AN OVERVIEW OF 2011 ACTIVITIES IN THE LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

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The Louisiana State University Agricultural Center (LSU AgCenter) Sugarcane Variety Development Program contributes to the profitability of the Louisiana sugarcane industry by developing improved sugarcane varieties.

Sugarcane variety development at the LSU AgCenter is a team effort carried out by scientists from a diversity of disciplines (Table 1). The LSU AgCenter and the United States Department of Agriculture (USDA) sugarcane variety development teams work independently as well as cooperatively to produce "L" and HoCP or Ho varieties, respectively. The best varieties from each program are brought together for evaluation at the nursery, infield, and outfield testing stages of the program (Table 2). Outfield testing is conducted by personnel from the LSU AgCenter, the USDA, and the American Sugar Cane League. Upon recommending a variety for commercial release, seed increase is carried out by the American Sugar Cane League and generally commences when varieties are introduced to the outfield testing stage. The cooperative effort under which the three entities (the LSU AgCenter, the USDA, and the American Sugar Cane League) participate to develop improved sugarcane varieties for the Louisiana sugarcane industry is outlined in the "Three-Way Agreement of 2007".

Table 1. Members of the LSU AgCenter Sugarcane Variety Development Team in 2011.

Team Member	Budgetary Unit	Responsibility
Collins Kimbeng	Sugar Res. Station	Program Leader
Michael Pontif	Sugar Res. Station	Crossing, Selection and Variety Testing
Sonny Viator	Iberia Research Station	Variety Testing
Niranjan Baisakh	School of Plant, Soil and Environmental Sciences	Molecular Breeding
Gene Reagan	Entomology	Insect Resistance
Jeff Hoy	Plant Pathology	Disease Resistance
Jim Griffin	Plant, Env. & Soil Sci.	Herbicide Tolerance
Brenda Tubana	Plant, Env. & Soil Sci.	Agronomy
Gert Hawkins	Sugar Res. Station	Sucrose Laboratory
Dexter Fontenot	Sugar Res. Station	Photoperiod & Crossing
David Sexton	Sugar Res. Station	Outfield

Success in developing improved sugarcane varieties is heavily dependent on the availability of novel genetic variation created through targeted crosses. Cultivated sugarcane

does not flower naturally in Louisiana because of the cool fall temperatures hence, the breeding program must rely on artificial photoperiod treatment to induce and synchronize flowering of sugarcane parents for crossing. Photoperiod treatment to induce flowering began on May 30 and continued until September 10, 2011. Leading up to flowering, temperatures during initiation were conducive to flowering, which resulted in good flowering in 2011 with a total of 1001 tassels produced. Crossing lasted from September 2 to October 26, 2011 with a total of 611 crosses made for the year. Germination tests showed that a total of 338,269 viable seeds were produced during the 2011 crossing campaign of which, 100,340 were obtained from bi-parental crosses and 211,412 from polycrosses.

A total of 90,294 seedlings from 211 crosses were planted to the field in April of 2011 compared to 76,095 the year before. The dramatic increase in the number of seedlings successfully transplanted to the field can be attributed to the purchase of a new seedling planter and the replacement of some of the old seedling trays. As the newer trays were less porous the seedling roots did not grow into them making it easier to pull seedlings out of the trays. Relatively fewer seedlings were broken while attempting to pull seedlings from the new trays. Planting went smoothly with the new seedling planter requiring less man-hour (2 instead of 4) of walking behind the planter to manually transplant seedlings that were not properly placed by the mechanical seedling planter. Many of these seedlings were progeny of crosses among commercial and superior experimental varieties. In addition, seedlings were planted in a cross appraisal trial. Individual seedling selection will be carried out in 2012 when these seedlings are in the first stubble crop.

Of 76,095 seedlings from the 2009 crossing series that survived the transplantation process only 54% (41,581) survived the winter. Individual seedling selection on these 41,581 first-stubble seedlings did not occur in September of 2011 as in past years because the seedlings were severely lodged following Tropical Storm Lee. Seedling selection was delayed until the mills opened in October. Each row was selected and harvested to expose the next row. Family selection, based on accumulated data from family appraisal studies and visual assessment of seedling populations, was used to discard ten percent of families prior to selection. A total of 1,888 clones (4 % selection rate) were selected and planted in 10-foot, first-line trial plots. The selection criteria included visual appraisal for pith, disease symptoms, insect damage, lodging, and for yield (mainly stalk number, stalk diameter and height). This was followed by evaluation of the visually selected clones for Brix using a hand held refractometer.

Established procedures were used to advance superior clones of the 2008 crossing series from the first-line to 16-foot, second-line trials (522 clones; 30% selection rate) and of the 2007 crossing series from second-line to 2-row, un-replicated, 16-foot increase plots (150 clones; 38% selection rate). Preliminary visual ratings for cane yield and plant type were done in August. Clones with acceptable ratings were further evaluated for lodging and/or broken tops, borer damage, disease symptoms, pith, and Brix/sugar per ton. From the 2006 crossing series, 25 experimental varieties judged to be superior to the checks were assigned permanent variety designations (“L”) in the fall of 2011 (Table 2). These newly assigned experimental varieties were entered into replicated nursery trials (2 replicates, 16-foot plots) at three locations (Sugar Research Station, Iberia Research Station and USDA-ARS Ardoyne Farm). In addition, the experimental varieties were exchanged in the fall of 2011 to plant cooperative infield and off-station nursery tests the following year.

Experimental varieties were replanted in infield and off -station nursery tests (14 varieties of the 2010 assignment series), introduced to the outfield (4 varieties of the 2009 assignment series), and planted in outfield tests (2 experimental varieties of the 2008 assignment series, L 08-88 and L 08-90) (Table 2). Breeding personnel assisted Dr. Jeff Hoy and Dr. Gene Reagan to enter experimental varieties in the sugarcane smut and sugarcane borer resistance tests, respectively.

Infestation levels from the most common pests and diseases of sugarcane were generally low at the Sugar Research Station in 2011. Sugarcane borer infestations were extremely light at the Sugar Research Station and no insecticide application was necessary at the Station in 2011. Brown rust was not seen at significant levels among experimental varieties throughout different stages of the program. For example, only 0.3 percent of varieties were dropped in the first line trial because of rust while 1.3 % were dropped in the second line. However, I would be remiss if I fail to mention that at the time of writing this report (May 2012) brown rust was a disease of economic importance in Louisiana. The incidence of smut was low among experimental varieties in the program. Less than one percent and 2.7 % of clones were dropped in the first and second line trials, respectively, because of smut. Very few incidences of leaf scald were recorded among experimental varieties. The number of clones dropped for pith and lodging was also below average throughout different stages of the program. It was relatively easy to differential cane that went down as a result of Tropical Storm Lee and cane that was predisposed to lodging by looking at the base of the cane and the direction in which it was lodged. Varieties that went down as a result of tropical storm Lee were all laying in one direction while those that were predisposed to lodging lay in several different directions.

The 2011 season was very weather dependent. The earlier part of the season/year was generally warm and very dry and windy. Crop growth was affected as the crop was generally shorter by late spring compared to previous years. The later part of the season was characterized by flooding conditions throughout the Mississippi river but no flooding was experienced at the Sugar Research Station as the levee was not compromised. Tropical Storm Lee (September 1 to September 5, 2011) dumped some much needed rain on the crop (about 8 inches at the Sugar Research Station) and growth picked up after that. Planting and harvesting of experimental varieties experienced a few delays but in the end all experiments were planted and harvested without incidence. All experimental varieties were harvested by December 2011.

The decision regarding the further testing and seed increase of candidate varieties in the program was determined at the Variety Advancement Committee meeting. The 2011 meeting was held on August 17th at the American Sugar Cane League office in Thibodaux, Louisiana.

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

Table 2. Number of "L" varieties by assignment series for each stage of testing in 2011.

Assignment Series	Stage of Testing	Number of experimental varieties
L 2005	Outfield – Replanted and harvested as plantcane, first stubble, and second stubble	0
L 2006	Outfield – Replanted and harvested as plantcane and first stubble Off-station nurseries and infield – 3rd stubble harvested	0
L 2007	Outfield – Replanted and harvested as plantcane On-station nurseries - 3rd stubble harvested Off-station nurseries and infield – 2nd stubble harvested.	0
L 2008	Outfield – Planted On-station nurseries - 2nd stubble harvested Off-station nurseries and infield - 1st stubble harvested	2
L 2009	Outfield – Introduced On-station nurseries - 1st stubble harvested Off-station nurseries and infield - plantcane harvested.	4
L 2010	On-station nurseries - plantcane harvested Off-station nurseries and infield planted	14
L 2011	Assignment On-station nurseries planted	25

2011 PHOTOPERIOD AND CROSSING IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

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Photoperiod and crossing are the first stages in the LSU Agcenter's Sugarcane Variety Development Program. For the release of new varieties to be productive, success must first be achieved at photoperiod and crossing. Proper photoperiod induction in addition to proper hybridization techniques are key factors for the production of viable seed belonging to viable crosses. Viable crosses are the optimum and most desirable combinations that will be advanced to the seedling stage of the Sugarcane Variety Development Program. In order to accomplish viable crosses, the seed must be viable or alive to produce adequate germination. This seed will then be advanced to the seedling stage of the Sugarcane Variety Development Program.

Cuttings of potential parent varieties used for the 2011 crossing season were planted in the fall of 2010. After establishing the plants from the cuttings, the plants were fertilized biweekly with a 400 ppm solution of Peter's 20-20-20. In late January 2011, the cuttings were then transferred to can culture. In April, the cans were moved from the greenhouse to the photoperiod rail carts. Soluble fertilizer applications were continued on a biweekly basis. Fertilization was discontinued in early- to mid-May to condition the plants for floral induction. Two additional applications of dry granular fertilizer (8-24-24, one Tbs/can) were applied to the cans during July and August. A reduced nitrogen ratio makes a higher C:N ratio, which is more desirable for the ease of flowering.

Natural lighting and six light-tight chambers were used for photoperiod treatments. To prevent overwhelming the crossing facilities, two flowering peaks were planned for September 23 and October 8 although these two flowering peaks can be advanced or delayed because of certain climatic factors. Records of varietal flowering, past photoperiod response, and pollen production were used to determine the most appropriate photoperiod treatment for each variety. The first photoperiod treatments began on May 30. All photoperiod treatments (time from artificial sunrise to natural sunset) were initiated with a minimum of 34 consecutive days of 12 ½ hours of constant day length. After the initial constant photoperiod days, day length was shortened by one minute per day. Treatments differed by the number of days with constant day length and the date on which the decline of photoperiod was initiated. All photoperiod treatments were discontinued on September 10, 2011, when natural day length was 12 ½ hours and decreasing.

