standard Deviation							0.64	10.43	284.8	2.1442	0.5482
CV							10.69	20.16	2.75	3.31	0.75
Replicate F							2.131	3.627	49.290	0.505	1.335
Replicate Prob(F)							0.1145	0.0223	0.0001	0.5090	0.3001
Treatment F							16.410	9.129	1.838	0.338	0.815
Treatment Prob(F)							0.0001	0.0001	0.1510	0.8708	0.5863

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.

RICE PRODUCTION ECONOMICS RESEARCH IN 2009

Michael E. Salassi

Rice enterprise production cost budget projections for 2009 were developed in the fall of 2008 for alternative rice production systems in Louisiana. A summary of the enterprise budgeting analysis for rice production systems in Southwest Louisiana is presented in Table 1. Values presented represent rice breakeven prices to cover direct (variable) and total estimated rice production costs per hundredweight of 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 60.0 cwt/A for water- and drill-planted rice. Variable production costs ranged from $10.71 to $11.55/cwt for water-planted rice and from $9.69 to $10.77/cwt for drill-planted rice at the base yield level of 60.0 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. A 10% change in yield per harvested acre resulted in a $0.90 to $1.10/cwt change in variable cost for water-planted rice and a $0.80 to $1.00/cwt change in variable cost for drill-planted rice. Total projected rice production costs for 2009 ranged from $11.81 to $13.34/cwt for water-planted rice and from $11.01 to $11.99/cwt for drill-planted rice at the base yield level of 60.0 cwt/A.

The Projected 2009 Rice Farm Cash Flow Model was developed to assist producers in planning for the 2009 crop year. The model is an Excel spreadsheet that allows rice producers to enter projected acreage, yield, market price, and production cost data for 2009 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.

An economic analysis was conducted to evaluate the Average Crop Revenue Election (ACRE) Program, a farm program payment option under the 2008 Farm Bill. This program is a substitute for the counter-cyclical program. Under the ACRE program, both a state- and farm-level income trigger must be met before a farm is eligible for rice program payments. Evaluations were made in 2009 to determine how this program would operate for rice farms in Louisiana.

A statewide survey of crop rental arrangements for major crops in Louisiana was conducted in 2009. The survey was specifically designed to obtain data on: (a.) form of crop lease (oral or written); (b.) type of crop lease (cash or share); (c.) number of crop leases per farm; (d.) number of multiyear leases; and (e.) specific crop acreage under each type of lease. Rice acreage was reported on 467 of the lease arrangements returned in the survey. Of the leases including rice acreage for 2009, 296 of them (63.4%) were oral leases, while 171 leases (36.6%) were reported as written. Of the 76,887 leased rice acreage reported in the survey, 43,842 acres (57.0%) were leased utilizing oral agreements. Only 43.0% of the rice acreage reported in the survey was leased under written contracts. The most common type of rice oral crop lease was crop share arrangements, accounting for 87.5% of rice oral crop lease numbers and 72.9% of total leased rice acreage under oral agreements. However, the majority of rice acreage leased under written lease agreements was for cash, rather than a share of the crop. Of the 171 written crop leases including 33,045 acres of leased rice land reported in the survey, 119 leases (69.6%) and 24,375 acres of rice (73.8%) were leased under a cash basis. Average acres of rice per lease agreement were 321 acres for oral-cash arrangements, 123 acres for oral-share arrangements, 205 acres for written-cash arrangements, and 167 acres for written-share arrangements.

Table 1. Estimated Rice Breakeven Prices to Cover Variable and Total Production Costs, Southwest Louisiana, 2009.

	Yield Level in cwt/A				
	-10%	-5%	Base	+5%	+10%
Crop Description	54.0	57.0	60.0	63.0	66.0
	Variable Rice Production Costs				
	------------------------------------$/cwt----------------------------------				
Southwest Louisiana:					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	11.87	11.31	10.81	10.36	9.94
- Fallow Land	12.16	11.59	11.07	10.60	10.18
(ii) Stale Seedbed:					
- In Rotation	11.76	11.21	10.71	10.26	9.85
- Fallow Land	12.05	11.49	10.97	10.51	10.09
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	12.40	11.82	11.29	10.81	10.38
- Fallow Land	12.69	12.09	11.55	11.06	10.61
(ii) Stale Seedbed:					
- In Rotation	12.29	11.71	11.19	10.71	10.28
- Fallow Land	12.58	11.99	11.45	10.97	10.52
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	10.63	10.14	9.69	9.29	8.93
(ii) Stale Seedbed:					
- In Rotation	10.94	10.43	9.97	9.55	9.18
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	11.38	10.85	10.37	9.94	9.54
(ii) Stale Seedbed:					
- In Rotation	11.82	11.27	10.77	10.31	9.90
	Total Rice Production Costs				
	----------------------------------$/cwt-----------------------------------				
Southwest Louisiana:					
(1) Water Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	13.52	12.87	12.29	11.77	11.29
- Fallow Land	14.15	13.47	12.86	12.31	11.80
(ii) Stale Seedbed:					
- In Rotation	12.99	12.37	11.81	11.31	10.85
- Fallow Land	13.62	12.97	12.39	11.86	11.37
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	14.05	13.38	12.77	12.22	11.72
- Fallow Land	14.68	13.97	13.34	12.76	12.24
(ii) Stale Seedbed:					
- In Rotation	13.52	12.87	12.29	11.77	11.29
- Fallow Land	14.15	13.47	12.86	12.31	11.81
(2) Drill Planted – Tenant Operator:					
(a) Conventional Variety:					
(i) Conventional Tillage:					
- In Rotation	12.09	11.52	11.01	10.54	10.12
(ii) Stale Seedbed:					
- In Rotation	12.34	11.76	11.23	10.76	10.33
(b) Clearfield Variety:					
(i) Conventional Tillage:					
- In Rotation	12.67	12.07	11.53	11.04	10.59
(ii) Stale Seedbed:					
- In Rotation	13.19	12.56	11.99	11.48	11.02

Table 2. Evaluation of Average Crop Revenue Election (ACRE) Program Under Increasing Price Scenario, 2009.

Year	National MYA Price ($/cwt)	State Yield per Planted Acre	5-yr Olympic Average State Yield (cwt/A)	Previous 2-yr National MYA Price ($/cwt)	State Revenue Guarantee ($/A)	State Actual Revenue ($/A)	State Trigger Met?
2009	13.50	63.33	57.99	14.80	772.41	854.91	NO
2010	14.00	63.33	59.18	15.15	806.97	886.57	NO
2011	14.00	63.33	60.81	13.75	752.48	886.57	NO
2012	14.00	63.33	62.59	14.00	788.61	886.57	NO

Table 3. Evaluation of Average Crop Revenue Election (ACRE) Program Under Decreasing Price Scenario, 2009.

Year	National MYA Price ($/cwt)	State Yield per Planted Acre	5-yr Olympic Average State Yield (cwt/A)	Previous 2-yr National MYA Price ($/cwt)	State Revenue Guarantee ($/A)	State Actual Revenue ($/A)	State Trigger Met?
2009	13.50	63.33	57.99	14.80	772.41	854.91	NO
2010	13.00	58.95	59.18	15.15	806.97	766.32	YES
2011	13.00	58.95	59.35	13.25	726.28	766.32	NO
2012	13.00	58.95	59.67	13.00	698.12	766.32	NO

Table 4. Agricultural Cropland Lease Structures for Major Row Crops in Louisiana, 2009 Statewide Survey Results.

	Rice Leases		Leases for All Crops	
Crop Lease Type	Number of Leases	Percent	Number of Leases	Percent
Oral Lease:				
Cash Lease	37	7.9	384	16.9
Crop Share	259	55.5	1,098	48.5
Total Oral Leases	296	63.4	1,482	65.4
Written Lease:				
Cash Lease	119	25.5	332	14.6
Crop Share	52	11.1	453	20.0
Total Written Leases	171	36.6	785	34.6
Total	467	100.0	2,267	100.0
	Rice Lease Acreage	Percent	Crop Lease Acreage	Percent
Oral Lease:				
Cash Lease	11,879	15.5	48,753	12.8
Crop Share	31,963	41.6	97,651	25.7
Total Oral Leases	43,842	57.0	146,404	38.5
Written Lease:				
Cash Lease	24,375	31.7	99,670	26.2
Crop Share	8,670	11.3	134,296	35.3
Total Written Leases	33,045	43.0	233,966	61.5
Total	76,887	100.0	380,370	100.0

RICE INSECTS RESEARCH

RICE INSECT CONTROL STUDIES, 2009

M.J. Stout, M.J. Frey, and N. Hummel

OVERVIEW OF PROGRAM

The goal of the Rice Entomology Project is the development and implementation of cost-effective management programs for arthropod pests of Louisiana rice. Insects and other arthropods can cause severe yield losses in rice; feeding by the rice water weevil (RWW), for example, can reduce yields by 25% or more. The use of insecticides remains the primary means of controlling arthropod pests, but alternatives to insecticides are needed to reduce costs, improve sustainability, and minimize environmental impacts. In 2009, more than 15 separate experiments were conducted at the Rice Research Station to evaluate insecticides, cultural practices, and host-plant resistance as management tactics for rice insect pests. In addition, Dr. Hummel coordinated a series of demonstration trials in commercial fields to compare the effectiveness of commercially available insecticides against the RWW, and a number of experiments related to rice insect pest management were conducted in a laboratory and a greenhouse on the LSU campus in Baton Rouge. These experiments involved the RWW (the major early-season insect pest of rice), the rice stink bug (the major late-season insect pest of rice), and stem-boring insects, an emerging threat to Louisiana rice.

The Entomology Project continued an active program of evaluating insecticides for efficacy against the RWW in order to identify alternatives to the currently registered pyrethroid insecticides. Data generated by the Entomology Project are used to help justify registration of new insecticides and to develop recommendations for the use of new insecticides in commercial rice fields. In 2008 and 2009, the insecticidal seed treatment Dermacor X-100 (active ingredient, chlorantraniliprole, DuPont Crop Protection) was available to rice growers on a provisional (Section 18) label, and, in 2010, the insecticidal seed treatment Cruiser Maxx (active ingredient, thiamethoxam, Syngenta Crop Protection) will be available on a full (Section 3) label. With the availability of these insecticidal seed treatments in dry-seeded rice, the focus of our research efforts has shifted to identifying foliar and granular insecticides that can be used in water-seeded rice. Continuing efforts in drill-seeded rice focused on the use of seed treatments at different seeding rates. All of the pyrethroid alternatives appear to be effective in reducing RWW infestations, although optimal rates, formulations, and use patterns are still being determined. Results from small-plot evaluations of some of these alternative insecticides are presented in the following reports.

All insecticides that are being considered for registration are being evaluated for compatibility with crawfish production. Results of experiments using caged crawfish in field plots and results of laboratory acute toxicity tests suggest that all of the alternatives being considered for registration against the RWW are less toxic to crawfish than are the pyrethroids. In particular, in 2010, chlorantraniliprole was found to be less acutely toxic to crawfish than pyrethroids in seed-feeding and water exposure tests. Data from field experiments also suggest that deploying insecticides as seed treatments reduces negative impacts of insecticides on non-target organisms.

Work has begun to revise the management program for the rice stink bug. Several new insecticides are being tested for efficacy against the rice stink bug. In particular, several neonicotinoid insecticides have shown promise as alternatives to currently registered pyrethoids and organophosphates. Among other results, a multi-state collaboration has obtained some evidence that heavy use of pyrethroid insecticides may be leading to insecticide resistance in rice stink bugs, and another experiment showed that sweep net sampling captures only about 15 to 20% of stink bugs in a plot. In 2010, we will begin to reevaluate treatment thresholds for stink bugs to determine population levels that warrant insecticide applications.

A long-term goal of the Entomology Project is to cooperate with breeders to develop rice varieties that are more resistant to, or tolerant of, insect injury. Several experiments were conducted in 2009 to identify rice lines or varieties with resistance to rice pests. A small-plot field experiment suggested that tolerance to weevil feeding may be related to tillering capacity of rice.

The impacts of planting date, flooding depth, and seeding rate on RWW management have been investigated over the past several years. In 2010, analysis of planting date studies conducted over the last decade showed that early planting (planting toward the beginning of the recommended range of planting dates) facilitates weevil management by reducing populations of RWWs infesting rice fields, by reducing yield losses from weevil injury, and by increasing the efficacy of foliar insecticides. Experiments were initiated in 2010 to investigate combinations of cultural practices, resistant varieties, and insecticides for weevil management.

EVALUATION OF DERMACOR™ X-100 SEED TREATMENT AGAINST THE RICE WATER WEEVIL IN DRILL-SEEDED RICE, 2009

M.J. Stout, M.J. Frey, and N. Hummel

Dermacor X-100 is an insecticidal seed treatment (active ingredient: chlorantraniliprole [Rynaxypyr]) that has been used commercially in Louisiana on a provisional basis (Section 18 registration) in drill-seeded rice for the past two growing seasons. The first experiment described below was a drill-seeded test conducted to compare the performance of Dermacor at three rates to the performance of a preflood foliar spray of Karate and of a seed treatment of HGW-86 (a compound related in structure to chlorantraniliprole). In the second experiment described below, rice seeding rate was varied (120, 90, and 60 lb/A) but the "per-acre" rate of Dermacor was held constant (1.75 oz/100 lb seed) by varying "per seed" rate.

EXPERIMENT NO. 1: DUPONT VARIABLE RATE STUDY

Location: Rice Research Station, Crowley, LA

Variety/Seeding Rate: Wells

Plot Size: 4.1 x 18 ft

Planting Method/Date: Drill-seeded, 80 lb seed/A, May 18, 2009

Agronomic Practices: Standard for drill-seeded rice

Water Management: Flush, May 22, June 5; flood, June 17 (4- to 5-leaf stage)

Experimental Design: Randomized complete block, seven treatments, four replicates

Treatments (seeds treated by Dupont):

1. Dermacor, 0.071 lb ai/A
2. Dermacor, 0.081 lb ai/A
3. Dermacor, 0.101 lb ai/A
4. HGW86, 0.071 lb ai/A
5. HGW86, 0.101 lb ai/A
6. Karate 0.03 lb ai/A, applied 1 d preflood
7. Untreated control

Sampling: Two root/soil core samples per plot

Sampling Dates: July 8 (21 dpf [days post-flood]), July14 (27 dpf), July 27 (40 dpf)

Harvested: September 28

Data Analysis: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the two core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields (four out of seven rows harvested) were adjusted to 12% moisture (but were not converted to lb/A) and analyzed by mixed-model ANOVA.

Results:

Results of a small-plot evaluation of Dermacor™ X-100 conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2009.

