AN OVERVIEW OF 2015 ACTIVITIES IN THE LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

Collins Kimbeng
Sugar Research Station

The continuous influx of new, genetically improved, varieties of sugarcane has contributed immensely to the long-term sustainability of the Louisiana sugar industry. Research to develop new, varieties of sugarcane is accomplished through a multidisciplinary approach drawing from the expertise of scientists and allied professionals from a diversity of disciplines within the LSU AgCenter (Table 1). The LSU AgCenter research team also works in collaboration with other institutions such as the United States Department of Agriculture (USDA) and the American Sugar Cane League. The best varieties from the LSU AgCenter ('L' varieties) and USDA ('Ho' and 'HoCP') programs are brought together for evaluation at the nursery, infield, and outfield testing stages of the program (Table 2). Outfield testing is conducted by personnel from the LSU AgCenter, the USDA, and the American Sugar Cane League. Upon recommending a variety for commercial release, seed increase is carried out by the American Sugar Cane League and generally commences when varieties are introduced to the outfield testing stage (Table 2). The cooperative effort under which the three entities (the LSU AgCenter, the USDA, and the American Sugar Cane League) participate to develop improved sugarcane varieties for the Louisiana sugarcane industry is outlined in the "Three-Way Agreement of 2007".

Table 1. Members of the LSU AgCenter Sugarcane Variety Development Team in 2015.

Team Member	Budgetary Unit	Responsibility
Collins Kimbeng	Sugar Research Station	Program Leader
Michael Pontif	Sugar Research Station	Selection and Variety Testing
Sonny Viator	Iberia Research Station	Variety Testing
Niranjan Baisakh	School of Plant, Environmental and Soil Sciences	Molecular Breeding
Gene Reagan	Entomology	Insect Resistance
Jeff Hoy	Plant Pathology	Disease Resistance
Gertrude Hawkins	Sugar Research Station	Sucrose Laboratory
Mavis Finger	Sugar Research Station	Photoperiod & Crossing
David Sexton	Sugar Research Station	Outfield
Everton Barreto	Sugar Research Station	Bioenergy Research
Todd Robert	Sugar Research Station	Farm Crew
Alphonse Coco	Sugar Research Station	Farm Manager

Success in developing improved sugarcane varieties is heavily dependent on the availability of novel genetic variability made available for selection via targeted cross hybridization among desirable sugarcane parents or clones. Cultivated sugarcane does not flower naturally in Louisiana because of the cool fall temperatures hence, the breeding program must resort to artificial photoperiod treatment to induce and synchronize flowering of sugarcane

parents for crossing. Photoperiod treatment to induce flowering began on June 1, 2015 and continued until September 12, 2015. The first crosses were made in the first week of September 2015 and lasted till November 6, 2015. A total of 710 tassels of 97 clones were used to make 409 crosses with a total of 166,564 viable seeds produced. The number of viable seeds per cross was estimated by counting the number of shoots produced per 0.5 g of seed (fuzz). A total of 138,922 seeds were produced from bi-parental crosses, and 22,659 seeds were produced from polycrosses. The 2015 crossing campaign was an improvement over the 2014 campaign with more tassels flowering, more crosses made and more seeds produced. Details about the 2015 crossing campaign are found in the section titled '**2015 PHOTOPERIOD AND CROSSING IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM**'.

Seeds (fuzz) were germinated in the green house in 25 l x 15 w x 4 h inches metal trays filled with 2 inches of potting mix in January of 2015. Individual seedlings were transplanted into styrofoam trays with 128 (1.5 l x 1.5 w x 1.5 h inches per cell) cells in late February to early March. A total of 85,659 seedlings from 194 crosses, most of them from the 2014 crossing campaign, were transplanted to the field in April, 2015. Many of these seedlings were progeny of biparental crosses among commercial as well as superior experimental varieties. In addition, seedlings were planted in a cross appraisal trial. Individual seedling selection will be carried out next year when these seedlings are in the first stubble crop.

Individual seedling selection was practiced on 51,399 first stubble single stools in the fall of 2015. These seedlings were mostly from the 2013 crossing series that were planted to the field in 2014, allowed to overwinter and were in the first ratoon cane crop in 2015. Selection was conducted in September. Family selection, based on accumulated data from family appraisal studies and visual assessment of seedling populations, was used to discard about ten percent of families prior to selection. The selection criteria included visual appraisal of individual seedlings for disease and insect damage, lodging, yield (stalk number, stalk diameter and height) and then lastly for the absence of pith. This was followed by evaluation of the visually selected clones for Brix using a hand held refractometer. A total of 1,663 clones (3.2 % selection rate) were selected and planted in 10-foot, first line trial plots.

The first line trial plots established the year before (2012 crossing series) were evaluated and superior clones selected and planted into a second line trial. Breeders walked through the plots and dropped clones based on visual appraisal for diseases, insect damage and, if the stand was poor or weak. Clones that were not dropped the first time around were evaluated for pith, and Brix. A total of 473 clones (33 % selection rate) were eventually selected and planted into single row, 16-foot second line trial. From the second line trial established the year before (2011 crossing series) 209 clones were selected and planted into 2-row, unreplicated, 16-foot increase plots. These are tentative selections with the 'seed cane' being increased pending data from the ratoon crop. By the time clones are assigned a permanent 'L' variety number using both the plant and first ratoon cane crop data there will be enough material to plant replicated trials in three on-station nurseries.

Preliminary visual ratings for cane yield and plant type were done in August on the 116 clones from the 2010 crossing series that remained active in the second line trial. Clones with

acceptable ratings were further evaluated for lodging and/or broken tops, borer damage, disease symptoms, pith, cane yield, sucrose content and sugar yield. A total of 38 experimental varieties judged to be superior to the checks were assigned permanent variety designations ("L") in the fall of 2015. These newly assigned experimental varieties were entered into replicated on-station nursery trials (2 replicates, 16-foot plots) at three locations (Sugar Research Station, Iberia Research Station and USDA-ARS Ardoyne Farm). Details about the seedling and early clonal stage selection activities can be found in the section titled '**SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2015**'.

Seventeen experimental varieties from the 2014 assignment series that performed well in the plant cane crop on-station nursery trials were replanted into infield and off station nursery tests. Seven experimental varieties from the 2013 assignment series that performed well in the infield, off-station and on-station nurseries tests were introduced to outfield locations as increase plots. Those that continue to perform well in these tests will subsequently be planted into the outfield testing stage of the program in 2016. Two experimental varieties (L12-201 and L12-202) introduced to outfield locations last year that continued to perform well were entered into the outfield tests and introduced on primary increase stations. One experimental variety, L11-183, continues to be tested in the outfield tests. Additional information can be found in the section titled **'2015 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM NURSERY AND INFIELD VARIETY TRIALS'.**

Rust caused by *Puccinia melanocephalacan* was not a major problem in the 2015 season. There was no need to rate trials specifically for incidence of rust infection. Other diseases also had a minimal effect on the selection process. For example, only 0.92 % of clones were dropped from the first line trial for susceptibility to smut. Artificial screening for these diseases will be carried out to weed out susceptible clones before time and resources are spent evaluating them in multiple locations and years. It was not necessary to spray the crop on the station to prevent borer damage as very little incidences of borer damage were reported.

Promising experimental varieties that made it to the more advanced stages of the program were entered into several tests to screen for resistance to prominent diseases (Dr. Jeff Hoy, Plant Pathologist) and insect pests (Dr. Gene Reagan, Entomologist). Results gathered from these screening tests will be influential in determining which varieties to recommend for commercial release and how best to manage these varieties during commercial production. The data will also be useful in the crossing program in determining what parents to pair in order to avoid making susceptible by susceptible crosses. Also informative were data from the molecular breeding program (Dr. Niranjan Baisakh) in deciding, which crosses to make based on genetic diversity among parents at the molecular level and, which parents harbor the Bru 1 gene that confers rust resistance.

In general, the 2015 sugarcane crop improvement program accomplished all of its goals for the year. The season started slowly because of the uncharacteristically wet conditions experienced during peak planting and harvesting times throughout the year. Hurricane Patricia

came through in late October causing the remainder of the planting and harvesting operations to suffer several delays but in the end all the experiments were planted and harvested as planned.

The decision regarding further testing and seed increase of candidate varieties in the program was determined at the Variety Advancement Committee meeting. The 2015 meeting was held on Friday August 7, 2015 at the American Sugar Cane League office in Thibodaux, Louisiana.

Progress in the LSU AgCenter Sugarcane Variety Development Program would not be possible without the financial support of state funds through the LSU AgCenter and the Louisiana sugar industry through the American Sugar Cane League and the cooperation of personnel from the American Sugar Cane League and the USDA-ARS Sugarcane Research Unit. All are gratefully acknowledged.

Table 2. Chronological activities within the LSU AgCenter sugarcane variety ('L' varieties) development program.

Year	Stage and activity
1	Crossing
2	Seedlings planted
3	Seedlings selected in 1R to plant first line trial
4	First line trial selected in PC to plant second line trial
5	Second line trial selected in PC to plant increase plots
6	Second line trial selected in 1R Assign permanent 'L' variety numbers On-station nurseries planted (at St. Gabriel, Houma, New Iberia) from increase plots
7	On-station nurseries PC harvested Off-station (3) and infield (2) nurseries planted
8	On-station nurseries 1R harvested Off-station and infield nurseries PC harvested Increase experimental clones at 12 outfield test sites Introduce experimental clones to 3 ASCL primary increase stations
9	On-station nurseries 2R harvested Off-station and infield 1R nurseries harvested Outfield tests planted at 12 locations Increase experimental clones on 3 ASCL primary increase stations
10	On-station nurseries 3R harvested Off-station and infield nurseries 2R harvested Outfield tests PC harvested Continue to increase experimental clones on primary increase stations
11	Off-station and infield nurseries 3R harvested Outfield tests 1R harvested Introduce experimental clones to 44 ASCL secondary increase stations
12	Outfield tests 2R harvested Increase experimental clones on 44 ASCL secondary increase stations
13	Variety release meeting New variety distributed by ASCL from secondary increase stations

1R, First ratoon cane crop; PC, Plant cane crop; 2R, Second ratoon cane crop; ASCL, American Sugar Cane League.

2015 PHOTOPERIOD AND CROSSING IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

Mavis Daigle and Collins Kimbeng
LSU AgCenter Sugar Research Station
St. Gabriel, LA

The longstanding and continued goal of the LSU AgCenter's Sugarcane Variety Development Program is the development of genetically improved sugarcane varieties which will positively impact the sugar industry. The variety development program begins with the photoperiod and crossing stages. Photoperiod treatments are managed as to encourage flowering of genotypes that would otherwise not naturally flower in Louisiana's climatic conditions. Crosses are made through hybridization techniques that use sugarcane yield components, borer resistance characteristics, and disease resistance characteristics as criteria. The breeding program strives to produce crosses that will yield superior progeny.

Eyepiece cuttings of breeding genotypes to be used for the 2015 crossing season were planted in October of 2014. The cuttings were planted in Styrofoam cell trays and maintained in the greenhouse. In late January of 2015, the cuttings were transferred to can culture. The transplants were planted in large cans (38 liters) containing equal parts of field soil, washed sand, and peat moss and maintained in the greenhouse. In early April of 2015, after the danger of frost, the cans were moved from the greenhouse to the photoperiod rail carts. Natural lighting and six light-tight chambers were used for photoperiod treatments. The cans were placed on photoperiod carts and assigned to a specific photoperiod regime based on flowering type. Genotypes that are difficult to flower were given a longer induction treatment and longer decline period. Fertilization was adjusted to condition plants for floral induction as a high C:N ratio has been shown to promote flowering in sugarcane.

The first photoperiod treatment began on June 1, 2015. All photoperiod treatments were initiated with a minimum of 37 consecutive days of 12 ½ hours of constant day length (Table 1). After the initial constant photoperiod days, artificial day length was shortened by one minute per day. Tassel (flower) initiation begins when day length begins to decrease. Treatments differed by the number of days with constant day length and the date on which the decline of photoperiod was initiated (Table 1). All photoperiod treatments were discontinued on September 12, 2015, when natural day length was less than 12 ½ hours and decreasing at a rate conducive to sugarcane flowering.

The flowering season began in the first week of September in 2015. The 2015 flowering season started approximately a week later than the flowering season observed in 2014. The normal time frame for first flowering can be as early as the last week of August or as late as the third week of September. There may be a slight deviation in the appearance of the first flower due to temperature during the photoperiod induction phase, varietal characteristics, and the photoperiod treatments. Flowering percentages of stalks on photoperiod carts did improve in 2015 as compared with the 2014 flowering season. The largest increase in flowering percentages was observed in photoperiod carts located in position "C" (Table 1). Flowering percentages of stalks in all position "C" locations did not exceed 28% in 2014, whereas, in 2015, flowering

percentages were as high as 53% in a particular position "C" location (Table 1). The total flowering percentage for the six photoperiod bays increased from 38% in 2014 to 42% in 2015. Of a total of 1,674 stalks, 710 tassels were produced (Table 2). The peak of the 2015 flowering season was observed approximately 3 weeks earlier than the peak observed during the 2014 flowering season. In 2015, the flowering season peaked in early-September through late-September (Fig. 1).

Crossing began on September 4, 2015 and ended on November 6, 2015. A total of 710 tassels of 97 genotypes (Table 4) were used to produce 409 crosses (Table 3, Table 5). A total of 166,564 viable seed were produced in 2015 (Table 3). A total of 138,922 seed were produced from bi-parental crosses and a total of 22,659 seed were produced from polycrosses (Table 3). Germination rate was estimated based on the germination of 0.5 g of seed under greenhouse conditions in late December of 2015. Germination rates improved in 2015 (Table 3) as compared with germination rates observed in 2014.

Overall, weather conditions throughout the 2015 crossing season were relatively mild. The average high temperatures in September and October of 2015 were 90˚F and 83˚F respectively. Average weekly high temperatures did not exceed 90˚F during the 2015 crossing season. Additionally, there were few days of unfavorable weather conditions and plants on the rail carts were allowed to remain outside in direct sunlight for maximum allowable light exposure. The increase in flower production in 2015 as compared with flower production in 2014, especially in the photoperiod carts located in position "C", may have been due in part to the increased exposure of the plants to direct sunlight. In an attempt to increase watering efficiency, Terra-Sorb® was added to marcotts in 2015. Terra-Sorb® is a super-absorbent hydrogel designed to absorb up to 150 times its weight in water and absorb and release water into the soil to meet plant needs. Terra-Sorb® was added to marcotts to ensure that they remained well watered especially after being removed from the mother plant for crossing purposes. Continued use of the data-logging system installed in the crossing greenhouse in 2014 allowed for better management of temperature and relative humidity in the crossing greenhouse. Better control of the temperature and relative humidity in the crossing greenhouse as well as the relatively mild ambient temperatures observed in 2015 may have contributed to the increased seed set noted in 2015. Finally, insect pests were managed through an intensive scouting program. No problems due to insect pest were observed in 2015.

Table 1. Summary of the 2015 photoperiod treatments for the LSU AgCenter's sugarcane variety development program

Bay	Cart	Treatment Start Date	Days of Constant Photoperiod	Date Photoperiod Decline Started	Days of Declining Photoperiod		Mean Flowering Date	Total Stalks	Percent Flowered
					Peak 1	Peak 2			
1	A	16-Jun	44	30-Jul	72	87	291±2	95	36
1	B	16-Jun	44	30-Jul	72	87	284±2	90	21
1	C	16-Jun	44	30-Jul	72	87	293±2	95	19
2	A	16-Jun	44	30-Jul	72	87	293±1	97	52
2	B	16-Jun	44	30-Jul	72	87	285±2	97	30
2	C	16-Jun	44	30-Jul	72	87	284±2	85	45
3	A	01-Jun	37	8-Jul	87	102	265±1	88	65
3	B	01-Jun	37	8-Jul	87	102	268±2	96	30
3	C	01-Jun	37	8-Jul	87	102	265±3	90	38
4	A	01-Jun	37	8-Jul	87	102	271±2	96	61
4	B	01-Jun	37	8-Jul	87	102	273±3	95	34
4	C	01-Jun	37	8-Jul	87	102	263±2	90	33
5	A	01-Jun	41	12-Jul	82	97	270±1	94	53
5	B	01-Jun	41	12-Jul	82	97	265±1	90	50
5	C	01-Jun	41	12-Jul	82	97	265±1	93	45
6	A	01-Jun	41	12-Jul	82	97	272±2	94	60
6	B	01-Jun	41	12-Jul	82	97	277±2	96	41
6	C	01-Jun	41	12-Jul	82	97	272±2	93	53

Table 2. Summary of can, variety, and flower information in bays 1-6 subjected to photoperiod treatments.

Varieties used in crossing	Cans with stalks	Cans with tassels	Total stalks	Total tassels	Mean stalks per can	Mean tassels per can†	Mean pollen rating‡	Mean days to flower§
----------Number----------								
97	323	222	1674	710	5.18 ± 0.93	3.20 ± 1.53	5.33 ± 1.76	77.64 ± 14

† Based upon cans with tassels.

‡ Pollen rating of 1 through 4 indicates male tassel; pollen rating of 5 through 9 indicates female tassel.

§ Days from photoperiod decline start date to flowering.

Table 3. Summary of 2015 crossing and seed production.

Type of Cross	Crosses	Sum of Seed Production	Mean Seed Production Per Cross	Mean Seed Production Per Female Tassel	Mean Germination Per Gram Seed
----------Number----------					
Biparental	360	138922	386±581	386±581	31±41
Polycross	46	22659	493±855	493±855	34±42
Self	3	4983	1661±2869	1661±2869	65±112
Total	409	166564	407±656	407±656	34±44

Table 4. Varietal flowering summary in 2015 in the photoperiod bays.

Variety	Days of Constant Photoperiod	First Flower Date	Mean Days to Flower	Pollen Rating	Total Stalk Number	Total Flowers	Percent Flowering Stalks
CP1983-644	41	261	77±1	4	27	16	59
HO1995-988	41	264	72±1	5±1	4	4	100
HO2006-530	41	275	82	6	3	2	67
HO2006-563	37	266	82±3	4	5	4	80
HO2007-613	41±1	289	87±9	7	23	2	9
HO2007-617	44	.	.	.	6	.	.
HO2008-709	43	273	84±2	7	18	3	17
HO2008-711	44	.	.	.	5	.	.
HO2008-717	41±1	287	98	7	12	1	8
HO2008-730	41	.	.	.	6	.	.
HO2009-827	44	303	94±2	8±1	6	2	33
HO2009-832	44	.	.	.	5	.	.
HO2009-840	43	261	70±2	7	12	7	58
HO2009-9401	37	254	69±2	8	5	5	100
HO2009-9402	37	247	58	8	3	2	67
HO2011-515	44	294	90±3	5	6	6	100
HO2011-532	39±1	266	85±4	4	11	7	64
HO2011-556	37	247	61±3	4	6	5	83
HO2011-572	37	.	.	.	5	.	.
HO2011-573	37	.	.	.	5	.	.
HO2011-9405	44	.	.	.	6	.	.
HO2011-9406	44	.	.	.	4	.	.
HO2012-615	44	292	84±1	6±1	6	6	100
HO2012-626	41	.	.	.	6	.	.
HO2012-633	41	282	91±2	6	4	3	75
HO2012-641	41	289	96	4	3	1	33
HO2012-9410	37	254	69±2	8	5	4	80
HOCP1985-845	40	261	80±5	7	15	6	40
HOCP1991-552	41±1	252	65±1	4	28	22	79
HOCP1992-618	40±1	268	86±7	5±1	27	4	15
HOCP1992-624	41±1	259	77±2	7	42	9	21
HOCP1995-951	40±1	264	78±1	7	21	3	14
HOCP1996-540	41	261	79±2	3	37	19	51
HOCP1996-561	41±1	278	88±4	5	14	7	50
HOCP1997-609	39±1	273	87±3	3	12	5	42
HOCP2000-950	41	264	86±3	8	41	15	37
HOCP2001-517	41±1	299	110	7	29	1	3
HOCP2001-523	40	268	83±4	6±1	17	4	24
HOCP2002-618	40±1	264	81±3	4	16	9	56
HOCP2004-838	42±1	257	75±4	3	24	11	46
HOCP2004-847	39	268	80±5	8	19	3	16
HOCP2005-902	41	273	85±5	7	6	2	33
HOCP2009-804	41±1	268	79	4	16	3	19
HOCP2009-814	37	.	.	.	3	.	.
HOCP2009-846	44	.	.	.	6	.	.
HOCP2011-516	44	.	.	.	5	.	.
L1994-426	41±1	266	81±4	7	22	4	18

Table 4. Continued

Variety	Days of Constant Photoperiod	First Flower Date	Mean Days To Flower	Pollen Rating	Total Stalk Number	Total Flowers	Percent Flowering Stalks
L1994-428	41	.	.	.	4	.	.
L1994-433	38	296	109±4	7	16	3	19
L1997-128	40±1	257	73±2	7	22	16	73
L1998-207	42±1	259	69±3	7	30	2	7
L1998-209	40±1	259	84±7	7±1	17	6	35
L1999-226	41	266	85±2	4	53	26	49
L1999-233	41	254	71±2	4	34	20	59
L2001-283	41	273	96±4	6±1	28	12	43
L2001-299	40	254	73±1	4	59	49	83
L2001-315	37	261	74±1	7	6	3	50
L2003-371	41	268	78±2	5±1	5	3	60
L2005-448	37	259	71±1	4	5	3	60
L2005-457	42	247	66±1	8	35	33	94
L2006-001	41	261	81±2	5	42	14	33
L2006-038	40±1	261	73±2	4	14	9	64
L2006-040	41±1	264	82±3	7	22	12	55
L2007-057	39±1	254	67±1	4	21	16	76
L2008-088	37	.	.	.	6	.	.
L2008-090	40±1	259	77±2	4	30	22	73
L2009-099	41±1	254	75±3	4	23	15	65
L2009-112	39±1	.	.	.	11	.	.
L2009-123	37	259	71	7	6	6	100
L2009-125	44	.	.	.	3	.	.
L2009-131	44	.	.	.	4	.	.
L2010-146	37	.	.	.	5	.	.
L2011-168	37	257	76±5	8	3	3	100
L2011-172	37	261	77±2	4	10	10	100
L2011-178	37	261	72	7	6	5	83
L2011-183	41	266	89±5	7	6	5	83
L2011-187	39±1	264	78±2	4	10	7	70
L2012-201	37	.	.	.	3	.	.
L2012-202	37	261	86±8	6±1	7	4	57
L2012-210	37	.	.	.	5	.	.
L2012-218	40±1	275	91±5	5±1	9	3	33
L2012-227	42±1	271	84±2	4	8	5	63
L2013-234	41	259	71±3	5±1	6	6	100
L2013-236	44	.	.	.	5	.	.
L2013-240	41	.	.	.	3	.	.
L2013-241	41	264	71	7	5	4	80
L2013-242	44	.	.	.	6	.	.
L2013-243	41	264	72±1	4±1	5	2	40
L2013-245	44	.	.	.	4	.	.
L2013-246	41	273	81±1	7	4	3	75
L2013-249	44	.	.	.	4	.	.
L2013-250	41	.	.	.	6	.	.
L2013-251	41	259	69±1	4	6	6	100
L2013-254	44	.	.	.	4	.	.
L2013-256	44	.	.	.	6	.	.

Table 4. Continued

Variety	Days of Constant Photoperiod	First Flower Date	Mean Days To Flower	Pollen Rating	Total Stalk Number	Total Flowers	Percent Flowering Stalks
L2013-258	44	.	.	.	4	.	.
L2013-259	41	254	62±1	7	5	3	60
L2014-264	37	261	72	7	3	2	67
L2014-265	39±1	247	62±2	7	12	11	92
L2014-266	40±1	287	85±6	7	11	3	27
L2014-267	44	.	.	.	5	.	.
L2014-268	40±1	264	84±4	6±1	10	10	100
L2014-269	44	280	86±3	7	12	9	75
L2014-270	44	.	.	.	4	.	.
L2014-271	44	.	.	.	6	.	.
L2014-272	40±1	257	76±9	8	9	6	67
L2014-273	40±1	261	76±4	7	10	5	50
L2014-274	37	266	77	8	5	1	20
L2014-275	37	252	69±2	7	11	6	55
L2014-276	41	261	81±6	8	6	6	100
L2014-277	39±1	275	84±2	8	12	3	25
L2014-278	39±1	261	78±3	7	11	8	73
L2014-279	41	261	71±2	8	11	3	27
L2014-280	41±1	.	.	.	10	.	.
L2014-281	44	.	.	.	11	.	.
L2014-282	43	266	84±4	7±1	12	7	58
L2014-284	37	.	.	.	6	.	.
L2014-285	41	273	84±3	4	11	5	45
L2014-286	43	268	87±3	6±1	12	9	75
L2014-287	43	280	87	6	12	1	8
L2014-288	44	.	.	.	11	.	.
L2014-289	44	.	.	.	6	.	.
L2014-290	44	.	.	.	12	.	.
L2014-291	37	261	76±2	4	11	8	73
L2014-292	38±1	.	.	.	9	.	.
L2014-293	41	.	.	.	6	.	.
L2014-294	41	264	77±5	6±1	12	6	50
L2014-295	44	.	.	.	6	.	.
L2014-296	43±1	285	97±5	4±1	10	2	20
L2014-297	44	.	.	.	5	.	.
L2015-298	44	287	79±3	6	5	3	60
L2015-300	37	273	87±2	4	5	4	80
L2015-301	37	.	.	.	5	.	.
L2015-302	44	285	78±1	8	4	4	100
L2015-303	37	.	.	.	6	.	.
L2015-304	37	268	81±2	4	5	3	60
L2015-305	37	.	.	.	5	.	.
LCP1981-010	42±1	261	80±2	5	17	11	65
LCP1985-384	41	261	82±3	4	39	18	46
LCP1986-454	41	271	78	4	8	1	13
N27	41	266	85±4	7	17	8	47
US2001-040	39±1	282	93±2	6±1	10	4	40

Table 5. Crosses and seed made in 2015

Cross	Female	Male	Seed
XL15-001	L05-457	HO11-556	1207
XL15-002	L14-265	HO11-556	54
XL15-003	HO09-9402	HO11-556	515
XL15-004	L14-265	HOCP91-552	1295
XL15-005	L05-457	HOCP91-552	2557
XL15-006	L14-265	HOCP91-552	1735
XL15-007	L14-275	HOCP91-552	676
XL15-008	HOCP91-552	HOCP91-552	4974
XL15-009	L14-265	HOCP91-552	2075
XL15-010	HO12-9401	HOCP91-552	512
XL15-011	L14-275	L07-057	2384
XL15-012	L13-259	L14-265	0
XL15-013	L14-265	L14-265	0
XL15-014	HO09-9401	L01-299	7
XL15-015	HO12-9410	L01-299	57
XL15-016	L07-057	15P1	729
XL15-017	L09-099	15P1	3195
XL15-018	L99-233	15P1	1274
XL15-019	L11-168	L09-099	862
XL15-020	HO09-9401	L09-099	426
XL15-021	L14-272	L09-099	326
XL15-022	L13-259	L09-099	53
XL15-023	HO12-9410	L09-099	864
XL15-024	L97-128	L99-233	81
XL15-025	L14-272	L99-233	493
XL15-026	L07-057	L01-299	608
XL15-027	L07-057	L01-299	422
XL15-028	L14-275	HOCP04-838	755
XL15-029	L99-233	L01-299	304
XL15-030	L05-457	L01-299	575
XL15-031	L01-299	L01-299	9
XL15-032	HOCP92-624	L01-299	62
XL15-033	L98-209	L01-299	211
XL15-034	L05-457	L01-299	448
XL15-035	L08-090	L13-234	9
XL15-036	L13-251	L13-234	631
XL15-037	L05-448	L13-234	66
XL15-038	L05-457	L07-057	353
XL15-039	L97-128	L07-057	0
XL15-040	L01-299	L07-057	295
XL15-041	L01-299	L99-233	236
XL15-042	L09-123	L99-233	1269
XL15-043	L98-207	HOCP04-838	1069
XL15-044	L01-299	L13-234	45
XL15-045	L13-234	HOCP04-838	1443
XL15-046	L97-128	HOCP04-838	51
XL15-047	L14-264	HOCP04-838	15
XL15-048	L97-128	HOCP96-540	0
XL15-049	HO09-9401	HOCP96-540	0
XL15-050	HO12-9410	HOCP96-540	872
XL15-051	L14-279	HOCP96-540	0
XL15-052	L14-273	HOCP91-552	425
XL15-053	L11-178	HOCP91-552	832
XL15-054	L12-202	HOCP91-552	91
XL15-055	L09-123	HOCP91-552	22
XL15-056	HOCP91-552	L05-448	124
XL15-057	LCP81-010	L05-448	670
XL15-058	L09-123	L05-448	261
XL15-059	L09-123	LCP85-384	333
XL15-060	L01-315	LCP85-384	724
XL15-061	L14-273	LCP85-384	98
XL15-062	HOCP92-624	L08-090	215
XL15-063	HO12-9410	L08-090	873
XL15-064	L14-276	L08-090	111
XL15-065	L09-123	L08-090	0
XL15-066	HOCP92-624	L01-299	857
XL15-067	HO09-840	L01-299	63
XL15-068	L14-264	L01-299	0
XL15-069	HO09-840	L06-038	240
XL15-070	L14-275	L06-038	729
XL15-071	L05-457	L06-038	468
XL15-072	HOCP85-845	L13-251	251
XL15-073	L97-128	L13-251	33
XL15-074	L14-278	L13-251	228
XL15-075	HO09-840	L14-291	78
XL15-076	L11-178	L14-291	607
XL15-077	L14-275	L14-291	923
XL15-078	L08-090	L01-299	78
XL15-079	HOCP91-552	L01-299	297
XL15-080	CP83-644	L01-299	87
XL15-081	L14-278	L09-099	352
XL15-082	L11-178	L09-099	1008
XL15-083	L13-251	L09-099	2233
XL15-084	L97-128	L11-172	0
XL15-085	L11-178	L11-172	145
XL15-086	L14-275	L11-172	0
XL15-087	L07-057	L01-299	81
XL15-088	L06-001	15P2	0
XL15-089	L07-057	15P2	414
XL15-090	L11-178	15P2	426
XL15-091	L14-278	15P2	63
XL15-092	HOCP95-951	LCP85-384	526
XL15-093	L13-241	LCP85-384	148
XL15-094	L14-294	LCP85-384	0
XL15-095	HO95-988	LCP85-384	34
XL15-096	L99-233	L01-299	1183

Table 5. Continued

Cross	Female	Male	Seed
XL15-097	HO95-988	L01-299	132
XL15-098	L14-294	HOCP96-540	12
XL15-099	LCP81-010	HOCP96-540	56
XL15-100	HO95-988	HOCP96-540	27
XL15-101	L06-040	HOCP96-540	0
XL15-102	L14-276	L08-090	85
XL15-103	L14-294	L08-090	262
XL15-104	HOCP92-624	L08-090	12
XL15-105	L01-315	L08-090	92
XL15-106	L13-241	CP83-644	276
XL15-107	L14-268	CP83-644	475
XL15-108	L14-276	CP83-644	190
XL15-109	HOCP00-950	L11-172	22
XL15-110	L01-315	L11-172	108
XL15-111	L06-040	L11-172	73
XL15-112	L98-207	L11-172	319
XL15-113	L06-040	L11-172	159
XL15-114	L13-241	L11-172	738
XL15-115	L97-128	L14-291	0
XL15-116	L06-040	L14-291	42
XL15-117	L13-243	15P3	368
XL15-118	L14-268	15P3	397
XL15-119	LCP85-384	15P3	116
XL15-120	L09-099	15P3	248
XL15-121	L08-090	15P3	0
XL15-122	HO11-556	15P3	808
XL15-123	HOCP91-552	15P3	213
XL15-124	L13-241	15P4	130
XL15-125	L07-057	15P4	72
XL15-126	L11-172	15P4	973
XL15-127	L11-187	15P4	453
XL15-128	L98-209	15P4	310
XL15-129	HOCP02-618	15P4	282
XL15-130	HOCP96-540	15P4	296
XL15-131	HO09-9401	L99-226	391
XL15-132	L11-183	L99-226	0
XL15-133	L14-274	L99-226	0
XL15-134	L05-457	L99-226	22
XL15-135	N27	LCP85-384	21
XL15-136	HOCP00-950	LCP85-384	83
XL15-137	L14-279	LCP85-384	51
XL15-138	L05-457	LCP85-384	60
XL15-139	L14-279	HO11-532	23
XL15-140	L14-282	HO11-532	670
XL15-141	N27	HO11-532	214
XL15-142	L05-457	HO11-532	292
XL15-143	L97-128	L13-243	5
XL15-144	L11-168	L13-251	0
XL15-145	L14-272	HO06-563	95
XL15-146	L94-426	HO06-563	48
XL15-147	L14-294	HOCP02-618	58
XL15-148	HOCP04-838	HOCP02-618	9
XL15-149	L98-209	HOCP02-618	37
XL15-150	L14-291	HOCP02-618	0
XL15-151	L06-001	HOCP02-618	16
XL15-152	L03-371	HOCP09-804	109
XL15-153	L14-278	HOCP09-804	32
XL15-154	HOCP00-950	HOCP09-804	0
XL15-155	HOCP04-847	HOCP09-804	78
XL15-156	L05-457	HOCP09-804	79
XL15-157	L11-187	L14-286	0
XL15-158	CP83-644	L14-286	67
XL15-159	HOCP85-845	L14-286	181
XL15-160	L14-282	L14-286	996
XL15-161	L99-233	L01-299	312
XL15-162	N27	L99-226	1353
XL15-163	HOCP92-624	L99-226	318
XL15-164	HOCP04-847	L99-226	13
XL15-165	HOCP92-618	L15-304	44
XL15-166	L11-187	L15-304	149
XL15-167	HOCP85-845	L15-304	355
XL15-168	LCP85-384	L15-304	34
XL15-169	HOCP00-950	L15-304	9
XL15-170	L14-265	CP83-644	0
XL15-171	HO95-988	CP83-644	0
XL15-172	L14-294	CP83-644	0
XL15-173	L14-278	CP83-644	299
XL15-174	L12-202	CP83-644	0
XL15-175	L14-282	HOCP96-540	114
XL15-176	HOCP85-845	HOCP96-540	0
XL15-177	L97-128	HOCP96-540	0
XL15-178	HOCP01-523	15P5	326
XL15-179	L11-172	15P5	7
XL15-180	L11-172	15P5	192
XL15-181	L06-001	15P5	0
XL15-182	L06-001	15P5	0
XL15-183	HOCP91-552	15P5	104
XL15-184	HO06-563	15P5	106
XL15-185	CP83-644	15P5	0
XL15-186	CP83-644	15P5	30
XL15-187	HOCP02-618	15P5	0
XL15-188	HOCP92-618	15P5	0
XL15-189	HOCP91-552	15P5	0
XL15-190	L13-234	15P5	653
XL15-191	L08-090	15P5	8
XL15-192	L99-233	L01-299	359

Table 5. Continued

Cross	Female	Male	Seed
XL15-193	LCP86-454	L01-299	95
XL15-194	HOCP02-618	L12-227	45
XL15-195	HOCP95-951	L12-227	125
XL15-196	L05-457	L12-227	88
XL15-197	L14-268	L12-227	271
XL15-198	HOCP01-523	CP83-644	140
XL15-199	L06-001	CP83-644	0
XL15-200	L14-272	CP83-644	57
XL15-201	L11-172	CP83-644	2
XL15-202	L14-291	CP83-644	23
XL15-203	CP83-644	HOCP91-552	0
XL15-204	L06-038	HOCP91-552	51
XL15-205	L09-099	HOCP91-552	104
XL15-206	L14-272	L08-090	13
XL15-207	L94-426	L08-090	0
XL15-208	HOCP00-950	L03-371	9
XL15-209	HOCP05-902	L03-371	80
XL15-210	L01-283	L03-371	209
XL15-211	L01-283	L99-226	657
XL15-212	L05-457	L99-226	1595
XL15-213	HO08-709	L99-226	2011
XL15-214	L11-168	L99-226	877
XL15-215	L05-457	L99-226	347
XL15-216	L05-457	HO11-532	1002
XL15-217	L14-282	HO11-532	485
XL15-218	L14-285	HO11-532	540
XL15-219	L14-268	L08-090	292
XL15-220	L12-202	L08-090	244
XL15-221	L11-187	L08-090	33
XL15-222	L14-285	HOCP97-609	110
XL15-223	L14-282	HOCP97-609	684
XL15-224	L14-276	HOCP97-609	988
XL15-225	N27	L99-226	1537
XL15-226	L94-426	L99-226	0
XL15-227	L14-268	L99-226	117
XL15-228	L13-246	L99-226	573
XL15-229	L05-457	15P6	4573
XL15-230	HOCP85-845	15P6	1160
XL15-231	HOCP95-951	15P6	857
XL15-232	HOCP96-540	15P6	1788
XL15-233	HOCP04-838	15P6	67
XL15-234	CP83-644	15P6	254
XL15-235	HO06-563	15P6	94
XL15-236	HOCP91-552	15P6	217
XL15-237	L07-057	15P6	1390
XL15-238	L14-291	15P6	0
XL15-239	L15-300	15P6	67
XL15-240	HOCP00-950	L15-300	0
XL15-241	L05-457	L15-300	15
XL15-242	L05-457	L99-226	585
XL15-243	HO06-530	L99-226	956
XL15-244	L98-209	L99-226	2696
XL15-245	L01-283	L99-233	1210
XL15-246	HO06-530	L99-233	1084
XL15-247	HOCP00-950	L15-300	0
XL15-248	HO09-840	L15-300	0
XL15-249	HOCP02-618	L09-099	107
XL15-250	L14-278	L09-099	0
XL15-251	HO11-532	L09-099	134
XL15-252	L14-277	L12-218	168
XL15-253	L13-246	L12-218	58
XL15-254	L11-187	L12-218	0
XL15-255	L05-457	HOCP04-838	258
XL15-256	L06-040	L06-038	308
XL15-257	L13-246	L06-038	1406
XL15-258	L14-278	L06-038	44
XL15-259	L14-282	L06-038	510
XL15-260	L13-234	HOCP97-609	0
XL15-261	L14-286	HOCP97-609	1021
XL15-262	HOCP00-950	L06-001	436
XL15-263	HOCP04-847	L11-172	0
XL15-264	HOCP96-561	L07-057	183
XL15-265	HO08-709	HO06-563	1071
XL15-266	L01-283	L99-226	0
XL15-267	L05-457	L99-226	2082
XL15-268	L06-040	L99-226	380
XL15-269	CP83-644	L99-226	28
XL15-270	L01-283	L08-090	364
XL15-271	L97-128	L08-090	36
XL15-272	CP83-644	L08-090	114
XL15-273	HO08-709	L08-090	927
XL15-274	L12-227	L08-090	0
XL15-275	L14-287	HOCP04-838	0
XL15-276	HOCP92-618	HOCP04-838	17
XL15-277	L14-285	HO11-532	16
XL15-278	L99-233	HO11-532	22
XL15-279	L01-299	HO11-532	101
XL15-280	L99-233	HOCP96-540	56
XL15-281	L97-128	L15-300	0
XL15-282	L14-273	L15-300	8
XL15-283	L14-273	L01-299	0
XL15-284	HOCP00-950	L01-299	46
XL15-285	L11-183	L01-299	6
XL15-286	L09-099	L01-299	13
XL15-287	L14-273	L01-299	109
XL15-288	HOCP00-950	L99-233	0