Photoperiod treatments require pulling the carts out of the photoperiod bays at their appropriate time each morning to receive full sunlight. On certain days when the weather was severe, the carts were pushed back into the photoperiod chambers to protect the parental varieties from wind damage. The doors were partially opened to allow natural light to enter the chambers.

Flowering percentage of total stalks were average on the photoperiod carts in 2011 (Tables 1-2). Total flowering percentage for the six bays was 63%, which was comprised from 1,592 stalks of which 1001 produce tassels. Although the flowering percentage was excellent in 2011, successful seed production is comprised of a multitude of factors. An adequate germination rate provided the Variety Development Program with sufficient seed production. In 2011 as in previous years, seedlings were produced from hybridization techniques that used sugarcane yield components, borer resistance, and disease resistance as some of the criteria to determine which breeding clones were most compatible.

Close attention was made once again to maintain high relative humidity within the crossing greenhouse; high relative humidity has been proven in past studies to increase seed set. High relative humidity is maintained with the use of a misting system that has been installed inside of the crossing greenhouse. High temperatures in the crossing house can also result in poor seed set as temperatures in excess of 95°F have adverse effects on pollen viability. Temperatures between 85-95°F were maintained in the greenhouse along with 85-98% relative humidity.

The flowering season in 2011 began during the first week of September. 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 can be a slight deviation for first flower due to temperature during the photoperiod induction phase, varietal characteristics, and the photoperiod treatments. Crossing began on September 2 and ended on October 26, 2010. A total of 1001 tassels of 96 clones were used to produce 611 crosses. Germination rate was estimated based on the germination of 0.5 g of seed that was germinated under greenhouse conditions in early December. A total of 338,269 viable seed were produced in 2011. A total of 100,340 seed were produced from bi-parental crosses, and 211,412 seed were produced from polycrosses (Table 3).

Table 1. Summary of the 2011 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	14-Jun	44	28-Jul	72	87	292±1	87	63
1	B	14-Jun	44	28-Jul	72	87	290±2	90	48
1	C	14-Jun	44	28-Jul	72	87	288±2	87	53
2	A	14-Jun	44	28-Jul	72	87	293±1	90	52
2	B	14-Jun	44	28-Jul	72	87	291±2	87	53
2	C	14-Jun	44	28-Jul	72	87	291±2	93	45
3	A	30-May	37	6-Jul	87	102	288±2	90	76
3	B	30-May	37	6-Jul	87	102	289±2	96	70
3	C	30-May	37	6-Jul	87	102	287±2	84	52
4	A	30-May	37	6-Jul	87	102	289±1	87	75
4	B	30-May	37	6-Jul	87	102	282±2	96	63
4	C	30-May	37	6-Jul	87	102	292±1	81	64
5	A	30-May	41	10-Jul	82	97	287±1	88	77
5	B	30-May	41	10-Jul	82	97	288±2	89	56
5	C	30-May	41	10-Jul	82	97	288±2	90	63
6	A	30-May	41	10-Jul	82	97	287±1	86	81
6	B	30-May	41	10-Jul	82	97	289±1	83	76
6	C	30-May	41	10-Jul	82	97	286±2	88	66

Table 2. Summary of can, variety, and flower information on 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----------								
96	324	278	1592	1001	4.91±1.00	3.60±1.47	5.43±2.03	76.32±12.03

† Based upon cans with tassels.
‡ Rating of 1 to 4 being male and 5 to 9 being female.
§ Days from decline date to flowering.

Table 3. Summary of 2011 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	315	100340	319±618	319±618	24±39
Polycross	232	211412	911±1260	911±1260	52±61
Self	64	26517	414±864	414±864	32±62
Total	611	338269	554±977	554±977	36±53

Table 4. Varietal flowering summary in 2011 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	39	283	105±2	7	24	11	46
HO05-961	40	287	97±2	7	33	3	9
HO06-530	42±1	280	97±3	5±1	22	11	50
HO06-563	42±1	255	72±1	4	20	19	95
HO07-613	42±1	297	86	7	23	1	4
HO07-617	40±1	259	90±6	8	33	7	21
HO08-709	44	292	83±1	7	6	4	67
HO08-711	41±1	306	101±6	7	9	4	44
HO08-717	42±1	271	92±1	7	22	18	82
HO09-822	44	292	81	.	5	1	20
HO09-824	44	283	74±2	4	4	4	100
HO09-825	44	273	66±3	8	6	5	83
HO09-827	39±1	266	82±1	8	11	8	73
HO09-831	44	287	76	6	5	2	40
HO09-840	44	.	.	.	5	.	.
HO09-841	37	259	72	3	5	5	100
HO95-988	40±1	262	80±1	5	26	17	65
HOCP00-930	42±1	264	80±4	6±1	23	13	57
HOCP00-950	41	257	75±1	8	47	39	83
HOCP01-517	40±1	276	100±4	5±1	12	6	50
HOCP01-523	40	269	85±2	6±1	15	10	67
HOCP02-618	40±1	264	81±2	6±1	14	9	64
HOCP02-623	39±1	262	82±1	4	19	16	84
HOCP04-838	41±1	245	64±1	5	24	21	88
HOCP04-847	39	257	85±4	7	23	14	61
HOCP05-902	39	259	88±6	7	19	9	47
HOCP08-726	40±1	252	68	6±1	12	12	100
HOCP09-803	41±1	285	100±3	8	13	6	46
HOCP09-810	44	273	63±1	8	5	5	100
HOCP09-814	44	273	70±3	8	6	4	67
HOCP09-846	42±1	257	79±7	7±1	12	4	33
HOCP85-845	40	262	85±2	6	27	23	85
HOCP91-552	42±1	251	65	5	27	15	56
HOCP92-618	39±1	266	87±4	6±1	15	4	27
HOCP92-624	41±1	245	63±1	8	29	23	79
HOCP95-951	39±1	255	70±1	5±1	11	9	82
HOCP96-540	41	262	81±1	4	46	39	85
HOCP96-561	42	266	85±2	6	30	22	73
HOCP97-609	40±1	259	77±2	4±1	13	12	92
HOL08-723	40±1	259	74±2	5±1	17	14	82
L01-283	41	259	95±2	3	49	23	47
L01-299	40	251	70	3	56	47	84
L01-315	39±1	255	71±1	7	12	9	75
L05-448	42±1	255	71	4	14	14	100
L05-457	42	251	64±2	4	11	9	82
L06-001	41	259	77±1	3±1	37	25	68

Table 4. Continue

Variety	Days of Constant Photoperiod	First Flower Date	Mean Days to Flower	Pollen Rating	Total Stalk Number	Total Flowers	Percent Flowering Stalks
L06-038	37	259	74±1	4	4	4	100
L06-040	41±1	257	70±1	7±1	13	12	92
L07-057	40±1	245	61	7	23	21	91
L08-088	40±1	269	89±2	7±1	13	8	62
L08-090	41±1	245	62±1	4	18	12	67
L08-092	39	.	.	.	21	.	.
L09-099	39±1	259	76±4	6	11	11	100
L09-105	39±1	249	62	5	12	12	100
L09-107	40±1	259	71±1	5±1	11	8	73
L09-108	41±1	245	60±1	8	10	9	90
L09-112	41±1	269	81±1	7±1	11	6	55
L09-114	41±1	.	.	.	15	.	.
L09-117	41±1	.	.	.	12	.	.
L09-118	40±1	.	.	.	11	.	.
L09-121	41±1	259	70±2	5±1	10	9	90
L09-123	40±1	252	66±1	7	11	11	100
L09-125	42±1	280	82±7	3	15	5	33
L09-129	41±1	255	71±3	8	8	4	50
L09-131	41±1	271	86±2	4	10	7	70
L10-132	39±1	252	67±1	3	12	12	100
L10-136	44	.	.	.	6	.	.
L10-137	44	271	60	8	5	2	40
L10-142	44	292	81	.	6	1	17
L10-144	43±1	259	71±1	5±1	8	8	100
L10-145	44	283	80±4	4±1	5	5	100
L10-146	44	.	.	.	4	.	.
L10-147	44	273	63±1	7±1	3	3	100
L10-148	44	306	95	7	4	1	25
L10-150	44	278	69±1	4	5	3	60
L10-156	44	285	74	6	5	2	40
L10-157	44	276	67±1	5±1	4	3	75
L10-158	44	.	.	.	6	.	.
L10-160	44	278	68	4±1	6	5	83
L10-163	41±1	259	71±1	3	11	7	64
L94-426	39	262	77±2	6	23	14	61
L94-428	39	259	85±6	4±1	17	7	41
L94-433	41	262	88±4	7	20	12	60
L97-128	40	252	69±1	8	43	40	93
L98-207	40±1	266	88±7	3	25	5	20
L98-209	40±1	259	72	8	9	5	56
L99-226	41	262	77±1	3	54	31	57
L99-233	41	252	67	3	46	22	48
LCP81-010	42±1	257	75±4	6	22	17	77
LCP85-384	40	257	83±2	4	38	33	87
LCP86-454	41	257	80±9	4	9	4	44
N-27	39	255	76±2	8	29	25	86
TUCCP77-042	40±1	266	79	7	9	3	33

Table 4. Continue.

Variety	Days of Constant Photoperiod	First Flower Date	Mean Days to Flower	Pollen Rating	Total Stalk Number	Total Flowers	Percent Flowering Stalks
US01-040	39±1	276	89	8	7	1	14
US79-010	40±1	257	74±1	6	15	15	100

Table 5. Crosses and seed made in 2011 sorted by cross number.