Treatment	Larvae per core sample (± S.E.) on:			Yield (gm/plot, adjusted to 12% moisture)
	7/8	7/14	7/27	
Derm low	0.8±0.3b	5.8±0.8b	15.3±4.5b	2975.4±155.4bc
Derm mid	0.9±0.2b	5.5±1.1b	7.0±1.4b	2814±23.5abc
Derm hi	1.4±0.6b	5.0±2.4b	9.3±2.0b	2977.7±126.6c
HGW low	4.1±2.0b	8.4±1.6b	9.4±1.6b	2841.4±79.6bc
HGW hi	2.0±1.2b	6.5±1.0b	13.3±4.4b	2684.7±42.4abc
Karate	0.8±0.3b	5.8±0.8b	15.3±4.5b	2975.4±155.4bc
UTC	21.4±2.5a	32.0±3.9a	49.0±14.8a	2345.6±134.5a

Means in the same column followed by different letters are significantly different.

EXPERIMENT NO. 2: DUPONT CONSTANT RATE STUDY

Location: Rice Research Station, Crowley, LA

Variety/Seeding Rate: Wells/variable (see below)

Plot Size: 4.1 x 18 ft (7 rows at 7-in spacing)

Planting Method/Date: Drill-seeded, May 11, 2009

Agronomic practices: Standard for drill-seeded rice

Water Management: Flood, June 1; drained, August 25

Experimental Design: Randomized complete block, nine treatments, four replicates

Treatments (seeds treated by Dupont; the per acre rate of Dermacor is 1.75 oz/A for treatments 1, 2, and 3 below):

1. Dermacor, 120 lb seed/A, 0.0142 mg ai/seed*
2. Dermacor, 90 lb seed/A, 0.019 mg ai/seed
3. Dermacor, 60 lb seed/A, 0.0285 mg ai/seed
4. Untreated, 120 lb seed/A
5. Untreated, 90 lb seed/A
6. Untreated, 60 lb seed/A

*mg ai/seed = milligrams of active ingredient per seed

Sampling: Two root/soil core samples per plot

Sampling Dates: June 18 (17 dpf), June 29 (28 dpf)

Harvested: September 1 (four interior rows harvested)

Data Analysis: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the two core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields (gm/plot) were adjusted to 12% moisture and analyzed by mixed-model ANOVA.

Results:

Results of a small-plot evaluation of Dermacor™ X-100 conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2009.

Treatment	Larvae per core sample ± s.e.		Yields (gm/plot ± s.e.)
	6/18	6/29	
Dermacor, high seeding rate	1.0±0.4 a	3.1±1.0 a	3270.0±51.0
Dermacor, mid seeding rate	1.1±0.5 a	3.3±0.9 a	2996.7±174.3
Dermacor, low seeding rate	0.3±0.1 a	3.0±0.5 a	2965.1±167.1
Untreated, high seeding rate	8.8±1.7 b	16.8±1.9 b	2961.3±307.6
Untreated, mid seeding rate	10.8±1.7 b	15.6±3.9 b	2871.2±128.5
Untreated, low seeding rate	10.0±1.3 b	15.8±0.6 b	2503.5±203.0

Comments: In the first experiment, performance of Dermacor was very good at all three rates, which represented the range of rates labeled for use in Louisiana. The performance of Dermacor was superior to that of the HGW compound and was also better than that of preflood Karate. In the second experiment, seeding rate did not impact performance of Dermacor.

EVALUATION OF CLOTHIANIDIN AGAINST THE RICE WATER WEEVIL IN DRILL-SEEDED RICE, 2009

M.J. Stout, M.J. Frey, and N. Hummel

Clothianidin is a neonciotinoid insecticide that has been evaluated for efficacy against the rice water weevil over the past several years. In 2010, this drill-seeded experiment was conducted to evaluate two use patterns of clothianidin against the rice water weevil: pre- and post-flood foliar applications (Belay 2.13 SC, Valent) and a seed treatment (Nipsit Inside, 5.0 FS, Valent). A Dermacor X-100 treatment was included as a standard, and the Nipsit treatment was evaluated at two seeding rates.

Location: Rice Research Station, Crowley, LA

Variety/Seeding Rate: Cocodrie, 90 lb/A (except treatment 7, 30 lb). When applicable, seed treated by Valent.

Plot Size: 4.1 x 18 ft (7 rows at 7-in spacing)

Planting Method/Date: Drill-seeded, May 26, 2009

Agronomic practices: Standard for drill-seeded rice

Water Management: Flush, May 28, June 11; permanent flood, June 23, 2009 (4-leaf stage)

Experimental Design: Randomized complete block, eight treatments, four replicates

Treatments (seeds treated by Dupont):

8. Cocodrie, 90 lb/A seeding rate, untreated (check)
9. Cocodrie, 90 lb/A seeding rate, Belay, 4 oz product/A, 1 d preflood
10. Cocodrie, 90 lb/A seeding rate, Belay, 6 oz/A, 1 d preflood
11. Cocodrie, 90 lb/A seeding rate, Belay, 4 oz product/A, 7 d post-flood (dpf)
12. Cocodrie, 90 lb/A seeding rate, Belay, 6 oz/A, 7 dpf
13. Cocodrie, 90 lb/A seeding rate, seed treated with Nipsit, 75 gm ai/100 kg seed
14. Cocodrie, 30 lb/A seeding rate, seed treated with Nipsit, 75 gm ai/100 kg seed
15. Cocodrie, 90 lb/A seeding rate, seed treated with Dermacor X-100, 2.0 fl oz/100 lb seed (standard)

Sampling: Two root/soil core samples per plot

Sampling Dates: July 15 (22 dpf), July 22 (29 dpf), July 29 (36 dpf)

Harvested: September 16 (four rows only harvested)

Data Analysis: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the two core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields (gm/plots) were adjusted to 12% moisture and analyzed by mixed-model ANOVA.

Results:

Results of a small-plot evaluation of clothianidin (various use patterns) conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2009.

Treatment	Larvae per core sample (± S.E.) on:			Yield (gm/plot), adjusted to 12% moisture
	7/15	7/22	7/29	
1. Untreated (check)	39.4±4.9a	27.6± 6.3a	34.4± 10.5ab	3563.3± 79.9a
2. Belay, 4 oz product/A, 1 d preflood	9.4± 2.8bc	11.1± 3.4a	15.5± 3.2ab	3975.2± 291.7a
3. Belay, 6 oz/A, 1 d preflood	7.0± 2.7c	12.6± 2.9a	15.1± 3.4ab	3843.6± 396.4a
4. Belay, 4 oz product/A, 7 d post-flood	23.6± 2.6ab	31.4± 11.5a	37.6± 7.2ab	3650.1± 106.4a
5. Belay, 6 oz/A, 7 d post-flood	17.8± 3.6bc	30.1± 5.6a	36.3± 3.5ab	3516.9± 237.6a
6. Nipsit, 75 gm ai/100 kg seed	12.5±1.7bc	21.6±3.7a	43.1±15.3ab	3769.7±124.0a
7. Nipsit, 75 gm ai/100 kg seed	25.1± 6.2ab	31.4± 0.7a	51.9± 13.6a	3451.7± 75.1a
8. Dermacor X-100, 2.0 fl oz/100 lb seed	6.4± 1.3c	7.9± 1.2a	10.8± 1.6b	4320.0± 160.6a

Means in each column followed by different lower-case letters differ significantly.

Comments: At the first sampling date, the preflood applications of Belay and the Nipsit seed treatment planted at 90 lb of seed/A provided weevil control comparable with that given by Dermacor; however, the Nipsit seed treatment at the low seeding rate and the post-flood applications of Belay did not adequately control weevils. At later sampling dates, the preflood applications of Belay appeared to perform better than the other clothianidin treatments. This experiment indicates that clothianidin holds potential as a weevil treatment in drill-seeded rice.

EVALUATION OF CLOTHIANIDIN AND DINOTEFURAN AGAINST THE RICE WATER WEEVIL IN WATER-SEEDED RICE, 2009

M.J. Stout, M.J. Frey, and N. Hummel

The registration of Cruiser Maxx and expected registration of Dermacor provide rice growers with effective alternatives to pyrethroids for weevil management in drill-seeded rice, but there are still no viable pyrethroid alternatives for weevil management in water-seeded rice. In 2009, two experiments were conducted to evaluate pre- and post-flood foliar applications of clothianidin (Belay 2.13 SC, Valent) and pre- and post-flood applications of granular dinotefuran (1% formulation, Mitsui) in water-seeded rice.

WATER-SEEDED EXPERIMENT NO. 1

Location: Rice Research Station, Crowley, LA

Variety/Seeding Rate: CL131/120 lb seed/A

Plot Size: ca. 5 x 16 ft, plot surrounded by metal flashing to restrict movement of insecticides in water

Planting Method/Date: Water-seeded, April 16, 2009

Water Management: Flood, April 14; seed, April 16; drain, April 17; flood, May 4 (3-leaf stage)

Experimental Design: Randomized complete block, six treatments, four replicates

Treatments:

1) Untreated check
2) Clothianidin "early" - 5 fl oz product/A, preflood
3) Clothianidin "mid" - 5 fl oz product/A, 8 dpf (days post-flood)
4) Dinotefuran "early" - 150 gm ai/A, preflood
5) Dinotefuran "late" - 150 gm ai/A, 14 dpf
6) Dinotefuran "split" – 75 gm ai x 2, preflood + 8 dpf

Preflood applications were made immediately before permanent flood applied (approximately 1 inch of rain the night before permanent flooding). .

Sampling: Three root/soil core samples per plot

Sampling Dates: May 21 (17 dpf), May 28 (24 dpf), June 4 (31 dpf)

Harvested: August 11

Data Analysis: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the three core samples. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields were not analyzed because 1) stand establishment was not uniform and 2) plot size was not uniform owing to differences in sizes of pre-fabricated flashing used to surround plots.

Results:

Results of a small-plot evaluation of clothianidin and dinotefuran conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2009.

Treatment	**Larvae per core sample (± S.E.) on:**		
	5/21	5/28	6/4
1) Untreated check	2.6±0.8	13.0±1.9 a	10.1±1.4
2) Clothianidin "early" - 5 fl oz product/A preflood	3.6±1.6	10.0±1.7 a	8.9±3.9
3) Clothianidin "mid" - 5 fl oz product/A 8 dpf	1.2±0.6	1.8±0.9 c	4.1±1.7
4) Dinotefuran "early" - 150 gm ai/A preflood	1.9±0.5	7.6±0.3 b	10.9±3.4
5) Dinotefuran "late" - 150 gm ai/A 14 dpf	2.8±0.9	2.6±0.6 bc	5.4±1.8
6) Dinotefuran "split" – 75 gm ai/A x 2, preflood + 8 dpf	0.3±0.2	2.4±0.8 bc	5.1±1.5

Means in each column followed by different lower-case letters differ significantly.

WATER-SEEDED EXPERIMENT NO. 2

Location: Rice Research Station, Crowley, LA

Variety/Seeding Rate: CL131/120 lb seed/A

Plot Size: ca. 5 x 16 ft, plots surrounded by flashing

Planting Method/Date: Water-seeded, May 21, 2009

Water Management/Plant Phenology: Flood, May 19; seed, May 21; drain, May 22; re-flood (shallow), May 26; drain, May 28; flood (permanent), June 1(rice at 1- to 2-leaf stage)

Experimental Design: Randomized complete block, six treatments, four replicates

Treatments:

1) Untreated check
2) Karate 2x - 0.03 lb ai/A 1 dpf + 7 dpf (days post-flood)
3) Dinotefuran “split” - 90 gm ai/A 1 dpf + 7 dpf (total 180 gm ai/A)
4) Dinotefuran “late” - 180 gm ai/A 14 dpf
5) Clothianidin “split” - 5 fl oz product/A 1 dpf + 7 dpf (total 10 fl oz)
6) Clothianidin “mid” - 6 fl oz product 7 dpf

Sampling: Two to four root/soil core samples per plot

Sampling Dates: June 22 (21 dpf [days postflood]), July 2 (31 dpf), July 13 (42 dpf)

Harvested: September 1

Data Analysis: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the two to four core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields were not analyzed because 1) stand establishment was not uniform and 2) plot size was not uniform owing to differences in sizes of pre-fabricated flashing used to surround plots.

Results:

Results of a small-plot evaluation of clothianidin and dinotefuran conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2009.

Treatment	**Larvae per core sample (± S.E.) on:**		
	6/22	7/2	7/13
1) Untreated check	7.7±1.1 a	16.0±1.7 a	23.0±2.1 a
2) Karate 2x – 0.03 lb ai/A 1 dpf + 7 dpf	2.4±1.6 b	12.3±2.5 ab	16.3±3.2 ab
3) Dinotefuran “split” – 90 gm ai/A 1 dpf + 7 dpf (total 180 gm ai/A)	1.8±1.1 b	13.7±1.9 ab	19.9±4.3 ab
4) Dinotefuran “late” - 180 gm ai/A 14 dpf	0.7±0.2 b	1.2±0.5 c	2.1±0.8 c
5) Clothianidin “split” – 5 fl oz product/A 1 dpf + 7 dpf (total 10 fl oz)	0.1±0.1 b	7.4±1.8 bc	11.5±2.1 bc
6) Clothianidin “mid” – 6 fl oz product 7 dpf	0.9±0.5 b	7.8±0.8 bc	14.3±2.7 ab

Means in each column followed by different lower-case letters differ significantly.

Comments: In both experiments, a single application of dinotefuran granules (150 to 180 gm ai/A) made 14 dpf significantly reduced densities of weevil larvae, indicating that this use pattern holds promise. Single applications of foliar clothianidin made ca. 1 week after flooding or split applications of clothianidin that included an application ca. 1 week after flooding were also effective in both experiments. Both dinotefuran and clothianidin applications were as effective, or more effective, than Karate in the second experiment.

RICE WATER WEEVIL MANAGEMENT DEMONSTRATION IN COMMERCIAL RICE FIELDS IN LOUISIANA, 2009

N. Hummel, M. Stout, D. Burns, B. Courville, G. Daniels, K. Fontenot,
M. Frey, S. Gauthier, D. Lee, and D. Ring

The rice water weevil (RWW) is the most important invertebrate pest of the rice production system in the state of Louisiana. In 2009, the extension entomology program at LSU AgCenter focused on RWW management in a series of demonstration test locations. Commercial farms were located in Acadia, Concordia, Evangeline, Jefferson Davis, and Vermilion parishes. Fields were managed by producers, with the exception of the RWW management strategy that was dictated by the experimental design. These fields compared currently recommended RWW treatments. The purpose of this demonstration was to evaluate the use of some currently available insecticides to control RWW in rice fields.