Table 5. Continued

Cross	Female	Male	Seed
XL15-289	L05-457	L99-233	298
XL15-290	L14-278	L99-233	23
XL15-291	N27	L99-233	221
XL15-292	US01-040	L99-233	35
XL15-293	HOCP05-902	L99-226	68
XL15-294	L11-183	L99-226	14
XL15-295	HOCP01-523	L99-226	173
XL15-296	HO09-840	L08-090	0
XL15-297	L06-040	L08-090	32
XL15-298	HOCP01-523	L08-090	67
XL15-299	HO09-840	L11-187	0
XL15-300	HO12-633	L11-187	0
XL15-301	N27	L11-187	66
XL15-302	HO12-633	L12-227	0
XL15-303	L05-457	L12-227	0
XL15-304	L14-277	L12-227	0
XL15-305	HOCP92-624	L99-226	154
XL15-306	LCP85-384	L99-226	180
XL15-307	L94-426	L99-226	0
XL15-308	L98-209	L99-226	22
XL15-309	L97-128	L01-299	23
XL15-310	HOCP91-552	L01-299	19
XL15-311	L14-286	L01-299	0
XL15-312	L11-187	L01-299	0
XL15-313	US01-040	L01-299	17
XL15-314	L97-128	HOCP04-838	0
XL15-315	L15-302	HOCP04-838	464
XL15-316	L14-296	LCP81-010	0
XL15-317	HOCP96-561	LCP81-010	10
XL15-318	HOCP92-624	L01-283	1155
XL15-319	HO12-633	L01-283	0
XL15-320	L05-457	L01-283	202
XL15-321	L14-276	L01-283	101
XL15-322	L14-266	L01-299	10
XL15-323	L14-285	L01-299	197
XL15-324	US01-040	L01-299	92
XL15-325	L08-090	L01-299	26
XL15-328	L11-183	L99-226	329
XL15-329	HO08-717	L99-226	1074
XL15-330	HOCP02-618	L99-226	32
XL15-331	HOCP97-609	L99-226	972
XL15-332	L15-298	L99-226	682
XL15-333	L15-298	L99-233	1020
XL15-334	US01-040	LCP85-384	492
XL15-335	L12-218	L06-001	2355
XL15-336	HO07-613	L06-001	1705
XL15-337	N27	L06-001	4733
XL15-338	L06-040	L06-001	454
XL15-339	L14-286	HOCP96-540	1119
XL15-340	L15-302	LCP81-010	422
XL15-341	L09-099	LCP81-010	200
XL15-342	L97-128	L14-268	21
XL15-343	HO12-641	L14-268	685
XL15-344	L14-269	HOCP04-838	577
XL15-345	HO09-840	HOCP96-561	629
XL15-346	HO12-615	HOCP96-561	134
XL15-347	HOCP92-618	HOCP96-561	416
XL15-348	HO12-615	L06-001	167
XL15-349	L06-040	L06-001	1270
XL15-350	L15-302	LCP81-010	753
XL15-351	L97-128	L09-099	102
XL15-352	LCP85-384	L01-299	476
XL15-353	HOCP00-950	HOCP96-540	57
XL15-354	L14-269	HOCP96-540	517
XL15-355	L11-183	L99-226	443
XL15-356	HO11-515	L99-226	1373
XL15-357	HOCP96-561	L99-226	1466
XL15-358	L98-209	L14-294	1029
XL15-359	L14-266	L14-294	520
XL15-360	L14-276	L14-296	153
XL15-361	L14-269	L14-296	260
XL15-362	L14-269	L09-099	1113
XL15-363	HOCP00-950	HOCP96-540	210
XL15-364	L14-286	HOCP96-540	924
XL15-365	HO12-615	L01-283	112
XL15-366	HOCP00-950	L01-283	302
XL15-367	HOCP11-516	L01-283	701
XL15-368	L94-433	L01-283	704
XL15-369	HO12-615	L06-001	107
XL15-370	L12-202	L06-001	0
XL15-371	L14-286	L06-001	419
XL15-372	L12-615	L99-226	137
XL15-373	L15-298	L99-226	730
XL15-374	HO12-615	HO11-532	90
XL15-375	HOCP01-517	L99-226	1520
XL15-376	N27	L01-299	1145
XL15-377	L08-090	HO11-515	0
XL15-378	L12-227	HO11-515	0
XL15-379	HOCP91-552	L09-099	16
XL15-380	LCP85-384	L09-099	214
XL15-381	L14-286	L99-233	1519
XL15-382	L14-269	L99-233	142
XL15-383	L94-433	L99-233	1905
XL15-384	L01-283	L99-226	306
XL15-385	HOCP92-624	L99-226	1244
XL15-386	L06-040	L99-226	104

Table 5. Continued

Cross	Female	Male	Seed
XL15-387	L01-283	HOCP04-838	22
XL15-388	HOCP85-845	HOCP04-838	2148
XL15-389	LCP85-384	HO11-515	73
XL15-390	HO09-827	L01-299	1827
XL15-391	LCP85-384	L01-299	0
XL15-392	LCP81-010	HOCP96-540	2185
XL15-393	L94-433	L99-226	1028
XL15-394	HO07-613	L99-226	1186
XL15-	HO09-827	L99-226	0
XL15-396	HOCP00-950	HO11-515	60
XL15-397	L14-266	L06-001	21
XL15-398	L14-269	L06-001	0
XL15-399	L98-209	L06-001	10
XL15-400	L14-269	LCP85-384	158
XL15-401	L14-282	LCP85-384	534
XL15-402	HOCP92-624	L99-226	129
XL15-403	L14-272	L99-226	101
XL15-404	HO11-515	L01-283	129
XL15-405	L14-282	L01-283	44
XL15-406	L14-286	L01-299	198
XL15-407	L09-112	L01-299	23
XL15-408	L14-268	L08-090	41
XL15-409	LCP81-010	L08-090	109

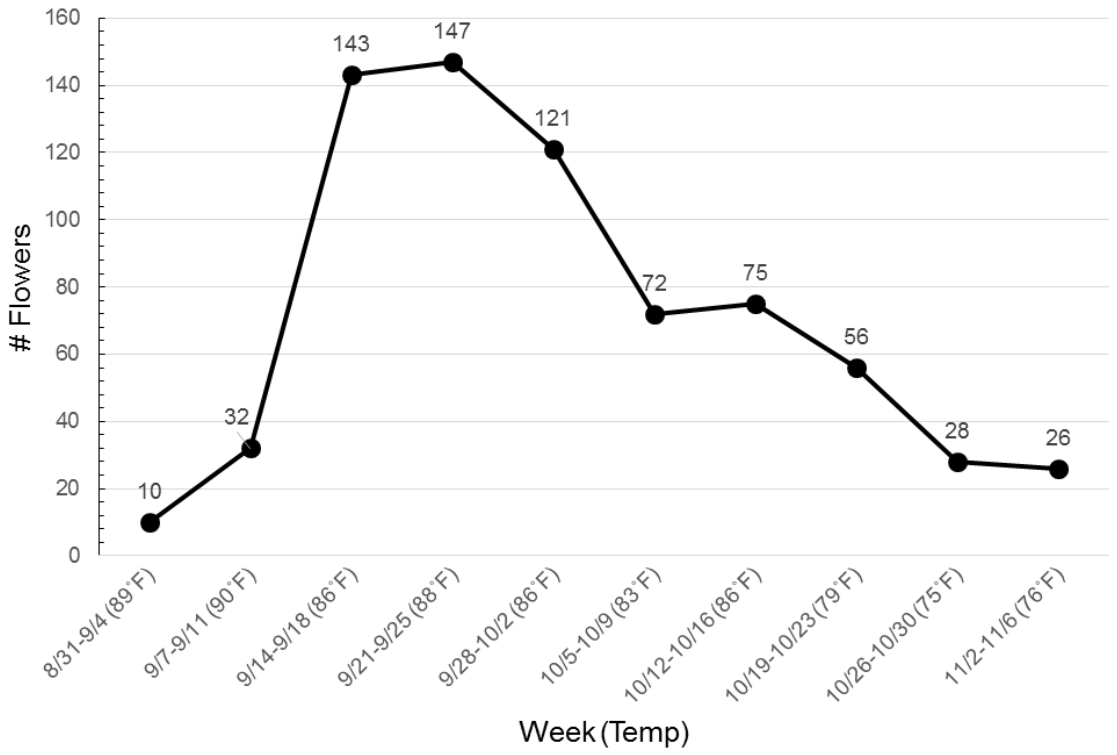

Fig. 1. Number of flowers produced during the 2015 crossing season. The average ambient temperature is reported for each week.

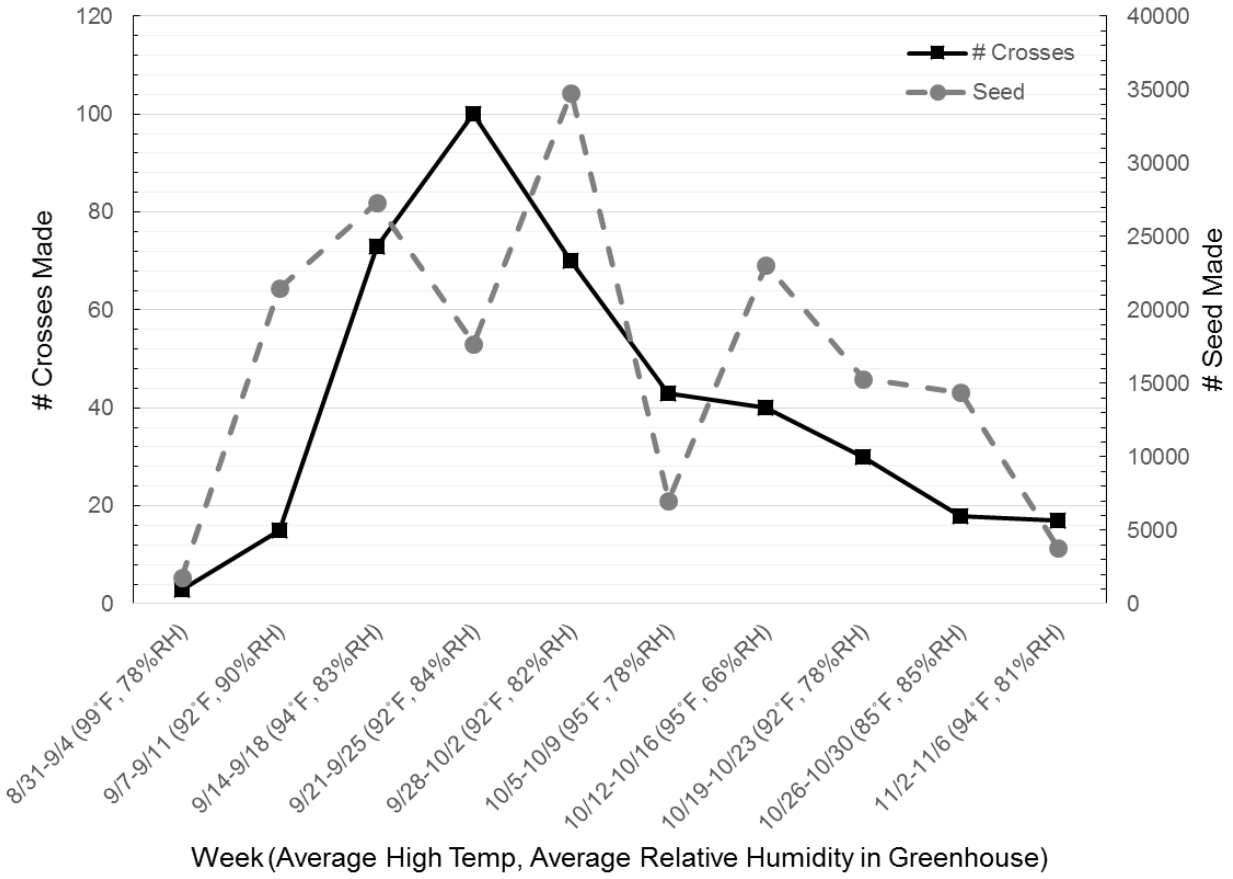

Fig. 2. Number of crosses made and number of seed made from those corresponding crosses in 2015. Average weekly high temperature and average weekly relative humidity readings were recorded inside the crossing greenhouse located in St. Gabriel, LA.

SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2015

Michael J. Pontif, Collins Kimbeng, Gert Hawkins, David Sexton,
Mavis Daigle, and Alphonse Coco
Sugar Research Station

SUMMARY

In the selection phase of the LSU AgCenter's Sugarcane Variety Development Program, superior clones are advanced through the single stool, first line, second line, and increase stages of the breeding program. In the first stubble crop of the second-line trials, those clones with acceptable breeding or commercial value are assigned a permanent variety number. A total of 85,659 seedlings from 194 crosses were planted in the field in the spring of 2015. The majority of these seedlings are progeny of bi-parental crosses among commercial and elite experimental varieties. In the fall of 2015, family selection was practiced on the 51,399 stubble seedlings surviving the winter. This selection resulted in the planting of 1,663 first-line trial plots. At the same time, superior clones were also selected and advanced through subsequent stages (473 to second line trials, 209 to the increase stage). Assignments of permanent "L15" numbers were given to the 38 best clones of the 2010 crossing series.

PROCEDURES

In the selection stage of the LSU AgCenter's Sugarcane Variety Development Program, single stools are established from seed generated in the crossing stage. After evaluating and selecting the families for cane yield potential in the cross appraisal studies, clones with desirable phenotypes are selected and advanced through single stool, first line, second line, and increase stages. In the first stubble crop of the second-line trials, clones judged to have breeding or commercial value are assigned a permanent variety number and advanced to the nursery stage of testing.

RESULTS AND DISCUSSION

A total of 85,659 seedlings from 194 crosses of the 2014 crossing series were planted to the field in the spring of 2015 (Table 1). Many of these seedlings were progeny of crosses among commercial and superior experimental varieties. In the fall of 2015, individual selection was practiced on the 51,399 stubble single stools of the 2013 crossing series that survived the winter. The 1,663 clones selected and advanced from the single stools were planted in 10-foot first-line trial plots. Dates of planting and harvesting of all plots in the selection phase of the program can be found in Table 2.

The 1,414 first-line trial plots of the 2012 crossing series were rated for cane yield and pest resistance in August of 2015 (Table 3). After screening for cane yield rating, acceptable clones were further evaluated for pest resistance (diseases and borer injury) stalk quality, and Brix (Table 3). This second stage of advancement was concluded with the planting of 473 clones in single row 16-foot second line trials plots.

Stalk counts were made on the 461 plant-cane second line trial plots of the 2011 crossing series in August 2014. Based on these counts and sucrose lab data collected in 2014, 209 clones were planted in two single row 16-foot plots representing the increase stage of the program (Table 4). One replication was planted in light soil and the other in heavy soil. These clones will be candidates for assignment in 2016. Of the 116 candidates from the first stubble crop of the second line trial plots, the best 38 clones from the 2010 crossing series were assigned permanent "L15" numbers (Table 5). These newly assigned "L15" varieties were then planted in replicated nursery trials at three on station locations (Sugar Research Station, Iberia Research Station, USDA-ARS Ardoyne Farm).

The advancement summary of clones from crosses made in 2010 through 2014 is shown in Table 6. Crosses are sorted by female parent in ascending order, with the percentile ranking given for each cross in each stage of the program.

Table 1. Summary of selections, advancements and assignments made during 2015 by the Louisiana, "L" Sugarcane Variety Development Program's personnel.

Crossing series	Crosses		Plants transplanted	Over-wintered plants	Advanced to			
	Progeny test	Selection program			1st line	2nd line	Increase	On-station Nurseries (L15 Assignments)
			---------- number of clones ----------					
X10	50	211	90,294	61,704	2,416	484	294	38
X11	58	166	75,703	45,543	1,985	461	209	
X12	40	170	78,747	38,616	1,414	473		
X13	--	155	76,217	51,399	1,663			
X14	24	194	85,659					

Table 2. Dates of seedling and line trials planted or harvested in 2015.

Crossing Series	Test	Crop	Date Planted	Date Harvested
X14	Seedlings	Planted	4/21 – 5/01/15	
X14	Progeny Test	Planted	5/01/15	
X13	Seedlings	First Stubble	4/23 – 4/28/15	9/21 – 9/29/15
X13	First Line Trials	Planted	9/24 – 9/29/15	
X12	First Line Trials	Plant-cane	9/11/15	9/16/15
X11	First Line Trials	First Stubble	10/11/13	12/16/15
X12	Second Line Trials	Planted	9/16/15	
X11	Second Line Trials	Plant-cane	9/24/14	11/5/15
X10	Second Line Trials	First Stubble	9/27/13	10/5/15
X09	Second Line Trials	Second Stubble	10/12/12	12/2/15
X11	Light Soil Increase	Planted	11/6/15	
X10	Light Soil Increase	Plant-cane	10/23/14	12/9/15
X09	Light Soil Increase	First Stubble	10/17/13	12/3/15
X08	Light Soil Increase	Second Stubble	10/30/12	11/20/15
X10	Heavy Soil Increase	Plant-cane	10/23/14	12/2/15
X09	Heavy Soil Increase	First Stubble	10/17/13	12/2/15
X08	Heavy Soil Increase	Second Stubble	10/30/12	11/20/15

Table 3. Numbers of experimental clones dropped for identified faults in the 2012 crossing series first-line trials.

	Fault	
Trait	Frequency	Percent
---------- 1414 clones enter first round of evaluation ----------		
Initial Selection (Rating)	599	42.36
---------- 815 clones enter second round of evaluation ----------		
Pith	144	10.18
Smut	13	0.92
Lodge	11	0.78
Tube	46	3.25
Other	17	1.20
---------- 231 clones dropped ----------		
----------584 clones enter third round of evaluation ----------		
Brix	111	7.85
Clones advanced	473	33.45

Table 4. Number of experimental clones dropped for identified faults in the 2011 crossing series of the plantcane second line trial prior to advancement to the increase stage.

	Fault	
Trait	Frequency	Percent
---------- 461 clones enter first round of evaluation ----------		
Stalk count <75 per plot & observations	146	31.67
Lodged	7	1.52
Pith	37	8.03
Tube	43	3.04
Smut	14	9.33
Other	5	1.08
---------- 252 clones dropped ----------		
Clones advanced to Increase stage	209	45.34

Table 5. Yield data for the 2015 “L” assignments made in the first-stubble second line trials.

Variety	Female	Male	Sugar Per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
HoCP96-540	LCP86-454	LCP85-384	5098	24.5	208	1.93	25410	11.1
L99-226	CP89-846	LCP81-030	5546	24.6	225	1.71	28133	11.2
L01-299	L93-365	LCP85-384	7352	30.7	239	1.65	36981	12.7
L03-371	CP83-644	LCP82-089	6718	29.5	228	1.81	32670	11.8
HoCP04-838	HOCP85-845	LCP85-384	6362	28.5	223	1.63	34939	12.9
L 15-306	CP83-644	L01-283	6277	24.4	257	1.54	31763	10.7
L 15-307	L05-457	L01-283	6514	28	233	1.82	30855	10.7
L 15-308	HOCP92-624	L01-283	4361	19.1	228	1.3	29494	13
L 15-309	HOCP92-624	LCP85-384	5716	24.6	232	1.67	29494	12.1
L 15-310	HOCP92-624	L01-283	6660	31.4	212	1.63	38569	10.5
L 15-311	L05-457	L01-283	8955	38	236	1.6	47644	11
L 15-312	CP83-644	L01-283	12250	47.5	258	2.91	32670	12.8
L 15-313	HOCP92-624	L01-283	6739	33.9	199	1.44	47190	10.9
L 15-314	L05-457	L01-283	6508	27.2	239	1.48	36754	12.6
L 15-315	HOCP92-624	L07-057	7267	27.8	262	1.8	30855	13.3
L 15-316	HOCP92-624	L07-057	5259	22.4	235	1.45	30855	13.7
L 15-317	HOCP01-517	10P12	9850	40.1	245	2.64	30401	13.2
L 15-319	N27	10P7	5758	22.2	259	1.46	30401	12.6
L 15-320	HOCP92-624	L99-233	9825	40.5	243	2.26	35846	10.2
L 15-322	L94-432	10P28	6932	27.2	255	1.6	34031	10.4
L 15-323	L05-457	L01-283	5820	22.9	255	1.55	29494	11.3
L 15-324	L98-209	L99-226	9474	39.3	241	1.81	43560	12.9
L 15-325	HOCP92-624	L09-106	7639	33.2	230	2.03	32670	12.1
L 15-326	CP83-644	L01-283	6792	27.2	250	1.56	34939	11.8
L 15-327	HOCP92-624	L01-283	8760	33.1	265	2.21	29948	10.3
L 15-328	L94-432	10P28	5582	22	254	1.29	34031	9.4
L 15-329	HOCP91-552	10P14	6309	25	252	1.65	30401	11.3
L 15-332	L05-457	L01-283	6690	24	279	1.43	33578	13
L 15-333	HOCP92-624	L01-283	5007	22.9	218	1.3	35393	12
L 15-334	HOCP92-624	L99-233	6651	29	229	1.91	30401	9.9
L 15-335	HOCP92-618	10P12	6293	25.3	249	1.3	39023	16.1
L 15-336	HOCP00-950	L01-299	7827	33.6	233	1.11	60803	11.9
L 15-337	L05-457	L01-283	8516	32.5	262	1.26	51728	10.2
L 15-338	L94-432	10P28	10294	43.7	235	1.84	47644	10.5
L 15-339	L94-432	10P28	6920	28.3	244	1.3	43560	11
L 15-340	L01-283	L99-233	5630	25.2	223	1.55	32670	11.5
L 15-341	L94-432	10P28	6428	26.8	240	1.76	30401	13.5
L 15-342	L05-457	L01-283	4502	18	250	0.96	37661	11.3
L 15-343	L05-457	L01-283	6287	25.5	247	1.58	32216	10.8
L 15-344	HOCP92-624	L01-283	7073	30.8	230	1.84	33578	10.7
L 15-345	L01-299	09P4	7266	27.7	262	1.59	34939	11.8
L 15-346	L94-426	L06-001	9397	40.9	230	1.96	41745	12
L 15-347	HOCP00-950	L01-299	7487	28.8	260	1.48	39023	10.7

Table 6. Advancement summary of the crosses in the 2009 through 2013 series.

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
2010 Crossing Series										
CP83-644	HOCP85-845	328	6	39	2	71	0	32	0	45
CP83-644	L01-283	477	58	98	21	98	13	97	3	98
CP83-644	L94-428	521	7	35	0	30	0	32	0	45
CP83-644	L99-233	304	13	67	3	77	2	81	0	45
HO05-961	L99-226	429	0	12	0	30	0	32	0	45
HO06-530	10P26	212	6	49	0	30	0	32	0	45
HO06-563	10P24	240	0	12	0	30	0	32	0	45
HO07-613	10P21	149	0	12	0	30	0	32	0	45
HO08-709	10P6	495	15	51	0	30	0	32	0	45
HO95-988	10P7	484	30	78	0	30	0	32	0	45
HO95-988	10P9	443	8	39	0	30	0	32	0	45
HOCP00-930	10P18	928	26	49	0	30	0	32	0	45
HOCP00-930	HO95-988	166	0	12	0	30	0	32	0	45
HOCP00-930	HOCP96-540	235	20	87	1	65	0	32	0	45
HOCP00-930	L06-001	214	8	59	1	68	1	74	0	45
HOCP00-930	L06-038	189	27	99	1	69	0	32	0	45
HOCP00-930	L94-428	250	18	84	0	30	0	32	0	45
HOCP00-930	L98-207	228	3	35	0	30	0	32	0	45
HOCP00-930	L99-226	131	4	51	0	30	0	32	0	45
HOCP00-930	L99-226	172	0	12	0	30	0	32	0	45
HOCP00-950	10P36	678	9	35	0	30	0	32	0	45
HOCP00-950	L01-299	637	74	96	10	84	4	80	2	94
HOCP00-950	L06-001	247	0	12	0	30	0	32	0	45
HOCP00-950	L99-226	2127	33	37	0	30	0	32	0	45
HOCP00-950	L99-233	199	5	46	0	30	0	32	0	45
HOCP00-950	US01-040	240	15	79	1	64	1	71	0	45
HOCP01-517	10P12	242	7	50	4	85	2	84	1	95
HOCP01-523	L99-226	89	4	68	0	30	0	32	0	45
HOCP02-618	10P12	178	16	89	0	30	0	32	0	45
HOCP02-623	10P24	324	12	59	0	30	0	32	0	45
HOCP02-623	10P29	674	3	24	0	30	0	32	0	45
HOCP02-623	10P5	180	5	49	0	30	0	32	0	45
HOCP04-838	10P2	117	2	38	1	75	1	85	0	45
HOCP04-838	HOCP02-623	170	6	56	0	30	0	32	0	45
HOCP04-838	L06-001	170	6	56	0	30	0	32	0	45
HOCP04-838	L06-001	221	0	12	.	.	.	.	.	.
HOCP05-902	10P34	440	15	54	0	30	0	32	0	45
HOCP85-845	10P10	488	39	86	3	71	3	79	0	45
HOCP85-845	10P11	650	6	31	0	30	0	32	0	45
HOCP85-845	10P13	129	9	81	0	30	0	32	0	45
HOCP85-845	10P28	415	18	67	0	30	0	32	0	45

Table 6. Continue

			1 st. Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP85-845	L99-233	136	0	12	0	30	0	32	0	45
HOCP91-552	10P12	421	5	33	0	30	0	32	0	45
HOCP91-552	10P13	348	0	12	0	30	0	32	0	45
HOCP91-552	10P14	210	5	44	5	92	4	94	1	96
HOCP91-552	10P2	64	0	12	0	30	0	32	0	45
HOCP91-552	10P44	93	0	12	0	30	0	32	0	45
HOCP91-552	HOCP02-623	396	0	12	0	30	0	32	0	45
HOCP91-552	HOCP02-623	485	4	29	.	.	.	.	.	.
HOCP91-552	L05-448	181	9	72	1	69	0	32	0	45
HOCP91-552	L07-057	232	7	51	0	30	0	32	0	45
HOCP91-552	L09-107	694	0	12	0	30	0	32	0	45
HOCP92-618	10P12	173	6	56	1	70	1	77	1	98
HOCP92-624	10P1	244	10	64	1	63	1	70	0	45
HOCP92-624	10P11	1095	20	39	1	60	1	65	0	45
HOCP92-624	10P21	304	13	67	0	30	0	32	0	45
HOCP92-624	10P3	385	14	57	3	73	1	69	0	45
HOCP92-624	10P39	468	0	12	0	30	0	32	0	45
HOCP92-624	HO08-706	166	6	57	1	70	1	77	0	45
HOCP92-624	HO08-706	476	12	46	.	.	.	.	.	.
HOCP92-624	HO95-988	701	26	59	0	30	0	32	0	45
HOCP92-624	HOCP04-838	950	0	12	0	30	0	32	0	45
HOCP92-624	L01-283	1152	140	98	37	95	22	94	6	97
HOCP92-624	L01-299	436	0	12	0	30	0	32	0	45
HOCP92-624	L01-299	153	0	12	0	30	0	32	0	45
HOCP92-624	L05-448	220	12	76	0	30	0	32	0	45
HOCP92-624	L05-448	489	20	64	0	30	0	32	0	45
HOCP92-624	L07-057	216	23	93	3	83	2	86	1	95
HOCP92-624	L07-057	385	18	69	7	88	3	83	1	93
HOCP92-624	L08-089	1118	0	12	0	30	0	32	0	45
HOCP92-624	L08-090	229	22	90	4	87	2	86	0	45
HOCP92-624	L09-106	205	24	96	7	96	3	92	1	96
HOCP92-624	L09-106	206	8	62	.	.	.	.	.	.
HOCP92-624	L99-226	1199	87	84	24	90	15	90	0	45
HOCP92-624	L99-226	892	23	48	0	30	0	32	0	45
HOCP92-624	L99-233	.	0	.	6	.	3	.	0	.
HOCP92-624	L99-233	369	19	73	0	30	0	32	0	45
HOCP92-624	L99-233	551	23	66	10	87	6	89	2	94
HOCP92-624	L99-233	864	29	54	.	.	.	.	.	.
HOCP92-624	LCP85-384	.	0	.	9	.	6	.	1	.
HOCP92-624	LCP86-454	182	0	12	0	30	0	32	0	45
HOCP92-648	L99-233	212	20	89	5	92	3	91	0	45
HOCP95-951	10P5	413	5	33	3	73	2	75	0	45

Table 6. Continue

			1 st. Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP95-951	10P6	606	14	43	4	72	1	68	0	45
HOCP96-540	10P10	893	12	35	0	30	0	32	0	45
HOCP96-540	10P11	1117	0	12	0	30	0	32	0	45
HOCP96-540	10P12	188	10	75	2	79	0	32	0	45
HOCP96-540	10P15	1217	0	12	0	30	0	32	0	45
HOCP96-540	10P17	206	8	62	4	89	2	87	0	45
HOCP96-540	10P18	225	0	12	0	30	0	32	0	45
HOCP96-540	10P19	446	0	12	0	30	0	32	0	45
HOCP96-540	10P40	383	0	12	0	30	0	32	0	45
HOL08-720	L99-233	87	0	12	0	30	0	32	0	45
L01-283	10P29	478	4	29	0	30	0	32	0	45
L01-283	10P29	462	23	72	.	.	.	.	.	.
L01-283	10P30	635	0	12	0	30	0	32	0	45
L01-283	10P32	1114	0	12	0	30	0	32	0	45
L01-283	10P34	194	19	91	2	78	2	88	0	45
L01-283	10P45	427	0	12	0	30	0	32	0	45
L01-283	HOCP02-610	237	27	95	13	98	9	98	0	45
L01-283	L94-428	472	23	71	7	84	4	85	0	45
L01-283	L99-233	435	27	78	7	85	7	92	1	93
L01-299	09P1	603	0	12	0	30	0	32	0	45
L01-299	09P3	718	69	90	10	83	4	76	0	45
L01-299	09P4	578	41	82	11	88	4	82	1	92
L01-299	10P10	242	15	78	6	93	2	84	0	45
L01-299	10P11	383	10	48	0	30	0	32	0	45
L01-299	10P17	234	0	12	0	30	0	32	0	45
L01-299	10P38	148	0	12	0	30	0	32	0	45
L01-299	10P38	472	57	97	20	97	10	95	0	45
L01-299	10P9	157	13	87	3	89	1	80	0	45
L01-315	10P12	238	3	35	0	30	0	32	0	45
L01-315	L99-233	226	9	63	5	91	5	96	0	45
L05-457	10P13	187	0	12	0	30	0	32	0	45
L05-457	10P3	206	10	71	0	30	0	32	0	45
L05-457	HO95-988	192	10	74	2	79	1	76	0	45
L05-457	HOCP04-838	248	5	41	0	30	0	32	0	45
L05-457	L01-283	1206	137	95	40	96	26	96	8	99
L05-457	L07-057	135	5	59	0	30	0	32	0	45
L05-457	L08-090	243	14	77	2	74	1	71	0	45
L05-457	L09-106	230	25	94	0	30	0	32	0	45
L05-457	L99-226	516	27	74	2	62	0	32	0	45
L05-457	L99-233	210	9	67	2	77	1	75	0	45
L06-001	10P17	138	7	73	1	72	1	82	0	45
L06-001	L99-226	123	4	52	0	30	0	32	0	45

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L07-057	10P1	193	9	69	4	90	2	88	0	45
L08-090	10P11	955	24	46	0	30	0	32	0	45
L08-090	10P16	163	8	71	2	80	1	78	0	45
L09-099	10P17	304	11	57	4	81	4	91	0	45
L09-118	10P31	383	0	12	0	30	0	32	0	45
L09-123	10P12	219	3	37	0	30	0	32	0	45
L09-123	10P6	122	3	46	1	74	0	32	0	45
L09-123	10P9	225	16	82	0	30	0	32	0	45
L09-125	L01-299	209	8	61	1	68	0	32	0	45
L09-130	10P9	231	16	81	1	65	1	72	0	45
L91-281	L06-001	.	0	.	7	.	4	.	0	.
L94-426	L06-001	1156	79	80	11	77	7	78	1	91
L94-426	L99-226	229	0	12	0	30	0	32	0	45
L94-428	LCP85-384	243	26	93	1	63	0	32	0	45
L94-432	10P11	238	29	98	2	75	1	72	0	45
L94-432	10P13	188	10	75	4	91	2	89	0	45
L94-432	10P15	143	0	12	0	30	0	32	0	45
L94-432	10P27	203	17	87	6	94	5	97	0	45
L94-432	10P28	1004	105	92	38	97	29	98	5	97
L94-432	10P31	226	0	12	0	30	0	32	0	45
L94-433	L01-283	419	0	12	0	30	0	32	0	45
L97-128	10P6	225	9	63	1	66	1	73	0	45
L97-128	HOCP95-951	219	15	80	1	67	0	32	0	45
L97-128	L06-001	164	25	99	5	95	3	93	0	45
L97-128	L98-207	249	27	94	16	99	12	99	0	45
L97-128	L99-226	137	1	27	0	30	0	32	0	45
L98-207	10P27	198	0	12	0	30	0	32	0	45
L98-207	10P41	204	0	12	0	30	0	32	0	45
L98-207	10P6	365	2	25	0	30	0	32	0	45
L98-207	10P9	235	9	61	4	86	3	90	0	45
L98-207	LCP81-010	172	4	43	0	30	0	32	0	45
L98-209	10P5	236	13	76	6	93	4	93	0	45
L98-209	HOCP95-951	403	4	32	0	30	0	32	0	45
L98-209	L99-226	485	42	88	8	85	3	79	1	92
L99-226	09P4	392	0	12	0	30	0	32	0	45
L99-226	HO08-706	245	9	59	3	80	1	70	0	45
L99-226	L01-299	116	4	54	0	30	0	32	0	45
L99-226	L06-038	152	12	86	2	81	1	81	0	45
L99-226	L06-038	613	5	29	2	61	1	67	0	45
L99-226	L06-038	401	3	27	.	.	.	.	.	.
L99-226	L99-233	557	18	52	0	30	0	32	0	45
L99-233	10P11	797	7	31	0	30	0	32	0	45

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L99-233	10P12	597	0	12	0	30	0	32	0	45
L99-233	10P2	146	0	12	0	30	0	32	0	45
L99-233	10P3	143	11	85	4	94	3	95	0	45
L99-233	HOCP04-838	224	23	92	1	67	1	74	0	45
LCP81-010	10P12	334	2	26	0	30	0	32	0	45
LCP81-010	10P14	287	7	44	0	30	0	32	0	45
LCP81-010	10P4	132	1	29	0	30	0	32	0	45
LCP81-010	HO06-530	222	4	39	0	30	0	32	0	45
LCP81-010	HO07-613	213	0	12	0	30	0	32	0	45
LCP81-010	HO07-613	469	12	48	.	.	.	.	.	.
LCP81-010	HO08-706	287	0	12	0	30	0	32	0	45
LCP81-010	HO08-706	389	4	32	0	30	0	32	0	45
LCP81-010	HO08-706	581	20	54	.	.	.	.	.	.
LCP81-010	HO08-706	408	8	41	.	.	.	.	.	.
LCP81-010	HOCP01-523	127	13	91	0	30	0	32	0	45
LCP81-010	L01-299	937	5	25	0	30	0	32	0	45
LCP81-010	LCP85-384	.	0	.	15	.	11	.	0	.
LCP85-384	10P17	295	6	41	0	30	0	32	0	45
LCP85-384	10P18	197	8	64	2	78	2	87	0	45
LCP85-384	10P19	208	7	54	0	30	0	32	0	45
LCP85-384	10P20	858	9	32	0	30	0	32	0	45
LCP85-384	10P24	443	28	79	4	76	1	68	0	45
LCP85-384	10P28	146	7	70	2	82	0	32	0	45
LCP85-384	10P31	604	0	12	0	30	0	32	0	45
LCP85-384	10P32	425	0	12	0	30	0	32	0	45
LCP85-384	10P4	252	22	88	1	62	1	69	0	45
LCP85-384	10P7	232	18	85	0	30	0	32	0	45
LCP85-384	10P8	159	4	46	0	30	0	32	0	45
LCP86-454	10P9	844	7	29	0	30	0	32	0	45
MISC	MISC	2005	0	12	0	30	0	32	0	45
N27	10P35	347	3	31	0	30	0	32	0	45
N27	10P42	425	0	12	0	30	0	32	0	45
N27	10P7	932	5	25	1	61	1	66	1	91
N27	10P8	1614	0	12	0	30	0	32	0	45
N27	HO08-706	876	19	42	1	61	1	67	0	45
N27	HOCP96-540	1635	12	27	0	30	0	32	0	45
N27	HOCP96-540	732	29	63	.	.	.	.	.	.
N27	L06-001	225	16	82	1	66	1	73	0	45
N27	L06-001	811	43	75	.	.	.	.	.	.
N27	L94-426	368	0	12	0	30	0	32	0	45
N27	L94-426	696	29	66	.	.	.	.	.	.
N27	L99-226	829	16	40	0	30	0	32	0	45