Cross	Female	Male	Seed
XL11-001	HOCP92-624	HOCP04-838	281
XL11-002	L07-057	HOCP04-838	22
XL11-003	L09-108	HOCP04-838	316
XL11-004	HOCP04-838	HOCP04-838	39
XL11-005	HOCP92-624	L08-090	234
XL11-006	L09-108	L08-090	57
XL11-007	L07-057	L08-090	0
XL11-008	L08-090	L08-090	816
XL11-009	HOCP92-624	L09-105	65
XL11-010	L07-057	L09-105	34
XL11-011	L09-108	L09-105	160
XL11-012	L09-105	L09-105	0
XL11-013	L07-057	11P1	0
XL11-014	L09-105	11P1	0
XL11-015	HOCP92-624	11P1	18
XL11-016	HOCP04-838	L08-090	1261
XL11-017	HOCP92-624	L08-090	559
XL11-018	L07-057	L08-090	152
XL11-019	L09-105	L08-090	0
XL11-020	L08-090	L08-090	785
XL11-021	L09-105	L05-457	0
XL11-022	L09-108	L05-457	55
XL11-023	HOCP92-624	L05-457	1351
XL11-024	L05-457	L05-457	0
XL11-025	L07-057	HOCP91-552	829
XL11-026	L09-105	HOCP91-552	0
XL11-027	HOCP91-552	HOCP91-552	4851
XL11-028	HOCP08-726	HOCP91-552	303
XL11-029	L09-105	HOCP91-552	73
XL11-030	L09-123	HOCP91-552	115
XL11-031	HOCP91-552	HOCP91-552	4058
XL11-032	HOCP04-838	L08-090	199
XL11-033	HOCP92-624	L08-090	154
XL11-034	L97-128	L08-090	0
XL11-035	L08-090	L08-090	1245
XL11-036	HOCP08-726	L99-233	844
XL11-037	L09-105	L99-233	0
XL11-038	L99-233	L99-233	248
XL11-039	L99-233	11P2	4236
XL11-040	L08-090	11P2	3446
XL11-041	L10-132	11P2	641
XL11-042	L05-457	11P2	63
XL11-043	L99-233	11P3	4723
XL11-044	HOCP92-624	11P3	804
XL11-045	L05-457	11P3	11
XL11-046	L08-090	11P3	1881
XL11-047	L10-132	11P3	685
XL11-048	L97-128	11P3	167
XL11-049	L09-123	L01-299	0
XL11-050	N27	L01-299	71
XL11-051	HOCP95-951	L01-299	37
XL11-052	HOCP91-552	L01-299	1693
XL11-053	L01-299	L01-299	0
XL11-054	L09-129	L05-448	12
XL11-055	L01-315	L05-448	40
XL11-056	HOCP08-726	L05-448	0
XL11-057	L05-448	L05-448	32
XL11-058	L09-129	HO06-563	0
XL11-059	L09-123	HO06-563	33
XL11-060	L97-128	HO06-563	151
XL11-061	HO06-563	HO06-563	0
XL11-062	HOCP91-552	HOCP04-838	3498
XL11-063	L07-057	HOCP04-838	67
XL11-064	L97-128	HOCP04-838	63
XL11-065	N27	HOCP04-838	110
XL11-066	HOCP04-838	HOCP04-838	427
XL11-067	HOCP91-552	L99-233	1833
XL11-068	L09-123	L99-233	341
XL11-069	L97-128	L99-233	613
XL11-070	L99-233	L99-233	557
XL11-071	L01-299	11P4	0
XL11-072	L05-457	11P4	23
XL11-073	L09-123	11P4	39
XL11-074	L97-128	11P4	530
XL11-075	L99-233	11P4	1144
XL11-076	HOCP00-950	L10-132	53

Table 5. Continue.

Cross	Female	Male	Seed
XL11-077	HOCP09-846	L10-132	80
XL11-078	LCP81-010	L10-132	2075
XL11-079	N27	L10-132	193
XL11-080	US79-010	L10-132	182
XL11-081	L10-132	L10-132	22
XL11-082	HOCP04-838	L08-090	474
XL11-083	HOCP08-726	L08-090	275
XL11-084	L01-315	L08-090	34
XL11-085	L06-040	L08-090	11
XL11-086	L08-090	L08-090	1048
XL11-087	HOCP04-838	LCP86-454	582
XL11-088	HOCP08-726	LCP86-454	27
XL11-089	LCP86-454	LCP86-454	51
XL11-090	HOCP04-838	HOCP95-951	563
XL11-091	L01-315	HOCP95-951	458
XL11-092	L97-128	HOCP95-951	93
XL11-093	HOCP95-951	HOCP95-951	117
XL11-094	L01-299	11P5	39
XL11-095	HOCP91-552	11P5	2808
XL11-096	L05-448	11P5	1353
XL11-097	HOCP00-950	11P5	7
XL11-098	US79-010	11P5	52
XL11-099	L97-128	11P5	40
XL11-100	L01-299	11P6	0
XL11-101	HO06-563	11P6	52
XL11-102	US79-010	11P6	170
XL11-103	HOCP04-838	11P6	250
XL11-104	L97-128	11P6	22
XL11-105	L10-132	11P6	274
XL11-106	HOCP00-950	L10-163	15
XL11-107	L09-099	L10-163	686
XL11-108	L10-144	L10-163	12
XL11-109	HO07-617	L10-163	13
XL11-110	L10-163	L10-163	50
XL11-111	HOCP00-950	L01-299	0
XL11-112	HOCP05-902	L01-299	0
XL11-113	HOL08-723	L01-299	12
XL11-114	L09-099	L01-299	0
XL11-115	L10-144	L01-299	0
XL11-116	L01-299	L01-299	9
XL11-117	HOCP00-950	L09-107	0
XL11-118	HOCP05-902	L09-107	0
XL11-119	HOL08-723	L09-107	72
XL11-120	L97-128	L09-107	52
XL11-121	N27	L09-107	568
XL11-122	L09-107	L09-107	0
XL11-123	HOCP00-950	L99-233	17
XL11-124	L09-099	L99-233	551
XL11-125	L94-428	L99-233	56
XL11-126	N27	L99-233	4269
XL11-127	L99-233	L99-233	1210
XL11-128	HOCP00-950	L06-001	11
XL11-129	L09-099	L06-001	850
XL11-130	HOCP05-902	L06-001	151
XL11-131	HOCP08-726	L06-001	459
XL11-132	L06-001	L06-001	25
XL11-133	HOCP00-950	L01-283	70
XL11-134	L09-099	L01-283	247
XL11-135	HOL08-723	L01-283	693
XL11-136	L06-040	L01-283	133
XL11-137	L97-128	L01-283	148
XL11-138	L01-283	L01-283	805
XL11-139	L98-209	HOCP95-951	228
XL11-140	HOCP97-609	HOCP95-951	288
XL11-141	HOL08-723	HOCP95-951	545
XL11-142	L01-315	HOCP95-951	148
XL11-143	HOCP95-951	HOCP95-951	128
XL11-144	L97-128	L99-233	428
XL11-145	L06-040	L99-233	472
XL11-146	L01-315	L99-233	1009
XL11-147	L05-457	L99-233	16
XL11-148	N27	L99-233	1254
XL11-149	US79-010	L99-233	59
XL11-150	L99-233	L99-233	636
XL11-151	HO09-841	11P7	491
XL11-152	HOCP04-838	11P7	537
XL11-153	L01-315	11P7	2190
XL11-154	L06-038	11P7	52
XL11-155	L09-121	11P7	220
XL11-156	L10-132	11P7	340
XL11-157	L01-299	11P8	27
XL11-158	L97-128	11P8	38
XL11-159	L10-163	11P8	70
XL11-160	LCP85-384	11P8	43
XL11-161	L06-040	11P8	15
XL11-162	HO06-563	11P9	194
XL11-163	HO09-841	11P9	339
XL11-164	HOCP09-846	11P9	372
XL11-165	L01-299	11P9	178
XL11-166	L97-128	11P9	175
XL11-167	HOCP00-950	L99-226	99
XL11-168	L97-128	L99-226	27

Table 5. Contine.

Cross	Female	Male	Seed
XL11-169	N27	L99-226	1191
XL11-170	US79-010	L99-226	3280
XL11-171	LCP81-010	L99-226	3750
XL11-172	L99-226	L99-226	916
XL11-173	HOCP00-950	L01-299	0
XL11-174	HOCP95-951	L01-299	523
XL11-175	HOCP97-609	L01-299	115
XL11-176	L06-040	L01-299	179
XL11-177	L94-426	L01-299	75
XL11-178	L01-299	L01-299	8
XL11-179	HOCP00-950	L09-107	0
XL11-180	L98-209	L09-107	10
XL11-181	N27	L09-107	113
XL11-182	L09-107	L09-107	0
XL11-183	HOCP00-950	L10-163	7
XL11-184	HOCP95-951	L10-163	195
XL11-185	L01-315	L10-163	29
XL11-186	N27	L10-163	503
XL11-187	L10-163	L10-163	264
XL11-188	HOCP00-950	L09-099	8
XL11-189	HOCP95-951	L09-099	513
XL11-190	L94-426	L09-099	139
XL11-191	L09-099	L09-099	421
XL11-192	HOCP02-623	11P10	387
XL11-193	HOCP04-838	11P10	984
XL11-194	HOCP85-845	11P10	2040
XL11-195	HOCP96-540	11P10	4053
XL11-196	HOCP97-609	11P10	1072
XL11-197	L06-001	11P10	177
XL11-198	L06-038	11P10	14
XL11-199	LCP85-384	11P10	1415
XL11-200	L01-299	11P11	187
XL11-201	L06-001	11P11	158
XL11-202	L94-428	11P11	2942
XL11-203	L99-226	11P11	246
XL11-204	L94-433	11P11	837
XL11-205	L06-040	11P11	338
XL11-206	L06-038	11P11	46
XL11-207	HO06-563	11P11	860
XL11-208	LCP85-384	11P12	1050
XL11-209	L01-299	11P12	68
XL11-210	HO06-563	11P12	786
XL11-211	HOCP96-540	11P12	2166
XL11-212	L98-209	11P12	388
XL11-213	L06-001	11P12	117
XL11-214	HOCP00-930	L99-226	2724
XL11-215	HOCP00-950	L99-226	700
XL11-216	L97-128	L99-226	599
XL11-217	L98-209	L99-226	154
XL11-218	LCP85-384	L99-226	1580
XL11-219	L99-226	L99-226	786
XL11-220	HOCP00-930	11P13	247
XL11-221	HOCP00-950	11P13	931
XL11-222	HOCP97-609	11P13	285
XL11-223	L06-001	11P13	277
XL11-224	L94-426	11P13	478
XL11-225	L97-128	11P13	53
XL11-226	L99-226	11P13	2639
XL11-227	HOCP02-618	11P13	1140
XL11-228	HOCP96-540	11P14	5141
XL11-229	HOCP97-609	11P14	776
XL11-230	HOL08-723	11P14	0
XL11-231	L06-001	11P14	19
XL11-232	L94-426	11P14	433
XL11-233	L94-433	11P14	904
XL11-234	L99-226	11P14	369
XL11-235	N27	11P14	29
XL11-236	US79-010	11P14	2009
XL11-237	HO07-617	L06-001	207
XL11-238	TUCCP77-042	L06-001	0
XL11-239	HOCP92-618	L06-001	1852
XL11-240	HOCP96-561	L06-001	377
XL11-241	L94-426	L06-001	541
XL11-242	HOCP02-623	L06-001	1145
XL11-243	L06-001	L06-001	77
XL11-244	L94-426	L99-226	288
XL11-245	L09-121	L99-226	612
XL11-246	HOCP96-561	L99-226	368
XL11-247	HOCP04-847	L99-226	95
XL11-248	HOCP02-618	L99-226	122
XL11-249	HOCP00-950	L99-226	188
XL11-250	L99-226	L99-226	20
XL11-251	HOCP00-950	L01-299	40
XL11-252	HOCP96-561	L01-299	63
XL11-253	L94-426	L01-299	126
XL11-254	TUCCP77-042	L01-299	0
XL11-255	HOCP04-847	L01-299	8
XL11-256	HOCP85-845	L01-299	399
XL11-257	L01-299	L01-299	10
XL11-258	HOCP00-950	L10-144	27
XL11-259	HOCP96-561	L10-144	69
XL11-260	L94-426	L10-144	0

