AN OVERVIEW OF 2017 ACTIVITIES IN THE LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

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The main objective of the Louisiana State University Agricultural Center (LSU AgCenter) Sugarcane Variety Development Program is to develop new, genetically improved varieties of sugarcane for 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 off-station, 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, 'seedcane' 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.

Team Member	Budgetary Unit	Responsibility
Collins Kimbeng	Sugar Research Station	Program Leader
Michael Pontif	Sugar Research Station	Selection and Variety Testing
Blake Wilson	Sugar Research Station	Insect Resistance
Kenneth Gravois	Sugar Research Station	Extension
Jeffrey Hoy	Plant Pathology and Crop Physiology	Disease Resistance
Niranjan Baisakh	School of Plant, Environmental and Soil Sciences	Molecular Breeding
Albert Orgeron	St. James Parish, Lutcher	Herbicide Tolerance
Carlton Baucum	Sugar Res. Station	Infield Variety Testing
Gertrude Hawkins	Sugar Res. Station	Sucrose Laboratory
Mavis Daigle	Sugar Res. Station	Photoperiod & Crossing
David Sexton	Sugar Res. Station	Outfield Variety Testing
Todd Robert	Sugar Res. Station	Farm Crew
Alphonse Coco	Sugar Res. Station	Farm Manager

Success in developing new sugarcane varieties is heavily dependent on the availability of novel genetic variability made available for selection via targeted cross hybridization among desirable sugarcane genotypes/parents (Table 2). 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 for crossing. Photoperiod treatment to induce flowering began on May 19, 2017 and continued until September 10, 2017. The first crosses were made in the first week of September and lasted till November 6, 2017. A total of 417 tassels from 77 genotypes or parents were used to make 228 crosses with a total of 92,549 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 89,928 seeds were produced from bi-parental crosses, and 2,621 seeds were produced from polycrosses.

The 2017 crossing campaign was not as productive as the 2016 campaign as fewer tassels flowered (417 vs. 553) and fewer crosses were made (228 vs. 333) resulting in even fewer viable seeds (92,549 vs. 176,644). Germination rate reduced slightly, from 41 seedlings per gram of seed in 2016 to 38 seedlings per gram of seed in 2017. A confluence of events including abnormally high and low temperatures, abnormal /unexplained physiological symptoms, aphid and leaf hopper infestation which although were aggressively controlled using insecticide invited predator birds. A number of flowering stalks were broken by the roosting birds. Details about the 2017 crossing campaign are found in the section titled '**2017 PHOTOPERIOD AND CROSSING IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM**'.

Seeds (fuzz), most of them from the 2016 crossing campaign, 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 2017. 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 83,214 seedlings from 333 crosses were transplanted to the field in April, 2017. Many of these seedlings were progeny of biparental crosses among commercial varieties as well as superior experimental clones. 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 49,088 first stubble single stools in the fall of 2017. These seedlings were mostly from the 2015 crossing series that were planted to the field in 2016 allowed to overwinter and were in the first ratoon cane crop in 2017. 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 1,395 clones (2.8 % selection rate) were selected and planted in 10-foot, first line trial plots.

The first line trial plots established last year (from the 2014 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, poor stand including lodging. Clones that were not dropped the first time around were evaluated for pith, and Brix. A total of 557 clones (26 % selection rate) were eventually selected and planted into single row, 16-foot second line trial. From the second line trial established the year before (2013 crossing series) 270 clones were selected and planted into 2-row, unreplicated, 16-foot increase plots. These are tentative selections with the 'seedcane' being increased pending

additional data from the first and second line ratoon crops. 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 348 clones from the 2012 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, estimated cane yield, sucrose content and sugar yield. A total of 43 experimental varieties judged to be superior to the checks were assigned permanent variety designations ("L") in the fall of 2017. 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 selection in the seedling and early clonal stages can be found in the section titled '**SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2017**'.

The section titled **'2017 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM NURSERY AND INFIELD VARIETY TRIALS'** describes experiments that were conducted outside of the experiment station in several locations scattered across the Louisiana sugarcane industry. The objective is to identify and select varieties that will perform well across the range of environments a commercial variety is likely to encounter in Louisiana. These tests are planted in grower's farms by the breeding crew but are managed by the growers. Nineteen experimental varieties from the 2016 assignment series (2011 Crossing series) that performed well in the plant cane crop on-station nursery trials were replanted into infield and off station nursery tests. 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 the off-station nursery and infield tests was a randomized complete block with two replications per location. The infield test is the first time experimental varieties are harvested and weighed using weigh wagons to estimate cane yield. Up until this point, cane yield was estimated using stalk counts multiplied by the weight of 10 random stalks in a plot.

Five experimental varieties from the 2015 assignment series that performed well in the infield, off-station and on-station nurseries tests were introduced to outfield locations and planted into increase plots. Those that continue to perform well in these tests will subsequently be planted into the outfield testing stage of the program in 2018. Two experimental varieties (L 14-267 and L 14-282) introduced to outfield locations last year that continued to perform well in off-station nurseries and infield tests were entered into the outfield tests and introduced on primary increase stations. Three experimental varieties, L 13-251, L 12-201 and L11-183, continue to be tested in the outfield stage and are being increased in primary and secondary stations to ensure there is enough 'seedcane' for growers if the varieties are recommended for release. A variety release meeting will be held in May 2018 to consider the release of L 11-182. The outfield stage of the program is described in the section titled '**2017 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM OUTFIELD VARIETY TRIALS'.**

The section titled **'SUCROSE LABORATORY AT THE SUGAR RESEARCH STATION'** describes activities in the sucrose ('juice lab') laboratory for 2017. More samples were processed in the 'juice lab' in 2017 (3,590) compared with 2016 (3,017). Of the 3,590 samples processed, 48% were from researcher programs other than breeding. Most of the samples were processed using the Spectracane FT-NIR instrument.

Clones in the breeding nursery from which parents are taken for crossing were rated for rust and this information will be useful during crossing. Mosaic virus was noticed on a newly released variety, HoCP09-804, mostly around the River-Bayou Lafourche region of the industry. This prompted us to screen the clones in the breeding nursery for the presence of mosaic virus infection. Again this information will be useful in the crossing program. Special attention will be made during crossing to avoid the pairing of two susceptible genotypes in a cross.

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. Blake Wilson, Entomologist) found in Louisiana. Results gathered from these screening tests will be instructive 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.

The decision regarding further testing and seed increase of candidate varieties in the program was determined at the Variety Advancement Committee meeting. The 2017 meeting was held on Friday August 10, 2017.

In general, all the goals set out for the 2017 season were accomplished. All trials were planted and harvested as planned. Fortunately, the Louisiana sugar industry was not directly impacted by tropical activity during 2017. However, the industry did receive high rainfall amounts from the remnants of Hurricane Harvey that went through Texas. The industry experienced mostly favorable conditions for much of the remainder of the harvest season. On December 8, 2017, south Louisiana experienced a rare winter snow event, with parts of the state reporting 1 to 4.5 inches of snow. A hard freeze occurred in the first and third weeks of January 2018. The impact of the freezes on the 2017 crop was minimal because most processing was nearing an end. All mills in the Louisiana industry completed grinding by January 21, 2018.

Progress in the LSU AgCenter Sugarcane Variety Development Program would not be possible without the collaboration of many growers on whose farm several of the trials are conducted. Financial support from the state of Louisiana disbursed through the LSU AgCenter and from the Louisiana sugar industry disbursed through the American Sugar Cane League is gratefully acknowledged. So too is the collaboration of personnel from the American Sugarcane League and the USDA-ARS Sugarcane Research Unit.

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 to assign permanent ‘L’ variety numbers On-station nurseries planted (at St. Gabriel, Houma, New Iberia) using ‘seedcane’ 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 Experimental clones introduced to 12 outfield test sites and planted as ‘seedcane’ increase plots Experimental clones introduced to 3 primary increase stations
9	On-station nurseries 2R harvested Off-station and infield 1R harvested Outfield tests planted at 12 locations Experimental clones increased on 3 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 secondary increase stations
12	Outfield tests 2R harvested Increase experimental clones on 44 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 Sugarcane League.

2017 PHOTOPERIOD AND CROSSING IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

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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 to select parents and to decide what crosses to make. The breeding program strives to produce crosses that will yield superior progeny.

Eyepiece cuttings of breeding genotypes to be used for the 2017 crossing season were planted in October of 2016. The cuttings were planted in Styrofoam cell trays and maintained in the greenhouse. On January 3, 2017, 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. On April 4, 2017, 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 previous knowledge of their flowering behavior. 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 May 29, 2017. 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 in day length was initiated (Table 1). All photoperiod treatments were discontinued on September 10, 2016, 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 2017, similar to the previous year. 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. A 25% reduction in flowering was observed in 2017 as compared to the previous crossing season. Fewer flowers were also observed in the 2016 crossing season as compared to the 2015 crossing season. Additionally, there was a 12%

reduction in total number of stalks in 2017 as compared to the 2016 crossing season. Again, a similar trend was observed in stalk reductions in the 2016 crossing season as compared to the previous year. As such, flowering percentages of stalks on photoperiod carts decreased in 2017 as compared with the 2016 flowering season. The largest decrease in flowering percentages was observed in photoperiod carts located in position "Bay 3" (Table 1). Notably, the percent of stalks that flowered in position "Bay 3, Cart A" decreased from 69% in 2016 to 46% in 2017 (Table 1). The total flowering percentage for the six photoperiod bays decreased from 37% in 2016 to 30% in 2017. Of a total of 1,371 stalks, 417 tassels were produced (Table 2). A smaller, longer peak in flowering was observed during the 2017 crossing season (Fig. 1). During the 2015 and 2016 crossing seasons, a definite peak which began during the 3rd week of crossing, reached a maximum during the 4th week, and decreased during the 5th week of crossing was observed. During the 2017 crossing season, the maximum number of flowers observed in one week was 61 flowers (Fig. 1). However, the maximum number of flowers observed in one week during the 2016 and 2015 crossing seasons was 106 and 104 flowers respectively. The peak in flowering occurred during the 4th week of the crossing season in 2016 and 2015.

Crossing began on September 5, 2017 and ended on November 6, 2017. A total of 417 tassels comprising 77 genotypes (Table 4) were used to produce 228 crosses (Table 3, Table 5). A total of 92,549 viable seed were produced in 2017 (Table 3). A total of 89,928 seed were produced from bi-parental crosses and a total of 2,621 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 2017. Germination rates remained high in 2017 with an average of 38 plants per gram of seed compared to 41 plants per gram of seed in 2016 (Table 3).

The 2017 crossing season was a rather tough crossing season. Unseasonably cool and warm weather appeared during the crossing season. This abnormality in weather patterns may have contributed, in part, to reduced flowering in 2017. A number of stressors also appeared during the 2017 crossing season. In late July, physiological stress was noted on the plants. An earlier than normal fertilizer application was made in an attempt to correct the physiological stress. Shortly after the physiological stress was noted, aphids were observed on the plants. An aggressive insecticide application was made to reduce aphid populations. High leaf hopper populations also appeared during the latter part of the 2017 crossing season. Insecticides were applied to eliminate the leaf hopper population. As a result of a high leaf hopper population, birds began roosting on the flowering stalks. A number of flowers were broken as a result of the roosting birds. Borer pressure remained light during the 2017 crossing season. A number of improvements were made to the crossing database in 2017 that will allow better crosses which limit the pairing of parental stock with undesirable traits to be made in future crossing years.

Table 1. Summary of the 2017 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	13-Jun	44	27-Jul	72	87	287±2	79	52
1	B	13-Jun	44	27-Jul	72	87	286±2	82	40
1	C	13-Jun	44	27-Jul	72	87	294±2	69	32
2	A	13-Jun	44	27-Jul	72	87	288±1	77	66
2	B	13-Jun	44	27-Jul	72	87	286±2	77	32
2	C	13-Jun	44	27-Jul	72	87	295±4	72	19
3	A	29-May	37	5-Jul	87	102	267±3	71	46
3	B	29-May	37	5-Jul	87	102	279±4	74	22
3	C	29-May	37	5-Jul	87	102	273±7	69	10
4	A	29-May	37	5-Jul	87	102	263±2	84	45
4	B	29-May	37	5-Jul	87	102	264±4	82	24
4	C	29-May	37	5-Jul	87	102	280±6	72	13
5	A	29-May	41	9-Jul	82	97	271±4	79	19
5	B	29-May	41	9-Jul	82	97	274±4	80	23
5	C	29-May	41	9-Jul	82	97	271±4	66	17
6	A	29-May	41	9-Jul	82	97	268±2	80	35
6	B	29-May	41	9-Jul	82	97	273±3	77	26
6	C	30-May	41	9-Jul	82	97	271±4	81	19

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---								
77	324	171	1371	417	4.23 ± 1.16	2.44 ± 1.26	5.60 ± 1.66	81.03 ± 13.71

† 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 2017 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	209	89928	430±625	430±625	40±50
Polycross	19	2621	138±251	583±823	15±27
Self	0	0	0	0	0
Total	228	92549	406±608	406±608	38±49

Table 4. Varietal flowering summary in 2017 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
CP83-644	41	286	85±6	6	23	3	13
HO06-530	41	279	89	7	4	1	25
HO06-537	43±1	.	.	.	5	.	.
HO06-563	37	256	78±5	4	5	5	100
HO07-613	41	.	.	.	11	.	.
HO07-617	41	.	.	.	8	.	.
HO08-711	37	.	.	.	4	.	.
HO08-717	41	.	.	.	16	.	.
HO08-730	39±1	275	92±7	7	11	2	18
HO09-827	43	265	89±3	7	12	8	67
HO09-832	44	.	.	.	5	.	.
HO09-840	42±1	251	69±2	7	19	14	74
HO09-9401	37	249	65±2	7	5	5	100
HO09-9402	37	.	.	.	6	.	.
HO11-532	43	261	78±4	4	13	6	46
HO11-573	37	.	.	.	15	.	.
HO11-9405	44	.	.	.	5	.	.
HO11-9406	44	272	64±0	6	3	3	100
HO12-615	44	284	91±4	7	8	7	88
HO12-9410	41	.	.	.	2	.	.
HO13-705	44	300	98±6	4	4	2	50
HO13-720	44	.	.	.	5	.	.
HO13-755	44	.	.	.	4	.	.
HO14-863	41	256	70±1	4	4	4	100
HO95-988	41	286	96	5	8	1	13
HOCP00-950	41±1	254	78±2	8	38	11	29
HOCP01-517	41±1	.	.	.	18	.	.
HOCP01-523	41	284	94	7	12	1	8
HOCP02-618	39±1	.	.	.	12	.	.
HOCP04-838	42	249	75±4	3	26	9	35
HOCP04-847	39	.	.	.	17	.	.
HOCP05-902	42±1	.	.	.	7	.	.
HOCP09-804	38	270	89±2	4	20	4	20
HOCP09-814	39±1	291	101	8	10	1	10
HOCP09-846	41	.	.	.	7	.	.
HOCP13-723	44	279	81±4	6±1	5	4	80
HOCP13-726	44	303	98±2	6±1	6	3	50
HOCP13-738	44	.	.	.	3	.	.
HOCP14-826	41	.	.	.	5	.	.
HOCP85-845	41	.	.	.	5	.	.
HOCP91-552	44	272	80±7	4	8	6	75
HOCP92-618	41±1	.	.	.	16	.	.
HOCP92-624	41±1	251	79±3	7	33	12	36
HOCP95-951	37	289	110±7	7	8	2	25
HOCP96-540	41±1	268	86±5	3	16	7	44
HOCP96-561	41±1	268	81±2	5	8	6	75
HOCP97-609	40±1	261	80±3	4	16	5	31
L01-283	41	300	116±6	7	32	2	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
L01-299	40	251	75±2	4	44	22	50
L01-315	39±1	254	80±5	7	9	6	67
L03-371	41	.	.	.	25	.	.
L05-448	37	254	83±6	4	10	6	60
L05-457	42	251	71±2	8	33	24	73
L06-001	40	270	86±2	4	30	10	33
L06-038	41±1	254	70±2	7	8	2	25
L06-040	41±1	254	77±3	7	11	4	36
L07-057	40±1	249	73±4	7	19	13	68
L08-088	41	275	94±5	7	8	3	38
L08-090	40±1	254	86±5	4	28	15	54
L09-099	42±1	263	84±3	4	18	11	61
L09-112	37	.	.	.	5	.	.
L09-123	37	249	68±2	7	9	9	100
L09-131	40	.	.	.	17	.	.
L10-146	41	277	104±17	6	16	2	13
L10-147	41	.		.	9	.	.
L11-183	41±1	256	80±5	7	24	10	42
L11-187	42±1	258	78±2	5	18	14	78
L12-201	38±1	.		.	12	.	.
L12-202	41±1	258	78±3	4	12	12	100
L12-218	37	282	96	7	4	1	25
L12-227	43±1	289	82±1	4	3	2	67
L13-234	44	.	.	.	5	.	.
L13-242	44	.	.	.	4	.	.
L13-243	44	275	75±7	5±1	3	3	100
L13-251	41±1	279	74±2	5±1	7	3	43
L13-257	39±1	282	96	7	6	1	17
L14-264	44	296	92±4	7±1	3	2	67
L14-265	41±1	289	109±3	8	7	3	43
L14-266	44	.	.	.	5	.	.
L14-267	41±2	.	.	.	6	.	.
L14-269	44	296	93±2	7	5	4	80
L14-270	44	.	.	.	4	.	.
L14-271	44	286	78	4	3	1	33
L14-273	44	279	87±8	7±1	4	3	75
L14-274	44	.	.	.	4	.	.
L14-275	44	275	75±3	7	6	5	83
L14-276	44	277	81±4	8	6	6	100
L14-282	41±1	289	82±1	6	9	3	33
L14-285	41±2	300	92	4	5	1	20
L14-288	40±1	.	.	.	11	.	.
L14-289	41±1	272	89±3	4	10	2	20
L14-290	44	.	.	.	6	.	.
L14-295	40±1	265	102±23	8	9	2	22
L14-296	44	286	87±9	8	5	2	40
L14-297	44	.	.	.	4	.	.
L15-298	37	258	86±12	6±1	3	3	100

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
L15-300	37	298	112	4	6	1	17
L15-301	37	.	.	.	5	.	.
L15-303	37	.	.	.	3	.	.
L15-304	37	289	103	5	5	1	20
L15-305	37	.	.	.	5	.	.
L15-306	39±1	.	.	.	8	.	.
L15-311	39±1	.	.	.	8	.	.
L15-312	39±1	.	.	.	7	.	.
L15-314	37	.	.	.	4	.	.
L15-317	39±1	.	.	.	7	.	.
L15-319	37	.	.	.	4	.	.
L15-320	37	.	.	.	4	.	.
L15-323	37	284	109±5	8	6	3	50
L15-324	41	265	75	4	8	1	13
L15-325	41±2	254	69±1	4	6	2	33
L15-327	40±1	.	.	.	8	.	.
L15-328	43	.	.	.	11	.	.
L15-336	43±1	.	.	.	10	.	.
L15-337	43	.	.	.	11	.	.
L15-345	44	.	.	.	3	.	.
L94-426	38±1	270	80	6	12	1	8
L94-428	37	284	98	4	4	1	25
L94-433	41	.	.	.	4	.	.
L97-128	41±1	275	92±6	7	18	6	33
L98-207	41±1	272	75±11	7	16	2	13
L98-209	41±1	279	94±5	7	14	2	14
L99-226	40	270	92±3	4	35	13	37
L99-233	40±1	251	71±4	4	28	15	54
LCP81-010	41±1	277	83±3	5	21	13	62
LCP81-030	41	.	.	.	2	.	.
LCP85-384	42±1	265	83±3	4	21	3	14
LCP86-454	41	.	.	.	3	.	.
N27	42	270	87±7	7	12	2	17
US01-040	41	265	86±2	8	7	6	86

Table 5. Crosses and seed made in 2017

Cross	Female	Male	Seed
XL17-001	L07-057	17P1	37
XL17-002	HO09-9402	17P1	178
XL17-003	HO09-9401	17P1	12
XL17-004	HO09-9401	17P1	5
XL17-005	HO09-9402	17P2	132
XL17-006	HO09-9401	17P2	0
XL17-007	HO09-9401	17P2	17
XL17-008	L07-057	17P2	26
XL17-009	L07-057	HOCP04-838	775
XL17-010	L09-123	HOCP04-838	627
XL17-011	L07-057	L01-299	0
XL17-012	L09-123	L01-299	58
XL17-013	HO09-840	L99-233	753
XL17-014	HOCP92-624	L99-233	1796
XL17-015	L05-457	L99-233	602
XL17-016	HO09-840	L15-325	0
XL17-017	L01-315	L15-325	0
XL17-018	HOCP00-950	L01-299	0
XL17-019	HO09-840	L08-090	0
XL17-020	L06-038	17P3	84

Table 5. Continued

Cross	Female	Male	Seed
XL17-021	L05-448	17P3	245
XL17-022	HOCP04-838	17P3	111
XL17-023	L06-040	L99-233	49
XL17-024	L11-183	L01-299	0
XL17-025	L09-123	HO06-563	647
XL17-026	L05-457	HOCP04-838	481
XL17-027	L09-123	L15-325	11
XL17-028	L05-457	L15-325	0
XL17-029	HO09-840	HO14-863	28
XL17-030	L06-038	L12-202	3
XL17-031	L05-457	L12-202	70
XL17-032	L11-187	L15-298	0
XL17-033	L01-315	L15-298	9
XL17-034	HOCP00-950	L08-090	0
XL17-035	L05-457	L08-090	0
XL17-036	HOCP92-624	L12-202	46
XL17-037	L01-315	L05-458	68
XL17-038	L05-457	L01-299	181
XL17-039	L11-187	L01-299	0
XL17-040	L05-457	L08-090	0
XL17-041	HOCP00-950	HO11-532	15
XL17-042	HO09-9401	HO14-863	21
XL17-043	L15-298	HO14-863	0
XL17-044	L05-457	L12-202	224
XL17-045	L11-187	L12-202	29
XL17-046	HOCP97-609	17P4	116
XL17-047	HO06-563	17P4	0
XL17-048	L11-183	L08-090	0
XL17-049	L05-457	L09-099	30
XL17-050	HO14-863	17P5	15
XL17-051	L05-448	17P5	12
XL17-052	HOCP04-838	17P5	119
XL17-053	L14-295	L08-090	91
XL17-054	US01-040	L08-090	0
XL17-055	L11-187	L01-299	40
XL17-056	HO09-827	L99-233	2098
XL17-057	HO09-840	LCP85-384	30
XL17-058	HO08-730	HO06-563	9
XL17-059	L15-324	17P5	1067
XL17-060	HO11-532	17P5	0
XL17-061	L05-448	17P5	446
XL17-062	L05-457	HOCP96-540	234
XL17-063	HO09-840	L01-299	40
XL17-064	L05-457	L11-187	9
XL17-065	L05-457	L08-090	14
XL17-066	L07-057	HOCP97-609	1225
XL17-067	HO09-840	HOCP96-561	0
XL17-068	N27	L11-187	0
XL17-069	L11-183	L11-187	148
XL17-070	L05-457	L11-187	14
XL17-071	HO09-827	L01-299	627
XL17-072	L06-040	HOCP96-561	0
XL17-073	L07-057	L06-001	14
XL17-074	HOCP00-950	L12-202	9
XL17-075	L06-040	HOCP09-804	0
XL17-076	L94-426	L99-226	28
XL17-077	L05-457	HOCP91-552	918
XL17-078	L09-123	HOCP91-552	927
XL17-079	HO11-9406	L08-090	41
XL17-080	L98-207	L08-090	554
XL17-081	L05-457	L09-099	270
XL17-082	L09-123	L09-099	201
XL17-083	L05-457	L99-233	681
XL17-084	HO11-9406	L99-233	762
XL17-085	L11-183	L99-233	220
XL17-086	L05-457	L99-233	1132
XL17-087	HO11-9406	L99-233	852
XL17-088	L07-057	HOCP96-540	0
XL17-089	L01-315	HOCP96-540	991
XL17-090	L14-289	L06-001	339
XL17-091	L14-275	HO09-804	1266
XL17-092	L97-128	HO09-804	60
XL17-093	US01-040	HO09-804	536
XL17-094	HO08-730	L12-202	541
XL17-095	L98-207	L12-202	343
XL17-096	L11-183	HOCP91-552	267
XL17-097	HOCP92-624	L01-299	310
XL17-098	L01-315	L99-233	295
XL17-099	L08-088	L09-099	29
XL17-100	L07-057	L13-243	26
XL17-101	L11-183	LCP81-010	10
XL17-102	L08-090*	LCP81-010	20
XL17-103	L14-276	HOCP04-838	589
XL17-104	L10-146	HOCP04-838	216
XL17-105	L11-183	HO11-532	397
XL17-106	L05-448	HO11-532	372
XL17-107	L14-276	L11-187	156
XL17-108	L13-243	HOCP91-552	104
XL17-109	US01-040*	L14-289	79
XL17-110	L05-457	L99-226	169
XL17-111	HO09-827	L01-299	455
XL17-112	US01-040	L01-299	761
XL17-113	HOCP92-624	L01-299	961
XL17-114	US01-040	L11-187	12
XL17-115	L97-128	L11-187	31
XL17-116	HO06-530	L11-187	401
XL17-117	L14-273	L12-202	22
XL17-118	L98-209	L12-202	0

Table 5. Continued

Cross	Female	Male	Seed
XL17-119	L14-275	HOCP09-804	807
XL17-120	L13-251	HOCP09-804	2149
XL17-121	L05-457	L06-001	211
XL17-122	HOCP00-950	L09-099	20
XL17-123	L13-723	L09-099	750
XL17-124	HOCP00-950	L09-099	74
XL17-125	L12-218	LCP01-010	13
XL17-126	HOCP96-561	L99-226	139
XL17-127	US01-040	L99-233	1440
XL17-128	L13-257	HOCP97-609	86
XL17-129	L14-275	L12-202	138
XL17-130	HOCP92-624	HOCP96-540	1702
XL17-131	HOCP00-950	HOCP96-540	18
XL17-132	L97-128	HOCP96-540	84
XL17-133	HO12-615	L09-099	74
XL17-134	L97-128	L09-099	98
XL17-135	L06-040	L13-251	53
XL17-136	HOCP01-523	L13-251	597
XL17-137	L08-088	LCP81-010	231
XL17-138	L07-057	LCP81-010	40
XL17-139	L15-323	L11-187	8
XL17-140	L07-057	L01-299	81
XL17-141	N27	L01-299	209
XL17-142	L05-457	L94-428	16
XL17-143	HOCP92-624	HO06-563	1652
XL17-144	HOCP00-950	L99-226	28
XL17-145	HOCP96-561	L99-226	405
XL17-146	L07-057	L99-226	239
XL17-147	L11-183	HOCP91-552	192
XL17-148	HOCP92-624	L08-090	6
XL17-149	L14-276	L14-271	0
XL17-150	HO09-840	L06-001	91
XL17-151	L14-275	L06-001	1568
XL17-152	HO95-988	L01-299	12
XL17-153	L14-296	L01-299	379
XL17-154	L05-457	LCP81-010	74
XL17-155	CP83-644	LCP81-010	131
XL17-156	HOCP00-950	HOCP96-540	26
XL17-157	HOCP95-951	HOCP96-540	33
XL17-158	L97-128	HOCP96-540	3
XL17-159	HOCP00-950	HOCP04-838	53
XL17-160	L14-282	HOCP04-838	1721
XL17-161	HOCP13-723	HOCP04-838	1393
XL17-162	HO12-615	HOCP04-838	202
XL17-163	HOCP00-950	L09-099	80
XL17-164	L01-315	L09-099	691
XL17-165	L15-304	L09-099	707
XL17-166	L14-282	L09-099	1388
XL17-167	HOCP13-723	L09-099	1024
XL17-168	HO09-840	L09-099	283
XL17-169	L14-265	L12-227	454
XL17-170	HO09-840	L12-227	727
XL17-171	HO09-827	L12-227	441
XL17-172	CP83-644	LCP85-384	1536
XL17-173	LCP81-010	LCP85-384	3031
XL17-174	HO08-730	HOCP97-609	102
XL17-175	HO09-840	HOCP97-609	435
XL17-176	LCP81-010	L99-226	2043
XL17-177	HOCP92-624	L99-226	958
XL17-178	L98-209	L99-226	86
XL17-179	HO12-615	L12-227	104
XL17-180	HOCP09-814	L12-202	321
XL17-181	LCP81-010	HOCP04-838	1656
XL17-182	HOCP92-624	L99-226	1620
XL17-183	L05-457	L99-226	691
XL17-184	L14-282	HOCP04-838	1241
XL17-185	L08-088	HO11-532	79
XL17-186	L14-275	L11-187	422
XL17-187	L14-276	L06-001	800
XL17-188	HOCP96-561	L12-202	166
XL17-189	L11-183	L99-226	367
XL17-190	L14-264	LCP85-384	45
XL17-191	L15-298	L08-090	0
XL17-192	L14-269	L05-448	47
XL17-193	L14-265	HOCP97-609	1401
XL17-194	L14-265	L12-202	2082
XL17-195	HOCP92-624	L99-226	935
XL17-196	L14-276	L15-300	131
XL17-197	HO09-827	HOCP13-723	0
XL17-198	L01-283	HOCP13-723	580
XL17-199	L97-128	HOCP13-723	27
XL17-200	L14-273	HO13-705	12
XL17-201	L14-276	HO13-705	387
XL17-202	HOCP92-624	HO13-705	891
XL17-203	L14-269	L06-001	271
XL17-204	L15-323	L06-001	96
XL17-205	L14-269	L14-285	79
XL17-206	L15-323	L14-285	65
XL17-207	HO09-827	L09-099	381
XL17-208	L14-296	L09-099	859
XL17-209	L14-264	HOCP13-726	194
XL17-210	HOCP95-951	L99-226	473
XL17-211	CP83-644	HO11-532	2885
XL17-212	HO09-827	L06-001	2453
XL17-213	L14-273	L99-226	449
XL17-214	HO12-615	L99-226	90
XL17-215	HOCP13-726	L01-299	827
XL17-216	HO12-615	L01-299	140