Table 6. Continue

Female	Male	Survive	1 st Line No	1 st Line Rank Percentile	2 nd Line No	2 nd Line Rank Percentile	Increases No	Increases Rank Percentile	Assignments No	Assignments Rank Percentile
N27	L99-226	494	35	82	.	.	.	.	.	.
TUCCP77-042	10P37	456	6	35	0	30	0	32	0	45
2011 Crossing Series										
CP83-644	11P35	273	0	9	0	15	0	22	.	.
CP83-644	11P36	198	1	27	1	51	0	22	.	.
CP83-644	L01-283	186	7	68	1	54	0	22	.	.
HO06-563	11P11	385	16	72	2	52	0	22	.	.
HO06-563	11P28	495	3	28	1	34	1	50	.	.
HO06-563	11P29	484	20	72	1	36	1	54	.	.
HO07-613	L99-226	164	0	9	0	15	0	22	.	.
HO08-709	LCP86-454	700	46	89	10	86	7	94	.	.
HO08-717	11P22	223	6	55	2	71	1	75	.	.
HO08-717	11P23	381	11	58	3	67	1	58	.	.
HO08-717	11P26	222	3	38	3	84	1	76	.	.
HO08-717	11P32	488	0	9	0	15	0	22	.	.
HO08-717	L09-131	219	16	94	4	91	1	77	.	.
HO09-824	11P33	234	23	97	10	98	6	98	.	.
HO09-827	L07-057	738	27	66	7	74	5	88	.	.
HO09-827	LCP85-384	170	4	52	1	56	1	85	.	.
HO09-841	11P7	162	21	99	1	60	1	86	.	.
HO09-841	11P9	227	5	50	3	84	0	22	.	.
HO95-988	11P15	715	21	58	2	40	0	22	.	.
HO95-988	11P16	653	19	58	2	43	1	49	.	.
HO95-988	11P17	477	2	23	0	15	0	22	.	.
HO95-988	L09-125	251	14	83	3	81	1	66	.	.
HOCP00-930	11P26	813	50	87	6	65	2	57	.	.
HOCP00-930	HOCP96-561	485	0	9	0	15	0	22	.	.
HOCP00-930	L10-147	241	5	48	2	68	2	93	.	.
HOCP00-930	L99-226	692	13	47	2	41	2	61	.	.
HOCP00-930	L99-226	220	6	55	.	.	.	.	.	.
HOCP00-950	11P13	535	7	36	0	15	0	22	.	.
HOCP00-950	11P33	251	10	70	2	67	1	66	.	.
HOCP01-517	11P22	648	24	66	6	73	1	49	.	.
HOCP01-517	L01-283	244	2	30	0	15	0	22	.	.
HOCP01-523	HOCP96-540	250	10	70	4	89	4	98	.	.
HOCP01-523	HOCP96-561	360	22	86	1	40	1	59	.	.
HOCP01-523	LCP85-384	1185	43	65	11	73	6	81	.	.
HOCP02-618	11P13	478	0	9	0	15	0	22	.	.
HOCP02-618	11P22	439	47	98	11	96	6	96	.	.
HOCP02-618	11P29	221	8	65	0	15	0	22	.	.
HOCP02-623	11P17	192	6	60	0	15	0	22	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP02-623	11P18	251	2	30	0	15	0	22	.	.
HOCP02-623	11P19	949	15	41	6	61	4	69	.	.
HOCP02-623	L06-001	476	15	61	6	82	2	68	.	.
HOCP04-838	11P10	429	0	9	0	15	0	22	.	.
HOCP04-838	11P18	933	4	23	3	44	3	65	.	.
HOCP04-838	11P20	440	29	89	3	63	1	55	.	.
HOCP04-838	HOCP95-951	220	3	38	1	49	0	22	.	.
HOCP04-838	L07-057	548	9	41	4	64	3	83	.	.
HOCP04-838	L08-090	926	62	90	23	95	7	91	.	.
HOCP04-838	L08-090	396	10	53	3	66	2	81	.	.
HOCP04-847	11P19	250	4	41	3	81	2	91	.	.
HOCP08-726	11P24	686	34	80	8	79	5	90	.	.
HOCP08-726	L06-001	131	0	9	0	15	0	22	.	.
HOCP08-726	L08-090	145	4	56	4	96	1	88	.	.
HOCP08-726	L99-233	501	23	77	11	94	7	96	.	.
HOCP09-803	HOCP96-540	168	1	28	1	57	0	22	.	.
HOCP09-810	11P22	686	17	53	1	33	0	22	.	.
HOCP09-846	11P23	245	15	86	1	44	1	67	.	.
HOCP09-846	11P9	206	9	74	0	15	0	22	.	.
HOCP85-845	11P10	492	34	92	3	58	1	51	.	.
HOCP85-845	11P16	677	9	36	4	56	1	47	.	.
HOCP85-845	11P17	818	3	23	0	15	0	22	.	.
HOCP85-845	11P18	667	8	33	2	42	2	63	.	.
HOCP85-845	11P19	263	4	40	4	88	0	22	.	.
HOCP85-845	11P24	255	0	9	0	15	0	22	.	.
HOCP85-845	11P33	710	34	78	10	85	5	89	.	.
HOCP85-845	L01-283	57	1	44	0	15	0	22	.	.
HOCP85-845	L10-160	378	2	27	2	53	0	22	.	.
HOCP91-552	11P5	442	6	38	.	.	.	.	.	.
HOCP91-552	HOCP04-838	210	0	9	0	15	0	22	.	.
HOCP91-552	HOCP04-838	379	4	32	.	.	.	.	.	.
HOCP91-552	L01-299	881	0	9	0	15	0	22	.	.
HOCP92-618	11P33	225	4	44	1	47	0	22	.	.
HOCP92-618	L06-001	702	1	18	0	15	0	22	.	.
HOCP92-624	11P3	372	18	78	8	93	3	92	.	.
HOCP92-624	HOCP01-523	433	30	92	5	78	2	77	.	.
HOCP92-624	L05-457	448	15	62	3	62	2	73	.	.
HOCP92-624	L08-090	411	19	77	1	37	1	56	.	.
HOCP92-624	L09-125	1173	53	75	9	66	3	57	.	.
HOCP95-951	L01-299	116	0	9	.	.	.	.	.	.
HOCP95-951	L09-099	234	9	68	3	83	0	22	.	.
HOCP97-609	11P10	488	39	95	16	98	6	94	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP97-609	11P15	699	38	81	13	91	6	93	.	.
HOCP97-609	11P18	212	12	84	3	86	1	79	.	.
HOCP97-609	11P19	547	7	36	5	72	3	83	.	.
HOL08-723	11P25	419	14	62	5	80	2	79	.	.
HOL08-723	L01-283	215	8	66	0	15	0	22	.	.
L01-283	11P33	231	1	23	1	46	0	22	.	.
L01-299	11P26	475	32	90	9	93	6	95	.	.
L01-299	11P27	500	23	77	1	34	1	50	.	.
L01-315	11P7	223	6	55	1	49	1	75	.	.
L01-315	HOCP95-951	265	0	9	.	.	.	.	.	.
L01-315	L99-233	754	0	9	0	15	0	22	.	.
L05-448	11P28	235	3	36	1	46	1	70	.	.
L05-448	11P5	215	1	27	0	15	0	22	.	.
L06-001	11P17	231	13	83	4	90	1	71	.	.
L06-040	11P25	475	1	19	1	36	0	22	.	.
L06-040	L05-448	151	6	70	0	15	0	22	.	.
L06-040	L99-233	208	8	68	2	75	1	80	.	.
L07-057	11P20	486	14	58	7	87	1	53	.	.
L07-057	HOCP91-552	226	1	23	.	.	.	.	.	.
L08-088	11P28	230	1	23	0	15	0	22	.	.
L08-090	11P2	583	40	92	6	77	2	66	.	.
L08-090	11P2	625	2	20	.	.	.	.	.	.
L08-090	11P3	642	32	80	6	73	2	64	.	.
L09-099	11P16	612	0	9	0	15	0	22	.	.
L09-099	L01-283	445	36	96	3	62	2	76	.	.
L09-099	L06-001	685	33	78	9	83	2	62	.	.
L09-099	L10-163	228	18	95	11	99	7	99	.	.
L09-099	L99-233	235	0	9	0	15	0	22	.	.
L09-107	11P27	116	0	9	0	15	0	22	.	.
L09-107	L09-125	485	8	41	5	77	1	53	.	.
L09-108	HOCP01-523	728	13	44	2	38	0	22	.	.
L09-108	HOCP92-618	452	0	9	0	15	0	22	.	.
L09-121	L98-207	762	0	9	0	15	0	22	.	.
L09-121	L99-226	138	4	58	3	94	1	89	.	.
L09-123	HOCP96-540	225	4	44	0	15	0	22	.	.
L09-123	L99-233	137	3	50	2	88	2	97	.	.
L10-132	11P2	195	5	54	1	51	1	82	.	.
L10-132	11P3	203	0	9	0	15	0	22	.	.
L10-147	HOCP96-540	680	5	29	1	33	0	22	.	.
L94-426	11P14	233	3	36	2	69	1	71	.	.
L94-426	11P15	386	0	9	0	15	0	22	.	.
L94-426	HOCP96-561	180	13	93	3	89	1	84	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L94-426	L06-001	202	14	92	6	97	0	22	.	.
L94-426	L99-226	185	0	9	0	15	0	22	.	.
L94-428	11P11	684	20	58	7	76	4	84	.	.
L94-433	11P11	498	6	33	0	15	0	22	.	.
L94-433	11P14	485	16	62	3	60	0	22	.	.
L94-433	HOCP96-540	699	3	23	1	31	1	47	.	.
L98-207	11P15	543	0	9	0	15	0	22	.	.
L98-207	11P19	669	12	44	3	49	1	48	.	.
L99-223	11P22	705	15	48	7	76	3	70	.	.
L99-226	11P13	514	0	9	0	15	0	22	.	.
L99-226	11P14	160	10	88	3	92	1	87	.	.
L99-226	11P15	239	1	23	0	15	0	22	.	.
L99-226	11P16	1292	16	33	11	69	6	78	.	.
L99-226	11P17	971	18	47	4	44	2	53	.	.
L99-233	11P2	334	7	48	3	71	1	62	.	.
L99-233	11P3	419	0	9	0	15	0	22	.	.
L99-233	11P4	634	0	9	0	15	0	22	.	.
LCP81-010	11P17	490	22	75	3	58	1	52	.	.
LCP81-010	11P28	700	0	9	0	15	0	22	.	.
LCP81-010	L09-125	776	19	52	.	.	.	.	.	.
LCP81-010	L10-132	952	72	94	2	36	1	45	.	.
LCP81-010	L10-132	166	15	97	.	.	.	.	.	.
LCP81-010	L99-226	1046	45	73	6	55	3	60	.	.
LCP81-010	L99-226	133	13	97	.	.	.	.	.	.
LCP85-384	11P10	691	5	29	1	31	0	22	.	.
LCP85-384	11P12	586	0	9	0	15	0	22	.	.
LCP85-384	11P15	575	0	9	0	15	0	22	.	.
LCP85-384	11P16	164	2	33	1	58	1	86	.	.
LCP85-384	11P17	696	40	84	4	55	0	22	.	.
LCP85-384	11P22	453	18	70	4	70	2	72	.	.
LCP85-384	11P25	224	10	75	1	49	1	73	.	.
LCP85-384	11P28	688	40	85	5	64	3	72	.	.
LCP85-384	11P31	850	8	31	0	15	0	22	.	.
LCP85-384	11P33	434	24	82	5	78	1	55	.	.
LCP85-384	L10-160	228	8	64	0	15	0	22	.	.
LCP85-384	L99-226	334	0	9	0	15	0	22	.	.
N27	L10-144	115	0	9	0	15	0	22	.	.
N27	L10-157	696	42	85	.	.	.	.	.	.
N27	L10-163	158	6	68	1	61	0	22	.	.
N27	L99-226	695	22	61	2	41	2	61	.	.
N27	L99-233	632	10	41	3	50	2	64	.	.
US79-010	11P14	549	0	9	0	15	0	22	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
US79-010	11P17	230	5	50	1	46	0	22	.	.
US79-010	11P30	192	10	81	0	15	0	22	.	.
US79-010	11P31	976	4	23	2	34	1	45	.	.
US79-010	L05-448	717	2	20	2	40	1	46	.	.
US79-010	L99-226	1126	21	47	3	38	3	59	.	.
2012 Crossing Series										
CP83-644	12P16	948	18	64	13	86	.	.	.	.
CP83-644	HOCP04-838	444	11	72	7	89	.	.	.	.
CP83-644	L06-001	1414	42	77	13	75	.	.	.	.
CP83-644	L06-001	220	1	40	.	.	.	.	.	.
HO05-961	L01-299	410	0	16	0	21	.	.	.	.
HO06-530	HOCP96-540	504	0	16	0	21	.	.	.	.
HO06-530	L11-182	451	2	36	0	21	.	.	.	.
HO06-563	L11-182	448	0	16	0	21	.	.	.	.
HO06-563	L99-226	399	6	57	3	68	.	.	.	.
HO07-613	L08-090	227	0	16	0	21	.	.	.	.
HO07-613	LCP85-384	972	7	45	2	45	.	.	.	.
HO08-709	12P17	389	7	62	3	69	.	.	.	.
HO08-709	HOCP96-540	419	8	64	1	49	.	.	.	.
HO08-709	L08-090	224	2	47	0	21	.	.	.	.
HO08-709	L99-226	229	0	16	0	21	.	.	.	.
HO08-709	L99-226	1182	14	52	2	43	.	.	.	.
HO08-709	LCP85-384	866	0	16	0	21	.	.	.	.
HO08-717	12P17	587	0	16	0	21	.	.	.	.
HO08-717	L06-001	434	16	85	4	75	.	.	.	.
HO09-832	L11-182	250	0	16	0	21	.	.	.	.
HO09-840	12P3	388	2	40	0	21	.	.	.	.
HO95-951	L99-233	657	21	79	10	88	.	.	.	.
HOCP00-950	HOCP04-838	959	14	57	4	56	.	.	.	.
HOCP00-950	L06-001	243	3	52	1	55	.	.	.	.
HOCP00-950	L94-428	235	2	47	0	21	.	.	.	.
HOCP01-517	L01-299	376	7	64	1	50	.	.	.	.
HOCP01-517	L06-001	781	53	94	14	92	.	.	.	.
HOCP01-517	L07-057	693	34	91	15	95	.	.	.	.
HOCP01-523	L01-299	227	0	16	0	21	.	.	.	.
HOCP02-618	HOCP96-540	206	7	82	5	96	.	.	.	.
HOCP04-838	HOCP01-523	478	38	97	14	98	.	.	.	.
HOCP04-838	L10-147	200	1	40	1	60	.	.	.	.
HOCP09-804	L99-233	234	9	86	0	21	.	.	.	.
HOCP09-814	12P17	411	17	89	6	87	.	.	.	.
HOCP09-814	LCP85-384	437	8	62	4	75	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP85-845	12P11	546	17	78	3	64	.	.	.	.
HOCP85-845	HOCP96-540	225	0	16	0	21	.	.	.	.
HOCP85-845	HOCP96-540	372	4	50	1	50	.	.	.	.
HOCP85-845	HOCP96-540	243	0	16	0	21	.	.	.	.
HOCP85-845	L06-001	236	1	36	0	21	.	.	.	.
HOCP85-845	L06-001	748	6	46	4	62	.	.	.	.
HOCP85-845	L08-090	209	0	16	0	21	.	.	.	.
HOCP85-845	L11-172	139	0	16	0	21	.	.	.	.
HOCP85-845	L11-172	497	0	16	0	21	.	.	.	.
HOCP85-845	L99-226	499	0	16	0	21	.	.	.	.
HOCP85-845	L99-226	467	0	16	0	21	.	.	.	.
HOCP91-552	12P11	373	0	16	0	21	.	.	.	.
HOCP91-552	12P11	1054	0	16	.	.	.	.	.	.
HOCP91-552	12P12	839	3	36	0	21	.	.	.	.
HOCP91-552	12P12	118	0	16	.	.	.	.	.	.
HOCP91-552	12P5	168	0	16	0	21	.	.	.	.
HOCP91-552	HOCP01-523	257	10	87	3	81	.	.	.	.
HOCP91-552	L01-283	473	3	43	1	45	.	.	.	.
HOCP91-552	L01-299	127	0	16	0	21	.	.	.	.
HOCP91-552	L08-090	295	0	16	0	21	.	.	.	.
HOCP91-552	LCP85-384	193	0	16	0	21	.	.	.	.
HOCP92-618	HOCP96-540	473	0	16	0	21	.	.	.	.
HOCP92-618	L01-299	220	0	16	0	21	.	.	.	.
HOCP92-624	12P1	152	5	80	2	84	.	.	.	.
HOCP92-624	HOCP01-523	459	11	70	5	79	.	.	.	.
HOCP92-624	HOCP04-847	381	8	66	4	78	.	.	.	.
HOCP92-624	HOCP91-552	812	30	85	10	82	.	.	.	.
HOCP92-624	HOCP96-540	217	10	90	2	75	.	.	.	.
HOCP92-624	HOCP96-540	497	12	70	4	70	.	.	.	.
HOCP92-624	L07-057	871	30	82	10	80	.	.	.	.
HOCP92-624	L08-090	448	36	98	6	84	.	.	.	.
HOCP92-624	L11-172	246	12	91	2	71	.	.	.	.
HOCP92-624	L11-190	248	3	52	1	53	.	.	.	.
HOCP92-624	L99-233	765	53	95	13	91	.	.	.	.
HOCP92-624	L99-233	197	8	89	1	61	.	.	.	.
HOCP95-951	HOCP96-540	948	19	65	7	68	.	.	.	.
HOCP95-951	L01-299	450	3	45	0	21	.	.	.	.
HOCP95-951	L09-099	395	6	57	2	61	.	.	.	.
HOCP95-951	L09-099	105	0	16	.	.	.	.	.	.
HOCP96-540	12P17	410	1	33	1	49	.	.	.	.
HOCP96-561	12P15	238	8	82	0	21	.	.	.	.
HOCP96-561	12P16	484	19	87	4	72	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP96-561	HOCP96-540	466	3	43	0	21	.	.	.	.
HOCP96-561	L06-001	432	6	56	0	21	.	.	.	.
HOCP97-609	12P6	674	24	84	11	90	.	.	.	.
HOCP97-609	12P8	387	0	16	0	21	.	.	.	.
HOCP97-609	12P9	200	8	88	3	87	.	.	.	.
L01-283	12P14	247	0	16	0	21	.	.	.	.
L01-299	12P8	244	8	80	1	55	.	.	.	.
L01-299	HOCP04-838	117	0	16	0	21	.	.	.	.
L01-299	L99-226	187	0	16	0	21	.	.	.	.
L05-448	L08-090	617	4	43	1	43	.	.	.	.
L05-448	L99-233	310	0	16	0	21	.	.	.	.
L05-457	12P14	222	6	73	3	85	.	.	.	.
L05-457	L01-299	440	2	40	1	47	.	.	.	.
L05-457	L99-233	686	37	92	13	94	.	.	.	.
L05-457	L99-233	467	27	93	6	82	.	.	.	.
L07-057	12P1	428	1	33	1	47	.	.	.	.
L08-090	12P1	1420	7	40	4	51	.	.	.	.
L09-099	HOCP96-540	626	8	54	4	66	.	.	.	.
L09-099	HOCP96-540	459	8	60	4	73	.	.	.	.
L09-099	L06-001	210	2	49	1	58	.	.	.	.
L09-099	L06-001	430	7	59	3	67	.	.	.	.
L09-099	L10-141	204	3	57	1	59	.	.	.	.
L09-099	L11-172	185	2	50	1	62	.	.	.	.
L09-099	L11-190	231	0	16	0	21	.	.	.	.
L09-123	L06-001	408	1	33	0	21	.	.	.	.
L09-131	12P11	1312	39	77	6	57	.	.	.	.
L09-131	12P12	476	26	92	4	72	.	.	.	.
L09-131	HOCP96-540	433	9	66	6	86	.	.	.	.
L09-131	HOCP96-540	328	6	62	2	65	.	.	.	.
L09-131	HOCP96-561	192	14	95	3	89	.	.	.	.
L09-131	L01-299	213	5	68	1	58	.	.	.	.
L09-131	L07-057	413	14	82	4	77	.	.	.	.
L09-131	L99-233	222	0	16	0	21	.	.	.	.
L10-138	12P1	434	12	75	4	75	.	.	.	.
L10-141	12P11	481	2	36	1	45	.	.	.	.
L10-141	12P6	444	1	33	0	21	.	.	.	.
L10-141	12P7	440	0	16	0	21	.	.	.	.
L10-148	12P16	175	0	16	0	21	.	.	.	.
L10-148	L05-448	1107	0	16	0	21	.	.	.	.
L10-148	LCP85-384	818	0	16	0	21	.	.	.	.
L10-156	12P6	391	0	16	0	21	.	.	.	.
L10-156	L99-226	855	48	93	24	97	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L10-163	12P10	223	0	16	0	21	.	.	.	.
L10-163	L99-226	350	1	34	0	21	.	.	.	.
L11-167	HOCP96-561	417	12	76	5	81	.	.	.	.
L11-168	HOCP09-800	90	0	16	0	21	.	.	.	.
L11-168	L99-226	447	2	36	2	56	.	.	.	.
L11-169	L05-448	251	20	98	1	53	.	.	.	.
L11-171	12P15	437	0	16	0	21	.	.	.	.
L11-173	L94-428	234	0	16	0	21	.	.	.	.
L11-174	L05-448	483	3	43	2	55	.	.	.	.
L11-174	L06-001	313	3	49	1	51	.	.	.	.
L11-180	HOCP96-540	391	0	16	0	21	.	.	.	.
L11-182	12P16	207	0	16	0	21	.	.	.	.
L11-182	12P16	238	7	76	.	.	.	.	.	.
L11-183	L01-299	225	8	84	5	96	.	.	.	.
L11-183	L06-001	195	17	99	8	99	.	.	.	.
L11-183	L09-099	182	2	50	2	79	.	.	.	.
L11-183	L99-226	215	2	47	0	21	.	.	.	.
L11-189	12P16	357	10	75	6	91	.	.	.	.
L97-128	HOCP96-540	499	5	49	1	44	.	.	.	.
L97-128	L01-299	463	0	16	0	21	.	.	.	.
L98-207	HOCP96-540	426	2	40	0	21	.	.	.	.
L98-207	L01-299	385	1	34	0	21	.	.	.	.
L98-207	L09-099	217	4	62	4	93	.	.	.	.
L98-207	L99-226	229	0	16	0	21	.	.	.	.
L98-207	L99-233	698	9	54	4	65	.	.	.	.
L98-207	LCP85-384	192	0	16	0	21	.	.	.	.
L98-209	HOCP04-838	325	9	75	7	94	.	.	.	.
L99-233	12P1	698	16	68	9	83	.	.	.	.
L99-233	12P11	181	3	60	1	64	.	.	.	.
L99-233	12P2	273	0	16	0	21	.	.	.	.
L99-233	12P3	200	0	16	0	21	.	.	.	.
L99-233	12P6	355	27	96	14	98	.	.	.	.
LCP81-010	HOCP04-838	143	0	16	0	21	.	.	.	.
LCP81-010	HOCP96-540	921	18	65	9	77	.	.	.	.
LCP85-384	L01-283	166	0	16	0	21	.	.	.	.
LCP85-384	L99-233	411	9	67	3	67	.	.	.	.
N27	HOCP04-847	232	3	54	0	21	.	.	.	.
N27	L05-448	933	22	70	5	62	.	.	.	.
N27	L05-448	238	6	72	.	.	.	.	.	.
N27	L06-001	1764	42	70	14	70	.	.	.	.
N27	L06-001	343	26	96	.	.	.	.	.	.
N27	L07-057	439	6	56	1	47	.	.	.	.

Table 6. Continue

			1 st. Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
N27	L99-226	1444	50	83	26	93	.	.	.	.
N27	L99-233	474	0	16	0	21	.	.	.	.
N27	L99-233	827	21	72	3	52	.	.	.	.
2013 Crossing Series										
HO07-613	13P21	234	0	15	.	.	.	.	.	.
HO08-709	CP06-2897	109	5	83	.	.	.	.	.	.
HO08-730	HOCP04-852	206	5	64	.	.	.	.	.	.
HO089-711	CP03-2390	223	2	39	.	.	.	.	.	.
HO09-824	POLY12-26	106	0	15	.	.	.	.	.	.
HO09-840	HOCP04-838	241	7	70	.	.	.	.	.	.
HO10-937	13P10	172	9	87	.	.	.	.	.	.
HO91-552	HOCP04-838	1138	18	55	.	.	.	.	.	.
HOCP01-517	13P12	886	28	75	.	.	.	.	.	.
HOCP01-517	HOCP96-540	227	8	79	.	.	.	.	.	.
HOCP01-517	L99-226	205	4	59	.	.	.	.	.	.
HOCP01-552	L01-299	361	3	34	.	.	.	.	.	.
HOCP09-808	CP95-1039	234	7	72	.	.	.	.	.	.
HOCP09-814	POLY12-30	109	3	68	.	.	.	.	.	.
HOCP09-846	HOCP09-814	220	0	15	.	.	.	.	.	.
HOCP11-544	13P3	185	10	91	.	.	.	.	.	.
HOCP85-845	L99-226	157	4	66	.	.	.	.	.	.
HOCP85-845	L99-233	162	2	45	.	.	.	.	.	.
HOCP91-552	13P10	185	0	15	.	.	.	.	.	.
HOCP91-552	L01-299	158	0	15	.	.	.	.	.	.
HOCP91-552	L08-090	131	0	15	.	.	.	.	.	.
HOCP91-552	L99-226	164	2	45	.	.	.	.	.	.
HOCP91-552	L99-233	918	2	31	.	.	.	.	.	.
HOCP92-624	13P19	127	12	95	.	.	.	.	.	.
HOCP92-624	13P20	134	2	52	.	.	.	.	.	.
HOCP92-624	13P3	454	18	81	.	.	.	.	.	.
HOCP92-624	HO11-556	432	6	50	.	.	.	.	.	.
HOCP92-624	L01-299	110	1	39	.	.	.	.	.	.
HOCP92-624	L07-057	2883	67	62	.	.	.	.	.	.
HOCP95-951	L11-172	247	2	34	.	.	.	.	.	.
HOCP96-540	13P12	249	5	59	.	.	.	.	.	.
HOCP96-540	L99-226	475	0	15	.	.	.	.	.	.
HOCP96-540	L99-233	1908	22	45	.	.	.	.	.	.
HOCP96-540	LCP81-010	354	0	15	.	.	.	.	.	.
HOCP96-540	LCP85-384	184	0	15	.	.	.	.	.	.
L06-040	L99-226	116	0	15	.	.	.	.	.	.
L07-057	13P12	238	12	85	.	.	.	.	.	.

Table 6. Continue

			1 st. Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L09-123	HOCP91-552	106	9	93	.	.	.	.	.	.
L10-138	L07-057	126	0	15	.	.	.	.	.	.
L12-197	L01-299	245	4	55	.	.	.	.	.	.
L12-197	L08-090	204	22	97	.	.	.	.	.	.
L12-205	HOCP04-838	118	0	15	.	.	.	.	.	.
L99-226	L01-299	246	13	89	.	.	.	.	.	.
L99-233	HOCP04-838	152	0	15	.	.	.	.	.	.
LCP81-010	13P5	205	7	77	.	.	.	.	.	.
MISC	MISC	230	2	39	.	.	.	.	.	.
US01-040	13P12	233	0	15	.	.	.	.	.	.
2009 Crossing Series										
CP83-644	HO06-562	457	1	13	.	.	.	.	.	.
CP83-644	HOCP01-517	2094	13	18	.	.	.	.	.	.
CP83-644	L08-093	1422	51	71	.	.	.	.	.	.
CP83-644	LCP85-384	842	23	64	.	.	.	.	.	.
HO05-961	HOCP96-540	436	10	55	.	.	.	.	.	.
HO06-537	HOCP02-610	222	0	5	.	.	.	.	.	.
HO06-563	HOCP96-540	217	10	84	.	.	.	.	.	.
HO06-563	L06-001	386	23	95	.	.	.	.	.	.
HO06-563	L99-226	208	10	90	.	.	.	.	.	.
HOCP00-930	US01-040	234	0	5	.	.	.	.	.	.
HOCP02-610	HO06-562	1136	35	67	.	.	.	.	.	.
HOCP02-610	HOCP01-523	1137	46	76	.	.	.	.	.	.
HOCP02-610	L06-001	233	10	80	.	.	.	.	.	.
HOCP02-610	L06-038	703	16	55	.	.	.	.	.	.
HOCP02-610	L94-428	390	8	47	.	.	.	.	.	.
HOCP02-610	L94-432	620	7	30	.	.	.	.	.	.
HOCP02-623	HO06-562	441	7	43	.	.	.	.	.	.
HOCP02-623	HOCP01-517	162	2	34	.	.	.	.	.	.
HOCP04-838	HOCP92-618	871	12	40	.	.	.	.	.	.
HOCP04-838	L08-089	413	0	5	.	.	.	.	.	.
HOCP05-902	L01-299	199	0	5	.	.	.	.	.	.
HOCP05-902	LCP86-454	142	3	47	.	.	.	.	.	.
HOCP05-918	L01-299	648	6	25	.	.	.	.	.	.
HOCP92-624	HOCP01-517	1013	23	55	.	.	.	.	.	.
HOCP92-624	HOCP06-523	1237	13	30	.	.	.	.	.	.
HOCP92-624	HOCP91-552	1078	75	96	.	.	.	.	.	.
HOCP92-624	L01-299	634	25	75	.	.	.	.	.	.
HOCP92-624	L06-001	204	10	93	.	.	.	.	.	.
HOCP92-624	L98-207	689	6	25	.	.	.	.	.	.
HOCP92-624	L99-226	823	14	45	.	.	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP96-561	L94-426	646	14	50	.	.	.	.	.	.
HOCP96-561	LCP85-384	453	5	30	.	.	.	.	.	.
L01-283	HOCP06-523	394	5	37	.	.	.	.	.	.
L01-315	HO06-523	694	5	20	.	.	.	.	.	.
L01-315	L01-283	477	1	13	.	.	.	.	.	.
L01-315	L06-038	432	2	16	.	.	.	.	.	.
L05-448	L06-001	384	18	86	.	.	.	.	.	.
L05-448	L06-038	542	22	78	.	.	.	.	.	.
L05-448	LCP85-384	833	7	23	.	.	.	.	.	.
L05-457	HOCP01-517	429	6	40	.	.	.	.	.	.
L05-457	HOCP01-517	1662	3	13	.	.	.	.	.	.
L05-457	HOCP06-523	946	7	20	.	.	.	.	.	.
L05-457	HOCP91-552	145	12	98	.	.	.	.	.	.
L05-457	L01-299	458	22	90	.	.	.	.	.	.
L05-457	L99-226	346	11	70	.	.	.	.	.	.
L94-432	L08-076	1277	35	64	.	.	.	.	.	.
L98-207	HOCP01-517	668	9	37	.	.	.	.	.	.
L99-233	L99-226	590	0	5	.	.	.	.	.	.
LCP81-010	HO06-523	1056	51	90	.	.	.	.	.	.
LCP81-010	HOCP02-618	1488	46	67	.	.	.	.	.	.
LCP81-010	HOCP05-918	630	24	73	.	.	.	.	.	.
LCP81-010	L06-001	916	11	34	.	.	.	.	.	.
LCP81-010	L06-038	1527	70	84	.	.	.	.	.	.
LCP81-010	L99-226	242	6	59	.	.	.	.	.	.
LCP81-010	L99-226	1674	0	5	.	.	.	.	.	.
LCP86-454	L06-001	632	27	80	.	.	.	.	.	.
N27	L94-428	238	6	59	.	.	.	.	.	.
N27	L94-432	1848	41	50	.	.	.	.	.	.
US01-040	HOCP97-609	468	12	61	.	.	.	.	.	.

2015 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM NURSERY AND INFIELD VARIETY TRIALS

Michael J. Pontif[1], Collins Kimbeng[1],
Gert Hawkins[1], David Sexton[1], Mavis Daigle[1], Alphonse Coco[1], and Sonny Viator[2]
[1]Sugar Research Station and [2]Iberia Research Station

Edwis Dufrene, William H. White, Michael J. Duet, and Francis J. Adams
USDA-ARS Sugarcane Research Unit

Five years after the initial hybridization of parents, clones that have met or exceeded criteria for desired characteristics at previous selection stages are assigned permanent numbers by each of the Louisiana Sugarcane Variety Development Programs. The LSU program assigns variety designations of "L," and the USDA program assigns variety designations of "Ho" and "HoCP." These varieties are planted in replicated nursery and infield tests at locations across the southern Louisiana sugarcane-growing areas.

One objective of the nursery and infield stages is to identify and select varieties that will perform well across the range of environments a commercial variety will encounter in Louisiana. Nursery tests are initially planted at three on-station locations (USDA-ARS - Ardoyne Farm, Iberia Research Station, and Sugar Research Station) during the year of assignment, and four to five additional and different off-station locations are planted the year after assignment. The off-station nurseries are Newton Cane, Inc. (Bunkie), Michael Melancon (Cecilia), and Landry Farms (Paincourtville), along with the two infield trial locations at Blackberry Farms (Vacherie), Sugarland Acres, Inc. (Youngsville) and Donnie Vallot (Abbeville). Both the LSU and USDA varieties were planted at each location. The locations, soil types, dates of planting and dates of harvest are listed in Table 1.

The on-station nursery trials were planted in single row (6-foot centers), 16-foot-long plots with 4-foot alleys. The off-station nurseries were planted in single row, 20-foot plots with 4-foot alleys. The infield tests were planted in two-row, 25-foot plots with 5-foot alleys. The experimental design for both nursery and infield tests was a randomized complete block with two replications per location. Five commercial check varieties, HoCP96-540, L99-226, L01-299, L01-283, and HoCP04-838 were planted in all nursery and infield tests for comparison.

Millable stalk counts for both nursery and infield tests were made in late July and August. A combine harvester and weigh wagon system was used to cut and weigh plots, respectively, for the infield tests. At harvest, 10-stalk samples were harvested by hand and stripped of leaves. A bundle weight was recorded to obtain a stalk weight (lb) estimate. Samples were then analyzed for sucrose content and fiber content. At the USDA-ARS laboratory, the pre-breaker press method was used to estimate fiber content. A juice sample was sent to the laboratory to obtain Brix and pol readings, which were used to estimate theoretical recoverable sugar per ton as estimated by the Winter-Carp formula as reported by Gravois and Milligan (1992). Samples sent to the Sugar Research Station sucrose laboratory were analyzed with a NIR Spectra Cane system to estimate sucrose and fiber content. Cane yield for the nursery tests was estimated as the product of stalk weight and stalk number. Cane yield for the infield tests was determined from the plot weights and reduced 14 percent to account for extraneous trash. Sugar per acre was calculated as the product of sugar per ton and cane yield.

The 2015 sugarcane crop experienced cold and above average rainfall during January through April, which led to a slow start for the cane crop. In June and July South Louisiana experienced favorable conditions with less rainfall. Tropical activity in the Atlantic basin was quiet in 2015, but the industry experienced quite a bit of rain and wind when the remnants of Hurricane Patricia (from the Pacific Ocean) spread across Louisiana in late October. By August, the weather turned to a drier pattern and by mid-October much of the state was in drought conditions. The dry conditions were alleviated in October by the remnants of Hurricane Patricia, which came through on October 20 – 24. This began a wet pattern that persisted through the remainder of the 2015-16 harvest. The majority of the Louisiana crop was harvested by the end of December. Recommended cultural practices were followed at all test locations.

The most widely grown varieties in Louisiana in 2015 were HoCP96-540 and L01-299, occupying 34% and 30% of the state's acreage, respectively. L01-299 was used as a standard for comparison and is highlighted in the tables. To adjust for missing data, the statistical analysis calculated least square means (SAS 9 Proc Mixed). Mean separation used least square means probability differences where P=0.05. Varieties that are significantly higher or lower than L01-299 are denoted by a plus (+) or minus (-), respectively, next to the value for each trait.

References:

Gravois, K.A. and S.B. Milligan. 1992. Genetic relationships between fiber and sugarcane yield components. Crop Sci. 32: 62-66.

Table 1. 2015 Location, soil texture, and planting and harvest dates for the nursery and infield tests.

					Harvest Date	Varieties	
Series	Location†	Stage	Soil Texture	Planting Date	2015	No. Planted	No. Harvested
2010	Blackberry Farms	Infield	Commerce silt loam	08/26/11	10/19/15	21	3
2010	Donnie Vallot Farm	Infield	Patoutville silt loam	09/22/11	10/09/15	21	3
2011	Donnie Vallot Farms	Infield	Patoutville silt loam	09/10/12		13	1
2011	Blackberry Farms	Infield	Commerce silt loam	08/17/12	10/19/15	13	1
2011	Newton Cane, Inc.	Nursery	Norwood silt loam	08/22/12	11/11/15	54	4
2011	Michael Melancon	Nursery	Loreauville silt loam	09/11/12	10/20/15	54	4
2011	Landry Farms	Nursery	Sharkey silty clay loam	09/27/12	10/13/15	54	4
2012	Sugar Research Station	Nursery	Commerce silt loam	10/25/12	11/19/15	40	2
2012	Ardoyne Farm – U.S.D.A.	Nursery	Commerce silt loam	11/02/12	10/23/15	40	2
2012	Iberia Research Station	Nursery	Baldwin silty clay	10/23/12	10/16/15	40	2
2012	Blackberry Farms	Infield	Commerce silt loam	08/30/13	10/19/15	21	5
2012	Donnie Vallot Farms	Infield	Patoutville silt loam	09/03/13	12/29/15	21	5
2012	Newton Cane, Inc	Nursery	Norwood silt loam	08/27/13	11/11/15	58	8
2012	Michael Melancon	Nursery	Loreauville silt loam	08/20/13	11/17/15	58	8
2012	Landry Farms	Nursery	Sharkey silty clay loam	08/22/13	11/03/15	58	8
2013	Sugar Research Station	Nursery	Commerce silt loam	10/29/13	12/04/15	30	7
2013	Ardoyne Farm – U.S.D.A.	Nursery	Commerce silt loam	10/31/13	12/04/15	30	7
2013	Iberia Research Station	Nursery	Baldwin silty clay	11/06/13	10/16/15	30	7
2013	Blackberry Farms	Infield	Commerce silt loam	08/26/14	12/16/15	34	13
2013	Donnie Vallot Farms	Infield	Patoutville silt loam	09/11/14	12/29/15	34	13
2013	Newton Cane, Inc.	Nursery	Norwood silt loam	08/20/14	11/11/15	67	25
2013	Michael Melancon	Nursery	Loreauville silt loam	08/22/14	11/17/15	67	25
2013	Landry Farms	Nursery	Sharkey silty clay loam	08/19/14	12/08/15	67	25
2014	Sugar Research Station	Nursery	Commerce silt loam	10/27/14	12/08/15	33	17
2014	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	10/30/14	12/04/15	33	17
2014	Iberia Research Station	Nursery	Baldwin silty clay	10/28/14	12/02/15	33	17
2014	Blackberry Farms	Infield	Commerce silt loam	08/25/15		36	
2014	Donnie Vallot Farms	Infield	Patoutville silt loam	09/10/15		36	
2014	Newton Cane, Inc.	Nursery	Norwood silt loam	08/11/15		77	
2014	Michael Melancon	Nursery	Loreauville silt loam	09/01/15		77	
2014	Landry Farms	Nursery	Sharkey silty clay loam	08/28/15		77	
2015	Sugar Research Station	Nursery	Commerce silt loam	10/12/15		38	
2015	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	10/22/15		38	
2015	Iberia Research Station	Nursery	Baldwin silty clay	10/15/15		38	

† Ardoyne-U.S.D.A. Ardoyne Farm (Chacahoula), Blackberry Farms (Vacherie), Iberia Research Station (Jeanerette), Newton Cane, Inc. (Bunkie), Sugar Research Station (St. Gabriel), Michael Melancon (Cecilia), Sugarland Acres Inc. (Youngsville), Donnie Vallot Farm (Erath), Landry Farms (Paincourtville).