Table 5. Continue.

Cross	Female	Male	Seed
XL11-261	HOCP02-618	L10-144	49
XL11-262	N27	L10-144	307
XL11-263	L10-144	L10-144	0
XL11-264	L99-226	11P15	1555
XL11-265	HOCP04-847	11P15	315
XL11-266	HOCP96-540	11P15	5334
XL11-267	HO95-988	11P15	1052
XL11-268	HOCP97-609	11P15	992
XL11-269	L06-001	11P15	30
XL11-270	L94-426	11P15	2673
XL11-271	L98-207	11P15	2296
XL11-272	LCP85-384	11P15	5041
XL11-273	HOCP02-618	11P15	635
XL11-274	HO95-988	11P16	1187
XL11-275	HOCP85-845	11P16	979
XL11-276	HOCP96-540	11P16	8550
XL11-277	L06-001	11P16	213
XL11-278	L09-099	11P16	2840
XL11-279	L94-426	11P16	373
XL11-280	L99-226	11P16	2812
XL11-281	LCP85-384	11P16	639
XL11-282	HOCP02-623	11P16	297
XL11-283	HO09-827	11P17	10
XL11-284	HO95-988	11P17	1106
XL11-285	HOCP02-623	11P17	453
XL11-286	HOCP85-845	11P17	1678
XL11-287	HOCP96-540	11P17	2810
XL11-288	L06-001	11P17	405
XL11-289	L99-226	11P17	1297
XL11-290	LCP85-384	11P17	1383
XL11-291	LCP81-010	11P17	1813
XL11-292	US79-010	11P17	451
XL11-293	HO07-617	HOCP96-540	136
XL11-294	HOCP01-523	HOCP96-540	676
XL11-295	HOCP04-847	HOCP96-540	32
XL11-296	L08-088	HOCP96-540	50
XL11-297	L09-112	HOCP96-540	494
XL11-298	L94-433	HOCP96-540	1079
XL11-299	HO09-827	HOCP96-561	77
XL11-300	HO95-988	HOCP96-561	72
XL11-301	HOCP00-930	HOCP96-561	998
XL11-302	L94-426	HOCP96-561	372
XL11-303	TUCCP77-042	HOCP96-561	20
XL11-304	HOCP01-523	HOCP96-561	460
XL11-305	HOCP96-561	HOCP96-561	89
XL11-306	HO09-827	LCP85-384	242
XL11-307	HO95-988	LCP85-384	0
XL11-308	HOCP01-523	LCP85-384	944
XL11-309	HOCP04-847	LCP85-384	44
XL11-310	L94-426	LCP85-384	80
XL11-311	LCP85-384	LCP85-384	30
XL11-312	HO09-827	US79-010	45
XL11-313	HO95-988	US79-010	0
XL11-314	L94-426	US79-010	36
XL11-315	US79-010	US79-010	32
XL11-316	HO09-827	HOCP85-845	130
XL11-317	HOCP04-847	HOCP85-845	0
XL11-318	L01-315	HOCP85-845	108
XL11-319	L97-128	HOCP85-845	13
XL11-320	HOCP85-845	HOCP85-845	394
XL11-321	HOCP02-623	11P18	824
XL11-322	HOCP97-609	11P18	372
XL11-323	L94-428	11P18	85
XL11-324	HOCP85-845	11P18	1315
XL11-325	HOCP02-618	11P18	0
XL11-326	HOCP04-838	11P18	1356
XL11-327	HOL08-723	11P18	0
XL11-328	HOCP02-623	11P19	1359
XL11-329	HOCP04-847	11P19	355
XL11-330	HOCP85-845	11P19	3239
XL11-331	HOCP96-540	11P19	16
XL11-332	HOCP97-609	11P19	647
XL11-333	HOL08-723	11P19	320
XL11-334	L98-207	11P19	1036
XL11-335	HOCP00-950	L09-131	0
XL11-336	L09-108	L09-131	193
XL11-337	L10-137	L09-131	0
XL11-338	L09-131	L09-131	5
XL11-339	L09-108	HOCP92-618	740
XL11-340	L09-112	HOCP92-618	333
XL11-341	L10-137	HOCP92-618	344
XL11-342	HOCP96-561	HOCP92-618	343
XL11-343	HO09-827	HOCP01-523	721
XL11-344	HOCP04-847	HOCP01-523	18
XL11-345	HOCP92-624	HOCP01-523	884
XL11-346	L09-108	HOCP01-523	912
XL11-347	N27	HOCP01-523	145
XL11-348	HOCP01-523	HOCP01-523	134
XL11-349	HO09-827	L07-057	1119
XL11-350	L09-108	L07-057	231
XL11-351	HOCP04-838	L07-057	694
XL11-352	L07-057	L07-057	0

Table 5. Continue

Cross	Female	Male	Seed
XL11-353	HO08-717	11P20	233
XL11-354	HO95-988	11P20	0
XL11-355	HOCP04-838	11P20	1509
XL11-356	HOCP96-540	11P20	455
XL11-357	L05-457	11P20	0
XL11-358	L07-057	11P20	862
XL11-359	HO09-825	HO95-988	0
XL11-360	HOCP92-624	HO95-988	50
XL11-361	HOCP96-561	HO95-988	0
XL11-362	L08-088	HO95-988	0
XL11-363	L10-147	HO95-988	795
XL11-364	HO95-988	HO95-988	0
XL11-365	HO09-825	HOCP02-623	31
XL11-366	L97-128	HOCP02-623	38
XL11-367	L09-121	HOCP02-623	0
XL11-368	L94-433	HOCP02-623	32
XL11-369	N27	HOCP02-623	43
XL11-370	HOCP02-623	HOCP02-623	13
XL11-371	L10-147	HOCP96-540	1181
XL11-372	L08-088	HOCP96-540	0
XL11-373	L09-123	HOCP96-540	493
XL11-374	HOCP04-847	HOCP04-838	36
XL11-375	L97-128	HOCP04-838	196
XL11-376	HOCP09-810	HOCP04-838	9
XL11-377	HOCP09-814	HOCP04-838	0
XL11-378	HOCP92-624	HOCP04-838	42
XL11-379	HOCP04-838	HOCP04-838	0
XL11-380	HO09-825	HOCP01-523	0
XL11-381	HO09-827	HOCP01-523	221
XL11-382	HOCP09-810	HOCP01-523	0
XL11-383	HOCP09-810	HOCP97-609	53
XL11-384	N27	HOCP97-609	38
XL11-385	HOCP04-838	HOCP97-609	122
XL11-386	HOCP02-623	11P21	18
XL11-387	HOCP85-845	11P21	89
XL11-388	HOCP92-624	11P21	114
XL11-389	LCP86-454	11P21	21
XL11-390	HO07-617	L98-207	0
XL11-391	L08-088	L98-207	158
XL11-392	L09-121	L98-207	2002
XL11-393	L09-123	L98-207	135
XL11-394	L98-207	L98-207	112
XL11-395	L09-099	L01-283	880
XL11-396	L09-121	L01-283	0
XL11-397	L09-123	L01-283	112
XL11-398	L97-128	L01-283	0
XL11-399	HOCP00-930	L10-147	320
XL11-400	L09-121	L10-147	115
XL11-401	L09-123	L10-147	340
XL11-402	L10-147	L10-147	1204
XL11-403	HO08-717	L09-131	554
XL11-404	L10-157	L09-131	174
XL11-405	L97-128	L09-131	93
XL11-406	L09-131	L09-131	44
XL11-407	HO08-717	L94-428	20
XL11-408	HOCP09-810	L94-428	73
XL11-409	HOCP92-624	L94-428	9
XL11-410	L94-433	L94-428	0
XL11-411	N27	L94-428	126
XL11-412	HO08-717	11P22	595
XL11-413	HOCP01-517	11P22	1778
XL11-414	HOCP02-618	11P22	1038
XL11-415	HOCP09-810	11P22	2699
XL11-416	HOCP96-540	11P22	1801
XL11-417	L99-223	11P22	1302
XL11-418	LCP85-384	11P22	2853
XL11-419	HO08-717	11P23	744
XL11-420	HOCP09-846	11P23	861
XL11-421	HOCP91-552	11P23	57
XL11-422	HOCP96-540	11P23	5003
XL11-423	LCP85-384	11P23	147
XL11-424	L10-160	L10-163	18
XL11-425	L97-128	L10-163	21
XL11-426	HOCP09-814	L10-163	28
XL11-427	L10-163	L10-163	0
XL11-428	L97-128	L10-150	0
XL11-429	L10-160	L10-150	10
XL11-430	HOCP92-624	L10-150	117
XL11-431	L10-150	L10-150	33
XL11-432	L97-128	L10-157	13
XL11-433	N27	L10-157	2034
XL11-434	HOCP01-523	L10-157	0
XL11-435	L10-157	L10-157	52
XL11-436	HO09-825	HOCP08-726	0
XL11-437	HOCP04-847	HOCP08-726	28
XL11-438	HOCP85-845	HOCP08-726	774
XL11-439	L97-128	HOCP08-726	9
XL11-440	LCP81-010	HOCP08-726	0
XL11-441	HOCP08-726	HOCP08-726	1294
XL11-442	HOCP00-930	11P24	2124
XL11-443	HOCP08-726	11P24	1030
XL11-444	L09-121	11P24	3051

Table 5. Continue.