Table 5. Continued

Cross	Female	Male	Seed
XL17-217	L11-183	L01-299	362
XL17-218	HO12-615	L08-090	0
XL17-219	L07-057	L11-187	9
XL17-220	L98-209	L06-001	1270
XL17-221	L14-269	HOCP91-552	74
XL17-222	HOCP13-726	HOCP96-540	1554
XL17-223	L14-295	HOCP96-540	523
XL17-224	L10-146	HOCP96-540	177
XL17-225	L01-283	HOCP91-552	29
XL17-226	LCP81-010	HO13-705	3797
XL17-227	HO12-615	L99-233	152
XL17-228	HO09-827	L08-090	13

* Indicates emasculated flower

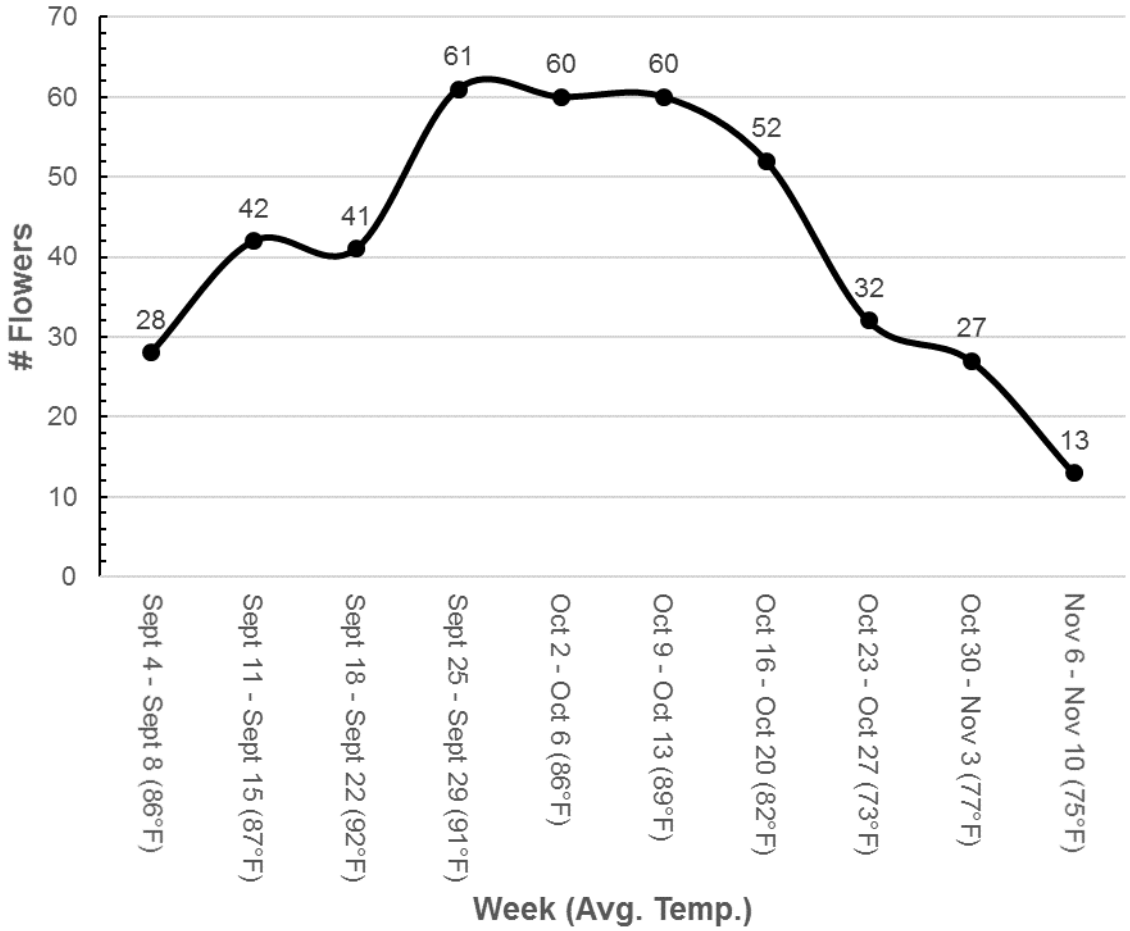

Fig. 1. Number of flowers produced during the 2017 crossing season. The average ambient high temperature is reported for each week.

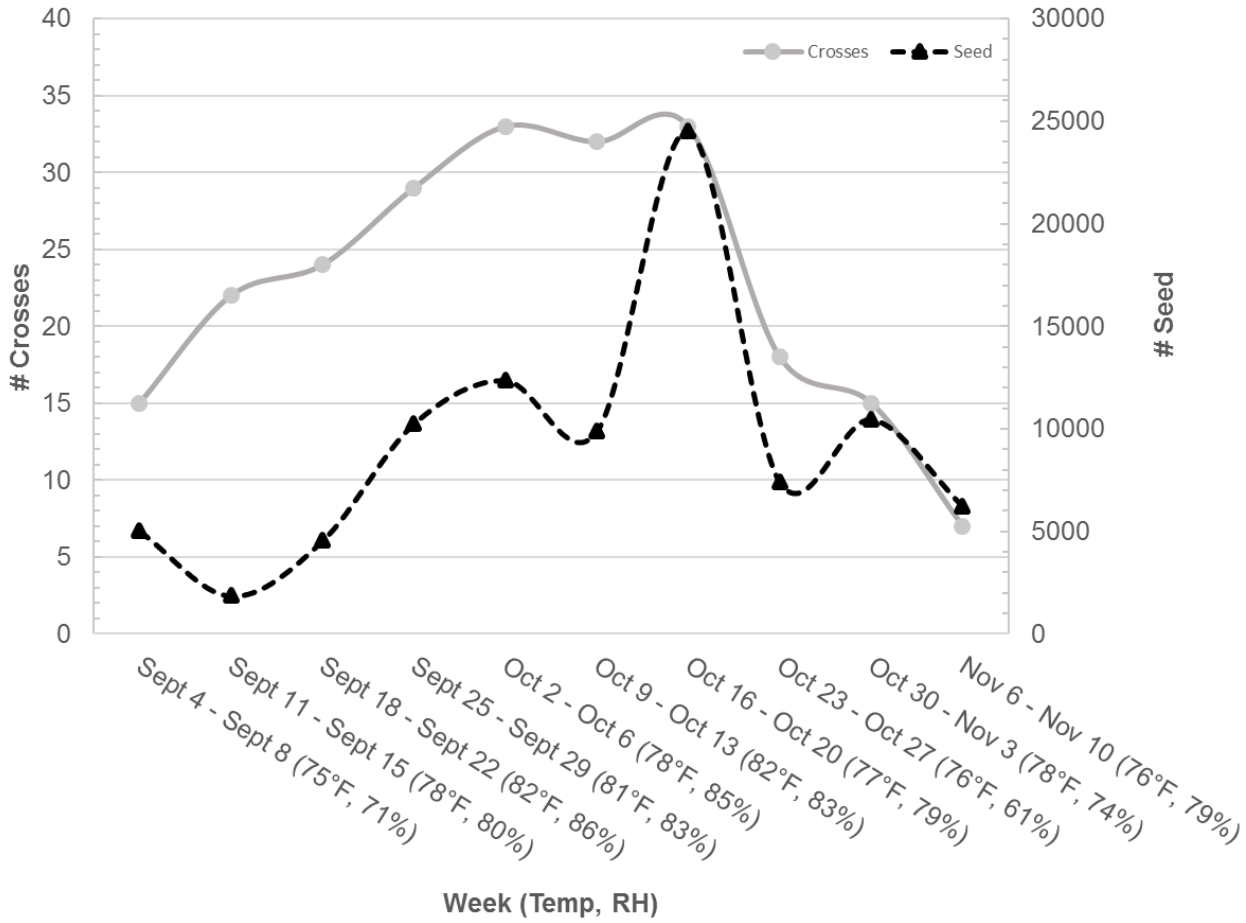

Fig. 2. Number of crosses made and number of seed made from those corresponding crosses in 2017. Average weekly high temperature and average weekly relative humidity readings were recorded inside the crossing greenhouse located in St. Gabriel, LA.

SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2017

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In the selection phase of the LSU AgCenter's Sugarcane Variety Development Program, superior clones are advanced through the seedling (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 83,214 seedlings from 333 crosses were planted in the field in the spring of 2017. The majority of these seedlings are progeny of bi-parental crosses among commercial and elite experimental varieties. In the fall of 2017, family selection was practiced on the 49,088 stubble seedlings, planted in 2016, surviving the winter. This selection resulted in the planting of 1,395 first-line trial plots. At the same time, superior clones were selected and advanced through subsequent stages (557 to second line trials, 270 to the increase stage). Assignments of permanent "L17" numbers were given to the 43 best clones of the 2012 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 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 83,214 seedlings from 333 crosses of the 2016 crossing series were planted to the field in the spring of 2017 (Table 1). Many of these seedlings were progeny of crosses among commercial and superior experimental varieties. In the fall of 2017, individual selection was practiced on the 49,088 stubble single stools of the 2015 crossing series, planted in 2016, that survived the winter. The 1,395 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 2,128 first-line trial plots of the 2014 crossing series were visually appraised for cane yield potential in August of 2017 (Table 3). After screening for cane yield potential, acceptable clones were further evaluated for pest resistance (diseases and borer injury), stalk quality, and Brix (Table 3). This second stage of advancement concluded with the planting of 557 clones in single row, 16-foot, second line trials plots.

The 551 plant-cane, second line trial plots of the 2013 crossing series were visually appraised for yield potential August 2017. Based on the field evaluation, comments and sucrose lab data collected in 2016, 270 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 2018. Of the 147 candidates from the first stubble crop of the second line trial plots, the best 43 clones from the 2012 crossing series were assigned permanent "L17" numbers (Table 5). These newly assigned "L17" 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 2012 through 2016 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 2017 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 (L17 Assignments)
			number of clones					
X12	40	170	78,747	38,616	1,414	473	348	43
X13	--	155	76,217	51,399	1,663	551	270	
X14	24	194	85,659	64,206	2,128	557		
X15	20	157	81,783	49,088	1,395			
X16	20	333	83,214					

Table 2. Dates of seedling and line trials planted or harvested in 2017.

Crossing Series	Test	Crop	Date Planted	Date Harvested
X16	Seedlings	Planted	4/11/17-4/20/17	
X16	Progeny Test	Planted	4/20/17	
X15	Seedlings	First Stubble	4/11/16-4/22/16	9/25/17-10/6/17
X15	Progeny Test	First Stubble	4/22/16	12/6/17
X14	First Line Trials	Plant-cane	10/10-10/25/16	9/27/17
X13	First Line Trials	First Stubble	9/14-9/29/15	12/5/17
X14	Second Line Trials	Planted	9/27/17	
X13	Second Line Trials	Plant-cane	10/4/16	10/18/17
X12	Second Line Trials	First Stubble	9/16/15	11/01/17
X11	Second Line Trials	Second Stubble	9/24/14	11/10/17
X13	Light Soil Increase	Planted	10/19/17	
X12	Light Soil Increase	Plant-cane	9/15/16	12/1/17
X11	Light Soil Increase	First Stubble	11/06/15	11/16/17
X10	Light Soil Increase	Second Stubble	10/23/14	11/16/17
X13	Heavy Soil Increase	Planted	10/19/17	
X12	Heavy Soil Increase	Plant-cane	9/28/16	11/15/17
X10	Heavy Soil Increase	Second Stubble	10/23/14	11/10/17

Table 3. Numbers of experimental clones dropped for identified faults in the 2014 crossing series first-line trials.

	Fault	
Trait	Frequency	Percent
---------- 2128 clones enter first round of evaluation ----------		
Initial Selection (Rating)	751	35.29
---------- 1377 clones enter second round of evaluation ----------		
Pith	107	5.03
Smut	2	0.09
Lodge	9	0.42
Tube	125	5.87
Rating	7	0.33
Red Rot	5	0.23
Other	5	0.23
---------- 260 clones dropped ----------		
----------1117 clones enter third round of evaluation ----------		
Brix	560	26.32
Clones advanced	557	26.17

Table 4. Number of experimental clones dropped for identified faults in the 2013 crossing series of the plant-cane second line trial prior to advancement to the increase stage.

	Fault	
Trait	Frequency	Percent
---------- 551 clones enter first round of evaluation ----------		
Lodged	34	6.17
Diameter	4	0.73
Pith	59	10.71
Tube	77	13.97
Smut	2	0.36
Population	62	11.25
Other	20	3.63
---------- 258 clones dropped ----------		
Clones advanced to Increase stage	293	53.18

Table 5. First stubble second line trial yield data for the 2017 "L" assignments. Assignments were made at the first stubble stage and included data accumulated from preceding stages. The mean, minimum and maximum values reported are for the assigned clones only.

Variety	Female	Male	Sugar Per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
HoCP 96-540	LCP86-654	LCP85-384	10444	44.6	234	2.61	34258	12.1
L99-226	CP89-846	LCP81-030	9398	39	241	2.66	29040	12.9
L01-283	L93-365	LCP85-384	9900	38.5	256	1.82	42426	12.6
L01-299	L93-365	LCP85-384	8796	36.4	243	1.82	40233	13.5
HoCP04-838	HOCP85-845	LCP85-384	11971	49.3	243	2.25	43787	13.6
L2017392	HOCP85-845	L06-001	6560	26.1	252	1.74	29948	13.7
L2017393	HOCP04-838	L10-147	5887	23.7	249	1.63	29040	13.5
L2017394	LCP85-384	11P22	11813	43.7	271	2.6	33578	13
L2017395	L10-156	L99-226	8659	33.5	258	2.69	24956	12.7
L2017396	L09-099	HOCP96-540	7466	27.7	270	1.47	37661	13.1
L2017397	HOCP91-552	L01-283	6337	24.2	262	1.39	34939	11
L2017398	L09-131	HOCP96-540	6839	24.5	279	1.8	27225	12.1
L2017399	L10-156	L99-226	8160	32.3	253	2.54	25410	11.4
L2017400	L05-457	L01-299	13483	50	270	2.66	37661	12.4
L2017401	HOCP00-950	HOCP04-838	5463	20.1	272	1.32	30401	12.2
L2017403	HOCP92-624	L07-057	9643	39.8	242	2.19	36300	13.3
L2017404	MISC	MISC	7713	30.8	251	1.49	41291	12.5
L2017405	L09-131	12P12	7495	27.4	274	1.46	37661	13.8
L2017406	HOCP97-609	12P6	9440	37.7	250	1.91	39476	13.2
L2017407	N27	L99-226	7354	33.2	222	1.81	36754	10.7
L2017409	L09-099	L06-001	6332	24.8	256	1.79	27679	13.5
L2017410	HOCP92-624	L11-172	9101	35.8	254	2.47	29040	11.7
L2017411	L09-131	HOCP96-540	6328	24.9	254	1.45	34485	13.8
L2017413	L05-457	L99-233	7562	29.2	259	1.48	39476	12.8
L2017414	LCP85-384	L99-233	9808	38.7	253	1.69	45829	12.3
L2017415	HOCP97-609	12P6	8375	33.6	249	2.03	33124	12.3
L2017416	L10-156	L99-226	9883	39.8	248	2.22	35846	12.8
L2017417	CP83-644	L06-001	8000	29.5	271	2.1	28133	11.6
L2017418	L11-183	L06-001	9554	37.9	252	2.02	37661	12.3
L2017419	HOCP92-624	L99-233	5781	21.2	272	1.8	23595	12.6
L2017420	HOCP09-814	12P17	8002	29.2	274	1.67	34939	12.1
L2017421	HOCP92-624	HOCP04-847	11189	44.9	249	2.54	35393	12.7
L2017422	CP83-644	HOCP04-838	9189	36	255	1.62	44468	12.1
L2017423	L10-138	12P1	9033	32.6	277	1.75	37208	10.3
L2017424	HOCP01-517	L06-001	9676	37.8	256	2.01	37661	12.1
L2017425	HOCP92-624	L99-233	8702	33.7	258	2.1	32216	12.5
L2017426	L10-156	L99-226	8264	30.5	271	1.82	33578	13.6
L2017428	HO08-717	L06-001	9157	34.6	264	2.39	29040	12.7
L2017429	HOCP01-517	L06-001	3449	13.1	264	1.6	16335	12.5
L2017430	HOCP97-609	12P6	13566	55.3	246	2.46	44921	11.2

Table 5. Continue.

Variety	Female	Male	Sugar Per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
L2017431	HOCP01-517	L06-001	8785	34.2	257	2.4	28586	10.5
L2017432	HOCP92-624	HOCP96-540	7094	29.6	239	1.77	33578	13.2
L2017433	HOCP04-838	HOCP01-523	8290	33.2	250	2.66	24956	12.5
L2017434	L11-167	HOCP96-561	12372	49.3	251	2.44	40384	11.8
L2017435	N27	L06-001	11429	45.3	252	1.94	46736	11.1
L2017436	HOCP09-814	12P17	8529	33.3	256	1.69	39476	11.5
L2017437	HOCP92-624	HOCP04-847	7271	28.6	255	1.73	33124	9.6
MEAN			8501	33.1	258	1.96	34042	12.3
MIN			3449	13.1	222	1.32	16335	9.6
MAX			13566	55.3	279	2.69	46736	13.8

Table 6. Advancement summary of the crosses in the 2009 through 2015 series.

				1 st Line		2 nd Line		Increases	
Series	**Female**	**Male**	**Survive**	**No.**	**Rank Percentile**	**No.**	**Rank Percentile**	**No.**	**Rank Percentile**
First Line Stage									
2015	HO14-9243	HO14-824	177	0	9				
2015	HOCP11-544	L99-233	637	11	61				
2015	HOCP11-541	HOCP04-838	680	6	38				
2015	HOCP00-950	HOCP04-838	469	5	45				
2015	HO12-629	HOCP12-676	195	2	43				
2015	HOCP11-541	HOCP12-674	848	5	29				
2015	HO14-811	HO11-508	475	16	87				
2015	HO11-517	HOCP04-838	219	4	63				
2015	HO12-628	HO14-852	699	15	72				
2015	HO11-517	HO13-705	165	0	9				
2015	HOCP13-749	HO13-705	277	2	31				
2015	HOCP13-764	HOCP10-900	706	27	89				
2015	HOCP13-726	HO14-807	497	4	35				
2015	HO14-805	L99-233	328	9	80				
2015	HO13-731	L99-233	199	0	9				
2015	HO11-508	HOCP13-749	735	19	78				
2015	HO12-628	HO13-705	425	1	19				
2015	HO11-508	L99-233	478	2	23				
2015	HO11-536	L99-233	428	4	40				
2015	HO14-913	L99-233	472	2	24				
2015	HOCP11-541	HO13-702	514	6	48				
2015	HOCP11-565	HO13-702	431	0	9				
2015	HO10-937	HOCP05-918	266	2	32				
2015	HOCP11-545	HOCP05-918	549	9	58				
2015	HOCP12-676	HOCP14-892	388	0	9				
2015	HOCP00-950	HOCP11-536	273	3	46				
2015	HOCP04-814	HO07-613	688	17	75				
2015	HOCP12-643	HOCP13-767	709	4	28				
2015	HOCP12-654	HOCP13-767	478	3	30				
2015	HOCP14-892	HO14-9219	198	1	27				
2015	HO11-556	HOCP14-865	434	0	9				
2015	HOCP12-654	HOCP14-865	501	8	57				
2015	HO12-633	HOCP14-865	204	6	83				
2015	HOCP14-815	HOCP13-726	135	2	56				
2015	HOCP13-751	HOCP13-726	261	2	34				
2015	HO12-626	HO13-704	372	3	36				
2015	HO13-718	HO13-704	715	15	70				
2015	HOCP05-918	HOCP96-540	710	28	90				

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2015	L05-457	HO11-556	902	12	52				
2015	L14-265	HOCP91-552	795	2	20				
2015	L05-457	HOCP91-552	615	31	94				
2015	L14-265	HOCP91-552	853	35	91				
2015	L14-275	HOCP91-552	191	0	9				
2015	L14-265	HOCP91-552	301	1	22				
2015	HO12-9401	HOCP91-552	158	0	9				
2015	L14-275	L07-057	748	6	34				
2015	L07-057	15P1	426	4	41				
2015	L09-099	15P1	1552	4	21				
2015	L99-233	15P1	396	3	33				
2015	L11-168	L09-099	490	27	94				
2015	HO09-9401	L09-099	189	11	96				
2015	L14-272	L09-099	217	1	25				
2015	HO12-9410	L09-099	162	0	9				
2015	L14-272	L99-233	203	4	68				
2015	L07-057	L01-299	365	4	46				
2015	L14-275	HOCP04-838	293	0	9				
2015	L99-233	L01-299	168	5	84				
2015	L13-251	L13-234	157	0	9				
2015	L01-299	L99-233	169	5	84				
2015	L09-123	L99-233	381	0	9				
2015	L98-207	HOCP04-838	241	4	58				
2015	L13-234	HOCP04-838	357	5	53				
2015	HO12-9410	HOCP96-540	286	8	82				
2015	L11-178	HOCP91-552	175	0	9				
2015	L01-315	LCP85-384	191	0	9				
2015	HO12-9410	L08-090	190	0	9				
2015	HOCP92-624	L01-299	605	9	56				
2015	L14-275	L06-038	142	0	9				
2015	L11-178	L14-291	119	1	36				
2015	L11-178	L09-099	352	5	53				
2015	L13-251	L09-099	703	10	54				
2015	L07-057	15P2	121	0	9				
2015	L11-178	15P2	216	1	25				
2015	HOCP95-951	LCP85-384	158	0	9				
2015	L99-233	L01-299	385	7	63				
2015	L13-241	L11-172	330	3	39				
2015	L13-243	15P3	158	0	9				
2015	L14-268	15P3	137	2	55				

Table 6. Continue.

Series	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
2015	L09-099	15P3	108	0	9				
2015	HO11-556	15P3	594	26	93				
2015	L11-172	15P4	571	7	49				
2015	L11-187	15P4	197	5	77				
2015	N27	L99-226	720	12	59				
2015	HOCP92-624	L99-226	254	3	48				
2015	L13-234	15P5	281	17	96				
2015	L99-233	L01-299	143	6	92				
2015	L01-283	L99-226	377	5	51				
2015	L05-457	L99-226	1453	35	74				
2015	HO08-709	L99-226	1147	24	69				
2015	L11-168	L99-226	226	1	24				
2015	L14-282	HO11-532	249	9	89				
2015	L14-285	HO11-532	226	5	74				
2015	L12-202	L08-090	127	0	9				
2015	L14-282	HOCP97-609	223	10	93				
2015	L14-276	HOCP97-609	153	3	67				
2015	N27	L99-226	1067	20	65				
2015	L13-246	L99-226	235	8	87				
2015	L05-457	15P6	1830	11	29				
2015	HOCP85-845	15P6	631	9	55				
2015	HOCP95-951	15P6	230	5	73				
2015	HOCP96-540	15P6	958	1	18				
2015	L05-457	L99-226	342	7	68				
2015	HO06-530	L99-226	671	2	22				
2015	L98-209	L99-226	1904	25	51				
2015	L01-283	L99-233	1117	13	47				
2015	HO06-530	L99-233	222	4	62				
2015	L13-246	L06-038	992	21	71				
2015	L14-282	L06-038	222	8	88				
2015	L14-286	HOCP97-609	431	1	18				
2015	HOCP00-950	L06-001	413	1	20				
2015	HO08-709	HO06-563	594	5	37				
2015	L05-457	L99-226	1035	9	37				
2015	L06-040	L99-226	184	0	9				
2015	L01-283	L08-090	238	5	70				
2015	HO08-709	L08-090	521	5	42				
2015	L05-457	L99-233	189	2	44				
2015	L15-302	HOCP04-838	250	22	99				
2015	HOCP92-624	L01-283	1163	6	27				

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2015	HO08-717	L99-226	132	1	33				
2015	HOCP97-609	L99-226	140	0	9				
2015	L15-298	L99-226	345	22	97				
2015	L15-298	L99-233	619	17	81				
2015	L12-218	L06-001	1939	63	86				
2015	HO07-613	L06-001	998	25	76				
2015	N27	L06-001	3221	80	75				
2015	L06-040	L06-001	360	10	81				
2015	L99-233	HOCP96-540	1405	26	64				
2015	L15-302	HOCP96-540	429	0	9				
2015	L14-286	HOCP96-540	796	17	72				
2015	L15-302	LCP81-010	235	4	60				
2015	HO12-641	L14-268	167	3	62				
2015	L14-269	HOCP04-838	383	10	79				
2015	HO09-840	HOCP96-561	229	3	50				
2015	L06-040	L06-001	1011	33	86				
2015	L15-302	LCP81-010	451	12	79				
2015	L14-269	HOCP96-540	235	20	98				
2015	L11-183	L99-226	175	0	9				
2015	HO11-515	L99-226	178	3	60				
2015	HOCP96-561	L99-226	955	9	41				
2015	L98-209	L14-294	807	4	26				
2015	L14-269	L09-099	692	39	95				
2015	L14-286	HOCP96-540	388	5	50				
2015	HOCP00-950	L01-283	212	4	66				
2015	HOCP11-516	L01-283	437	11	77				
2015	L94-433	L01-283	180	15	98				
2015	L15-298	L99-226	533	10	65				
2015	HOCP01-517	L99-226	938	37	91				
2015	N27	L01-299	248	8	85				
2015	L14-286	L99-233	773	7	39				
2015	L94-433	L99-233	1400	41	82				
2015	L01-283	L99-226	173	0	9				
2015	HOCP92-624	L99-226	672	13	67				
2015	HOCP85-845	HOCP04-838	223	0	9				
2015	LCP81-010	HOCP96-540	704	7	43				
2015	L94-433	L99-226	568	6	44				
2015	HO07-613	L99-226	910	6	31				
2015	L14-282	LCP85-384	134	0	9				

Table 6. Continue.