Table 2. Nursery second-stubble means of the 2011 "L" and "Ho" assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	9779 -	38.1 -	257	1.81	42108 -	10.3 -
L99-226	15036	55.8 +	270	2.44 +	45738 -	10.2 -
L01-299	16238 +	61.6	263	1.97	62799	12.3
L03-371	15655	56.2	278	2.06	54813	9.7 -
L11-183	9849 -	38.6 -	256 -	1.68	46101 -	10.8 -
Ho11-512	9209 -	31.4 -	294 +	1.55 -	40293 -	9.8 -
Ho11-515	12542	47.5	263	1.84	50820	10.9
Ho11-532	9011 -	35.1 -	258	1.72	40656 -	12.9 +

Table 3. Nursery second-stubble means of the 2011 "L" and "Ho" assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	5489	23.5	235	1.29	36300	12.6
L99-226	7175	28.8	250	1.57	36845	12.3
L01-299	6766	27.6	245	1.23	44649	12.1
L03-371	4469	21.9	204	1.14	38297	10.9 -
L11-183	5166	20.5	249	1.34	30129	11.4
Ho11-512	5453	20.9	253	1.13	36119	10.5 -
Ho11-515	9418	34.6	273	1.41	47735	11.7
Ho11-532	7715	29.9	258	1.23	49005	12.0

Table 4. Nursery second-stubble means of the 2011 "L" and "Ho" assignment series on a, Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	4937	22.5	219	1.39	33396	11.3
L99-226	5004	22.5	223	1.61	28496	10.2 -
L01-299	5878	27.1	216	1.36	39567	11.7
L03-371	5806	25.9	225	1.26	41019	10.9
L11-183	7366	34.3	208	1.69	40112	11.3
Ho11-512	7041	29.8	237	1.41	42290	10.1 -
Ho11-515	5457	21.0	263 +	1.24	33033	12.0
Ho11-532	6112	25.9	235	1.21	43016	11.1

Table 5. Nursery second-stubble means of the 2011 “L”and “Ho” assignment series across 3 locations (Newton, Melancon and Westfield) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	6735	28.0	237	1.50	37268	11.4
L99-226	9071	35.7	247	1.87 +	37026	10.9
L01-299	9628	38.8	241	1.52	49005	12.0
L03-371	8643	34.7	236	1.49	44710	10.5 -
L11-183	7460	31.2	238	1.57	38781	11.2
Ho11-512	7234	27.4	261	1.37	39567	10.1 -
Ho11-515	9139	34.4	267	1.50	43863	11.5
Ho11-532	7613	30.3	250	1.38	44226	12.0

Table 6. Nursery first-stubble means of the 2012 “L”, “Ho”, and “HoCP” assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8507	34.8	244 -	2.37	29766	10.8
L 99-226	14167	52.3	271	2.57	40838	10.9
L 01-283	13715	53.2	258	2.16 +	49368	11.5
L 01-299	11347	42.0	270	1.89	43923	10.8
HoCP 04-838	11178	44.8	250 -	1.94	46283	12.6 +
L 12-201	12229	43.5	282	2.23	38660	9.4
L 12-202	10602	40.9	258	2.11	38660	10.5
Ho 12-615	10752	44.0	245 -	1.41	62255 +	12.9 +
Ho 12-626	14087	53.1	265	1.92	55358	10.7
Ho 12-630	10665	40.4	265	2.21	36663	10.5
HoCP 12-667	9567	35.0	274	1.55	45194	10.3
HoCP 12-671	9399	35.0	268	2.05	33759	13.5 +
HoCP 12-673	10945	44.4	246	2.31	38478	10.4

Table 7. Nursery first-stubble means of the 2012 “L”, “Ho”, and “HoCP” assignment series on a Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	5646 -	18.8 -	301	1.37	27407 -	11.1
L 99-226	10018	33.0	303	1.82 +	36300	11.6
L 01-283	7404	24.9	298	1.21	41201	11.8
L 01-299	8421	28.1	300	1.41	39930	11.8
HoCP 04-838	6556	22.6	289	1.33	34122	12.4
L 12-201	9419	30.7	307	2.14 +	28859 -	9.7 -
L 12-202	7475	24.5	304	1.59	30855 -	11.3
Ho 12-615	9406	32.1	293	1.17	55176 +	11.3
Ho 12-626	10027	32.2	311	1.31	49368 +	10.7 -
Ho 12-630	10029	32.1	312	1.67	38660	11.2
HoCP 12-667	7856	26.0	302	1.28	41382	11.1
HoCP 12-671	7868	26.3	299	1.60	33215	12.5
HoCP 12-673	7438	26.5	280 -	1.53	34667	9.4 -

Table 8. Nursery first-stubble means of the 2012 “L”, “Ho”, and “HoCP” assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8142	34.3	237	1.98 +	34667	11.6
L 99-226	10370	41.5	249	2.06 +	40293	12.3
L 01-283	9386	35.1	267	1.50 -	47009	11.8
L 01-299	9274	36.6	252	1.62	45194	11.7
HoCP 04-838	7729	32.7	237	1.67	39204	12.8
L 12-201	11581	45.1	257	2.43 +	37208	10.3
L 12-202	10801	42.1	257	2.19 +	38478	11.8
Ho 12-615	8036	33.5	241	1.31 -	50820	12.9
Ho 12-626	8106	32.3	251	1.49	43560	10.7
Ho 12-630	9399	38.3	245	2.10 +	36482	11.5
HoCP 12-667	9265	36.4	250	1.63	43379	11.3
HoCP 12-671	8081	32.2	251	1.64	39204	12.9
HoCP 12-673	7911	33.6	237	1.86	36119	8.7 -

Table 9. Nursery first-stubble means of the 2012 “L”, “Ho”, and “HoCP” assignment series across 3 locations (Newton, Melancon and Westfield) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	7432 -	29.3	260 -	1.91	30613 -	11.2
L 99-226	11518	42.3	275	2.15 +	39144	11.6
L 01-283	10168	37.7	274	1.62	45859	11.7
L 01-299	9681	35.6	274	1.64	43016	11.4
HoCP 04-838	8488	33.4	259 -	1.65	39870	12.6 +
L 12-201	11076	39.8	282	2.27 +	34909 -	9.8 -
L 12-202	9626	35.8	273	1.96 +	35998 -	11.2
Ho 12-615	9398	36.5	260 -	1.30 -	56084 +	12.4 +
Ho 12-626	10740	39.2	276	1.57 -	49429 +	10.7
Ho 12-630	10031	36.9	274	1.99 +	37268	11.0
HoCP 12-667	8896	32.5	276	1.48 -	43318	10.9
HoCP 12-671	8450	31.2	273	1.76	35393	12.9 +
HoCP 12-673	8765	34.8	255 -	1.90	36421	9.5 -

Table 10. Nursery plantcane means of the 2013 “L”, “Ho”, and “HoCP”, assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9472	36.6	259	2.48	29585	11.0
L 01-283	10693	40.1	266	1.69	49368 +	10.1
L 01-299	7372	27.9	264	2.04	27225	9.9
HoCP 04-838	12084	46.0	260	2.16	42290 +	13.1 +
Ho 11-9403	11237	45.5	246	2.07	44105 +	11.0
L 13-234	12655	50.6	249	2.09	48461 +	11.5
L 13-242	10392	43.0	241 -	2.25	38297	9.7
L 13-243	9185	38.6	236 -	2.53	30129	10.7
L 13-251	11949	50.1	236 -	2.29	43742 +	9.2 -
L 13-257	12223	46.3	265	2.28	40475 +	10.4
L 13-260	9663	36.9	260	1.83	40293	11.0
L 13-263	11520	44.2	262	1.99	45012 +	12.1 +
Ho 13-700	10708	47.7	226 -	2.10	45194 +	8.6 -
Ho 13-708	11368	44.5	255	2.54	35030	11.8 +
Ho 13-710	10578	41.4	256	2.19	37752	11.4
Ho 13-720	13223	48.4	273	2.13	45375 +	10.9
HoCP 13-723	9329	33.0	283 +	1.56	42290 +	8.5 -
HoCP 13-726	10362	38.7	270	2.04	37752	10.0
HoCP 13-731	13062	48.7	268	1.95	49913 +	10.8
HoCP 13-737	16464	58.5	281	2.51	46646 +	9.4
HoCP 13-738	11702	44.9	261	2.33	38478	10.9
Ho 13-739	11534	43.9	263	2.38	36845	11.0
HoCP 13-740	12550	48.7	260	2.26	42834 +	10.2
HoCP 13-755	9208	33.6	273	1.64	40656 +	10.6
HoCP 13-756	9652	38.1	255	1.45 -	51546 +	10.7
HoCP 13-758	13343	53.2	249	2.42	43560 +	9.0
Ho 13-769	11706	43.6	268	2.54	34848	8.4 -
HoCP 13-771	10220	39.0	261	2.24	34848	10.1
HoCP 13-775	10414	41.4	251	1.65 -	50094 +	8.3 -

Table 11. Nursery plantcane means of the 2013 “L”, “Ho”, and “HoCP” assignment series on a Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9287	34.7	268 +	2.03	34122	9.9
L 01-283	8268	29.6	280 +	1.82	32489	10.9 +
L 01-299	8266	33.9	244	1.99	33941	9.9
HoCP 04-838	8826	33.7	262 +	1.78	38297	11.3 +
Ho 11-9403	7213	28.1	257	1.69 -	33215	10.3
L 13-234	7190	27.5	262 +	1.52 -	36119	10.9
L 13-242	7783	31.0	251	1.87	33215	11.7 +
L 13-243	7988	32.0	250	2.14	29948	9.8
L 13-251	8055	31.8	252	2.43 +	26136 -	9.9
L 13-257	9532	37.2	257	2.07	35937	11.7 +
L 13-260	8040	30.5	264 +	1.60 -	38115	12.0 +
L 13-263	8972	34.3	261 +	1.87	36663	13.0 +
Ho 13-700	7971	31.3	257	1.77 -	35211	9.0
Ho 13-708	9748	36.2	270 +	2.27	32126	12.0 +
Ho 13-710	7337	28.8	255	1.90	30311	10.6
Ho 13-720	7363	26.9	273 +	1.63 -	32852	10.6
HoCP 13-723	6565	23.7 -	277 +	1.47 -	32307	8.4 -
HoCP 13-726	7815	27.6	282 +	1.54 -	35574	9.3
HoCP 13-731	8264	30.1	275 +	1.43 -	42653 +	10.6 +
HoCP 13-737	6934	24.9 -	278 +	1.88	26862	8.2 -
HoCP 13-738	7635	28.4	269 +	1.93	29585	10.1
Ho 13-739	7721	27.8	278 +	1.80	31037	10.2
HoCP 13-740	9629	36.6	263 +	1.97	37208	9.5
HoCP 13-755	9062	32.1	282 +	1.66 -	38660	8.8 -
HoCP 13-756	7156	25.8 -	277 +	1.41 -	36663	10.1
HoCP 13-758	9740	38.4	253	2.20	34848	8.1 -
Ho 13-769	9482	34.3	276 +	1.86	36845	9.3
HoCP 13-771	7607	27.2	279 +	1.71 -	31944	9.3
HoCP 13-775	8103	31.0	263 +	1.81	34122	8.9 -

Table 12. Nursery plantcane means of the 2013 “L”, “Ho”, and “HoCP” assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9553	36.1	264	2.09	34485	10.2 -
L 01-283	7503	29.2	253	1.50 -	38660	9.3 -
L 01-299	8901	34.1	262	2.02	33578	11.9
HoCP 04-838	9599	36.9	259	1.73	42471	11.1
Ho 11-9403	6736	27.9	241	1.79	31400	11.5
L 13-234	8803	33.8	262	1.72	39023	11.5
L 13-242	12638	47.4	267	2.23	42653	12.4
L 13-243	10646	40.4	264	2.09	38478	9.9 -
L 13-251	11873	45.6	260	2.12	43197	11.8
L 13-257	9372	34.3	273	2.22	31218	11.6
L 13-260	9067	36.1	250	1.60	45194	11.8
L 13-263	10531	41.1	257	1.90	43197	13.3
Ho 13-700	11244	45.4	244	2.01	44831	9.0 -
Ho 13-708	11609	43.1	269	2.42	35574	12.8
Ho 13-710	10788	39.4	274	2.10	38115	10.9
Ho 13-720	7592	29.4	258	1.42 -	41564	11.5
HoCP 13-723	8827	33.7	262	1.67	40293	8.6 -
HoCP 13-726	10097	40.0	252	1.83	44831	9.5 -
HoCP 13-731	10223	39.8	257	1.45 -	54813 +	11.5
HoCP 13-737	11618	42.1	276	2.06	40838	8.8 -
HoCP 13-738	14721	53.1	278	2.43	44286	10.9
Ho 13-739	11685	45.2	258	2.11	42471	10.5
HoCP 13-740	14090	54.2	259	2.19	49368 +	10.2 -
HoCP 13-755	10587	40.6	261	1.78	45738	9.6 -
HoCP 13-756	10829	42.8	252	1.60	53906 +	11.0
HoCP 13-758	12345	45.8	270	1.95	45375	7.8 -
Ho 13-769	8813	33.5	264	1.89	37208	7.7 -
HoCP 13-771	7720	30.0	258	1.91	31400	8.7 -
HoCP 13-775	9537	36.6	261	1.84	39749	8.5 -

Table 13. Nursery plantcane means of the 2013 “L”, “Ho”, and “HoCP” assignment series across 3 locations (Newton, Melancon and Westfield) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9438	35.8	264	2.20	32731	10.4
L 01-283	8821	33.0	266	1.67 -	40172 +	10.1
L 01-299	8180	32.0	257	2.02	31581	10.6
HoCP 04-838	10170	38.9	261	1.89	41019 +	11.8 +
Ho 11-9403	8396	33.8	248 -	1.85	36240	10.9
L 13-234	9549	37.3	258	1.78	41201 +	11.3
L 13-242	10271	40.5 +	253	2.11	38055	11.2
L 13-243	9273	37.0	250	2.26 +	32852	10.2
L 13-251	10626 +	42.5 +	249	2.28 +	37692	10.3
L 13-257	10376	39.3	265	2.19	35877	11.2
L 13-260	8923	34.5	258	1.67 -	41201 +	11.6
L 13-263	10341	39.9	260	1.92	41624 +	12.8 +
Ho 13-700	9974	41.4 +	242 -	1.96	41745 +	8.9 -
Ho 13-708	10908 +	41.2 +	265	2.41 +	34243	12.2 +
Ho 13-710	9567	36.5	261	2.06	35393	11.0
Ho 13-720	9393	34.9	268	1.73 -	39930 +	11.0
HoCP 13-723	8240	30.1	274 +	1.57 -	38297 +	8.5 -
HoCP 13-726	9425	35.5	268	1.80	39386	9.6
HoCP 13-731	10516	39.5	267	1.61 -	49126 +	11.0
HoCP 13-737	11672 +	41.8 +	279 +	2.15	38115	8.8 -
HoCP 13-738	11353 +	42.1 +	269	2.23	37450	10.7
Ho 13-739	10313	38.9	267	2.09	36784	10.6
HoCP 13-740	12089 +	46.5 +	261	2.14	43137 +	10.0
HoCP 13-755	9619	35.4	272	1.69 -	41685 +	9.7 -
HoCP 13-756	9212	35.6	262	1.49 -	47372 +	10.6
HoCP 13-758	11810 +	45.8 +	257	2.19	41261 +	8.3 -
Ho 13-769	10000	37.1	270	2.10	36300	8.5 -
HoCP 13-771	8516	32.1	266	1.95	32731	9.4 -
HoCP 13-775	9351	36.3	258	1.76	41322 +	8.6 -

Table 14. Infield and nursery second-stubble means of the 2011 "L" and "Ho", assignment series across 5 locations (Blackberry, Melancon, Newton, Westfield, and Donnie Vallot Farms) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	6735	28.0	230	1.54	37268	11.5
L 99-226	9071	35.7	245	1.84 +	37026	11.1
L 01-299	9628	38.8	236	1.46	49005	11.8
L 03-371	8643	34.7	233	1.42	44710	10.4 -
L 11-183	7460	31.2	234	1.56	38781	11.3
Ho 11-512	7234	27.4	257	1.34	39567	10.1 -
Ho 11-515	9139	34.4	263	1.47	43863	11.5
Ho 11-532	7613	30.3	246	1.36	44226	12.0

Table 15. Infield and nursery first-stubble means of the 2012 "L" and 2011 "Ho" assignment series across 5 locations (Blackberry, Melancon, Newton, Sugarland Acres, and Westfield) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	7522	29.8	255	1.90 +	31359 -	11.8
L 99-226	10169	37.6	271	2.21 +	34946 -	12.2
L 01-283	9325	34.5	272	1.66	41300	12.1
L 01-299	8875	33.7	263	1.65	40590	12.1
HoCP 04-838	7898	31.3	253	1.62 -	38211	12.7
Ho 11-512	7807	27.8	284 +	1.81	30734 -	9.6 -
Ho 11-515	8580	33.0	263	1.93	33463 -	12.3
Ho 11-532	9132	35.3	262	1.86	37361	12.5
L 12-201	9924	36.2	273	2.25 +	31941 -	10.5 -
L 12-202	8616	32.4	269	1.92 +	33371 -	11.6

Table 16. Infield and nursery plantcane means of the 2013 "L", 2012 "Ho" and "HoCP" assignment series across 5 locations (Blackberry, Melancon, Newton, Sugarland Acres, and Westfield) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9536	36.8	259	2.16	34244	11.27
L 01-283	8691	32.4	267 +	1.76 -	37692	10.83
L 01-299	8317	32.8	254	2.00	32867	11.36
HoCP 04-838	9375	36.8	254	1.84	39888 +	12.14
Ho 11-9403	7877	32.2	246	1.84	35050	11.48
Ho 12-615	9599	37.9	252	1.77	43495 +	12.57 +
Ho 12-626	9801	37.5	258	1.78	41670 +	10.02 -
Ho 12-630	10647	40.6	261	2.34 +	34928	10.62
HoCP 12-667	7632	28.7	265	1.94	29042	11.73
HoCP 12-671	10022	38.7	257	2.12	36328	13.21 +
HoCP 12-673	10418	39.3	265	2.31 +	33754	8.87 -
L 13-234	9101	36.1	253	1.66 -	43395 +	11.74
L 13-242	9332	37.5	248	2.15	34838	11.98
L 13-243	7766	31.4	246	2.22 +	28238	10.66
L 13-251	9748	38.6	252	2.31 +	33862	11.06
L 13-257	10368 +	40.0 +	260	2.23 +	35991	11.37
L 13-260	8029	31.1	257	1.58 -	39181 +	12.16
L 13-263	9611	37.4	257	1.91	39595 +	13.06 +

Table 17. Nursery second-stubble means of the 2012 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	6885	28.6	241 -	1.80	31763	12.2
L 99-226	12994	49.6	262	2.32	42879	12.4
L 01-299	12538	49.3	255	1.89	52862	12.9
L 03-371	11883	48.9	245 -	1.94	49459	11.0 -
L 12-201	11205	43.7	256	2.32	37661	10.3 -
L 12-202	10302	38.8	266 +	2.18	35619	12.1

Table 18. Nursery second-stubble means of the 2012 “L” assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8842	36.0	246	1.60	44921	10.5 -
L 99-226	12459	49.7	251	2.02	49232	12.0 +
L 01-299	12267	51.7	239	1.82	57400	11.4
L 03-371	11246	45.9	246	1.69	54677	9.8 -
L 12-201	12275	47.3	260	2.11	44695	10.6 -
L 12-202	10710	42.7	250	2.04	41745	11.0

Table 19. Nursery second-stubble means of the 2012 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	10307	39.0	262	1.87	41291 -	10.6
L 99-226	16630 +	56.4	295 +	2.15 +	52635 -	11.8
L 01-299	12948	48.3	269	1.54	62844	12.9
L 03-371	12756	43.9	290 +	1.90	46283 -	10.3 -
L 12-201	12956	44.7	289 +	2.32 +	38569 -	10.7
L 12-202	10290	37.3	275	1.96 +	37888 -	11.6

Table 20. Nursery second-stubble means of the 2012 “L” assignment series across 3 locations (St. Gabriel, Iberia and U.S.D.A.- Ardoyne Farms) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8678 -	34.5 -	250	1.76	39325 -	11.1 -
L 99-226	14027	51.9	269	2.16 +	48249 -	12.1
L 01-299	12584	49.8	254	1.75	57702	12.4
L 03-371	11961	46.2	260	1.84	50139 -	10.3 -
L 12-201	12146	45.2	269	2.25 +	40308 -	10.5 -
L 12-202	10434 -	39.6 -	264	2.06 +	38418 -	11.6 -

Table 21. Nursery first-stubble means of the 2013 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	10109	37.8	266	2.67	27906 -	10.5
L 99-226	18858	65.8	287	3.17 +	41518	11.3
L 01-299	13196	49.2	268	2.22	43560	12.3
HoCP 04-838	15950	59.4	268	2.48	47871	12.7
L 13-234	18391	65.3	282	2.82 +	46283	11.7
L 13-242	9527	36.2	263	2.26	31989	12.0
L 13-243	13761	51.4	268	2.39	42879	10.2
L 13-251	14081	52.6	268	2.97 +	35393	11.7
L 13-257	16394	61.0	269	3.38 +	36073	10.1
L 13-260	13329	48.6	274	2.13	45602	11.5
L 13-263	11363	41.0	277	2.10	39249	11.6

Table 22. Nursery first-stubble means of the 2013 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	7346	31.1	236	1.96	31763	9.4
L 99-226	11024	42.5	259	2.24	37888	10.5
L 01-299	8628	35.6	245	1.87	37888	11.4
HoCP 04-838	9034	38.7	234	1.77	44241	11.1
L 13-234	10792	45.3	238	2.36 +	38342	10.7
L 13-242	6862	30.0	229	1.73	34712	11.2
L 13-243	7540	32.1	235	1.72	37434	10.8
L 13-251	7781	35.0	224	1.86	37434	9.9
L 13-257	7670	35.3	218	1.89	37434	10.3
L 13-260	5172 -	21.2	244	1.31 -	32443	10.7
L 13-263	8006	31.7	254	1.52	41972	11.5

Table 23. Nursery first-stubble means of the 2013 "L" assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8969	32.8	272	2.06	32443	11.1
L 99-226	13648	47.3	289	2.40	39476	12.6
L 01-299	9385	33.9	277	1.78	38342	12.3
HoCP 04-838	10013	37.2	269	1.81	41064	12.3
L 13-234	9262	34.7	267	1.66	41745	12.2
L 13-242	13312	51.9	255 -	2.26	46509	11.5
L 13-243	11804	44.6	264	2.21	40384	9.9
L 13-251	11820	43.6	272	2.22	39023	10.9
L 13-257	12344	44.2	280	2.30	38796	13.5
L 13-260	13089	48.0	273	1.71	56038 +	11.2
L 13-263	12454	44.0	283	1.70	52408 +	13.7

Table 24. Nursery first-stubble means of the 2013 "L" assignment series arcoss 3 locations (St. Gabriel, Iberia and U.S.D.A. - Ardoyne Farms) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	8808	33.9	258	2.23	30704	10.3
L 99-226	14510	51.9	278 +	2.60 +	39628	11.5
L 01-299	10403	39.6	263	1.96	39930	12.0
HoCP 04-838	11665	45.1	257	2.02	44392	12.0
L 13-234	12815	48.4	262	2.28	42123	11.5
L 13-242	9900	39.4	249 -	2.08	37737	11.6
L 13-243	11035	42.7	256	2.11	40233	10.3
L 13-251	11227	43.7	254	2.35	37283	10.9
L 13-257	12136	46.8	256	2.52 +	37434	11.3
L 13-260	10530	39.3	264	1.72 -	44694	11.1
L 13-263	10608	38.9	271	1.77 -	44543	12.3

Table 25. Nursery plantcane means of the 2014 “L” assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	12685	47.6	267 +	2.72	35166	11.6
L 01-283	12906	46.4	278 +	2.20	42199	11.3
L 01-299	10800	43.6	249	2.54	34031	12.4
HoCP 04-838	14586	53.8	273 +	2.67	39930	11.7
L 14-264	13315	47.5	280 +	2.66	35619	10.7
L 14-265	12295	45.3	272 +	1.99	45602 +	11.7
L 14-266	12157	44.3	276 +	2.65	33124	10.0 -
L 14-267	16935 +	57.8	293 +	2.93	39703	10.3 -
L 14-270	8839	33.0	268 +	1.91 -	34485	10.7
L 14-271	13927	51.1	273 +	2.42	41972	12.9
L 14-273	16865 +	60.6	278 +	2.26	53769 +	13.6
L 14-274	9474	35.1	270 +	2.21	31763	10.2 -
L 14 -275	13819	53.1	262	2.81	37888	11.1
L 14-276	10717	40.2	266 +	2.47	32443	11.6
L 14-282	14571	54.4	268 +	2.76	39476	10.6 -
L 14-285	11707	45.8	255	2.45	37434	9.2 -
L 14-288	10150	39.2	259	2.81	27906	9.7 -
L 14-289	10462	38.9	269 +	2.02 -	38569	12.5
L 14-294	13689	51.3	266 +	1.75 -	58761 +	11.0
L 14-295	16324 +	58.6	279 +	2.73	42879 +	12.2
L 14-297	14139	50.3	281 +	2.85	35393	9.7 -

Table 26. Nursery plantcane means of the 2014 “L” assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	4987	22.8	220	2.17	20646	9.2
L 01-283	6801	28.5	239	2.17	26544	9.8
L 01-299	5328	22.1	241	2.07	21326	10.3
HoCP 04-838	7802	36.6 +	212 -	2.48	29721	9.6
L 14-264	5486	21.1	260	1.97	21553	9.4
L 14-265	3701	15.5	239	1.52	20646	10.0
L 14-266	7247	28.3	256	1.93	29267	9.3
L 14-267	9679 +	38.5 +	251	2.42	32216	9.2 -
L 14-270	4471	17.4	252	1.49 -	24276	9.2 -
L 14-271	4142	17.0	242	1.84	18831	11.9 +
L 14-273	8943 +	34.2	261	1.70	40384 +	10.5
L 14-274	7672	30.2	255	2.13	28133	10.4
L 14 -275	5650	24.1	234	2.17	22234	10.3
L 14-276	5316	20.7	252	2.24	18604	10.9
L 14-282	9985 +	40.8 +	246	2.42	33804 +	10.4
L 14-285	5438	20.2	269 +	1.80	23141	10.0
L 14-288	8296	35.0 +	239	2.48	27906	10.0
L 14-289	7372	28.5	259	1.89	30174	11.1
L 14-294	5566	22.8	244	1.27 -	36300 +	9.0
L 14-295	7857	35.4 +	220 -	2.22	31536	7.9 -
L 14-297	6039	22.9	265	2.42	19284	9.0 -

Table 27. Nursery plantcane means of the 2014 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	10754	39.7	271	2.64	29948	12.0
L 01-283	10218	40.7	252	2.21	36754	9.9
L 01-299	8057	31.6	254	2.26	27906	11.9
HoCP 04-838	10449	41.2	254	2.37	34712	12.0
L 14-264	13645 +	47.0	290 +	2.09	44921	7.8 -
L 14-265	14209 +	51.2 +	277	2.59	39930	9.4 -
L 14-266	13246 +	50.0 +	260	2.40	41291	10.2
L 14-267	17548 +	62.9 +	279	2.79	45148	10.7
L 14-270	7556	27.8	272	1.98	28359	11.3
L 14-271	11255	41.6	271	2.21	37208	13.2
L 14-273	12905	48.7 +	267	2.24	43106	12.5
L 14-274	11211	40.8	275	1.87	44014	10.6
L 14 -275	13336 +	49.7 +	268	2.16	46056	12.8
L 14-276	9106	34.7	263	1.97	35166	10.7
L 14-282	14540 +	54.8 +	265	2.79	41291	11.4
L 14-285	11996	45.1	266	2.29	39476	9.8
L 14-288	11349	44.2	257	2.67	33351	9.9
L 14-289	6941	29.1	238	1.59 -	36754	9.3 -
L 14-294	8888	35.0	255	1.42 -	49232	11.1
L 14-295	9966	44.0	225 -	2.16	41972	8.6 -
L 14-297	10327	37.8	273	2.67	28330	8.2 -

Table 28. Nursery plantcane means of the 2014 “L” assignment series across 3 locations (St.Gabriel, Iberia and U.S.D.A. - Ardoyne Farms) in 2015.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs./A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP 96-540	9475	36.7	253	2.51	28586	11.0
L 01-283	9975	38.5	256	2.19	35166	10.3
L 01-299	8062	32.4	248	2.29	27754	11.5
HoCP 04-838	10946 +	43.9 +	246	2.51	34788	11.1
L 14-264	10815	38.5	277 +	2.24	34031	9.3 -
L 14-265	10068	37.3	263	2.03 -	35393 +	10.4
L 14-266	10883 +	40.9	264	2.33	34561	9.8 -
L 14-267	14721 +	53.1 +	274 +	2.71 +	39023 +	10.1
L 14-270	6955	26.1	264	1.79 -	29040	10.4
L 14-271	9775	36.6	262	2.16	32670	12.7 +
L 14-273	12904 +	47.8 +	269 +	2.07	45753 +	12.2
L 14-274	9453	35.4	267	2.07	34636	10.4
L 14 -275	10935 +	42.3 +	255	2.38	35393 +	11.4
L 14-276	8380	31.9	260	2.23	28738	11.0
L 14-282	13032 +	50.0 +	260	2.65 +	38191 +	10.8
L 14-285	9714	37.0	263	2.18	33351	9.7 -
L 14-288	9932	39.5	252	2.65 +	29721	9.9 -
L 14-289	8258	32.1	256	1.83 -	35166	11.0
L 14-294	9381	36.4	255	1.48 -	48098 +	10.4
L 14-295	11382 +	46.0 +	241	2.37	38796 +	9.6 -
L 14-297	10354	37.7	273 +	2.64 +	28237	9.1 -

2015 LOUISIANA "Ho" NURSERY VARIETY TRIALS

E. O. Dufrene, M. J. Duet, F. J. Adams, W. H. White, and J.R. Todd
USDA-ARS, Sugarcane Research Unit (SRU)
Houma, LA

In the Sugarcane Research Unit's sugarcane variety program, promising experimental varieties are assigned permanent "HoCP" or "Ho" numbers three years after selection in the seedling stage. These varieties are then planted in replicated yield trials at USDA's Ardoyne Farm in Schriever and at the LSU AgCenter's Iberia Research Station in Jeanerette and Sugar Research Station in St. Gabriel.

The USDA nursery test plots planted during the year of assignment employ a randomized complete block design with two replications. Plots are 16 feet long by six feet (one row) wide with a four-foot alley between plots. A minimum of three commercial varieties are planted in each test for comparison purposes. In addition to experimental commercial varieties, clones from the SRU Recurrent Selection for Borers (RSB) program are included in nursery trials. Yield data collected on RSB clones give breeders additional agronomic data to aid in selection of parents for use in the breeding program. The following year, experimental varieties advanced for further testing are combined with varieties from the LSU AgCenter program ("L" series) and planted in replicated nursery yield trials on commercial farms that collectively represent the different regions of the sugarcane belt.

In the spring and summer, researchers rate nursery test plots for yield traits such as population, height, diameter, erectness, etc. Mature, millable stalks are counted in each plot in late July or August. A 10-stalk sample is hand-cut from plots of active varieties during the harvest season. Samples from USDA nurseries are taken to the Juice and Milling Quality Laboratory at the USDA Ardoyne Farm, where they are weighed to determine stalk weight and processed for sucrose analysis. Brix and pol values are used to estimate the yield of theoretical recoverable sugar (TRS) per ton of cane. Estimated yields of cane and sugar per acre, and number of stalks per acre are calculated based on results from juice analyses, mature millable stalk counts, and mean stalk weight. Varieties with yields equal or higher than the control varieties (both cane tonnage and sugar per ton) and not appearing to be very susceptible to diseases are advanced for further testing.

Table 1 lists planting and harvest dates of USDA nursery evaluations. Results of these evaluations are presented in Tables 2 to 13. Statistical analyses were done for each test and for each series combined across locations using PROC MIXED procedures in SAS (version 9.4). For purposes of comparison, the check variety L 01-299 is highlighted in each table. Yield values that are significantly higher or lower (P=0.05) than values for L 01-299 are noted with a '+' or '-', respectively.

Table 1. Planting and harvest dates of "Ho" nursery tests in 2015.

Series	Location[1/]	Soil Series [2/]	Planting Date	Harvest Dates 2013	2014	2015
2012	AFH	Sc	10/17/12	12/16	11/18	11/02
2012	IRS	Bsc	10/29/12	12/12	11/21	11/04
2012	STG	Cscl	10/19/12	12/10	11/25	12/04
2013	AFH	Sc	11/06/13		12/11	11/05
2013	IRS	Bsc	11/13/13		11/24	11/04
2013	STG	Sc	11/08/13		12/10	12/15
2014	AFH	Sc	10/21/14			12/21
2014	IRS	Bsc	10/23/14			12/09
2014	STG	Sc	10/24/14			12/15
2015	AFH	Sc	10/21/15			
2015	IRS	Bsc	10/23/15			
2015	STG	Sc	11/13/15			

[1/] AFH = Ardoyne Farm heavy soil in Schriever, IRS = Iberia Research Station in Jeanerette, STG = St. Gabriel Research Station in St. Gabriel

[2/] Bsc = Baldwin silty clay, Cscl = Commerce silty clay loam, Csl = Commerce silt loam, Sc = Sharkey clay

Table 2. Nursery second-stubble means of the 2012 "Ho" and "HoCP" assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	11248	45.5	247	1.81	50366
HoCP 96-540	11849	50.1	239	2.16	46509
L 99-226	15402	58.7	261	2.64	45602
L 03-371	12140	51.3	236	1.81	56719
Ho 12-615	13140	50.1	263	1.90	56038
Ho 12-626	11503	45.0	256	1.54	58534
Ho 12-630	10056	40.2	248	2.41	33578
HoCP 12-667	14968	56.2	267 +	1.77	63298
HoCP 12-671	13358	54.2	247	1.95	56038
HoCP 12-673	12649	50.7	249	1.85	54677
Ho 11-9403	8304	32.1	259	1.44	44694
Ho 12-9631 [3/]	7042	34.1	208 -	2.36	28133 -
Ho 12-9632 [3/]	10303	41.6	247	2.35	34485
Ho 12-9633 [3/]	11383	41.6	274 +	1.74	47871
Ho 12-9634 [3/]	9480	49.4	192 -	1.76	56265

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 3. Nursery second-stubble means of the 2012 "Ho" and "HoCP" assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	14704	50.9	289	1.85	55131
HoCP 96-540	11584	45.6	254 -	2.05	45375
L 99-226	13565	47.7	286	2.25	41972
L 03-371	7581 -	29.2 -	260 -	1.21 -	48324
Ho 12-615	12550	46.6	270 -	1.54	59441
Ho 12-626	9113 -	32.4 -	281	1.37 -	48098
Ho 12-630	9297 -	36.1 -	257 -	2.03	35619 -
HoCP 12-667	11795	41.2	286	1.62	51047
HoCP 12-671	8434 -	29.8 -	282	1.64	36527 -
HoCP 12-673	10045 -	35.7 -	282	1.63	43787
Ho 12-9631 [3/]	6129 -	25.4 -	242 -	2.12	24049 -
Ho 12-9632 [3/]	10260 -	37.6	273 -	2.59 +	29040 -
Ho 12-9633 [3/]	8922 -	30.4 -	294	1.70	35846 -
Ho 12-9634 [3/]	7738 -	34.2 -	226 -	1.32 -	51954

[3/] Varieties from the SRU'S Recurrent Selection for Borers (RSB) program.

Table 4. Nursery second-stubble means of the 2012 "Ho" and "HoCP" assignment series on a Commerce silty clay loam soil at the Sugar Research Station in St. Gabriel, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	11179	38.2	293	1.62	47190
HoCP 96-540	5739	21.5	267 -	1.67	25864 -
L 99-226	11267	38.8	290	2.17 +	36073
L 03-371	8002	26.0	301	1.46	31989
Ho 12-615	7830	27.3	286	1.17	46736
Ho 12-626	3360	11.9	281	1.36	17243 -
Ho 12-630	5600	18.8	299	1.82	20646 -
HoCP 12-667	10440	35.1	298	1.69	41518
HoCP 12-671	10212	35.6	287	1.79	39023
HoCP 12-673	8924	31.0	288	1.47	42199
Ho 12-9631 [3/]	6029	22.5	264 -	2.31 +	19058 -
Ho 12-9632 [3/]	4530	15.5	292	2.13 +	14520 -
Ho 12-9633 [3/]	6985	25.0	280	1.78	28133 -
Ho 12-9634 [3/]	7817	30.9	253 -	1.38	44921

[3/] Varieties from the SRU'S Recurrent Selection for Borers (RSB) program.

Table 5. Nursery second-stubble means of the 2012 "Ho" and "HoCP" assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	12377	44.9	276	1.76	50896
HoCP 96-540	9724	39.1	253 -	1.96	39249
L 99-226	13411	48.4	279	2.35 +	41216
L 03-371	9241 -	35.5	266	1.49	45678
Ho 12-615	11418	42.0	273	1.59	53749
Ho 12-626	7992 -	29.8 -	272	1.42 -	41291
Ho 12-630	8318 -	31.7 -	268	2.08 +	29948 -
HoCP 12-667	12401	44.2	283	1.69	51954
HoCP 12-671	10668	39.9	272	1.79	43863
HoCP 12-673	10439	38.7	273	1.66	46095
Ho 12-9631 [3/]	6400 -	27.3 -	238 -	2.26 +	23746 -
Ho 12-9632 [3/]	8364 -	31.5 -	271	2.36 +	26015 -
Ho 12-9633 [3/]	9097 -	32.3 -	283	1.74	37283 -
Ho 12-9634 [3/]	8345 -	38.2	224 -	1.48	51047

[3/] Varieties from the SRU'S Recurrent Selection for Borers (RSB) program.

Table 6. Nursery first-stubble means of the 2013 "Ho" and "HoCP" assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	11238	41.7	272	2.00	41745
HoCP 96-540	17629	66.3	266	2.63 +	50593
L 99-226	17187	61.0	281	2.91 +	41972
L 01-283	15757	57.4	274	2.24	51274
HoCP 04-838	12697	47.7	266	2.23	42879
Ho 13-700	14070	58.1	242 -	2.49	46736
Ho 13-708	14101	52.4	270	2.29	46056
Ho 13-710	14653	51.0	287	2.23	46056
Ho 13-720	10488	37.2	282	1.90	39023
HoCP 13-723	12436	44.4	279	2.15	41064
HoCP 13-726	13781	47.3	291	1.90	49913
HoCP 13-731	14565	53.5	272	2.13	50820
HoCP 13-737	15503	53.9	288	2.19	48778
HoCP 13-738	13502	50.1	270	2.35	42653
Ho 13-739	17121	60.1	285	2.56 +	46963
HoCP 13-740	14061	51.2	275	2.03	50366
HoCP 13-755	11680	44.2	265	1.92	46283
HoCP 13-756	11998	46.8	256	2.02	46283
HoCP 13-758	15050	56.3	267	2.22	51274
Ho 13-769	18629	75.2	242 -	2.90 +	51274
HoCP 13-771	13539	47.6	284	2.23	42879
HoCP 13-775	14585	53.1	275	1.92	55358
Ho 11-9403	11443	43.3	265	1.83	47190
Ho 13-9635 [3/]	13182	52.2	254	2.17	47871
Ho 13-9636 [3/]	11595	53.6	217 -	2.01	53543
Ho 13-9637 [3/]	10483	40.8	256	1.45 -	56492

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 7. Nursery first-stubble means of the 2013 "Ho" and "HoCP" assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2015.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk		Stalks/ acre
	(lbs.)		(tons)		(lbs.)		(lbs.)		(no.)
L 01-299	8451		30.2		280		1.63		37888
HoCP 96-540	14507	+	52.9	+	275		2.52	+	41745
L 99-226	9628		33.6		286		2.36	+	28813
L 01-283	11635		40.6		287		2.03		41291
HoCP 04-838	10226		36.6		281		2.06		35166
Ho 13-700	8414		31.5		267		1.61		39249
Ho 13-708	9513		33.8		281		2.11		31989
Ho 13-710	9729		33.6		289		1.80		37434
Ho 13-720	8660		30.1		288		1.67		36073
HoCP 13-723	13048	+	42.5	+	307	+	2.16	+	39476
HoCP 13-726	9618		32.6		295		1.62		40611
HoCP 13-731	9404		33.2		284		1.36		48778
HoCP 13-737	11795		41.1		288		2.11		39023
HoCP 13-738	10062		37.2		270		1.87		39703
Ho 13-739	12104	+	43.3	+	280		2.27	+	38115
HoCP 13-740	11691		39.1		299		1.80		43560
HoCP 13-755	7750		26.6		292		1.51		35166
HoCP 13-756	6593		25.3		260	-	1.45		34939
HoCP 13-758	11014		38.9		284		1.85		42199
Ho 13-769	13318	+	45.4	+	295		2.05		44468
HoCP 13-771	10556		36.8		287		1.69		43333
HoCP 13-775	7856		27.0		291		1.28		42426
Ho 11-9403	9245		32.7		281		1.81		36300
Ho 13-9635 [3/]	8044		30.5		263		1.84		33351
Ho 13-9636 [3/]	8597		37.2		229	-	2.16	+	36073
Ho 13-9637 [3/]	7720		30.8		250	-	1.26		48324

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 8. Nursery first-stubble means of the 2013 "Ho" and "HoCP" assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	16348	52.2	313	2.01	52181
HoCP 96-540	17179	57.2	300	2.62 +	43787
L 99-226	22469 +	71.7 +	314	3.23 +	44468
L 01-283	12948	41.7	311	2.07	40384 -
HoCP 04-838	17664	57.8	305	2.24	51047
Ho 13-700	12269	43.4	286 -	2.05	42426
Ho 13-708	14520	50.6	288 -	2.83 +	35166 -
Ho 13-710	12515	41.1	306	1.83	44468
Ho 13-720	12710	41.8	304	1.94	43106
HoCP 13-723	15289	49.9	308	2.10	47417
HoCP 13-726	11744	39.2	299	1.54	51047
HoCP 13-731	9583 -	33.7 -	285 -	1.66	40838
HoCP 13-737	16666	56.6	296	2.56 +	44014
HoCP 13-738	14408	45.6	316	1.93	47417
Ho 13-739	14618	49.5	295	2.28	44014
HoCP 13-740	16511	56.6	291 -	1.90	59895
HoCP 13-755	15238	48.3	315	1.83	52635
HoCP 13-756	14642	50.4	291 -	1.78	56492
HoCP 13-758	13637	44.9	304	1.71	52408
Ho 13-769	18493	60.9	305	2.16	55131
HoCP 13-771	9898 -	33.2 -	298	1.60	41291
HoCP 13-775	12702	42.8	298	1.75	48778
Ho 11-9403	13363	43.8	305	1.89	47417
Ho 13-9635 [3/]	11243	43.5	259 -	2.17	40157 -
Ho 13-9636 [3/]	12980	44.2	293 -	1.68	52635
Ho 13-9637 [3/]	7782 -	30.2 -	257 -	1.31 -	46056

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 9. Nursery first-stubble means of the 2011 "Ho" and "HoCP" assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	12012	41.4	289	1.88	43938
HoCP 96-540	16439 +	58.8 +	280	2.59 +	45375
L 99-226	16428 +	55.4 +	294	2.83 +	38418
L 01-283	13447	46.6	290	2.11	44316
HoCP 04-838	13529	47.4	284	2.17	43031
Ho 13-700	11584	44.3	265 -	2.05	42804
Ho 13-708	12711	45.6	280	2.41 +	37737
Ho 13-710	12299	41.9	294	1.95	42653
Ho 13-720	10619	36.4	291	1.83	39401
HoCP 13-723	13591	45.6	298	2.13	42653
HoCP 13-726	11714	39.7	295	1.68	47190
HoCP 13-731	11184	40.1	280	1.72	46812
HoCP 13-737	14654	50.5	291	2.29 +	43938
HoCP 13-738	12658	44.3	286	2.05	43258
Ho 13-739	14614	51.0	287	2.37 +	43031
HoCP 13-740	14088	49.0	288	1.91	51274 +
HoCP 13-755	11556	39.7	291	1.75	44694
HoCP 13-756	11078	40.8	269 -	1.75	45904
HoCP 13-758	13234	46.7	285	1.92	48627
Ho 13-769	16814 +	60.5 +	281	2.37 +	50291
HoCP 13-771	11331	39.2	290	1.84	42501
HoCP 13-775	11714	41.0	288	1.65	48854
Ho 11-9403	11350	39.9	284	1.84	43636
Ho 13-9635 [3/]	10823	42.1	258 -	2.06	40459
Ho 13-9636 [3/]	11057	45.0	246 -	1.95	47417
Ho 13-9637 [3/]	8662 -	33.9	254 -	1.34 -	50291