Cross	Female	Male	Seed
XL11-445	L09-123	11P24	48
XL11-446	LCP81-010	11P24	911
XL11-447	HOCP85-845	11P24	557
XL11-448	HOCP96-540	11P25	2946
XL11-449	HOL08-723	11P25	507
XL11-450	L01-299	11P25	211
XL11-451	L06-040	11P25	848
XL11-452	L09-121	11P25	2194
XL11-453	L97-128	11P25	8
XL11-454	LCP81-010	11P25	2107
XL11-455	LCP85-384	11P25	689
XL11-456	L09-107	L09-125	860
XL11-457	L97-128	L09-125	392
XL11-458	HO95-988	L09-125	636
XL11-459	HOCP92-624	L09-125	1258
XL11-460	LCP81-010	L09-125	4790
XL11-461	L09-125	L09-125	2381
XL11-462	HO08-717	L10-144	194
XL11-463	HO06-530	L10-144	74
XL11-464	HOCP04-847	L10-144	0
XL11-465	HOCP85-845	L10-144	158
XL11-466	L08-088	L10-144	25
XL11-467	L97-128	L10-144	0
XL11-468	L10-144	L10-144	0
XL11-469	HO08-717	L10-160	137
XL11-470	HOCP85-845	L10-160	606
XL11-471	L09-129	L10-160	0
XL11-472	L94-433	L10-160	109
XL11-473	L97-128	L10-160	27
XL11-474	LCP85-384	L10-160	661
XL11-475	L10-160	L10-160	75
XL11-476	HOCP00-930	11P26	1087
XL11-477	HOCP02-623	11P26	38
XL11-478	L01-299	11P26	1680
XL11-479	L09-107	11P26	1081
XL11-480	L99-233	11P26	160
XL11-481	HO08-717	11P26	447
XL11-482	L06-040	11P26	148
XL11-483	HOCP96-540	11P27	6380
XL11-484	HOL08-723	11P27	3717
XL11-485	L01-299	11P27	825
XL11-486	L05-448	11P27	667
XL11-487	L09-107	11P27	587
XL11-488	L94-433	11P27	1880
XL11-489	L06-040	11P27	331
XL11-490	CP83-644	L99-226	0
XL11-491	HOCP01-517	L99-226	52
XL11-492	HOCP05-902	L99-226	35
XL11-493	HOL08-723	L99-226	141
XL11-494	L99-226	L99-226	181
XL11-495	HOCP01-523	L05-448	252
XL11-496	HOCP09-846	L05-448	17
XL11-497	L06-040	L05-448	418
XL11-498	US79-010	L05-448	993
XL11-499	L05-448	L05-448	171
XL11-500	HO06-563	11P28	716
XL11-501	HO06-824	11P28	351
XL11-502	L05-448	11P28	606
XL11-503	L08-088	11P28	581
XL11-504	L10-150	11P28	45
XL11-505	LCP81-010	11P28	1342
XL11-506	LCP85-384	11P28	1689
XL11-507	HO06-563	11P29	828
XL11-508	HO09-824	11P29	235
XL11-509	HOCP00-930	11P29	120
XL11-510	HOCP02-618	11P29	729
XL11-511	HOCP96-540	11P29	1080
XL11-512	L01-299	11P29	186
XL11-513	L05-448	11P29	147
XL11-514	L10-144	11P29	17
XL11-515	HOCP96-540	11P30	2004
XL11-516	L01-299	11P30	6
XL11-517	L05-448	11P30	375
XL11-518	L10-145	11P30	153
XL11-519	LCP85-384	11P30	3963
XL11-520	US79-010	11P30	639
XL11-521	CP83-644	L01-283	15
XL11-522	HO07-617	L01-283	0
XL11-523	HOCP00-950	L01-283	0
XL11-524	HOCP09-803	L01-283	0
XL11-525	L10-156	L01-283	6
XL11-526	L01-283	L01-283	0
XL11-527	CP83-644	HOCP96-540	0
XL11-528	L10-156	HOCP96-540	37
XL11-529	L08-088	HOCP96-540	26
XL11-530	L94-426	L09-125	20
XL11-531	HO08-717	L09-125	76
XL11-532	L09-125	L09-125	414
XL11-533	HO06-530	11P31	151
XL11-534	HOCP02-618	11P31	0
XL11-535	HOCP92-618	11P31	16
XL11-536	HOCP96-540	11P31	0

Table 5. Continue.

Cross	Female	Male	Seed
XL11-537	L01-283	11P31	10
XL11-538	L06-001	11P31	0
XL11-539	LCP85-384	11P31	322
XL11-540	US79-010	11P31	264
XL11-541	CP83-644	L10-145	0
XL11-542	HO05-961	L10-145	14
XL11-543	HO07-617	L10-145	0
XL11-544	HOCP00-950	L10-145	0
XL11-545	L10-145	L10-145	0
XL11-546	CP83-644	L06-001	0
XL11-547	HO09-831	L06-001	473
XL11-548	HOCP01-517	L06-001	135
XL11-549	L09-112	L06-001	0
XL11-550	L06-001	L06-001	0
XL11-551	HO09-831	HOCP96-540	249
XL11-552	HOCP09-814	HOCP96-540	16
XL11-553	L08-088	HOCP96-540	0
XL11-554	HO08-717	L99-226	72
XL11-555	HO09-825	L99-226	8
XL11-556	HO06-530	L99-226	20
XL11-557	HOCP09-814	L01-283	120
XL11-558	HOCP85-845	L01-283	756
XL11-559	HO06-563	L01-283	209
XL11-560	HO06-563	11P32	167
XL11-561	HO08-717	11P32	521
XL11-562	HOCP96-540	11P32	2079
XL11-563	L94-433	11P32	19
XL11-564	HOCP00-950	L09-112	27
XL11-565	HOCP05-902	L09-112	32
XL11-566	L09-129	L09-112	7
XL11-567	L09-112	L09-112	0
XL11-568	HOCP00-950	L09-131	225
XL11-569	L94-433	L09-131	0
XL11-570	L09-131	L09-131	198
XL11-571	HO09-824	11P33	624
XL11-572	HOCP00-950	11P33	740
XL11-573	HOCP85-845	11P33	969
XL11-574	HOCP92-618	11P33	335
XL11-575	L01-283	11P33	673
XL11-576	LCP85-384	11P33	750
XL11-577	HOCP00-950	LCP86-454	91
XL11-578	HOCP01-517	LCP86-454	108
XL11-579	HO08-709	LCP86-454	1267
XL11-580	HO95-988	HOCP96-540	479
XL11-581	HOCP00-950	HOCP96-540	0
XL11-582	HOCP09-803	HOCP96-540	486
XL11-583	HO08-709	11P34	146
XL11-584	HOCP00-930	11P34	0
XL11-585	HOCP02-623	11P34	39
XL11-586	HOCP96-561	11P34	0
XL11-587	HO07-613	L99-226	443
XL11-588	HO08-709	L99-226	12
XL11-589	HOCP05-902	L99-226	18
XL11-590	HOL08-723	L99-226	49
XL11-591	HOCP96-561	L99-226	8
XL11-592	CP83-644	L01-283	240
XL11-593	HO95-988	L01-283	17
XL11-594	HOCP00-950	L01-283	0
XL11-595	HOCP01-517	L01-283	413
XL11-596	L09-099	L01-283	87
XL11-597	CP83-644	HOCP02-623	193
XL11-598	HOCP00-950	HOCP02-623	47
XL11-599	HOCP04-847	HOCP02-623	9
XL11-600	HOCP85-845	HOCP02-623	13
XL11-601	CP83-644	11P35	1239
XL11-602	HO06-530	11P35	2512
XL11-603	HOCP96-561	11P35	141
XL11-604	L01-283	11P35	158
XL11-605	LCP81-010	11P35	0
XL11-606	LCP85-384	11P35	0
XL11-607	HOCP00-950	11P36	56
XL11-608	HO06-530	11P36	6
XL11-609	HOCP09-803	11P36	0
XL11-610	N27	11P36	0
XL11-611	CP83-644	11P36	262
XL11-589	HOCP05-902	L99-226	18

SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2011

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SUMMARY

In the selection phase of the LSU AgCenter's Sugarcane Variety Development Program, superior clones are advanced through the single stool, first line, second line, and increase stages of the breeding program. In the first stubble crop of the second-line trials, those clones with acceptable breeding or commercial value are assigned a permanent variety number. A total of 90,294 seedlings from 211 crosses were planted in the field in the spring of 2011. The majority of these seedlings are progeny of poly crosses among commercial and elite experimental varieties. In the fall of 2011, family selection was practiced on the 41,581 stubble seedlings surviving the winter. This selection resulted in the planting of 1,888 first-line trial plots. At the same time, superior clones were also selected and advanced through subsequent stages (522 to second line trials, 150 to the increase stage). Assignments of permanent "L11" numbers were given to the 25 best clones of the 2006 crossing series.

PROCEDURES

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

RESULTS AND DISCUSSION

A total of 90,294 seedlings from 211 crosses of the 2010 crossing series were planted to the field in the spring of 2011 (Table 1). Many of these seedlings were progeny of crosses among commercial and superior experimental varieties. In the fall of 2011, individual selection was practiced on the 41,581 stubble single stools of the 2009 crossing series that survived the winter. The 1,888 clones selected and advanced from the single stools were planted in 10-foot first-line trial plots. Dates of planting and harvesting of all plots in the selection phase of the program can be found in Table 2.

The 1,730 first-line trial plots of the 2008 crossing series were rated for cane yield and pest resistance in August of 2011 (Table 3). After screening for cane yield rating, acceptable clones were further evaluated for pest resistance (diseases and borer injury) stalk quality, and Brix (Table 3). This second stage of advancement was concluded with the planting of 522 clones in single row 16-foot second line trials plots.