Series	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
Second Line Stage									
2014	HOCP09-804	HOCP96-540	458	0	15	0	23		
2014	HOCP01-517	HOCP96-540	134	8	92	1	66		
2014	L08-90	HOCP96-540	186	19	98	2	73		
2014	L03-371	HOCP04-852	147	0	15	0	23		
2014	HOCP01-517	HOCP05-918	410	0	15	0	23		
2014	L03-371	HOCP05-918	165	0	15	0	23		
2014	L11-183	L99-226	207	0	15	0	23		
2014	HO11-512	HOCP05-920	227	0	15	0	23		
2014	HO05-961	HOCP09-814	198	0	15	0	23		
2014	HOCP05-920	HO05-961	133	0	15	0	23		
2014	L09-112	HO05-961	374	0	15	0	23		
2014	L09-112	HO07-613	171	0	15	0	23		
2014	HO11-512	HOCP09-814	186	0	15	0	23		
2014	L10-156	HO06-530	103	0	15	0	23		
2014	L10-156	HO07-613	182	0	15	0	23		
2014	LCP85-384	L10-141	162	0	15	0	23		
2014	HO11-511	HO07-613	348	0	15	0	23		
2014	HO11-512	HO07-613	138	0	15	0	23		
2014	HO07-613	HOCP09-814	287	0	15	0	23		
2014	HO07-613	HOCP09-814	203	0	15	0	23		
2014	HO10-925	HO09-832	.	0	.	1	.		
2014	HO09-840	HOCP11-542	136	6	81	2	82		
2014	HO09-840	HOCP11-504	105	0	15	0	23		
2014	L11-191	HOCP11-504	141	2	43	1	65		
2014	HO10-908	L09-099	218	12	89	3	80		
2014	HOCP11-504	L09-099	172	4	56	0	23		
2014	HO08-717	L09-099	210	0	15	0	23		
2014	L09-099	14P18	112	2	48	2	89		
2014	L11-191	14P18	134	6	82	2	83		
2014	HOCP09-804	HO11-556	202	0	15	0	23		
2014	HO11-563	HO10-937	121	0	15	0	23		
2014	L09-099	HOCP09-804	111	0	15	0	23		
2014	L10-156	HOCP09-804	193	0	15	0	23		
2014	L11-191	HOCP12-666	199	0	15	0	23		
2014	L08-90	HOCP11-504	245	0	15	0	23		
2014	L09-099	HOCP11-504	118	6	87	5	97		
2014	HO11-556	HOCP04-838	132	5	73	4	95		
2014	L08-90	HOCP04-838	228	0	15	0	23		
2014	HO11-556	HO11-529	235	0	15	0	23		

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2014	HO11-556	HO10-937	143	0	15	0	23		
2014	L12-201	HO10-937	181	0	15	0	23		
2014	L12-202	HO10-937	249	0	15	0	23		
2014	HOCP01-517	HOCP04-838	222	0	15	0	23		
2014	L08-90	HOCP04-838	467	1	30	0	23		
2014	L09-112	HOCP04-838	256	13	87	4	84		
2014	L12-201	HO11-529	271	2	33	0	23		
2014	L01-299	HO11-529	257	3	39	2	67		
2014	L09-112	HO11-529	105	0	15	0	23		
2014	HOCP03-743	HO11-529	243	0	15	0	23		
2014	L01-299	L09-112	451	11	58	5	74		
2014	L12-202	L09-112	239	16	93	11	98		
2014	HO11-556	HOCP01-517	125	5	77	2	87		
2014	L12-201	HOCP01-517	127	2	45	2	85		
2014	L01-299	HOCP01-517	243	1	32	0	23		
2014	L11-183	HOCP10-917	154	0	15	0	23		
2014	L11-183	HO11-532	340	7	53	2	63		
2014	HO08-730	L11-172	388	4	36	1	53		
2014	HO08-730	HOCP10-917	257	3	39	1	58		
2014	L09-112	L09-112	264	18	94	10	96		
2014	L12-201	HO11-532	248	0	15	0	23		
2014	L11-172	L11-187	133	4	65	4	94		
2014	HO10-937	HO11-556	.	0	.	2	.		
2014	L12-202	HO10-937	.	0	.	2	.		
2014	HO11-556	HO11-529	.	0	.	2	.		
2014	L08-090	HOCP04-838	.	0	.	1	.		
2014	HOCP03-743	HO11-529	.	0	.	1	.		
2014	HOCP08-726	HOCP10-900	262	3	38	0	23		
2014	HOCP08-726	L99-226	232	1	33	0	23		
2014	HOCP12-674	L99-226	107	0	15	0	23		
2014	HO12-621	LCP85-384	341	13	74	6	88		
2014	LCP85-384	HO11-528	117	0	15	0	23		
2014	HO11-573	HOCP96-540	242	11	83	0	23		
2014	L11-187	HOCP96-540	244	0	15	0	23		
2014	HO11-528	HOCP01-517	246	14	90	11	97		
2014	HO11-531	HOCP96-540	131	5	74	1	67		
2014	HO05-961	HOCP01-517	85	0	15	0	23		
2014			.	0	.	5	.		
2014			.	0	.	4	.		
2014	HOCP92-624	L99-233	359	4	36	0	23		

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2014	HOCP92-624	L04-425	509	18	70	8	85		
2014	L05-457	L99-233	375	22	91	9	91		
2014	L05-457	L04-425	259	7	63	3	77		
2014	HOCP92-624	L99-233	138	0	15	0	23		
2014	LCP81-010	L99-233	381	15	76	4	72		
2014	LCP81-010	LCP85-384	767	10	42	2	54		
2014	LCP85-384	HOCP00-950	187	5	62	0	23		
2014	L01-315	10P12	466	2	32	0	23		
2014	HOCP91-552	10P12	666	5	34	1	49		
2014	HOCP91-552	10P13	127	3	57	0	23		
2014	HOCP96-540	10P22	706	9	41	1	48		
2014	HO06-530	10P26	419	6	44	1	52		
2014	HOCP96-540	10P27	244	12	85	0	23		
2014	L94-432	10P31	112	0	15	0	23		
2014	L09-118	10P31	458	23	86	12	93		
2014	HOCP92-624	HOCP04-838	133	0	15	0	23		
2014	HOCP91-552	L99-233	135	0	15	0	23		
2014	N27	L99-233	1636	29	47	5	55		
2014	N27	L99-233	369	0	15	0	23		
2014	L01-315	11P7	172	0	15	0	23		
2014	L94-428	11P11	708	8	37	3	60		
2014	LCP85-384	11P15	1103	27	59	4	57		
2014	L09-112	HOCP96-540	235	0	15	0	23		
2014	HO09-827	HOCP01-523	154	2	41	0	23		
2014	LCP85-384	11P22	704	10	44	1	48		
2014	HOCP00-930	11P24	1224	52	79	17	81		
2014	L09-121	11P24	1012	12	40	3	55		
2014	L09-121	11P25	1135	4	31	2	50		
2014	LCP81-010	11P25	919	22	58	3	56		
2014	LCP81-010	L09-125	2063	78	73	2	46		
2014	HOCP96-540	11P27	557	11	51	0	23		
2014	HOL08-723	11P27	882	36	77	14	86		
2014	L94-433	11P27	241	0	15	0	23		
2014	HOCP96-540	11P30	602	0	15	0	23		
2014	LCP85-384	11P30	685	23	69	2	54		
2014	HO09-840	L08-090	375	8	55	0	23		
2014	N27	L99-233	252	3	40	0	23		
2014	N27	L99-233	691	2	30	0	23		
2014	L11-174	L99-226	134	6	82	1	66		
2014	HOCP91-552	12P11	618	0	15	0	23		

Table 6. Continue.

				1 st. Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2014	L10-148	12P17	186	0	15	0	23		
2014	HOCP91-552	L99-233	169	3	48	0	23		
2014	L05-448	13P10	170	0	15	0	23		
2014	HOCP92-624	HOCP92-618	112	11	97	0	23		
2014	HOCP95-951	HOCP92-618	184	6	68	1	62		
2014	L13-239	L07-057	443	4	35	0	23		
2014	HO09-9401	L99-233	171	5	64	1	63		
2014	L07-057	L99-233	374	40	98	3	68		
2014	HO09-9401	HOCP04-838	464	8	46	1	50		
2014	L12-232	HOCP04-838	370	12	68	4	74		
2014	HO09-9402	L11-191	618	22	71	11	89		
2014	HOCP04-838	L07-057	178	2	37	0	23		
2014	L05-457	HOCP11-504	1376	53	75	16	78		
2014	L05-457	L99-233	1806	37	52	6	56		
2014	HOCP92-624	HOCP91-552	227	7	66	0	23		
2014	HO09-9401	HOCP91-552	441	24	89	5	76		
2014	L13-234	L98-209	460	8	47	1	51		
2014	HOCP92-624	L07-057	896	20	55	2	51		
2014	L09-123	L05-448	1230	25	52	3	53		
2014	HOCP92-624	L99-233	1338	56	78	15	75		
2014	L09-123	HOCP11-548	434	8	49	3	65		
2014	L05-448	HOCP11-548	368	25	93	12	95		
2014	L05-457	L99-226	447	7	45	1	52		
2014	HOCP95-951	L01-299	242	12	86	1	59		
2014	L09-123	HOCP04-838	1057	37	70	12	77		
2014	HOCP97-609	HO06-563	392	9	56	0	23		
2014	L13-239	HO11-532	199	6	65	1	62		
2014	HOCP91-552	L199-226	224	11	85	6	93		
2014	HO06-563	L199-226	162	0	15	0	23		
2014	L99-233	L01-299	199	0	15	0	23		
2014	N27	L99-226	214	5	57	2	72		
2014	L05-457	L99-226	415	22	88	6	81		
2014	L13-251	HOCP92-624	172	16	96	13	99		
2014	L09-123	HOCP96-540	591	44	95	13	91		
2014	L11-172	HOCP96-540	687	6	34	3	61		
2014	HO10-937	L06-001	375	20	88	6	87		
2014	HO11-532	L11-172	349	15	80	3	71		
2014	L13-241	LCP85-384	964	44	83	9	71		
2014	L05-457	L09-099	437	30	94	2	61		
2014	L11-183	L13-261	236	5	54	0	23		

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2014	HOCP02-618	L99-233	476	40	96	12	92		
2014	L05-457	L99-226	477	16	69	3	64		
2014	L12-197	L99-226	438	18	78	7	86		
2014	HO10-937	HOCP96-540	178	7	75	2	76		
2014	HOCP92-624	L13-248	183	30	99	12	98		
2014	L13-261	14P2	1249	5	31	2	49		
2014	LCP85-384	14P2	664	29	80	10	83		
2014	HO12-9411	14P2	247	8	67	0	23		
2014	HOCP01-517	L06-001	212	3	43	0	23		
2014	HOCP01-517	L01-299	961	18	50	1	47		
2014	L13-239	L01-299	230	13	90	1	60		
2014	L13-237	L01-299	244	4	46	0	23		
2014	L01-283	L99-226	254	0	15	0	23		
2014	L12-218	L99-226	228	7	66	0	23		
2014	L12-197	L99-226	243	14	91	0	23		
2014	L98-209	HO11-556	190	0	15	0	23		
2014	L09-099	HOCP04-838	474	17	72	4	70		
2014	HOCP91-552	14P3	217	3	42	0	23		
2014	HOCP92-624	LCP85-384	1789	84	84	15	69		
2014	L01-283	HO12-615	222	6	63	4	90		
2014	HO08-709	L99-226	242	6	60	2	68		
2014	HO12-512	L81-010	479	19	76	6	78		
2014	HOCP96-561	HO09-832	235	5	54	2	70		
2014	HOCP95-951	HOCP96-540	224	4	48	3	80		
2014	L13-246	HOCP92-624	140	0	15	0	23		
2014	L01-299	L99-226	232	11	84	7	94		
2014	L98-207	L99-226	875	8	35	1	47		
2014	HOCP92-618	HOCP04-838	239	5	53	3	79		
2014	L01-299	L06-001	146	9	92	1	64		
2014	LCP85-384	L06-001	204	5	60	3	82		
2014	HOCP00-950	HOCP96-540	237	0	15	0	23		
2014	HOCP00-950	L06-001	228	23	97	8	96		
2014	HOCP85-845	L06-001	1500	56	72	27	90		
2014	HOCP92-624	L06-001	1535	55	71	24	84		
2014	HO07-613	L06-001	476	15	67	5	73		
2014	HO09-840	L06-001	1078	48	81	12	75		
2014	HO10-937	L06-001	479	9	51	4	69		
2014	HOCP92-624	HOCP96-540	1631	48	64	6	57		
2014	HOCP11-516	14P4	241	19	95	4	88		
2014	L13-246	HO12-9411	242	6	60	1	59		

Table 6. Continue.

				1 st. Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2014	L94-433	HOCP04-838	162	3	50	0	23		
2014	L13-254	HOCP96-540	116	3	62	3	92		
2014	L94-433	HOCP96-540	241	6	61	0	23		
Increase Stage									
2013	HO09-824	POLY12-26	106	0	9	0	14	0	22
2013	HO08-730	HOCP04-852	206	5	56	1	51	0	22
2013	HO08-709	CP06-2897	109	5	82	0	14	0	22
2013	HOCP09-846	HOCP09-814	220	0	9	0	14	0	22
2013	HOCP09-808	CP95-1039	234	7	67	1	44	0	22
2013	HO089-711	CP03-2390	223	2	32	1	47	0	22
2013	HOCP09-814	POLY12-30	109	3	65	1	66	0	22
2009	HOCP92-624	HOCP91-552	1078	75	93	7	56	1	46
2009	L05-457	HOCP91-552	145	12	95	2	77	0	22
2009	HOCP92-624	L98-207	689	6	31	2	40	0	22
2009	LCP81-010	L99-226	242	6	58	2	63	2	81
2009	HOCP92-624	L01-299	634	25	76	3	49	1	50
2009	L05-457	L01-299	458	22	84	4	64	4	82
2009	L05-457	L99-226	346	11	70	5	78	4	89
2009	HO06-563	HOCP96-540	217	10	83	2	66	2	83
2009	LCP81-010	L06-001	916	11	38	6	56	0	22
2009	N27	L94-428	238	6	59	0	14	0	22
2009	LCP81-010	L99-226	1674	0	9	0	14	0	22
2009	L05-448	L06-001	384	18	84	10	94	3	79
2009	HOCP02-610	L06-001	233	10	81	1	45	1	71
2009	HO06-563	L06-001	386	23	92	3	61	1	58
2009	HOCP02-610	HOCP01-523	1137	46	78	9	61	3	59
2009	HO06-563	L99-226	208	10	85	0	14	0	22
2009	LCP86-454	L06-001	632	27	80	12	89	5	80
2009	HOCP92-624	L06-001	204	10	87	5	93	4	94
2009	HOCP02-610	L94-428	390	8	51	0	14	0	22
2009	HOCP02-610	L94-432	620	7	36	5	62	1	51
2009	N27	L94-432	1848	41	53	8	46	3	51
2009	HOCP00-930	US01-040	234	0	9	0	14	0	22
2009	HOCP02-610	HO06-562	1136	35	68	11	67	4	64
2009	HOCP02-623	HO06-562	441	7	46	4	65	1	56
2009	HOCP05-902	L01-299	199	0	9	0	14	0	22
2009	HOCP05-918	L01-299	648	6	33	4	54	3	73
2009	HOCP04-838	HOCP92-618	871	12	43	2	35	0	22
2009	HOCP02-623	HOCP01-517	162	2	39	1	54	1	76

Table 6. Continue.

				1 st. Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2009	L05-457	HOCP01-517	429	6	44	1	35	1	56
2009	HOCP04-838	L08-089	413	0	9	0	14	0	22
2009	L01-315	L01-283	477	1	20	1	31	0	22
2009	HOCP92-624	HOCP01-517	1013	23	53	3	41	0	22
2009	L05-457	HOCP01-517	1662	3	19	1	29	0	22
2009	L98-207	HOCP01-517	668	9	41	5	59	4	75
2009	HOCP92-624	L99-226	823	14	48	1	30	1	48
2009	HOCP92-624	HOCP06-523	1237	13	34	6	51	4	63
2009	L05-457	HOCP06-523	946	7	26	2	33	1	46
2009	L01-283	HOCP06-523	394	5	41	1	38	1	57
2009	LCP81-010	HOCP05-918	630	24	74	7	71	2	62
2009	LCP81-010	L06-038	1527	70	82	36	92	16	87
2009	L01-315	HO06-523	694	5	25	1	30	0	22
2009	HOCP05-902	LCP86-454	142	3	51	0	14	0	22
2009	HOCP02-610	L06-038	703	16	54	8	71	5	77
2009	L01-315	L06-038	432	2	24	0	14	0	22
2009	L05-448	L06-038	542	22	79	7	74	2	66
2009	HO06-537	HOCP02-610	222	0	9	0	14	0	22
2009	L94-432	L08-076	1277	35	64	13	69	10	79
2009	HO05-961	HOCP96-540	436	10	55	6	76	2	72
2009	CP83-644	HOCP01-517	2094	13	25	5	36	3	48
2009	LCP81-010	HO06-523	1056	51	86	22	90	16	92
2009	CP83-644	HO06-562	457	1	21	1	33	1	53
2009	HOCP96-561	L94-426	646	14	52	5	60	2	61
2009	L05-448	LCP85-384	833	7	30	4	50	3	65
2009	CP83-644	LCP85-384	842	23	64	13	83	8	84
2009	HOCP96-561	LCP85-384	453	5	35	1	34	1	54
2009	US01-040	HOCP97-609	468	12	62	7	82	5	88
2009	LCP81-010	HOCP02-618	1488	46	69	17	72	4	60
2009	L99-233	L99-226	590	0	9	0	14	0	22
2009	CP83-644	L08-093	1422	51	74	15	69	6	70
2010	HOCP92-624	L09-106	206	8	75	3	79	2	85
2010	HOCP92-624	L99-233	864	29	71	23	95	10	90
2010	LCP81-010	HO08-706	581	20	72	9	84	2	64
2010	HOCP92-624	HO08-706	476	12	59	1	32	0	22
2010	HOCP04-838	L06-001	221	0	9	0	14	0	22
2010	N27	L06-001	811	43	90	6	58	3	66
2010	L99-226	L06-038	401	3	27	0	14	0	22
2010	N27	L99-226	494	35	94	2	42	0	22
2010	N27	L94-426	696	29	79	11	85	7	87

Table 6. Continue.

				1 st Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2010	N27	HOCP96-540	732	29	76	10	76	7	84
2010	HOCP91-552	HOCP02-623	485	4	28	2	43	1	52
2010	LCP81-010	HO07-613	469	12	61	10	91	1	53
2010	LCP81-010	HO08-706	408	8	49	1	37	0	22
2010	L01-283	10P29	462	23	87	6	74	4	82
2011	L07-057	HOCP91-552	226	1	23	1	46	0	22
2011	L08-090	11P2	625	2	22	0	14	0	22
2011	HOCP91-552	HOCP04-838	379	4	35	2	53	1	59
2011	LCP81-010	L10-132	166	15	97	8	98	5	97
2011	L01-315	HOCP95-951	265	0	9	0	14	0	22
2011	HOCP91-552	11P5	442	6	42	3	57	1	55
2011	LCP81-010	L99-226	133	13	98	2	82	2	92
2011	HOCP95-951	L01-299	116	0	9	0	14	0	22
2011	HOCP00-930	L99-226	220	6	63	3	75	3	91
2011	N27	L10-157	696	42	92	2	39	1	49
2011	LCP81-010	L09-125	776	19	57	4	52	3	67
2012	N27	L06-001	343	26	94	5	79	1	61
2012	HOCP95-951	L09-099	105	0	9	0	14	0	22
2012	HOCP91-552	12P11	1054	0	9	0	14	0	22
2012	HOCP91-552	12P12	118	0	9	0	14	0	22
2012	N27	L05-448	238	6	59	1	43	0	22
2012	CP83-644	L06-001	220	1	23	1	48	0	22
2012	L11-182	12P16	238	7	66	3	73	1	69
2013	HOCP92-624	L07-057	2883	67	56	31	70	13	71
2013	L10-138	L07-057	126	0	9	0	14	0	22
2013	HOCP92-624	HO11-556	432	6	43	0	14	0	22
2013	L99-233	HOCP04-838	152	0	9	0	14	0	22
2013	HO91-552	HOCP04-838	1138	18	46	3	38	1	45
2013	HOCP91-552	L99-233	918	2	20	0	14	0	22
2013	HO09-840	HOCP04-838	241	7	66	4	87	1	69
2013	L12-205	HOCP04-838	118	0	9	0	14	0	22
2013	HOCP11-544	13P3	185	10	91	5	96	2	89
2013	HOCP92-624	13P3	454	18	77	4	64	3	76
2013	LCP81-010	13P5	205	7	71	2	68	1	74
2013	HOCP85-845	L99-226	157	4	61	3	89	3	94
2013	HOCP91-552	L99-226	164	2	38	0	14	0	22
2013	HOCP01-517	L99-226	205	4	48	3	80	2	86
2013	HOCP01-517	HOCP96-540	227	8	73	7	97	6	97
2013	HOCP95-951	L11-172	247	2	28	1	42	0	22
2013	HOCP91-552	13P10	185	0	9	0	14	0	22

Table 6. Continue.

				1 st. Line		2 nd Line		Increases	
Series	Female	Male	Survive	No.	Rank Percentile	No.	Rank Percentile	No.	Rank Percentile
2013	HO10-937	13P10	172	9	89	8	97	6	99
2013	L09-123	HOCP91-552	106	9	96	2	88	0	22
2013	HOCP96-540	L99-233	1908	22	37	13	58	9	74
2013	HOCP96-540	LCP81-010	354	0	9	0	14	0	22
2013	L07-057	13P12	238	12	88	6	94	6	96
2013	US01-040	13P12	233	0	9	0	14	0	22
2013	HOCP01-552	L01-299	361	3	29	0	14	0	22
2013	HOCP92-624	L01-299	110	1	33	0	14	0	22
2013	L12-197	L01-299	245	4	47	4	87	1	68
2013	L12-197	L08-090	204	22	99	15	99	7	98
2013	HOCP96-540	13P12	249	5	50	4	86	4	93
2013	HOCP01-517	13P12	886	28	69	4	48	1	47
2013	HOCP91-552	L08-090	131	0	9	0	14	0	22
2013	L06-040	L99-226	116	0	9	0	14	0	22
2013	HOCP96-540	L99-226	475	0	9	0	14	0	22
2013	HOCP85-845	L99-233	162	2	39	1	54	0	22
2013	HOCP96-540	LCP85-384	184	0	9	0	14	0	22
2013	L99-226	L01-299	246	13	89	6	92	5	95
2013	HOCP91-552	L01-299	158	0	9	0	14	0	22
2013	HOCP92-624	13P19	127	12	97	2	84	0	22
2013	HOCP92-624	13P20	134	2	45	2	81	1	78
2013	HO07-613	13P21	234	0	9	0	14	0	22
2013	MISC	MISC	230	2	30	0	14	0	22

2017 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM NURSERY AND INFIELD VARIETY TRIALS

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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, L01-299, L01-283, HoCP04-838 and HoCP09-804 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 2017 season was marked by above average rainfall most of the year. Rainfall was above normal for all months of 2017 except for September, October and November where rainfall was below normal. Temperatures throughout the year were normal to above normal. The Louisiana industry was spared of any tropical activity during the 2017 season. On December 8, 2017, south Louisiana experienced a rare winter snow event, with parts of the state reporting 1 to 4.5 inches of snow. A hard freeze occurred in the first and third weeks of January 2018. The impact of the freezes were minimal because most processing was nearing an end. All mills in the Louisiana industry completed grinding by January 21, 2018. Recommended cultural practices were followed at all test locations.

The most widely grown varieties in Louisiana in 2017 were L01-299 and HoCP96-540 and, occupying 45% and 25 % 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. 2017 Location, soil texture, and planting and harvest dates for the nursery and infield tests.

					Harvest Date	Varieties	
Series	Location†	Stage	Soil Texture	Planting Date	2017	No. Planted	No. Harvested
2012	Blackberry Farms	Infield	Commerce silt loam	08/30/13	10/16/17	21	1
2012	Newton Cane, Inc	Nursery	Norwood silt loam	08/27/13	10/11/17	58	2
2012	Landry Farms	Nursery	Sharkey silty clay loam	08/22/13	10/11/17	58	2
2013	Iberia Research Station	Nursery	Baldwin silty clay	11/06/13	10/25/17	30	1
2013	Blackberry Farms	Infield	Commerce silt loam	08/26/14	10/16/17	34	3
2013	Donnie Vallot Farms	Infield	Patoutville silt loam	09/11/14	12/11/17	34	3
2013	Newton Cane, Inc.	Nursery	Norwood silt loam	08/20/14	10/11/17	67	5
2013	Michael Melancon	Nursery	Loreauville silt loam	08/22/14	11/09/17	67	5
2013	Landry Farms	Nursery	Sharkey silty clay loam	08/19/14	10/11/17	67	5
2014	Sugar Research Station	Nursery	Commerce silt loam	10/27/14	10/30/17	33	3
2014	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	10/30/14	11/14/17	33	3
2014	Iberia Research Station	Nursery	Baldwin silty clay	10/28/14	10/25/17	33	3
2014	Blackberry Farms	Infield	Commerce silt loam	08/25/15	10/16/17	36	7
2014	Donnie Vallot Farms	Infield	Patoutville silt loam	09/10/15	12/11/17	36	7
2014	Newton Cane, Inc.	Nursery	Norwood silt loam	08/11/15	11/29/17	77	10
2014	Michael Melancon	Nursery	Loreauville silt loam	09/01/15	11/09/17	77	10
2014	Landry Farms	Nursery	Sharkey silty clay loam	08/28/15	12/13/17	77	10
2015	Sugar Research Station	Nursery	Commerce silt loam	10/12/15	10/30/17	38	5
2015	Ardoyne Farm – U.S.D.A.	Nursery	Commerce silt loam	10/22/15	11/14/17	38	5
2015	Iberia Research Station	Nursery	Baldwin silty clay	10/15/15	10/25/17	38	5
2015	Blackberry Farms	Infield	Commerce silt loam	09/21/16	12/4/17	37	13
2015	Sugar Research Station	Infield	Commerce Silty Clay loam	09/30/16	11/16/17	37	13
2015	Newton Cane, Inc.	Nursery	Norwood silt loam	09/12/16	11/30/17	75	34
2015	Michael Melancon	Nursery	Loreauville silt loam	09/23/16	12/12/17	75	34
2015	Landry Farms	Nursery	Sharkey silty clay loam	08/25/16	12/13/17	75	34
2016	Sugar Research Station	Nursery	Commerce silt loam	11/07/16	11/29/17	34	18
2016	Ardoyne Farm – U.S.D.A.	Nursery	Commerce silt loam	11/14/16	12/13/17	34	18
2016	Iberia Research Station	Nursery	Baldwin silty clay	11/09/16	11/07/17	33	18
2016	Blackberry Farms	Infield	Commerce silt loam	09/06/17		47	
2016	Circle A Farm	Infield	Coteau-Patoutville-Frost silt loam	08/24/17		47	
2016	Newton Cane, Inc.	Nursery	Norwood silt loam	08/16/17		64	
2016	Michael Melancon	Nursery	Loreauville silt loam	08/18/17		64	
2016	Landry Farms	Nursery	Sharkey silty clay loam	09/08/17		64	
2017	Sugar Research Station	Nursery	Commerce silt loam	11/18/17		42	
2017	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	11/13/17		42	
2017	Iberia Research Station	Nursery	Baldwin silty clay	11/7/17		42	

† 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), Donnie Vallot Farm (Erath), Landry Farms (Paincourtville), and Circle A Farm (Maurice).

Table 2. Off-station nursery third-stubble means of the 2012 "L" and "Ho" assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2017.

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	6005	22.6	266	1.68	26862 -	11.3
L99-226	10270	36.1	281	2.05	35211 -	11.9
L01-283	12439	47.7	261	1.70	55721	12.5
L01-299	13386	48.3	275	1.59	60258	11.7
HoCP04-838	11466	43.7	263	1.88	46464	11.8
L12-201	9547	35.7	267	2.02	35393 -	10.9
Ho12-615	7970	31.7	253	1.36	46646	12.8
Ho12-630	9081	38.2	235	2.06	37208 -	10.7

Table 3. Off-station nursery third-stubble means of the 2012 "L" and "Ho" assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2017.

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	5970	24.7	241 -	1.68	--	12.0 -
L99-226	9879	35.1	282	1.83	--	13.4
L01-283	9727	38.6	252	1.64	--	12.1 -
L01-299	9856	36.5	270	1.39	--	13.3
HoCP04-838	9819	37.1	266	1.57	--	14.1
L12-201	10025	39.8	251	2.04	--	11.6 -
Ho12-615	8160	32.2	254	1.24	--	13.9
Ho12-630	8798	33.2	266	1.69	--	12.8

Table 4. Off-station nursery third-stubble means of the 2012 "L" and "Ho" assignment series across 2 locations (Newton and Westfield) in 2017.

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	5987 -	23.6 -	253	1.68	28223 -	11.6
L 99-226	10075	35.6	282	1.94 +	36663 -	12.7
L 01-283	11083	43.1	256	1.67	51365	12.3
L 01-299	11621	42.4	273	1.49	56537	12.5
HoCP 04-838	10642	40.4	264	1.73	46827 -	13.0
L 12-201	9786	37.8	259	2.03 +	37389 -	11.3
Ho 12-615	8065 -	31.9	253	1.30	49550	13.3
Ho 12-630	8940	35.7	250	1.87 +	37934 -	11.7

Table 5. Off-station nursery second-stubble means of the 2013 “L”, “Ho”, and “HoCP” assignment series on a Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2017.

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	5114	19.5	265	1.57	24866 -	12.7 -
L 01-283	10407	35.5	291	1.60	44286	12.9 -
L 01-299	9406	33.4	281	1.47	45557	13.6
HoCP 04-838	10090	36.6	276	1.77	41201	14.4 +
L 13-251	7459	28.4	261	2.13	26681 -	12.7 -
Ho 13-708	8619	30.7	281	2.09	29040 -	14.0
Ho 13-739	7696	28.4	271	1.87	30311 -	11.8 -
HoCP 13-740	6964	24.9	280	1.77	28133 -	12.0 -
HoCP 13-758	7768	28.9	270	1.71	33941 -	10.7 -

Table 6. Off-station nursery second-stubble means of the 2013 “L”, “Ho”, and “HoCP”, assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2017.

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	7534	28.1	268	1.67	33941	12.3
L 01-283	11651	44.8	261	1.47	59714	12.1
L 01-299	10222	37.3	274	1.49	50094	12.4
HoCP 04-838	15247	54.5	279	2.03	53724	12.8
L 13-251	11669	48.0	244 -	2.02	47553	12.0
Ho 13-708	10465	38.2	278	1.85	39930	12.9
Ho 13-739	14638	49.0	299 +	1.88	52091	11.7
HoCP 13-740	11501	45.5	253 -	1.72	52998	11.2
HoCP 13-758	16726	64.0	261	2.18	58988	11.4

Table 7. Off-station nursery second-stubble means of the 2013 “L”, “Ho”, and “HoCP” assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2017.

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	8103	31.8	255	1.72	37026 -	11.4 -
L 01-283	9811	35.8	274 +	1.35 -	52998	11.8
L 01-299	11339	44.6	255	1.84	48461	13.0
HoCP 04-838	11283	42.3	266 +	1.75	48279	12.8
L 13-251	11836	50.0	237 -	2.35 +	43016	11.9
Ho 13-708	12121	46.0	263 -	2.17	42290	13.2
Ho 13-739	13272	46.6	285 +	1.99	46827	11.8
HoCP 13-740	14545	53.9	270 +	1.73	62073 +	11.7
HoCP 13-758	10770	43.0	251	1.66	51546	10.3 -

Table 8. Off-station nursery second-stubble means of the 2013 “L”, “Ho”, and “HoCP” assignment series across 3 locations (Newton, Melancon and Westfield) in 2017.

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	6917	26.4	263	1.65	31944 -	12.1 -
L 01-283	10623	38.7	275	1.47	52333	12.3 -
L 01-299	10322	38.5	270	1.60	48037	13.0
HoCP 04-838	12207	44.5	274	1.85	47735	13.3
L 13-251	10321	42.2	247 -	2.17 +	39083	12.2 -
Ho 13-708	10401	38.3	274	2.04 +	37087 -	13.4
Ho 13-739	11869	41.3	285	1.91 +	43076	11.8 -
HoCP 13-740	11003	41.4	267	1.74	47735	11.6 -
HoCP 13-758	11754	45.3	261	1.85	48158	10.8 -

Table 9. Off-station nursery first-stubble means of the 2014 “L”, “Ho”, “HoCP” and “HoL”, assignment series on a Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2017.