Locations: Commercial farms in the following parishes: Acadia, Concordia, Evangeline, Jefferson Davis, and Vermilion.

Variety/Seeding Rate: Varied depending on location (all seed treatments were applied by a certified applicator). The following varieties were included in the test: CL151, CL161, CLXL745, CLXL729, XL723, Catahoula, and Jazzman. The seeding rates varied from approximately 30 to 90 lb/A.

Plot Size: Commercial fields - acreage varied across locations, ranging from 8- to 25-acre fields

Planting Method: Drill-seeded

Agronomic Practices: Standard for drill-seeded rice

Water Management: Permanent flood at the discretion of the farmer

Experimental Design: One replicate per farm. All treatments were present at all locations.

Treatments:

1. Untreated Control (Check)
2. Dermacor™ X-100 (0.025 mg ai/seed*)
3. Karate Z (2.56 fl oz/A) preflood
4. Karate Z (2.56 fl oz/A) preflood followed by Mustang EW on fertilizer (4.3 fl oz/A) 7 days post-flood
5. Mustang EW on fertilizer (4.3 fl oz/A) 1 day post-flood
6. Trebon 3G (9 lb/A) preflood

*mg ai/seed = milligrams of active ingredient per seed

Sampling: 10 root/soil core samples per field

Sampling Dates: 3 to 4 weeks after application of flood

Harvested: Varied depending on location

Data Analysis: Relative percent control (by comparison to an untreated check) was calculated to determine efficacy of insecticides evaluated.

Results: There was an average of 11 RWW larvae per core in the untreated control fields. Greater management of RWW larvae was observed using insecticide treatments in the following order (from most effective to least effective): Dermacor X-100 > Karate & Mustang > Karate > Trebon > Mustang (Fig. 1).

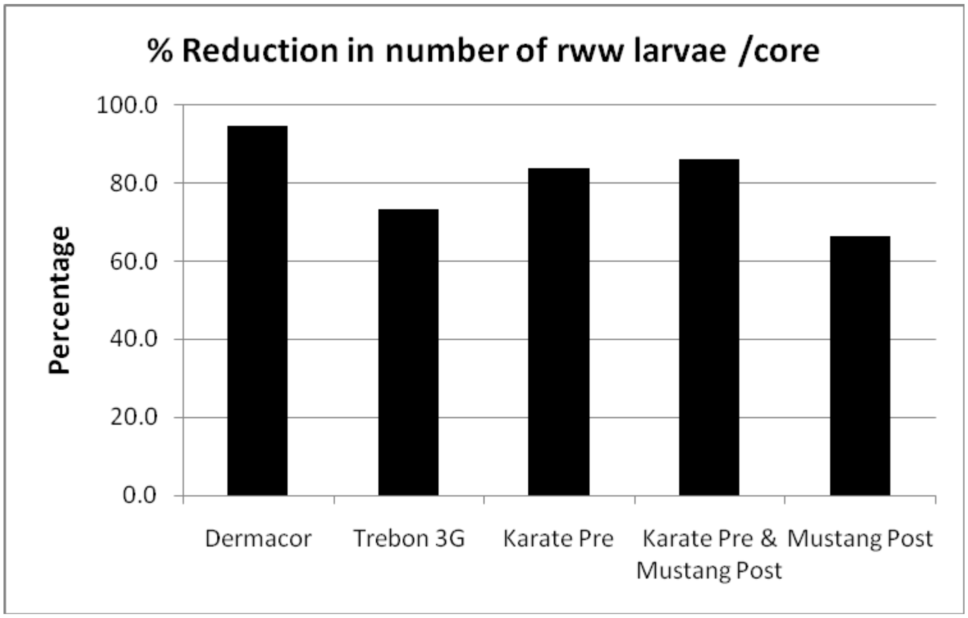


Figure 1. Results of a commercial demonstration evaluation of RWW insecticide treatments conducted at various on-farm locations throughout Louisiana in 2009. The bar graph illustrates the percent reduction in number of RWW larvae per core by comparison to an untreated check field.

Comments: The most inconsistent treatment was Mustang on fertilizer. This was mostly due to one location, where it did not provide any reduction in numbers of RWW larvae. The relative percent control with each product varied from an average of 95% for Dermacor-treated fields, down to 66% in Mustang treated fields. Results of this study were presented at summer field meetings and winter rice schools to producers, county agents, and other rice industry representatives.

COASTAL EROSION CONTROL RESEARCH

DEVELOPMENT OF POLYC15 TO PROVIDE FERTILE, GENETICALLY DIVERSE, AND SUPERIOR SMOOTH CORDGRASS POLYCROSS FOR COASTAL EROSION CONTROL AND HABITAT RESTORATION

Herry S. Utomo, Ida Wenefrida, Michael Materne, and Jeb Linscombe

INTRODUCTION

A seed production system of smooth cordgrass (*Spartina alterniflora* Loisel.) is being developed at the Rice Research Station. This seed-based propagation technology will provide an alternative to the current restoration technique and can be used to accommodate a large-scale erosion control and habitat restoration. Louisiana coastal marshes suffer from catastrophic loss of 40 square miles annually. The land losses are not uniformly distributed, and the highest loss happens within two regions; the Deltaic Plain of Terrebonne-Barataria-Mississippi Basin and the Chenier Plain of Calcasieu and Sabine lakes. Efforts to reduce the loss include constructions of new wetlands, terraces, barrier islands, and modification of hydrology through river diversions. Typically, six to nine marsh creation projects are funded annually to create over 1,000 A/yr of new marsh by pumping dredge materials. Engineers strategically place these projects to give maximum benefits but they are expensive, and currently, no efficient revegetation technology is available to rapidly stabilize these new marshes.

A current revegetation practice involves the use of clonal planting of Vermilion, the only available smooth cordgrass cultivar in Louisiana. Vermilion is a poor seed producer and it is used only in any revegetation project through clonal propagation and hand-transplanting. This clonal propagation process is slow and inefficient compared with seed-based propagation. Hand-transplanting offers a limited applicability to deal with a widespread erosion problem occurring across Louisiana estuarine systems. A seed-based production system will improve the efficiency of plant production. The seed-based planting can potentially be tailored for restoration projects that support large-scale efforts to stabilize newly created marshes, reverse or reduce the land loss, and build more productive habitat.

Louisiana smooth cordgrass ecotypes are typically sterile. Through years of selection and field trials, a set of 15 seed-producing lines were developed from native smooth cordgrass, an open-pollinated plant. These lines were used as parents to develop a seed-based propagation system that has a high level of genetic diversity and superior agronomic performance. Development of new native plants that can provide faster accumulation of biomass, help stabilize, and protect land mass from being eroded is needed to offset the combined effects of subsidence, erosion, and sea-level- rise. Native species have high adaptability to specific localities and have evolved with the competing species, predators, and diseases in the area over many thousands of years. They provide an ecological balance in association with their competitors and also have pests, predators, and diseases that limit their abundance, contributing to rich species diversity that is critical in creating productive ecosystems. The 15-seed producing genotypes are genetically diverse as indicated by their genomic composition quantified using DNA markers (AFLP, RAPD, and microsatellite markers). These 15 lines were used as parental lines, planted in 4x4 ft spacing in a random fashion to allow free intermating to produce seed from all possible combinations of crosses (Figure 1A-C). As a result, a smooth cordgrass population that has a maximum allelic diversity can be obtained through the planting of the polycross seed. The agronomic aspects of this experimental polycross seed (PolyC15) are currently being evaluated. They include its seed production potential, germination rates, seedling vigor, aerial seeding applications, plug, and potted plant productions. Genetic performance of polycross population derived from PolyC15 seed is being evaluated at two locations; the Rice Research Station and Rockefeller Wildlife Refuge Center.

For further improvement of polycross population, recurrent selection is conducted. This practice has been widely recognized as one of the most effective breeding methods in population improvement, especially for quantitative traits with low heritability. Through extensive phenotypic evaluation and molecular testing, it will be possible to create cycles of steady incremental genetic gain that is required for successful long-term improvement. Genetic gain from the selection of the top 15 lines from Syn-1 conducted last year will be determined.

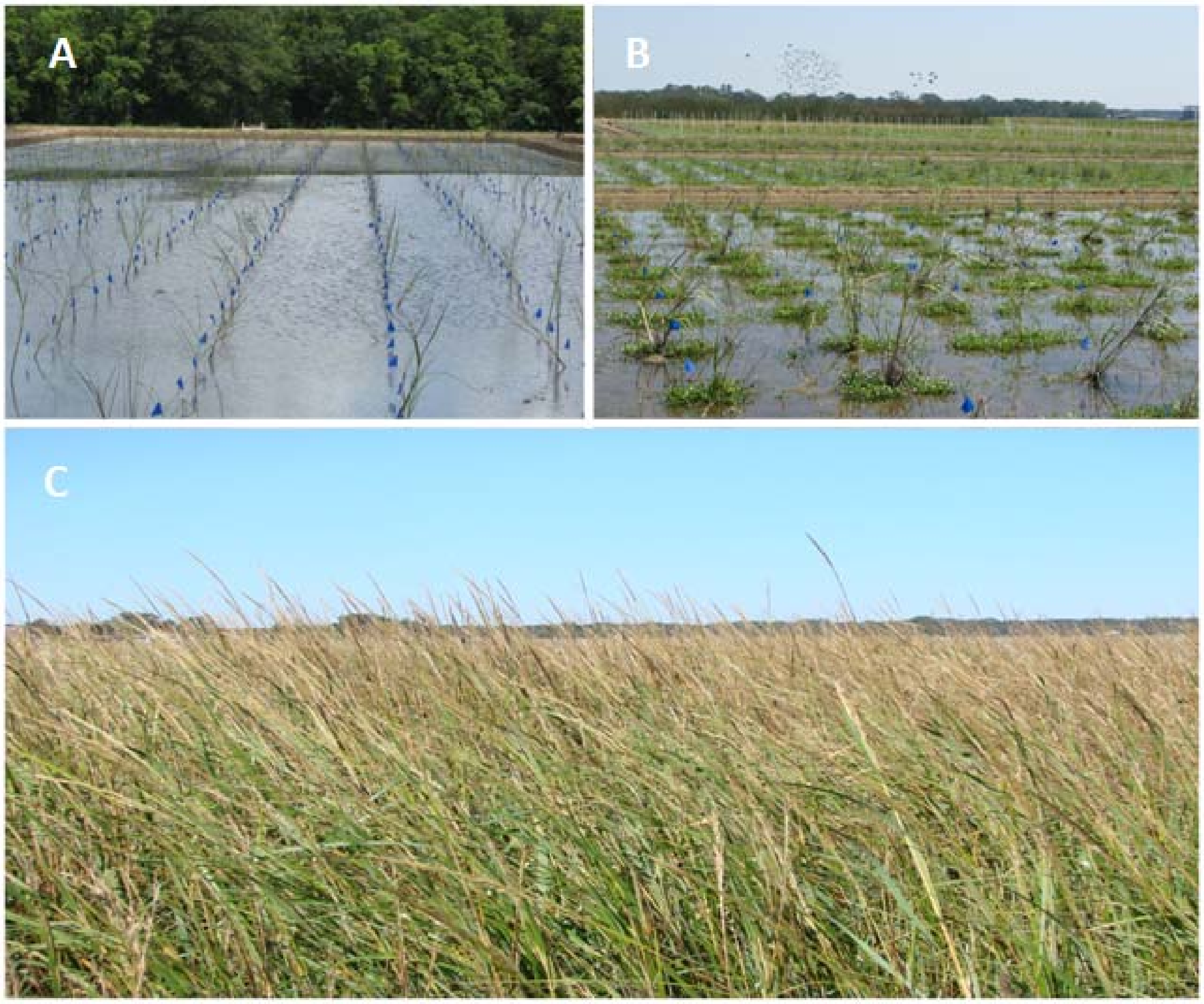


Figure 1: A) Seed production plots of PolyC15 was established through random planting of 15 parental lines in 4x4 ft. spacing to allow free intermating to produce seed from all possible combinations of crosses. B) Development of new shoots from rhizome that grew from a single stem's planting. C) PolyC15 seed production plots approaching seed maturity.

Cultivation of smooth cordgrass is needed to obtain a steady supply of large amounts of seed. *S. alterniflora* is facultative halophyte that has adaptations to survive in a high-salinity environment by excreting salt and using the water for its metabolic processes. The salt is not required for growth and development, and therefore, it has the ability to tolerate a wide range of salinities, from freshwater to sea strength. Because of its high adaptability to salinity levels, commercial seed production is highly probable and could be an adjunct to aquatic crops, such as rice, with little modification to existing equipment or land. Due to increasing salt contamination of inland groundwater, many areas historically used for freshwater crop production have been abandoned. This provides opportunity for *S. alterniflora* production as an alternative crop.

Genetic Materials

A total of 15 parental lines were selected from Louisiana native populations based on their superior growth characteristics and seed-producing capabilities. Genetic analyses using DNA markers (AFLP, RAPD, and SSR) show that these parental lines have a high level of genetic diversity, comparable with that from natural populations within major Louisiana basins analyzed before.

Planting Establishment and Soil Conditions

Thirty stems (40-50 cm height; 5-10 cm root ball) were pulled from each parental stock. The stems were hand-transplanted randomly in 1.2 x 1.2 m spacing in three replicated plots of 12.2 x 45.7 m in Crowley silt loam (fine, montmorillonitic, thermic Typic Albaqualf) soil at the Rice Research Station plots near Rayne, LA, in early June 2008 to produce polycross seed.

Cultural Conditions

PolyC15 was grown in a fresh water environment in the area commonly used for rice. The cultural conditions were similar to growing rice. The plants were fertilized with 164 kg N ha^{-1} on May 21, 2009, and 90 kg N ha^{-1} on July 23, 2009, by broadcasting. The plots were maintained in permanent flood under freshwater environments and drained occasionally during herbicide applications to control weeds. A mix of herbicide glyphosate (0.8 kg ha^{-1}) and 2,4-D (0.8 kg ha^{-1}) was used to control weeds around the plants. To evaluate the response of these polycross genotypes to various pathogens and abiotic stresses, neither fungicides nor plant growth regulators were applied.

Flowering Period

The polycross population started to flower in July, reaching its peak in mid-October. As a protogynously flowering plant in which its stigmas extrude prior to anther dehiscence, the polycross was a largely open-pollinated plant.

Seed Ripening Period

Pollinated flowers developed into seed. The seed did not mature at the same time. The ripening process occurs in a 4-week period (from early- to late-November). Maturing seed turned golden yellow in color. Once seeds mature, they shatter. Panicles were hand-harvested prior to shattering.