Stalk counts were made on the 388 plant-cane second line trial plots of the 2007 crossing series in August 2011. Based on these counts and sucrose lab data collected in 2010, 150 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 2012. Of the 54 candidates from the first stubble crop of the second line trial plots, the best 25 clones from the 2006 crossing series were assigned permanent ■L11" numbers (Table 5). These newly assigned ■L10" 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 2006 through 2010 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 2011 by the Louisiana, "L," Sugarcane Variety Development Program's personnel.

	Crosses				Advanced to			
Crossing series	Progeny test	Selection program	Plants transplanted	Over-wintered plants	1st line	2nd line	Increase	On-station Nurseries (L11 Assignments)
			---------- number of clones ----------					
X06	120	178	84307	51867	2623	341	119	25
X07	70	132	81474	70878	1836	388	150	
X08	--	153	76213	39329	1730	522		
X09	60	215	76095	41581	1888			
X10	50	211	90294					

Table 2. Dates of seedling and line trials planted or harvested in 2011.

Crossing Series	Test	Crop	Date Planted	Date Harvested
X10	Seedlings	Planted	4/11 – 4/18	
X10	Progeny Test	Planted	4/18	
X09	Seedlings	First Stubble	4/14 – 4/21	
X09	Progeny Test	First Stubble	4/20	10/07/11
X09	First Line Trials	Planted	9/30/11	
X08	First Line Trials	Plant-cane	9/17/10	
X07	First Line Trials	First Stubble	9/10/09	12/13/11
X08	Second Line Trials	Planted	09/14/11	
X07	Second Line Trials	Plant-cane	9/23/10	10/26/11
X06	Second Line Trials	First Stubble	10/1/09	10/12/11
X05	Second Line Trials	Second Stubble	10/21/08	11/01/11
X07	Light Soil Increase	Planted	10/25/11	
X06	Light Soil Increase	Plant-cane	9/23/10	12/07/11
X05	Light Soil Increase	First Stubble	10/21/09	11/29/11
X04	Light Soil Increase	Second Stubble	10/02/08	11/01/11
X07	Heavy Soil Increase	Planted	10/25/11	
X06	Heavy Soil Increase	Plant-cane	9/23/10	12/02/11
X04	Heavy Soil Increase	Second Stubble	10/02/08	11/01/11

Table 3. Numbers of experimental clones dropped for identified faults in the 2008 crossing series first-line trials.

	Fault	
Trait	Frequency	Percent
---------- 1730 clones enter first round of evaluation ----------		
Initial Selection (Rating)	805	46.5
---------- 925 clones enter second round of evaluation ----------		
Pith / Tube	171	9.9
Smut	4	0.2
Rust	5	0.3
Lodge	34	2.0
Other	9	0.5
---------- 223 clones dropped ----------		
----------702 clones enter third round of evaluation ----------		
Brix	180	10.4
Clones advanced	522	30.2

Table 4. Number of experimental clones dropped for identified faults in the 2007 crossing series of the plant-cane second line trial prior to advancement to the increase stage.

	Fault	
Trait	Frequency	Percent
---------- 388 clones enter first round of evaluation ----------		
Stalk count <75 per plot & observations	121	31.2
Lodged	45	11.6
Pith / Tube	45	11.6
Smut	11	2.7
Diameter	3	0.8
Short	3	0.8
Rust	5	1.3
Other	5	1.3
---------- 238 clones dropped ----------		
Clones advanced to Increase stage	150	38.7

Table 5. Yield data of the 2011 “L” assignments made in the first- stubble second line trials.

Variety	Female	Male	Sugar Per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
HOCP96-540	LCP86-454	LCP85-384	7808	36.3	211	1.9	37434	10.6
L99-226	CP89-846	LCP81-030	11556	52.8	218	2.34	45148	11.3
L01-283	L93-365	LCP85-384	10359	42.9	243	1.7	50139	11.6
L11-167	HOCP92-624	HOCP96-540	8648	40.8	212	1.78	45829	12.2
L11-168	L94-433	HOCP96-540	8919	42.4	210	1.77	48098	11.2
L11-169	HOCP92-624	L01-299	8170	37.6	217	1.64	45829	14.3
L11-170	HOCP92-624	LCP85-384	7990	35.5	225	1.65	43106	12
L11-171	L94-433	HOCP96-540	8277	33.3	249	1.71	39023	11.8
L11-172	L99-233	HOCP96-540	10227	45.3	226	2.17	41745	12.8
L11-173	HOCP95-951	L04-410	11362	43.8	260	1.64	53543	13.4
L11-174	HOCP92-624	HOCP96-540	8175	36.1	227	2.07	34939	13.5
L11-175	LCP85-384	L02-325	9764	41.6	235	1.85	44921	12.2
L11-176	HOCP00-930	L04-408	10288	47.4	217	1.67	56719	11.5
L11-177	L94-433	HOCP96-540	7259	33.2	218	1.5	44468	13.2
L11-178	HOCP92-624	LCP85-384	9607	43	223	1.94	44468	11.4
L11-179	L94-426	L99-233	8524	39.8	214	1.63	49005	10.6
L11-180	HOCP00-930	L04-408	12135	48.9	248	1.61	60803	9.5
L11-181	L04-408	L99-233	9815	43.6	225	2.32	37661	11.7
L11-182	L94-433	HOCP96-540	11388	56.2	203	2.56	44014	12.3
L11-183	HOCP92-624	LCP85-384	9631	46.3	208	2.3	40384	11.4
L11-184	L02-316	06P2	11352	49.7	228	1.73	57626	11
L11-185	L94-433	HOCP96-540	10372	42.5	244	2	42653	12.8
L11-186	HOCP00-933	L04-410	11002	48.5	227	2.06	47190	11.4
L11-187	HOCP00-950	HOCP01-523	8347	33.5	249	1.72	39023	13.3
L11-188	HOCP92-624	LCP85-384	9013	37.9	238	1.26	60349	11.6
L11-189	LCP81-010	L99-226	11368	54.9	207	2.11	52181	11.3
L11-190	L01-299	HOCP02-610	9887	41.7	237	1.55	53996	12.6
L11-191	L04-408	L99-233	9908	43.4	228	1.73	50366	10.1
L11-167	HOCP92-624	HOCP96-540	8648	40.8	212	1.78	45829	12.2
L11-168	L94-433	HOCP96-540	8919	42.4	210	1.77	48098	11.2
L11-169	HOCP92-624	L01-299	8170	37.6	217	1.64	45829	14.3
L11-170	HOCP92-624	LCP85-384	7990	35.5	225	1.65	43106	12
L11-171	L94-433	HOCP96-540	8277	33.3	249	1.71	39023	11.8
L11-172	L99-233	HOCP96-540	10227	45.3	226	2.17	41745	12.8
L11-173	HOCP95-951	L04-410	11362	43.8	260	1.64	53543	13.4
L11-174	HOCP92-624	HOCP96-540	8175	36.1	227	2.07	34939	13.5
L11-175	LCP85-384	L02-325	9764	41.6	235	1.85	44921	12.2

Table 6. Advancement summary of crosses in the 2006 through 2009 crossing series.

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
2006 Crossing Series										
CP83-644	HOCP04-836	239	0	31	0	33	0	37	0	45
CP83-644	HOCP89-846	211	20	80	2	80	1	86	0	45
CP83-644	LCP81-010	210	0	31	0	33	0	37	0	45
HO95-988	L99-233	729	56	71	5	77	1	74	0	45
HO95-988	LCP85-384	379	0	31	0	33	0	37	0	45
HOCP00-905	HOCP04-836	981	0	31	0	33	0	37	0	45
HOCP00-930	L04-408	474	44	78	3	76	2	83	2	96
HOCP00-930	L99-233	476	47	83	3	76	1	77	0	45
HOCP00-933	06P3	447	0	31	0	33	0	37	0	45
HOCP00-933	L04-410	433	49	89	5	83	5	97	1	94
HOCP00-933	L92-312	215	0	31	0	33	0	37	0	45
HOCP00-950	HOCP00-930	952	34	63	1	66	0	37	0	45
HOCP00-950	HOCP01-523	377	36	80	5	84	4	97	1	96
HOCP00-950	HOCP04-836	166	0	31	0	33	0	37	0	45
HOCP00-950	HOCP91-552	300	24	73	2	76	0	37	0	45
HOCP00-950	L99-226	82	18	99	4	98	1	98	0	45
HOCP00-950	LCP85-384	157	24	98	3	91	1	89	0	45
HOCP00-950	LCP85-384	193	21	87	1	74	0	37	0	45
HOCP01-523	L99-233	215	28	95	2	80	0	37	0	45
HOCP01-561	L99-233	196	0	31	0	33	0	37	0	45
HOCP01-827	LCP85-384	229	0	31	0	33	0	37	0	45
HOCP02-610	L04-410	1217	0	31	0	33	0	37	0	45
HOCP02-618	HOCP99-825	222	0	31	0	33	0	37	0	45
HOCP02-618	L99-226	408	0	31	0	33	0	37	0	45
HOCP02-618	L99-226	472	46	82	2	70	1	78	0	45
HOCP02-623	HOCP01-523	210	0	31	0	33	0	37	0	45
HOCP02-623	HOCP04-836	236	0	31	0	33	0	37	0	45
HOCP02-623	HOCP91-552	464	36	72	9	92	4	93	0	45
HOCP02-623	HOCP96-540	486	0	31	0	33	0	37	0	45
HOCP02-652	HOCP96-540	237	0	31	0	33	0	37	0	45
HOCP04-809	HOCP04-829	180	13	69	1	75	1	88	0	45
HOCP04-809	L99-233	460	0	31	0	33	0	37	0	45
HOCP04-810	HOCP96-561	201	0	31	0	33	0	37	0	45
HOCP04-824	HOCP96-540	492	0	31	0	33	0	37	0	45
HOCP04-827	HOCP02-623	236	0	31	0	33	0	37	0	45
HOCP04-829	L05-448	141	18	94	3	93	1	91	0	45
HOCP04-843	HOCP04-809	216	0	31	0	33	0	37	0	45
HOCP04-843	L99-233	236	0	31	0	33	0	37	0	45
HOCP04-843	L99-233	657	55	75	12	89	3	85	0	45