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	4854 -	17.7 -	274	1.81	19602 -	11.8 -
L 01-283	9740	33.7	289 +	1.57	43016	12.9
L 01-299	10019	37.3	269	1.69	44286	13.8 +
HoCP 04-838	7360 -	27.5 -	268	1.69	32489 -	14.1 +
L 14-267	9027	32.9	275	2.06	32307 -	12.5
L 14-282	11768	42.0	280	1.97	42834	12.8
HoCP 14-802	9367	33.6	279	1.70	39930	13.4
HoCP 14-826	6733 -	24.0 -	280	1.76	27588 -	12.3
Ho 14-836	8384	30.1	278	1.41	42471	11.5 -
HoL 14-841	10416	37.8	275	1.76	42834	11.5 -
Ho 14-864	9968	36.2	275	1.80	40293	13.7 +
HoCP 14-867	8463	33.2	255 -	2.00	33396 -	12.7
HoCP 14-878	6870 -	25.6 -	269	1.75	29040 -	11.9 -
HoCP 14-885	9105	31.9	286 +	1.86	34304 -	11.4 -

Table 10. Off-station nursery first-stubble means of the 2014 “L”, “Ho”, “HoCP”, and “HoL” assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2017.

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	10677	40.9	262	2.17	37934 -	10.0 -
L 01-283	14344	53.1	271	1.93	54813	11.4
L 01-299	16927	60.1	282	1.93	62618	12.3
HoCP 04-838	18817	66.6	283	2.44	54632	14.7 +
L 14-267	13835	50.2	275	2.34	42834 -	11.3
L 14-282	14075	55.5	254	2.14	52091 -	11.2
HoCP 14-802	17352	61.5	281	2.14	56628	12.2
HoCP 14-826	15928	57.1	273	2.28	49550 -	12.2
Ho 14-836	11511	40.1	285	1.64	48642 -	10.0 -
HoL 14-841	12184	47.0	258	1.67	56084	9.7 -
Ho 14-864	14293	53.7	266	2.17	49731 -	12.4
HoCP 14-867	15978	58.9	271	2.40	49187 -	12.3
HoCP 14-878	12422	44.9	277	1.93	46646 -	11.2
HoCP 14-885	20124	76.2	261	2.42	62618	9.3 -

Table 11. Off-station nursery first-stubble means of the 2014 “L”, “Ho”, “HoCP”, and “HoL” assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	11807	43.6	271	2.07 +	42108	11.3 -
L 01-283	13019	47.7	274	1.95 +	48461	12.0
L 01-299	8615	31.1	277	1.45	42653	12.5
HoCP 04-838	12367	44.3	280	1.94 +	45920	13.4
L 14-267	15166	53.2	285	2.61 +	40838	11.1 -
L 14-282	13757	52.8	261	2.03 +	52272	10.7 -
HoCP 14-802	12262	41.0	299	1.73	47553	13.2
HoCP 14-826	12059	42.1	286	2.03 +	41564	12.3
Ho 14-836	10179	37.5	270	1.68	44831	10.3 -
HoL 14-841	12233	47.0	267	1.78	51728	10.8 -
Ho 14-864	13405	57.2	240	2.11 +	53724	12.4
HoCP 14-867	11117	45.4	243	1.98 +	45920	11.7
HoCP 14-878	12664	46.6	272	2.19 +	42471	11.8
HoCP 14-885	13043	47.1	277	2.10 +	44831	10.5 -

Table 12. Off-station nursery first-stubble means of the 2014 “L”, “Ho”, “HoCP”, and “HoL” assignment series across 3 locations (Newton, Melancon and Westfield) in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	9113	34.1	269	2.02 +	33215 -	11.0 -
L 01-283	12368	44.8	278	1.82	48763	12.1
L 01-299	11853	42.8	276	1.69	49852	12.9
HoCP 04-838	12848	46.1	277	2.02 +	44347	14.1 +
L 14-267	12676	45.4	278	2.33 +	38660 -	11.6 -
L 14-282	13200	50.1	265	2.04 +	49066	11.6 -
HoCP 14-802	12993	45.4	286	1.85	48037	12.9
HoCP 14-826	11573	41.1	280	2.02 +	39567 -	12.3
Ho 14-836	10025	35.9	278	1.58 -	45315	10.6 -
HoL 14-841	11611	43.9	267	1.73	50215	10.6 -
Ho 14-864	12555	49.1	260	2.03 +	47916	12.8
HoCP 14-867	11853	45.8	257 -	2.12 +	42834	12.2
HoCP 14-878	10652	39.0	272	1.96 +	39386 -	11.7 -
HoCP 14-885	14091	51.8	275	2.13 +	47251	10.4 -

Table 13. Off-station nursery plantcane means of the 2015 “L”, “Ho”, “HoCP”, “HoH” and “HoL”, assignment series on a Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	7732	29.6 -	265	2.30	25592 -	11.3 -
L 01-283	10118	38.1	266	2.01 -	38297	12.6
L 01-299	10840	43.4	249	2.64	33033	13.2
HoCP 04-838	13511	49.1	275 +	2.37	41564 +	14.2
HoCP 09-804	12714	43.3	293 +	2.01 -	43197 +	14.9 +
L 15-306	13690	49.7	275 +	2.18	45557 +	10.8 -
L 15-317	11934	43.5	274 +	2.62	33578	12.8
L 15-320	11026	41.5	267	2.18	37934	9.6 -
L 15-338	12384	47.0	264	2.40 -	39204	11.0 -
L 15-343	9229	35.9	257	1.94 -	37026	10.9 -
HoL 15-501	12835	43.4	296 +	2.20	39567	12.3
HoL 15-508	14027	49.4	284 +	2.59	38115	10.3 -
HoCP 15-510	12712	46.3	274 +	2.63	35937	12.1
HoL 15-511	12214	48.6	253	3.02	32126 -	11.1 -
HoCP 15-519	11761	41.7	282 +	2.25	37389	11.2 -
HoL 15-539	17127 +	59.3 +	289 +	2.30	51365 +	10.2 -
HoL 15-547	12820	45.8	280 +	2.34	39204	11.6 -
HoCP 15-548	13510	48.4	279 +	2.81	34485	11.1 -
HoCP 15-915	15324 +	53.6	286 +	2.93	36482	12.4
Ho 15-916	14168	51.0	278 +	2.27	45012 +	11.8
Ho 15-918	14594 +	51.3	284 +	3.22 +	31944 -	11.1 -
Ho 15-921	13221	48.3	274 +	2.32	41745 +	9.6 -
HoH 15-927	14681 +	54.0	272 +	2.29	47190 +	11.4 -
Ho 15-930	10057	44.6	226 -	2.71	32852	10.3 -
Ho 15-938	11105	42.5	260	1.97 -	43016 +	10.0 -
Ho 15-943	14115	48.6	290 +	2.15 -	45194	12.4
Ho 15-945	12961	48.6	267	2.56	37934	11.2 -
Ho 15-957	13614	56.4 +	242 -	2.68	41927 +	12.3
Ho 15-960	16005 +	57.7 +	278 +	2.63	44105 +	12.8
Ho 15-962	16682 +	59.4 +	283 +	2.65	45557 +	10.6 -
Ho 15-963	13010	49.2	268	2.75	35393	11.8
Ho 15-964	11439	40.3	284 +	2.07 -	39023	12.4
Ho 15-971	16636 +	59.1 +	282 +	2.55	45920 +	12.5
Ho 15-972	16386 +	60.1 +	273 +	2.28	52998 +	11.8
Ho 15-985	12970	47.5	275 +	2.23	42471 +	12.5
HoCP 15-986	12695	49.6	257	2.42	40112	11.9
HoCP 15-987	14499 +	53.7	270 +	2.98	36119	12.4
Ho 15-993	11460	41.0	280 +	2.04 -	40112	13.1
Ho 15-997	9582	37.2	257	1.84 -	40112	12.6

Table 14. Off-station nursery plantcane means of the 2015 “L”, “Ho”, “HoCP”, “HoH” and “HoL”, assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	11404	44.9	255	2.40	37571	10.6
L 01-283	12720	50.1	255	2.01	49913 +	10.8
L 01-299	10813	41.9	257	2.34	35756	12.5
HoCP 04-838	13535	52.3	256	1.87	56265 +	12.3
HoCP 09-804	9505	38.8	245	1.64 -	47916 +	11.3
L 15-306	12607	51.5	244	2.57	40293	10.5
L 15-317	12324	53.1	233	2.53	41927	10.8
L 15-320	7415	34.4	211	1.81 -	37934	7.2
L 15-338	12649	46.3	274	2.19	42834	10.7
L 15-343	12041	47.5	254	2.23	42653	9.8
HoL 15-501	13503	52.7	256	2.33	45194	11.0
HoL 15-508	12649	48.6	259	2.40	40838	10.0
HoCP 15-510	12139	44.5	271	2.56	34667	11.1
HoL 15-511	18487 +	70.7 +	261	2.98 +	47372	11.0
HoCP 15-519	10730	41.7	258	2.01	41564	10.1
HoL 15-539	11603	48.3	241	1.94	50639 +	9.4
HoL 15-547	13875	51.1	271	2.66	38297	9.7
HoCP 15-548	13222	48.9	270	2.54	38478	10.2
HoCP 15-915	16088 +	64.9 +	245	3.08 +	42108	10.5
Ho 15-916	13838	52.3	264	2.53	41382	11.5
Ho 15-918	12867	48.6	262	3.12 +	30129	9.8
Ho 15-921	10011	40.2	250	2.20	36482	8.5
HoH 15-927	10332	46.2	220	2.00	46101	8.7
Ho 15-930	8685	47.3	183	2.60	36300	8.1
Ho 15-938	8673	36.8	231	1.77 -	41564	9.3
Ho 15-943	13793	54.0	256	1.97	54632 +	10.6
Ho 15-945	12288	51.6	238	2.51	41201	10.3
Ho 15-957	12273	50.5	243	2.34	43016	11.1
Ho 15-960	13722	55.6	244	2.74	40475	11.2
Ho 15-962	14454	54.5	265	2.77	39567	10.5
Ho 15-963	14544	56.4	259	2.95 +	38115	11.9
Ho 15-964	11796	43.4	272	2.29	38297	12.1
Ho 15-971	21329 +	77.6 +	275	3.21 +	48098 +	11.4
Ho 15-972	8751	37.6	231	1.78 -	42290	10.0
Ho 15-985	12153	44.9	271	2.30	39023	12.4
HoCP 15-986	13282	57.6	231	2.39	48279 +	10.1
HoCP 15-987	16410 +	62.3 +	263	3.38 +	37026	10.6
Ho 15-993	11533	46.1	252	1.99	46464	10.9
Ho 15-997	11433	49.6	231	1.83 -	54450 +	10.3

Table 15. Off-station nursery plantcane means of the 2015 “L”, “Ho”, “HoCP”, “HoH” and “HoL”, assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	13242	47.8	277	2.30 +	42290	11.2
L 01-283	9967	38.1	261	1.61	48642	10.6 -
L 01-299	12314	44.9	274	1.73	51909	11.4
HoCP 04-838	16340	56.3	290	2.15	52635	12.7
HoCP 09-804	15786	54.5	290	1.85	58988	13.9 +
L 15-306	14490	55.8	260	2.42 +	45738	10.9
L 15-317	18560 +	71.5 +	261	2.60 +	55176	12.4
L 15-320	11288	45.1	248	1.99	46283	9.0 -
L 15-338	16791	62.4 +	268	2.13	59351	11.3
L 15-343	15319	61.3 +	250	2.33 +	52817	10.6
HoL 15-501	12257	45.8	269	2.28 +	40112	11.9
HoL 15-508	14695	55.6	264	2.32 +	48098	9.7 -
HoCP 15-510	16158	57.4	280	2.62 +	43742	11.1
HoL 15-511	16012	57.4	279	2.62 +	43379	11.8
HoCP 15-519	10596	47.0	220	1.83	52091	9.4 -
HoL 15-539	12966	53.1	244	1.79	60803	10.0
HoL 15-547	18613 +	63.9 +	291	2.35 +	54632	10.6
HoCP 15-548	17745 +	65.3 +	272	2.62 +	49913	10.6
HoCP 15-915	13833	51.4	270	2.36 +	43742	10.7
Ho 15-916	23238 +	83.6 +	279	2.79 +	59895	11.5
Ho 15-918	18193 +	65.5 +	278	3.04 +	43197	10.6
Ho 15-921	14624	54.9	267	1.92	57717	9.4 -
HoH 15-927	15711	54.5	288	2.08	52998	10.8
Ho 15-930	13532	54.2	251	2.45 +	44105	11.4
Ho 15-938	12571	49.2	255	1.50	65885 +	9.5 -
Ho 15-943	12341	44.0	280	1.64	53543	11.5
Ho 15-945	14665	57.8	254	2.51 +	46101	11.0
Ho 15-957	14026	52.1	269	2.29 +	45557	12.8
Ho 15-960	19788 +	73.6 +	269	2.75 +	53543	12.2
Ho 15-962	19075 +	70.3 +	272	2.78 +	50457	10.7
Ho 15-963	17981 +	67.5 +	267	2.82 +	47916	12.7
Ho 15-964	17050	60.8 +	280	2.68 +	45375	12.1
Ho 15-971	18910 +	70.7 +	263	2.56 +	54450	11.4
Ho 15-972	16109	59.3	272	2.10	56447	11.6
Ho 15-985	12436	45.3	275	2.22 +	40838	12.2
HoCP 15-986	13120	53.5	248	2.30 +	46464	11.7
HoCP 15-987	13979	51.4	272	2.37 +	44649	12.0
Ho 15-993	11989	45.0	266	1.87	48279	11.6
Ho 15-997	11454	49.0	233	1.89	51909	10.4

Table 16. Off-station nursery plantcane means of the 2015 “L”, “Ho”, “HoCP”, “HoH” and “HoL”, assignment series across 3 locations (Newton, Melancon and Westfield) in 2017.

Variety	Sugar per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	10793	40.8	266	2.33	35151	11.0 -
L 01-283	10935	42.1	260	1.87 -	45617	11.3 -
L 01-299	11322	43.4	260	2.23	40233	12.3
HoCP 04-838	14447	52.4	275	2.18	50155 +	13.1
HoCP 09-804	12668	45.5	276	1.83 -	50034 +	13.4 +
L 15-306	13595	52.3	260	2.39	43863	10.7 -
L 15-317	14273	56.1 +	256	2.58 +	43560	12.0
L 15-320	9910	40.4	242	1.99	40717	8.6 -
L 15-338	13941	51.9	269	2.24	47130	11.0 -
L 15-343	12197	48.2	254	2.16	44165	10.4 -
HoL 15-501	12865	47.3	274	2.27	41624	11.7
HoL 15-508	13790	51.2	269	2.44	42350	10.0 -
HoCP 15-510	13670	49.4	275	2.60 +	38115	11.4
HoL 15-511	15571 +	58.9 +	264	2.88 +	40959	11.3 -
HoCP 15-519	11029	43.5	253	2.03	43681	10.2 -
HoL 15-539	13899	53.6	258	2.01	54269 +	9.9 -
HoL 15-547	15103 +	53.6	280	2.45	44044	10.6 -
HoCP 15-548	14826 +	54.2	274	2.66 +	40959	10.6 -
HoCP 15-915	15081 +	56.6 +	267	2.79 +	40777	11.2 -
Ho 15-916	17081 +	62.3 +	274	2.53	48763 +	11.6
Ho 15-918	15417 +	55.9 +	275	3.13 +	35090	10.5 -
Ho 15-921	12618	47.8	264	2.15	45315	9.2 -
HoH 15-927	13574	51.5	260	2.12	48763 +	10.3 -
Ho 15-930	10758	48.7	220 -	2.59 +	37752	10.0 -
Ho 15-938	10783	42.9	249	1.75 -	50155 +	9.6 -
Ho 15-943	13416	48.9	275	1.92	51123 +	11.5
Ho 15-945	13305	52.6	253	2.52	41745	10.8 -
Ho 15-957	13304	53.0	252	2.44	43500	12.0
Ho 15-960	16505 +	62.3 +	264	2.71 +	46041	12.1
Ho 15-962	16737 +	61.4 +	273	2.73 +	45194	10.6 -
Ho 15-963	15178 +	57.7 +	265	2.84 +	40475	12.1
Ho 15-964	13428	48.2	278	2.34	40898	12.2
Ho 15-971	18958 +	69.1	273	2.77 +	49489 +	11.8
Ho 15-972	13749	52.3	258	2.05	50578 +	11.1 -
Ho 15-985	12520	45.9	273	2.25	40777	12.3
HoCP 15-986	13032	53.6	245	2.37	44952	11.2 -
HoCP 15-987	14963 +	55.8 +	268	2.91 +	39265	11.6
Ho 15-993	11661	44.0	266	1.96	44952	11.9
Ho 15-997	10823	45.3	240	1.85 -	48824	11.1 -

Table 17. On-station nursery third-stubble means of the 2013 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2017.

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	7571	28.3	268	2.13	26771 -	11.9
L 99-226	11163	40.4	279	2.16	36754 -	12.4
L 01-283	12319	46.8	264	1.55	59668	13.0
L 01-299	10766	40.6	265	1.90	42653 -	12.7
HoCP 04-838	12737	52.7	248	2.68	38569 -	12.3
L 13-251	7571	28.3	268	2.13	26771 -	11.9

Table 18. On-station nursery second-stubble means of the 2014 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2017.

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	8611 -	35.8 -	241 -	2.34 +	31082	12.8 -
L 01-283	11096	39.0	285 +	1.79	43560	13.8
L 01-299	11539	44.0	262	1.81	48778	14.6
HoCP 04-838	12923	48.9	265	2.18	44921	14.6
L 14-267	16369 +	57.7 +	284 +	2.44 +	47190	12.8 -
L 14-282	14183 +	51.7 +	274	2.22 +	46509	13.0 -

Table 19. On-station nursery second-stubble means of the 2014 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2017.

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	7625	29.7	256	1.78	33804	11.7
L 01-283	9169	36.5	252	1.44 -	50593	11.3 -
L 01-299	12781	49.1	261	1.85	52408	12.8
HoCP 04-838	13720	52.6	261	1.97	53316	13.5
L 14-267	12171	46.8	261	2.25 +	41518	12.2
L 14-282	8310	31.9	261	1.69	36981	11.4 -

Table 20. On-station nursery second-stubble means of the 2014 "L" assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2017.

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	10272	39.5	260	2.04 +	39023	12.9 -
L 01-283	9869	36.2	273	1.35	54450	12.5 -
L 01-299	11783	42.1	280	1.52	56038	14.0
HoCP 04-838	11110	41.6	267	1.60	52181	13.8
L 14-267	13215	48.5	272	2.24 +	43333	12.4 -
L 14-282	10840	40.3	269	1.72	46963	12.5 -

Table 21. On-station nursery second-stubble means of the 2014 "L" assignment series across 3 locations (St. Gabriel, Iberia and U.S.D.A- Ardoyne Farms) in 2017.

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	8836 -	35.0	253	2.05 +	34636 -	12.5 -
L 01-283	10045	37.2	270	1.53	49534	12.6 -
L 01-299	12034	45.1	268	1.73	52408	13.8
HoCP 04-838	12584	47.7	264	1.92	50139	14.0
L 14-267	13919	51.0	272	2.31 +	44014 -	12.5 -
L 14-282	11111	41.3	268	1.88	43484 -	12.3 -

Table 22. On-station nursery first-stubble means of the 2015 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2017.

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	11123	43.2	257	2.92	29948	12.9 -
L 01-283	12406	45.7	271	2.25	40838	13.4
L 01-299	12144	45.6	266	1.97	46963	14.4
HoCP 04-838	13049	49.9	261	2.22	44921	14.2
L 15-306	13320	49.0	270	2.23	43560	12.7 -
L 15-317	15090	56.0	270	2.82	40157	14.6
L 15-320	13019	49.8	262	2.23	49913	10.7 -
L 15-338	13286	48.8	272	2.30	42879	12.4 -
L 15-343	11751	42.5	276	2.05	41291	13.3 -

Table 23. On-station nursery first-stubble means of the 2015 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2017.

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	8683	35.8	243	1.76	41064	10.7 -
L 01-283	10540	42.9	246	1.77	48778	11.2 -
L 01-299	9715	40.5	241	1.89	42653	12.7
HoCP 04-838	7076	28.7	247	1.55	36981	12.8
L 15-306	11309	44.2	256 +	2.07	42653	11.1 -
L 15-317	10896	40.4	271 +	2.46	32216	12.8
L 15-320	7908	33.5	236	1.88	35393	9.6 -
L 15-338	7550	30.1	251	1.70	35619	10.9 -
L 15-343	8477	34.1	249	1.57	43333	10.8 -

Table 24. On-station nursery first-stubble means of the 2015 "L" assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2017.

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	12855	51.3	251	2.20 +	46509	13.1
L 01-283	12069	45.7	264	1.68	54450	12.8
L 01-299	11604	44.9	259	1.87	48098	13.5
HoCP 04-838	16323 +	62.1 +	262	2.33 +	53543	14.1
L 15-306	12949	48.9	265	1.89	51728	12.0 -
L 15-317	10867	43.8	251	2.05	42653	12.8
L 15-320	13197	50.6	261	2.02	50139	10.7
L 15-338	8668 -	42.4	207	1.88	44921	10.9 -
L 15-343	10030	40.6	248	1.91	42426	11.2 -

Table 25. On-station nursery first-stubble means of the 2015 "L" assignment series across 3 locations (St. Gabriel, Iberia and U.S.D.A. - Ardoyne Farms) in 2017.

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	10887	43.4	250	2.29	39174	12.2 -
L 01-283	11672	44.7	260	1.90	48022	12.5 -
L 01-299	11154	43.7	255	1.91	45904	13.5
HoCP 04-838	12149	46.9	257	2.04	45148	13.7
L 15-306	12526	47.4	263	2.06	45980	11.9 -
L 15-317	12284	46.7	264	2.44	38342	13.4
L 15-320	11374	44.6	253	2.04	45148	10.3 -
L 15-338	9835	40.4	243	1.96	41140	11.4 -
L 15-343	10086	39.0	258	1.84	42350	11.8 -

Table 26. On-station nursery plantcane means of the 2016 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2017.

Variety	Sugar Per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	12014	45.3	266	3.07 +	29494 -	12.1
L 01-283	11426	40.6	282	2.15	37888	12.7
L 01-299	12349	45.1	272	2.29	39249	13.3
HoCP 04-838	12656	46.8	270	2.69	34712	15.3 +
HoCP 09-804	11539	39.7	290 +	2.15	36981	13.8
L 16-348	8326 -	33.2	250 -	2.37	27906 -	11.5 -
L 16-350	9854	35.5	278	2.80 +	25183 -	12.1
L 16-352	8529 -	29.3	291 +	2.03	28813 -	13.0
L 16-353	11769	40.8	289	2.28	35846	12.5
L 16-354	11293	39.8	283	2.44	32670	12.2
L 16-355	9229	36.7	251 -	2.98 +	24503 -	9.4 -
L 16-358	12240	44.7	274	2.74 +	32670	12.2
L 16-360	14303	49.2	292 +	2.34	41745	12.5
L 16-372	15288	53.6	285	2.77 +	38796	10.4 -
L 16-373	11061	42.6	262	2.53	33804	13.5
L 16-375	13095	48.0	273	2.58	37208	13.6
L 16-376	8927 -	30.7	291 +	1.73 -	35619	11.1 -
L 16-377	13770	47.4	292 +	2.69	34939	14.0
L 16-380	11415	39.7	288	2.35	33804	12.7
L 16-381	11223	42.6	263	2.00	42879	11.5 -
L 16-386	14918	51.5	290	3.03 +	34031	13.4
L 16-388	11029	41.5	265	2.18	38115	12.0
L 16-391	11391	40.6	281	2.33	34939	12.9

Table 27. On-station nursery plantcane means of the 2016 “L” assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2017.

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	5290 -	22.6 -	236	2.06	21780 -	11.3
L 01-283	6817	27.1	255	1.95	27679	11.9
L 01-299	8469	35.2	240	2.19	32216	12.6
HoCP 04-838	8697	36.5	238	2.31	31536	13.7
HoCP 09-804	8283	32.5	255	1.91	33804	13.5
L 16-348	8271	34.2	242	2.02	34031	10.2 -
L 16-350	8495	33.6	253	2.89 +	23141	11.6
L 16-352	5939	23.2	259	1.85	25183	13.1
L 16-353	8192	32.4	252	2.28	28359	11.3
L 16-354	6821	28.3	241	2.54	22461 -	11.6
L 16-355	6513	26.4	246	2.18	24276	9.6 -
L 16-358	8781	35.7	246	2.63 +	27225	11.9
L 16-360	10204	38.3	266	2.15	35846	12.0
L 16-372	11612 +	45.7	254	2.38	38569	11.6
L 16-373	7463	32.6	229	2.05	32216	11.9
L 16-375	9595	38.5	249	2.32	33124	11.1 -
L 16-376	6323	26.3	240	1.88	27679	10.4 -
L 16-377	8973	33.9	265	2.48	27906	13.9
L 16-380	7088	28.2	251	2.11	26544	11.1 -
L 16-381	7916	33.1	239	2.06	32216	11.6
L 16-386	11109	42.0	266	2.71 +	30855	12.2
L 16-388	6529	26.8	244	1.73 -	31309	11.1 -
L 16-391	10218	40.9	249	2.12	38569	11.8

Table 28. On-station nursery plantcane means of the 2016 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2017.

Variety	Sugar Per Acre (lbs./A)	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP 96-540	12994	47.5	273	3.02 +	31536	12.1 -
L 01-283	10804	40.4	268	2.54	31763	11.8 -
L 01-299	10835	41.1	263	2.31	35619	14.5
HoCP 04-838	17080	62.7	272	2.81	44921	13.9
HoCP 09-804	11591	42.5	272	2.20	38796	14.0
L 16-348	10851	45.5	240	2.64	34485	9.5 -
L 16-350	12542	47.0	267	2.36	39584	12.9
L 16-352	10593	37.4	282	1.88	39930	12.9
L 16-353	15231	52.7	290	2.59	40611	12.3 -
L 16-354	10714	45.9	233	2.58	36300	10.8 -
L 16-355	13878	52.3	263	2.93 +	35393	9.8 -
L 16-358	14720	50.5	292	2.99 +	33804	12.3 -
L 16-360	14489	52.0	279	2.39	43560	12.1 -
L 16-372	13111	53.3	246	2.72	39249	9.3 -
L 16-373	11313	44.4	254	2.25	39930	13.1
L 16-375	15877	58.9	269	2.75	43106	12.7
L 16-376	9918	35.9	276	1.85 -	39249	11.0 -
L 16-377	14195	51.6	275	2.82	36300	14.1
L 16-380	16978	59.0	288	2.67	44468	12.2 -
L 16-381	12482	50.7	249	2.01	50139	11.6 -
L 16-386	16703	68.7	242	3.39 +	40384	11.5 -
L 16-388	12764	46.6	273	2.24	41745	11.9 -
L 16-391	10322	46.3	218	2.19	42199	12.3 -

Table 29. On-station nursery plantcane means of the 2016 “L” assignment series across 3 locations (St.Gabriel, Iberia and U.S.D.A. - Ardoyne Farms) in 2017.

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	10099	38.4	258	2.71 +	27603 -	11.8 -
L 01-283	9683	36.0	268	2.21	32443	12.1 -
L 01-299	10551	40.5	259	2.26	35695	13.4
HoCP 04-838	12811 +	48.7 +	260	2.60 +	37056	14.3
HoCP 09-804	10471	38.2	273	2.09	36527	13.8
L 16-348	9149	37.6	244	2.34	32141	10.4 -
L 16-350	10243	38.5	266	2.76 +	28077 -	12.1 -
L 16-352	8354	30.0 -	277	1.92 -	31309	13.0
L 16-353	11731	42.0	277	2.38	34939	12.0 -
L 16-354	9609	38.0	252	2.52	30477	11.6 -
L 16-355	9873	38.5	254	2.70 +	28057 -	9.6 -
L 16-358	11914	43.6	270	2.78 +	31233	12.2 -
L 16-360	12998 +	46.5	279 +	2.29	40384 +	12.2 -
L 16-372	13337 +	50.9 +	262	2.62 +	38871	10.5 -
L 16-373	9946	39.8	248	2.28	35317	12.8
L 16-375	12856 +	48.5 +	264	2.55	37813	12.4 -
L 16-376	8389	31.0 -	269	1.82 -	34183	10.8 -
L 16-377	12313	44.3	277	2.66 +	33048	14.0 +
L 16-380	11827	42.3	276	2.37	34939	12.0 -
L 16-381	10540	42.2	251	2.02	41745 +	11.6 -
L 16-386	14243 +	54.1 +	266	3.05 +	35090	12.4 -
L 16-388	10107	38.3	261	2.05	37056	11.7 -
L 16-391	10643	42.6	249	2.21	38569	12.3 -

2017 LOUISIANA VARIETY DEVELOPMENT PROGRAM INFIELD TRIALS

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The infield stage of variety development is the first stage in which yield estimates are based on plot weights instead of estimated yields derived from stalk population and stalk weight. 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 included two years after assignment. Infield trials are generally planted at three locations. In 2017, tests were planted at USDA's Ardoyne Farm in Schriever and commercial farms located in Vacherie and Maurice, LA 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 to estimate stalk weight and processed through the pre-breaker/press for an estimation of sucrose content and fiber content. Brix (% w/w) and pol reading (Z°) 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 TRS 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 11. Statistical analyses were done for each test and for each series 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 2017.