Seed Handling and Storage

Seeds were hand-harvested at the first sign of seed shattering by cutting the entire inflorescence just below the bottom floret and placing them in 60-gallon plastic bags for transportation and storage. Each bag was tied and stored in a walk-in cooler with the temperature set to 2°C for 1 to 2 months. The seedheads were checked at 5-day intervals after the first 30 days to determine the degree of seed release from their panicles. Hand shattering began 45 days after the beginning of the after-ripening process. Seeds were shattered by tapping the seedhead on a plastic sheet laid on the ground, or in some cases, tapped against the inside wall of a drum. Once the panicles and seeds were separated, seeds were sieved through a standard seed cleaning screen to separate seed from chaff and other debris. Individual seed lots were shattered, cleaned, and stored separately. Seeds were immersed in a Vitavax solution (5 mg l^{-1} containing 17% carboxin and 17% thiram) to minimize fungus contamination during storage. Seed was stored in eight 1-gallon tubs with snap lids and placed in refrigeration units at 2°C. For germination and viability, testing was conducted throughout the collection and storage phases. To assess germination, a number of standardized protocols were followed. One hundred seeds were randomly selected after harvest and again at 30, 60, 90, and 120 days post-harvest intervals. Each individual sample and replicate were placed in a separate, lidded, clear container with 8 mls of Vitavax solution to maintain hydration. Containers were then placed in a germination chamber maintained at 25°C with a 18:6 (D/N) photoperiod. Germination counts were made at 7, 14, 21, 28, and 35 days; the presence or absence of an epicotyl (shoot) was used as an indicator. To determine viability, a cut or nicking test that removed approximately one-fourth of the seed's distal tip prior to planting was used. The same testing frequency used for the germination assessment was used for the viability testing.

Seed Production, Characteristics, and Germination

Field data on yield potential, seed characteristic, germination rate, and related parameters are presented in Tables 1 to 5.

Table 1. Average yield and number of viable seed.

				Estimate in Acres		Estimate in Hectares (kg/ha)	
	Yield (lb)	Yield (kg)	Viable seed (millions)	Yield (lb/A)	Viable seed (millions)/A	Yield (kg/ha)	Viable seed (millions)/ha
Field sample 1 (900 ft^2)	5.41	2.45	0.21	261.84	10.60	293.36	25.55
Field sample 2 (900 ft^2)	4.85	2.2	0.19	234.74	9.52	263.00	22.94
Field sample 3 (900 ft^2)	5.86	2.66	0.26	283.83	12.82	317.99	30.90
Mean	5.37	2.44	0.22	260.14	10.98	291.45	26.46

[1]Seed were harvested from a 900 ft^2 block within each plot (a total of three plots) and used to estimate yield potential and the number of viable seed.

Table 2. Panicle length and weight, total seed weight/panicle, number of full seeds/panicle, and weight of full seeds/panicle of 18 randomly selected panicles.

Panicle No.	Panicle length (cm)	Panicle weight (g)	Total seed weight /panicle (g)	Number of full seed/panicle	Weight of full seed /panicle (g)
1	26.5	1.21	0.8	159	0.54
2	27.5	1.94	1.26	158	0.55
3	24	1.51	1.14	148	0.53
4	30.3	1.89	1.46	177	0.92
5	26	1.13	0.84	128	0.58
6	28.6	1.52	0.93	73	0.35
7	26.7	2.26	1.7	349	1.24
8	31	2.12	1.64	220	1.16
9	32.2	1.93	1.29	175	0.67
10	29.6	2.25	1.74	179	0.95
11	24.5	1.69	1.27	240	0.91
12	26.9	1.28	0.78	54	0.2
13	27.5	1.31	0.91	163	0.61
14	25.8	1.58	1.19	239	0.93
15	27.4	1.91	1.31	219	0.95
16	27.9	2.34	1.78	306	1.26
17	30	2.12	1.47	305	1.02
18	25.5	2.29	1.82	176	1.08
MIN	24	1.13	0.78	54	0.2
MAX	32.2	2.34	1.82	349	1.26
AVERAGE	27.66	1.79	1.29	192.66	0.802
STD	2.25	0.40	0.35	76.57	0.31

Table 3. Dimension (length, width, and depth) and weight of PolyC15 seeds.

Seed #	Hulled seed				De-hulled seed			
	Length (mm)	Width (mm)	Depth (mm)	Weight (mg)	Length (mm)	Width (mm)	Depth (mm)	Weight (mg)
1	11.7	1.7	0.6	6.6	9.5	0.6	0.5	2.6
2	12.5	1.7	0.7	5.8	9.1	1.1	0.4	2.5
3	13.7	1.5	0.5	4.4	8.2	0.8	0.4	1.9
4	13.9	1.6	0.5	4.6	7.9	0.7	0.5	1.8
5	14.0	1.7	0.9	5.0	8.8	0.8	0.4	2.9
6	12.1	1.7	0.6	5.2	8.2	0.8	0.4	2.3
7	14.0	1.8	0.7	5.6	9.0	1.1	0.5	2.6
8	11.7	1.3	0.6	4.4	7.3	0.7	0.3	1.7
9	11.0	1.3	0.5	4.2	7.1	0.9	0.5	2.7
10	12.2	1.3	0.6	4.5	8.9	0.8	0.5	1.8
11	11.0	1.5	0.5	4.1	7.2	0.9	0.5	1.9
12	12.5	1.8	0.8	5.3	7.0	0.9	0.4	2.8
13	13.7	1.3	0.6	6.1	9.3	0.7	0.4	3.6
14	13.4	1.7	0.6	5.5	6.9	0.9	0.5	2.4
15	11.6	1.8	0.6	7.3	8.2	0.9	0.5	3.2
16	13.6	1.5	0.6	5.1	7.3	0.8	0.4	2.1
17	13.4	1.9	0.6	5.1	7.3	0.7	0.4	2.8
18	12.6	1.4	0.6	6.1	6.9	0.8	0.4	2.7
19	11.9	1.2	0.5	4.2	7.6	0.8	0.4	2.0
20	11.5	1.6	0.5	4.2	7.5	1.0	0.5	2.4
21	12.1	1.7	0.7	5.9	7.6	0.8	0.4	2.3
22	10.4	1.4	0.7	3.7	7.9	0.8	0.5	2.4
23	11.6	1.6	0.6	2.9	7.5	0.8	0.4	1.0
24	9.8	1.8	0.5	3.8	6.3	0.8	0.4	2.4
25	11.6	1.2	0.5	4.4	8.0	0.8	0.5	2.5
26	15.3	1.5	0.6	8.5	8.4	0.8	0.4	2.8
27	11.0	1.5	0.5	3.9	7.5	0.8	0.4	2.2
28	11.5	1.2	0.8	4.0	7.0	0.7	0.3	1.4
29	10.9	1.6	0.5	4.1	8.2	0.6	0.2	1.2
30	11.3	1.3	0.4	4.4	7.2	0.6	0.4	1.9
Mean	12.25	1.54	0.60	4.96	7.83	0.81	0.42	2.29
STD	1.27	0.21	0.11	1.17	0.81	0.12	0.07	0.57
Min	9.8	1.2	0.4	2.9	6.3	0.6	0.2	1
Max	15.3	1.9	0.9	8.5	9.5	1.1	0.5	3.6

[1]Equal amounts of seed were taken from quadrat 2 (Plot #1), quadrat 5 (Plot #2), and quadrat 3 (Plot #3) and thoroughly mixed. From the mixed seed, 50 were randomly selected and used to to measure seed dimension for both hulled and de-hulled seeds.

Table 4. 1000-seed weight of PolyC15 seed from 3 seed production plots.

Seed sample	Seed weight/ 1000(g)	Seed sample	Seed weight/ 1000 (g)	Seed sample	Seed weight/ 1000 (g)
Plot 1, Q1	3.98	Plot 2, Q1	3.53	Plot 3, Q1	4.09
Plot 1, Q2	4.09	Plot 2, Q2	3.98	Plot 3, Q2	3.53
Plot 1, Q3	3.53	Plot 2, Q3	4.09	Plot 3, Q3	3.98
Plot 1, Q4	3.98	Plot 2, Q4	3.53	Plot 3, Q4	4.09
Plot 1, Q5	4.09	Plot 2, Q5	3.98	Plot 3, Q5	3.53
MIN	3.53	MIN	3.53	MIN	3.53
MAX	4.09	MAX	4.09	MAX	4.09
AVERAGE	3.93	AVERAGE	3.82	AVERAGE	3.84
STD	0.23	STD	0.27	STD	0.29

[1]Sample of seed weight were collected from each production plot based on a 1-square meter quadrat (Q) and a sampling frequency of five quadrats per plot.

Table 5. Germination dates and seed germination rates.

Seed sample (Plot 1, Q1)	Germination rate (%)	Seed sample (Plot 2, Q5)	Germination rate (%)	Seed sample (Plot 3, Q3)	Germination rate (%)
Jan. 21, 2009	63.3	Jan. 21, 2009	60.52	Jan. 21, 2009	63.40
Jan. 28, 2009	57.25	Jan. 28, 2009	68.35	Jan. 28, 2009	57.28
Feb. 4, 2009	57.2	Feb. 4, 2009	64.10	Feb. 4, 2009	67.22
Feb. 11, 2009	70.12	Feb. 11, 2009	59.83	Feb. 11, 2009	75.12
Feb. 20, 2009	66.60	Feb. 20, 2009	68.60	Feb. 20, 2009	78.54
Mar. 13, 2009	67.60	Mar. 13, 2009	68.60	Mar. 13, 2009	73.61
Mar. 18, 2009	61.15	Mar. 18, 2009	60.15	Mar. 18, 2009	80.12
Mean ± Stdv	63.31 ± 5.07	Mean ± Stdv	64.30 ± 4.18	Mean ± Stdv	70.75 ± 8.40

[1]Randomly selected seeds from specified quadrat (Q) and plot were used in germination tests (100 seed/Petri dish, five dishes/replicate). Seeds were harvested on Nov. 11, 2008, stored in 2^{o}C (100% RH), threshed on Jan. 8, 2009, and sampled for germination tests on the dates specified. Germination rates were measured weekly for a 5-week period. At the end of observation period, non-germinated seeds were considered non-viable.

Potential Applications

In addition to providing seed for aerial seeding, the polycross seed can be used to develop plugs, potted plant (in 10.2 cm pots or 1-gallon trade containers; Fig. 2A-D).

Seed can be grown for mass production of plugs or potted plants much easier and faster than production of plugs and potted plants from clonal proliferation. This will benefit the nursery industry by providing more efficient plant production and increased ability to produce a large number of planting materials. The seed-based revegetation technique will, therefore, offer new approaches in conducting coastal erosion control, habitat restoration, and managing the ecosystem.

Recurrent Selection

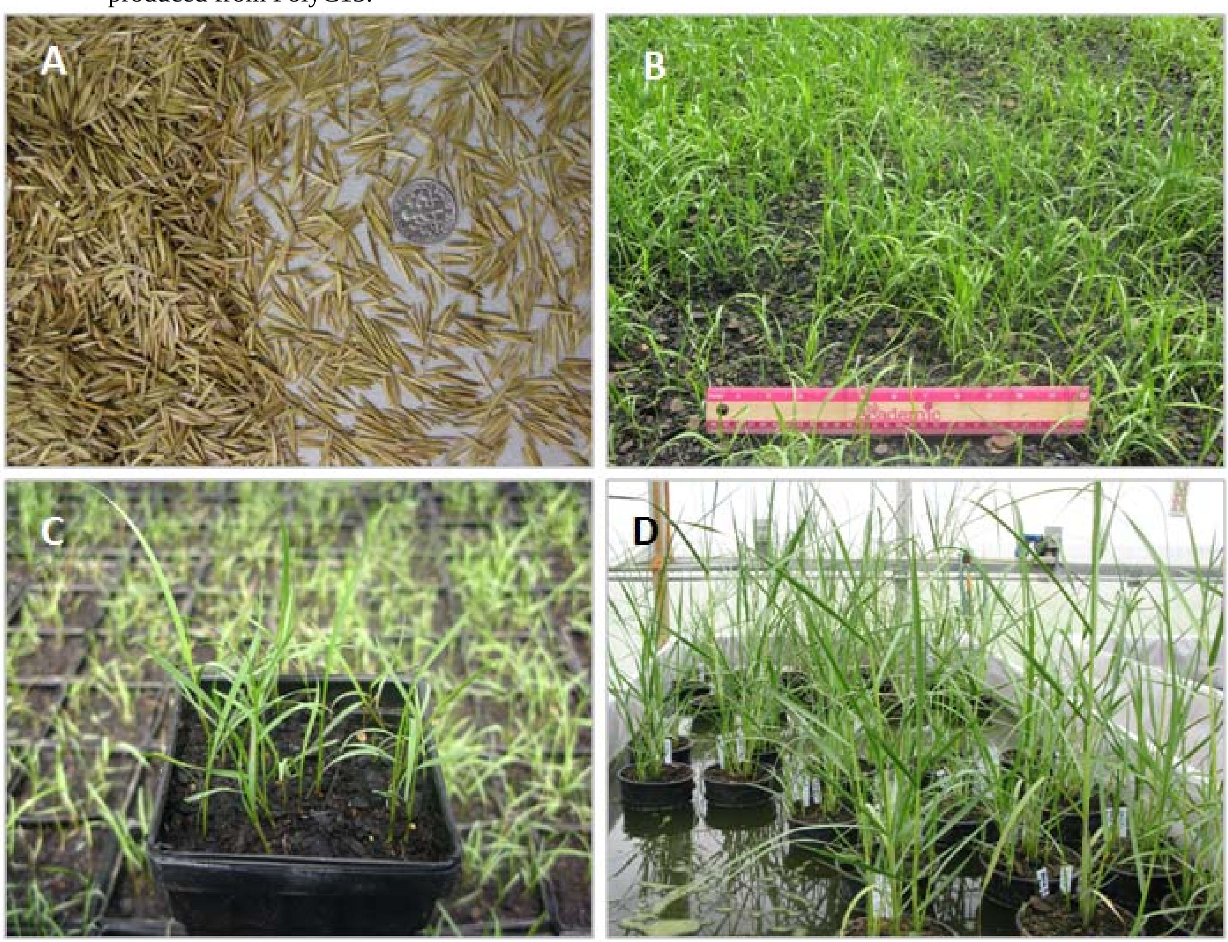
Multi-location performance trials of PolyC15 progeny were conducted in two locations; the Rice Research Station (RRS) and Rockefeller (Cameron Parish). Two genotypes, (1) parental genotypes represented by 15 lines with 10 clones per line and (2) PolyC15 represented by a set of randomly selected 150 syn-1 lines, were planted linearly parallel to the shore line in 5-ft spacings, replicated three times in a randomized complete block design. Important phenotypic data, including stem count, rate of spread, plant height, disease rating, heading date, seed weight/1000, panicle number, seed fertility, germination rates, seed dormancy, and seed production, were collected. Based on data collected, 15 top syn-1 genotypes were selected and will be used to develop a second generation of polycross population. These elite lines are currently being increased in the greenhouse to produce enough planting material for 2010 spring planting.