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 10. Nursery plant cane means of the 2014 “Ho” and “HoCP” assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	12820	44.3	289	2.58	34258
HoCP 96-540	16380	57.8	284	2.67	43333 +
L 01-283	12286	43.1	282	2.33	36754
HoCP 04-838	12254	46.6	267	2.27	40838
HoL 14-800	13753	52.7	253	2.56	40611
HoCP 14-801	12649	50.0	257	2.89	35619
HoCP 14-802	18168 +	64.9 +	280	2.46	52862 +
HoCP 14-803	11217	41.5	270	3.12	26771
Ho 14-805	14320	50.5	284	2.29	44921 +
Ho 14-806	14999	56.4	268	2.80	40384
Ho 14-809	13299	49.9	266	2.88	34939
Ho 14-811	13057	48.4	270	2.21	44014 +
Ho 14-812	15120	63.0 +	240	2.51	50366 +
Ho 14-813	11940	49.2	243	2.22	44468 +
HoCP 14-814	13332	46.9	285	2.12	44014 +
HoCP 14-817	11232	43.0	261	2.33	36981
HoCP 14-818	16861	65.4 +	259	2.31	56492 +
Ho 14-819	14607	50.9	287	2.79	36527
Ho 14-821	12899	47.0	274	2.42	38796
HoCP 14-823	14488	56.3	257	3.30 +	34485
HoCP 14-826	19602 +	68.4 +	288	3.16	43333 +
Ho 14-827	13682	52.2	262	2.77	37888
HoCP 14-828	14273	51.9	278	3.10	33351
HoCP 14-829	13622	51.7	264	2.39	43333 +
HoCP 14-830	13741	47.5	289	2.97	31989
HoCP 14-831	14098	50.4	282	2.46	41291
Ho 14-832	10173	34.8	292	2.13	33804
HoL 14-834	15530	53.1	292	2.66	39930
Ho 14-835	17243 +	58.6	294	2.46	47644 +
Ho 14-836	16216	55.7	291	2.39	46736 +
HoL 14-837	12689	45.8	276	2.46	37208
HoL 14-839	18026 +	61.6 +	292	2.90	42426
HoL 14-841	13873	49.1	283	2.06	47644 +
HoCP 14-843	17071 +	59.8 +	286	2.89	41518
HoCP 14-844	12263	48.7	250	1.97	49459 +
HoL 14-849	11936	42.8	279	2.47	34712
Ho 14-852	13519	48.1	281	2.95	32897
HoCP 14-853	16518	59.5	278	2.85	42653
HoCP 14-854	12169	43.6	282	2.04	42653

Table 10. (Continued)

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
HoCP 14-855	13653	46.4	294	2.88	32443
HoL 14-857	17539 +	67.9 +	258	2.84	49232 +
HoL 14-858	10240	37.0	277	2.03	36527
HoL 14-859	14814	53.7	275	2.60	41291
HoCP 14-861	12722	46.8	272	3.42 +	27906
Ho 14-863	16396	58.3	281	2.62	44468 +
Ho 14-864	19146 +	77.3 +	253	3.15	48778 +
HoCP 14-865	16475	61.2 +	270	2.57	47644 +
HoCP 14-867	15758	60.6 +	260	3.24 +	37434
HoCP 14-868	15195	52.7	288	2.29	46056 +
HoCP 14-872	14294	51.2	279	2.74	37434
HoCP 14-874	15085	58.2	259	3.34 +	34939
HoCP 14-876	13237	45.7	288	2.28	40157
HoCP 14-878	12174	45.0	270	2.38	38115
HoH 14-882	14178	49.7	285	2.74	36300
HoH 14-883	9807	35.6	275	2.20	32443
HoL 14-884	12511	46.8	270	2.50	37208
HoCP 14-885	15782	59.9 +	264	2.96	40611
HoCP 14-890	16832	63.3 +	266	3.21	39476
HoCP 14-891	15579	56.7	275	3.05	37208
HoCP 14-892	13927	48.6	285	2.21	43333 +
HoCP 14-897	15712	53.1	296	2.55	41745
Ho 14-899	15110	54.5	277	2.68	40611
HoCP 14-901	14639	51.3	285	2.40	43106
HoCP 14-902	16663	55.3	301	3.23 +	34258

Table 11. Nursery plant-cane means of the 2014 “Ho” and “HoCP” assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	8067	30.5	264	2.27	26771
HoCP 96-540	10490	39.7	264	2.75	29040
L 01-283	5046	18.1	279	2.14	17016
HoCP 04-838	6399	24.6	259	2.05	24049
HoL 14-800	5964	22.2	269	2.43	18377
HoCP 14-801	12086 +	43.7	276	2.93 +	29948
HoCP 14-802	9229	34.6	267	2.28	30401
HoCP 14-803	8557	31.8	269	2.38	26771
Ho 14-805	6133	21.8	282	1.50 -	29040
Ho 14-806	5301	20.4	260	2.21	18604
Ho 14-809	8896	35.8	248	2.49	28813
Ho 14-811	7492	29.5	254	1.73	34258
Ho 14-812	10475	40.8	256	2.16	38115 +
Ho 14-813	5846	23.9	244 -	1.96	24276
HoCP 14-814	7459	27.7	269	1.65 -	33578
HoCP 14-817	9434	34.8	271	2.25	31536
HoCP 14-818	7930	30.6	261	1.97	31082
Ho 14-819	9853	35.1	280	3.01 +	23368
Ho 14-821	7517	28.3	269	2.07	27225
HoCP 14-823	6652	24.5	272	2.35	20873
HoCP 14-826	7453	25.6	292 +	2.70	19284
Ho 14-827	7615	27.3	279	2.02	26998
HoCP 14-828	7404	28.4	261	2.47	22688
HoCP 14-829	7285	26.0	281	1.90	26998
HoCP 14-830	9166	33.5	274	2.93 +	22914
HoCP 14-831	6790	24.8	277	1.86	26544
Ho 14-832	6956	26.0	267	2.04	25410
HoL 14-834	8198	31.1	269	2.23	27679
Ho 14-835	7073	26.8	263	2.02	26544
Ho 14-836	8853	31.2	283 +	2.18	29040
HoL 14-837	6334	24.0	266	2.11	22688
HoL 14-839	7217	25.0	287 +	2.09	23822
HoL 14-841	9225	33.6	275	2.18	30855
HoCP 14-843	6199	22.8	270	1.67 -	27452
HoCP 14-844	4835	17.9	270	1.67 -	21553
HoL 14-849	9370	32.7	287 +	2.55	25637
Ho 14-852	6038	21.7	278	2.18	19965
HoCP 14-853	6548	24.4	268	2.13	23141
HoCP 14-854	9805	38.0	258	2.38	31989

Table 11. (Continued)

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
HoCP 14-855	7220	25.1	288 +	2.39	20873
HoL 14-857	7988	28.2	283 +	1.80	31309
HoL 14-858	8139	30.2	265	2.28	25864
HoL 14-859	5964	23.5	258	2.16	21553
HoCP 14-861	5987	24.3	252	2.27	19284
Ho 14-863	8775	31.4	280	1.95	32216
Ho 14-864	11331	42.1	269	2.48	34939
HoCP 14-865	7392	30.0	244 -	2.03	28359
HoCP 14-867	9488	34.1	278	2.56	26544
HoCP 14-868	5462	20.8	263	1.49 -	27906
HoCP 14-872	7471	27.9	264	2.43	22688
HoCP 14-874	8180	32.6	251	2.28	28586
HoCP 14-876	5570	20.9	267	2.11	19738
HoCP 14-878	9045	33.9	267	2.29	29494
HoH 14-882	4243 -	16.6 -	256	2.06	16562 -
HoH 14-883	7554	29.0	260	2.14	27225
HoL 14-884	5992	22.6	265	1.68 -	27452
HoCP 14-885	8269	30.7	273	2.86 +	21099
HoCP 14-890	8730	35.1	248	2.85 +	25183
HoCP 14-891	8891	35.8	249	2.70	26544
HoCP 14-892	7187	26.2	273	1.64 -	31989
HoCP 14-897	7351	26.0	284 +	1.99	25864
Ho 14-899	3917 -	14.9 -	263	2.25	13386 -
HoCP 14-901	7373	26.5	278	2.42	22007
HoCP 14-902	7492	27.7	269	2.80	19738
Ho 14-9638 [3/]	12256 +	44.9 +	273	3.35 +	26998
HoL 14-9639 [3/]	5105	20.3	253	2.11	19284

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 12. Nursery plant cane means of the 2014 "Ho" and "HoCP" assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	12825	49.0	264	2.04	47871
HoCP 96-540	19160 +	71.0 +	270	3.44 +	41518
L 01-283	11942	45.0	264	2.05	44014
HoCP 04-838	16346	60.2	273	2.53	47644
HoL 14-800	13116	53.8	241	2.73 +	39476 -
HoCP 14-801	11974	49.9	240	2.36	42653
HoCP 14-802	20600 +	70.7 +	291	2.94 +	48098
HoCP 14-803	10639	38.6	276	2.51	30855 -
Ho 14-805	13005	47.8	278	1.88	48778
Ho 14-806	13662	46.4	294	2.37	39023 -
Ho 14-809	13994	58.4	234	2.70 +	43106
Ho 14-811	15192	57.1	266	2.39	48098
Ho 14-812	15097	58.8	257	2.47	47644
Ho 14-813	14700	53.3	274	2.67 +	39930 -
HoCP 14-814	10905	40.1	268	1.60	49459
HoCP 14-817	16765	60.9	275	2.69 +	45602
HoCP 14-818	11954	45.5	262	2.02	45829
Ho 14-819	15374	52.7	291	2.67 +	39476 -
Ho 14-821	11674	46.8	250	2.09	44694
HoCP 14-823	16519	59.9	276	2.71 +	44468
HoCP 14-826	19738 +	68.7 +	287	3.39 +	40611
Ho 14-827	13150	47.5	276	2.41	39249 -
HoCP 14-828	13851	53.0	258	2.60	40611
HoCP 14-829	17169	62.4	275	2.62	46736
HoCP 14-830	17988 +	61.5	292	2.84 +	43333
HoCP 14-831	19953 +	72.7 +	274	2.92 +	49913
Ho 14-832	11852	41.7	284	2.17	38569 -
HoL 14-834	14844	54.1	277	2.63	40838
Ho 14-835	14463	51.4	282	2.21	46509
Ho 14-836	11975	41.0	291	2.25	36300 -
HoL 14-837	11623	44.0	264	2.28	38569 -
HoL 14-839	20455 +	68.5 +	302 +	2.77 +	50139
HoL 14-841	16122	58.4	277	2.24	52181
HoCP 14-843	13914	49.6	281	2.40	41518
HoCP 14-844	12379	45.1	274	1.77	51047
HoL 14-849	17093	56.7	302 +	2.55	44468
Ho 14-852	16382	55.4	295 +	2.99 +	36981 -
HoCP 14-853	8115	37.9	246	1.72	45148
HoCP 14-854	13341	54.8	243	2.45	44921

Table 12. (Continued)

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
HoCP 14-855	11380	39.1	291	2.38	32897 -
HoL 14-857	9787	37.0	265	1.63	45602
HoL 14-858	13782	49.1	280	2.22	44241
HoL 14-859	10970	41.8	259	2.22	37434 -
HoCP 14-861	15294	58.1	264	3.21 +	36300 -
Ho 14-863	18420 +	66.1 +	278	2.71 +	48778
Ho 14-864	22233 +	80.4 +	277	3.08 +	52181
HoCP 14-865	14033	50.1	280	2.05	49005
HoCP 14-867	17152	61.5	279	2.97 +	41518
HoCP 14-868	15773	56.8	278	2.39	47644
HoCP 14-872	16392	56.4	291	2.59	43560
HoCP 14-874	14872	56.0	268	2.60	43106
HoCP 14-876	12819	47.1	271	2.03	46283
HoCP 14-878	14814	53.6	276	2.49	43106
HoH 14-882	15400	56.6	273	2.59	43787
HoH 14-883	11060	39.6	279	1.84	43106
HoL 14-884	12426	45.3	274	2.16	41972
HoCP 14-885	21335 +	71.7 +	297 +	2.64	54450
HoCP 14-890	15674	57.1	274	2.64	44014
HoCP 14-891	17868 +	66.6 +	268	2.99 +	44694
HoCP 14-892	10847	41.5	261	1.60	51954
HoCP 14-897	14769	49.6	298 +	2.25	44468
Ho 14-899	16650	58.6	284	2.61	45148
HoCP 14-901	14148	51.6	274	2.28	45375
HoCP 14-902	15396	55.3	279	3.68 +	29948 -
Ho 14-9638 [3/]	20366 +	70.2 +	290	3.64 +	38569 -
HoL 14-9639 [3/]	11217	42.0	267	2.45	34258 -

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

Table 13. Nursery plant cane means of the 2014 "Ho" and "HoCP" assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	11237	41.3	272	2.30	36300
HoCP 96-540	15343 +	56.2 +	273	2.95 +	37964
L 01-283	9758	35.4	275	2.17	32594
HoCP 04-838	11667	43.8	266	2.28	37510
HoL 14-800	10944	42.9	255 -	2.57	32821
HoCP 14-801	12236	47.9	258	2.73 +	36073
HoCP 14-802	15999 +	56.7 +	279	2.56	43787 +
HoCP 14-803	10138	37.3	271	2.67	28133 -
Ho 14-805	11244	40.2	281	1.89	40913
Ho 14-806	11321	41.1	274	2.46	32670
Ho 14-809	12063	48.0	250 -	2.69	35619
Ho 14-811	11914	45.0	263	2.11	42123
Ho 14-812	13564	54.2 +	251 -	2.38	45375 +
Ho 14-813	10828	42.1	254 -	2.28	36224
HoCP 14-814	10565	38.3	274	1.79 -	42350
HoCP 14-817	12477	46.2	269	2.42	38039
HoCP 14-818	12248	47.2	260	2.10	44468 +
Ho 14-819	13278	46.2	286	2.82 +	33124
Ho 14-821	10697	40.7	265	2.19	36905
HoCP 14-823	12553	46.9	268	2.78 +	33275
HoCP 14-826	15598 +	54.2 +	289	3.08 +	34409
Ho 14-827	11482	42.3	272	2.40	34712
HoCP 14-828	11843	44.4	266	2.72 +	32216
HoCP 14-829	12410	45.7	273	2.24	39023
HoCP 14-830	13632	47.5	285	2.91 +	32746
HoCP 14-831	13614	49.3	278	2.41	39249
Ho 14-832	9661	34.2	281	2.11	32594
HoL 14-834	12857	46.1	279	2.51	36149
Ho 14-835	12926	45.6	279	2.23	40233
Ho 14-836	12348	42.6	289	2.27	37359
HoL 14-837	10215	37.9	269	2.28	32821
HoL 14-839	14845 +	50.5	294 +	2.55	38796
HoL 14-841	13073	47.0	278	2.16	43560 +
HoCP 14-843	12395	44.1	279	2.32	36829
HoCP 14-844	9825	37.3	264	1.80 -	40686
HoL 14-849	12800	44.1	289	2.52	34939
Ho 14-852	11980	41.7	285	2.70 +	29948 -
HoCP 14-853	10520	40.7	261	2.25	36981
HoCP 14-854	11772	45.5	261	2.29	39854

Table 13. (Continued)

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
HoCP 14-855	10751	36.9	291 +	2.55	28738 -
HoL 14-857	11771	44.4	269	2.09	42048
HoL 14-858	10721	38.8	274	2.17	35544
HoL 14-859	10582	39.7	264	2.33	33426
HoCP 14-861	11334	43.1	263	2.96 +	27830 -
Ho 14-863	14530 +	51.9 +	280	2.43	41821
Ho 14-864	17262 +	65.8 +	264	2.88 +	45192 +
HoCP 14-865	12633	47.1	265	2.21	41669
HoCP 14-867	14133	52.1 +	272	2.92 +	35166
HoCP 14-868	12143	43.5	276	2.06	40535
HoCP 14-872	12719	45.2	278	2.58	34561
HoCP 14-874	12713	48.9	259	2.74 +	35544
HoCP 14-876	10542	37.9	275	2.14	35393
HoCP 14-878	12011	44.2	271	2.39	36905
HoH 14-882	11274	41.0	271	2.46	32216
HoH 14-883	9474	34.7	272	2.06	34258
HoL 14-884	10310	38.2	270	2.11	35544
HoCP 14-885	15129 +	54.1 +	278	2.82 +	38720
HoCP 14-890	13745	51.8 +	263	2.90 +	36224
HoCP 14-891	14112	53.0 +	264	2.91 +	36149
HoCP 14-892	10654	38.8	273	1.82 -	42426
HoCP 14-897	12611	42.9	293 +	2.26	37359
Ho 14-899	11892	42.7	275	2.51	33048
HoCP 14-901	12053	43.2	279	2.36	36829
HoCP 14-902	13184	46.1	283	3.24 +	27981 -
Ho 14-9638 [3/]	16311 +	57.6 +	282	3.50 +	32783
HoL 14-9639 [3/]	8161	31.2	260	2.28	26771 -

[3/] Varieties from the SRU's Recurrent Selection for Borers (RSB) program.

2015 LOUISIANA VARIETY DEVELOPMENT PROGRAM INFIELD TRIALS

E. O. Dufrene, M. J. Duet, F. J. Adams, and W. H. White
USDA-ARS, Sugarcane Research Unit (SRU)
Houma, LA

M. J. Pontif and G. L. Hawkins
LSU AgCenter Sugar Research Station
St. Gabriel, LA

The infield stage of variety development is the first stage in which yield estimates are based on plot weights instead of stalk counts. Varieties from the LSU AgCenter program (L' s) are planted in infield tests the year after assignment while varieties from the USDA program (Ho's) are include two years after assignment. Infield trials are planted at three locations (USDA's Ardoyne Farm in Schriever and commercial farms located in Vacherie and Erath) representing three distinct regions and soil types of the Louisiana sugarcane industry.

Infield evaluations on commercial farms are conducted cooperatively with LSU AgCenter sugarcane variety personnel. Infield tests are planted in a randomized complete block design with two replications and at least three commercial varieties as controls. The plot size in infield tests are two rows wide by 24 feet long. A 10-stalk sample is hand-cut from each plot just prior to combine harvesting and sent to the lab at the Ardoyne Farm, where it is weighed and processed through the pre-breaker/press for sucrose and fiber analysis. Brix and pol values are then used to calculate the yield of theoretical recoverable sugar (TRS) per ton of cane. Plots are weighed with a tractor-pulled weigh-wagon fitted with electronic load cells mounted in the axle and hitch. The weight of harvested cane in each plot, stalk weight, and sucrose content are used to estimate sugar per acre, tons of cane per acre, sugar per ton of cane, and number of stalks per acre.

Table 1 lists planting and harvest dates of infield evaluations. Results of infield trials are presented in Tables 2 to 16. Statistical analyses were done for each test and for each series combined across locations using PROC MIXED procedures in SAS (version 9.4). For purposes of comparison, the check variety L 01-299 is highlighted in each table. Yield values that are significantly higher or lower (P=0.05) than values for L 01-299 are noted with a '+' or '-', respectively.

Table 1. Planting and harvest dates of infield tests in 2015.

'Ho' Series	'L' Series	Location[1/]	Soil Series [2/]	Planting Date	Harvest Dates			
					2012	2013	2014	2015
2009	2010	BLK	Csl	8/26/11	12/13	12/17	10/17	10/19
2009	2010	VAL	Pasl	9/22/11	12/12	12/09	12/04	10/09
2010	2011	AFH	Sc	10/30/12		11/22	-	11/02
2010	2011	BLK	Csl	8/17/12		11/12	11/19	10/19
2010	2011	VAL	Pasl	9/10/12		12/09	12/04	-
2011	2012	AFH	Sc	9/30/13			11/12	11/24
2011	2012	BLK	Csl	8/30/13			11/19	10/19
2011	2012	VAL	Pasl	9/03/13			12/04	12/29
2012	2013	AFH	Sc	9/25/14				11/24
2012	2013	BLK	Csl	8/26/14				12/16
2012	2013	VAL	Pasl	9/11/14				12/29
2013	2014	AFH	Sc	9/25/15				
2013	2014	BLK	Csl	8/25/15				
2013	2014	VAL	Pasl	9/10/15				

[1/] AFH = Ardoyne Farm heavy soil in Schriever, BLK = Blackberry Farms in Vacherie, VAL = Vallot Farm in Erath.

[2/] Csl = Commerce silt loam, Pasl = Patoutville silt loam, Sc = Sharkey clay

Table 2. Infield third-stubble means of the 2009 "Ho" and 2010 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	7035	30.5	230	1.47	41840	12.5
HoCP 96-540	6755	31.5	215	1.67	37989	11.1
L 99-226	7369	32.2	231	2.08 +	31060 -	12.5
L 03-371	8155	32.4	252	1.53	42341	11.8
HoCP 04-838	7813	35.5	220	1.34	52991 +	12.6
HoCP 09-804	10152 +	41.0	248	1.31	62686 +	14.1
Ho 09-840	7841	32.3	243	1.09 -	59173 +	11.5
L 10-147	8329	34.6	240	1.49	46646	9.6

Table 3. Infield third-stubble means of the 2009 “Ho” and 2010 “L” assignment series on a Patoutville silt loam soil at Vallot Farm in Erath, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	8023	29.9	269	1.04	57701	9.9
HoCP 96-540	7326	26.3	278	1.20	43849 -	10.6
L 99-226	7700	25.2	306 +	1.77 +	28524 -	10.1
L 03-371	7376	26.0	284	1.24	42239 -	8.4 -
HoCP 04-838	6194 -	22.0	282	1.29 +	34194 -	11.0 +
HoCP 09-804	7774	27.0	289 +	1.22	44166 -	11.8 +
Ho 09-840	6232 -	25.0	250 -	0.94	53160	9.1 -
L 10-147	6710 -	25.3	265	1.45 +	35432 -	9.1 -

Table 4. Infield third -stubble means of the 2009 “Ho” assignment series across two locations (Blackberry Farms and Vallot Farm) in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	7529	30.2	250	1.25	49770	11.2
HoCP 96-540	7041	28.9	247	1.43	40919	10.8
L 99-226	7535	28.7	268	1.92 +	29792	11.3
L 03-371	7766	29.2	268	1.39	42290	10.1
HoCP 04-838	7003	28.7	251	1.31	43593	11.8
HoCP 09-804	8963	34.0	268	1.27	53426	12.9 +
Ho 09-840	7037	28.6	246	1.01	56167	10.3
L 10-147	7519	30.0	253	1.47	41039	9.3 -

Table 5. Infield second-stubble means of the 2010 “L” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	9694	38.1	255	1.51	50142
HoCP 96-540	9462	41.7	227	2.40 +	34818
L 99-226	8039	31.4	257	2.49 +	25377 -
L 03-371	8392	34.3	244	1.80 +	38310
L 10-147	5802	25.7	224	1.97 +	26053 -

Table 6. Infield second-stubble means of the 2011 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	7648	32.4	240	1.81	35662	13.3
HoCP 96-540	6914	28.8	240	1.72	33458	12.8
L 99-226	7311	27.5	265	1.74	31771	12.4
L 03-371	8879	33.1	269	1.58	41857	12.1
L 11-183	6665	26.7	250	1.79	29976	11.6

Table 7. Infield first-stubble means of the 2011 "Ho" assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	9745	40.5	241	1.95	41252	14.2
HoCP 96-540	10482	40.6	258	2.39	34367	12.4
L 99-226	9594	35.9	267 +	3.39 +	21713 -	12.8
L 01-283	10613	41.6	255	1.91	43922	12.9
HoCP 04-838	9452	38.0	249	1.73	44338	13.6
Ho 11-512	9464	34.6	278 +	2.41	28796	10.3 -
Ho 11-515	10711	45.5	235	2.43	37621	14.4
Ho 11-532	12342	49.4	249	1.96	51114	13.7

Table 8. Infield first-stubble means of the 2011 "Ho" and 2012 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2015.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	5824	24.9	234	1.58	31747	13.4
HoCP 96-540	6092	27.4	220	1.62	33934	13.0
L 99-226	8233	32.7	252	1.81	36854	13.5
L 01-283	6034	24.2	248	1.54	31693	14.0
HoCP 04-838	4680	22.0	216	1.33	33121	13.2
Ho 11-512	6293	23.9	262 +	1.50	31805	10.9
Ho 11-515	6767	27.3	247	1.78	30766	13.0
Ho 11-532	6850	29.6	236	1.59	37164	14.3
L 12-201	5587	23.4	236	1.76	26240	11.5
L 12-202	5713	21.6	264 +	1.69	25745	12.9

Table 9. Infield first-stubble means of the 2011 “Ho” and 2012 “L” assignment series on a Patoutville silt loam soil at Vallot Farm in Erath, LA in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	9509	36.6	260	1.74	42158	12.8
HoCP 96-540	9222	33.9	272	2.19 +	31020	12.3
L 99-226	8056	28.7	281	2.81 +	20447	12.5
L 01-283	10086	34.9	289	1.90	37231	11.5
HoCP 04-838	9347	34.3	271	1.81	38323	12.5
Ho 11-512	7037	24.3	289	2.13	23365	9.6
Ho 11-515	8109	31.1	261	2.08	29863	13.0
Ho 11-532	9131	33.4	271	2.14	31260	12.1
L 12-201	10805	38.2	283	2.69 +	28738	11.6
L 12-202	8487	32.7	259	2.00	33120	11.5

Table 10. Infield first-stubble means of the 2011 “Ho” assignment series across three locations (Ardoyne Farm, Blackberry Farms, and Vallot Farm) in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	8359	34.0	245	1.76	38386	13.5
HoCP 96-540	8599	34.0	250	2.07	33107	12.6
L 99-226	8628	32.4	267 +	2.67 +	26338	12.9
L 01-283	8911	33.6	264 +	1.78	37615	12.8
HoCP 04-838	7826	31.5	245	1.62	38594	13.1
Ho 11-512	7598	27.6	276 +	2.01	27989	10.3 -
Ho 11-515	8529	34.6	248	2.10	32750	13.5
Ho 11-532	9441	37.5	252	1.89	39846	13.4

Table 11. Infield first-stubble means of the 2011 “Ho” and 2012 “L” assignment series across two locations (Blackberry Farms and Vallot Farm) in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	7666	30.8	247	1.66	36953	13.1
HoCP 96-540	7657	30.7	246	1.90	32477	12.6
L 99-226	8145	30.7	267	2.31	28651	13.0
L 01-283	8060	29.6	269	1.72	34462	12.8
HoCP 04-838	7014	28.2	244	1.57	35722	12.9
Ho 11-512	6665	24.1	275	1.82	27585	10.3 -
Ho 11-515	7438	29.2	254	1.93	30314	13.0
Ho 11-532	7991	31.5	254	1.86	34212	13.2
L 12-201	8196	30.8	260	2.23	27489	11.5 -
L 12-202	7100	27.1	262	1.84	29432	12.2

Table 12. Infield plant-cane means of the 2012 “Ho” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	12364	48.2	257	2.65	36413	12.9
HoCP 96-540	12931	53.2	243	2.86	37444	11.7
L 01-283	11226	42.0	267	2.37	35622	12.1
HoCP 04-838	11229	43.9	256	2.23	39492	13.5
Ho 12-615	11759	46.4	253	2.34	39976	13.8
Ho 12-626	8436 -	32.2	262	1.97 -	31926	11.5
Ho 12-630	11291	43.3	261	3.10	28448	12.2
HoCP 12-667	10023	36.6	274	2.54	28915	12.2
HoCP 12-671	10888	42.0	259	2.65	31740	13.2
HoCP 12-673	13552	52.1	261	3.08	33776	10.9

Table 13. Infield plant-cane means of the 2012 “Ho” and 2013 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	9444	37.9	249	1.98	38326	13.0
HoCP 96-540	11988	46.5	258	2.19	42431	13.4
L 01-283	9178	33.8	270	1.75	38400	11.9
HoCP 04-838	9105	39.3	232	1.62	49078	13.2
Ho 12-615	10706	42.8	251	1.60	53650 +	13.8
Ho 12-626	11736	44.1	266	1.74	50775 +	11.1
Ho 12-630	12076	46.9	257	2.37	40155	12.1
HoCP 12-667	6881	26.2	262	2.01	26107 -	13.7
HoCP 12-671	11354	43.3	261	2.10	41410	15.1 +
HoCP 12-673	11299	43.3	261	2.52 +	34435	9.9 -
L 13-234	9602	39.0	247	1.47 -	52857 +	13.6
L 13-242	9087	37.4	244	2.53 +	29714	14.5
L 13-243	5903	25.8	228	2.12	24238 -	11.8
L 13-251	9267	35.9	259	2.38 +	30214	13.4
L 13-257	10927	44.2	249	2.19	40295	11.0
L 13-260	8479	32.5	260	1.50 -	43359	13.4
L 13-263	9866	38.9	253	1.81	43169	14.2

Table 14. Infield plant-cane means of the 2012 “Ho” and 2013 “L” assignment series on a Patoutville silt loam soil at Vallot Farms in Erath, LA in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	7602	30.4	250	1.97	31267	12.1
HoCP 96-540	7377	30.1	244	2.02	30598	11.8
L 01-283	7810	29.4	265	2.01	29544	11.9
HoCP 04-838	7142	28.1	254	1.73	32694	11.2
Ho 12-615	6935	27.9	247	1.91	29773	12.9
Ho 12-626	6310	26.0	242	1.78	28999	10.5 -
Ho 12-630	7661	29.3	258	2.28	26133	10.7
HoCP 12-667	6826	26.2	260	1.84	28409	11.4
HoCP 12-671	7133	29.2	244	2.11	27679	12.9
HoCP 12-673	7979	30.5	262	2.07	29505	9.4 -
L 13-234	7255	29.8	243	1.50	40516	11.3
L 13-242	6762	28.5	238	1.88	30313	11.7
L 13-243	5106	20.5	250	2.24	18397	11.0
L 13-251	7595	29.8	254	2.32	26024	10.9
L 13-257	9784	38.1	255	2.40	32030	12.1
L 13-260	4894	19.6	249	1.40 -	28945	12.6
L 13-263	7165	28.6	251	1.98	29934	12.8

Table 15. Infield plant-cane means of the 2012 “Ho” assignment series across three locations (Ardoyne Farm, Blackberry Farms, and Vallot Farm) in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	9803	38.8	252	2.20	35335	12.7
HoCP 96-540	10765	43.3	248	2.36	36825	12.3
L 01-283	9405	35.1	267	2.04	34522	12.0
HoCP 04-838	9158	37.1	247	1.86 -	40421	12.6
Ho 12-615	9800	39.0	250	1.95	41133	13.5
Ho 12-626	8827	34.1	257	1.83 -	37233	11.0 -
Ho 12-630	10343	39.8	259	2.58 +	31579	11.7
HoCP 12-667	7910	29.7 -	265	2.13	27811 -	12.4
HoCP 12-671	9792	38.2	255	2.29	33610	13.7 +
HoCP 12-673	10943	41.9	261	2.56 +	32572	10.1 -

Table 16. Infield plant-cane means of the 2012 “Ho” and 2013 “L” assignment series across two locations (Blackberry Farms and Vallot Farm) in 2015.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)
L 01-299	8523	34.1	250	1.97	34796	12.6
HoCP 96-540	9682	38.3	251	2.11	36515	12.6
L 01-283	8494	31.6	267	1.88	33972	11.9
HoCP 04-838	8123	33.7	243	1.67	40886	12.2
Ho 12-615	8821	35.4	249	1.75	41711	13.4
Ho 12-626	9023	35.0	254	1.76	39887	10.8 -
Ho 12-630	9868	38.1	258	2.32	33144	11.4
HoCP 12-667	6853	26.2 -	261	1.92	27258	12.5
HoCP 12-671	9244	36.2	253	2.11	34545	14.0
HoCP 12-673	9639	36.9	261	2.29	31970	9.7 -
L 13-234	8428	34.4	245	1.48 -	46687 +	12.4
L 13-242	7924	33.0	241	2.20	30013	13.1
L 13-243	5504 -	23.1 -	239	2.18	21318 -	11.4
L 13-251	8431	32.8	256	2.35 +	28119	12.2
L 13-257	10356	41.2	252	2.29	36162	11.6
L 13-260	6686	26.1 -	255	1.45 -	36152	13.0
L 13-263	8516	33.7	252	1.89	36552	13.5

2015 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM
OUTFIELD VARIETY TRIALS

David Sexton and Collins Kimbeng
Sugar Research Station

Edwis Dufrene and Mike Duet
USDA-ARS, Sugarcane Research Laboratory

Herman Waguespack, Jr. and Atticus Finger
American Sugar Cane League

The outfield variety trials are the final stage of testing experimental varieties for their potential commercial production in Louisiana. Results from these trials are used in both variety advancement and crossing decisions. The outfield variety trials are cooperatively conducted at 12 locations throughout the Louisiana sugarcane belt by the LSU AgCenter, the USDA-ARS, and the American Sugar Cane League.

To be considered for release, an experimental variety must equal or exceed the performance of commercial varieties with regard to yield and harvestability across locations, crops, and years. Accurate varietal evaluation requires overall yield performance information in addition to performance under adverse harvest conditions. The objective of this report is to provide overall and specific location yield data by crop for the 2015 outfield tests. Included are multi-year yield analyses for appropriate test varieties.

The experimental design used at each outfield location was a randomized complete block design with three replications per location. Test plots were two rows wide and 50 feet long with a 5-foot alley between plots. All locations were harvested with a combine harvester and each plot was weighed with a weigh wagon fitted with load cells mounted on each axle and hitch. A 10-stalk, whole-stalk sample, topped but not stripped of leaves, was taken from each plot and sent to the USDA-ARS sucrose laboratory. Samples were hand cut for all tests. The samples were weighed, milled, and the juice analyzed for Brix and pol. Pounds of theoretical recoverable sugar per ton of cane were reported.

Cane yield for each plot was estimated by plot weight, less 14% to adjust for leaf-trash weight and 10% for harvester efficiency. Stalk number was calculated by dividing adjusted cane yield by stalk weight. Adjustments made to cane yield resulted in lower estimated stalk numbers than those achieved by growers.

Interpreting one year of yield data can be misleading because varieties may differ in relative performance from year to year. Across location means can likewise be misleading since a variety, experimental or commercial, may not perform consistently at all locations. Multi-year and multi–location testing solves these problems by averaging the inconsistent performances.

The most widely grown varieties in Louisiana in 2015 were HoCP96-540 and L01-299, occupying 34% and 30% of the state's acreage, respectively. For comparison, L01-299 was used as the check variety and is highlighted in the tables. To adjust for missing data, the SAS analysis calculated least square means (v 9.2, Proc Mixed). Mean separation was done with the Student's t test by using PDIFF option (P=0.05). Varieties that are significantly higher or lower than L01-299 are denoted by a plus (+) or minus (-), respectively, next to the value for each trait.

Twenty-four experimental varieties representing the 2013 assignment series were introduced to outfield locations for seed increase in 2015 (Table 1). Fourteen experimental and five commercial varieties were planted at 12 outfield locations. Forty-one tests were harvested in 2015 including twelve plantcane, twelve first-stubble, eleven second-stubble, and six third-stubble crops (Table 2).

Variety yield traits are reported by crop and trait with overall means and individual location data in the same table and in summary tables by crop. A combined analysis of plantcane, first-stubble, second-stubble, and third-stubble crops averaged over several years is also provided.

The 2015 season was marked by higher than average rainfall, most of which fell in the spring during cultivation and fertilization and the fall during harvest. Tropical activity in the Atlantic basin was quiet in 2015, but the industry experienced quite a bit of rain and wind when the remnants of Hurricane Patricia (from the Pacific Ocean) spread across Louisiana in late October. By August, the weather turned to a drier pattern and by mid-October much of the state was in drought conditions. The dry conditions were alleviated in October by the remnants of Hurricane Patricia, which came through on October 20 – 24. This began a wet pattern that persisted through the remainder of the 2015-16 harvest.

Some late planted cane struggled to establish due to drought followed by excessive rain. However, the warm fall was conducive to good establishment of newly planted cane. No new sugarcane varieties were released in 2015. Experimental varieties HoCP 09-804 and Ho 09-840 were harvested in plant cane through second stubble in 2015 and will be considered for release in 2016.

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Data were obtained through a cooperative effort of personnel from the LSU AgCenter, USDA-ARS, Sugarcane Research Laboratory, and the American Sugar Cane League in accordance to the provisions of the "Three-way Agreement of 2007." Outfield testing would not be possible without the full cooperation of the growers at each outfield location

Table 1. Commercial and experimental varieties planted in the outfield in 2015.

Commercial Varieties	Experimental Varieties			Experimental Varieties Introduced to the Outfield			
HoCP96-540	HoCP09-804	L12-201	HoCP12-671	L10-147	L13-263	Ho13-723	HoCP13-755
L01-283	HoCP09-840	L12-202	HoCP12-673	L13-234	Ho11-573	Ho13-726	HoCP13-756
L01-299	L11-183	Ho12-615		L13-242	Ho11-9403	HoCP13-731	HoCP13-758
HoCP04-838	Ho11-512	Ho12-626		L13-243	Ho13-700	HoCP13-737	Ho13-769
Ho07-613	Ho11-515	Ho12-630		L13-251	Ho13-708	HoCP13-738	HoCP13-771
	Ho11-532	HoCP12-667		L13-257	Ho13-710	Ho13-739	HoCP13-775
				L13-260	Ho13-720	HoCP13-740	

Table 2. Harvest and planting dates for all outfield locations harvested in 2015.

Location	Parish		Plantcane		First-stubble		Second-stubble		Third-stubble	
		2015 Planting Date	2015 Harvest Date	2014 Planting Date	2015 Harvest Date	2013 Planting Date	2015 Harvest Date	2012 Planting Date	2015 Harvest Date	2011 Planting Date
Al Landry	Iberville	09/02	11/27	08/27	11/27	09/06	**	09/25	**	08/11
Allains	St. Mary	09/23	01/04/16	10/13	01/04/16	09/19	01/04/16	09/27	01/04/16	08/31
Alma	Pointe Coupee	09/08	12/07	10/09	12/07	08/28	10/01	08/17	10/01	09/14
Bon Secour	St. James	*	12/15	09/09	12/01	08/29	12/01	09/07	10/20	09/13
Brunswick	Pointe Coupee	09/09	12/08	09/17	12/08	09/04	12/08	09/05	10/06	09/09
Frank Martin	St. Mary	08/14	12/28	10/08	10/21	10/05	10/21	09/26	**	09/15
Glenwood	Assumption	09/16	11/16	10/07	11/16	08/23	11/16	09/24	**	09/01
Lanaux	St. John	08/19	11/24	08/25	11/24	09/10	10/09	08/23	10/09	08/31
Levert-St. John	St. Martin	09/15	11/11	09/10	11/11	09/03	11/11	09/06	**	09/02
Magnolia	Terrebonne	09/17	12/01	10/27	12/02	11/05	12/01	09/11	**	09/21
Mary	Lafourche	10/08	01/06	10/28	10/13	09/17	10/13	09/12	**	10/11
Ronald Hebert	Iberia	09/01	12/23	09/29	12/23	09/05	10/22	09/25	10/22	09/16

* No test planted at this location.
** No test harvested at this location.