'Ho' Series	'L' Series	Location[1/]	Soil Series[2/]	Planting Date	Harvest Dates			
					2014	2015	2016	2017
2011	2012	BLK	Csl	8/30/13	11/19	10/19	10/13	10/16
2011	2012	VAL	Pasl	9/03/13	12/04	12/29	10/25	-
2012		AFH	Sc	9/25/14		11/24	10/21	10/18
2012	2013	BLK	Csl	8/26/14		12/16	10/13	10/16
2012	2013	VAL	Pasl	9/11/14		12/29	12/07	-
2013	2014	AFH	Sc	9/25/15			11/16	10/18
2013	2014	BLK	Csl	8/25/15			12/07	10/16
2013	2014	VAL	Pasl	9/10/15			12/07	-
2014		AFH	Sc	10/06/16				11/22
2014	2015	BLK	Csl	9/21/16				12/04
2015		AFH	Sc	8/23/17				
2015	2016	BLK	Csl	9/6/17				
2015	2016	CAF	Co	8/24/17				

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

[2/] Co = Coteau-Patoutville-Frost silt loam, Cm = Commerce silty clay loam, Csl = Commerce silt loam, Pasl = Patoutville silt loam, Sc = Sharkey clay.

Table 2. Infield third-stubble means of the 2012 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	11021	43.6	235	1.75	51496	14.5
HoCP 96-540	5512 -	26.7 -	206	1.78	31294 -	12.5
L 99-226	8605 -	33.8 -	255	2.15	32343 -	12.8
L 01-283	9892	40.8	243	1.43	57155	14.0
HoCP 04-838	6662 -	28.8 -	232	1.70	33901 -	12.8
L 12-201	9041	36.1 -	250	2.46	29377 -	13.5

Table 3. Infield second-stubble means of the 2012 “Ho” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	7920	33.4	238	1.67	40427	13.8
HoCP 96-540	7130	31.3	228	1.63	38565	12.8 -
L 01-283	7154	27.7	259 +	1.57	36324	13.6
HoCP 04-838	7262	31.6	229	1.37	47647	13.7
Ho 12-615	6586	27.0	244	1.19	45216	12.8 -
Ho 12-630	6872	31.4	219	1.76	35569	12.0 -

Table 4. Infield second-stubble means of the 2012 “Ho” and 2013 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	8441	37.4	226	1.45	51649	13.6
HoCP 96-540	7680	38.2	201 -	1.97 +	38900	12.8
L 01-283	7560	30.8	245 +	1.54	40033	12.9
HoCP 04-838	7131	30.7	232	1.21	51311	12.8
Ho 12-615	8864	38.2	233	1.44	53373	13.5
Ho 12-630	7330	31.4	234	1.51	41763	13.0
L 13-251	8099	35.9	225	1.91 +	38030	13.6

Table 5. Infield second-stubble means of the 2012 “Ho” assignment series across two locations (Ardoyne Farm and Blackberry Farms) in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	8180	35.4	232	1.56	46038	13.7
HoCP 96-540	7405	34.7	215	1.80	38732	12.8
L 01-283	7357	29.2	252	1.55	38179	13.3
HoCP 04-838	7197	31.2	231	1.29	49479	13.3
Ho 12-615	7725	32.6	239	1.31	49295	13.1
Ho 12-630	7101	31.4	226	1.63	38666	12.5

Table 6. Infield first-stubble means of the 2013 “Ho” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	6881	28.0	246	1.57	35775	14.2
HoCP 96-540	5735	25.3	222 -	1.97	25654	12.5 -
L 01-283	7293	27.7	264	1.63	34348	14.2
HoCP 04-838	6263	25.7	244	1.53	33657	14.5
Ho 11-573	6752	28.7	236	1.87	30711	13.5
Ho 13-708	6244	25.3	247	1.83	27643	15.6 +
Ho 13-739	7088	26.6	267	2.10	25509	12.0 -
HoCP 13-740	6455	27.5	236	1.72	32281	11.4 -
HoCP 13-758	5699	22.4	252	1.89	23931	11.0 -

Table 7. Infield first-stubble means of the 2013 “Ho” and 2014 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	9650	45.3	213	1.84	50720	12.5
HoCP 96-540	8972	44.1	203	2.26	38809	11.4
L 01-283	9800	39.6	247 +	1.66	48051	11.7
HoCP 04-838	11051	46.7	237 +	1.86	51701	12.3
Ho11-573	11182	45.0	248 +	2.76 +	32571	12.4
Ho 13-708	10626	48.9	217	2.38	41404	12.3
Ho 13-739	10997	43.9	250 +	2.18	40737	11.1
HoCP 13-740	8647	35.5	242 +	2.00	35229	11.4
HoCP 13-758	14064	54.4	258 +	2.45 +	44574	10.7
L 14-267	10203	42.6	239 +	2.26	37925	11.3
L 14-282	12145	53.9	225	1.89	57512	11.0

Table 8. Infield first-stubble means of the 2013 "Ho" assignment series across two locations (Ardoyne Farm and Blackberry Farms) in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	8265	36.6	230	1.70	43248	13.3
HoCP 96-540	7354	34.7	213	2.11	32231	12.0
L 01-283	8547	33.7	255	1.64	41200	12.9
HoCP 04-838	8657	36.2	240	1.69	42679	13.4
Ho 11-573	8967	36.9	242	2.31 +	31641	13.0
Ho 13-708	8435	37.1	232	2.10	34523	13.9
Ho 13-739	9043	35.2	258	2.14 +	33123	11.5 -
HoCP 13-740	7551	31.5	239	1.86	33755	11.4 -
HoCP 13-758	9882	38.4	255	2.17 +	34253	10.9 -

Table 9. Infield plant-cane means of the 2014 "Ho" assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	8731	35.0	249	2.35	29916	13.9
HoCP 96-540	8907	37.4	239	3.00	25006	12.2 -
L 01-283	7791	28.7	272	2.31	25050	13.8
HoCP 04-838	9633	37.9	253	2.58	29440	13.3
09-804	9573	35.4	270	2.25	31612	13.5
HoCP 14-802	10031	39.2	256	2.59	30419	15.1 +
HoCP 14-826	10815	39.7	272	3.00	26330	12.9 -
Ho 14-836	9787	35.5	276	2.54	27746	11.4 -
HoL 14-841	9305	34.3	275	2.66	25508	11.6 -
Ho 14-864	10530	41.5	254	2.73	31054	14.2
HoCP 14-867	10247	39.0	263	2.68	29283	12.3 -
HoCP 14-878	8166	31.6	258	2.82	22395	12.4 -
HoCP 14-885	11105	42.6	263	2.78	31729	10.4 -

Table 10. Infield plant-cane means of the 2014 “Ho” and 2015 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	9858	38.3	259	1.90	40186	12.4
HoCP 96-540	11595	46.9 +	247	2.57 +	36568	13.1
L 01-283	7813	30.8 -	253	1.80	34146	13.7
HoCP 04-838	9598	39.0	246	1.90	41901	14.1
HoCP 09-804	9063	34.4	263	1.63	42384	13.2
HoCP 14-802	11420	46.3 +	247	1.88	51199	15.9 +
HoCP 14-826	11344	41.8	272	2.73 +	30604	12.9
Ho 14-836	10102	36.4	277	2.01	37110	11.8
HoL 14-841	12527 +	44.0	285	1.61	54780 +	12.0
Ho 14-864	13441 +	53.8 +	251	1.99	54233 +	14.3
HoCP 14-867	12814 +	48.2 +	266	2.12	45529	13.6
HoCP 14-878	11454	42.8	268	2.53 +	33964	13.4
HoCP 14-885	16846 +	58.8 +	286	2.22	53161 +	11.8
L 15-306	11219	42.2	265	2.17	38905	12.7
L 15-317	10588	41.1	258	2.70 +	30815	14.7 +
L 15-320	10350	38.5	269	2.12	36370	11.2
L 15-338	10048	36.2	278	1.92	37959	11.8
L 15-343	8987	34.1	264	2.16	31629	12.3

Table 11. Infield plant-cane means of the 2014 “Ho” assignment series across two locations (Ardoyne Farm & Blackberry Farms) in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
L 01-299	9294	36.7	254	2.12	35051	13.2
HoCP 96-540	10251	42.1	243	2.79 +	30787	12.7
L 01-283	7802	29.7	263	2.06	29598	13.7
HoCP 04-838	9615	38.4	250	2.24	35671	13.7
HoCP 09-804	9318	34.9	267	1.94	36998	13.4
HoCP 14-802	10725	42.7	251	2.23	40809	15.5 +
HoCP 14-826	11079	40.7	272	2.87 +	28467	12.9
Ho 14-836	9944	35.9	276 +	2.27	32428	11.6 -
HoL 14-841	10916	39.1	280 +	2.13	40144	11.8 -
Ho 14-864	11986	47.6 +	252	2.36	42644	14.2
HoCP 14-867	11530	43.6	265	2.40	37406	13.0
HoCP 14-878	9810	37.2	263	2.67 +	28180	12.9
HoCP 14-885	13975 +	50.7 +	275 +	2.50 +	42445	11.1 -

2017 LOUISIANA "Ho" NURSERY VARIETY TRIALS

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In the USDA Sugarcane Research Unit's sugarcane variety program, promising experimental varieties are assigned permanent numbers three years after selection in the seedling stage. Varieties where both the cross and selection were done in Houma were assigned a prefix of "Ho". Varieties where a cross was made at the USDA facility in Canal Point, FL and selection was done in Houma have a "HoCP" prefix. Varieties where the cross was made at the LSU Sugar Research Station in St. Gabriel and selection was done in Houma, LA have a "HoL" prefix. These varieties are 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.

Nursery test plots are established during the year of assignment and planted in 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. 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 represent the different regions of the sugarcane belt.

In the spring and summer, researchers rate nursery test plots for yield traits such as population, stalk height, stalk diameter, erectness, etc. Mature, millable stalks are counted in each plot in late July or early August. A 10-stalk sample is hand-cut from plots of active varieties during the harvest season. Samples from USDA nurseries are analyzed at the Juice and Milling Quality Laboratory at the USDA Ardoyne Farm, where they are weighed to determine stalk weight and processed for sucrose analysis. Estimates of theoretical recoverable sugar (TRS) per ton of cane are calculated based on Brix (% w/w) and pol reading (Z°) values, while estimated yields of cane per acre, 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 and not 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 17. Statistical analyses were run for each test and for each crop 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 2017.

Series	Location[1/]	Soil Series [2/]	Planting Date	Harvest Dates 2014	2015	2016	2017
2013	AFH	Sc	11/06/13	12/11	11/05	10/20	10/11
2013	IRS	Bsc	11/13/13	11/24	11/04	10/26	10/13
2013	STG	Csl	11/08/13	12/10	12/15	10/27	10/27
2014	AFH	Sc	10/21/14		12/21	10/06	10/11
2014	IRS	Bsc	10/23/14		12/09	11/03	10/13
2014	STG	Csl	10/24/14		12/15	11/09	10/27
2015	AFH	Sc	10/21/15			11/21	10/24
2015	IRS	Bsc	10/23/15			11/29	11/08
2015	STG	Csl	11/13/15			12/09	12/12
2016	AFH	Sc	10/20/16				11/20
2016	IRS	Bsc	10/26/16				11/16
2016	STG	Csl	10/27/16				11/28
2017	AFH	Sc	10/20/17				
2017	IRS	Bsc	11/02/17				
2017	STG	Csl	10/27/17				

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

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

Table 2. Nursery third-stubble means of the 2013 "Ho" and "HoCP" assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	8190	27.0	303	1.31	41405
HoCP 96-540	6397	23.4	274 -	1.44	33578
L 99-226	7235	25.3	286	1.40	35960
L 01-283	8851	29.7	299	1.26	47190
HoCP 04-838	6548	22.5	292	1.27	35733
Ho 13-708	10561	35.0	300	1.77	39363
Ho 13-739	7921	25.9	305	1.45	35619
HoCP 13-740	6571	24.3	271 -	1.16	41972
HoCP 13-758	7299	25.3	288	1.40	35960

Table 3. Nursery third -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 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	8843	29.3	302	1.27	46850
HoCP 96-540	8733	31.2	279	1.51	41632
L 99-226	8966	33.0	275	1.87 +	35166
L 01-283	10922	41.7	259	1.56	55244
HoCP 04-838	9285	34.4	271	1.50	45715
Ho 13-708	11712	41.7	281	1.94 +	42993
Ho 13-739	14766	46.2	320	1.87 +	49459
HoCP 13-740	11196	41.0	273	1.38	59441
HoCP 13-758	12047	40.0	301	1.69 +	47190

Table 4. Nursery third -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 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	11693	39.4	297	1.38	58080
HoCP 96-540	8210	31.0	265	1.95	32216
L 99-226	14394	46.3	311	1.91	48892
L 01-283	11541	39.0	299	1.74	44468
HoCP 04-838	8757	29.8	292	1.29	45715
Ho 13-708	12374	40.3	307	1.91	42539
Ho 13-739	10332	33.7	307	1.70	39590
HoCP 13-740	12649	45.8	273	1.81	50480
HoCP 13-758	13319	44.5	298	1.67	52975

Table 5. Nursery third-stubble means of the 2013 "Ho" and "HoCP" assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	9575	31.9	301	1.32	48778
HoCP 96-540	7780	28.5	273 -	1.63 +	35808
L 99-226	10198	34.9	290	1.73 +	40006
L 01-283	10438	36.8	285	1.52	48967
HoCP 04-838	8197	28.9	285	1.35	42388
Ho 13-708	11549	39.0	296	1.87 +	41632
Ho 13-739	11006	35.2	311	1.67 +	41556
HoCP 13-740	10138	37.0	272 -	1.45	50631
HoCP 13-758	10888	36.6	296	1.59 +	45375

Table 6. Nursery second-stubble means of the 2014 "Ho" and "HoCP" assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	10255	35.4	288	1.60	43787
HoCP 96-540	8580	33.2	259 -	1.73	38569
L 01-283	8247	27.8	297	1.33	41745
HoCP 04-838	8609	29.4	293	1.16 -	51274
HoCP 14-802	11690	39.9	292	1.42	56038
HoCP 14-826	8855	30.2	293	1.75	34712
Ho 14-836	9190	29.8	308 +	1.23 -	48551
HoL 14-841	9871	33.7	293	1.48	45375
Ho 14-864	8747	31.9	279	1.43	40951
HoCP 14-867	8368	30.8	271 -	1.82	33691
HoCP 14-878	7734	28.1	276	1.38	40497
HoCP 14-885	10906	37.1	294	1.64	45148

Table 7. Nursery second-stubble means of the 2014 "Ho" and "HoCP" assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	14423	55.0	261	1.66	66134
HoCP 96-540	7557	32.7 -	233	1.70	38115 -
L 01-283	8497	30.5 -	278	1.54	39703 -
HoCP 04-838	8653	30.1 -	287	1.50	39703 -
HoCP 14-802	10649	44.5	239	1.42	62391
HoCP 14-826	10047	40.3 -	250	1.71	47190 -
Ho 14-836	7751	30.1 -	261	1.27	48098 -
HoL 14-841	12006	47.3	255	1.62	58874
Ho 14-864	12421	54.8	224	1.83	59895
HoCP 14-867	11714	41.4 -	283	1.77	46963 -
HoCP 14-878	11710	41.8 -	279	1.72	48892 -
HoCP 14-885	12159	46.0	265	2.03	46850 -
HoCP 16-685	11911	42.2 -	282	1.84	47077 -

Table 8. Nursery second-stubble 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 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	10880	37.7	288	1.39	54337
HoCP 96-540	12322	43.9	280	1.72	50933
L 01-283	10700	35.6	300	1.54	46283 -
HoCP 04-838	12236	40.4	303	1.47	54677
HoCP 14-802	15210	50.2	303	1.58	63525 +
HoCP 14-826	15374	49.5	310	1.89	52295
Ho 14-836	10428	33.4	313	1.30	51274
HoL 14-841	8817	30.6	288	1.16	52408
Ho 14-864	17671	60.4 +	287	1.71	69948 +
HoCP 14-867	10078	35.4	287	1.51	46283 -
HoCP 14-878	10711	39.7	271	1.52	51954
HoCP 14-885	12347	50.7	241	1.65	61823 +
HoCP 16-685	9483	34.6	271	1.50	45262 -

Table 9. Nursery second-stubble means of the 2014 “Ho” and “HoCP” assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	11852	42.7	279	1.55	54753
HoCP 96-540	9486	36.6	257	1.72	42539 -
L 01-283	9148	31.3 -	292	1.47	42577 -
HoCP 04-838	9833	33.3	294	1.38	48551
HoCP 14-802	12516	44.9	278	1.47	60651
HoCP 14-826	11425	40.0	284	1.78	44732 -
Ho 14-836	9123	31.1 -	294	1.27 -	49308
HoL 14-841	10231	37.2	278	1.42	52219
Ho 14-864	12300	47.7	261	1.64	55640
HoCP 14-867	10053	35.9	280	1.70	42312 -
HoCP 14-878	10052	36.5	275	1.54	47114
HoCP 14-885	11804	44.6	267	1.77	51274

Table 10. Nursery first-stubble means of the 2015 “Ho” and “HoCP” assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	10007	34.5	291	1.56	44468
HoCP 96-540	7058	27.2	257 -	1.95	25637 -
L 01-283	8870	29.8	298	1.73	34485 -
HoCP 04-838	6489 -	22.4 -	290	1.46	30628 -
HoL 15-501	9379	29.3	320 +	1.72	34031 -
HoL 15-508	13026	42.2	308	2.05	41064
HoCP 15-510	7595	26.0	292	1.78	29721 -
HoL 15-511	9196	32.3	285	2.23 +	29040 -
HoCP 15-519	7101	24.3	293	1.57	30968 -
HoL15-539	5650 -	20.6 -	273	1.25	33124 -
HoL 15-547	7771	25.8	301	1.58	32897 -
HoCP 15-548	7983	27.8	289	1.87	29721 -
HoCP 15-915	10789	39.1	274	2.57 +	30628 -
Ho 15-916	9657	33.9	284	2.17 +	31763 -
Ho 15-918	9464	31.1	304	2.07	30174 -
Ho 15-921	9470	33.8	278	1.76	38115
HoH 15-927	7554	25.6	294	1.43	35846 -
Ho 15-930	13221	42.9	308	3.09 +	27906 -
Ho 15-938	8884	30.9	289	1.59	38796
Ho 15-943	9964	32.5	306	1.79	36754
Ho 15-945	5328 -	18.9 -	281	1.55	24049 -
Ho 15-957	9570	34.6	277	1.75	39476
Ho 15-960	9467	32.6	291	2.01	32670 -
Ho 15-962	8430	29.6	285	1.90	31309 -
Ho 15-963	9591	34.2	281	1.93	35846 -
Ho 15-964	8839	29.5	300	1.86	31763 -
Ho 15-971	9348	32.6	287	1.90	34258 -
Ho 15-972	8455	29.7	284	1.56	38115
Ho 15-985	8435	29.3	288	1.67	35166 -
HoCP 15-986	9390	32.0	293	1.92	33351 -
HoCP 15-987	6934	24.8	279	1.81	27112 -
HoL 15-993	5893 -	19.4 -	302	1.42	26998 -
HoL 15-997	8017	29.9	269 -	1.53	38796

Table 11. Nursery first-stubble means of the 2015 “Ho” and “HoCP” assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	15866	55.2	289	2.07	53089
HoCP 96-540	14396	54.9	264 -	2.36	46169
L 01-283	12817	45.1	284	1.68	53656
HoCP 04-838	12129	42.9	281	1.96	43560
HoL 15-501	16374	53.1	308 +	2.58 +	41064 -
HoL 15-508	16232	54.8	296	2.01	54790
HoCP 15-510	15671	52.3	301	2.35	44468
HoL 15-511	12898	47.4	272 -	2.42	38682 -
HoCP 15-519	16317	55.6	292	2.06	53769
HoL15-539	13893	52.8	263 -	1.99	53202
HoL 15-547	13696	47.8	287	2.19	43787
HoCP 15-548	14602	50.8	286	2.30	44581
HoCP 15-915	18176	60.0	303	2.72 +	44127
Ho 15-916	17303	61.2	283	2.64 +	46396
Ho 15-918	14588	49.9	293	2.42	41291 -
Ho 15-921	14920	55.7	268 -	2.07	53883
HoH 15-927	12724	44.3	288	1.84	48211
Ho 15-930	17807	58.8	303	3.28 +	35960 -
Ho 15-938	15717	56.7	277	1.81	62731
Ho 15-943	15752	50.9	310 +	1.90	53656
Ho 15-945	14559	53.7	271 -	2.30	46396
Ho 15-957	16237	59.8	272 -	2.29	52295
Ho 15-960	13993	53.0	264 -	2.47	42879 -
Ho 15-962	14966	53.4	281	2.25	47417
Ho 15-963	15923	53.3	299	2.62 +	40724 -
Ho 15-964	13754	47.4	290	2.26	41972 -
Ho 15-971	15598	52.8	296	2.28	46283
Ho 15-972	17416	62.0	281	1.96	63752 +
Ho 15-985	15089	50.3	300	1.96	51501
HoCP 15-986	16279	58.4	278	2.58 +	45375
HoCP 15-987	16703	58.9	283	2.47	47417
HoL 15-993	15333	50.1	306 +	1.91	53656
HoL 15-997	14026	51.3	274	1.94	53089

Table 12. Nursery first-stubble means of the 2015 “Ho” and “HoCP” assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	12857	41.1	313	1.76	46623
HoCP 96-540	15427	51.1	302	2.71 +	37548
L 01-283	14683	45.6	321	1.97	45715
HoCP 04-838	13146	42.0	314	2.16	39136
HoL 15-501	15285	45.6	336 +	2.08	43787
HoL 15-508	18689 +	57.7 +	325	2.47 +	46736
HoCP 15-510	17225	53.8	320	2.53 +	42539
HoL 15-511	11274	36.3	310	2.14	34031 -
HoCP 15-519	15362	48.1	319	2.32 +	41632
HoL15-539	15176	51.2	297 -	2.17	47417
HoL 15-547	17631	54.7	324	2.36 +	46169
HoCP 15-548	19518 +	63.3 +	310	2.81 +	45262
HoCP 15-915	18988 +	61.3 +	309	2.93 +	42085
Ho 15-916	23099 +	73.7 +	313	2.83 +	52068
Ho 15-918	19567 +	62.3 +	314	3.32 +	37321
Ho 15-921	14384	47.4	302	1.92	49913
HoH 15-927	12264	41.3	298 -	2.28	36640 -
Ho 15-930	21987 +	68.2 +	323	3.61 +	37888
Ho 15-938	15475	48.1	322	2.09	46056
Ho 15-943	13941	43.2	323	2.03	42766
Ho 15-945	16385	53.9	304	2.69 +	40043
Ho 15-957	15922	51.8	308	2.20	47077
Ho 15-960	16707	54.2	309	2.33 +	46509
Ho 15-962	13274	42.6	312	2.24	38228
Ho 15-963	16496	54.5	303	2.64 +	41405
Ho 15-964	16788	52.8	317	2.22	47530
Ho 15-971	18473 +	57.5 +	321	2.56 +	45035
Ho 15-972	13541	44.0	308	1.84	47984
Ho 15-985	13064	41.3	317	1.83	45035
HoCP 15-986	14580	47.2	309	2.46 +	38342
HoCP 15-987	15969	51.8	308	2.45 +	42539
HoL 15-993	15918	49.6	320	2.25	44127
HoL 15-997	12447	41.2	302	1.69	48892

Table 13. Nursery first-stubble means of the 2015 “Ho” and “HoCP” assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2017.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	12910	43.6	297	1.79	48060
HoCP 96-540	12294	44.4	274 -	2.34 +	36451 -
L 01-283	12123	40.2	301	1.79	44619
HoCP 04-838	10588	35.8	295	1.86	37775 -
HoL 15-501	13679	42.7	321 +	2.13 +	39628 -
HoL 15-508	15982 +	51.6	310 +	2.17 +	47530
HoCP 15-510	13497	44.0	304	2.22 +	38909 -
HoL 15-511	11123	38.7	289	2.26 +	33918 -
HoCP 15-519	12927	42.7	302	1.98	42123
HoL15-539	11573	41.5	278 -	1.80	44581
HoL 15-547	13033	42.8	304	2.04	40951 -
HoCP 15-548	14034	47.3	295	2.33 +	39854 -
HoCP 15-915	15984 +	53.5 +	295	2.74 +	38947 -
Ho 15-916	16687 +	56.3 +	293	2.55 +	43409
Ho 15-918	14539	47.8	304	2.60 +	36262 -
Ho 15-921	12925	45.6	283 -	1.91	47303
HoH 15-927	10847	37.1	293	1.85	40233 -
Ho 15-930	17672 +	56.6 +	311 +	3.33 +	33918 -
Ho 15-938	13359	45.2	296	1.83	49194
Ho 15-943	13219	42.2	313 +	1.91	44392
Ho 15-945	12090	42.1	285 -	2.18 +	36829 -
Ho 15-957	13910	48.7	285 -	2.08	46283
Ho 15-960	13389	46.6	288	2.27 +	40686 -
Ho 15-962	12223	41.9	292	2.13 +	38985 -
Ho 15-963	14004	47.4	294	2.39 +	39325 -
Ho 15-964	13127	43.2	302	2.11 +	40422 -
Ho 15-971	14473	47.6	301	2.25 +	41858 -
Ho 15-972	13137	45.3	291	1.78	49950
Ho 15-985	12196	40.3	302	1.82	43900
HoCP 15-986	13416	45.9	294	2.32 +	39023 -
HoCP 15-987	13202	45.2	290	2.24 +	39023 -
HoL 15-993	12381	39.7	309 +	1.86	41594 -
HoL 15-997	11497	40.8	282 -	1.72	46925

Table 14. Nursery plant cane means of the 2016 “Ho” and “HoCP” assignment series on a Sharkey clay soil at the Ardoyne Farm in Schriever, LA in 2017.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	8479	28.5	298	2.16	26885
HoCP 96-540	9269	35.0	265 -	2.47	28586
L 01-283	9588	32.1	297	2.29	27792
HoCP 04-838	5738	20.2	281	2.61	17016 -
HoCP 09-804	9283	30.2	307	1.98	30628
Ho 16-600	12303 +	39.3	313	2.87 +	27225
Ho 16-601	13279 +	48.1 +	276 -	2.82 +	34031
Ho 16-603	10991	40.7	270 -	2.66	30628
Ho 16-605	10577	38.9	272 -	2.67	29153
Ho 16-606	12213 +	39.7	308	2.52	31649
Ho 16-607	11366	37.9	300	2.05	36981 +
Ho 16-608	14698 +	49.8 +	295	2.66	37548 +
Ho 16-609	10130	32.4	312	1.85	35052
Ho 16-610	10699	37.1	289	2.08	36867 +
Ho 16-617	10292	34.8	296	2.27	30742
Ho 16-619	8501	32.6	259 -	2.13	31195
Ho 16-621	11306	38.8	292	2.60	29834
Ho 16-622	13071 +	45.4 +	288	2.68	33918
Ho 16-624	10867	36.8	296	2.15	34372
Ho 16-626	11198	38.8	289	2.42	31989
Ho 16-627	11960	40.4	298	2.45	32330
Ho 16-628	8722	32.7	271 -	2.12	30628
Ho 16-631	14639 +	49.7 +	295	2.86 +	34825
Ho 16-632	10202	37.3	276 -	2.09	35506 +
Ho 16-635	11536	37.3	309	2.68	27792
Ho 16-636	10214	33.0	309	2.52	26204
Ho 16-638	11474	39.7	290	2.51	31536
Ho 16-639	8448	29.0	292	1.75	33124
Ho 16-641	11864	46.7 +	254 -	3.30 +	28246
Ho 16-645	6645	22.4	297	2.68	16789 -
Ho 16-646	10729	36.0	298	2.26	31876
Ho 16-647	8149	26.8	304	2.36	22688
Ho 16-648	12755 +	43.5 +	293	2.10	41405 +
Ho 16-649	14435 +	49.3 +	293	2.88	34258
Ho 16-650	7851	25.3	310	1.62	31536
Ho 16-651	10764	35.9	301	2.04	35393 +
Ho 16-652	10105	32.0	315	2.09	30742
Ho 16-653	12722 +	42.1 +	302	2.20	38228 +
Ho 16-654	9906	33.6	295	2.74	24503

Table 14. (Continued)

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
Ho 16-657	9147	30.6	300	2.27	26885
Ho 16-662	6833	23.9	286	1.66	28813
Ho 16-666	10261	34.6	297	2.51	27679
HoCP 16-669	9184	33.0	277 -	2.60	25523
HoCP 16-670	8997	32.6	276 -	2.29	28473
HoCP 16-672	10367	36.1	286	2.39	30288
HoCP 16-674	11936	41.2 +	290	2.98 +	28019
HoCP 16-675	9922	32.7	303	1.90	34372
Ho 16-677	7430	28.5	261 -	2.39	23822
Ho 16-678	10022	33.5	300	1.85	36300 +
Ho 16-680	11964	41.1	293	2.77 +	29494