Genetic gain will be measured using two genotypes, (1) Syn-0 parental genotypes represented by 15 lines, 10 clones/line and (2) Syn-1 parental genotypes (15 top lines), 10 clones/line. Field trials will be carried out in two locations; the RRS and Bayou DuPont – (Belle Chase, New Orleans). Genotype entries will be planted randomly in 4x4 ft spacings in a randomized complete block design replicated three times. Important phenotypic data, including stem count, plant height, disease rating, heading date, seed weight/1000, panicle number, seed fertility, germination rates, seed dormancy, and seed production, will be collected. Parental mean comparisons, breeding values, selection index, selection gain, mean performance, and GXE effects will be analyzed.

Marker Analyses of the Top 15 Selected Lines

Genetic properties of these elite lines are currently being analyzed using various DNA markers (AFLP, SCAR, and SSR). Molecular quantification of allelic diversity of PolyC15 progeny lines is also being conducted using SSR and amplified fragment length polymorphism (AFLP) markers. A total of 125 randomly selected Syn-1 lines will be analyzed using 40 SSR markers. In addition, four primer combinations will be used to generate approximately 250 polymorphic AFLP markers.

Figure 2. A. PolyC15 seed; B. PolyC15 seedling; C. PolyC15 seedlings in 4-inch pots; and D. 1-gallon potted plants produced from PolyC15.



LOUISIANA RICE RESEARCH VERIFICATION PROGRAM - 2009[1]

J.K. Saichuk and K.J. Landry

Introduction

The Louisiana Rice Research Verification Program (LRRVP) began in 1997 in three parishes: Allen, Calcasieu and Jeff Davis. In 1998, the program was funded and expanded to 10 parishes: Acadia, Avoyelles, Calcasieu, East Carroll, Evangeline, Jeff Davis, Madison, Morehouse, St. Landry and Vermilion. From 1999 to 2008, 96 fields had been included in the verification program. In 2009, the program included nine fields (Figure 1).

The fields were visited on at least a weekly basis by a Specialist, County Agent or the Extension Associate. 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 8,131 lb/A (180.7 bu/A or 50.2 bbl/A) at 12% moisture. Second crop was harvested in 4 parishes, adding another 947 lb/A to the total, for a final average of 9,078 lb/A (201.7 bu/A or 56.0 bbl/A). This yield exceeded that of the parishes participating in the program by 2,300 lb/A.

Economic data continue to reveal large production cost differences between growers. It is also clear that more needs to be done to help farmers reduce production costs (Table 2).

The program continues to provide an accurate evaluation of current recommendations and provide insight into other areas of research. The educational value of the program to all concerned (farmers, researchers and extension personnel) increases each year.

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[1] This project is supported in part by funding provided by rice producers through their check-off contributions to the Louisiana Rice Research Board.

Figure 1. 2009 Louisiana Rice Research Verification Program Parishes.

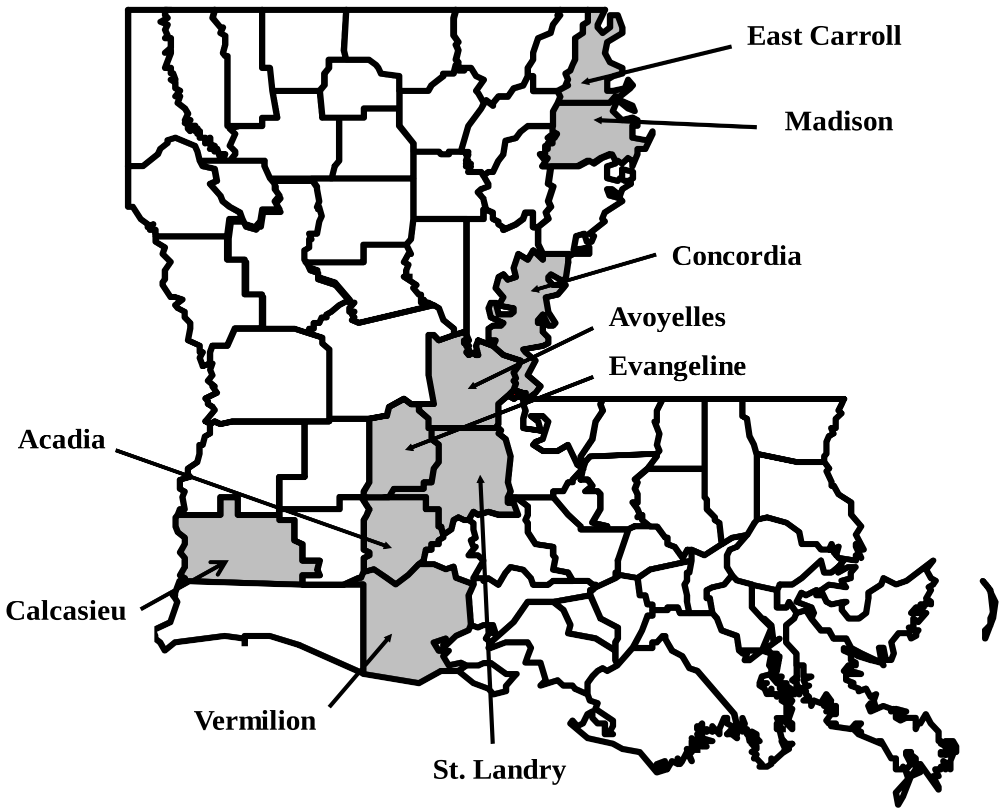

Table 1. 2009 Louisiana Rice Research Verification Program Yield Summary.

Parish	Acres in Verification Program	Verification Yield @ 12% Moisture (cwt/A)		Verification Program			Average Parish Yield[1]	Parish Acreage	Total Parish Production
		1st Crop Alone	Second Crop	Total Yield/A	1st Crop Production	Total Production			
Acadia	56.6	91.10	23.79	114.89	5156.26	6502.77	67.00	79434	5322078
Avoyelles	28.6	82.14	0.0	82.14	2349.20	2349.20	65.47	12764	835659
Calcasieu	41.7	76.26	17.92	94.18	3180.04	3927.31	62.00	12407	769234
Concordia	57.0	80.35	0.0	80.35	4579.95	4579.95	67.50	16144	1089720
East Carroll	33.6	66.92	0.0	66.92	2248.51	2248.51	76.50	8826	675189
Evangeline	22.5	80.95	19.04	99.99	1821.38	2249.78	66.42	42424	2817802
Madison	29.0	81.68	0.0	81.68	2368.72	2368.72	62.00	7282	451484
St. Landry	49.4	79.87	0.0	79.87	3945.58	3945.58	64.80	26457	1714414
Vermilion	41.5	87.08	21.35	108.43	3613.82	4499.84	67.23	41055	2760128
TOTAL	**359.9**	**81.31**	**9.47**	**90.78**			**66.60**	**246793**	**16435707**
						Verif. Avg.	**Parish Avg.**		**Difference**
Average Yield (cwt/A)						**90.78**	**66.60**		**24.18**

Table 2. 2009 Louisiana Rice Research Verification Program Yield, Milling and Economic Summary.

Parish	Variety	Yield @ 12% Moisture (cwt/A)[1]	Milling (% Whole / % Total)	Variable Costs ($/A)[2]	Cost of Production ($/cwt)[2]	Return on Variable Costs ($/A)[2,3]
Acadia	CL151	114.89	63.48/71.36	603.16	5.25	775.76
Avoyelles	Catahoula	82.14	60.33/72.44	422.69	5.15	562.99
Calcasieu	CLXL729	94.18	61.73/72.26	527.80	5.60	602.36
Concordia	Catahoula	80.35	67.05/72.41	405.35	5.04	558.85
East Carroll	Cocodrie	66.92	62.81/72.50			
Evangeline	Jupiter	99.99	65.71/70.12	284.55	2.85	1065.32
Madison	Cocodrie	81.68	64.31/72.56	599.50	7.34	380.66
St. Landry	CL161	79.87	61.54/72.28	444.19	5.56	514.25
Vermilion	CL151	108.43	66.14/72.39	596.58	5.50	704.58

[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 $13.50/cwt.

ACADIA PARISH

The field in Acadia Parish was the earliest planted field having been planted March 9, which is technically prior to our recommended planting date of March 15. However, weather conditions the week of the 9th were better than the next two weeks. This was likely a contributing factor to the outstanding yield produced there. The variety was CL151. It was drill seeded into a fall stale seedbed.

Because of the history of sprangletop and fall Panicum, we recommended Command herbicide. When rice had reached the 1-leaf stage, 5 inches of rain fell on the field. As soon as it dried, the first application of Newpath was made. A little more than three weeks elapsed between the first and second Newpath applications. Cold, wet conditions were responsible for the delay in making the second application. Late in the season the weed eclipta did break through, which was not surprising.

Even though rice water weevil adults were observed in the field, the Dermacor treatment performed as expected, keeping the larvae from becoming a problem.

Permanent flood was established through rainfall. When the spring rains ended, conditions quickly changed from too wet to too dry, resulting in difficulty keeping the field flooded.

Sheath blight was detected prior to panicle differentiation (PD). We monitored the progression of it until late boot when we recommended 21 ounces of Quilt plus 4 ounces of Quadris. Quilt was used to prevent the smuts and Cercospora and the high rate of Quadris was necessary to provide protection for an extended period. Late in the season, blast was picked up in one area of the field.

Drain was started July 10 and the field was harvested July 27. Moisture was a little high, averaging 19.4%. Yield was the best of the verification fields this year at 99.47 cwt (61.4 bbls or 221 bu) per acre green. When this was adjusted to 12%, the yield was 91.1 cwt (56.2 bbls or 202 bu) per acre.

The field was fertilized, flooded, and 2,4-D was applied to produce a second crop. This was one of four verification fields to attempt a second crop this year.

Second crop was harvested October 28, having been delayed by weather. Yield was a surprising 26.10 cwt (16.1 bbls or 58 bu) per acre green. Adjusted to 12% moisture, it was 23.79 cwt (14.7 bbls or 52.9 bu) per acre.

Total yield was 123.26 cwt (76.1 bbls or 273.9 bu) per acre at 12% moisture. This is a record for the verification program.

ACADIA PARISH

Cooperator: Darryl Hoffpauir
Agent: Barrett Courville
Field Size: 56.6 Acres

Cultural Practices

Variety: CL151
Method of Planting: No Till
Water Management: Delay Flood

Seeding Rate: 70 – 75 lb
Date of Planting: March 9, 2009
Date of Emergence: March 22, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	May 11	May 9
PD	May 28	May 22
50% Heading	June 15	June 15
Drain for Harvest	July 10	
Harvest	July 27	July 20

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	91.10	63/71	603.16	5.25	775.76
2nd Crop	23.79	--	--	--	--

Average Parish Yield (1st and 2nd Crop):   cwt/A.

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2]This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
March 25, 2009	25-10-15	400	100	40	60
April 15, 2009	Zinc	5 pt			
April 17, 2009	46-0-0	100	46		
July 29, 2009[1]	46-0-0	180	83	0	0
Total			229	40	60

[1]Second crop.

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Burn down	February 15, 2009	2,4-D + Glyphosate
	March 12, 2009	Command + Glyphosate
Narrowleaf Aster, Nutsedge	March 25, 2009	Newpath
Dayflower, Jointvetch, Eclipta, Sedge, Red Rice	April 15, 2009	Newpath + Londax

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Sheath Blight, Blast	June 3, 2009	Quadris + Quilt

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Rice Water Weevils	March 9, 2009	Dermacor

AVOYELLES PARISH

The field in Avoyelles Parish presented some unique problems - the pH in the soil type there is above 8.0. Glyphosate plus First Shot was applied immediately behind the drill. In spite of nearly 4 inches of rain shortly after planting a week later, we recommended flushing to keep the soil soft to encourage seedling emergence.

The farmer noted he had problems with Command previously so we recommended propanil plus Prowl to burn back emerged weeds and provide longer term protection. Seedling growth progressed very slowly. Fifty pounds of urea was applied as a starter. This was followed by heavy rains that kept the seedlings submerged for three days. We recommended an application of zinc chelate once the field was drained.

Within two weeks the field had changed from too wet to too dry. Vague nutrient problems were also observed along with the detection of rice water weevil adults. We recommended 100 lb of diammonium phosphate (DAP) per acre followed by a flush then an application of insecticide. Because of the slow seedling growth, a permanent flood could not be established in a timely manner which led to more weed emergence.

Eventually more urea was applied, the field was flooded, and Clincher and Londax were applied separately. Rice water weevil adults were picked up again about 10 days prior to green ring. We made the decision to leave them alone because they were coming in late. At topdressing, we recommended a blend of urea and ammonium sulfate. We had discovered several years before on another high pH field that we got better response from ammonium sulfate or blends of it than we did with urea.

Even though no disease was picked up in regular scouting, we recommended an application of Quilt fungicide to prevent the smuts and Cercospora. It was easy to justify the fungicide because the field was a seed rice field of Catahoula.

Given the difficulties we experienced and the poor appearance throughout most of the growing season, we did not expect especially good yields. We were very surprised with green weights (17.2% moisture) of 87.29 cwt (53.9 bbls or 194 bu) per acre, which when adjusted to 12% moisture were 82.14 cwt (50.7 bbls or 182 bu) per acre.

AVOYELLES PARISH

Cooperator: Stewart Lyles
Agent: Carlos Smith
Field Size: 28.6 Acres

Cultural Practices

Variety: Catahoula
Method of Planting: Drill
Water Management: Delay

Seeding Rate: 75 lb
Date of Planting: April 8, 2009
Date of Emergence: April 22, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	June 14	May 16
PD	June 24	June 16
50% Heading	July 16	July 9
Drain for Harvest	August 7	
Harvest	August 4	August 13

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	82.14	60/72	422.69	5.15	562.99
2nd Crop	--	--	--	--	--

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2]This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
May 1	Urea	60	28	0	0
May 13	DAP	100 lb	18	46	0
May 20	Zinc				
June 1	Urea	200 lb	92	0	0
			138	46	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Various	April 8	Roundup
Sprangletop, Foxtail	April 30	Prowl + Stam
Sprangletop, Barnyardgrass, Signalgrass, Foxtail, Texasweed	June 1	Clincher + Londax

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Preventative, Smuts and Cercospora	July 6	21 oz Quilt + 4 oz Quardris

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Rice Water Weevil	May 20	2 oz Karate
Stink bug	July 17	2 oz Karate

CALCASIEU PARISH

Because the field in Calcasieu Parish was laser leveled in the fall prior to planting, it eliminated the use of some herbicides from the program. The hybrid CLXL729 was drill seeded into a prepared seedbed. Phosphorus and potassium fertilizer had been incorporated ahead of the drill. After planting and before levees could be pulled, the field was flooded by 4.67 inches of rain. This delayed the first Newpath application until the rice was in the 1-leaf stage.