Table 3. Plantcane sugar per acre for seven commercial and five experimental varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(lbs./A)						
HoCP96-540	8180	9094	9704	11419	7453	10166	10269	6657	8261	9899	9435 +	6060	8883
L99-226	7708	9081	9913	10132	7719	8958	10404	7792	8368	11654	6780 -	7738	8854
HoCP00-950	6200	7947	9651	10827	7000	11297	9375	7386	9083	11454	9418 +	7557	8952
L01-283	8272	8828	10380	11324	6623	9133	10266	7319	9154	10218	8703	6956	8904
L01-299	7385	9300	8958	10821	5135	8348	9887	7500	8622	11482	8320	7069	8569
HoCP04-838	6331	8428	9648	8536	5708	10556	10966	7274	10217	11060	7970	8758 +	8795
Ho07-613	5934	8472	11076	12139	5426	10453	11709 +	6426	9014	10271	8615	7814	8946
HoCP09-804	7026	9607	12106	9734	6002	10482	9681	7651	9979	9596	9186	7562	9051
Ho09-840	8175	8741	9352	11506	5475	9408	10451	5494	9065	-------	7665	7047	8551
L11-183	4856 -	7035	9563	10707	5930	10025	12167 +	7167	8631	10854	9386 +	8127	8704
Ho11-515	4752 -	7729	8791	9355	6693	8287	9123	7701	9121	8979	7670	6358	7880
Ho11-532	7247	9929	10379	9975	6531	11135	9389	7365	10376	10166	9071	6538	9008

Table 4. Plantcane cane yield for seven commercial and five experimental varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(tons/A)						
HoCP96-540	25.7	30.5	34.0	40.8	22.5	34.4	35.6	24.8	32.9	34.7	35.9 +	22.4 -	31.2
L99-226	23.4	31.0	34.0	32.4	22.7	29.0	35.4	24.5	31.0	38.5	27.1 -	27.0	29.7
HoCP00-950	18.3	26.3 -	30.6	33.0	19.9	36.4	30.5	24.2	30.4	37.5	32.9	24.7	28.7
L01-283	25.9	31.2	36.3	35.7	19.8	30.8	34.2	25.5	34.0	35.5	34.5	25.3	30.6
L01-299	23.5	32.5	31.3	34.5	16.0	28.3	34.7	25.7	33.5	42.2	31.5	26.5	30.0
HoCP04-838	20.9	30.5	37.2	27.9	17.8	37.1	39.5	25.8	39.0	40.0	31.3	31.6 +	31.6
Ho07-613	17.7	29.4	38.8	38.1	16.2	34.2	41.0 +	23.0	33.3	36.7	32.4	27.5	30.7
HoCP09-804	21.6	33.0	41.2	30.4	17.7	34.0	33.5	27.6	34.2	35.8	33.2	27.0	30.8
Ho09-840	24.8	31.7	34.3	36.6	17.0	31.5	38.3	20.4	34.3	-------	29.6	25.5	30.1
L11-183	15.3 -	24.2 -	32.3	34.0	17.8	32.5	39.7	24.8	33.7	39.3	34.3	27.9	29.7
Ho11-515	14.6 -	28.5	31.8	31.2	20.6	29.6	31.8	26.8	33.2	33.1	29.5	23.3	27.8
Ho11-532	23.2	35.1	36.2	31.0	19.7	37.3	32.1	26.7	36.7	34.8	34.8	22.5	30.8

Table 5. Plantcane sugar per ton for seven commercial and five experimental varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs./tons)							
HoCP96-540	318	298	282	280 -	331	296	288	270	249	286	263	271	286
L99-226	329 +	290	291	313	340 +	308	292	318 +	270	302 +	249	287 +	299 +
HoCP00-950	339 +	302	316 +	329 +	353 +	310	307	306	299 +	306 +	287 +	306 +	313 +
L01-283	321	282	285	317	336 +	297	300	287	268	289	253	275	293
L01-299	314	285	287	314	322	295	285	292	259	272	263	267	288
HoCP04-838	306	277	261 -	306	321	285	278	281	262	275	255	277	282
Ho07-613	334 +	287	286	320	335 +	306	286	281	271	279	265	284	294
HoCP09-804	325	291	294	321	340 +	308	289	278	291 +	268	276	280	297 +
Ho09-840	329 +	275	273	314	328	299	273	268 -	264	-------	259	278	286
L11-183	317	290	296	315	334	308	307	291	256	276	273	291 +	296 +
Ho11-515	326 +	271	276	299 -	324	281 -	287	288	275	272	260	273	286
Ho11-532	313	283	287	322	333	300	292	277	283 +	292	261	290 +	294

Table 6. Plantcane stalk weight for seven commercial and five experimental varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs.)							
HoCP96-540	2.02	2.01 -	2.92 +	2.63	2.25	2.42	2.54 +	2.78 +	2.90 +	2.47	3.41 +	2.61	2.58 +
L99-226	2.26 +	2.94 +	2.44	3.11 +	2.50 +	2.99 +	2.91 +	2.53	3.12 +	3.09 +	3.07 +	2.97 +	2.83 +
HoCP00-950	1.66	2.28	2.18	2.14	2.15	2.53	2.02	2.04	2.56	2.54	2.51	2.00	2.22
L01-283	1.50	2.42	2.05	2.00	1.94	1.99	2.04	1.75	2.21	1.81	2.64	1.78 -	2.01 -
L01-299	1.72	2.56	1.92	2.27	1.98	2.15	2.08	2.12	2.38	2.34	2.35	2.37	2.19
HoCP04-838	1.74	1.90 -	2.11	1.97	1.72	2.29	2.12	1.98	2.22	2.66	2.19	1.57 -	2.03
Ho07-613	1.34 -	2.56	2.34	2.14	2.30	2.46	2.68 +	2.05	2.33	2.32	2.70	2.61	2.32
HoCP09-804	1.45	1.87 -	1.92	1.73 -	1.43 -	1.94	2.01	1.69	2.16	1.64 -	1.86 -	1.74 -	1.79 -
Ho09-840	1.55	1.45 -	1.25 -	1.83	1.56	1.62 -	1.79	1.54 -	1.59 -	------	1.55 -	1.51 -	1.58 -
L11-183	1.89	2.10 -	2.64 +	2.00	2.22	2.52	2.27	2.42	2.43	2.60	2.64	1.98	2.31
Ho11-515	1.35 -	1.87 -	2.28	2.11	1.99	2.31	2.28	2.26	2.09	2.30	2.59	1.95	2.11
Ho11-532	1.67	1.91 -	1.94	1.94	1.89	2.28	1.88	1.92	2.43	2.35	2.69	1.94	2.07

Table 7. Plantcane stalk number for seven commercial and five experimental varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(stalks/A)						
HoCP96-540	25703	30317	23034	31160	19853	28700	28334	17850 -	22873	28118	21490	17587	24585 -
L99-226	20676	21051	29206	20895 -	18766	19414	24355 -	19800	19907 -	25836	17636 -	18465	21334 -
HoCP00-950	21953	23013	27952	30880	18431	28763	30387	23720	23755	30268	26144	24710	25849
L01-283	34703	25779	35559	36853	20217	31066	34417	29386	31155	39629	26467	28792 +	31053 +
L01-299	27820	25566	32762	31299	16351	26855	33428	24766	28068	36640	26878	22382	27735
HoCP04-838	23986	32311 +	35125	28608	20482	32396	37561	26548	35100 +	30748	29564	41194 +	31225 +
Ho07-613	26417	23137	33188	36049	14264	28183	30601	22568	28847	31839	24014	21127	26686
HoCP09-804	29943	35184 +	43473	35129	24584	35936 +	33736	32692 +	31701	43228	35742 +	31128 +	34373 +
Ho09-840	33237	43638 +	59449 +	40287	22219	39023 +	42913 +	26278	43642 +	-------	39038 +	33792 +	38896 +
L11-183	16141 -	23180	24407	34077	16729	25826	35379	20351	27706	30840	26069	28109	25735
Ho11-515	21144	31421	28193	29835	20662	25623	27874	24064	31836	29157	22837	24546	26433
Ho11-532	27735	36780 +	37369	32233	20705	32671	34495	27697	30203	29948	26012	23221	29922

Table 8. First-stubble sugar per acre for two experimental and eight commercial varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(lbs./A)						
HoCP96-540	7412	8013	6161	10725	7201	6739	8630	6880 -	7988 -	7564	11277 -	5973 -	7880 -
L99-226	8289	9328	7941	9716 -	6848	6812	9174	7691	8918	8879	10276 -	7891	8480
HoCP00-950	6717	7689	6290	10111 -	4313 -	6209	7902	6788	7876 -	9037	10742 -	7620	7608 -
L01-283	7946	9205	6955	9480 -	6749	6620	7595	8340	8872	8018	11522 -	7938	8270 -
L01-299	8187	10058	8235	12392	6574	6730	9098	8918	8785	8536	13725	7783	9085
L03-371	6572	9554	7448	9187 -	7325	6561	7846	7747	6359	7161	9127 -	8857 +	7812 -
HoCP04-838	7335	9615	7129	9046 -	5788	5431 -	7321 -	5772 -	7308	9800	11410 -	7643	7800 -
Ho07-613	8331	8969	7125	9588 -	7341	7463	8142	6106 -	6062	7828	10691 -	7619	7939 -
HoCP09-804	6374	9489	7075	8276 -	3553 -	7986	7566	7588	8780	10259	10990 -	7222	7930 -
Ho09-840	6290	8111	6698	8923 -	5069	6201	6506 -	6295 -	8054	-------	9761 -	7441	7255 -

Table 9. First-stubble cane yield for two experimental and eight commercial varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(tons/A)						
HoCP96-540	21.1	27.2	24.1	34.4	22.9	31.6	30.0	22.8 -	27.8	28.2	41.9	22.2 -	27.8 -
L99-226	24.7	31.7	28.5	29.7 -	20.9	29.4	29.4	24.8	29.4	31.2	36.7 -	25.7	28.5 -
HoCP00-950	19.2	23.9	21.8	29.6 -	12.7 -	22.4 -	24.7 -	20.5 -	25.1 -	30.0	38.9 -	24.3	24.4 -
L01-283	23.9	29.6	26.6	28.4 -	21.2	27.9	25.1 -	24.7	28.2	27.4	40.8 -	26.2	27.5 -
L01-299	24.2	34.2	29.6	37.7	20.9	29.6	30.0	27.8	29.3	33.1	47.6	26.6	30.9
L03-371	19.5	31.4	30.1	28.6 -	21.8	26.5	25.1 -	23.3 -	20.8 -	26.3 -	31.8 -	29.8 +	26.2 -
HoCP04-838	23.2	33.5	28.9	28.7 -	18.5	25.7	24.3 -	20.0 -	27.4	35.5	42.4	26.4	27.9 -
Ho07-613	23.4	29.6	24.6	29.5 -	22.9	29.9	26.0	19.0 -	20.8 -	26.5 -	36.9 -	25.6	26.2 -
HoCP09-804	19.4	32.6	26.4	25.6 -	11.6 -	30.7	24.2 -	24.0	29.6	34.9	38.9 -	25.3	26.9 -
Ho09-840	19.8	29.0	26.9	28.2 -	15.6 -	27.5	22.6 -	20.2 -	27.4	-------	38.0 -	26.2	25.8 -

Table 10. First-stubble sugar per ton for two experimental and eight commercial varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(lbs./tons)						
HoCP96-540	351 +	295	257	312	315	213	288 -	303 -	287	269	269 -	270 -	286 -
L99-226	337	295	277	327	329	231	311	310	303	285 +	280	307	299
HoCP00-950	350	321 +	290	342	340 +	278 +	320 +	331	314 +	301 +	275	313	315 +
L01-283	332	311 +	262	334	321	237	302	337	314 +	292 +	282	304	302
L01-299	338	295	279	326	314	229	304	321	299	259	288	294	296
L03-371	337	306	248	321	336 +	247	312	335	305	270	287	297	300
HoCP04-838	316 -	287	247	315	314	211	301	291 -	267 -	276	269 -	290	282 -
Ho07-613	355 +	303	290	324	322	250	313	321	291	295 +	290	297	304 +
HoCP09-804	328	292	268	323	310	259 +	312	317	297	293 +	283	285	297
Ho09-840	318 -	280 -	250	317	327	226	287 -	312	293	-------	257 -	285	285 -

Table 11. First-stubble stalk weight for two experimental and eight commercial varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald .Hebert	Levert St. John	Overall Mean
							(lbs.)						
HoCP96-540	1.58	1.96	1.59 -	2.17	2.24 +	1.78	2.63 +	2.35	1.86	2.44	2.61 +	2.05	2.11 +
L99-226	1.89	2.52 +	2.24	2.36 +	2.57 +	1.88	2.43 +	3.02 +	2.07 +	2.50	2.88 +	2.28 +	2.39 +
HoCP00-950	1.25 -	1.68	1.39 -	1.85	2.08 +	1.55	1.84	2.04	1.65	2.16	2.17	1.79	1.79
L01-283	1.40	1.77	1.65 -	1.77	1.77	1.35	1.59	1.67	1.49	1.71 -	2.07	1.54	1.65 -
L01-299	1.60	2.04	1.98	1.86	1.63	1.72	1.94	2.05	1.69	2.26	2.11	1.72	1.88
L03-371	1.44	2.01	1.96	1.74	1.75	1.78	1.57	2.03	1.50	2.01	1.83	2.02	1.80
HoCP04-838	1.38	1.71	1.66 -	1.42 -	1.72	1.62	1.91	1.65 -	1.43	2.00	2.00	1.92	1.70 -
Ho07-613	1.46	2.01	1.66 -	2.00	1.85	1.74	2.41	1.70	1.63	2.11	2.07	2.17 +	1.90
HoCP09-804	1.19 -	1.53 -	1.45 -	1.51 -	1.40	1.39	1.41 -	1.55 -	1.43	1.89	1.61 -	1.62	1.50 -
Ho09-840	1.02 -	1.31 -	1.29 -	1.34 -	1.32	1.41	1.36 -	1.26 -	1.30 -	-------	1.47 -	1.31 -	1.33 -

Table 12. First-stubble stalk number for two experimental and eight commercial varieties at twelve outfield locations in 2015.

	Heavy						Light						
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald .Hebert	Levert St. John	Overall Mean
							(stalks/A)						
HoCP96-540	26830	28101	30416	31837 -	20290	35974	22967 -	19506 -	29981	23372 -	32445 -	21598 -	26943 -
L99-226	26161	25168	26099	25136 -	16234 -	31746	24406	16515 -	28933	25009	25633 -	22571	24467 -
HoCP00-950	30707	28610	31377	32093 -	12150 -	29353	26964	20531	30482	27831	36030 -	27556	27807 -
L01-283	34847	33613	32083	32507 -	24019	41350	32088	29659	38634	32025	39765	34508	33758
L01-299	30418	33849	30121	41652	25674	34463	30873	27535	35195	29047	45502	31284	32968
L03-371	27243	31149	30676	32969 -	24920	30714	31675	22803	27787 -	26383	34780 -	29597	29225 -
HoCP04-838	34049	40003	34631	40456	21443	31858	26268	25018	38667	35576 +	42459	27677	33175
Ho07-613	32239	29621	30022	29739 -	24981	34473	22601 -	22298	25577 -	25135	35758 -	23862	28026 -
HoCP09-804	32867	43406	37053 +	34038	15943 -	44440 +	34609	31024	41550	36808 +	48714	32238	36057 +
Ho09-840	38949	45929 +	41854 +	42040	23868	39938	33245	32604	42223 +	-------	51919 +	41590 +	39361 +

Table 13. Second-stubble sugar per acre for eight commercial and two experimental varieties at eleven outfield locations in 2015.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	OverallMean
						(lbs./A)						
HoCP96-540	7576	5233 -	3791	8951	5130	7908 -	4742 -	7486	4597 -	6003 -	4417 -	5985 -
L99-226	8469	7237	5653	8421	6054	8740 -	8066	8579	6209	5786 -	7617 -	7348 -
HoCP00-950	6762	7321	4403	6864	6070	7288 -	6713 -	5889	7930	7678	8150	6808 -
L01-283	8651	8867	4897	7685	6193	7403 -	6824 -	9446	6623	8677	8170	7577
L01-299	8551	8179	5261	9291	5841	10066	8868	9430	7265	8234	10015	8273
L03-371	6636	5691 -	5542	7515	6207	8697 -	8791	7339	7184	6811	7299 -	7065 -
HoCP04-838	5232	7854	5249	8470	5413	8247 -	7899	8649	6585	7561	9620	7343 -
Ho07-613	6412	5633 -	5570	8074	5000	8993	3191 -	7479	5983	6478	5652 -	6224 -
HoCP09-804	6790	8131	3495	6930	6957	8228 -	7933	7758	8118	8351	9466	7469
Ho09-840	6834	7121	5028	7430	5820	7169 -	6563 -	7640	-------	6045 -	7300 -	6659 -

Table 14. Second-stubble cane yield for eight commercial and two experimental varieties at eleven outfield locations in 2015.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	OverallMean
						(tons/A)						
HoCP96-540	22.8	23.0 -	12.8	28.1	24.2	27.8 -	17.7 -	22.5	21.2	24.7 -	15.0 -	21.8 -
L99-226	25.3	29.7	18.9	24.8	25.8	28.8 -	25.1 -	24.7	24.5	22.6 -	25.1 -	25.0 -
HoCP00-950	19.3	26.1 -	13.3	20.6	22.5	22.7 -	21.0 -	18.8	27.5	26.2	25.8	22.1 -
L01-283	25.8	31.7	15.3	23.2	26.3	23.9 -	21.6 -	29.1	25.3	31.2	28.0	25.6 -
L01-299	26.9	33.5	17.3	28.6	25.8	33.0	29.6	28.2	30.1	30.7	32.5	28.8
L03-371	20.0	24.3 -	18.6	22.8	27.2	27.8 -	28.1	22.6	27.0	25.0	23.9 -	24.3 -
HoCP04-838	16.5	30.0	17.6	27.0	24.0	28.0 -	26.4	27.8	26.5	28.9	33.7	26.0 -
Ho07-613	19.5	20.8 -	18.7	24.0	22.6	28.2 -	10.8 -	22.8	22.1	22.9 -	19.3 -	21.1 -
HoCP09-804	21.0	31.5	11.9	21.7	28.5	27.5 -	26.3 -	24.0	28.9	29.5	31.7	25.7 -
Ho09-840	21.2	29.0 -	17.1	23.1	27.0	24.8 -	21.7 -	25.7	-------	22.7 -	25.6 -	23.9 -

Table 15. Second-stubble sugar per ton for eight commercial and two experimental varieties at eleven outfield locations in 2015.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	OverallMean
						(lbs./tons)						
HoCP96-540	332 +	228	296	321	213	284 -	270 -	331	215 -	240 -	299	276 -
L99-226	335 +	242	301	340	236	303	321	347	253	254	304	294
HoCP00-950	350 +	280 +	330 +	333	269 +	322 +	319	314 -	289 +	293	315	310 +
L01-283	336 +	280 +	322 +	330	235	309	316	321	263 +	278	291	298 +
L01-299	318	243	304	325	226	305	300	334	241	268	308	288
L03-371	332 +	234	298	330	229	312	313	325	266 +	270	306	292
HoCP04-838	316	261	299	315	224	294	298	310 -	249	261	284	283
Ho07-613	329 +	269 +	297	338	220	319 +	296	327	271 +	284	290	295
HoCP09-804	324	258	294	318	245	300	301	321	281 +	283	298	293
Ho09-840	322	246	295	323	213	289 -	303	298 -	-------	266	284	281

Table 16. Second-stubble stalk weight eight commercial and two experimental varieties at eleven outfield locations in 2015.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	OverallMean
						(lbs.)						
HoCP96-540	1.74	1.59	1.17 -	1.92 +	1.67	2.07	2.14	1.55	2.06	1.93 +	2.20	1.82
L99-226	1.99 +	2.11 +	1.77 +	2.11 +	1.69	2.46 +	2.84 +	2.03 +	2.29	2.19 +	2.52 +	2.18 +
HoCP00-950	1.64	1.53	1.24	1.79	1.45	1.82	2.33	1.32	1.95	1.66	1.75	1.68
L01-283	1.66	1.69	1.31	1.53	1.29 -	1.82	1.71	1.46	1.61 -	1.66	1.79	1.59
L01-299	1.62	1.41	1.46	1.48	1.71	1.91	1.94	1.58	2.17	1.45	1.98	1.70
L03-371	1.34 -	1.53	1.65	1.67	1.63	1.63	1.85	1.33	1.94	1.67	1.84	1.64
HoCP04-838	1.31 -	1.38	1.40	1.30	1.31 -	1.93	1.75	1.28	1.61 -	1.51	1.64	1.49 -
Ho07-613	1.74	1.75 +	1.57	1.50	1.27 -	2.23 +	1.74	1.45	1.85	1.56	1.82	1.68
HoCP09-804	1.11 -	1.39	1.32	1.29	1.34 -	1.58 -	1.83	1.28	1.56 -	1.40	1.50 -	1.42 -
Ho09-840	1.31 -	1.04 -	1.10 -	1.29	1.19 -	1.32 -	1.29 -	1.08 -	------	1.27	1.06 -	1.22 -

Table 17. Second-stubble stalk number for nine commercial varieties at eleven outfield locations in 2015.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Bon Secour	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(stalks/A)						
HoCP96-540	26383	29495 -	22087	29170 -	29139	27033 -	16785 -	29072	20896 -	25925 -	12990 -	24452 -
L99-226	25459	27995 -	21394	23701 -	32233	23299 -	17647 -	24260	21546	20970 -	20107 -	23510 -
HoCP00-950	23772 -	32402 -	21341	24841 -	31170	25090 -	18288 -	30312	28167	32178 -	29787	27027 -
L01-283	31665	37580 -	23430	31035	41787	26294 -	25676	40686	31251	37959	31254	32602
L01-299	33367	48761	23664	39477	30201	34581	30646	35696	27800	42755	32842	34526
L03-371	29921	31595 -	22425	27239 -	33347	34439	30942	33516	28009	30247 -	25992 -	29788 -
HoCP04-838	25255	43804	25499	41524	36816	29178	31612	43490	32960	38710	41514 +	35444
Ho07-613	22645 -	23871 -	24253	31855	35725	25663 -	12420 -	31826	24925	29387 -	21039 -	25783 -
HoCP09-804	37810	46044	18190	33423	42557	35209	28446	36368	37171 +	42309	42169 +	36336
Ho09-840	32522	56041 +	31048	36072	46534	38316	33911	47700	-------	35646	48242 +	40437 +

Table 18. Third-stubble sugar per acre for nine commercial varieties at six outfield locations in 2015.

	Heavy		Light				
Variety	Allains	Alma	Bon Secour	Brunswick	Lanaux	Ronald Hebert	Overall Mean
			(lbs./A)				
HoCP96-540	6509	4859 -	5306 -	2633 -	4541 -	7014	5144 -
L99-226	6655	6405	5908 -	6445	5952 -	7687	6509
L99-233	6309	5806 -	5920 -	6789	6796	7380	6500
HoCP00-950	6595	5839	6702 -	5898	5588 -	7303	6328 -
L01-299	6957	7286	7852	6970	7932	7185	7364
L03-371	6711	5518 -	7788	7164	6381 -	6920	6732
HoCP04-838	6074	5506 -	6539 -	6264	6465	7599	6408 -
Ho05-961	4736 -	5975 -	6334 -	6340	5860 -	7405	6108 -
Ho07-613	4578 -	5075 -	6103 -	2697 -	6459	5818	5095 -

Table 19. Third-stubble cane yield for nine commercial varieties at six outfield locations in 2015.

	Heavy		Light				
Variety	Allains	Alma	Bon Secour	Brunswick	Lanaux	Ronald Hebert	Overall Mean
			(tons/A)				
HoCP96-540	19.9	22.9 -	22.1 -	12.4 -	21.7 -	25.4	20.7 -
L99-226	19.9	26.5	23.3 -	25.8	27.3 -	26.1	24.8
L99-233	20.3	25.8	23.5 -	27.5	29.6	29.0	26.0
HoCP00-950	19.1	22.3 -	21.9 -	20.4 -	21.9 -	24.8	21.7 -
L01-299	21.5	29.1	28.7	26.2	34.7	27.5	28.0
L03-371	20.3	24.4 -	27.6	28.4	28.4 -	24.9	25.6
HoCP04-838	19.1	22.6 -	24.2 -	24.7	26.1 -	27.8	24.1 -
Ho05-961	14.7 -	24.1 -	23.2 -	25.5	24.7 -	26.7	23.1 -
Ho07-613	13.8 -	20.8 -	22.7 -	10.7 -	26.7 -	21.1 -	19.2 -

Table 20. Third-stubble sugar per ton for nine commercial varieties at six outfield locations in 2015.

	Heavy		Light				
Variety	Allains	Alma	Bon Secour	Brunswick	Lanaux	Ronald Hebert	Overall Mean
			(lbs./tons)				
HoCP96-540	327	212 -	239 -	214 -	209	276	246 -
L99-226	334 +	242	257	251	219	295 +	266
L99-233	312 -	224 -	252	245 -	229	255	253 -
HoCP00-950	345 +	261	306 +	289 +	255	295 +	292 +
L01-299	324	249	273	267	228	260	267
L03-371	330 +	227	283	253	226	278	266
HoCP04-838	319	243	271	257	248	273	268
Ho05-961	321	249	273	250	236	276	267
Ho07-613	331 +	245	269	255	245	276	270

Table 21. Third-stubble stalk weight for nine commercial varieties at six outfield locations in 2015.

	Heavy		Light				
Variety	Allains	Alma	Bon Secour	Brunswick	Lanaux	Ronald Hebert	Overall Mean
			(lbs.)				
HoCP96-540	1.54	1.67	1.56	1.83	1.83	1.59	1.67 +
L99-226	1.90	2.01 +	1.76	2.33 +	1.76	2.29 +	2.01 +
L99-233	1.40	1.47	1.36	1.62	1.51	1.45	1.47
HoCP00-950	1.60	1.59	1.41	1.74	1.62	1.48	1.57
L01-299	1.37	1.60	1.21	1.71	1.70	1.53	1.52
L03-371	1.50	1.53	1.82	1.91	1.76	1.37	1.65
HoCP04-838	1.49	1.35 -	1.35	1.74	1.54	1.44	1.48
Ho05-961	1.29	1.64	1.38	1.88	1.72	1.62	1.59
Ho07-613	1.29	1.49	1.57	1.66	1.63	1.49	1.52

Table 22. Third-stubble stalk number for nine commercial varieties at six outfield locations in 2015.

	Heavy		Light				
Variety	Allains	Alma	Bon Secour	Brunswick	Lanaux	Ronald Hebert	Overall Mean
			(stalks/A)				
HoCP96-540	25930	27514 -	28628 -	13248 -	24122 -	32401	25307 -
L99-226	22447	26410 -	27292 -	22181 -	31055 -	22899 -	25381 -
L99-233	29223	35648	34559 -	34388	39382	40117	35553
HoCP00-950	25448	26593 -	31477 -	23511 -	27727 -	33589	28184 -
L01-299	32762	36442	47594	30636	41720	36537	37615
L03-371	25963	31851	30382 -	29441	32794 -	36943	31364 -
HoCP04-838	25964	33841	35892 -	28032	34043	38822	32765 -
Ho05-961	23218	29466 -	33829 -	26964	28668 -	34415	29427 -
Ho07-613	21176	28128 -	32860 -	12495 -	32686 -	28341	25734 -

Table 23. Plantcane means from twelve outfield locations in 2015: Allains, Alma, Bon Secour, Brunswick, F. Martin, Glenwood, Lanaux, Landry, Magnolia, Mary, R. Hebert and St. John.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	8883	31.2	286	2.58 +	24585 -
L99-226	8854	29.7	299 +	2.83 +	21334 -
HoCP00-950	8952	28.7	313 +	2.22	25849
L01-283	8904	30.6	293	2.01 -	31053 +
L01-299	8569	30.0	288	2.19	27735
HoCP04-838	8795	31.6	282	2.03	31225 +
Ho07-613	8946	30.7	294	2.32	26686
HoCP09-804	9051	30.8	297 +	1.79 -	34373 +
Ho09-840	8551	30.1	286	1.58 -	38896 +
L11-183	8704	29.7	296 +	2.31	25735
Ho11-515	7880	27.8	286	2.11	26433
Ho11-532	9008	30.8	294	2.07	29922

Table 24. First-stubble means from twelve outfield locations in 2015: Allains, Alma, Bon Secour, Brunswick, F. Martin, Glenwood, Lanaux, Landry, Magnolia, Mary, R. Hebert and St. John.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	7880 -	27.8 -	286 -	2.11 +	26943 -
L99-226	8480	28.5 -	299	2.39 +	24467 -
HoCP00-950	7608 -	24.4 -	315 +	1.79	27807 -
L01-283	8270 -	27.5 -	302	1.65 -	33758
L01-299	9085	30.9	296	1.88	32968
L03-371	7812 -	26.2 -	300	1.80	29225 -
HoCP04-838	7800 -	27.9 -	282 -	1.70 -	33175
Ho07-613	7939 -	26.2 -	304 +	1.90	28026 -
HoCP09-804	7930 -	26.9 -	297	1.50 -	36057 +
Ho09-840	7255 -	25.8 -	285 -	1.33 -	39361 +

Table 25. Second-stubble means from eleven outfield locations in 2015: Allains, Alma, Bon Secour, Brunswick, F. Martin, Glenwood, Lanaux, Magnolia, Mary, R. Hebert and St. John.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	5985 -	21.8 -	276 -	1.82	24452 -
L99-226	7348 -	25.0 -	294	2.18 +	23510 -
HoCP00-950	6808 -	22.1 -	310 +	1.68	27027 -
L01-283	7577 -	25.6 -	298 +	1.59	32602
L01-299	8273	28.8	288	1.70	34526
L03-371	7065 -	24.3 -	292	1.64	29788 -
HoCP04-838	7343 -	26.0 -	283	1.49 -	35444
Ho07-613	6224 -	21.1 -	295	1.68	25783 -
HoCP09-804	7469	25.7 -	293	1.42 -	36336
Ho09-840	6659 -	23.9 -	281	1.22 -	40437 +

Table 26. Third-stubble means from six outfield locations in 2015: Allains, Alma, Bon Secour Brunswick, Lanaux and R.Hebert

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	5144 -	20.7 -	246 -	1.67 +	25307 -
L99-226	6509	24.8	266	2.01 -	25381 -
L99-233	6500	26.0	253 -	1.47	35553
HoCP00-950	6328 -	21.7 -	292 +	1.57	28184 -
L01-299	7364	28.0	267	1.52	37615
L03-371	6732	25.6	266	1.65	31364 -
HoCP04-838	6408 -	24.1 -	268	1.48 -	32765 -
Ho05-961	6108 -	23.1 -	267	1.59	29427 -
Ho07-613	5095 -	19.2 -	270	1.52	25734 -

Table 27. Combined plantcane means across outfield locations from 2013 to 2015.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	8883	31.2	286	2.58 +	24585 -
L99-226	8854	29.7	299 +	2.83 +	21334 -
HoCP00-950	8961	28.8	313 +	2.22	25873
L01-283	8918	30.7	293	2.01	31070 +
L01-299	8569	30.0	288	2.19	27735
HoCP04-838	8811	31.6	282	2.04	31256 +
Ho07-613	8946	30.7	294	2.32	26686
HoCP09-804	9051	30.8	297 +	1.79 -	34373 +
Ho09-840	8558	30.1	286	1.58 -	38950 +

Table 28. Combined first-stubble means across outfield locations from 2013 to 2015.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	7880 -	27.8 -	286 -	2.11 +	26943 -
L99-226	8480	28.5 -	299	2.39 +	24467 -
HoCP00-950	7608 -	24.4 -	315 +	1.79	27807 -
L01-283	8270 -	27.5 -	302	1.65 -	33758
L01-299	9085	30.9	296	1.88	32968
L03-371	7812 -	26.2 -	300	1.80	29225 -
HoCP04-838	7800 -	27.9 -	282 -	1.70 -	33175
Ho07-613	7939 -	26.2 -	304 +	1.90	28026 -

Table 29. Combined second-stubble means across outfield locations from 2013 to 2015.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	5985 -	21.8 -	276 -	1.82	24452 -
L99-226	7348 -	25.0 -	294	2.18 +	23510 -
HoCP00-950	6799 -	22.1 -	310 +	1.68	26989 -
L01-283	7594	25.6 -	298 +	1.59	32602
L01-299	8273	28.8	288	1.70	34526
L03-371	7065 -	24.3 -	292	1.64	29788 -
HoCP04-838	7343 -	26.0 -	283	1.49 -	35461
Ho07-613	6224 -	21.1 -	295	1.68	25783 -

Table 30. Combined third-stubble means across outfield locations from 2013 to 2015.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	5144 -	20.7 -	246 -	1.67 +	25307 -
L99-226	6509	24.8	266	2.01 +	25381 -
L99-233	6500	26.0	253 -	1.47	35553
HoCP00-950	6328 -	21.7 -	292 +	1.57	28184 -
L01-299	7364	28.0	267	1.52	37615
L03-371	6732	25.6	266	1.65	31364 -
HoCP04-838	6408 -	24.1 -	268	1.48	32765 -
Ho05-961	6108 -	23.1 -	267	1.59	29427 -
Ho07-613	5095 -	19.2 -	270	1.52	25734 -

SUCROSE LABORATORY AT THE SUGAR RESEARCH STATION

Gert Hawkins, Michael Pontif and Collins Kimbeng
Sugar Research Station

The Sugar Research Station sucrose laboratory processed 3,017 samples during the 2015 harvest season (Table 1). Standard laboratory procedures were used to analyze 6 samples. The juice was extracted via a Honiron sugarcane hydraulic press. Procedures included the use of Octapol® for clarification, with Brix being measured by refractometer and pol measured by saccharimeter (Autopol 880). Sucrose percent and theoretical recoverable sugar (lbs/ton of cane) was calculated based on the Brix and pol values. In addition 16 samples of sweet sorghum, 40 energy cane samples and 60 sugarcane were analyzed for brix only. The sucrose laboratory processed samples from July 2015 to February 2016.

A total of 3,011 samples were analyzed using the Spectracane FT-NIR instrument of which 107 where sweet sorghum and 294energy cane samples. The sample was prepared using a Dedini shredder then fed into the Spectracane unit containing NIR technology to analyze the sample for Brix, pol, fiber, moisture, purity, and theoretical recoverable sugar. Samples that were spectral outliers were automatically sent into a bin and reanalyzed using wet chemistry procedures.

Table 1. Number of sugarcane samples processed at the Sugar Research Station sucrose laboratory during the 2015 harvest season.

Unit/Project Area	Leader	Number of Samples
School of Plant, Environmental, and Soil Sciences	Magdi Selim	18
	Brenda Tubana	437
	Jim Wang	36
Iberia Research Station	Sonny Viator	51
Plant Pathology and Crop Physiology	Jeff Hoy	282
LCES	Albert Orgeron	306
LCES (Energy Cane)	Kenneth Gravois	40
LCES (Sugarcane)	Kenneth Gravois	105
Sugar Research Station/Variety Development	Line Trials	589
	Increase	154
	Nursery	543
	Energy Cane	294
Contract Services		55
Rice Research Station (Sweet Sorghum)	Dustin Harrell	16
Iberia Research Station (Sweet Sorghum)	Sonny Viator	83
School of Plant, Environmental, and Soil Sciences (Sweet Sorghum)	Kun-Jun Han	8
TOTAL		3,017

LAES SUGARCANE TISSUE CULTURE LABORATORY

Q.J.Xie[1], D. P. Fontenot[1], and K.A.Gravois[2]
[1]Certis USA, LLC and [2]Sugar Research Station

During the 2015-2016 production season, about 33,000 sugarcane plantlets regenerated in the Louisiana Agricultural Experiment Station Sugarcane Tissue Culture Laboratory, were turned over to Certis USA, LLC, Kleentek Div., for transplanting into the greenhouse at Houma. The number of plantlets transplanted for each cultivar are listed in Table one.

Table 1. The number of tissue-culture-derived plantlets of different cultivars transplanted in the greenhouse.

Cultivar	Number of plantlets
HoCP 96-540	1,224
L 01-283	2,664
L 01-299	8,122
HoCP 04-838	792
Ho07-613	360
HoCP09-804	9,550
HoCP09-840	10,524
TOTAL	33,236

THE 2015 LOUISIANA SUGARCANE VARIETY SURVEY

Kenneth A. Gravois[1] and Benjamin L. Legendre[2]
[1] LSU Agricultural Center, Sugar Research Station, St. Gabriel, LA 70776
[2] LSU Agricultural Center, Audubon Sugar Institute, St. Gabriel, LA 70776
Email: kgravois@agcenter.lsu.edu

Each year a sugarcane variety survey is conducted by the county agents in the sugarcane-growing parishes of Louisiana to determine the variety makeup and distribution across the state. Surveys were obtained from 19 of the 23 parishes; no parish survey reports were obtained from Cameron, Evangeline, St. Charles, or St. Landry parishes. According to USDA Farm Service Agency (FSA), there were 410,553 acres planted to sugarcane in Louisiana in 2015. This survey was based on 97.8 percent of the acres reported by USDA-FSA.

Agents collected acreage according to variety and crop. A total of 10 sugarcane varieties, HoCP 85-845, HoCP 96-540, L 99-226, L 99-233, HoCP 00-950, L 01-283, L 01-299, L 03-371, HoCP 04-838, and Ho 07-613 were listed along with "Others" in the survey. The category of "Others" included, but was not limited to, small acreages of LCP 85-384, CP 89-2143, Ho 95-988, L 97-128, and Ho 05-961. Small seed-cane increase acreages were devoted to HoCP 09-804 and Ho 09-840, which were grown on primary and secondary seed-cane increase stations. The crop was divided into four categories that included plant-cane, first-stubble, second-stubble and third-stubble and older crops. Additional information regarding parish acreage was collected as needed from the local and state FSA offices.

Total State Acreage. Actual area surveyed for each parish, region and the statewide total are shown in Table 1. Statewide, the area planted to sugarcane in 2015 was 410,553 acres according to state FSA records. A total of 401,587 acres comprised the sample for the 2015 variety survey. An estimated 383,867 acres were available for harvest for sugar, assuming 6.5% of the total acres were used for seed-cane.

Sugarcane Distribution by Variety. Statewide sugarcane acreage in percent by variety and crop is shown in Table 2. The leading variety for 2015 was HoCP 96-540, which occupied 33% of the Louisiana sugarcane acreage. This percentage was four points lower than HoCP 96-540's acreage in 2014 (Gravois and Legendre, 2015). L 01-299 was next in total acreage as it was planted on 30% of the state's acreage. The varieties planted in the next largest areas were L 99-226, L 01-283, HoCP 04-838, L 03-371 , and HoCP 00-950, occupying 11%, 9%, 9%, 4%, and 3% of the state's acreage, respectively. All other varieties in the survey had each 2% or less of the planted area for the 2015 crop.

Sugarcane Distribution by Region and Crop. The total sugarcane acreage was highest for Teche region (174,484 acres); followed by the River-Bayou Lafourche region (162,821 acres); then the Northern region at 67,588 acres (Table 3). Total FSA reported sugarcane acreage for Louisiana was similar to the acreage grown in 2014.

In 2015, 14.1% of the state's acreage was grown as third and older stubble crops, which was 1.9 percentage points higher than 2014. The milder winter during 2014-2015 likely accounted for the increase of acreage devoted to older stubble cane. In 2015, 29.5%, 28.1%, and 28.3% of the state's acreage was in a plant-cane, first stubble, and second stubble crops, respectively.

For the current survey, the Bayou Teche region had a lower percentage of plant-cane (28.5%) than the other growing regions. For the third and older stubble crops, the River-Bayou Lafourche region had the lowest percentage at 13.3%, whereas the northern region had the highest percentage at 16.8%.

Sugarcane Distribution by Variety and Crop for the Three Regions. HoCP 96-540 was the most widely grown variety for the Bayou Teche and Northern regions in 2015; L 01-299 was the most widely grown variety in the River-Bayou Lafourche region (Tables 4-6). L 01-299 led the way in plant-cane acreage all three growing areas of Louisiana. The largest variety trend in sugarcane acreage was the increased planting of L 01-299 and increased older stubble crops devoted to L 01-299, which may make the this variety the most widely sugarcane variety grown in 2016. The River-Bayou Lafourche and Northern growing areas planted more L 01-283 than the Bayou Teche region. HoCP 04-838 was more widely grown in the Bayou Teche and River-Bayou Lafourche growing areas of the state.

Variety Trends. HoCP 96-540, released for commercial planting in 2003, now occupies 33% of the state's 2015 acreage, which is a decrease of four percentage points from the previous year. The variety continues to perform well, in spite of its slow emergence and average stubbling ability. Rust infections were limited in scope in 2015. No fungicide applications were necessary in Louisiana in 2015 for the control of brown rust. HoCP 96-540 was widely planted by growers in 2015.

L 99-226 decreased in acreage by two percentage points. The variety is difficult to plant due to lodging and the amount of shucks (long leaves) on the variety. L 99-226 is moderately susceptible to brown rust. L 99-226 exhibits resistance to the sugarcane borer, competitive with most problem weeds, and stubbles well. Sucrose content is very good in the variety, but cane yield at times has been disappointing. L 99-226 will likely continue to decrease in acreage.