Table 15. Nursery plant-cane means of the 2016 “Ho” and “HoCP” assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, LA in 2017.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
L 01-299	9886	35.8	277	2.27	31876
HoCP 96-540	10955	41.4	265	2.66	31309
L 01-283	10957	37.7	291	1.91	39590
HoCP 04-838	11575	41.0	283	2.00	41064
HoCP 09-804	11677	39.3	297	2.08	38342
Ho 16-600	16660	55.1	302	3.00 +	36754
Ho 16-601	12581	56.8	221 -	2.91 +	39136
Ho 16-603	13657	54.3	252	2.54	42766 +
Ho 16-605	12485	47.1	265	2.48	38115
Ho 16-606	15111	52.6	287	2.78 +	38002
Ho 16-607	14490	48.3	298	2.22	44127 +
Ho 16-608	13461	49.3	274	2.25	43787 +
Ho 16-609	13015	43.9	297	2.08	41972 +
Ho 16-610	12563	44.7	281	2.00	44694 +
Ho 16-617	11328	41.7	273	2.17	38228
Ho 16-619	11147	43.7	254	1.95	44808 +
Ho 16-621	11481	42.3	272	2.46	34485
Ho 16-622	11920	48.9	243 -	2.83 +	34598
Ho 16-624	12330	44.3	278	1.99	44694 +
Ho 16-626	14461	50.8	285	2.62	38909

Table 15. (Continued)

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
Ho 16-627	18789	66.5	283	3.36 +	39703
Ho 16-628	12192	44.8	272	2.47	36300
Ho 16-631	11429	40.9	279	2.80 +	28927
Ho 16-632	12264	46.3	266	2.19	42539 +
Ho 16-635	14453	47.7	303	2.57	37434
Ho 16-636	14476	46.9	308 +	2.64	35619
Ho 16-638	10564	38.8	272	2.24	34712
Ho 16-639	9929	35.2	282	1.86	38002
Ho 16-641	10581	47.7	225 -	3.28 +	29153
Ho 16-645	12552	44.8	280	2.20	40724
Ho 16-646	16204	57.1	284	2.58	44354 +
Ho 16-647	10738	40.3	267	2.86 +	28473
Ho 16-648	11326	40.1	283	2.11	38115
Ho 16-649	14202	50.4	282	2.80 +	36187
Ho 16-650	10861	37.5	290	1.84	40724
Ho 16-651	12016	44.4	271	2.27	39249
Ho 16-652	10748	38.4	279	2.38	32443
Ho 16-653	11923	46.1	260	2.16	42653 +
Ho 16-654	10799	43.7	246 -	2.94 +	30174
Ho 16-657	11691	41.1	285	2.23	36867
Ho 16-662	11191	40.8	276	2.22	36754
Ho 16-666	13898	49.5	281	2.82 +	35166
HoCP 16-669	12321	47.9	255	2.81 +	33804
HoCP 16-670	10593	48.9	216 -	2.75	35506
HoCP 16-672	11502	40.8	282	2.76	29607
HoCP 16-674	14582	54.5	266	2.65	40838
HoCP 16-675	12863	46.6	276	2.38	38796
Ho 16-677	12612	49.6	253	2.93 +	33691
Ho 16-678	14753	52.2	283	2.48	42199 +
Ho 16-680	15384	53.4	289	2.71	39363

Table 16. Nursery plant cane means of the 2016 “Ho” and “HoCP” assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, LA in 2017.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	9327	33.1	278	3.01	22347
HoCP 96-540	13592	48.2	282	3.09	31422
L 01-283	9423	32.6	290	2.22 -	29948
HoCP 04-838	10703	36.6	293	2.89	25297
HoCP 09-804	8723	29.6	295	2.44	24276
Ho 16-600	19160 +	62.0	309 +	3.51	34825
Ho 16-601	9941	40.8	244 -	3.30	24956
Ho 16-603	11074	42.3	261	3.24	26204
Ho 16-605	9939	40.7	242 -	2.86	30515
Ho 16-606	7511	29.7	256	2.46	24389
Ho 16-607	9656	35.6	275	2.28 -	30515
Ho 16-608	15638 +	54.9	285	3.01	36640
Ho 16-609	7773	25.6	304	2.13 -	24049
Ho 16-610	7045	25.7	276	2.45	20986
Ho 16-617	7198	26.4	272	2.51	20986
Ho 16-619	8863	36.5	256	2.36 -	30401
Ho 16-621	9931	35.2	284	2.92	23708
Ho 16-622	12424	45.3	274	3.32	27452
Ho 16-624	10882	39.3	280	3.02	25864
Ho 16-626	11865	42.0	283	2.89	29153
Ho 16-627	9412	38.8	240 -	3.47	24616
Ho 16-628	6687	24.1	274	2.46	19058
Ho 16-631	11652	40.6	286	3.21	25297
Ho 16-632	11139	42.0	264	2.68	31309
Ho 16-635	11689	38.9	300	2.71	28586
Ho 16-636	14529	47.4	307 +	3.25	29153
Ho 16-638	11535	42.1	275	2.66	31649
Ho 16-639	7821	30.0	260	2.38 -	25410
Ho 16-641	11657	49.4	237 -	3.93 +	25070
Ho 16-645	7868	26.6	298	2.34 -	21893
Ho 16-646	15874 +	58.2	273	3.05	38228
Ho 16-647	15159	52.1	291	3.61 +	28927
Ho 16-648	10175	36.0	286	2.31 -	31422
Ho 16-649	8543	30.7	280	3.11	19738
Ho 16-650	11425	37.4	306 +	2.45	30515
Ho 16-651	12273	44.6	275	2.68	33464
Ho 16-652	8193	27.7	305	2.50	21667
Ho 16-653	8379	30.8	283	2.40	24276
Ho 16-654	13374	53.1	253	3.81 +	27679

Table 16. (Continued)

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)	Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)
Ho 16-657	10922		38.6	283		2.84		27225
Ho 16-662	7662		30.6	248		1.97	-	29267
Ho 16-666	16270	+	57.4	284		3.31		34712
HoCP 16-669	8868		31.9	279		3.10		20532
HoCP 16-670	11403		44.8	255		3.36		26431
HoCP 16-672	10878		38.1	286		2.74		28019
HoCP 16-674	8501		35.3	239	-	2.78		25637
HoCP 16-675	8227		30.6	270		2.58		24049
Ho 16-677	11702		46.4	253		3.69		25070
Ho 16-678	11472		39.4	290		2.73		28700
Ho 16-680	10497		38.0	276		3.27		23822

Table 17. Nursery plant cane means of the 2016"Ho" and "HoCP" assignment series across locations (Ardoyne Farm, Iberia Research Station, & Sugar Research Station) in 2017.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
L 01-299	9231	32.4	284	2.48	27036
HoCP 96-540	11272	41.5	271	2.74	30439
L 01-283	9989	34.1	292	2.14	32443
HoCP 04-838	9339	32.6	286	2.50	27792
HoCP 09-804	9894	33.0	300	2.16	31082
Ho 16-600	16041 +	52.2 +	308 +	3.13 +	32935
Ho 16-601	11933	48.6 +	247 -	3.01 +	32708
Ho 16-603	11907	45.7 +	261 -	2.81	33199
Ho 16-605	11093	42.3	262 -	2.69	32594
Ho 16-606	11612	40.7	284	2.58	31347
Ho 16-607	11837	40.6	291	2.18	37208
Ho 16-608	14599 +	51.4 +	285	2.64	39325
Ho 16-609	10306	34.0	304 +	2.02 -	33691
Ho 16-610	10102	35.8	282	2.17	34183
Ho 16-617	9606	34.3	280	2.31	29985
Ho 16-619	9504	37.6	257 -	2.14	35468
Ho 16-621	10906	38.7	283	2.66	29343
Ho 16-622	12472 +	46.6 +	268	2.94 +	31989
Ho 16-624	11360	40.1	284	2.39	34977
Ho 16-626	12508 +	43.9 +	286	2.64	33351
Ho 16-627	13961 +	50.2 +	279	3.08 +	32216
Ho 16-628	9200	33.9	272	2.35	28662
Ho 16-631	12573	43.7 +	287	2.95 +	29683
Ho 16-632	11202	41.9	269	2.32	36451
Ho 16-635	12559	41.3	304 +	2.65	31271
Ho 16-636	13073	42.5	308 +	2.80	30326
Ho 16-638	11191	40.2	279	2.47	32632
Ho 16-639	8733	31.4	278	1.99 -	32178
Ho 16-641	11367	47.9 +	239 -	3.50 +	27490
Ho 16-645	9022	31.3	292	2.41	26469
Ho 16-646	14269 +	50.4 +	285	2.63	38153
Ho 16-647	11349	39.8	287	2.94 +	26696
Ho 16-648	11419	39.9	287	2.17	36981
Ho 16-649	12393 +	43.5 +	285	2.93 +	30061
Ho 16-650	10046	33.4	302 +	1.97 -	34258
Ho 16-651	11684	41.6	282	2.33	36035
Ho 16-652	9682	32.7	300	2.32	28284
Ho 16-653	11008	39.6	282	2.25	35052
Ho 16-654	11359	43.4 +	264 -	3.16 +	27452

Table 17. (Continued)

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
Ho 16-657	10587	36.8	289	2.45	30326
Ho 16-662	8629	31.8	273	2.00 -	31611
Ho 16-666	13476 +	47.2 +	287	2.88 +	32519
HoCP 16-669	10124	37.6	270	2.83 +	26620
HoCP 16-670	10331	42.1	249 -	2.80	30137
HoCP 16-672	10916	38.4	285	2.63	29305
HoCP 16-674	11673	43.7 +	265 -	2.80	31498
HoCP 16-675	10338	36.6	283	2.29	32405
Ho 16-677	10581	41.5	256 -	3.00 +	27528
Ho 16-678	12082	41.7	291	2.35	35733 +
Ho 16-680	12615 +	44.1 +	286	2.92 +	30893

2017 LOUISIANA SUGARCANE VARIETY DEVELOPMENT PROGRAM OUTFIELD VARIETY TRIALS

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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 2017 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 2017 were HoCP96-540 and L01-299, occupying 25% and 45% 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.

Thirty-four experimental varieties representing the 2015 assignment series were introduced to outfield locations for seed increase in 2017 (Table 1). Twenty experimental and five commercial varieties were planted at 12 outfield locations. Thirty-seven tests were harvested in 2017 including eleven plantcane, eleven first-stubble, eleven second-stubble, and four 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 Louisiana sugar industry was not directly impacted by tropical activity during 2017. However, the industry did receive high rainfall amounts from the remnants of Hurricane Harvey. The industry experienced mostly favorable conditions for much of the remainder of the harvest season. On December 8, 2017, south Louisiana experienced a rare winter snow event, with parts of the state reporting 1 to 4.5 inches of snow. A hard freeze occurred in the first and third weeks of January 2018. The impact of the freezes were minimal because most processing was nearing an end. All mills in the Louisiana industry completed grinding by January 21, 2018.

Experimental variety L 11-183 was harvested in plant cane through second stubble tests in the outfield testing stage and is eligible for release in 2018. Experimental varieties L 12-201, Ho 12-615 and Ho 12-630 were harvested in plant cane and first stubble and are eligible for release in 2019.

Acknowledgments

The assistance of Lawrence "Junior" Lovell from the USDA-ARS Sugarcane Research Unit is greatly appreciated. Sincere appreciation is expressed to the growers who participate in the many different stages of the Louisiana sugarcane variety improvement program. The continued advancement of the Louisiana sugarcane industry depends on the dedication and commitment of many individuals throughout the industry.

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 2017.

Commercial Varieties	Experimental Varieties			Experimental Varieties Introduced to the Outfield				
HoCP96-540	L11-183	Ho13-739	Ho14-836	L15-306	HoCP15-510	Ho15-916	Ho15-945	Ho15-972
L01-283	Ho11-573	HoCP13-740	HoL14-841	L15-317	HoL15-511	Ho15-918	Ho15-957	Ho15-985
L01-299	L12-201	HoCP13-758	Ho14-864	L15-320	HoCP15-519	Ho15-921	Ho15-960	HoCP15-986
HoCP04-838	Ho12-615	L14-267	HoCP14-867	L15-338	HoL15-539	HoH15-927	Ho15-962	HoCP15-987
HoCP09-804	Ho12-630	L14-282	HoCP14-878	L15-343	HoL15-547	Ho15-930	Ho15-963	HoL15-993
	L13-251	HoCP14-802	HoCP14-885	HoL15-501	HoCP15-548	Ho15-938	Ho15-964	HoL15-997
	Ho13-708	HoCP14-826		HoL15-508	HoCP15-915	Ho15-943	Ho15-971	

Table 2. Harvest and planting dates for all outfield locations harvested in 2017.

Location	Parish	Plantcane			First-stubble		Second-stubble		Third-stubble	
		2017 Planting Date	2017 Harvest Date	2016 Planting Date	2017 Harvest Date	2015 Planting Date	2017 Harvest Date	2014 Planting Date	2017 Harvest Date	2013 Planting Date
Al Landry	Iberville	09/13	**	09/28	12/27	09/02	10/05	08/27	10/05	09/06
Allains	St. Mary	09/21	12/04	10/11	12/04	09/23	12/04	10/13	**	09/19
Alma	Pointe Coupee	09/20	11/13	10/04	09/26	09/08	11/13	10/09	09/26	08/28
Bon Secour	St. James	*	**	*	**	*	**	09/09	**	08/29
Brunswick	Pointe Coupee	09/22	11/27	09/19	11/27	09/09	10/04	09/17	10/04	09/04
Frank Martin	St. Mary	*	11/08	09/27	10/30	08/14	10/30	10/08	**	10/05
Glenwood	Assumption	08/24	12/13	09/21	10/17	09/16	10/17	10/07	**	08/23
Harper Farms	Rapides	09/18	11/20	09/16	**	*	**	*	**	*
Lanaux	St. John	09/07	12/11	08/31	12/11	08/19	10/13	08/25	**	09/10
Levert-St. John	St. Martin	09/08	12/14	09/20	11/09	09/15	11/09	09/10	**	09/03
Magnolia	Terrebonne	09/11	11/09	10/01	11/09	09/17	10/06	10/27	**	11/05
Mary	Lafourche	09/28	11/28	10/10	11/28	10/08	11/28	10/28	**	09/17
Ronald Hebert	Iberia	09/14	11/30	08/25	11/29	09/01	11/30	09/29	11/29	09/05

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

Table 3. Plantcane sugar per acre for six commercial and nine experimental varieties at eleven outfield locations in 2017.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Brunswick	Glenwood	Harper	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(lbs./A)											
HoCP96-540	9988 +	9016	7858	1006	8990 +	9107	10891	9575	11146 +	11271	10173	9825 +
L01-283	9591	8402	7316	9435	7881	8971	11226	10445	9186	9793 -	9928	9289
L01-299	8233	7847	5912	8262	7511	8645	10633	9778	9654	11274	10009	8887
HoCP04-838	8995	8394	6281	9014	8094	9714	12386	10588	9773	11295	12013 +	9686 +
Ho07-613	9470	7567	6590	9615	8968 +	8518	11649	10523	10033	9970	10319	9384
HoCP09-804	7972	7856	8120	8239	9760 +	8718	13690 +	11068	10926	12299	10000	9877 +
L11-183	9181	1010 +	9388 +	9469	9438 +	10297	13563 +	11512 +	12225 +	13809 +	11172	10924 +
L12-201	9283	7597	8728 +	9893	9463 +	9073	12285	9895	10922	12061	11443	10058 +
Ho12-615	8372	9615 +	8089	1006	10894 +	9473	13817 +	12720 +	10951	12555	12535 +	10826 +
Ho12-630	1037 +	8111	7748	9346	9070 +	8641	12701	10580	11127 +	11377	11494	10053 +
L13-251	9779	9517 +	8139	9336	9554 +	10058	12795 +	10319	11597 +	12897 +	11350	10486 +
Ho13-708	9037	8440	5944	9795	10646 +	9718	14225 +	11570 +	10924	11160	11112	10234 +
Ho13-739	8713	8064	7346	8380	8007	9687	12237	10968	9769	11071	10392	9512
HoCP13-740	8886	9638 +	6019	9437	7843	9508	12485	10585	8931	12170	7791 -	9390
HoCP13-758	1126 +	1033 +	10358 +	9432	9763 +	11104	14848 +	12081 +	12811 +	12176	13812 +	11635 +

Table 4. Plantcane cane yield for six commercial and nine experimental varieties at eleven outfield locations in 2017.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Brunswick	Glenwood	Harper	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(tons/A)											
HoCP96-540	34.3 +	33.8 +	29.4 +	37.1	31.0 +	36.8 +	37.4	35.4	37.9 +	40.4	35.2	35.3 +
L01-283	31.8	28.1	22.8	30.7	25.1	29.6	37.1	35.8	28.9	34.8	34.0	30.8
L01-299	27.7	28.7	19.5	28.6	25.1	31.9	38.0	35.0	31.0	38.0	36.1	30.9
HoCP04-838	31.1	30.5	21.4	32.0	27.6	34.3	42.5	38.1	31.7	39.1	41.6 +	33.6 +
Ho07-613	31.0	27.3	22.4	32.6	29.7	29.6	39.4	37.3	31.9	35.6	35.6	32.0
HoCP09-804	26.6	29.0	27.0	30.1	31.8 +	32.8	46.1 +	40.2 +	35.7 +	44.1 +	34.4	34.3 +
L11-183	31.6	37.2 +	33.2 +	34.4	33.9 +	37.1 +	50.2 +	44.3 +	40.2 +	50.7 +	41.7 +	39.5 +
L12-201	31.5	28.8	29.2 +	35.3	32.2 +	33.0	41.3	34.7	35.0	43.1 +	37.3	34.7 +
Ho12-615	28.4	35.2 +	27.7	35.2	35.6 +	34.5	46.8 +	48.1 +	36.0 +	45.3 +	44.0 +	37.9 +
Ho12-630	33.7 +	30.0	24.9	32.4	28.7	29.9	43.0	38.0	34.4	40.4	38.2	34.0 +
L13-251	33.8 +	35.8 +	28.0	36.0	33.0 +	34.8	46.4 +	40.0 +	38.1 +	47.4 +	40.4	37.6 +
Ho13-708	30.8	31.9	20.7	34.5	35.1 +	33.8	49.6 +	42.8 +	35.2	38.7	38.9	35.7 +
Ho13-739	28.4	27.9	23.7	28.2	26.1	32.9	40.9	38.4	31.6	40.6	34.9	32.1
HoCP13-740	29.1	34.8 +	22.1	31.6	26.3	32.4	40.3	35.9	29.9	41.6	33.3	32.5
HoCP13-758	38.1 +	36.5 +	32.3 +	31.2	32.4 +	36.8 +	48.0 +	42.8 +	39.6 +	41.7	44.3 +	38.5 +

Table 5. Plantcane sugar per ton for six commercial and nine experimental varieties at eleven outfield locations in 2017.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Brunswick	Glenwood	Harper	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(lbs./tons)											
HoCP96-540	292	266	268 -	271 -	291	247 -	291	270	293	279 -	289	278 -
L01-283	302	299	321 +	307 +	314	303 +	302 +	292	318	281 -	292	303 +
L01-299	297	273	303	289	299	271	280	280	312	297	279	289
HoCP04-838	289	275	293	282	293	283	291	277	308	289	288	288
Ho07-613	306	278	294	295	302	287	296	282	314	280 -	290	293
HoCP09-804	300	272	301	273 -	306	266	297	276	306	279 -	291	288
L11-183	290	272	282 -	276 -	278 -	276	269	260 -	304	272 -	268	277 -
L12-201	295	264	298	280	294	275	298	286	312	280 -	307	290
Ho12-615	295	273	292	286	307	275	295	264	304	277 -	284	287
Ho12-630	307	270	310 +	289	316	287	296	279	324	282	301	296
L13-251	290	265	291	260 -	289	290	275	258 -	305	272 -	281	280 -
Ho13-708	293	264	288	283	304	286	286	271	310	289	286	287
Ho13-739	307	288	310	298	307	294 +	299	285	309	273 -	298	297 +
HoCP13-740	306	276	274 -	299	299	294 +	309 +	295	300	293	235	289
HoCP13-758	295	283	321 +	301	301	301 +	309 +	282	323	292	312	302 +

Table 6. Plantcane stalk weight for six commercial and nine experimental varieties at eleven outfield locations in 2017.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Brunswick	Glenwood	Harper	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(lbs)											
HoCP96-540	2.15	2.63	2.72	3.25 +	2.96 +	3.50 +	2.78	3.14	2.64 +	3.04 +	2.41	2.84 +
L01-283	2.46	1.95	1.88	2.16	1.96	2.09	2.06 -	2.27	1.74	1.94	2.43	2.09 -
L01-299	2.08	2.42	2.29	2.49	1.95	2.65	2.78	2.73	1.75	2.19	2.56	2.35
HoCP04-838	2.29	2.49	2.13	2.34	2.16	2.25	2.44	2.57	2.19 +	2.23	2.42	2.32
Ho07-613	2.03	2.00	2.09	2.09	2.12	1.95 -	2.67	2.22 -	1.58	1.79 -	1.67 -	2.02 -
HoCP09-804	2.28	2.61	2.50	2.56	2.55	2.60	2.32	2.75	2.39 +	2.34 +	2.40	2.48
L11-183	3.26 +	3.32 +	3.32 +	3.47 +	3.54 +	3.03	4.07 +	3.66 +	3.15 +	3.79 +	3.58 +	3.47 +
L12-201	2.68 +	3.47 +	2.84	3.63 +	3.60 +	3.17	3.18	3.12	3.09 +	3.04 +	3.05 +	3.17 +
Ho12-615	1.92	2.27	1.85	2.17	2.11	2.31	2.23	2.42	1.85	2.08	2.20	2.13 -
Ho12-630	2.73 +	2.88	2.62	3.03 +	2.62	2.62	2.50	2.51	2.26 +	2.41	2.57	2.61 +
L13-251	3.39 +	3.11 +	3.11 +	3.37 +	3.58 +	2.80	2.95	3.14	2.63 +	2.74 +	2.94	3.07 +
Ho13-708	2.66 +	3.39 +	2.93	3.17 +	3.32 +	2.77	3.07	3.22 +	2.70 +	3.19 +	3.35 +	3.07 +
Ho13-739	2.46	2.61	2.66	2.86	2.72 +	2.44	2.98	3.07	2.35 +	2.93 +	2.51	2.69 +
HoCP13-740	2.38	2.44	2.40	2.44	2.40	2.36	2.30	2.91	2.15 +	1.96	2.37	2.37
HoCP13-758	3.09 +	3.18 +	2.59	2.44	2.90 +	2.97	2.92	2.82	2.36 +	2.65 +	2.91	2.80 +

Table 7. Plantcane stalk number for six commercial and nine experimental varieties at eleven outfield locations in 2017.

	Heavy					Light						
Variety	Allains	Alma	Frank Martin	Magnolia	Mary	Brunswick	Glenwood	Harper	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(stalks/A)											
HoCP96-540	32320	25755	21830	22871	21817	21255	27288	22529	28791 -	26927 -	29238	25511
L01-283	25687	29633	24135	28538	25881	27181	36093	31558	33445	36236	28518	29748 +
L01-299	26713	24148	17050	23307	25860	24509	27356	25809	36287	35640	28522	26837
HoCP04-838	27553	24769	20310	27363	25689	30610	35650	29738	29012 -	35598	34386	29153
Ho07-613	32120	27345	21759	31343 +	28073	30543	29553	33895 +	40660	40090	43231 +	32601 +
HoCP09-804	24107	22924	21730	23722	25324	26192	41694 +	30056	29922 -	37844	28630	28377
L11-183	19609	22686	20137	19896	19166 -	24750	24708	24189	25693 -	26862 -	23377	22825 -
L12-201	24245	16949 -	20696	19492	18213 -	20946	27523	22267	22771 -	28751 -	24693	22413 -
Ho12-615	29832	31135 +	30877	32427 +	33703 +	29996	42038 +	40182 +	39043	44228 +	40083 +	35777 +
Ho12-630	24844	20892	18489	21426	21970	22875	34696	30260	30711 -	33614	30171	26366
L13-251	20002	23267	17902	21454	18801 -	25002	31435	25999	29117 -	34646	27430	25005
Ho13-708	23193	18842	15421	22225	21203	25859	32745	26692	26282 -	24230 -	23341	23639 -
Ho13-739	23185	21532	17949	19569	19176 -	27322	27755	25300	26979 -	27721 -	27868	24032 -
HoCP13-740	24847	28797	18619	26150	22194	27462	35572	25273	27862 -	42887 +	29316	28089
HoCP13-758	24679	23012	25562	25525	22392	24688	32825	30683	33606	31687	30455	27738

Table 8. First-stubble sugar per acre for four experimental and six commercial varieties at eleven outfield locations in 2017.

	Heavy					Light					
Variety	Allains	Alma	Frank Martin	Landry	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs./A)					
HoCP96-540	9836	6701 -	11219	8191 -	8065	8204 -	9542	8065 -	12849	10001 -	9267 -
L01-283	8992	8709	9028	10507	5978 -	11626	9681	9603	10730 -	10813 -	9567 -
L01-299	9753	8929	9800	10443	7770	11953	9556	9927	13291	13254	10468
HoCP04-838	8204	8504	8046	9188	6323 -	12139	10516 +	9274	13843	12117	9815
Ho07-613	10599	9435	10169	10005	6996	10737	10819 +	11021	12536	10201 -	10252
HoCP09-804	9314	10014	8554	10139	5575 -	12173	10323	7606 -	13221	12199	9912
L11-183	10282	7883	9689	9950	7562	11293	9234	9924	12843	11596 -	10026
L12-201	9617	7868	10441	10201	7967	11572	11063 +	9591	11825	10440 -	10059
Ho12-615	10955	9663	11288	10153	6697	11508	10917 +	8016 -	13731	10882 -	10381
Ho12-630	10938	9215	10798	11776	7423	11004	11150 +	9829	13286	11522 -	10694

Table 9. First-stubble cane yield for four experimental and six commercial varieties at eleven outfield locations in 2017.

	Heavy					Light					
Variety	Allains	Alma	Frank Martin	Landry	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(tons/A)					
HoCP96-540	33.4	25.0 -	34.9	30.1	26.0	29.3 -	39.2 +	25.7 -	43.1	31.9 -	31.8 -
L01-283	28.7	31.5	25.7	35.4	18.8 -	36.8	34.0	29.9	35.7 -	32.8 -	30.9 -
L01-299	31.6	32.4	28.8	37.6	25.1	39.0	36.4	31.5	44.4	40.9	34.8
HoCP04-838	27.4	28.7	23.5	33.4	20.6 -	41.2	38.3	29.4	44.8	38.7	32.6
Ho07-613	33.2	30.8	29.6	34.0	22.2	34.8	38.5	34.1	39.4 -	32.5 -	32.9
HoCP09-804	29.7	34.5	25.2	35.2	18.0 -	39.7	37.6	24.0 -	43.9	38.4	32.6
L11-183	32.2	30.4	28.5	34.5	23.5	38.3	38.1	31.7	42.0	36.1 -	33.5
L12-201	31.8	29.0	31.2	35.4	24.8	38.1	42.2 +	30.4	38.4 -	32.5 -	33.4
Ho12-615	35.1	34.4	32.9	37.7	21.3 -	39.5	42.7 +	26.3 -	46.2	35.2 -	35.1
Ho12-630	34.0	33.3	32.0	39.8	22.7	38.6	42.4 +	30.0	43.2	36.3 -	35.2

Table 10. First-stubble sugar per ton for four experimental and six commercial varieties at eleven outfield locations in 2017.

	Heavy					Light					
Variety	Allains	Alma	Frank Martin	Landry	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs./tons)					
HoCP96-540	295 -	269	322	272	310	280 -	243 -	314	298	314	292 -
L01-283	313	277	349	296 +	319	316	285 +	321	301	329	311 +
L01-299	309	276	340	278	309	306	263	315	300	324	302
HoCP04-838	299	296	342	275	308	295	276	316	309	314	303
Ho07-613	319	306 +	344	295 +	315	308	281 +	324	318	314	312 +
HoCP09-804	313	290	339	288	309	307	275	317	302	318	306
L11-183	319	262	341	288	322	295	243 -	314	306	321	301
L12-201	303	273	336	288	322	304	262	316	307	322	303
Ho12-615	313	281	343	270	314	292 -	256	304	298	310	298
Ho12-630	321	277	337	296 +	327	285 -	263	327	307	317	306

Table 11. First-stubble stalk weight for four experimental and six commercial varieties at eleven outfield locations in 2017.

	Heavy					Light					
Variety	Allains	Alma	Frank Martin	Landry	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs)					
HoCP96-540	2.53	2.13	2.30 +	2.43	2.02	2.68	2.41	2.13	2.72 +	2.26	2.36 +
L01-283	2.24	1.88	1.89	1.77 -	1.60 -	1.72 -	2.00	1.99	2.19	2.02	1.93
L01-299	2.31	1.97	1.74	2.28	1.94	2.34	2.09	1.80	1.99	2.04	2.05
HoCP04-838	2.13	1.77	1.66	2.22	1.79	2.72	2.01	2.16	2.34	2.33	2.11
Ho07-613	2.35	2.37	1.97	2.31	1.96	2.78	2.57 +	2.49 +	2.75 +	2.73 +	2.43 +
HoCP09-804	1.76 -	1.53 -	1.80	1.88	1.38 -	2.06	1.80	1.57	1.75	1.82	1.73 -
L11-183	2.40	1.84	2.26 +	2.10	1.96	2.26	2.10	2.15	2.53 +	2.35	2.19
L12-201	2.91 +	2.66 +	2.43 +	3.03 +	2.39 +	3.10 +	2.98 +	2.79 +	3.12 +	3.04 +	2.85 +
Ho12-615	1.87	1.72	1.35	1.67 -	1.50 -	2.10	1.78	1.78	2.08	1.87	1.77 -
Ho12-630	2.41	2.21	2.43 +	2.55	1.96	2.34	2.21	2.20 +	2.26	1.87	2.24 +

Table 12. First-stubble stalk number for four experimental and six commercial varieties at eleven outfield locations in 2017.