By the time the levees were pulled so that water could be managed properly, the rice plants were beginning to tiller. Rice water weevil adults were observed necessitating the addition of Karate to the mixture of Newpath and Regiment. Nitrogen fertilizer was applied just ahead of the establishment of permanent flood which followed the herbicide application.

Water management plagued this field from the beginning. The top paddy continuously leaked into the bottom, resulting in not enough flood in the top and too much in the bottom. Weed control suffered in the top despite good control in the bottom. At green ring, we recommended an application of 2,4-D to the top paddy alone. This was never accomplished. Nitrogen was added a few days later as a topdressing.

No sheath blight was detected, but Stratego was recommended as a preventative to Cercospora and/or kernel and false smut. The primary target was Cercospora. The large amount of volunteer rice throughout the southwest area caused concern that Cercospora could be a problem as it was a few years ago. This was validated later in the season.

The field was harvested at 17.1% moisture, a little lower than we would have liked with a hybrid. Yield was a very respectable 80.95 cwt (50.0 bbls or 179.9 bu) per acre at 17.1% grain moisture. When adjusted to 12%, yield was 76.26 cwt (47.1 bbls or 169.5 bu) per acre. Had the flood been maintained in the top paddy, both weed control and nitrogen utilization would have been better and so would have yields. The field was fertilized and flooded for second crop. Second crop produced 17.92 cwt (11.1 bbls or 39.8 bu) per acre at 12% moisture for a total of 94.18 cwt (58.1 bbls or 209.3 bu) per acre at 12% moisture.

CALCASIEU PARISH

Cooperator: Ryan Stelly
Agent: Jerry Whatley
Field Size: 42 Acres

Cultural Practices

Variety: Clearfield XL 729
Method of Planting: Drill
Water Management: Delay Flood

Seeding Rate: 25 lb
Date of Planting: April 9, 2009
Date of Emergence: April 19, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	May 30	
PD	June 7	
50% Heading	July 2	
Drain for Harvest	July 25	
Harvest	August 11	

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	76.26	62/72	527.80	5.60	602.36
2nd Crop	17.92	----	----	----	----

Average Parish Yield (1st and 2nd Crop):   cwt/A.

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2]This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
April 29	0-26-26	230 lb	0	60	60
May 5	Urea	190 lb	87	0	0
May 26	Urea	100 lb	46		
August 12[1]	Urea	150 lb	69		
Total			202	60	60

[1]Second crop

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Sedges, Sesbania, Alligatorweed, Red Rice, Sprangletop	April 26	4 oz Newpath
Jointvetch, Plus Those Above	May 5	4 oz Newpath + .4 oz Regiment
Alligatorweed, Sesbania, Jointvetch	August 12	2 pt. 2,4-D

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
None, Preventative	June 26	15 oz Stratego

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Rice Water Weevil	May 5	Karate

CONCORDIA PARISH

The field in Concordia Parish was planted to Catahoula rice that had been treated with Dermacor seed treatment. In spite of the heavy dose of Command herbicide rate applied at planting, it did not hold. Heavy barnyardgrass pressure along with hemp sesbania, jointvetch, and annual sedges appeared. Control of sesbania and jointvetch was not expected, but barnyardgrass and sedges were a surprise. Once the rice was large enough, Regiment was applied. Where water was present, excellent control was realized, but eventually, Clincher had to be applied to the entire field. Permit was applied to the high areas where more sesbania and jointvetch broke through. This was one of the most expensive weed control programs in the verification program this year.

About a week past internode elongation a bacterial disease similar to Crown Rot was discovered. It is being studied by plant pathologist Dr. Chuck Rush and his team. Within a couple of weeks, heavy sheath blight pressure developed. Because it showed up early and the pressure was heavy, an application of 21 ounces of Quilt plus 6 ounces of Quadris was recommended. This proved to be a good decision.

Dermacor did an excellent job controlling the rice water weevil. Stink bug pressure was moderate, but heavy enough to warrant an insecticide treatment.

The field was harvested on August 18, yielding 87.61 cwt (54 bbls or 195 bu) per acre green. Adjusted to 12% moisture, the yield was 80.35 cwt (50 bbls or 179 bu) per acre. At the time of harvest, it appeared the yield would be even higher.

CONCORDIA PARISH

Cooperator: Noble Guedon
Agent: Glen Daniels
Field Size: 57 Acres

Cultural Practices

Variety: Catahoula
Method of Planting: Drill
Water Management: Delay Flood

Seeding Rate: 90-95 lb
Date of Planting: April 9, 2009
Date of Emergence: April 19, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	June 1	May 21
PD	June 17	June 1
50% Heading	July 10	June 25
Drain for Harvest	July 29	
Harvest	August 18	July 30

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	80.35	63/72	405.35	5.04	558.85
2nd Crop	--	--	--	--	--

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2] This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
May 11	Urea	50	23	0	0
May 25	Urea + Agrotain	230	106	0	0
June 4	Urea	115	53	0	0
Total			182	0	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Burn down	February 6, 2009	Glyphosate 1 lbs. + 2,4 –D 1 pt
Preventative	February 10, 2009	Command 21. 33 oz
Barnyardgrass, Sesbania, Sedges	May 9, 2009	Regiment .25 oz
Barnyardgrass, Sprangletop	May 25, 2009	Clincher 13.5 oz
Sesbania	June 12, 2009	Permit 1 oz (15 A)
Barnyardgrass, Signalgrass	June 20, 2009	Clincher 15 oz (7.5 A)

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Sheath Blight	July 1, 2009	Quilt 21 oz + Quadris 6 oz

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Preventative	April 9, 2009	Dermacor
Stink Bugs	July 11, 2009	Karate Z 2.13 oz

EAST CARROLL PARISH

This field proved to be one of the more difficult fields in the verification program this year. Prior to planting, we noted among the usual weeds a heavy population of smartweed so glyphosate plus First Shot was recommended, but the First Shot was left out of the mixture by mistake. Touchdown and Command were applied at planting.

Cocodrie was drill seeded into moisture in the heavy clay soil. Levees were not pulled until a month after planting. Fortunately, there were enough rain showers to keep the field moist enough to maintain rice growth. A permanent flood could not be established soon enough to keep weeds in check. When Command began to break, propanil was recommended to provide suppression until a permanent flood could be established. It was anticipated that another herbicide combination would be recommended ahead of the flood. Instead, the grower elected to apply .6 lb of Facet plus .75 oz of Londax and 80 lb of urea to a field with no levees, thus no way to flush or flood the field. The grower was concerned about nearby corn. Luckily, 1.45 inches of rain occurred providing some help.

A total of 200 pounds of urea was applied ahead of the permanent flood. Heavy barnyardgrass pressure warranted the application of 15 oz of Clincher. About a week following the herbicide application, 80 lb of urea per acre was applied. The two recommended nitrogen applications provided about 130 lb of actual nitrogen per acre. Given the first nitrogen application was to dry soil, it was assumed that about 50% of the nitrogen (or about 18 lb/A) had been utilized by the crop. This would have brought the total nitrogen to about 150 lb of actual N per acre. It became obvious late in the season that the initial application of fertilizer probably only provided 8 to 10 lb per acre at best resulting in inadequate nitrogen.

Heavy sheath blight pressure developed early (prior to mid-boot) necessitating an application of 21 oz of Quilt plus 6 oz of Quadris per acre.Stink bugs never reached treatment levels.

Yield was a disappointing 68.32 cwt (42.2 bbls or 151.8 bu)/A at 13.8% moisture. Adjusted to 12%, these become 66.92 cwt (41.3 bbls or 148.7 bu)/A at 12% moisture.

EAST CARROLL PARISH

Cooperator: William King
Agent: Donna Lee
Field Size: 33.6 Acres

Cultural Practices

Variety: Cocodrie
Method of Planting: Drill
Water Management: Delayed flood

Seeding Rate: Approximately 75 lb/A
Date of Planting: April 24, 2009
Date of Emergence: May 2, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	June 4	June 6
PD	July 2	June 15
50% Heading	July 26	July 8
Drain for Harvest	August 17	
Harvest	September 8	August 12

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	66.92	63/72			
2nd Crop	--	--	--	--	--

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2]This value was obtained using a selling price of $16.35/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
May 21	Urea	80	37	0	0
June 4	Urea	200	92	0	0
June 18	Urea	80	37	0	0
Total			166	0	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Smartweed and Others	April 16	Glyphosate + First Shot (received glyphosate only)
Burndown and Preemerge	April 30	Glyphosate + Command
Barnyardgrass, Sedges, Dayflower, Texasweed	May 14	Propanil to slow weeds – used Facet + Londax instead
Barnyardgrass	June 8	Clincher

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Sheath Blight	July 9	21 oz Quilt + 6 oz Quadris

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Preventative	April 16	Dermacor

EVANGELINE PARISH

The field in Evangeline Parish offered a true educational experience for all parties involved. Because the farmer knew he had a history of red rice in the selected field and because he wanted to plant Jupiter, a non-Clearfield medium-grain variety, a pinpoint flood water management system was planned. The grower had no previous experience with this water management scheme. Soil texture also prevented the use of Command herbicide.

Jupiter seed were sown by air into standing water at 125 lb per acre. The higher-than-usual planting rate was utilized to compensate for the somewhat uneven field and cold weather. During the brief drain interval between draining after planting and re-flooding the field, 175 lb of urea was applied. No phosphorus and potassium were needed based on the soil test. Keeping the high areas covered with water resulted in deeper than desired water levels and some stand loss in the low areas. Zinc chelate was applied to alleviate some of the stress of deep water and low temperatures. Flood management during the first 3 weeks was intense.

Detection of rice water weevils required an application of pyrethroid insecticide.

A couple of weeks prior to green ring red stem and ducksalad were noted in the thin areas of the field so 1 oz of Londax per acre was applied. About a week later, the field was topdressed with 85 lb of urea per acre because nitrogen deficiency had begun to show. The intense water management paid off because no grass herbicide was ever applied to the field even though the borders were heavily populated with fall Panicum and sprangletop.

When the crop was in late boot, Stratego fungicide was applied because blast had been discovered 2 weeks prior. Even though stink bugs never reached economic threshold numbers, the grower applied malathion on his own.

In spite of the thin areas of the field and the struggle with water management and cold weather early, the field yielded a surprising 85.21 cwt (53 bbls or 189 bu) per acre at 16.4% moisture. Adjusted to 12%, the yield was 80.45 cwt (50 bbls or 180 bu) per acre.

The field was then fertilized with urea and flooded to produce a second crop. Second crop yielded 19.04 cwt (11.8 bbls or 42.3 bu) per acre at 12% moisture. Total yield was 99.99 cwt (61.7 or 222.2 bu) per acre at 12% moisture.

EVANGELINE PARISH

Cooperator: Jeffrey Sylvester
Agent: Keith Fontenot
Field Size: 22.5 Acres

Cultural Practices

Variety: Jupiter
Method of Planting: Water Seed
Water Management: Pinpoint Flood

Seeding Rate: 125 lb
Date of Planting: March 19, 2009
Date of Emergence: April 4, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	May 17	May 16
PD	June 3	May 24
50% Heading	June 21	June 18
Drain for Harvest	July 20	
Harvest	August 10	August 2

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	80.95	66/70	284.55[3]	2.85[3]	1065.32[3]
2nd Crop	19.04	--	--	--	--

Average Parish Yield (1st and 2nd Crop):   cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2] This value was obtained using a selling price of $13.50/cwt.

[3] First and second crop data combined.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
April 6	Urea	175	80	0	0
May 14	Urea	85	39	0	0
Total	--	--	119	0	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Red Stem, Ducksalad	5/7	1 oz Londax

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Blast	June 11	17 oz Stratego

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Rice Water Weevil	April 30	Karate
Stink Bugs (Below Threshold)	July 1	Malathion (not recommended)

MADISON PARISH

If we had imposed the rules regarding verification fields as we did early in the program, this field would not have been included in the program because it was planted on May 30, 20 days beyond the LSU AgCenter's May 10 cutoff date for planting rice in northeast Louisiana. We chose to keep the field in the program because the farmer was a first time rice grower and we felt he could benefit from the program more than most participants.

An early problem was the undulating field surface caused mainly by equipment tracking on a soil that had not completely settled following laser leveling. Recent laser leveling prohibited the use of Command herbicide at planting. The absence of a water well at planting also limited herbicide application because no flushing was possible. There had been enough rain to get both rice and weeds to emerge. Once the well was in place, a mixture of propanil and Prowl was applied, followed by 50 lb of urea and flushing of the field.

The uneven field surface delayed establishment of permanent flood until rice plants in the lower areas were large enough to tolerate a flood. Clincher was applied to a muddy surface followed by 200 lb of urea and the establishment of permanent flood.

Shortly after flooding the field, rice water weevils were found and a pyrethroid insecticide was applied.

When the majority of rice plants had three crown nodes visible, the field was drained to prevent straighthead. This was deemed necessary because rice had never been planted in this field, it had some history of cotton production, and it was thought to have been planted to Cocodrie, which is susceptible to straighthead. At the end of the season, it was discovered that Cheniere had been planted instead of Cocodrie, even though the seed was labeled Cocodrie.

Once the field was flooded, 1 oz of Permit herbicide was applied per acre to control sedges and hemp sesbania and suppress palm leaf morningglory. One hundred fifteen lb of urea had been applied around the same time.

The proximity of corn to the rice field was the probable cause of a fairly high incidence of sugarcane borers in the rice. When fungicide was applied as a preventative to the smuts and Cercospora, we included 2.5 oz of Karate per acre to suppress borers. The insecticide may have provided some stink bug control also because they never reached treatable levels.

Drain was recommended on September 21; then it rained for 3 weeks. The field was finally harvested on November 3, the latest a first crop has been harvested in the Verification Program. Yield was extremely surprising at 84.57 cwt (52.5 bbls or 187.9 bu) per acre at 15% moisture. Adjusted to 12% moisture, yield was 81.68 cwt (50.4 bbls or 181.5 bu) per acre.