L 99-233 also decreased in acreage in 2015. Field yields of L 99-233 were not good, and the variety does not respond well to ripeners. This variety is no longer recommended for planting. HoCP 00-950 was released for commercial planting in 2007 and occupied 3% of the state's

acreage in 2015. This variety has high sugar per ton of cane and is considered an early maturing variety. HoCP 00-950 does not grow as well in poorly drained soils and is better suited to the sandier soils in the sugar belt. Some growers have been very pleased with the performance of HoCP 00-950, while others have discontinued its planting. In 2015, some fields of HoCP 00-950 were severely affected by the disease red stripe (*Acidovorax avenai* subsp. Avenae).

L 01-283 was released for commercial planting in 2008 and occupied nine percent of the state's acreage in 2015. The variety has excellent stubbling ability, good sugar yield and erectness. Naturally occurring, environmentally induced off-types have been increasing in L 01-283. The variety has performed best in well drained sandier soils along with good fertility programs, all of which reduce stress. The variety is especially susceptible to late season sugarcane borer infestations when off-types are present.

L 01-299 was grown on 30% of the state's acreage in 2015. This variety was released in 2009 after superior sugar yields were obtained in the outfield variety trials. The variety is known for outstanding stubbling ability and is well suited for heavy land. The variety has an erect growth habit. L 01-299 can have difficulty establishing after planting in sandier soils, especially with high rainfall just after planting. L 01-299 is susceptible to the disease brown stripe. The variety can pick up smut, and growers are encouraged to monitor seed-cane sources for this disease. L 01-299 performed well in all crops for the 2015 grinding season and has superior stubbling ability. This variety will likely be widely planted again in 2016.

L 03-371, released in 2010, has not been widely planted since its release. The variety is moderately susceptible to brown rust. L 03-371 is very susceptible to the sugarcane borer and should not be planted where insecticides cannot be applied. L 03-371 is no longer recommended for planting in Louisiana.

HoCP 04-838 was released in 2011. This variety has good sugar and cane yield potential, with its most notable attribute being cold tolerance. Field yields for HoCP 04-838 were erratic in 2015; the variety did not appear to take the drought well. The fiber content of HoCP 04-838 is about 13.6%. Harvesting trials have been conducted with HoCP 04-838, and fiber content can be managed by careful operation of combines.

Ho 07-613 was released to Louisiana sugarcane growers in 2014. The new variety has good sucrose content, but after the winter of 2014-15, Ho 07-613 did not establish well in the stubble cane crops. Therefore, the small acreage of Ho 07-613 was not widely increased in the 2015 planting season.

The dominance of a single variety can lead to disease and insect shifts as was the case with brown rust and LCP 85-384 (Hoy, 2005) and HoCP 96-540. It has been fortunate that HoCP 96-540 was grown on less than 50% of the state's acreage each year that it has been planted. This

has likely extended the life span of HoCP 96-540. With the release of many new sugarcane varieties in recent years, growers are encouraged to continue to plant a more balanced mix of varieties.

ACKNOWLEDGMENTS

We acknowledge the assistance of the county agents for conducting the sugarcane variety survey in their parishes. We also thank the sugarcane growers and/or their consultants who took the time and effort to respond to the survey. We also acknowledge the assistance of the USDA-FSA offices in the sugarcane parishes for certified acreage figures.

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Table 1. Total area planted to sugarcane in Louisiana by region and parish, 2015.[1]

Bayou Teche		**River-Bayou Lafourche**		**Northern**	
Parish	**Acres**	**Parish**	**Acres**	**Parish**	**Acres**
Acadia	3990.7	Ascension	16,985.3	Avoyelles	7,275.4
Calcasieu	411.9	Assumption	33,441.7	Evangeline[2]	257.3
Cameron[2]	33.1	Iberville	35,845.9	Pointe Coupee	37,858.1
Iberia	55,439.6	Lafourche	25,869.7	Rapides	10,947.2
Jeff Davis	740.5	St. Charles[2]	1,254.3	St. Landry[2]	7,421.3
Lafayette	9787.6	St. James	26,996.7	West Baton Rouge	13,964.3
St. Martin	27,922.4	St. John	6,873.6		
St. Mary	44,298.6	Terrebonne	8,678.2		
Vermilion	34,259.8				
Total	176,884.2	Total	155,945.4	Total	77,723.6
Total acres all regions: **410,553.2**					

[1]Acreage based on information obtained in variety surveys from 19 parishes by the county agents in 2015

[2] No variety survey

Table 2. Estimated statewide sugarcane acreage percentage by variety and crop, all regions, 2015.[1]

Variety	Plant-cane	First-stubble	Second-stubble	Third-stubble and older	Total
	----------%----------				
HoCP 85-845	<1	<1	1	1	1
HoCP 96-540	29.1	33.5	36.5	37.5	33.4
L 99-226	5.0	8.9	14.2	18.4	10.5
L 99-233	0.1	0.2	1.0	2.3	0.7
HoCP 00-950	2.0	2.4	2.8	5.5	2.8
L 01-283	10.0	9.6	7.9	11.3	9.4
L 01-299	39.2	31.4	23.6	19.2	29.6
L 03-371	1.4	2.8	6.7	3.2	3.5
HoCP 04-838	12.0	10.5	6.6	1.7	8.5
Ho 07-613	0.9	0.3	0.1	-	0.4
Others	0.4	0.5	0.9	0.6	0.6
Total acres Percent of total crop	119,542.5 29.52	113,692.3 28.08	114,584.2 28.30	57,074.2 14.10	404,893.2

[1] Based on information obtained in variety surveys from 19 parishes by county agents in 2015.

Table 3. Estimated sugarcane distribution by region and crop, 2015.[1]

Crop	Bayou Teche	River-Bayou Lafourche	Northern	State Total
Plant-cane Area (acres) Percent (%)	49,797.5 28.5	49,099.3 30.2	20,645.7 30.5	119,542 29.5
First-stubble Area (acres) Percent (%)	48,787.8 28.0	47,396.9 29.1	17,507.6 25.9	113,692 28.1
Second-stubble Area (acres) Percent (%)	51,834.9 29.7	44,648.7 27.4	18,100.6 26.8	114,584 28.3
Third-stubble and older Area (acres) Percent (%)	24,063.4 13.8	21,676.4 13.3	11,334.4 16.8	57,074 14.1
Total area (acres) Percent (%)	174,483.5 43.4	162,821.3 40.5	67,588.4 16.8	404,893.2

[1] Based on information obtained in variety surveys from 19 parishes by county agents in 2015.

Table 4. Estimated area planted to sugarcane in percent by variety and crop for the Bayou Teche region, 2015.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP 85-845	0.5	0.5	0.6	1.0	0.6
HoCP 96-540	33.1	33.3	36.1	37.2	33.4
L 99-226	4.5	8.8	14.0	18.3	10.5
L 99-233	0.2	0.2	1.0	2.3	0.7
HoCP 00-950	3.4	2.4	2.8	5.5	2.8
L 01-283	2.0	9.5	7.9	11.2	9.4
L 01-299	38.9	31.2	23.4	19.1	29.6
L 03-371	2.4	2.8	6.6	3.2	3.5
HoCP 04-838	14.2	10.4	6.5	1.6	8.5
Ho 07-613	0.9	0.3	0.1		0.4
Others	0.4	0.0.5	0.9	0.6	0.6
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 8 parishes by county agents in 2015.

Table 5. Estimated area planted to sugarcane in percent by variety and crop for the River/Bayou Lafourche region, 2015.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP 85-845	<1	0.8	1.0	1.6	0.9
HoCP 96-540	23.1	26.0	27.3	28.6	25.8
L 99-226	4.6	5.7	15.7	16.3	9.5
L 99-233	0.1	0.4	1.3	3.6	1.0
HoCP 00-950	0.7	1.2	1.3	7.5	1.9
L 01-283	16.4	13.9	12.6	18.5	14.9
L 01-299	40.8	39.5	28.8	19.0	34.2
L 03-371	0.4	0.5	1.8	1.7	1.0
HoCP 04-838	11.6	10.4	7.7	1.5	8.8
Ho 07-613	0.9	0.4	0.2		0.4
Others	0.9	1.3	2.3	1.7	1.5
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 7 parishes by county agents in 2015.

Table 6. Estimated area planted to sugarcane in percent by variety and crop for the Northern region, 2015[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP 85-845	1.4			1.6	0.7
HoCP 96-540	32.8	34.5	33.3	31.9	33.2
L 99-226	6.8	11.4	5.5	11.5	8.4
L 99-233			0.2	0.7	0.2
HoCP 00-950	1.4	2.5	5.5	2.7	3.0
L 01-283	13.8	20.9	15.0	12.7	15.8
L 01-299	35.3	22.4	30.2	31.6	30.0
L 03-371	1.1	0.5	7.9	6.7	3.7
HoCP 04-838	7.2	7.7	2.4	0.6	4.9
Ho 07-613	0.3	0.1	<1		0.1
Others					
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 4 parishes by county agents in 2015.

Table 7. Louisiana sugarcane variety trends, by variety and years, all regions, 2011- 2015[1]

	Area planted to sugarcane by variety and years (%)					
Variety	**2011**	**2012**	**2013**	**2014**	**2015**	**1 yr. Change**
HoCP 85-845	1	<1	2	1	1	0
HoCP 96-540	43	39	39	37	33	-4
L 99-226	19	21	17	13	11	-2
L 99-233	11	9	6	2	1	-1
HoCP 00-950	6	6	4	4	3	-1
L 01-283	8	11	10	10	9	-1
L 01-299	3	7	15	22	30	+8
L 03-371	1	2	3	3	4	+1
HoCP 04-838	<1	1	3	6	9	+3
Others	<1	1	2	1	<1	-1
Totals	100	100	100	100	100	

[1] Based on annual variety surveys from 19 parishes by county agents, 2011-2015.

MATURITY CHARACTERISTICS OF FLORIDA SUGARCANE VARIETIES

Kenneth Gravois, Michael Pontif, Gert Hawkins, and Collins Kimbeng
LSU AgCenter, Sugar Research Station

In 2014, another set of sugarcane varieties from Florida was obtained from the Kleentek foundation greenhouse and seed-cane increases were planted. These seed-cane increases were used to plant a yield trial in 2015, and there were sufficient stalks left so that each increase could be sampled across time during the 2015 harvest season.

Standard cultural practices were followed during the 2015 growing season. The seed-cane increase was not replicated, and samples were harvested on September 30, October 28, and December 2 of 2015. An 8-stalk sample was hand-cut out of each plot for a quality analysis. Each sample was then sent to the laboratory to determine theoretical recoverable sugar per ton of cane (lbs/ton); fiber content (%); purity (%) (Gravois and Milligan, 1992). The seed-cane increases were erect for the September sampling date, but lodged after the remnants of Hurricane Patricia crossed into Louisiana in late October. No freezes were experienced prior to the sampling of these varieties.

Gravois, K.A. and S.B. Milligan. 1992. Genetic relationships between fiber and sugarcane yield components. Crop Sci. 32:62-67.

Table 1. Maturity characteristics of Florida sugarcane varieties across three sampling dates. The varieties were grown at the Sugar Research Station, St. Gabriel, LA during 2015.

Date	Variety	TRS (lbs/ton)	Fiber Content (%)	Purity (%)	Stalk Weight (lbs.)
30-Sep	HOCP96-540	235	12.47	83.97	2.51
28-Oct	HOCP96-540	250	11.30	85.28	1.71
2-Dec	HOCP96-540	273	11.84	85.34	3.00
30-Sep	L01-283	251	11.97	85.07	1.77
28-Oct	L01-283	256	12.11	84.63	2.13
2-Dec	L01-283	269	12.12	85.35	2.12
30-Sep	L01-299	239	11.91	84.75	1.63
28-Oct	L01-299	257	14.54	85.53	2.30
2-Dec	L01-299	267	12.18	84.96	2.20
30-Sep	CPCL02-6848	210	13.65	80.37	2.48
28-Oct	CPCL02-6848	255	14.65	83.86	2.28
2-Dec	CPCL02-6848	251	14.50	82.90	2.39
30-Sep	CPCL05-1102	213	9.48	82.40	3.53
28-Oct	CPCL05-1102	227	9.34	84.34	3.53
2-Dec	CPCL05-1102	269	8.69	84.39	3.91
30-Sep	CPCL05-1201	209	11.81	80.02	2.23
28-Oct	CPCL05-1201	240	12.42	83.23	2.52
2-Dec	CPCL05-1201	247	11.90	83.70	2.58
30-Sep	CP05-1526	239	13.56	86.56	3.22
28-Oct	CP05-1526	240	12.80	86.18	2.58
2-Dec	CP05-1526	271	12.02	86.08	4.02
30-Sep	CP05-1791	200	12.13	80.05	2.73
28-Oct	CP05-1791	226	12.10	81.64	2.96
2-Dec	CP05-1791	254	11.76	82.73	3.15

PERFORMANCE OF FLORIDA SUGARCANE VARIETIES IN LOUISIANA

Kenneth Gravois, Michael Pontif, Gert Hawkins, and Collins Kimbeng
LSU AgCenter, Sugar Research Station

Sugarcane brown rust is becoming an increasingly larger problem for sugarcane growers in Louisiana. The primary means of combatting this disease has been to breed resistant varieties. Previous work has identified a QTL (quantitative trait loci) *Bru1* that is associated with resistance to brown rust disease in sugarcane. Unfortunately, the prevalence of *Bru1* is low in the clones used for breeding sugarcane in Louisiana. In fact, the only commercial Louisiana variety that has *Bru1* is L 01-299. The prevalence of *Bru1* in Florida sugarcane varieties is much higher. Table 1 lists some of the newer sugarcane varieties being planted in Florida and whether or not *Bru1* is present.

In 2013, a few stalks of each sugarcane variety were obtained from the Kleentek quarantine greenhouse and used to plant a small seed-cane increase. A yield trial was planted on August 28, 2014 at the Sugar Research Station in St. Gabriel, Louisiana. A randomized complete block (two replications) experiment was planted. Plots were paired rows that were 25 feet in length and a four foot alley separated plots. The soil type was a Commerce silt loam.

Standard cultural practices were followed during the 2015 growing season. The field trial was harvested on December 8, 2015 for the plant-cane crop. Plots were combine-harvested and weighed to determine cane yield (tons/acre). An 8-stalk sample was hand-cut out of each plot for a quality analysis. Each sample was then sent to the laboratory to determine juice Brix by refractometer and pol (Z^o) by saccharimeter. Sucrose content (lbs/ton of cane) and fiber content were determined by the pre-breaker press method (Gravois and Milligan, 1992).

Data were analyzed with SAS (v 9.4) software. Replication was considered a random effect; variety was considered a fixed effect. Least square means were estimated and tested for statistical significance (P=0.05) with the Student's t test using the PDIFF option of PROC MIXED.

Gravois, K.A. and S.B. Milligan. 1992. Genetic relationships between fiber and sugarcane yield components. Crop Sci. 32:62-67.

Table 1. A listing of Florida sugarcane varieties, rating for the presence of *Bru1*, and year of Introduction for seed-cane increase.

Variety	Bru1 Positive	Year Introduced
CP 03-1912	Yes	2013
CPCL 97-2730	Yes	2013
CPCL 00-4111	No	2013
CP 01-1372	Yes	2013
CP 00-1101	Yes	2013
CP 96-1252	No	2013
CP 04-1844	Yes	2013
CP 04-1935	Yes	2013
CPCL 02-1295	Yes	2013
CP 04-1566	No	2013
CPCL 95-2287	No	2013
CPCL 02-0926	Yes	2013
CPCL 99-4455	Yes	2013
CP 89-2143	Yes	2013
CPCL02-6848	Yes	2014
CPCL05-1102	No	2014
CP05-1791	No	2014
CP05-1526	No	2014
CPCL05-1201	Yes	2014
CP06-2400	Yes	2015

Table 2. Plant-cane data obtained from a yield trial conducted at the Sugar Research Station, St. Gabriel, LA and harvested on December 8, 2015. The test was planted on August 27, 2014, and the soil type was a Commerce silt loam.

Variety	Sugar Yield[1]		Cane Yield		Sugar Content		Fiber		Purity	
	lbs/ac		tons/ac		lbs/ton		%		%	
HoCP 96-540	13407		48.1		278		10.8	-	86.0	
L 01-299	11422		42.5		269		12.2		85.8	
HoCP 04-838	13048		45.8		285		13.7	+	85.2	
CP 89-2143	12182		43.9		277		9.1	-	86.7	
CPCL 95-2287	14335		50.8		282		11.8		85.2	
CP 96-1252	12256		49.9		245		9.9	-	84.4	
CPCL 97-2730	12446		46.5		268		11.6		84.9	
CPCL 99-4455	9088		31.2	-	291		10.5	-	86.1	
CP 00-1101	12040		43.6		276		10.2	-	85.3	
CPCL 00-4111	11397		44.9		250		9.2	-	83.9	
CP 01-1372	14587		50.8		287		9.0	-	85.7	
CPCL 02-0926	11371		41.7		272		10.5	-	85.9	
CPCL 02-1295	11163		41.5		269		13.1		86.0	
CP 03-1912	14722		55.9	+	263		10.0	-	86.9	
CP 04-1566	9953		39.8		250		14.0	+	84.5	
CP 04-1844	14402		55.9		258		12.3		85.6	
CP 04-1935	11456		42.2		272		12.4		84.8	
Pr > F	0.084		0.003		0.142		<0.001		0.261	

[1]Values that are significantly higher or lower than L 01-299 are denoted by a '+' or '-', respectively.

YIELD AND FIBER CONTENT OF HIGH-FIBER SUGARCANE CLONES

Kenneth Gravois, Mavis Finger, Collins Kimbeng, and Michael Pontif
LSU AgCenter, Sugar Research Station

Brian Baldwin
Dept. of Plant & Soil Sciences
Mississippi State, MS 39762

In 2008, the LSU AgCenter partnered with Mississippi State University to evaluate high-fiber sugarcane clones (energycane). Dr. Brian Baldwin of Mississippi State University is the coordinator of the Sun Grant proposal: "Regional Biomass Feedstock – Herbaceous Bioenergy Crop Field Trial". These trials are located across the southeastern U.S. with one located at the LSU AgCenter's Sugar Research Station at St. Gabriel, LA. The sugarcane clones were bred and selected at the USDA-ARS Sugarcane Research Unit in Houma, LA.

A yield trial was planted on September 18, 2008 at the Sugar Research Station in St. Gabriel, Louisiana. Seed-cane of five varieties was obtained at the USDA-ARS Sugarcane Research Unit's Ardoyne Farm, and a randomized complete block (four replications) experiment was planted.

Standard cultural practices were followed during the 2009, 2010, 2011, 2012, 2013, and 2014 growing seasons. The field trial was harvested on December 16, 2009 for the plant-cane crop; December 2, 2010 for the first stubble crop; December 15, 2011 for the second stubble crop; December 19, 2012 for the third stubble crop; December 11, 2013 for the fourth stubble crop; December 11, 2014 for the fifth stubble crop; December 8, 2015 for the sixth stubble crop. Plots were combine-harvested and weighed to determine cane yield (tons/acre). A 10-stalk sample was hand-cut out of each plot for a quality analysis. Each sample was then sent to the laboratory to determine juice Brix by refractometer and pol (Z°) by saccharimeter. Fiber content was determined by the pre-breaker press method (Gravois and Milligan, 1992). Brix % cane was determined as ((100-Fiber content)*juice Brix)/100.

Data were analyzed with SAS (v 9.4) software. Replication was considered a random effect; variety was considered a fixed effect. Least square means were estimated and tested for statistical significance (P=0.05) with the Student's t test using the PDIFF option of PROC MIXED.

Gravois, K.A. and S.B. Milligan. 1992. Genetic relationships between fiber and sugarcane yield components. Crop Sci. 32:62-67.

Table 1. Plant-cane data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2009.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight	
	tons/ac		%		%		tons/ac		tons/ac	
Ho 02-144	30.5	B	9.9	A	20.6	B	6.27	C	3.02	AB
Ho 02-147	44.2	A	8.8	B	17.8	C	7.87	AB	3.89	A
Ho 06-9001	28.9	B	7.9	B	26.4	A	7.58	ABC	2.28	BC
Ho 06-9002	25.5	B	7.5	BC	25.3	A	6.44	BC	1.91	C
HoCP 72-114	42.8	A	7.3	C	20.7	B	8.84	A	3.12	AB

Table 2. First-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2010.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	25.0	C	12.3	A	25.9	B	6.49	D	3.08	C	61.8	C
Ho 02-147	47.0	A	13.6	A	19.5	D	9.15	A	6.39	A	66.9	A
Ho 06-9001	26.0	C	9.9	C	29.7	A	7.70	BC	2.57	C	60.4	D
Ho 06-9002	24.4	C	10.2	BC	29.6	A	7.22	CD	2.49	C	60.2	D
HoCP 72-114	35.8	B	11.5	B	24.0	C	8.58	AB	4.12	B	64.5	B

Table 3. Second-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	55.3	A	11.9	A	23.6	B	12.95	B	6.58	B	64.5	BC
Ho 02-147	72.4	B	13.1	A	18.4	D	13.21	AB	9.48	A	68.6	A
Ho 06-9001	57.2	A	9.6	BC	28.7	A	16.41	A	5.49	B	61.7	C
Ho 06-9002	50.7	A	9.2	C	28.3	A	14.41	AB	4.66	B	62.6	C
HoCP 72-114	57.1	A	11.1	B	22.6	C	12.39	B	6.34	B	66.2	AB

Table 4. Third-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2012.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	34.6	B	13.1	AB	23.2	AB	7.99	AB	4.53	B	63.7	B
Ho 02-147	49.7	A	14.4	A	19.6	C	9.74	A	7.16	A	66.0	AB
Ho 06-9001	27.3	C	11.6	BC	24.8	A	6.85	B	3.17	C	63.6	B
Ho 06-9002	28.0	C	10.9	C	25.7	A	7.24	B	3.05	C	63.3	B
HoCP 72-114	39.4	B	10.8	C	21.5	BC	8.46	AB	4.26	B	67.8	A

Table 5. Fourth-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2013.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	36.5	A	10.9	A	23.2	B	8.52	A	3.98	AB	65.9	B
Ho 02-147	40.7	A	11.9	A	19.8	C	8.14	A	4.84	A	68.3	A
Ho 06-9001	38.2	A	9.6	B	27.8	A	10.57	A	3.67	AB	62.6	D
Ho 06-9002	28.3	A	9.3	BC	26.4	A	7.41	A	2.63	B	64.3	C
HoCP 72-114	38.0	A	9.5	C	23.1	B	8.75	A	3.61	AB	67.5	A

Table 6. Fifth-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2014.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	35.2	BC	11.6	A	27.0	B	9.51	A	4.10	A	63.1	AB
Ho 02-147	44.8	A	12.1	A	21.3	D	9.53	A	5.42	B	53.8	C
Ho 06-9001	34.9	BC	8.5	B	31.0	A	10.81	A	2.97	C	63.5	AB
Ho 06-9002	31.5	C	9.0	B	30.0	A	9.43	A	2.84	C	66.8	A
HoCP 72-114	39.5	AB	9.8	B	24.3	C	9.64	A	3.89	B	58.9	BC

Table 7. Sixth-stubble data obtained from an energycane field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2015.

Variety	Cane Yield		Cane Brix		Fiber Content		Insoluble Solids (Fiber) Weight		Brix Weight		Moisture Content	
	tons/ac		%		%		tons/ac		tons/ac		%	
Ho 02-144	51.1	BC	12.7	B	21.5	B	11.0	B	6.5	C	65.8	B
Ho 02-147	64.0	A	13.6	A	18.3	D	11.7	B	8.7	A	68.1	A
Ho 06-9001	55.2	B	10.7	D	25.7	A	14.2	A	5.9	CD	63.6	C
Ho 06-9002	47.9	C	11.0	CD	24.7	A	11.8	B	5.3	D	64.4	BC
HoCP 72-114	64.1	A	11.6	C	19.7	C	12.7	AB	7.5	B	68.7	A

2015 ENERGY CANE FEEDSTOCK DEVELOPMENT ACTIVITIES

Everton Barreto, Kaitlin Barrios, Ana Oliveira, Michael Pontif and Collins Kimbeng
Sugar Research Station, Saint Gabriel, LA

Anna Hale
USDA-ARS, Sugarcane Breeding, Houma, LA

John Jifon
Texas A&M Agrilife Research, Weslaco, TX

In 2010 the LSU AgCenter along with several partners received funding from the Agriculture and Food Research Initiative (AFRI) program. This multifaceted project is titled 'A Regional Program for Production of Multiple Agricultural Feedstocks and Processing to Biofuels and Biobased Chemicals' and is being led by the LSU AgCenter. Feedstock development is one of the Tasks in this multifaceted project. The objective of the Feedstock Development Task as spelt out in the call for proposals was to 'Optimize yields, expand feedstock diversity and range of cultivation and allow for reduced inputs through breeding**'.**

Energy cane clones bred by the USDA-ARS Sugarcane Research Unit at Houma, LA were evaluated at the LSU AgCenter Macon Ridge Research Station in Winnsboro (32°09'48"N) in north Louisiana. About 1,000 clones were evaluated in small plots (3 meters) in 2012 from which about 200 clones were selected in 2013, based on visual appraisal for biomass yield, cold tolerance, and ratooning ability, and replanted into bigger plots (5 meters). These are currently being evaluated for estimated biomass yield (the product of stalk weight and stalk counts), dry matter yield, cold tolerance, and ratooning ability. A subsample of 42 clones were randomly taken from Winnsboro and planted at the Sugar Research Station in St. Gabriel, LA (30°15'13"N) in south Louisiana in 2014. Each clone, along with two energy cane, Ho 02-113 and HoCP 72-114, and one sugarcane, L01-299, check varieties were planted into 3-m plots and replicated 6 times. Whereas the trials in Winnsboro were set up for evaluation, selection and variety advancement purposes, this trial is meant to provide more in depth agronomic and genetic characterization of the energy cane population.

The experiment was planted on 09/08/14, and the first three replicates were harvested on 12/11/15 and the second on 02/18/16. A 15-stalk sample (10 on the second sampling date) was hand-cut from each plot, topped, stripped of leaves, weighed, shredded and the shredded material fed through the Near-infrared spectroscopy (NIRS) machine (SpectraCane, New Zealand) to analyze for Brix, Pol (Z^o), Fiber, Moisture, Sucrose, and Theoretical Recoverable Sugar (TRS). Also, 1000 grams of shredded material from each sample was weighed out and dried in an oven till a constant weight was achieved. The oven-dried samples were ground through a 1mm sieve (IKA® 2939200MF1.0) and the residue was used to analyzed for Extractives, Cellulose, Hemicellulose and Lignin using a near infrared reflectance spectrophotometer (Model 2500X RTW, SpectraStar^{TM}). The data were analyzed using the Genes software (http://www.ufv.br/dbg/genes/gdown2.htm) assuming all variables as random in the model.

Table 1. Plant cane data showing biomass characteristics of energy cane clones evaluated at the Sugar Research Station in Saint Gabriel, Louisiana. Experiment sampled on 12/11/2015.

Genotype	Dry Matter	Fresh Cane	Moisture	Stalk		
	(tons/acre)	(tons/acre)	(%)	(Number/meter)	(stalk/acre)	stalk weight (lb)
132	15.4	48.7	68.5	31	67760	1.4
134	15.1	48.5	69.0	21	45738	2.1
709	13.5	39.1	65.6	25	55176	1.4
542	12.8	35.4	63.6	22	48884	1.4
659	12.7	42.3	70.0	18	40898	2.1
473	12.2	37.4	67.4	22	48400	1.6
103	12.0	35.4	66.1	21	45496	1.6
194	11.2	35.5	68.2	24	53482	1.3
283	11.2	36.1	69.1	20	44044	1.7
902	10.9	36.7	69.6	28	60984	1.2
Ho02-113	10.8	33.4	67.7	33	73084	0.9
34	10.7	39.8	73.2	16	34606	2.3
403	10.4	32.8	67.2	21	46464	1.4
14	10.4	32.5	68.1	21	46464	1.4
61	10.0	38.3	73.7	19	43076	1.8
15	9.9	31.3	68.7	24	53724	1.2
45	9.7	31.4	69.3	15	33880	1.9
187	9.7	31.1	68.7	17	36542	1.7
181	9.6	37.1	74.4	16	35816	2.1
HoCP72-114	9.5	28.7	66.8	25	54450	1.1
178	9.2	30.3	69.7	22	49368	1.2
522	9.1	27.6	67.1	16	34364	1.6
293	9.0	32.5	72.0	15	33880	1.9
L01-299	8.8	29.2	69.7	14	30492	1.9
472	8.6	26.1	67.3	16	34848	1.5
242	8.4	28.4	70.6	19	41140	1.4
661	8.1	30.5	73.4	18	40898	1.5
690	8.0	25.0	67.8	18	40414	1.3
128	8.0	27.4	70.7	19	41382	1.3
461	8.0	30.0	73.4	14	31702	1.9
267	7.9	26.1	69.6	15	32428	1.6
50	7.8	28.8	72.9	12	26862	2.2
308	7.8	28.2	72.6	15	32428	1.7
28	7.5	28.9	74.1	15	32912	1.7
105	7.4	25.2	71.0	17	36784	1.4
753	7.2	22.6	68.6	14	30492	1.5
380	7.1	24.8	71.3	15	32670	1.6
447	7.1	23.9	70.4	19	42108	1.1
396	6.6	19.4	66.1	17	37268	1.0
660	6.5	18.6	65.4	12	26136	1.4
252	6.5	24.1	73.0	14	30976	1.6
517	6.5	20.0	67.9	14	30976	1.3
65	6.2	22.2	72.2	11	24546	1.9
811	5.4	17.5	69.5	17	36784	1.0
102	4.1	13.3	70.1	15	33880	0.8
Average	9.2	30.3	69.6	18.5	41004.9	1.5
Max	18.7	59.0	77.4	36.4	80586.1	2.6
Min	2.0	6.9	62.2	7.6	16698.0	0.7
CV%	24.0	23.3	2.2	19.7	19.7	13.7
SMD-Tukey(5%)	7.4	23.5	5.1	12.2	26944.8	0.7
Phenot. Var. (means)	6.1	58.0	6.9	23.2	113750837.0	0.1
Envir. Var. (means)	1.6	16.6	0.76	4.4	21778417.6	0.1
Gen. Var. (means)	4.5	41.4	6.13	18.8	91972419.9	0.1
Herdability %	73.2	71.4	88.9	80.8	80.9	88.2
Coef. Genetic Var. (%)	23.0	21.2	3.56	23.4	23.4	21.7
Relation CVg/Cve	1.0	0.9	1.63	1.2	1.2	1.6

Table 1. Continued.

Genotype	Sugar Yield		Cane			Juice Quality			
	(lb./ton)	(lb/acre)	Fiber%	Brix%	Ratio Fiber% /(F+B)%	Brix	Pol.	Purity %	Sucrose %
396	147.4	2850.0	23.1	11.8	66.0	15.3	47.7	72.5	11.3
542	202.7	7160.8	23.0	14.2	61.8	18.4	63.3	78.9	14.8
660	183.2	3506.4	22.1	12.8	63.4	16.4	56.4	79.5	13.3
709	191.2	7496.0	21.0	14.1	60.0	17.8	60.1	77.6	14.1
14	152.2	4953.0	20.5	12.0	62.9	15.1	48.4	74.5	11.5
HoCP72-114	182.2	5229.1	20.3	13.7	59.6	17.2	57.3	77.0	13.5
103	205.3	7257.1	19.9	14.6	57.7	18.3	63.6	79.9	14.9
403	175.1	5847.2	19.6	13.6	58.5	16.9	55.5	75.9	13.1
902	135.9	4727.8	19.3	11.9	61.9	14.8	44.7	70.2	10.6
15	170.5	5404.5	19.0	13.0	59.5	16.0	53.3	77.2	12.6
522	208.1	5702.2	18.7	15.1	55.3	18.5	64.6	79.9	15.1
753	175.2	4137.4	18.3	13.9	56.9	17.0	55.8	75.2	13.1
Ho02-113	192.5	6426.0	18.3	14.8	55.3	18.1	60.7	77.2	14.2
194	180.1	6331.4	18.0	14.1	56.2	17.1	56.9	76.5	13.4
473	216.6	8106.1	17.8	15.0	54.2	18.3	65.9	82.7	15.4
134	175.6	8536.3	17.5	13.9	55.7	16.9	55.6	76.0	13.1
472	211.5	5530.1	17.3	15.6	52.4	18.9	65.9	79.6	15.3
132	211.6	10308.1	17.1	15.1	53.2	18.2	64.7	81.6	15.1
690	209.5	5247.3	17.0	16.0	51.5	19.3	66.0	78.1	15.3
102	174.5	2420.9	17.0	13.3	55.9	16.1	54.2	78.1	12.8
105	149.5	3885.0	17.0	12.7	57.1	15.3	48.1	73.1	11.4
811	191.7	3358.3	16.7	14.4	53.7	17.3	59.4	79.2	13.9
517	226.3	4580.1	16.7	16.1	50.9	19.4	69.5	82.0	16.1
178	202.4	6126.2	16.3	14.6	52.7	17.4	61.8	81.6	14.5
447	199.3	4724.7	15.8	14.5	52.2	17.2	60.8	81.4	14.3
267	211.1	5457.7	15.5	15.6	49.8	18.4	65.0	80.8	15.2
128	177.9	4837.1	15.4	14.4	51.7	17.0	56.2	76.3	13.2
187	217.3	6710.5	15.4	16.6	48.0	19.7	68.2	79.0	15.8
659	215.7	9118.4	15.0	15.7	48.8	18.5	66.0	81.9	15.4
380	184.3	4562.8	14.4	15.1	48.9	17.6	58.4	76.3	13.7
45	230.4	7280.8	14.3	16.9	45.8	19.7	70.9	81.8	16.5
252	163.0	3927.3	14.3	13.6	51.2	15.9	51.6	75.5	12.2
283	242.0	8727.0	14.2	17.3	45.0	20.2	73.9	83.4	17.1
308	174.7	4989.1	13.7	14.1	49.1	16.4	54.7	77.3	12.9
242	222.0	6299.7	13.0	16.7	43.8	19.2	68.4	81.4	15.9
28	162.5	4653.3	12.4	13.7	47.6	15.6	51.1	76.1	12.1
L01-299	263.3	7694.9	12.3	18.4	40.1	21.0	79.6	85.9	18.3
661	188.4	5743.6	11.9	15.1	44.0	17.2	58.5	78.7	13.7
293	222.2	7183.0	11.3	16.9	40.0	19.1	68.2	81.9	15.9
181	189.1	7153.1	11.2	14.6	43.3	16.4	57.6	81.1	13.6
50	217.5	6341.9	11.1	16.4	40.3	18.5	66.4	82.3	15.5
461	209.3	6233.5	10.8	16.4	39.8	18.4	64.5	80.6	15.1
65	237.2	5327.6	10.7	17.6	37.6	19.7	72.2	83.6	16.8
34	227.1	9053.5	10.0	16.9	37.1	18.8	68.8	83.8	16.0
61	227.7	8584.9	8.9	17.5	33.5	19.2	69.6	82.4	16.2
Average	195.2	5955.4	16.1	14.8	51.6	17.6	60.7	78.9	14.2
Max	271.1	11582.2	26.3	19.1	69.5	21.4	81.8	86.6	18.8
Min	100.3	1141.7	7.2	11.0	31.9	13.4	35.8	62.9	8.6
CV%	8.3	24.2	8.2	4.5	4.0	4.9	7.4	2.7	7.0
SMD-Tukey(5%)	54.3	4802.9	4.4	2.2	6.9	2.9	15.0	7.1	3.3
Phenot. Var. (means)	667.3	3175685.2	12.8	2.4	60.0	2.0	51.9	10.1	2.6
Envir. Var. (means)	88.4	691966.6	0.6	0.2	1.4	0.2	6.8	1.5	0.3
Gen. Var. (means)	578.9	2483718.6	12.2	2.2	58.5	1.7	45.2	8.6	2.2
Herdability %	86.8	78.2	95.4	93.6	97.6	87.4	87.0	84.9	86.9
Coef. Genetic Var. (%)	12.3	26.5	21.7	10.0	14.8	7.5	11.1	3.7	10.5
Relation CVg/Cve	1.5	1.1	2.6	2.2	3.7	1.5	1.5	1.4	1.5

Brix = soluble solid content in juice; Brix% = percentage of soluble solid content in cane.

Table 1. Continued.

Genotype	Cell Wall Composition					Extractives	Cellulose	Hemi Cellul.	Total Lignocell. Matter
	Extract. %	Cellul. %	Hemi Cell.%	Lignin %	Lignocell. Matter%	(tons/acre)	(tons/acre)	(tons/acre)	(tons/acre)
14	10.6	37.2	23.1	15.5	75.7	1.1	3.9	2.4	7.9
396	13.5	36.7	23.7	15.0	75.4	0.9	2.5	1.6	5.0
902	12.1	36.7	22.8	15.3	74.9	1.3	4.0	2.5	8.2
709	14.4	35.8	22.9	15.6	74.3	1.9	4.8	3.1	10.0
660	12.5	35.4	22.8	14.6	72.7	0.8	2.3	1.5	4.8
542	13.7	34.4	22.2	15.5	72.1	1.8	4.4	2.9	9.3
103	16.4	33.8	23.0	14.8	71.5	1.9	4.1	2.8	8.6
403	13.1	34.6	22.2	14.5	71.2	1.5	3.5	2.3	7.2
194	13.0	34.2	23.3	13.5	71.0	1.4	3.9	2.6	8.0
753	13.5	34.1	22.4	14.4	70.8	1.0	2.4	1.6	5.0
134	14.2	33.0	23.4	13.9	70.3	2.2	5.0	3.5	10.7
HoCP72-114	14.2	32.4	22.5	14.3	69.3	1.4	3.1	2.2	6.6
15	15.0	31.7	21.4	15.9	68.9	1.6	3.1	2.1	6.7
105	14.6	32.9	22.2	13.0	68.1	1.1	2.4	1.7	5.1
522	14.9	29.8	22.3	14.2	66.3	1.3	2.7	2.0	6.0
102	14.9	30.8	22.3	13.0	66.0	0.6	1.3	0.9	2.8
447	20.0	29.9	21.1	14.4	65.4	1.4	2.1	1.5	4.6
Ho02-113	17.2	29.6	21.9	13.8	65.3	1.9	3.2	2.4	7.0
811	17.5	29.5	21.6	13.4	64.5	0.9	1.6	1.2	3.4
308	19.9	30.5	20.8	11.9	63.2	1.5	2.4	1.6	4.9
472	17.5	30.3	21.4	11.3	62.9	1.5	2.6	1.8	5.4
132	20.8	28.9	21.1	12.3	62.4	3.2	4.4	3.2	9.6
178	21.4	29.0	20.0	13.3	62.3	2.0	2.7	1.8	5.7
690	20.0	28.9	21.6	11.5	62.0	1.6	2.3	1.7	5.0
252	13.1	26.3	21.4	14.1	61.8	0.9	1.7	1.4	4.0
267	21.8	27.7	21.1	12.9	61.6	1.7	2.2	1.7	4.9
128	17.2	27.9	22.3	11.5	61.6	1.4	2.2	1.8	4.9
473	17.8	27.7	22.0	11.9	61.6	2.2	3.4	2.7	7.5
517	18.8	27.0	21.1	12.7	60.7	1.2	1.8	1.4	3.9
380	15.1	25.4	21.2	13.8	60.5	1.1	1.8	1.5	4.3
187	21.5	26.8	20.4	12.8	60.0	2.1	2.6	2.0	5.8
659	20.2	26.0	19.8	13.5	59.3	2.6	3.3	2.5	7.5
181	19.2	26.2	20.1	12.8	59.1	1.9	2.6	1.9	5.8
28	17.4	25.4	21.9	11.3	58.7	1.3	2.0	1.7	4.5
45	20.5	24.4	20.7	11.5	56.6	2.0	2.4	2.0	5.5
283	23.1	25.6	20.9	10.2	56.6	2.6	2.9	2.3	6.3
242	19.9	26.7	21.7	8.3	56.6	1.7	2.2	1.8	4.7
661	20.3	22.4	20.6	11.1	54.1	1.6	1.8	1.7	4.4
L01-299	25.8	22.3	19.5	10.7	52.6	2.3	2.0	1.7	4.6
65	24.6	21.7	20.0	10.5	52.2	1.5	1.3	1.2	3.2
293	21.9	22.1	20.9	8.4	51.5	2.0	2.0	1.9	4.6
461	19.9	19.8	20.1	11.1	51.1	1.6	1.6	1.6	4.0
34	24.2	22.1	20.1	8.6	50.8	2.6	2.4	2.2	5.5
50	22.9	20.7	20.2	9.7	50.6	1.8	1.6	1.6	4.0
61	24.0	17.9	18.6	9.5	46.0	2.4	1.8	1.9	4.6
Average	17.7	28.9	21.5	12.7	63.1	1.6	2.7	2.0	5.9
Max	28.3	42.1	24.8	17.4	82.6	3.5	6.4	4.2	12.9
Min	7.7	16.2	18.1	7.1	43.4	0.3	0.6	0.4	1.3
CV%	15.8	8.1	3.6	9.8	5.2	30.0	27.9	24.4	26.3
SMD-Tukey(5%)	9.3	7.8	2.6	4.2	10.9	1.6	2.5	1.6	5.1
NIST8419 Standard*	0.04	0.97	1.09	0.86					
Phenot. Var. (means)	14.2	24.1	1.3	4.1	57.6	0.3	0.9	0.3	3.6
Envir. Var. (means)	2.6	1.8	0.2	0.5	3.6	0.1	0.2	0.1	0.8
Gen. Var. (means)	11.6	22.3	1.1	3.6	54.1	0.2	0.7	0.2	2.8
Herdability %	81.8	92.4	84.9	87.3	93.8	72.4	79.3	75.6	77.0
Coef. Genetic Var. (%)	19.3	16.3	4.9	14.8	11.6	28.1	31.6	24.8	28.5
Relation CVg/Cve	1.2	2.0	1.4	1.5	2.2	0.9	1.1	1.0	1.1

- A standard sample with a predefined (expected) value is used to test the validity of the NIR machine during each run and that test is expressed as a ratio of the Observed value/Expected value.