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP85-845	HOCP96-540	738	0	31	0	33	0	37	0	45
HOCP89-831	HOCP04-836	229	28	92	1	72	0	37	0	45
HOCP89-846	L99-233	223	0	31	0	33	0	37	0	45
HOCP89-846	LCP81-010	242	0	31	0	33	0	37	0	45
HOCP91-552	06P1	114	0	31	0	33	0	37	0	45
HOCP91-552	HOCP04-809	625	0	31	0	33	0	37	0	45
HOCP92-624	HOCP04-824	239	0	31	0	33	0	37	0	45
HOCP92-624	HOCP04-836	243	0	31	0	33	0	37	0	45
HOCP92-624	HOCP04-836	252	0	31	0	33	0	37	0	45
HOCP92-624	HOCP91-552	152	0	31	0	33	0	37	0	45
HOCP92-624	HOCP91-552	504	0	31	0	33	0	37	0	45
HOCP92-624	HOCP96-540	1391	152	87	30	94	10	91	2	92
HOCP92-624	HOCP96-540	465	52	89	0	33	0	37	0	45
HOCP92-624	HOCP96-561	493	0	31	0	33	0	37	0	45
HOCP92-624	L01-299	697	85	92	21	96	6	93	1	91
HOCP92-624	L02-316	232	0	31	0	33	0	37	0	45
HOCP92-624	L04-408	186	0	31	0	33	0	37	0	45
HOCP92-624	L04-410	986	0	31	0	33	0	37	0	45
HOCP92-624	L05-445	214	33	98	0	33	0	37	0	45
HOCP92-624	L05-448	1156	0	31	0	33	0	37	0	45
HOCP92-624	L99-233	1338	0	31	0	33	0	37	0	45
HOCP92-624	LCP81-010	240	0	31	0	33	0	37	0	45
HOCP92-624	LCP85-384	486	63	95	8	87	1	76	1	92
HOCP92-624	LCP85-384	457	53	90	5	82	1	79	0	45
HOCP92-624	LCP85-384	242	36	96	17	99	8	99	2	99
HOCP92-624	LCP85-384	230	27	91	7	97	2	94	1	97
HOCP92-648	HOCP02-623	228	0	31	0	33	0	37	0	45
HOCP92-648	HOCP04-824	245	24	82	5	92	1	82	0	45
HOCP92-648	HOCP04-836	500	0	31	0	33	0	37	0	45
HOCP92-648	L04-410	424	0	31	0	33	0	37	0	45
HOCP92-648	L92-312	241	0	31	0	33	0	37	0	45
HOCP92-648	L99-233	472	45	80	2	70	0	37	0	45
HOCP92-648	LCP85-384	486	29	67	2	69	1	76	0	45
HOCP93-749	HOCP02-618	421	0	31	0	33	0	37	0	45
HOCP95-951	HOCP00-905	488	0	31	0	33	0	37	0	45
HOCP95-951	HOCP04-824	416	0	31	0	33	0	37	0	45
HOCP95-951	HOCP91-552	390	35	77	11	96	5	98	0	45
HOCP95-951	HOCP96-522	238	0	31	0	33	0	37	0	45
HOCP95-951	HOCP96-540	695	0	31	0	33	0	37	0	45
HOCP95-951	L01-299	407	0	31	0	33	0	37	0	45
HOCP95-951	L04-410	230	24	85	5	94	1	84	1	97

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP95-951	L04-425	180	0	31	0	33	0	37	0	45
HOCP96-540	06P1	419	0	31	0	33	0	37	0	45
HOCP96-540	06P2	1053	0	31	0	33	0	37	0	45
HOCP96-540	HOCP02-618	211	0	31	0	33	0	37	0	45
HOCP96-561	06P1	231	0	31	0	33	0	37	0	45
HOCP96-561	L04-410	231	0	31	0	33	0	37	0	45
HOCP96-561	L05-448	219	27	94	7	97	1	85	0	45
HOCP97-609	HOCP04-807	232	0	31	0	33	0	37	0	45
HOCP97-609	L01-283	235	29	94	5	93	2	92	0	45
L01-299	HOCP02-610	380	22	66	5	84	2	87	1	95
L01-299	HOCP04-824	160	16	84	3	91	0	37	0	45
L01-299	HOCP96-540	374	36	81	7	90	1	82	0	45
L01-299	L05-448	194	0	31	0	33	0	37	0	45
L01-299	L99-226	189	0	31	0	33	0	37	0	45
L01-315	L01-299	246	22	76	4	86	0	37	0	45
L01-315	LCP81-010	448	42	79	4	78	1	80	0	45
L02-316	06P2	220	14	67	5	95	2	95	1	98
L02-320	06P2	174	0	31	0	33	0	37	0	45
L02-320	HOCP04-824	203	0	31	0	33	0	37	0	45
L02-320	HOCP96-522	121	0	31	0	33	0	37	0	45
L02-320	L99-226	341	0	31	0	33	0	37	0	45
L03-396	HOCP91-552	209	0	31	0	33	0	37	0	45
L03-396	L04-410	479	0	31	0	33	0	37	0	45
L04-407	HOCP96-540	1176	0	31	0	33	0	37	0	45
L04-407	L99-233	324	0	31	0	33	0	37	0	45
L04-408	HOCP04-807	452	0	31	0	33	0	37	0	45
L04-408	HOCP85-845	232	14	67	0	33	0	37	0	45
L04-408	L05-448	464	0	31	0	33	0	37	0	45
L04-408	L99-233	939	71	71	12	83	5	88	2	93
L04-425	06P1	229	0	31	0	33	0	37	0	45
L04-425	06P3	398	0	31	0	33	0	37	0	45
L04-425	HOCP91-552	450	47	85	8	88	3	89	0	45
L04-425	L02-316	179	0	31	0	33	0	37	0	45
L04-425	L99-233	245	0	31	0	33	0	37	0	45
L05-408	HOCP02-623	229	0	31	0	33	0	37	0	45
L05-445	L99-233	211	0	31	0	33	0	37	0	45
L05-445	LCP85-384	130	0	31	0	33	0	37	0	45
L05-448	06P1	221	18	73	2	79	2	94	0	45
L05-450	06P3	238	0	31	0	33	0	37	0	45
L05-451	06P6	219	0	31	0	33	0	37	0	45
L05-451	HOCP96-522	200	30	97	2	81	1	87	0	45

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L05-451	L99-233	428	39	78	6	85	1	80	0	45
L05-460	HOCP04-807	211	0	31	0	33	0	37	0	45
L05-460	HOCP85-845	480	26	65	7	85	4	92	0	45
L05-460	HOCP96-540	693	0	31	0	33	0	37	0	45
L05-460	L04-410	215	0	31	0	33	0	37	0	45
L05-460	L99-226	386	45	91	2	74	0	37	0	45
L05-460	L99-233	147	0	31	0	33	0	37	0	45
L91-281	HOCP89-848	218	0	31	0	33	0	37	0	45
L93-399	HOCP04-836	479	0	31	0	33	0	37	0	45
L94-426	HOCP04-836	201	0	31	0	33	0	37	0	45
L94-426	L99-233	448	30	69	5	82	1	80	1	94
L94-428	HOCP04-824	228	0	31	0	33	0	37	0	45
L94-428	L05-448	1094	0	31	0	33	0	37	0	45
L94-432	L04-410	964	0	31	0	33	0	37	0	45
L94-432	L99-233	466	39	75	2	71	1	78	0	45
L94-433	HOCP00-930	220	8	63	0	33	0	37	0	45
L94-433	HOCP96-540	947	94	83	16	88	10	96	5	98
L94-433	L04-410	1585	79	65	8	73	4	81	0	45
L97-128	HOCP02-623	214	16	70	2	80	0	37	0	45
L97-128	HOCP96-540	244	25	84	15	98	1	83	0	45
L97-128	HOCP96-540	486	0	31	0	33	0	37	0	45
L97-128	L01-283	134	10	70	0	33	0	37	0	45
L97-128	L01-299	429	64	96	7	86	3	90	0	45
L97-128	L04-410	489	0	31	0	33	0	37	0	45
L97-128	L92-312	161	0	31	0	33	0	37	0	45
L98-197	HOCP00-930	227	0	31	0	33	0	37	0	45
L98-197	HOCP04-807	235	0	31	0	33	0	37	0	45
L98-197	HOCP96-540	477	0	31	0	33	0	37	0	45
L98-207	L94-428	301	0	31	0	33	0	37	0	45
L98-207	LCP81-010	444	2	62	1	67	0	37	0	45
L99-226	L04-410	429	0	31	0	33	0	37	0	45
L99-233	HOCP96-540	840	100	92	15	89	8	96	1	91
LCP81-010	HOCP96-540	951	0	31	0	33	0	37	0	45
LCP81-010	HOCP96-561	679	0	31	0	33	0	37	0	45
LCP81-010	L01-283	819	0	31	0	33	0	37	0	45
LCP81-010	L01-299	480	41	75	0	33	0	37	0	45
LCP81-010	L04-410	723	0	31	0	33	0	37	0	45
LCP81-010	L99-226	1129	100	76	1	66	1	74	1	90
LCP81-010	L99-233	713	47	68	3	70	0	37	0	45
LCP81-010	L99-233	969	47	64	2	67	0	37	0	45