MADISON PARISH

Cooperator: Garrett Marsh
Agent: R.L. Frazier
Field Size: 29 Acres

Cultural Practices

Variety: Cocodrie
Method of Planting: Drill
Water Management: Delay Flood

Seeding Rate: 93 lb
Date of Planting: May 31, 2009
Date of Emergence: June 8, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	July 21	July 4
PD	August 2	July 13
50% Heading	August 18	August 4
Drain for Harvest	September 21	
Harvest	November 3	September 8

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	81.68	64/72	599.50	7.34	380.66
2nd Crop	----	----	----	----	----

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2] This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
June 4	Urea	50	23	0	0
July 2	Urea	200	92	0	0
July 25	Urea	115	53	0	0
Total			168	0	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Barnyardgrass, Signalgrass, Crabgrass, Sesbania	June 4	4 qt propanil + 2 pt Prowl
Red Sprangletop, Barnyardgrass, Sesbania, Sedges	July 2	13.5 oz Clincher
Sesbania and Sedges	July 15	1 oz Permit

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Preventative	August 12	15 oz Stratego + 2 oz propiconazole

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Rice Water Weevil	July 6	2 oz. Karate
Sugarcane Borers	August 12	2.5 oz Karate

ST. LANDRY PARISH

CL161 was drilled into the heavy clay on April 11. Command and glyphosate were applied immediately afterward. Rainfall for the next 2 weeks totaled 13.5 inches, keeping the field completely flooded for one 3-day period. Within a couple of weeks after emergence, it was clear the 8 oz rate of Command was either too low or the water had caused it to move because barnyardgrass and other weeds began to emerge. A second 8-oz rate of Command was applied with the first 4-oz rate of Newpath.

When the rice plants started tillering, a second 4-oz rate of Newpath plus 1.25 oz of Londax was applied. Then, 190 lb of urea per acre was flown on and the field flooded. Around internode elongation, we recommended 160 lb of a 50:50 blend of ammonium sulfate and urea (33% nitrogen) plus 7 to 8 lb of zinc because of the known high pH and symptoms of iron toxicity near the well outlet. There was some confusion about what field received this mixture because one or more of the superbags were mixed up by the applicator. Obvious nitrogen streaks showed up and remained until harvest.

Sheath blight was expected because the variety is known to be very susceptible to the disease. It was detected fairly early, requiring an application of 21 oz of Quilt plus 4 oz of Quadris to provide the longevity of control expected to be necessary. Luckily, stink bug populations never reached treatable levels.

The crop was harvested at an average moisture level of 13.5%, much lower than recommended. This was brought about by frequent rainfall that followed draining the field. It still yielded an exceptional 81.26 cwt (50 bbls or 181 bu) per acre. Adjusted to 12%, shrinkage was minimal for a dry yield of 79.87 cwt (49 bbls or 178 bu) per acre.

ST. LANDRY PARISH

Cooperator: Barrett Olivier
Agent: Keith Normand
Field Size: 50 Acres

Cultural Practices

Variety: CL161
Method of Planting: No Till Drill
Water Management: Delay Flood

Seeding Rate: 75 lb
Date of Planting: April 11
Date of Emergence: April 19

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	June 7	May 29
PD	June 17	June 9
50% Heading	July 11	June 28
Drain for Harvest	August 4	
Harvest	August 25	August 2

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	79.87	61/72	444.19	5.56	514.25
2nd Crop	----	----	----	----	----

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2] This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
May 12	Urea + agrotain	190 lb	87	0	0
June 4	33 % + Zn	160 lb	74	0	0
Total			161	0	0

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Burndown	Fall	Glyphosate
Persian Clover, Ryegrass, Barnyardgrass, Alligatorweed	April 11	8 oz Command + 1 qt Glyphosate
Barnyardgrass Fall Panicum, Alligatorweed, Bull Tongue, Sedges, Texasweed	April 29	4 oz Newpath + 8 oz Command
Alligatorweed, Sedges, Bull Tongue	May 13	4 oz Newpath + 1.25 oz Londax

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Sheath Blight	June 29	21 oz Quilt + 4 oz Quadris

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Preventative	April 11	Dermacor

VERMILION PARISH

Because the grower told us the field had a history of severe fall Panicum and sprangletop pressure, we recommended 12.5 oz of Command at planting on a silt loam soil. Based on the amount of bleaching in some areas of the field, this was the maximum herbicide rate for this field. Grass control was excellent. Newpath was deliberately left out of the herbicide combination to allow for pure post emergence use of the first application. At spiking, the first Newpath application at 4 oz per acre was made.

Over 5 inches of rain fell on the field between spiking and 1-leaf stage. This caused a delay in making the second Newpath application until the rice was in the 3-leaf stage. A 1-oz application of Permit was included with the Newpath, followed by 200 lb of urea per acre and establishment of the permanent flood.

At green ring, 125 lb of a blend of ammonium sulfate and urea (38% nitrogen) were applied. Both blast and sheath blight were found in this field so 17 oz of Stratego was applied. Stink bug numbers remained fairly low so no insecticide was applied.

Rain delayed harvest until the rice was at 16.3% moisture, a little lower than we normally like to start at. We harvested a very satisfying 91.55 cwt (57 bbls or 208 bu) per acre. Adjusted to 12% moisture, the yield was 87.08 cwt (54 bbls or 194 bu) per acre.

The field was then fertilized and flooded to produce a second crop.

VERMILION PARISH

Cooperator: Durel Romaine
Agent: Stuart Gauthier
Field Size: 41.5 Acres

Cultural Practices

Variety: CL151
Method of Planting: Drill
Water Management: Delayed flood

Seeding Rate: 75 lb
Date of Planting: April 7, 2009
Date of Emergence: April 17, 2009

Growth and Development

Stage	Observation Date	DD50 Date
Green Ring	May 29	May 24
PD	June 14	June 4
50% Heading	June 30	June 27
Drain for Harvest	July 22	--
Harvest	August 14	August 1

Yield, Milling, and Economic Data

	Yield @ 12% Moisture (cwt/A)	Milling Yield (% whole / % total)	Variable Costs ($/A)[1]	Cost of Production ($/cwt)[1]	Return on Variable Costs ($/A)[1,2]
1st Crop	87.08	66/72	596.58	5.50	704.58
2nd Crop	21.35	----	----	----	----

Average Parish Yield (1st and 2nd Crop): cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage or fixed costs.

[2] This value was obtained using a selling price of $13.50/cwt.

Fertilization

Date	Source	Rate (lb/A)	N (lb/A)	P (lb/A)	K (lb/A)
March 13	Chicken litter	2000			
April 29	46-0-0	200	92	0	0
May 27	38-0-0	125	48	0	0
August 20[1]	46-0-0	200	92		
Total			232	0	0

[1]Second crop

Weed Management

Weeds Present	Date of Treatment Decision	Recommendation
Burndown	March 13	Glyphosate
Preemerge	April 7	Command + glyphosate
Sedges, Dayflower, Jointvetch, Alligatorweed	April 29	Newpath + Permit

Disease Management

Diseases Present	Date of Treatment Decision	Recommendation
Blast, Sheath Blight	June 24	Stratego

Insect Management

Insects Present	Date of Treatment Decision	Recommendation
Preventative	April 7	Dermacor

Table 3. Twelve-Year Louisiana Rice Research Verification Summary.

1998 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia*	53.0	32.8	118.1	5314
Avoyelles	32.5	42.9	154.4	6950
Calcasieu*	60.0	34.1	122.8	5524
East Carroll	33.9	41.1	148.0	6658
Evangeline	33.0	42.9	154.4	6950
Jeff Davis*	61.8	37.3	134.3	6043
Madison	36.6	39.0	140.4	6318
Morehouse	63.0	33.8	121.7	5476
St. Landry	37.1	38.2	137.5	6188
Vermilion	16.7	29.4	105.8	4763
TOTALS	**427.6**	**37.2**	**133.7**	**6018.4**

* Yields include second crop.

1999 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia*	31.1	37.4	134.6	6059
Avoyelles	32.5	46.6	167.8	7549
Calcasieu	49.3	34.6	124.6	5605
Catahoula	30.4	33.4	120.2	5411
East Carroll	36.1	47.0	169.2	7614
Evangeline	22.3	43.1	155.2	6982
Jeff Davis*	26.6	30.8	110.9	4990
Madison	38.1	39.0	140.4	6318
St. Landry	30.1	38.8	139.7	6286
Vermilion	23.8	36.5	131.4	5913
TOTALS	**320.3**	**38.7**	**139.4**	**6272.7**

* Yields include second crop.

2000 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia	53.3	39.4	141.8	6383
Avoyelles	63.2	36.7	132.1	5945
Calcasieu	22.1	25.1	90.4	4066
Catahoula	39.6	36.4	131.0	5897
East Carroll	45.1	49.1	176.8	7956
Evangeline	19.9	38.2	137.5	6188
Jeff Davis	30.6	26.7	96.1	4325
Morehouse	27.7	28.3	101.9	4585
St. Landry	70.7	39.2	141.1	6350
Vermilion*	21.6	37.7	135.7	6107
TOTALS	**393.8**	**35.7**	**128.4**	**5780.2**

* Yields include second crop.

Table 3. Continued.

2001 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia*	60.6	50.8	182.9	8230
Allen	41.6	35.1	126.4	5686
Avoyelles	63.2	38.1	137.2	6172
Calcasieu*	61.9	39.4	142.0	6388
Concordia	79.6	36.1	130.1	5853
Evangeline*	20.8	52.7	189.7	8538
Jeff Davis*	21.6	57.3	206.4	9289
Richland	65.9	46.0	165.5	7447
St. Landry*	40.6	51.1	184.0	8282
Vermilion*	33.3	52.4	188.7	8493
TOTALS	**489.1**	**45.9**	**165.3**	**7437.8**

* Yields include second crop.

2002 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia*	38.4	49.8	179.3	8068
Allen*	25.1	46.0	165.6	7452
Avoyelles	37.4	49.9	179.6	8084
Beauregard*	49.5	53.1	191.2	8602
Calcasieu*	41.4	42.4	152.6	6869
Concordia	67.6	48.2	173.5	7808
Evangeline	42.0	37.6	135.4	6091
Jeff Davis*	31.7	45.0	162.0	7290
Richland	35.8	42.1	151.5	6819
St. Landry	32.7	48.8	175.7	7906
Vermilion*	32.0	49.8	179.4	8072
TOTALS	**433.6**	**46.6**	**167.8**	**7551.0**

* Yields include second crop.

2003 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia	57.2	44.0	158.4	7128
Allen*	35.7	46.1	166.0	7469
Avoyelles	37.4	50.1	180.4	8116
Beauregard*	45.7	48.7	175.2	7884
Concordia	79.5	49.2	177.1	7970
Evangeline*	48.4	44.5	160.2	7209
Jeff Davis*	52.9	28.7	103.3	4649
Richland	40.2	44.7	160.8	7234
St. Landry*	32.7	61.1	220.0	9898
Vermilion*	33.0	40.0	144.0	6480
TOTALS	**462.7**	**45.7**	**164.5**	**7403.7**

* Yields include second crop.

Table 3. Continued.

2004 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Allen*	53.2	40.9	147.1	6620
Avoyelles	33.3	32.8	118.0	5307
Beauregard*	21.8	42.5	153.3	6899
Concordia	82.3	36.0	130.0	5843
East Carroll	54.8	45.8	165.0	7427
Evangeline	30.7	34.8	125.2	5638
Jeff Davis*	42.3	38.5	138.6	6237
Natchitoches	47.2	44.1	158.8	7144
St. Landry*	60.1	65.1	234.3	10543
Vermilion*	30.0	42.1	151.6	6824
TOTALS	**455.7**	**42.3**	**152.2**	**6848.2**

*Yields include second crop.

2005 Verification Acres and Yields

		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia	28.9	39.6	143.8	6427
Allen	76.7	25.6	92.0	4140
Avoyelles	32.1	35.9	129.3	5819
Calcasieu	49.0	51.0	184.0	8282
Concordia	60.5	43.0	156.0	7003
East Carroll	30.4	47.9	172.7	7771
Evangeline	30.0	37.1	133.6	6014
Jeff Davis	39.2	32.5	117.0	5264
Natchitoches	30.0	43.3	156.0	7022
Richland	47.4	49.2	177.2	7974
St. Landry	61.7	47.5	170.9	7689
Vermilion	52.8	40.9	147.3	6631
TOTALS	**538.7**	**41.1**	**148.3**	**6669.7**

*Yields include second crop.

2006 Verification Acres and Yields

		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Avoyelles	41.8	43.0	155.0	6972
Concordia	54.7	50.8	183.0	8237
East Carroll	60.4	44.5	150.0	7210
Evangeline	29.4	32.3	116.0	5227
Jeff Davis	21.5	43.8	157.8	6000
St. Landry	40.9	36.8	132.5	5962
Vermilion	29.6	37.0	133.3	7100
West Carroll	50.1	53.1	191.2	8603
TOTALS	**328.4**	**43.4**	**156.4**	**7040**

*Yields include second crop.

Table 3. Continued.

2007 Verification Acres and Yields				
		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Avoyelles	40.9	56.7	204	9187
Concordia	53.8	53.6	193	8680
East Carroll	23.0	49.0	176	7917
Evangeline – St. Landry	33.9	50.1	180	8122
Jeff Davis*	38.9	55.8	201	9046
Vermilion*	36.6	46.0	166	7451
West Carroll	40.2	45.4	164	7356
TOTALS	**267.3**	**51.2**	**184**	**8293**

*Yields include second crop

2008 Verification Acres and Yields

		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Avoyelles	40.9	47	170	7657
Calcasieu*	55.1	51	183	8247
Concordia	54.7	44	160	7178
Evangeline	46.4	42	152	6840
Madison	41.5	51	182	8208
Jeff Davis*	37.7	52	189	8481
St. Landry	60.2	48	173	7801
Vermilion*	51.1	70	252	11359
TOTALS	**387.8**	**51**	**183**	**8,228**

*Yields include second crop

2009 Verification Acres and Yields

		Yield @ 12% Moisture		
Parish	**Acres**	**Barrels/A**	**Bushels/A**	**Pounds/A**
Acadia*	56.6	70.9	255.3	11489
Avoyelles	28.6	50.7	182.5	8214
Calcasieu*	41.7	58.1	209.3	9418
Concordia	57.0	49.6	178.6	8035
East Carroll	33.6	41.3	148.7	6692
Evangeline*	22.5	61.7	222.2	99.99
Madison	29.0	50.4	181.5	8168
St. Landry	49.4	49.3	177.5	7987
Vermilion*	41.5	66.9	241.0	10843
TOTALS	**359.9**	**56.0**	**201.7**	**9078**

*Yields include second crop

Table 3. Continued.