Table 2. Plant cane data showing biomass characteristics of energy cane clones evaluated at the Sugar Research Station in Saint Gabriel, Louisiana. Experiment sampled on 02/18/2016.

Genotype	Dry Matter	Fresh Cane	Moisture	Stalk		
	(tons/acre)	(tons/acre)	(%)	(Number/ meter)	(stalk/acre)	stalk weight (lb)
134	15.0	45.6	66.6	16	35090	2.5
659	13.2	43.1	69.5	17	37268	2.3
542	12.3	34.2	64.3	19	42108	1.6
132	12.0	39.7	69.9	28	60984	1.3
45	11.9	37.7	68.4	16	35332	2.2
14	11.9	33.8	65.1	26	58080	1.2
283	11.7	37.3	68.5	18	40656	1.8
103	10.9	34.1	68.2	22	47674	1.4
403	10.5	29.0	63.5	21	46464	1.2
473	10.5	31.9	67.2	21	46706	1.4
709	9.8	29.8	67.1	22	47916	1.2
Ho02-113	9.7	30.4	67.9	30	67276	0.9
128	9.6	32.7	70.5	21	47190	1.4
447	9.5	33.6	71.5	18	40172	1.7
HoCP72-114	9.2	29.2	68.4	27	60016	1.0
308	9.2	31.0	70.4	15	32186	1.9
242	9.1	29.5	69.5	18	40414	1.5
522	9.0	25.5	64.7	14	30008	1.7
753	8.9	28.2	68.3	20	44528	1.3
181	8.9	33.1	73.2	15	32670	2.1
267	8.8	28.8	69.3	15	32428	1.8
293	8.5	30.5	72.0	13	29524	2.1
105	8.3	28.1	70.6	17	37994	1.5
178	7.9	26.7	70.3	17	37752	1.4
661	7.7	28.9	73.3	15	32670	1.7
194	7.6	24.1	68.4	19	41382	1.2
34	7.5	27.6	72.6	13	28798	1.9
187	7.4	23.2	68.1	13	28798	1.6
690	7.3	22.6	67.5	12	27588	1.6
902	7.3	25.1	71.2	16	35346	1.4
61	7.1	25.7	72.4	17	37752	1.4
461	7.1	27.2	73.7	13	29766	1.8
65	6.8	24.1	72.0	8	16698	2.6
472	6.6	20.3	67.3	11	25410	1.6
811	6.6	21.9	70.0	22	47916	0.9
15	6.6	20.8	68.7	16	35090	1.2
380	6.4	22.8	71.8	13	29040	1.6
50	6.1	21.1	71.5	11	24926	1.7
252	6.0	20.5	71.3	14	30492	1.5
517	5.6	16.8	66.4	10	22264	1.5
660	5.3	14.5	63.4	10	22506	1.3
102	5.1	15.3	67.6	18	40656	0.8
28	4.6	16.8	72.9	9	19118	1.7
396	4.5	13.0	65.2	12	25894	1.0
Average	8.53	27.6	69.1	17	37103	1.6
Max	21.87	69.0	74.7	34.1	75504	3.1
Min	1.35	5.0	62.1	3.0	6534	0.7
CV%	23.78	22.7	1.8	19.4	19.4	15.2
SMD-Tukey(5%)	6.76	20.9	4.1	10.9	24019.3	0.8
Phenot. Var. (means)	5.76	53.2	7.4	25.7	125603426.8	0.2
Envir. Var. (means)	1.37	13.1	0.5	3.5	17305989.1	0.0
Gen. Var. (means)	4.38	40.2	6.9	22.1	108297437.7	0.1
Herdability %	76.14	75.5	93.2	86.2	86.2	88.9
Coef. Genetic Var. (%)	24.53	22.9	3.8	28.0	28.0	24.9
Relation CVg/Cve	1.03	1.0	2.1	1.4	1.4	1.6

Table 2. Continued.

Genotype	Sugar Yield		Cane			Juice Quality			
	(lb./ton)	(lb/acre)	Fiber%	Brix%	Ratio Fiber% /(F+B)%	Brix	Pol.	Purity %	Sucrose %
403	181.1	5278.1	24.2	13.5	64.2	17.8	58.0	75.2	13.6
660	183.3	2608.2	24.1	13.3	64.5	17.5	58.0	76.5	13.6
396	152.2	1979.4	23.6	12.4	65.5	16.2	50.0	71.4	11.8
14	159.8	5422.0	23.4	12.5	65.1	16.4	51.7	73.1	12.2
542	194.5	6708.5	23.0	13.9	62.3	18.1	61.1	77.6	14.3
522	230.6	5885.6	21.1	15.4	57.7	19.5	70.6	82.5	16.4
15	144.4	3034.3	20.3	12.3	62.3	15.5	47.4	71.1	11.2
709	173.5	5186.4	20.2	13.8	59.5	17.3	55.8	74.4	13.1
902	76.9	2031.2	20.0	10.2	66.1	12.8	30.4	56.7	7.3
753	173.8	4932.8	19.7	13.2	60.0	16.4	54.5	76.8	12.8
HoCP72-114	166.2	4929.2	19.6	13.1	60.0	16.3	52.9	75.1	12.5
134	196.1	8611.7	19.4	14.8	56.7	18.3	61.8	77.4	14.4
103	177.0	5940.7	19.1	13.8	58.1	17.0	56.1	76.0	13.2
194	173.5	4205.0	19.1	13.5	58.6	16.7	54.8	76.1	12.9
Ho02-113	182.5	5514.4	18.8	14.2	56.9	17.5	57.9	76.2	13.6
102	192.0	3059.8	18.8	14.3	56.7	17.7	60.0	78.0	14.1
517	231.3	3848.5	18.3	16.4	52.7	20.1	71.7	81.0	16.6
690	202.9	4565.5	18.3	15.4	54.3	18.8	63.9	77.8	14.9
473	224.5	7198.8	18.0	15.5	53.8	18.9	68.4	82.7	15.9
811	163.0	3611.5	17.9	13.2	57.7	16.1	52.0	74.3	12.2
187	216.5	5036.3	17.5	15.6	52.8	18.9	66.8	80.9	15.6
132	160.8	6443.7	16.9	14.5	54.0	17.4	53.5	70.1	12.5
105	159.4	4535.7	16.9	13.4	55.8	16.1	51.3	73.6	12.1
472	232.4	4739.9	16.9	16.4	50.7	19.8	71.4	82.2	16.6
178	195.2	5241.2	16.5	14.1	53.9	16.9	59.6	80.9	14.0
267	214.9	6196.0	16.2	15.7	50.8	18.7	66.1	81.1	15.4
128	179.7	5759.7	16.0	14.4	52.5	17.2	56.9	76.2	13.3
447	182.1	6090.0	15.6	13.7	53.3	16.3	56.0	79.6	13.2
308	191.0	5888.7	15.4	15.2	50.4	18.0	60.3	77.1	14.1
252	166.2	3790.5	15.4	14.5	51.4	17.2	54.3	71.4	12.7
45	228.1	8598.0	15.3	17.3	46.9	20.5	71.6	79.6	16.5
659	226.1	9722.7	15.0	16.6	47.6	19.5	69.7	81.5	16.2
242	216.1	6540.2	14.8	16.5	47.5	19.3	67.4	79.4	15.7
380	167.6	3796.0	14.7	14.5	50.3	17.0	54.2	73.4	12.7
283	252.6	9322.7	14.2	17.9	44.2	20.8	77.2	83.9	17.8
28	153.2	2489.0	14.2	13.8	50.7	16.0	49.9	72.0	11.8
181	169.3	5598.8	13.8	14.1	49.5	16.3	53.5	75.9	12.6
661	152.4	4507.5	13.6	13.8	49.6	16.0	49.7	71.7	11.7
50	226.9	4839.0	13.1	16.4	44.4	18.9	68.8	83.5	16.0
61	210.3	5389.4	12.1	16.5	42.2	18.8	65.3	79.9	15.2
293	221.8	6764.7	11.7	16.7	41.3	18.9	67.8	82.1	15.8
65	219.2	5074.8	11.7	17.2	40.4	19.5	68.3	79.6	15.9
461	195.8	5227.1	11.5	15.9	41.9	18.0	61.3	78.1	14.3
34	189.2	5321.1	11.5	16.6	40.8	18.8	61.2	74.3	14.2
Average	188.8	5260.6	17.2	14.7	53.5	17.7	59.5	76.8	13.9
Max	275.3	11604.0	25.9	18.4	68.1	21.6	83.0	87.3	19.1
Min	55.9	874.3	10.5	9.4	38.5	12.3	25.6	47.8	6.2
CV%	12.3	27.7	5.8	4.2	3.2	4.4	9.4	6.2	9.1
SMD-Tukey(5%)	77.5	4854.5	3.3	2.0	5.7	2.6	18.6	16.0	4.2
Phenot. Var. (means)	1041.2	3055738.2	12.3	2.6	50.6	2.4	75.5	23.5	3.8
Envir. Var. (means)	180.3	706915.3	0.3	0.1	1.0	0.2	10.4	7.7	0.5
Gen. Var. (means)	860.9	2348822.9	11.9	2.4	49.6	2.2	65.1	15.8	3.2
Herdability %	82.7	76.9	97.3	95.2	98.1	91.6	86.2	67.4	85.8
Coef. Genetic Var. (%)	15.5	29.1	20.1	10.6	13.2	8.5	13.6	5.2	12.9
Relation CVg/Cve	1.3	1.1	3.4	2.6	4.1	1.1	1.4	0.8	1.4

Brix = soluble solid content in juice; Brix% = percentage of soluble solid content in cane.

DISTRIBUTION AND PREVALENCE OF *Bru*1, A MAJOR BROWN RUST RESISTANCE GENE, IN THE SUGARCANE WORLD COLLECTION

Carolina Avellaneda[1], Arnold Parco[1], Jeff Hoy[1], Collins Kimbeng[1], Niranjan Baisakh[1]
Louisiana State University Agricultural Center, Baton Rouge, LA

INTRODUCTION

Brown rust is an economically important disease in many regions where sugarcane is grown (Raid and Comstock 2000). Brown rust symptoms consist of reddish-brown lesions on the leaves, and severe infections can cause leaf necrosis and premature death of even young leaves (Raid and Comstock 2000). Brown rust can cause reductions in stalk weight and number adversely affecting yield in susceptible cultivars (Comstock et al. 1992, Hoy and Hollier 2009). Disease severity can be affected by weather conditions, plant growth stage, plant nutrition, and soil characteristics (Anderson and Dean 1986, Anderson et al.1991, Raid and Comstock 2000, Barrera et al. 2013), as well as genetic interactions between the host and pathogen.

The development and cultivation of resistant cultivars has been the primary means of disease control. Unfortunately, brown rust resistance durability is uncertain, since the pathogen, *Puccinia melanocephala* H. & P. Syd., possesses adaptive ability to overcome host plant resistance. Shifts from resistance to susceptibility have been reported for cultivars in different regions (Purdy et al. 1983, Dean and Purdy 1984, Hoy 2005, Raid 1989). Three studies have shown differential sugarcane cultivar reactions resulting from inoculations with different pathogen isolates, indicating specialization in *P. melanocephala* to host genotype (Srinivasan and Muthaiyan 1965, Shine et al. 2005, Hoy et al. 2014).

Brown rust resistance has been reported to be a quantitatively inherited trait with high heritability (Tai et al. 1981, Hogarth et al. 1993). However molecular genetic tools identified a major gene, *Bru*1, for brown rust resistance in a selfed population of sugarcane cultivar R570 from the Reunion breeding program (Daugrois et al.1996, Asnaghi et al. 2004). Resistance was observed to segregate in a 3: 1 ratio indicative of a single dominant resistance gene. This gene was linked to a RFLP probe, CDSR29, which was initially not integrated in any linkage group in a R570 map. Subsequent additional mapping in R570 (Asnaghi et al. 2004) indicated that *Bru*1 was located on the linkage group VII–1a in homology group VII (HGVII) of R570. Results of mapping of R570 revealed in an atypical RFLP profile the presence of one band cosegregating with *Bru*1 suggesting that it might originate from *S. spontaneum* (Le Cunff et al. 2008). Raboin et al. (2006) identified a second major brown rust resistance gene nonorthologous to the *Bru*1 of R570 in MQ76-53, an old Australian cultivar lacking *Bru*1, which came from a cross between an interspecific cultivar (Trojan) and a *S. spontaneum* clone (SES528).

*Bru*1 as a source of resistance to brown rust is of particular interest since it has been durable. *Bru*1 resistance breakdown was not been detected despite intensive cultivation of R570 for more than 20 years in different regions of the world (Le Cunff et al. 2008). Moreover, inoculation tests revealed *Bru*1 provided resistance against diverse rust isolates in Africa and the Americas (Asnaghi et al. 2004). Two markers, R12H16 and 9020-F4 were strongly linked to *Bru*1 (Coste et al., 2012) and only found in resistant genotypes, and these markers subsequently

enabled molecular diagnosis and marker assisted selection for *Bru*1. Glynn et al. (2013) found that 27% of 1072 clones carried the *Bru*1 gene when Canal Point Florida sugarcane germplasm was screened. In the same study, *Bru*1 was detected in 7% of Louisiana clones and 59% of Florida clones that were resistant to brown rust. Recently, two studies performed in Argentina and Guatemala showed that 49 of 129 (38%) and 26 out of 80 (32%) clones showed the presence of *Bru*1, respectively (Molina et al. 2013, Racedo et al. 2013). A comprehensive marker- assisted screening of Louisiana sugarcane germplasm was performed with 506 clones, including 117 cultivars and elite breeding clones, 208 early generation progeny of crosses with wild/exotic germplasm, and 181wild/exotic germplasm clones (Parco et al. 2014). Cultivars and advanced breeding clones showed a low frequency of detection with 5 out of 117 (4%) testing positive for *Bru*1. In progeny from crosses involving wild/exotic germplasm, only 14 of 208 clones (7%) tested *Bru*1 positive. However, *Bru*1 frequency was higher (29%, 52 of 181 clones) in wild/exotic germplasm, which indicated that diverse genetic resources were available for *Bru*1 introgression.

The variable situation in *Bru*1 frequency in different sugarcane industries around the world and on-going efforts to incorporate other sources of brown rust resistance and genes for additional traits from other *Saccharum* species and related genera suggest that the WCSRG should be screened to identify the distribution, prevalence, and existence of any variability for *Bru*1. It also would be of interest to determine the origin of *Bru*1 in the *Saccharum* complex. The objective of this study was therefore to determine the distribution and prevalence of *Bru*1in the world collection of sugarcane and related grasses (WCSRG), maintained at the USDA National Plant Repository in Miami, FL, to assist in the development of the most effective strategies for breeding programs to breed for brown rust resistance along with additional gene introgression from wild species.

MATERIALS AND METHODS

Plant materials

All sugarcane and related genotypes in the World Collection of Sugarcane and Related Grasses (WCSRG) that is part of the United States National Plant Germplasm System (NPGS) were included in the study. All genotypes were clonally maintained in the field or pots at the United States Department of Agriculture-Agricultural Research Service Subtropical Horticulture Research Station at Miami, Florida. A total of 1,282 clones from the WCSRG were collected as leaf pieces sampled for DNA extraction (Appendix 1).

Genomic DNA Isolation and PCR Genotyping

Total genomic DNA was extracted from approximately 100 mg of leaf tissue using CTAB miniprep methodology (Doyle and Doyle 1990). The quantity and quality of DNA was determined using a ND-100 spectrophotometer (Nanodrop Technologies Inc, Wilmington, DE, USA). PCR reactions were performed with 100 ng of total DNA with *Bru*1-specific markers, R12H16 and 9020-F4 (Costet et al. 2012), following the method described earlier (Parco et al. 2014). PCR reactions were carried out in a total volume of 20 µl containing 100 ng template DNA, 0.4 µM of each primer; 0.4 mM of each dNTP, 2.5 mM $MgCl_2$, and 0.5 units Taq Polymerase with 1X PCR buffer. The primer sequences used were: R12H16 Fw –

CTACGATGAAACTACACCCTTCTC, R12H16 Rv – CTTCTGTAAGCGTGACCTATGGTC; 9020-F4 Fw – TACATAATTTTAGTGGCACTCAGC, 9020-F4 Rv - ACCATAATTCAATTCTGCAGGTAC. Thermocycling was performed as follows: 4 min denaturation at 94 ºC followed by 35 cycles of 94 ºC for 30 s, 55.5 ºC for 45 s, 72 ºC for 72 s and final elongation for 8 min at 72 ºC. Ten microliters of PCR product amplified with 9020-F4 primers were digested overnight at 37 °C with *Rsa*I in a total volume of 20 µl. Restriction fragments were resolved on 3% agarose gels in 1X TAE buffer and stained with ethidium bromide for visualization and documentation in a KODAK Gel Logic 200 Imaging system (Kodak, New Haven, CT). Presence of *Bru*1 was indicated by presence of an amplification product of 570 bp with the R12H16 marker or a 200 bp fragment produced after *Rsa*I digestion of 9020-F4 marker amplicon.

Genotype identifications

Genotype names from the WCSRG were defined on a curator's name system available from the USDA Germplasm Resources Information Network (USDA-GRIN) as part of the NPGS. Accession numbers and descriptors of each genotype are maintained at the National Germplasm Repository in Miami, Florida.

RESULTS

Classification of WCSRG Genotypes

A total of 1,282 genotypes from the WCSRG were screened for the presence of *Bru*1 gene using two linked markers. The species S. *spontaneum* and *S. officinarum* and *Saccharum* interspecific hybrids comprised the major portion of the collection with 40.6, 19.2, and 13.2% of the genotypes, respectively (Figure 3.1). *Saccharum robustum, S. sinense,* and *S. barberi* comprised 5.1, 3.0, and 2.2% of the genotypes. Other *Saccharum* species, including *S. arundinaceum, S. bengalense, S. brevibarbe, S. edule, S. kanashiroi, S. procerum, S. ravennae* and *S. rufipilum* represented 12.6% of the genotypes screened, while genotypes belonging to other genera such as *Coix, Erianthus, Imperata* and *Miscanthus* comprised 3.2%. Genotypes without classification comprised 10.9% of the collection.

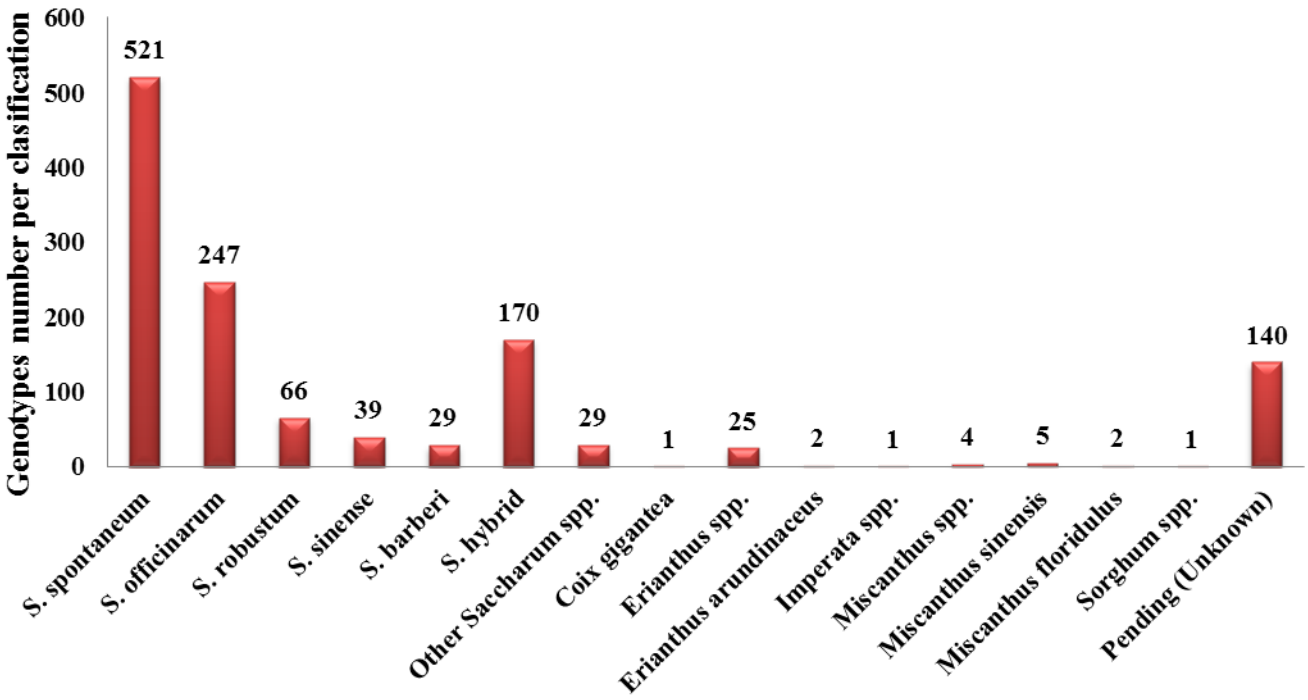

Figure 3.1Genotypic classification of the World Collection of Sugarcane and Related Grasses

Detection of *Bru*1 in WCSRG

The presence of *Bru*1 was indicated by the detection of amplification products for the R12H16 (570bp) and/or 9020-F4-*Rsa*I (200bp) markers (Figure 3.2). A total of 280 (21.8%) of the 1,282 genotypes in the WCSRG tested positive for *Bru*1 as indicated by the detection of one or both markers (Table3.1). The R12H16 marker was detected alone in 72 (25.7%) of the 280 *Bru*1 positive genotypes, while marker 9020-F4-*Rsa*I was detected alone in 70 (25%) of the 280 *Bru*1 positive genotypes (Table3.1). Both molecular markers, R12H16 and 9020-F4-*Rsa*I, associated with *Bru*1 were detected in (49.3%) of 280 *Bru*1 positive genotypes (Table3.1). The frequency of *Bru*1 detection for single markers alone or both markers varied among *Saccharum* species (Table 3.1). The proportion of genotypes with *Bru*1 was highest for *S. barberi* (79.3%), *S. sinense* (71.8%), and S. *robustum* (33.3%). Interspecific hybrids and *Saccharum officinarum* genotypes had similar lower percentages of *Bru*1 (26.4% and 21.0%, respectively), and *S. spontaneum* genotypes had the lowest percentage with *Bru*1 (13.2%).

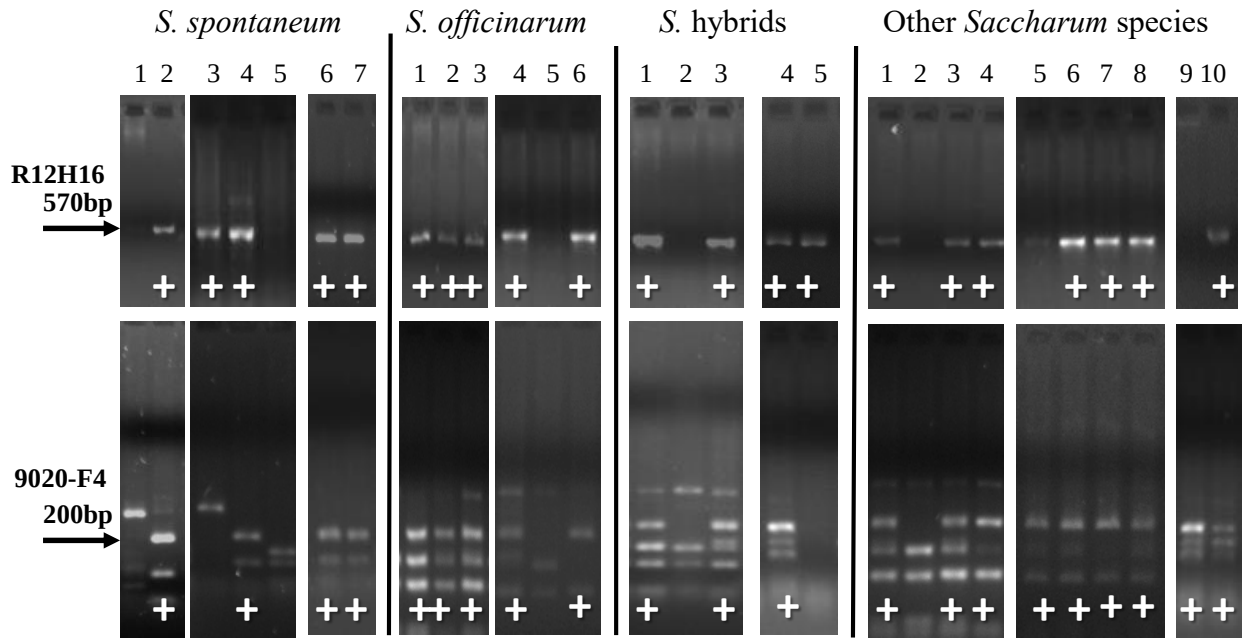

Figure 3.2 Representative gel images showing presence of *Bru*1 detected by diagnostic PCR amplification products for R12H16 (570 bp product) and 9020-F4-*Rsa*I (200 bp product) in *Saccharum* species or interspecific hybrid cultivars. Genotypes with positive *Bru*1 detection provided by presence of either one or both markers are indicated by (+). *Saccharum spontaneum*: #1-7 represent 'Unknown 2009:R433P78', 'IranSpont', 'SH3013' (R12H16 marker only), 'IND81161', 'US4625', 'SPONT 84089', 'WI 8711+2'. *Saccharum officinarum*: #1-6 represent 'PMAG8428(221),'Puri' 'Pundi', IJ76316','IJ76324','IJ76319'. *Saccharum* hybrids: #1-5 represent 'MEX856196', 'MOL6427', 'R570', 'B37161','Mesangen' (R12H16 marker only). Other *Saccharum* species: #1-10 represent: 'Merthi'(*S.sinense*), 'Unknown' (*S*. sp), 'Nepal3'(*S.sinense*), 'DB58661'(*S*. sp),' 'Mcilkrum'(*S.sinense*) (9020-F4 marker only), 'Maneira'(*S.barberi*), 'Kavangeri'(*S. officinarum*), 'Merthizell'(*S.sinense*), 'IK6340' (*S. robustum*) (9020-F4 marker only), 'IJ6480' (*S. robustum*).

The unknowns that probably include additional hybrids had 22.1% of the genotypes with *Bru*1, other *Saccharum* species 10.3%, and the other genera such as *Erianthus* spp. and *Miscanthus sinensis* had a low percentage of genotypes (14%, and 2.4%, respectively), that contained *Bru*1 with.

The frequencies of genotypes with both markers or only a single marker also varied across *Saccharum* species (Table 3.1). *Saccharum sinense* (71.4%), *S. officinarum* (65.4%), the interspecific hybrids (62.2%), and the unknowns (64.5%) had the highest percentages of genotypes with both markers. *Saccharum robustum* and S. *sinense* had intermediate percentages of genotypes with both markers (59.1% and 43.5%, respectively). *Saccharum spontaneum* genotypes had the lowest frequency with only 18.8 % containing both markers. None of the genotypes from other genera and other *Saccharum* species that were *Bru*1 positive had both markers.

Table 1. Distribution and prevalence of *Bru*1 molecular markers in the World Collection of Sugarcane and Related Grasses

	Number of genotypes with positive detection of *Bru*1 based on the presence of single or both markers				
	Genotypes with only R12H16[c]	**Genotypes with only 9020-F4[c]**	**Genotypes with both markers[c]**	**Total genotypes in the collection *Bru*1 + [d]**	**Total genotypes in the collection**
Saccharum spontaneum	23 (33.3%)	33 (47.8%)	13 (18.8%)	**69** (13.2%)	**521**
Saccharum officinarum	13 (25.0%)	5 (9.6%)	34 (65.4%)	**52** (21.1%)	**247**
Saccharum hybrids	8 (17.7%)	9 (20.0%)	28 (62.2%)	**45** (26.5%)	**170**
Saccharum robustum	5 (22.7%)	4 (18.1%)	13 (59.1%)	**22** (33.3%)	**66**
Saccharum sinense	3 (10.7%)	5 (17.8%)	20 (71.4%)	**28** (71.8%)	**39**
Saccharum barberi	12 (52.1%)	1 (4.3%)	10 (43.5%)	**23** (79.3%)	**29**
Other *Saccharum* species[a]	1 (33.3%)	2 (66.7%)	0 (0%)	**3** (10.3%)	**29**
Other Genus[b]	2 (28.6%)	5 (71.4%)	0 (0%)	**7** (17.1%)	**41**
Pending (Unknown)	5 (16.1%)	6 (19.3%)	20(64.5%)	**31** (22.1%)	**140**
Total	**72 (25.7%)**	**70 (25%)**	**138 (49.3%)**	**280 (21.8%)**	**280/1,282**

[a] Other *Saccharum* species that included *Bru*1 positive genotypes: *Saccharum arundinaceum* (2) and *S.edule* (1).
[b] Other genera that included *Bru*1 positive genotypes: *Erianthus* spp. (6) and *Miscanthus sinensis* (1).
[c] Number of genotypes *Bru*1 positive with percentage of the total number of genotypes *Bru*1 positive for that taxonomic group in parentheses.
[d] Total genotypes *Bru*1 positive for each taxonomic group with percentage of the total number of genotypes of that group in collection in parentheses.

Geographical Distribution of *Bru*1 in the World Collection of Sugarcane and Related Grasses

The genotypes screened represent clonal accessions obtained from 55 locations in 48 countries. Countries in Southeast Asia contributed the highest proportions of genotypes to the WCSRG compared with the rest of the world. India was the source of the greatest number of clones with 226 genotypes followed by Indonesia and Papua New Guinea with 174 and 133, respectively (Table 3.2). The majority of the genotypes in the collection were obtained from breeding programs and associated germplasm collections located around the world at locations where sugarcane does not occur naturally. The geographic origins of these genotypes within the natural range of *Saccharum* are uncertain.

The frequency of *Bru*1 positive genotypes within species varied by geographic location from which the clones were obtained for some *Saccharum* species (Table3.2). The frequencies of *Bru*1 positive genotypes of *S. officinarum* were 18.1% (17 of 94) for clones with a known origin of Papua New Guinea compared to 36.7% (11 of 30) for clones with a known Indonesian origin. Across the entire collection, 21.1% (52 of 247) of *S. officinarum* genotypes were positive for *Bru*1. The same pattern was evident for the frequency of *Bru*1 positive genotypes for the

ancestral species, *S. robustum*, with a higher frequency of detection for clones known to originate from Indonesia (31.6%, 6 of 19) compared to genotypes known to originate from Papua New Guinea (21.4%, 6 of 28). *Saccharum spontaneum* which occurs over a wider geographic range with more variability in climatic conditions exhibited some variation in *Bru*1 frequency. The frequencies of *Bru*1 were 15.4% (24 of 156) for genotypes from India, 14.8% (12 of 81) for genotypes from Indonesia, 9.6% (8 of 83) from the Philippines, 11.1% (1 of 9) from Sri Lanka, 11.4% (4 of 35) from Taiwan, and 16.7% (3 of 18) from Thailand, with an overall collection frequency of 13.2% (69 of 521). The accessions of species with the highest frequencies of *Bru*1, *S. sinense* and *S. barberi*, came primarily from the countries where they originated with 68.7% (6 of 10) *Bru*1 positive from China with 84.8% (28 of 39) positive overall for *S. sinense* and 80.0% (20 of 25) *Bru*1 positive from India with 79.3% (23 of 29) positive overall for *S. barberi*.

Table 2. Geographical distribution of *Bru*1 markers in World Collection of Sugarcane and Related Grasses

	Genotypes distribution and detection of *Bru*1																		
	Saccharum spontaneum		*Saccharum officinarum*		*Saccharum* hybrid		*Saccharum robustum*		*Saccharum sinense*		*Saccharum barberi*		Other *Saccharum* species		Other genera		Pending (Unknow)		Total genotypes
	***Bru*1 marker presence**																		
Location	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	
Afganisthan	1																		**1**
Argentina	1		2		1														**4**
Australia	1		1		2												2		**6**
Bangladesh	2				5	3													**10**
Barbados	15	4	2		6	2							1						**30**
Brazil				1	1					1									**3**
Canal Point					18	9							1				1	1	**30**
China	6			1					4	6									**17**
Costa Rica										1									**1**
Cuba			3	3	2					1									**9**
Dominican Republic					2														**2**
Fiji			3	1	3	2		1											**10**
Guadeloupe			3																**3**
Guam	3	1																	**4**
Guatemala					5														**5**
Guyana						1						1							**2**
Hawaii			26	7	9	4	1												**47**
Houma					2										2				**4**
India	131	24	9	1	5	4			5	11	5	20	9			1	1		**226**
Indonesia	69	12	19	11	22	4	13	6	1	1	1	1	8	3	3				**174**
Iran	14	3																	**17**
Japan	4					1				1									**6**
Kenya	3																5	1	**9**
LSU			1		3												1	1	**6**
Malaysia	5		11																**16**
Mauritius	1		3	1	4										1				**10**
Mexico						1											1		**2**

Table 2. Continued

	Genotypes distribution and detection of *Bru*1																		
	Saccharum spontaneum		*Saccharum officinarum*		*Saccharum* hybrid		*Saccharum robustum*		*Saccharum sinense*		*Saccharum barberi*		Other *Saccharum* species		Other genera		Pending (Unknow)		Total genotypes
	***Bru*1 marker presence**																		
Location	**-**	+	**-**	+	**-**	+	**-**	+	**-**	+	**-**	+	**-**	+	**-**	+	**-**	+	
Myanmar	1		1	1	1														**4**
Nepal										1			1						**2**
New Caledonia			2	1															**3**
Nicaragua			1																**1**
Pakistan	14	2	1			2											3		**22**
Panama		1																	**1**
Papua New Guinea	3	1	77	17	4	1	22	6					1		1				**133**
Philippines	75	8	7	2	1														**93**
Puerto Rico			2		2												1		**5**
Reunion					1	2													**3**
Saudi Arabia	4																		**4**
South Africa			3		10	1				3									**17**
Spain				1															**1**
Sri Lanka	8	1																	**9**
Surinam			1																**1**
Taiwan	31	4	2		3	5						1							**46**
Tanzania										1									**1**
Texas					2														**2**
Thailand	15	3	1		1	1									1		6		**28**
Timor													1						**1**
Turkistan	1																		**1**
Uganda	4																		**4**
United States	2				2								1		6		4		**15**
Unknown	38	5	11	4	8	2	8	8	1	1			1		20	6	84	28	**225**
Vanuatu			2					1											**3**
Vietnam													2						**2**
Virgin Islands			1																**1**
Total genotypes	**452**	**69**	**195**	**52**	**125**	**45**	**44**	**22**	**11**	**28**	**6**	**23**	**26**	**3**	**34**	**7**	**109**	**31**	**1282**

DISCUSSION

A genetic explanation for the wide distribution of *Bru*1 with varying frequencies in the different *Saccharum* species and related genera is not clear. The results suggest the *Bru*1 present in *S. officinarum* and the interspecific hybrids may have come from *S. robustum* rather than *S. spontaneum*. Although, some evidence suggests *S. robustum* evolved from *S. spontaneum* in association with some other genera. The explanation for the high frequencies of *Bru*1 in both *S. barberi* and *S. sinense* also is unclear. These two species might provide good sources for brown rust resistance along with other genes introgression into commercial sugarcane clones.

Variability in the occurrence of *Bru*1 as indicated by the presence of only one of the two molecular markers was detected to varying degrees in different *Saccharum* species. Variability was highest in *S. spontaneum* for which a majority of the clones amplified only a single marker. However, *Bru*1 was detected by a single marker in 8 of 14 *Saccharum* species while in other genera *Bru*1 was detected only by a single marker. The implications of this variability are uncertain. This result suggested that a possible weak (less strong) linkage disequilibrium between the two diagnostic markers (Costet et al. 2013). Another possibility is the variations in the sequences around *Bru*1 among the genotypes that may lead to change in the priming and/or restriction sites (Parco et al. 2014).

Many sugarcane breeding programs are attempting to introgress additional genes from other wild *Saccharum* species, especially *S. spontaneum*, and other related genera to widen the narrow genetic base of commercial sugarcane cultivars (Jannoo et al. 1999). Louisiana has had one of the most active efforts in this area (Dunckelman and Breaux 1972, Dunckelman 1979). The characterization of the WCSRG for *Bru*1 distribution and prevalence will complement efforts to characterize diversity in the *Saccharum* complex for the expected expanded use of marker-assisted selection in the future. The high level of genetic variability in *S. spontaneum* is a proven valuable asset in sugarcane breeding providing the first interspecific hybrids that allowed the establishment of modern industries worldwide (Daniels and Roach 1987, Lu et al. 1994, Grivet et al. 2004). The more recent effort in Louisiana was successful in improving sucrose content and resistance to mosaic caused by *Sorghum mosaic virus* (Dunckelman and Breaux 1972, Dunckelman 1979). However, in the absence of another major disease, smut, a *S. spontaneum* clone, US 56-15-8, was chosen to be utilized in the breeding effort that turned out to be highly susceptible to the disease subsequently. The later incursion of smut (Koike et al. 1981) then resulted in extensive losses of promising clones due to smut susceptibility (J. Hoy, unpublished). The characterization by molecular markers of *S. spontaneum* clones and other potential gene introgression sources for brown rust resistance in the absence of the pathogen or under conditions of low disease pressure may prevent unintentional disease susceptibility problems from limiting success in other breeding endeavors.

Interspecific hybrid populations under recurrent selection for resistance to brown rust based on natural infection ratings unknowingly increased the frequency of *Bru*1 (Asnaghi et al. 2004, Glynn et al. 2013), and it was suggested that this has resulted in a potentially risky dependence on *Bru*1 for resistance worldwide (Costet et al. 2012, Glynn et al. 2013). The prevalence of *Bru*1 as indicated by the two molecular markers is much lower in two more isolated, related breeding populations under more subtropical conditions in Louisiana (Parco et al. 2014) and Argentina (Racedo et al. 2013). This difference has resulted in different breeding strategies utilizing marker-assisted selection for *Bru*1. There is a common interest in using the

absence of *Bru*1 in clones exhibiting brown rust resistance to suggest possible alternative sources of resistance. Programs with high frequency of *Bru*1 are then attempting to reduce over reliance, while programs with low frequency of *Bru*1 occurrence are using marker-assisted selection to make bi-parental crosses that will increase the frequency of this source of demonstrated effective and durable resistance gene with other sources of resistance. One Louisiana genotype positive for *Bru*1 was rated susceptible to brown rust (Parco et al. 2014), and there have been unpublished reports of susceptibility in *Bru*1 positive clones in other sugarcane production areas. In Colombia, five brown rust susceptible cultivars showed the presence of *Bru*1 (J. Victoria, personal communication). Sugarcane breeding programs are now attempting to use the ability to monitor *Bru*1 to breed and select for cultivars with the brown rust resistance it confers in combination with other genes for resistance to obtain effective, durable resistance to this important disease.

Acknowledgement

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