	Heavy					Light					
Variety	Allains	Alma	Frank Martin	Landry	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(stalks/A)					
HoCP96-540	26437	23499	30268	24798 -	26014	21998 -	32593	24441 -	31824 -	28261 -	27013 -
L01-283	26033	34208	27565	40081	23634	43459 +	34098	30200	32787 -	32599	32467
L01-299	27855	32946	33012	33341	25925	30978	35068	35546	45320	40677	34115
HoCP04-838	25610	33800	28385	30710	23012	30481	38375	27453 -	38433	33635	30989
Ho07-613	28193	26005	30174	29861	22597	25100	29988	27242 -	28784 -	23721 -	27166 -
HoCP09-804	34330	45615 +	28116	38453	26968	38638	42409 +	30946	50431	42476	37838 +
L11-183	27328	33628	25432 -	33889	24159	33993	36375	29507	33297 -	31370 -	30898
L12-201	21923	22074 -	26022 -	23890 -	20857	25043	28651	22596 -	24753 -	21415 -	23722 -
Ho12-615	37606 +	41041	49288 +	46099 +	28585	39899 +	48170 +	29587	44669	38558	40387 +
Ho12-630	28808	30165	26507	31838	23398	33272	39479	27598 -	38294	39889	31925

Table 13. Second-stubble sugar per acre for eight commercial and one experimental varieties at eleven outfield locations in 2017.

	Heavy						Light					
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
							(lbs./A)					
HoCP96-540	9443	6782 -	7784 -	7010	4312	7231	3687 -	6497 -	6744	12154 -	1625 -	6661 -
L99-226	9827	9285 -	8356	6433	4308	6412	6812 -	6744 -	6874	11065 -	6450	7506 -
HoCP00-950	7000	8290 -	7526 -	8051	3258	5468	6385 -	8183	7761	12278 -	7567	7433 -
L01-283	8592	10320	10065	8030	4326	7332	7822	7972	8489	10964 -	7757	8334
L01-299	9365	10703	10085	6817	4339	6501	8756	8710	8026	13878	8038	8658
HoCP04-838	5826	9221 -	7616 -	6304	3163	6204	6509 -	9089	7508	11398 -	7382	7293 -
Ho07-613	7307	8344 -	4821 -	7353	4216	7048	4983 -	8178	7342	9232 -	3393 -	6565 -
HoCP09-804	8496	9479	8925	7141	-------	6379	8583	8256	8746	12449 -	7890	8304
L11-183	7845	8764 -	7517 -	7071	4411	6948	6924 -	7848	6905	11330 -	6202	7433 -

Table 14. Second-stubble cane yield for eight commercial and one experimental varieties at eleven outfield locations in 2017.

	Heavy						Light					
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(tons/A)											
HoCP96-540	29.9	25.4 -	23.2 -	29.1	17.3	22.8	17.0 -	28.7 -	25.7	41.3 -	5.0 -	24.1 -
L99-226	30.5	30.9 -	23.7 -	24.2	15.7	20.2	24.8 -	25.9 -	24.6	35.1 -	18.5	24.9 -
HoCP00-950	20.3	26.6 -	20.4 -	27.6	10.4 -	16.3	22.3 -	28.8 -	24.7	37.6 -	21.5	23.3 -
L01-283	26.7	32.2 -	28.1	28.8	15.0	22.5	28.2 -	29.8 -	28.4	36.7 -	22.6	27.2
L01-299	29.8	36.8	29.0	28.2	14.8	21.8	34.5	34.9	29.0	45.4	24.0	29.8
HoCP04-838	19.3	31.3 -	22.7 -	25.2	11.6	20.6	23.0 -	35.9	26.8	38.9 -	21.6	25.2 -
Ho07-613	22.5	28.3 -	13.5 -	27.5	14.7	22.9	18.6 -	30.6 -	25.2	29.3 -	10.2 -	22.1 -
HoCP09-804	27.5	32.7 -	26.3	27.0	--------	20.4	32.4	28.8 -	29.5	41.3 -	23.8	27.9
L11-183	24.8	29.9 -	23.0 -	28.7	16.2	22.6	29.1	31.5	26.7	38.9 -	18.5	26.4 -

Table 15. Second-stubble sugar per ton for eight commercial and one experimental varieties at eleven outfield locations in 2017.

	Heavy						Light					
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
	(lbs./tons)											
HoCP96-540	315	267 -	335	241	254 -	318 +	212 -	227 -	264	294	326	278 -
L99-226	322	300	354	266	277	316 +	276	260	280	315	349 +	301 +
HoCP00-950	344 +	311	369 +	291 +	311	336 +	286 +	284 +	314 +	327 +	353 +	321 +
L01-283	322	320 +	359	279 +	290	325 +	277	267	299 +	299	344	307 +
L01-299	314	292	348	241	294	298	256	249	276	306	337	292
HoCP04-838	303 -	294	336	250	276	300	282	253	280	292 -	343	292
Ho07-613	323	295	356	268 +	284	309	267	267	292	315	335	301 +
HoCP09-804	308	289	340	265	--------	315	265	286 +	297	301	332	298
L11-183	316	293	326 -	247	272	308	235	250	258	290 -	335	285

Table 16. Second-stubble stalk weight eight commercial and one experimental varieties at eleven outfield locations in 2017.

	Heavy						Light					
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs.)						
HoCP96-540	2.00	2.16	1.76	1.77	1.36	1.74	2.21	2.10	2.30 +	2.63 +	1.95	2.00 +
L99-226	2.72 +	2.67	1.80	1.62	1.47	2.16 +	1.92	2.39 +	2.53 +	3.48 +	2.24 +	2.27 +
HoCP00-950	1.70 -	2.22	1.48	1.76	1.07	1.30	1.80	1.88	1.88	2.33	1.84	1.75
L01-283	1.91	1.71	1.57	1.50	1.29	1.47	1.69	1.47	1.59	1.68	1.50	1.58
L01-299	2.13	2.19	1.45	1.53	1.06	1.47	1.80	1.81	1.61	2.01	1.61	1.70
HoCP04-838	2.14	2.13	1.70	1.33	1.24	1.70	1.55	1.67	1.78	2.24	1.70	1.74
Ho07-613	2.21	2.12	1.58	1.50	1.29	1.72	1.82	2.05	2.02 +	2.41 +	1.94	1.88 +
HoCP09-804	1.56 -	1.70	1.21	1.30	--------	1.25	1.78	1.38 -	1.48	1.69	1.65	1.45 -
L11-183	2.22	1.97	1.50	1.68	1.53	1.63	1.88	1.91	1.88	2.24	2.02 +	1.86 +

Table 17. Second-stubble stalk number for eight commercial and one experimental varieties at eleven outfield locations in 2017.

	Heavy						Light					
Variety	Allains	Alma	Frank Martin	Landry	Magnolia	Mary	Brunswick	Glenwood	Lanaux	Ronald Hebert	Levert St. John	Overall Mean
						(lbs./A)						
HoCP96-540	30048	23749 -	26380 -	33081	25385	26669	15639 -	27625 -	22379 -	31765 -	5151 -	24352 -
L99-226	22442	23634 -	26835 -	29922	22001	18713	26145 -	21777 -	19674 -	20313 -	16577 -	22548 -
HoCP00-950	24264	24190	27630 -	31565	18829	26210	24475 -	30612	26460 -	32578 -	23143	26360 -
L01-283	28622	38454	35800	38454	23259	30664	33734	40456	35698	44089	30509	34522
L01-299	28030	34731	41950	38600	28332	29255	38187	39080	36607	45242	29934	35462
HoCP04-838	17944	30006	27556 -	38247	18808	24267	29820	44121	30257	35107 -	25137	29206 -
Ho07-613	20169	26870	17170 -	36546	23515	26756	21329 -	30245 -	24934 -	24352 -	11178 -	23915 -
HoCP09-804	35298	40193	45193	41546	-------	32716	38219	41951	39719	48907	28915	38775
L11-183	22774	30774	30721 -	35380	21840	28374	31047	33659	28873 -	34943 -	18563 -	28814 -

Table 18. Third-stubble sugar per acre for nine commercial varieties at four outfield locations in 2017.

	Heavy		Light		
Variety	Alma	Landry	Brunswick	Ronald Hebert	Overall Mean
			(lbs./A)		
HoCP96-540	2698 -	6925	4014 -	9453 -	5772 -
L99-226	4987 -	6003 -	7270 -	8207 -	6617 -
HoCP00-950	6458	7193	6631 -	8989 -	7318
L01-283	6937	6936	7635 -	8278 -	7447
L01-299	7765	7221	9872	10981	8960
L03-371	5491 -	6411	5796 -	6979 -	6169 -
HoCP04-838	6871	6262 -	7767 -	8342 -	7311
Ho07-613	3181 -	6047 -	875 -	7348 -	4363 -
HoCP09-804	7280	6368	7345 -	8830 -	7456

Table 19. Third-stubble cane yield for nine commercial varieties at four outfield locations in 2017.

	Heavy		Light		
Variety	Alma	Landry	Brunswick	Ronald Hebert	Overall Mean
			(tons/A)		
HoCP96-540	13.0 -	28.1	16.1 -	32.9	22.5 -
L99-226	23.2 -	24.6 -	26.5 -	25.5 -	24.9 -
HoCP00-950	25.3	24.0 -	21.7 -	28.8 -	25.0 -
L01-283	28.8	23.6 -	26.1 -	27.3 -	26.5
L01-299	33.8	28.1	35.5	35.6	33.3
L03-371	23.9 -	25.5	22.6 -	21.9 -	23.5 -
HoCP04-838	29.7	25.7	26.6 -	28.2 -	27.5
Ho07-613	13.9 -	22.8 -	2.9 -	24.7 -	16.1 -
HoCP09-804	30.8	23.7 -	26.8 -	30.6 -	28.0

Table 20. Third-stubble sugar per ton for nine commercial varieties at four outfield locations in 2017.

	Heavy		Light		
Variety	Alma	Landry	Brunswick	Ronald Hebert	Overall Mean
			(lbs./tons)		
HoCP96-540	198 -	247	245	287 -	244
L99-226	215	244	273	322 +	264
HoCP00-950	255 +	300 +	306	313	293
L01-283	241	293 +	293	303	283
L01-299	229	257	278	308	268
L03-371	227	252	257	319	264
HoCP04-838	233	244	293	296	267
Ho07-613	229	265	199	297	248
HoCP09-804	238	269	274	289 -	267

Table 21. Third-stubble stalk weight for nine commercial varieties at four outfield locations in 2017.

	Heavy		Light		
Variety	Alma	Landry	Brunswick	Ronald Hebert	Overall Mean
			(lbs.)		
HoCP96-540	1.96	1.50	1.90	1.95	1.83
L99-226	2.79 +	1.74	2.44 +	2.57 +	2.39 +
HoCP00-950	1.78	1.69	1.93	1.67	1.77
L01-283	1.56	1.33	1.51	1.71	1.53
L01-299	1.91	1.61	1.74	2.02	1.82
L03-371	1.86	1.28	1.77	1.81	1.68
HoCP04-838	1.76	1.49	1.69	1.82	1.69
Ho07-613	1.94	1.82	1.00 -	2.10	1.72
HoCP09-804	1.38 -	1.11	1.48	1.42 -	1.35 -

Table 22. Third-stubble stalk number for nine commercial varieties at four outfield locations in 2017.

	Heavy		Light		
Variety	Alma	Landry	Brunswick	Ronald Hebert	Overall Mean
			(stalks/A)		
HoCP96-540	13525 -	39875	16761 -	34344	26126 -
L99-226	16657 -	29279	21762 -	20440 -	22035 -
HoCP00-950	28565	29330	22918 -	34993	28952
L01-283	37197	36137	34665	31932	34983
L01-299	35422	35226	42207	35573	37107
L03-371	25455	40042	26008 -	24266 -	28943
HoCP04-838	34296	35551	31451 -	31167	33116
Ho07-613	14921 -	26285	3967 -	23616 -	17197 -
HoCP09-804	44513	43258	36222	43585 +	41895

Table 23. Plantcane means from eleven outfield locations in 2017: Allains, Alma, Brunswick, F. Martin, Glenwood, Harper, 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	9825 +	35.3 +	278 -	2.84 +	25511
L01-283	9289	30.8	303 +	2.09 -	29748 +
L01-299	8887	30.9	289	2.35	26837
HoCP04-838	9686 +	33.6 +	288	2.32	29153
HoCP09-804	9384	32.0	293	2.02 -	32601 +
L11-183	9877 +	34.3 +	288	2.48	28377
Ho11-573	10924 +	39.5 +	277 -	3.47 +	22825 -
L12-201	10058 +	34.7 +	290	3.17 +	22413 -
Ho12-615	10826 +	37.9 +	287	2.13 -	35777 +
Ho12-630	10053 +	34.0 +	296	2.61 +	26366
L13-251	10486 +	37.6 +	280 -	3.07 +	25005
Ho13-708	10234 +	35.7 +	287	3.07 +	23639 -
Ho13-739	9512	32.1	297 +	2.69 +	24032 -
HoCP13-740	9390	32.5	289	2.37	28089
HoCP13-758	11635 +	38.5 +	302 +	2.80 +	27738

Table 24. First-stubble means from eleven outfield locations in 2017: Allains, Alma, 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	9187	31.7	291 -	2.33 +	27279 -
L01-283	9642	31.1	312 +	1.90	33205
L01-299	10340	34.3	303	1.99	34728
HoCP04-838	9643	32.1	303	2.07	31202
Ho07-613	9767	31.4	311 +	2.33 +	26942 -
HoCP09-804	9405	30.9	306	1.71 -	36180
L11-183	9969	33.3	301	2.19 +	30796 -
L12-201	9658	32.0	303	2.80 +	23205 -
Ho12-615	10188	34.4	298	1.76 -	39616 +
Ho12-630	10150	33.5	305	2.18 +	30936

Table 25. Second-stubble means from eleven outfield locations in 2017: Allains, Alma, 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	6661 -	24.1 -	278 -	2.00 +	24352 -
L99-226	7506 -	24.9 -	301 +	2.27 +	22548 -
HoCP00-950	7433 -	23.3 -	321 +	1.75	26360 -
L01-283	8334	27.2	307 +	1.58	34522
L01-299	8658	29.8	292	1.70	35462
HoCP04-838	7293 -	25.2 -	292	1.74	29206 -
Ho07-613	6565 -	22.1 -	301 +	1.88 +	23915 -
HoCP09-804	8304	27.9	298	1.45 -	38775
L11-183	7433 -	26.4 -	285	1.86 +	28814 -

Table 26. Third-stubble means from four outfield locations in 2017: Alma, 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	5772 -	22.5 -	244	1.83	26126 -
L99-226	6617 -	24.9 -	264	2.39 +	22035 -
HoCP00-950	7318	25.0 -	293	1.77	28952
L01-283	7447	26.5	283	1.53	34983
L01-299	8960	33.3	268	1.82	37107
L03-371	6169 -	23.5 -	264	1.68	28943
HoCP04-838	7311	27.5	267	1.69	33116
Ho07-613	4363 -	16.1 -	248	1.72	17197 -
HoCP09-804	7456	28.0	267	1.35 -	41895

Table 27. Combined plantcane means across outfield locations from 2015 to 2017.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	9129	32.4	282 -	2.67 +	24742 -
L99-226	9346	31.0	301 +	2.89 +	21701 -
HoCP00-950	9442	30.1	315 +	2.28	26242
L01-283	9148	30.6	299 +	2.03 -	30597 +
L01-299	8985	31.1	289	2.23	28374
HoCP04-838	9421	32.7 +	288	2.15	30751 +
Ho07-613	9811 +	33.0 +	298 +	2.40 +	27828
HoCP09-804	9366	31.7	296 +	1.86 -	34510 +
L11-183	9606 +	32.6 +	295 +	2.41 +	27437

Table 28. Combined first-stubble means across outfield locations from 2016 to 2017.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	7926 -	26.8 -	298 -	2.08 +	25770 -
L99-226	8689	27.2 -	323 +	2.32 +	23309 -
HoCP00-950	7593 -	23.4 -	331 +	1.71	25961 -
L01-283	8652	27.6 -	314 +	1.72	32361
L01-299	9107	29.9	306	1.80	33061
HoCP04-838	8250 -	27.3 -	303	1.81	29948 -
Ho07-613	8486 -	27.0 -	315 +	2.07 +	25938 -
HoCP09-804	8770	28.4	311	1.55 -	36501 +
L11-183	8742	28.5	309	2.01 +	28588 -

Table 29. Second-stubble means across outfield locations from 2017.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	6661 -	24.1 -	278 -	2.00 +	24352 -
L99-226	7506 -	24.9 -	301 +	2.27 +	22548 -
HoCP00-950	7433 -	23.3 -	321 +	1.75	26360 -
L01-283	8334	27.2	307 +	1.58	34522
L01-299	8658	29.8	292	1.70	35462
HoCP04-838	7293 -	25.2 -	292	1.74	29206 -
Ho07-613	6565 -	22.1 -	301 +	1.88 +	23915 -
HoCP09-804	8304	27.9	298	1.45 -	38775
L11-183	7433 -	26.4 -	285	1.86 +	28814 -

SUCROSE LABORATORY AT THE SUGAR RESEARCH STATION

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Sugar Research Station

The Sugar Research Station sucrose laboratory processed 3,590 samples during the 2017 harvest season (Table 1). Standard laboratory procedures were used to analyze 85 samples of which 62 were also processed through the Spectracane FT-NIR instrument. 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. The sucrose laboratory processed samples from September 2017 to December 2017.

A total of 3,567 samples were analyzed using the Spectracane FT-NIR instrument of which 264 were energy 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 2017 harvest season.

Unit/Project Area	Leader	Number of Samples
School of Plant, Environmental, and Soil Sciences	Magdi Selim	12
	Brenda Tubana	606
	Jim Wang	48
	Collins Kimbeng	419
Iberia Research Station	Sonny Viator	54
Plant Pathology and Crop Physiology	Jeff Hoy	308
LCES	Albert Orgeron	187
LCES	Kenneth Gravois	106
Sugar Research Station/Variety Development	Line Trials	748
	Increase	150
	Nursery	638
	Infield	18
	Energy Cane	264
Contract Services		32
TOTAL		3,590

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 2017-2018 production season, about 22,000 plantlets regenerated in the Louisiana Agricultural Experiment Station 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
HoCP96-540	1,080
L01-283	1,280
L01-299	6,300
HoCP05-961	1,414
HoCP09-804	2,854
L11-183	4,392
L12-201	1,368
Ho12-615	3,456
Total	22,144

THE 2017 LOUISIANA SUGARCANE VARIETY SURVEY

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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 20 of the 24 parishes; no parish survey reports were obtained from Cameron, Acadia, Concordia, and Evangeline parishes. According to USDA Farm Service Agency (FSA), there were 439,102 acres planted to sugarcane in Louisiana in 2017. This survey was based on 99.1 percent of the acres reported by USDA-FSA.

Agents collected acreage according to variety and crop. A total of eight sugarcane varieties, HoCP 96-540, L 99-226, HoCP 00-950, L 01-283, L 01-299, HoCP 04-838, Ho 07-613, and HoCP 09-804 were listed along with "Others" in the survey. The category of "Others" included, but was not limited to, small acreages of LCP 85-384, HoCP 85-845, CP 89-2143, L 99-233, L 03-371, and Ho 05-961. The crop was divided into four categories that included plant-cane, first-stubble, second-stubble and third-stubble and older crops. Total parish acreage was obtained from the state FSA office.

Total State Acreage. Total sugarcane acreage for each parish, region and the statewide total is shown in Table 1. Statewide, the area planted to sugarcane in 2017 was 439,102 acres according to the state FSA office. A total of 434,835 acres comprised the sample for the 2017 variety survey.

Sugarcane Distribution by Variety. Statewide sugarcane acreage in percent by variety and crop is shown in Table 2. The leading variety for 2017 was L 01-299, which occupied 45% of the Louisiana sugarcane acreage. This percentage was nine points higher than L 01-299's acreage in 2016 (Gravois and Legendre, 2017). HoCP 96-540, the leading sugarcane variety grown in Louisiana from 2008-2015, was next in total acreage as it was planted on 25% of the state's acreage. The varieties planted in the next largest areas were L 01-283, HoCP 04-838, L 99-226, and HoCP 00-950, occupying 12%, 8%, 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 2017 crop.

Sugarcane Distribution by Region and Crop. The total sugarcane acreage was highest for Teche region (183,697.5 acres); followed by the River-Bayou Lafourche region (160,422.1 acres); then the Northern region (95,328.6 acres). Total FSA reported sugarcane acreage for Louisiana in 2017 was approximately 8,000 acres higher than in 2016. The northern area showed the greatest increase in acreage, with Pointe Coupee, Avoyelles, and Rapides parishes showing

the largest percentage increases compared to 2016. A new sugarcane growing parish, Concordia, reported 190.0 acres of sugarcane.

In 2017, 13.0% of the state's acreage was grown as third and older stubble crops, which was slightly lower than the acreage of the same category for 2016. In 2017, 30.8%, 29.0%, and 27.3% of the state's acreage was in a plant-cane, first stubble, and second stubble crops, respectively.

For the current survey, plant-cane percentage was highest in the northern region (34.8%) where most new expansion is occurring (Table 3). For the third and older stubble crops, the northern region had the lowest percentage at 9.4%, whereas the Bayou Teche and River-Bayou Lafourche regions had the highest percentage at 14.0% and 13.9%, respectively.

Sugarcane Distribution by Variety and Crop for the Three Regions. L 01-299 was the most widely grown variety in all three regions (Tables 4-6). L 01-299 was the most widely represented variety in all crops of each region with the exception of HoCP 96-540 having the largest percentage of third and older stubble crops in the northern region. The largest variety trend in sugarcane acreage was the continued increased planting of L 01-299 and increased older stubble crops devoted to L 01-299. The River-Bayou Lafourche and Northern growing areas planted more L 01-283 than the Bayou Teche region. HoCP 96-540 was most widely grown (30.7%) in the Bayou Teche region, followed by the northern region (24.0%) and the River-Bayou Lafourche region (18.7%). The survey picked up more HoCP 09-804 in the Bayou Teche regions, an area where mosaic is not present in the variety.

Variety Trends. HoCP 96-540, released for commercial planting in 2003, now occupies 25% of the state's 2017 acreage, which is a decrease of five percentage points from the previous year. The variety continues to perform well, but HoCP 96-540 is better adapted to sandier soils because of average stubbling ability. Rust infections were common in the variety in 2017. Fungicides were successfully applied to limit yield loss due to brown rust. HoCP 96-540 is an important variety for Louisiana was widely planted by growers in 2017.

L 99-226 decreased in acreage by two percentage points from 2016. 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.

HoCP 00-950 was released for commercial planting in 2007 and occupied three percent of the state's acreage in 2017. This variety has high sugar per ton of cane and is early maturing. HoCP 00-950 does not grow as well in poorly drained soils and is better suited to the sandier soils in the sugar belt. In some fields, HoCP 00-950 was severely affected by the disease red stripe (*Acidovorax avenai* subsp. Avenae).

L 01-283 was released for commercial planting in 2008 and occupied 12 percent of the state's acreage in 2017. 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 45% of the state's acreage in 2017. 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 when planted just prior to high rainfall. L 01-299 is susceptible to the disease brown stripe and smut. Growers are encouraged to closely monitor seed-cane sources. L 01-299 performed well in all crops for the 2017 grinding season, and it is important to note its excellent response to ripening with glyphosate. Because of its superior stubbling ability, L 01-299 will likely be widely planted again in 2018.

HoCP 04-838 was released in 2011. This variety has good sugar and cane yield potential, with its most notable attribute being cold tolerance. Cane yield in stubble crops can be erratic; the variety does 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 colder than average winters, 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 2017 planting season.

A new sugarcane variety was released to growers in 2016 – HoCP 09-804 (Anon., 2016). This variety has a high population of small diameter stalks. Sucrose content is similar to L 01-283, and early yield trials suggest that the variety will stubble well. The variety did have some mosaic disease, primarily in the River-Bayou Lafourche region. Seed-cane of HoCP 09-804 for distribution was more limited because of rouging for mosaic. Growers are encouraged to plant the variety with healthy seed-cane sources.

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. 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. The same strategy needs to happen with the new leading sugarcane variety L 01-299. With the release of many new sugarcane varieties in recent years, growers are encouraged to continue to plant a 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, 2017.[1]

Bayou Teche		River Bayou Lafourche		Northern	
Parish	**Acres**	**Parish**	**Acres**	**Parish**	**Acres**
Acadia	3731.6	Ascension	18,055.7	Avoyelles	10,415.1
Calcasieu	193.2	Assumption	33,847.5	Concordia	190.0
Cameron	9.0	Iberville	37,062.3	Evangeline	334.1
Iberia	56,055.5	Lafourche	26,046.3	Pointe Coupee	46,651.1
Jeff Davis	900.8	St. Charles	1,386.7	Rapides	12,036.2
Lafayette	8,714.1	St. James	28,435.4	St. Landry	10,620.7
St. Martin	29,844.5	St. John	6,353.1	West Baton Rouge	15,081.4
St. Mary	46,318.5	Terrebonne	9,235.1		
Vermilion	37,930.3				
Total	183,697.5	Total	160,422.1	Total	95,328.6

Total acres all regions: **439,102.4**

[1]Acreage based on information obtained in variety surveys from 20 of 24 sugarcane-producing parishes by the county agents in 2017.

Table 2. Estimated statewide sugarcane percentage by variety and crop, all regions, 2017.[1]

Variety	Plant-cane	First-stubble	Second-stubble	Third-stubble and older	Total
	---------- percentage ----------				
HoCP96-540	18.9	25.2	28.4	30.5	**24.8**
L99-226	2.7	3.9	4.1	6.4	**3.9**
HoCP00-950	2.3	3.3	3.0	3.7	**3.0**
L01-283	14.1	12.4	11.7	8.7	**12.2**
L01-299	52.1	44.0	40.0	40.6	**45.0**
HoCP04-838	5.8	7.9	10.4	8.1	**8.0**
Ho07-613	0.4	1.0	0.7	0.1	**0.6**
HoCP09-804	2.6	0.6	0.1	0.0	**1.0**
Others	1.3	1.6	1.6	1.9	**1.6**
% Crop	30.8	29.0	27.3	13.0	

[1] Based on information obtained in variety surveys by county agents in 2017.

Table 3. Estimated sugarcane distribution by region and crop, 2017.[1]

Crop	Bayou Teche	River-Bayou Lafourche	Northern	State Total
Plant-cane Area (acres) Percent (%)	56,962.1 31.8	43,801.3 27.3	33,055.3 34.8	133,818.8 30.8
First-stubble Area (acres) Percent (%)	46,693.9 27.7	49,779.0 31.0	226,725.5 28.1	126,198.4 29.0
Second-stubble Area (acres) Percent (%)	47,598.2 26.5	44,623.1 27.8	26,248.7 27.6	118,470.0 27.3
Third-stubble and older Area (acres) Percent (%)	25,105.0 14.0	22,248.1 13.9	8,950.6 9.4	56,303.7 13.0
Total area (acres) Percent (%)	179,359.3 41.3	160,451.5 36.9	94,980.1 21.8	434,791.8

[1] Based on surveyed acres; information obtained in variety surveys by county agents in 2017.

Table 4. Estimated area planted to sugarcane in percent by variety and crop for the Bayou Teche region, 2017.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP96-540	21.0	34.6	37.8	31.4	30.7
L99-226	1.9	2.8	4.1	2.6	2.8
HoCP00-950	2.4	2.5	3.2	5.2	3.0
L01-283	4.4	3.8	2.2	3.8	3.6
L01-299	61.0	46.8	39.3	46.6	49.3
HoCP04-838	4.1	6.3	11.3	9.9	7.4
Ho07-613	0.4	0.9	1.0	0.2	0.7
HoCP09-804	4.2	1.2	0.3	0.0	1.7
Others	0.7	1.0	0.8	0.3	0.7
Total acres	56,962.1	46,693.9	47,598.2	25,105.0	

[1] Based on information obtained in variety surveys by county agents in 2017.

Table 5. Estimated area planted to sugarcane in percent by variety and crop for the River/Bayou Lafourche region, 2017.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP96-540	17.0	16.4	19.3	26.3	18.7
L99-226	2.9	4.4	3.4	8.9	4.3
HoCP00-950	1.9	3.3	2.8	2.0	2.6
L01-283	18.0	15.8	16.6	10.4	15.9
L01-299	46.7	46.4	43.4	40.5	44.8
HoCP04-838	8.8	9.5	11.0	7.7	9.5
Ho07-613	0.3	1.3	0.6	0.1	0.7
HoCP09-804	1.8	0.3	0.0	0.0	0.6
Others	2.6	2.7	2.8	4.1	2.9
Total acres	43,801.3	49,779.0	44,623.1	22,248.1	

[1] Based on information obtained in variety surveys by county agents in 2017.

Table 6. Estimated area planted to sugarcane in percent by variety and crop for the Northern region, 2017[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
HoCP96-540	17.7	24.1	26.9	38.6	24.0
L99-226	3.7	5.1	5.1	10.9	5.1
HoCP00-950	2.6	4.6	3.1	3.6	3.4
L01-283	25.6	22.2	20.7	18.2	22.6
L01-299	43.7	34.4	35.5	23.7	36.9
HoCP04-838	4.7	7.8	7.6	4.1	6.3
Ho07-613	0.4	0.7	0.4	0.0	0.4
HoCP09-804	1.0	0.2	0.0	0.0	0.4
Others	0.7	1.0	0.7	0.9	0.8
Total acres	33,055.3	26,725.5	26,248.7	8,950.6	

[1] Based on information obtained in variety surveys by county agents in 2017.