1998 - 2009 Verification Summary					
Verification Totals			Verification Parish Totals		
Year	**Acres**	**Pounds/A**	**Acres**	**Pounds/A**	**Verification - Parish**
1998	427.6	6018	475,103	5052	966
1999	320.3	6273	444,015	5502	771
2000	393.8	5780	385,824	5620	160
2001	489.1	7438	412,286	5794	1644
2002	433.6	7551	412,630	5764	1787
2003	462.7	7404	327,843	5843	1561
2004	455.7	6848	311,606	5582	1266
2005	538.7	6670	402,759	6165	505
2006	328.4	7040	185,249	5644	1396
2007	267.3	8293	183,357	6501	1792
2008	387.6	8228	258,845	6047	2181
2009	359.9	9078	246,793	6715	2363
Totals	**4864.7**		**4,046,310**		

RICE WEED CONTROL

WEED MANAGEMENT IN HERBICIDE-RESISTANT/TOLERANT AND CONVENTIONAL RICE

Eric P. Webster, Sunny L. Bottoms, Justin B. Hensley, Tyler P. Carlson, and J. Caleb Fish

Introduction and Justification

Weed control studies were conducted at the Rice Research Station and producer fields in south Louisiana in 2009. A total of 53 studies were established with a total of 2,756 research plots. These studies indicate that weed control in rice will continue to be more effective as the new technologies and new herbicides become available to the producers. Many of these studies have been conducted over two to three years. However, several of these studies have one year of data and need to be repeated in order to verify the results over time. This project continues to work on different application methods for products in drill- and water-seeded rice, and it continues to supply data for herbicide development and aid in the expansion of current herbicide labels.

Ammonium Sulfate Formulations

Several studies were established in 2009 to evaluate different ammonium sulfate formulations. Ammonium sulfate has been used in spray solutions to buffer the water used as a carrier with high pH vales to lower pH values. Water with low pH values is important when applying Roundup and several other herbicides. The four formulations evaluated were the dry sprayable ammonium sulfate (AMS), Alliance, Quest, and Choice. Preliminary lab studies were established to determine the amount of pH adjustment of each formulation. Dry sprayable AMS and Alliance adjusted Rice Research Station tap water from 8.3 to 7.0 and 7.1, respectively. Choice adjusted the pH to 5.5 and Quest to 3.5. Data indicates all of the formulations are similar from a weed control standpoint. Dry AMS and Alliance appear to be the most consistent followed by Choice and then Quest. Quest may adjust the pH too low which may cause unforeseen problems. A pH of 3.5 can cause many things to occur in a spray mixture. If one chooses to use an AMS or AMS substitute to add to a spray mixture the use of dry AMS or the liquid formulation Alliance would be the most beneficial. Data indicate that Choice may be beneficial to a Clincher application.

Ducksalad Control in a Rice Production System

A study was established to evaluate several broadleaf herbicides for control of ducksalad. The area was conventionally tilled and a seeding flood was established in order to simulate a water-seeded system. Rice was not seeded in order to eliminate any competition from rice. The initial flood was removed 48 hours after flooding and herbicides with residual activity were applied 24 hours later as a preemergence/delayed preemergence application prior to ducksalad emergence. One postemergence timing was evaluated. The postemergence timing was applied to ducksalad in the cotyledon to first spoon leaf. The flood was removed for postemergence application to guarantee herbicide coverage. Permit and Grasp were evaluated along with three experimental herbicides. V-10142 applied preemergence did not control ducksalad at the level observed in 2007; however, a delayed preemergence treatment followed by a postemergence application provided suppression. The best ducksalad herbicide available is Grasp. Ducksalad control was 85% at 28 DAT for a delayed preemergence Grasp application to 96% with two applications of 2 oz/A.

Permit Versus Halomax

Several trials were established in 2009 to evaluate the activity of these two products with the same active ingredient. Data indicate the two products are similar in activity on sedges and broadleaf weeds. In 2008, a problem was observed with the activity of Halomax on hemp sesbania; however, this reduction in control was not observed in 2009.

Newpath and Propanil Formulations and Application Timings

A study was established in 2008 and 2009 to evaluate the addition of propanil to Newpath in a Clearfield rice production system. The standard program of two applications of Newpath applied at 4 oz/A was used. The first application was applied early postemergence (EPOST) and the second application was applied late POST (LPOST). The various propanil formulations were mixed with either the EPOST or LPOST applications of Newpath. The propanil formulations evaluated were Stam M4, Stam SC, Riceshot, Superwham, and Stam EDF. Weed control was similar for all combinations and application timings; however, yield was generally higher with all Newpath plus propanil applied at the EPOST timing. An economic analysis will be conducted for all treatments to determine the best propanil formulation to be used with Newpath based on economic returns.

SafeGuard: A Safener for Pendimethalin
This product has been evaluated for several years in this project. The product is currently labeled for use as a true preemergence application for rice in California. In 2009, the product was evaluated in combination with Prowl 3.3, Prowl H_2O, and Harbinger 3.3. Rates evaluated were 1, 2, and 4 X. No difference was observed for rice injury at any rate and no difference in yield was observed.

Hybrid Interference with CL131
A study was established this year to evaluate the potential of hybrid rice as weeds. The hybrids used in this study were Arize, CLXL 745, CLXL 729, and XL 723. In 2010, the F_1 and F_2 hybrids will be evaluated. The hybrids we established at populations of 0, 1, 2, and 4 plants/yd^2. CL131 was planted at 60 lb/A. With each hybrid, as densities increased, CL131 tiller numbers and seedhead numbers decreased. When densities reached 4 plant/yd^2, yield decreased 16% from Arize, 19% from CLXL 745 and CLXL 729, and 24% from XL 723 compared with no hybrid planted with CL131. Data indicate all of the hybrids are strong competitors with rice and cannot be allowed to shatter or outcross when grown as crops the previous year.

Evaluation of RiceBeaux – A Pre-Package Mixture of Propanil and Thiobencarb (Bolero)
RiceBeaux is a pre-package mix of propanil plus thiobencarb or Bolero. This product was widely used in 2009. The product is sold at an economical price that only provides the equivalent of 2.25 qt of propanil and 2.25 pt of Bolero. This project has evaluated this product for three years. In order to obtain the residual from the Bolero portion of this mix, a rate of 1 gal/A must be used. The 1-gal rate will provide 3 qt of propanil plus 3 pt of Bolero. It is also important for this product to receive a surface irrigation or rainfall soon after application to get the full benefit of the Bolero portion of the mix. In initial tolerance trials, little to no cultivar or hybrid tolerance issues were observed.

Rice Cultivar and Hybrid Tolerance to Ricestar HT
Short grain Pirogue; medium grains Neptune, Jupiter, and Bengal; long grain Catahoula; aromatic Jazzman; and hybrids Arize and CLXL 745 were evaluated in water-seeded trials for tolerance to Ricestar applied at 17 and 24 oz/A early postemergence and late postemergence. At 8 days after EPOST, injury was 15 to 34% for all lines evaluated. Pirogue injury was the most severe with 30 to 34% injury. Pirogue injury was above 20% at 28 days after early postemergence application. As rice matured, injury was less severe for late postemergence applications. At 21 days after late postemergence application, no visual injury was observed except on Arize. Early-season injury did not translate into a yield reduction.

Evaluation of Experimental Herbicides
This project continues to evaluate several experimental herbicides for potential use in rice. In 2009, ten experimental herbicides were evaluated in rice. One herbicide has both residual and postemergence activity and may receive a federal label in the next 1 to 2 years. These projects are often supported by the company that has the product under development; however, when enough of a product is available, this project expands the research program to gain a better understanding of the herbicide and how it best fits in Louisiana rice production.

Extension Activities
This project is continuing to extend the findings from the weed management research programs in Louisiana to producers, agents, and consultants. An annual report is published every year in a timely manner in order to transfer research findings to the clientele of the state and the region. Over 5,000 Weed Identification Publications have been distributed, and a weed science course at Texas A&M uses it as a teaching tool. This project has done numerous on-farm calls to aid producers, agents, and consultants by making herbicide recommendations and to identify weeds, consult on herbicide failures, and identify herbicide drift problems.

This is a summary of the research that was conducted in 2009. To see the complete weed control annual report, please go to:
http://www.lsuagcenter.com/MCMS/RelatedFiles/%7B9CF8B5B7-6472-4816-A2E6-B5F272939C94%7D/2009+Annual+Report+(Eric+Webster).pdf

STATION PERSONNEL

Steve Linscombe, Professor --- Resident Coordinator

Jodie R. Gautreaux	Administrative Coordinator II
Kimberly G. Guidry	Accounting Specialist I
Carol D. LeDoux	Administrative Program Specialist-A
Darlene M. Regan	Administrative Coordinator IV
Donna L. Sonnier	Custodian I

S. Brooks Blanche, Assistant Professor/Research[1] --- Rice Breeding

Raymond R. Dilly, Jr.	Research Associate/Specialist

Michael D. Dronet, Research Farm Maintenance Manager --------------------------------- Maintenance Department

Harold J. Doucet[2]	Maintenance Repairer Master
Samuel R. Scritchfield[3,4]	Maintenance Repairer I
Ted R. Trahan	Maintenance Repairer I

Donald E. Groth, Professor/Research Coordinator--- Rice Pathology

Carl W. Dischler	Research Associate/Specialist
Marty J. Frey (25%)	Research Associate/Specialist
Laura E. Leonards[5]	Research Farm Assistant I
Xin Hua Wang[6]	Research Associate/Specialist

Dustin Harrell, Assistant Professor --- Rice Agronomy/Rotational Crops

Jacob S. Fluitt[7]	Research Associate/Specialist
James P. Leonards	Research Associate/Specialist
Ronald P. Regan	Research Associate/Specialist
Douglas M. Walker[8]	Research Associate/Coordinator

William J. Leonards, Jr., Research Associate/Coordinator/Manager ----------------------------- Farm Management

Brian D. Broussard	Research Farm Specialist II
Joshua S. Hebert[9]	Research Farm Assistant II
Paul A. Miller	Research Farm Assistant II
Timothy C. Miller	Research Farm Supervisor
Jimmy D. Pellerin	Research Farm Specialist II
Ronald J. Pellerin	Research Farm Manager I
Thomas J. Reed	Research Farm Specialist II

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[1] Transferred to Dean Lee Research Station 12/15/2009.
[2] Retired 05/01/2009.
[3] Appointed 01/26/2009.
[4] Separated 05/15/2009.
[5] Transferred from Breeding Project 02/09/2009.
[6] Retired 03/31/2009.
[7] Appointed 03/01/2009.
[8] Retired 03/31/2009.
[9] Appointed 12/14/2009.

STATION PERSONNEL
(Continued)

Steven D. Linscombe, Professor-- Rice Breeding

Karen F. Bearb	Research Associate/Coordinator
Joshua S. Hebert[10,11]	Research Farm Assistant I
Herman L. Hoffpauir	Research Farm Specialist II
Brent W. Theunissen	Research Associate/Specialist
Richard E. Zaunbrecher[12]	Research Associate/Specialist

Mona M. Meche, Research Associate/Coordinator ------------------------ Rice Anther Culture/Tissue Culture

Jennifer Dronet	Research Farm Assistant II
Xue Jin	Research Farm Specialist I

W. Ray McClain, Professor -- Aquaculture

John J. Sonnier	Research Farm Specialist II

John K. Saichuk, Professor-- Rice Agronomy/Extension

Kim Landry[13]	Extension Associate

Xueyan Sha, Associate Professor-- Rice Breeding

Blake J. Henry	Research Farm Specialist II
Weike Li[14]	Visiting Rice Hybrid Breeder
Shane J. Theunissen	Research Associate/Specialist

Herry Utomo, Assistant Professor ---------------------------------Marker-Assisted Selection Breeding/Biotechnology

Anna L. McClain	Research Farm Specialist II
Soelistijono[15]	Visiting (3-mo) Research Associate/Specialist
Gretchen Zaunbrecher	Research Associate/Specialist

Ida Wenefrida, Assistant Professor/Research--- Biotechnology

Lawrence M. White, III, Research Associate/Coordinator--- Foundation Seed Rice

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[10] Appointed 01/05/2009.
[11] Resigned 05/21/2009.
[12] Appointed 12/21/2009.
[13] Separated 11/04/2009.
[14] Appointed 02/17/2009.
[15] Appointed 12/07/2009.

LSU AGCENTER CAMPUS PERSONNEL

LSU AgCenter personnel conducting research at the Rice Research Station include the following:

Natalie Hummel-- **Rice Insect Control**
Department of Entomology
Anna Meszaros | Extension Associate

James H. Oard --**Rice Genetics**
School of Plant, Environmental and Soil Sciences

Michael E. Salassi--- **Economics**
Department of Agricultural Economics and Agribusiness

Michael J. Stout-- **Rice Insect Control**
Department of Entomology
Marty J. Frey (75%) (Rice Research Station) | Research Associate/Specialist
Jason C. Hamm | Research Associate/Specialist

Eric Webster--- **Weed Control**
Department of Plant Pathology & Crop Physiology
Justin B. Hensley | Post-Doctoral Researcher

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

Jeff Davis-- Soybean Entomology
Department of Entomology
Louisiana State University Agricultural Center

Jong Hyun Ham --Rice Diseases
Department of Plant Pathology and Crop Physiology
Louisiana State University Agricultural Center

Steve A. Harrison --- Wheat and Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Clayton A. Hollier---Rice Diseases
Department of Plant Pathology & Crop Physiology
Louisiana State University Agricultural Center

COOPERATING PERSONNEL
(Continued)

Carrie Knott -- Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Jeb Linscombe --- Coastal Erosion Control
Louisiana Department of Wildlife and Fisheries
Rockefeller Wildlife Refuge, Grand Chenier, LA

Rick Mascagni -- Grain Sorghum
Northeast Research Station
Louisiana State University Agricultural Center

Mike Materne --- Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Boyd Padgett --- Sorghum and Wheat Diseases
Macon Ridge Research Station
Louisiana State University Agricultural Center

Anthony Rivera -- Rice Breeding
University of Puerto Rico Research & Extension Center
Lajas, Puerto Rico

Robert Romaire --- Aquaculture
Aquaculture Research Station
Louisiana State University Agricultural Center

Milton C. Rush -- Rice Diseases
Department of Plant Pathology & Crop Physiology
Louisiana State University Agricultural Center

Prasanta Subudhi -- Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Brenda Tubaña -- Rice Fertilization
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Sonny Viator -- Sweet Sorghum
Iberia Research Station
Louisiana State University Agricultural Center

Bill Williams -- Weed Control/Rice Breeding
Northeast Research Station
Louisiana State University Agricultural Center

E. Allen Wilson -- Bird Control
USDA Animal Damage Control
Crowley, Louisiana