Table 7. Louisiana sugarcane variety trends, by variety and years, all regions, 2013-2017[1].

	Area planted to sugarcane by variety and years (%)						
Variety	**2013**	**2014**	**2015**	**2016**	**2016**	**2017**	**1 yr. Change**
HoCP96-540	39	37	33	30	30	25	-5
L99-226	17	13	11	6	6	4	-2
HoCP00-950	4	4	3	4	4	3	-1
L01-283	10	10	9	12	12	12	0
L01-299	15	22	30	36	36	45	+9
HoCP04-838	3	6	9	10	10	8	-2
Ho07-613	2	1	<1	1	1	1	0
HoCP09-804	-	-	-	<1	<1	1	+1

[1] Based on annual variety surveys by county agents, 2013-2017.

PERFORMANCE OF FLORIDA SUGARCANE VARIETIES IN LOUISIANA

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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 01299. 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.

Each year a few stalks of each sugarcane variety were obtained from the Kleentek quarantine greenhouse and used to plant a small seedcane increase. Yield trials were planted each subsequent year during August at the Sugar Research Station in St. Gabriel, Louisiana. Each test was planted as a randomized complete block (two replications) design. Plots were paired rows that were 25 feet in length and a fourfoot alley separated plots. The soil type was a Commerce silt loam. In 2017, a new trial was planted on August 22nd.

Standard cultural practices were followed during each growing season. The first and second stubble trials were harvested on October 9, 2017; the plantcane trial was harvested on November 28, 2017. Plots were combine harvested and weighed to determine cane yield (tons/acre). A 6-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 (% w/w) by refractometer and pol reading (Z^{o}) by saccharimeter. Sucrose content (lbs/ton of cane) and fiber content were determined by the prebreaker press method (Gravois and Milligan, 1992).

Gravois, K.A. and S.B. Milligan. 1992. Genetic relationships between fiber and sugarcane yield components. Crop Sci. 32:6267.

Table 1. Plantcane and first stubble Florida variety yield trials harvested in 2017 at the Sugar Research Station in St. Gabriel, LA.

Variety	Sugar Yield	Cane Yield	TRS	Fiber
Plantcane	Lbs/acre	Tons/acre	Lbs/ton of cane	%
CPCL 95-2287	10719	44.3	242	11.3
CP 96-1252	12962	52.5	247	14.2
HoCP 96540	12940	48.6	266	11.4
CP 01-1372	12485	46.6	268	9.7
L 01-299	13354	49.7	269	13.3
CPCL 02-6848	12842	47.7	270	14.9
CP 03-1912	10867	53.3	204	10.7
CP 04-1844	13348	58.2	230	12.6
HoCP 04-838	13168	51.2	257	13.8
CPCL 05-1102	15115	56.5	268	10.8
CPCL 05-1201	12821	52.4	245	10.5
CP 056-1526	13858	58.0	240	11.5
CP 05-1791	10650	41.0	260	12.9
CP 06-2400	10377	40.8	254	15.0
First Stubble				
CP 89-2143	6852	30.7	223	12.4
HoCP 96-540	8038	41.5	194	11.8
CPCL 97-2730	7278	41.3	176	12.1
CP 00-1101	7816	34.7	225	11.8
CP 01-1372	10127	47.2	216	10.5
L 01-299	9099	49.0	186	12.0
CPCL 02-0926	8692	43.5	199	11.8
CPCL 02-1295	8232	44.9	184	15.3
CPCL 02-6848	9351	40.6	230	15.7
CP 03-1912	6980	47.5	146	10.4
CP 04-1566	9080	44.4	206	12.9
CP 04-1844	10272	52.8	195	13.5
CP 04-1935	8629	38.5	223	13.3
HoCP 04-838	9710	44.3	221	14.5
CPCL 05-1102	9870	45.6	216	11.7
CPCL 05-1201	9133	45.1	202	12.0
CP 05-1791	7623	35.8	214	13.1

Table 2. Second stubble Florida variety yield trial harvested in 2017 at the Sugar Research Station in St. Gabriel, LA.

Second Stubble	Sugar Yield	Cane Yield	TRS	Fiber
	Lbs/acre	Tons/acre	Lbs/ton of cane	%
CP 89-2143	5181	25.2	205	12.2
CPCL 95-2287	8040	36.2	222	13.8
CP 96-1252	6319	32.2	196	13.2
HoCP 96-540	6746	32.8	207	12.8
CPCL 97-2730	5731	32.7	174	12.9
CPCL 99-4455	3909	19.5	202	12.0
CP 00-1101	7215	32.3	224	12.3
CPCL 00-4111	5741	25.9	221	12.3
CP 01-1372	11579	50.3	230	11.7
L 01-299	9764	43.4	225	14.2
CPCL 02-0926	8565	42.1	203	12.0
CPCL 02-1295	7034	38.0	185	15.3
CP 03-1912	4107	28.8	142	11.1
CP 04-1566	4196	23.9	175	15.5
CP 04-1844	9854	55.5	178	12.7
CP 04-1935	7784	37.3	209	13.2
HoCP 04-838	8596	35.4	243	14.8

IDENTIFICATION OF GENOMIC REGIONS CONTROLLING LEAF SCALD RESISTANCE IN SUGARCANE USING A BI-PARENTAL MAPPING POPULATION AND SELECTIVE GENOTYPING BY SEQUENCING

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Introduction

Diseases are one of the most important problems that affect sugarcane productivity (Rott et al. 2000). Leaf scald, caused by the bacterium *Xanthomonas albilineans* (Ashby) Dowson, is one of the major diseases worldwide (Wang et al., 1999; Rott and Davis, 2000). The disease is characterized by possible latent, chronic and acute phases varying in severity from a white, sharply defined longitudinal leaf stripe to death of shoots or entire plants (Ricaud and Ryan, 1989; Rott et al., 1997). Leaf scald causes high losses in tons of cane per hectare and reduction in juice quality (Ricaud and Ryan, 1989; Rott and Davis, 2000). Hot water treatment has been shown to partially control leaf scald because of the pathogen's vascular association. Moreover, management by hot water treatment is considered another significant cost to the industry (Rott and Davis, 2000). Host plant resistance, tissue culture to produce healthy seed-cane, disinfection of cutting and harvesting tools with bactericides, and quarantine measures during germplasm exchanges are methods used to prevent and control the disease (Ricaud and Ryan, 1989; Rott and Davis, 2000).

The development of resistant varieties is considered the best strategy to manage leaf scald in sugarcane. The troublesome aspect of resistance evaluation is that symptom expression is strongly affected by environmental conditions with severe symptom development being associated with the occurrence of drought conditions (Rott and Davis, 2000; Rott et al., 1997). The erratic symptom expression results in the failure to accurately detect susceptibility and thus multiple field trials utilizing inoculation are needed. However, inoculation can result in systemic infection of resistant clones (Gutierrez et al., 2016). Under this scenario, the marker-assisted selection (MAS) technique, which uses DNA marker(s) linked to useful trait(s), would be very useful in breeding for resistance against the disease (Costet al., 2012).

The large (10 Gb) and complex genome, the absence of a reference genome draft, the coexistence of single and multi-dose alleles, and the irregular number of chromosomes in the homo(eo)logy groups have hindered progress in the development and application of genetic/genomic tools in sugarcane (Wang et al., 2010). Until recently, all sugarcane genetic maps constructed were incomplete due to the large number of chromosomes and the limited number of markers used for mapping. Moreover, the makers that were used in the past for developing genetic maps are SSRs, EST-derived AFLPs, and DArTs that did not generate enough markers to cover the large sugarcane genome. However, with the decrease in the cost of DNA sequencing technologies, next generation sequencing (NGS)-based genotyping has recently been used to develop high-density molecular maps that are being used in QTL mapping, gene tagging, and map-based cloning (Yang et al., 2017).

With the development of next generation sequencing and software tools capable of producing and processing millions of sequence variations, restriction enzyme-based genotyping by sequencing method has been used to identify single nucleotide polymorphism (SNP) markers that were used for development of high-density linkage maps in sugarcane. A handful of QTL studies have been conducted in sugarcane reporting the genomic regions that control agronomic traits of interest, including sugar traits. DNA markers associated with disease resistance have been reported for brown rust (Daugrois et al., 1996; Asnaghi et al., 2004; Le Cunff et al., 2008; Costet et al., 2012; Yang et al., 2017), yellow spot (Aljanabi et al. 2007), yellow leaf virus (Costet et al. 2012; Debibakas et al. 2014), and downy mildew (Baer and Lalusin, 2013). However, the only QTL that has been fine resolved using synteny-based comparative mapping with sorghum is *Bru*1 for brown rust resistance (Costet et al. 2012). This led to the development of PCR-based markers linked to *Bru*1 that have been used in marker-assisted selection in several breeding programs worldwide including Louisiana (Parco et al., 2014, 2017). The success with *Bru*1 provides an example that marker-assisted selection is feasible in sugarcane. The present study reports on the identification of QTLs associated with resistance to leaf scald using selective genotyping of a subset of an F_1 progeny from a bi-parental population developed from the cross between two parents with contrasting disease response.

Materials and Methods

Plant materials

High heterozygosity of sugarcane cultivars makes it possible to use an F_1 population as a pseudo F_2 mapping population. The F_1 progeny derived from the cross between a leaf scald resistant cultivar LCP 85-384 (female) and a susceptible cultivar L 99-226 (male) was used to develop a linkage map. LCP 85-384 and L 99-226 were selected from the progeny of a cross between CP 77-310 and CP 77-407 (Milligan et al., 1994) and HoCP 89-846 and LCP 81-30 (Bischoff et al., 2009), respectively. The seedling progeny of the mapping population was germinated in the greenhouse and transplanted to seedling trays after 3 weeks, and the survivor clones of this process were planted in the field at the Sugar Research Station, St. Gabriel, LA. One hundred and eighty-six individuals randomly selected from the population were used in the study. The population along with the parents was maintained as clones in field plots where each clone represented a single plot 2.4 m long in a completely randomized layout.

Leaf scald reaction evaluation and data analysis

The population (186 F_1 and parents) was evaluated as plant canes (first year crop) in two growing seasons (2014 and 2015). *Xanthomonas albineans* isolation and quantification, and plant inoculation by decapitation were performed following the protocols previously described (Garces et al. 2014). Bacterial suspension at a concentration of 3.5×10^8 CFU/µL (0.18 OD at 590 nm) was kept at 4 °C in the dark prior to inoculation. Plants (20 per clone) were inoculated at sunset by spraying the bacterial suspension on the surface of the shoot cut above the apical meristem with scissors dipped in the inoculum suspension (Koike, 1965). In the summer of 2014, inoculation was performed on June 12. Two inoculations were performed in 2015, in different sugarcane plantings – the first inoculation was performed on May 29 and the second on June 9.

Disease severity was evaluated based on the type of symptoms observed 8 weeks after inoculation in intact leaves that emerged after the inoculation in 6 to 14 stalks per clone. Visual symptom severity was assessed for systemically infected leaves and rated using a 1 to 9 scale where 1-3 was considered to be resistant, 4-6 as moderately susceptible, and 7-9 as highly susceptible. Disease severity was evaluated for each clone using the formula: Resistance rating =

[(1 × NS) + (3 × PL) +(5 × ML) + (7 × N) + (9 × D)]/ T, where NS = number of stalks without symptoms; PL= number of stalks with leaves exhibiting one or two narrow, white, pencil-line streaks; ML = number of stalks with more than two pencil-line streaks in leaves; N = number of stalks with leaf necrosis or bleaching; D = number of dead stalks or stalks with side shooting; and T = total number of stalks evaluated per clone.

The visual ratings were transformed using the Box-Cox transformation with λ values of -1.2 (2014 data), -0.2 (first set of 2015) and 0.1 (second set 2015) using the formula $(y^{\lambda} - 1)/\lambda$ (if $\lambda \neq 0$). The Box-Cox coefficients (λ) were obtained using SAS software v. 9.3 (SAS Institute Inc., Cary, NC). The transformed data were evaluated for normality using the Shapiro and Wilk test, and heritability was estimated using VARCOMP procedure in SAS software v. 9.3.

DNA extraction and genotyping

Genomic DNA was isolated from freshly collected leaves of the progeny and parents using the potassium acetate protocol (Dellaporta et al., 1983). The DNA samples of parents, grandparents and 89 F_1 selected based on the disease symptom severity ratings assigned in 2014 (36 resistant, 28 moderate resistant, 16 moderate susceptible and 9 highly susceptible clones; the samples in each disease reaction group were represented in similar proportions in the original population of 186 progeny) were used for genotyping. DNA quantity and quality were estimated using the Nanodrop 1000 spectrophotometer (Nanodrop, Bethesda, MD).

Genotyping was performed using simple sequence repeat (SSR) as well as SNP markers. A total of 121 SSR primers (mapped on 10 *Sorghum bicolor* chromosomes) from the Sugarcane Microsatellite Consortium (Cordeiro et al. 2000; Pan 2006) and 31 eSSRs developed from the leaf scald suppressive subtractive hybridization cDNA library (supplementary table S1) were used. For SSR genotyping, 50 ng of genomic DNA was used as the template in PCR reactions in a final volume of 10 µl containing 1X PCR buffer, 2.5 mM $MgCl_2$, 0.2 µM dNTP mix, 0.4 unit of *Taq* DNA polymerase (Promega, Madison, WI), and 0.75 µM of each primer. PCR amplification reactions were conducted on a C1000 Touch Thermal Cycler equipped with a 384 well block (Bio-Rad, Hercules, CA) with a thermal profile of initial denaturation at 95°C for 5 min, 35 cycles at 95°C for 15 sec, 58°C for 15 sec and 72°C for 1 min, and a final extension at 72°C for 10 min. PCR products were resolved in 13% polyacrylamide gels using a HEGS electrophoresis apparatus (Nihon Eido, Tokyo, Japan). The gels were stained using ethidium bromide and visualized and documented in a Kodak GelLogic200 gel documentation system (Carestream, Rochester, NY). The SSRs and eSSRs amplified fragments were manually scored as '1' for presence and '0' for absence.

For genotyping by sequencing, 500 ng of DNA of each sample was used for library preparation as per Elshire et al. (2011). Briefly, DNA was restricted by *Pst*I enzyme and ligated with adapters for barcoding. Barcoded DNA from parents, grandparents, and the progeny were pooled and 96-plex sequenced in a single flow cell on an Illumina HiSeq2500 platform at the Institute of Biotechnology of Cornell University, BRC Genomics Facility, Ithaca, NY.

Clean, filtered sequence reads after removing the adapter and restriction enzyme reminiscent with Phred quality score ≥20 were used for SNP calling. Two reference-based SNP callers, GBS Tassel (Glaubitz et al., 2014) and Samtools (Li et al., 2009) were used. In the absence of the sugarcane reference genome, the *Sorghum bicolor* genome (v.3.0), because of its microsynteny with sugarcane (Wang et al., 2010), was used as the reference, and uniquely mapped reads were used for variant calling. SNPs were called from GBS tags that constituted of at least three reads with identical sequence. Samtools pipeline was used as per the default parameters. Only SNPs that were commonly called by both software tools were subjected to a

second level of filtering to remove SNPs that were not present in both parents and had more than 10% missing data.

Marker segregation analysis

Mono- and polymorphic fragments were produced by all the marker systems. In sugarcane, several segregation ratios are possible in the F_1 population. With the assumptions of polysomic inheritance and absence of segregation distortion, single dose (SD) markers are present only once in the genome and they are expected to segregate in 1:1 (present in one parental genome) and 3:1 (present in both parents) (Da Silva et al. 1993). Each marker was tested against expected segregation ratio using a χ^2 goodness fit test (df = 1) at 5% error level (type I) for SD or bi-parental SD segregation ratios.

Linkage map construction

Mapping of the SD markers onto linkage groups was done using OneMap v. 2.0-4 package of R v.3.1.3 (Margarido et al., 2007). The SSR and eSSR markers were mapped as a dominant marker (presence versus absence). The linkage map construction was performed in two steps following the method suggested for polyploid species (Wu et al., 1992). Markers were grouped as D1 (D1.10 and D1.13) originating from LCP 85-384 and D2 (D2.15 and D2.18) from L 99-226, and C8 and B3.7 originating from both parents as described by Wu et al. (2002). Only SD markers were used to build the framework map of each parent with LOD (Log_{10} of odds) score threshold of 4.0 and a recombination fraction value of 0.40. Linkage groups containing only the 3:1 SD markers (C8 and B3.7) belonged to both parental maps. OneMap allows construction of linkage groups carrying markers from both parents (D1 and D2) using 3:1 markers as hinge. Genetic distances between markers were computed using the Kosambi mapping function. To construct the homology group (HG), the markers in LGs were aligned into the sorghum chromosomes. LGs with more than 80% of their markers mapped to a single sorghum chromosome were grouped into one HG. Recombinant linkage groups were formed with markers that were located on different homology groups. Linkage groups with significant QTLs with high LOD scores and percentage of phenotypic variance explained (PVE) were selected for saturation. In the saturation process, the SD markers that could not be mapped previously but flanking the QTL regions (based on the genome information of *Sorghum bicolor*) were selected with a less stringent selection (Bonferroni correction was applied in the χ^2 test) for integration into the map. The graphic representation of the linkage groups was performed using MapChart v.2.3 (Voorrips, 2002).

QTL mapping

QTL analysis was performed on the transformed phenotypic data from the three field trials over two crop years, using the Windows QTL Cartographer Software v.2.5 (Wang et al., 2012) and QTL ICIM Mapping Software v.4.1 (Wang et al., 2016). To confirm the location of the QTLs, composite interval mapping (CIM) was undertaken with markers as co-factors selected by forward and backward step-wise regression with 10 cM window size and 1 cM walking speed settings in WinQTL Cartographer v.2.5 (Wang et al., 2012) with 1,000 iterations. A LOD of 2.5 and a 5% PVE were used as the threshold to declare a QTL significant (Churchill and Doerge, 1994).

Based on the microsynteny between sugarcane and sorghum genomes, the location of the markers from QTL analysis were ascertained in the sorghum genome that facilitated the search for the genes flanking/within the QTL regions. Genes located within 20-kb surrounding the QTL

regions were considered as candidate genes associated with the resistance response to leaf scald. For validation of the effect of a marker closest to a QTL, allele-specific primers were designed and PCR was run on all 186 F1 progeny as described earlier (Drenkard et al., 2012; Solis et al., 2017). Expression profile of three genes selected in the QTL regions was analyzed using real-time PCR as described earlier (Khan et al., 2013).

Results

Leaf scald response of the F_1 progeny in the field

Leaf scald reaction of the F_1 population was evaluated visually 8 weeks after inoculation for plant cane in three different trials (one in 2014 and two in 2015) on a scale of 1-9. The phenotypic distribution was not normal and skewed to the left due to the high number of resistant progeny in the F_1 population. The use of the Box-Cox transformation showed low to intermediate correlation among the three field trials (Table 1). In contrast, the correlation among the different trials evaluated with the average of the visual symptom rating was high. Moreover, the transformed data presented a near-normal distribution (Fig. 1) by Shapiro-Wilk test with p-value = 0.4157, W = 0.9943, and eliminated the left skewness with the skewness value near to zero (0.086). The heritability in broad sense of the leaf scald reaction (H^2), based on the severity of symptom expression, was 0.24 per plot and 0.48 per mean (Supplementary Data S1) that showed a low to medium genetic variance component and a high effect of the environment on leaf scald symptom expression.

The low to medium correlation among the data sets of the three time-point disease reaction evaluation led to the use of all the data sets in the QTL analysis. The QTLs reported in this study were found with at least two of the three field evaluations. The high (visual symptom rating) correlations of the average data with the trials allowed using the average information for the initial QTL mapping.

Genotyping and marker data

A total of 332 unambiguous alleles were obtained with genotyping of the F_1 progeny using 121 polymorphic SSR markers. Genotyping using 31 polymorphic eSSR markers resulted in 24 scorable alleles. Of these, 202 SSR (60.8%) and 20 eSSR (83.3%) alleles segregated as SD markers by χ^2 test that were included for linkage mapping. A total of 250,451,013 single-end 100 bp reads were obtained from the GBS of the mapping population and parents of which 225,489,934 were good-barcoded reads. Filtering for barcodes and restriction enzyme remnants produced 209,848,011 reads.

From the genotyping by sequencing of 95 individuals (89 F_1 individuals plus parents and grandparents), a total of 28,722 and 27,260 SNP markers were called using Samtools and Tassel, respectively. Filtering to select only the non-redundant bi-allelic markers that are present in the parent(s) with less than 10% of missing data in the population produced 5,835 markers commonly found between the two SNP calling tools. Allelic dosage test by $\chi 2$ test showed 1,726 (29.6%) as SD markers that were used for linkage mapping.

Linkage map construction

A total of 1,948 SD (SNP and SSR and eSSR) markers were used for construction of a linkage map. A framework map was built for both parental clones and the progeny using pseudo-test cross strategy (Supplementary Fig. S1). A total of 1,437 SD markers were assigned to 294 linkage groups (LGs) with the genome coverage of 19,464 cM (Supplementary Data S2). Of the 294 linkage groups, 120 LGs were assigned to the maternal parent LCP 85-384 with a total map length of 4,160 cM by 378 SD markers, and 138 LGs were assigned to the paternal clone L 99-

226 with genome coverage of 4,745 cM by 424 markers (Supplementary Fig. S1; Supplemntary Data S2). Sixty nine LGs contained SD markers that came from both parents (D1 or D2 = 1:1). Thirty three LGs were constructed with only SD markers that were present in both parents and segregated 3:1 (c8 or B3.7 = 3.1; Supplementary Fig. S1; Supplementary Data S2). The length of the LGs varied from 0.0001 cM (LG-272) to 491 cM (LG-20) with an average of 66.20 cM per LG and an average distance of 17.03 cM between two adjacent markers. The number of mapped markers per LG varied from 2 to 31 with an average marker density of 4.89.

Homology groups (HGs) were assembled based on the mapping position of the markers in a LG on sorghum chromosomes. Of the 1,437 mapped markers in LGs, 1,027 markers (71.5%) aligned with sorghum chromosomes. Based on the synteny, 907 markers from 208 (out of 294) were grouped into 10 sorghum chromosomes and named as HG1, HG2….HG10. These 10 HGs covered 12,260 cM of the total map length, which accounted to 63% of the total genome coverage. The number of LGs grouped in a HG ranged from 5 (HG8 with 22 markers and 238.2 cM coverage) to 49 (HG1 with 272 markers and 3891.cM coverage) (Supplementary Data S2).

QTL mapping

Composite interval mapping was performed on the quantitative phenotypic data of leaf scald reaction obtained through visual symptom severity rating using initially only the SD markers that mapped onto the linkage groups. A putative QTL was called positive when the LOD score was higher than 2.5 and the percentage of the phenotypic variance explained (PVE) was higher than 5%. Composite interval mapping identified eight QTLs on seven LGs associated with resistance to leaf scald (Table 2; Fig. 2). Of these, six QTLs were identified from the mean visual data over three ratings, while one each was identified with the 2015 first and second rating data. The percentage phenotypic variance explained (PVE) by an individual QTL for mean rating varied from 5.2 (LG 262) to 12.8 (LG 77) with 15% and 11% additive variance contributed by the resistant parent, LCP 85-384. QTLs with high additive phenotypic variance, such as qLSR37.1 (27.8%) and qLSR77.1 (54.1%) were contributed by alleles from the resistant parent. The QTL identified on LG 250 for 2015 second season explained for the highest population phenotypic variance (16.9%). Interestingly, this QTL with highest additive variation was contributed by the alleles from the susceptible parent, L 99-226. The QTL regions of six LGs were saturated with SNPs of different dosages that mapped to the sorghum genome and were not included for construction of the reference linkage map. The saturation process focused on QTL regions controlling the leaf scald response allowed for a reduction in the gap between the markers flanking some of the QTLs. Also, the recombinant LG 37 (336.09 cM), LG 104 (18.40 cM), and LG 250 (364.63 cM), which were formed after saturation with 21, 3, and 18 markers, respectively, contained one marker and two QTLs associated with leaf scald resistance (Table 2).

The QTL, qLSR77.1 accounted for 12.8% of the phenotypic variation and an additive genetic variance of 0.11. To further evaluate the marker 5_1527e that was closest to the qLSR77.1 peak, allele-specific primers were run on the total 186 F1 progeny that were evaluated for leaf scald resistance. The marker, expectedly, accounted for 9% of the variation in leaf scald resistance. Based on the synteny between sugarcane and *Sorghum bicolor*, the genes located within and neighboring qLSR29.1, qLSR44.1, and qLSR77.1 were identified in sorghum. The expression of RPM1 and beta-adaptin showed up-regulation in the resistant cultivar, LCP 85-384 until one week after infection, whereas in susceptible cultivar, HoCP 86-845, the expression was down-regulated after an initial up-regulation at 24 h after infection. On the other hand, the expression of PIC1 was repressed at all time points in the resistant cultivar.

The QTL flanked by 5_1527g and 5_1527e (LG 77, 12.8 % PVE) served as the starting point for subsequent analysis because of the high value of PVE and the information on the expression of the neighboring ESTs/genes that are associated with disease resistance. Pinpointing causative genes/markers within/around QTLs suggested that the QTL analysis and the use of the microsynteny between *S. bicolor* and *Saccharum* spp. could be a valuable tool in sugarcane research. Subsequent analysis of allelic polymorphism and comprehensive gene expression profile around the QTLs can enhance our knowledge of the nature of leaf scald resistance in sugarcane. These results further suggested that other QTLs identified in the present study need to be fine mapped to identify diagnostic SNPs linked to leaf scald resistance.

The GBS-derived SNP-enriched genetic map developed in the present study coupled with comparative analysis with the sorghum genome overcame the limitations associated with the small population used in the mapping process and the high environmental influence in the symptom expression of the disease, in addition to providing improved understanding of the sugarcane genome structure. However, small number of progeny used for QTL mapping in this study could result in identification of genomic regions with overestimated phenotypic variation. Marker c5_1527 tightly linked to qLSR77, being a codominant, could be used, in combination with other linked SNPs, as leaf scald resistance diagnostic markers in marker-assisted breeding. Validation of the markers identified in this study is being performed using diverse germplasm with known leaf scald reaction. The validated molecular markers linked to leaf scald resistance can be used as new selection tools for large-scale screening of parents and early generation progeny in the breeding program to develop resistant cultivars.

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Table 1. Pearson correlation among three field evaluations of leaf scald resistance reaction on the bi-parental F_1 population of LCP 85-384 x L 99-226.

	Visual rating		
Trials	2014	2015a	2015b
2014	1	0.3486 (p=0.0009)	0.2558 (p=0.0162)
2015a		1	0.3865 (p=0.0002)
2015b			1

a, 2015 first season; b, 2015, second season

Table 2: QTLs associated with leaf scald resistance in the F1 progeny of LCP 85-384 x L 99-226.

QTL	Year	LG	LOD	Position (cM)	Left marker	Right marker	PVE (%)	Closest marker to peak	Add	Dom	Left CI (cM)	Right CI (cM)
qLSR37.1	2015-A	37	4.90	41.00	8_1112	CA1916a	6.69	CA1916a	-0.28	-0.07	27.85	44.25
qLSR77.1	2015-B	77	4.18	58.10	5_1527g	5_1527e	5.01	5_1527e	-0.54	0.04	50.65	61.30
qLSR77.1	Mean	77	7.63	61.30	5_1527g	5_1527e	12.83	5_1527e	-0.11	0.30	53.75	61.30
qLSR104.1	2015-A	104	2.98	17.60	c3_689a	c3_689b	2.95	c3_689b	-0.18	0.16	13.15	18.40
qLSR104.1	Mean	104	3.67	18.40	c3_689a	c3_689b	5.48	c3_689b	-0.04	0.27	14.75	18.40
qLSR156.1	2015-A	156	3.35	266.91	c6_540a	6_5843a	3.69	6_5843a	0.06	0.86	259.06	274.56
qLSR156.1	Mean	156	3.95	271.71	c6_540a	6_5843a	11.59	6_5843a	0.11	0.79	263.86	278.56
qLSR247.1	2014	247	21.90	15.70	1x13545	1x71593	1.10	1x71593	-0.10	-0.55	15.15	18.05
qLSR247.1	2015-A	247	5.26	17.70	1x13545	1x71593	3.74	1x71593	-0.04	-0.82	14.25	21.05
qLSR247.1	Mean	247	3.46	19.30	1x13545	1x71593	8.89	1x71593	0.05	-0.66	14.45	26.55
qLSR250.1	2015-B	250	3.25	281.51	3x59273a	3z57080b	16.93	3z57080b	0.76	0.17	275.06	288.06
qLSR250.2	Mean	250	3.76	306.71	3z57080b	2x73961b	7.89	3z57080b	0.24	-0.01	304.36	315.76
qLSR250.2	2015-B	250	3.13	316.41	3z57080b	2x73961b	13.59	3z57080b	0.70	0.16	313.16	319.76
qLSR262.1	2015-A	262	3.36	81.70	1x61508c	1x57609	3.95	1x57609	0.03	0.86	78.95	85.95
qLSR262.1	Mean	262	2.96	89.70	1x61508c	1x57609	5.23	1x57609	-0.15	0.12	78.75	92.65

LG, linkage group; LOD, logarithm-base 10- of odds score (threshold=2.5, to call a QTL positive); Position, scanning position in cM on the linkage group; PVE (%), percentage of the phenotypic variation explained by QTL at the current scanning position; Add, estimated additive effect of QTL at the current scanning position; Dom, Estimated dominance effect of QTL at the current scanning position; Left CI and Right CI, confidence intervals calculated by one-LOD drop from the estimated QTL position.