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
LCP82-089	HOCP91-552	228	25	88	2	78	0	37	0	45
LCP82-089	HOCP96-561	202	0	31	0	33	0	37	0	45
LCP82-089	L04-408	239	0	31	0	33	0	37	0	45
LCP82-089	L92-312	229	0	31	0	33	0	37	0	45
LCP85-384	06P3	724	0	31	0	33	0	37	0	45
LCP85-384	HO95-988	860	0	31	0	33	0	37	0	45
LCP85-384	HOCP96-540	1194	0	31	0	33	0	37	0	45
LCP85-384	L02-325	483	39	73	2	69	1	76	1	93
LCP85-384	L92-312	907	0	31	0	33	0	37	0	45
US01-040	HOCP91-552	480	0	31	0	33	0	37	0	45
US01-040	L01-283	228	25	88	1	72	1	84	0	45
US79-010	L99-226	723	79	87	3	69	1	75	0	45
US93-015	HOCP91-552	186	0	31	0	33	0	37	0	45
US96-002	HOCP96-540	244	0	31	0	33	0	37	0	45
US99-002	LCP85-384	210	0	31	0	33	0	37	0	45
US99-004	HO95-988	467	0	31	0	33	0	37	0	45
2007 Crossing Series										
CP79-348	HOCP02-610	950	9	23	2	33	2	66	.	.
CP79-348	L99-226	691	5	19	2	42	1	59	.	.
HO91-572	07P2	214	6	61	0	15	0	25	.	.
HO91-572	HOCP96-540	247	8	67	1	50	1	79	.	.
HO95-988	HOCP96-540	1210	24	50	7	62	6	88	.	.
HO95-988	L99-233	235	3	30	0	15	0	25	.	.
HO95-988	L99-233	699	16	54	2	42	2	74	.	.
HO95-988	L99-233	466	7	36	2	53	0	25	.	.
HOCP00-930	07P2	246	5	50	2	73	2	94	.	.
HOCP00-930	HOCP02-618	250	16	94	4	93	2	93	.	.
HOCP00-930	L00-266	1052	35	70	6	61	3	73	.	.
HOCP00-930	L99-233	410	7	43	6	91	3	91	.	.
HOCP00-950	HOCP96-540	457	6	30	0	15	0	25	.	.
HOCP00-950	L06-001	485	34	97	7	90	3	90	.	.
HOCP00-950	L99-233	575	13	54	3	60	2	78	.	.
HOCP01-523	LCP85-384	836	0	7	0	15	0	25	.	.
HOCP02-610	HOCP96-540	948	28	65	6	68	3	75	.	.
HOCP02-618	L05-450	248	12	85	2	73	0	25	.	.
HOCP02-618	L06-001	707	23	70	7	85	2	73	.	.
HOCP02-618	L99-226	214	13	94	4	94	3	98	.	.
HOCP02-620	HOCP02-623	220	3	33	0	15	0	25	.	.
HOCP02-620	L99-226	480	3	17	0	15	0	25	.	.
HOCP02-620	L99-226	229	6	57	2	80	0	25	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP02-623	HOCP04-803	201	3	36	1	58	1	88	.	.
HOCP02-623	L99-226	252	0	7	0	15	0	25	.	.
HOCP04-809	L99-226	243	14	91	1	51	0	25	.	.
HOCP04-809	L99-233	430	8	48	3	71	1	67	.	.
HOCP04-810	TUC95-25	265	9	74	5	95	0	25	.	.
HOCP04-838	TUC95-25	132	6	82	0	15	0	25	.	.
HOCP05-902	L99-226	481	14	63	3	66	1	65	.	.
HOCP85-845	HOCP96-540	226	4	46	1	54	0	25	.	.
HOCP89-831	HOCP96-540	454	8	46	2	54	2	86	.	.
HOCP89-831	LCP85-384	713	42	92	15	96	9	97	.	.
HOCP89-846	L99-233	450	5	26	1	36	0	25	.	.
HOCP91-552	L99-226	930	4	15	2	36	0	25	.	.
HOCP92-624	HOCP02-623	1011	10	24	1	31	1	54	.	.
HOCP92-624	HOCP91-552	1043	32	66	3	42	1	52	.	.
HOCP92-624	HOCP96-561	970	11	26	2	33	0	25	.	.
HOCP92-624	L01-299	237	9	77	2	79	1	83	.	.
HOCP92-624	L01-299	1102	49	81	9	76	3	70	.	.
HOCP92-624	L04-425	955	78	98	21	97	4	82	.	.
HOCP92-624	L99-226	481	16	70	5	86	1	65	.	.
HOCP92-624	L99-233	1281	24	48	8	66	3	68	.	.
HOCP92-624	LCP85-384	1429	69	85	7	57	4	72	.	.
HOCP93-746	L99-233	249	0	7	0	15	0	25	.	.
HOCP95-951	HOCP05-923	210	9	80	1	56	0	25	.	.
HOCP95-951	HOCP96-540	1160	75	95	6	60	1	51	.	.
HOCP95-951	L01-299	858	58	96	15	94	7	95	.	.
HOCP96-540	HOCP00-950	897	0	7	0	15	0	25	.	.
HOCP96-540	HOCP00-950	642	11	43	1	32	1	60	.	.
HOCP96-540	HOCP89-831	448	0	7	0	15	0	25	.	.
HOCP96-540	L02-325	215	8	76	2	84	1	87	.	.
HOCP96-561	L06-001	735	16	52	2	39	1	55	.	.
HOCP96-561	L06-016	239	7	63	0	15	0	25	.	.
HOCP96-561	L99-226	246	10	79	2	73	2	94	.	.
HOCP96-561	LCP85-384	460	7	36	1	36	0	25	.	.
HOCP99-825	L99-233	434	6	33	1	38	0	25	.	.
HoCP00-950	Poly	183	10	89	0	15	0	25	.	.
L01-283	L99-226	1199	12	24	1	30	1	50	.	.
L01-283	L99-226	246	21	99	0	15	0	25	.	.
L01-283	LCP85-384	741	0	7	0	15	0	25	.	.
L01-299	HOCP96-540	165	8	85	1	65	0	25	.	.
L01-299	L99-233	244	8	70	2	76	0	25	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L01-299	Poly	240	8	70	2	77	1	80	.	.
L02-325	L99-226	1405	23	40	4	40	2	57	.	.
L04-408	HOCP04-803	236	13	89	3	89	1	84	.	.
L04-408	HOCP96-540	1800	48	59	0	15	0	25	.	.
L04-408	TUC95-25	267	12	82	1	48	0	25	.	.
L04-425	L99-226	1172	34	63	7	64	4	77	.	.
L04-434	L01-299	221	17	97	1	55	0	25	.	.
L05-445	L05-450	490	4	21	0	15	0	25	.	.
L05-450	07P2	183	0	7	0	15	0	25	.	.
L05-451	07P1	407	0	7	0	15	0	25	.	.
L05-457	HOCP02-610	245	1	15	0	15	0	25	.	.
L05-457	HOCP91-552	852	11	30	3	47	0	25	.	.
L05-457	HOCP96-540	426	7	40	3	71	1	69	.	.
L05-457	HOCP96-561	245	6	55	2	76	0	25	.	.
L05-457	L01-299	695	12	43	2	42	1	58	.	.
L05-457	L04-425	1096	36	70	10	83	3	71	.	.
L05-457	L04-425	240	8	70	2	77	1	80	.	.
L05-457	L99-226	717	19	57	7	85	3	81	.	.
L05-457	L99-233	240	5	51	0	15	0	25	.	.
L05-457	L99-233	482	13	59	2	51	1	64	.	.
L05-457	L99-233	1036	17	40	3	42	1	53	.	.
L05-457	LCP81-010	248	12	85	6	97	3	97	.	.
L05-459	L99-226	475	24	87	3	68	1	66	.	.
L06-003	L99-233	743	19	57	9	88	1	55	.	.
L06-010	07P2	682	8	27	0	15	0	25	.	.
L06-010	HOCP96-540	1189	57	85	6	58	1	50	.	.
L06-010	L99-226	1053	0	7	0	15	0	25	.	.
L06-010	LCP85-384	251	0	7	0	15	0	25	.	.
L06-010	LCP85-384	655	20	66	0	15	0	25	.	.
L06-025	LCP81-010	236	4	43	0	15	0	25	.	.
L06-026	L99-226	230	10	80	2	80	1	85	.	.
L06-040	HOCP96-540	251	14	91	9	98	4	99	.	.
L91-281	HOCP02-620	199	0	7	0	15	0	25	.	.
L91-281	L06-001	936	14	36	3	45	0	25	.	.
L91-281	LCP85-384	220	13	92	10	99	2	96	.	.
L91-281	LCP85-384	183	3	40	0	15	0	25	.	.
L94-428	L06-023	478	13	59	6	88	2	81	.	.
L97-128	HOCP05-923	220	4	46	2	83	0	25	.	.
L97-128	HOCP96-540	1130	60	88	17	91	8	91	.	.
L97-128	HOCP96-540	436	17	78	3	70	0	25	.	.

Table 6. Continue.

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L97-128	L01-299	247	7	61	1	50	0	25	.	.
L97-128	L04-425	251	0	7	0	15	0	25	.	.
L97-128	L99-233	624	10	40	5	72	2	76	.	.
L97-128	L99-233	1163	8	19	4	47	1	51	.	.
L97-128	L99-233	250	2	21	0	15	0	25	.	.
L98-197	07P2	890	0	7	0	15	0	25	.	.
L98-197	HOCP85-845	244	0	7	0	15	0	25	.	.
L98-197	L99-226	675	0	7	0	15	0	25	.	.
L98-207	L94-428	449	0	7	0	15	0	25	.	.
L98-207	Poly	710	8	26	3	52	1	56	.	.
L98-209	L99-226	596	0	7	0	15	0	25	.	.
L99-233	L99-226	227	3	30	2	82	0	25	.	.
LCP81-010	HOCP00-950	263	14	88	4	92	2	92	.	.
LCP81-010	HOCP02-620	1191	21	46	7	63	3	70	.	.
LCP81-010	HOCP96-540	970	8	21	3	44	2	63	.	.
LCP81-010	L06-016	193	0	7	0	15	0	25	.	.
LCP81-010	L99-233	1120	6	17	0	15	0	25	.	.
LCP81-010	L99-233	1356	11	21	2	32	0	25	.	.
LCP81-010	LCP85-384	1524	22	33	6	49	3	62	.	.
LCP85-384	HOCP00-950	218	3	33	0	15	0	25	.	.
N27	L01-299	1395	32	54	3	36	2	58	.	.
N27	L99-226	928	1	14	0	15	0	25	.	.
N27	L99-226	1544	59	77	10	69	5	76	.	.
N27	LCP85-384	1209	18	36	3	38	2	61	.	.
TUC89-28	HOCP01-517	141	5	75	0	15	0	25	.	.
TUCCP77-042	Poly	382	11	63	4	87	2	89	.	.
US79-010	HOCP96-540	1220	5	15	4	46	2	61	.	.
US79-010	L01-299	693	15	52	4	62	0	25	.	.
US79-010	LCP85-384	494	6	27	3	65	0	25	.	.
US99-004	LCP85-384	235	8	74	2	79	1	85	.	.
2008 Crossing Series										
CB79-318	LCP85-384	191	3	32	0	14	.	.	.	.
CP79-318	LCP85-384	445	17	76	4	64	.	.	.	.
CP83-644	HOCP04-836	938	11	23	4	37	.	.	.	.
HO95-988	L99-233	247	7	60	2	58	.	.	.	.
HOCP00-930	HOCP91-552	866	21	52	1	29	.	.	.	.
HOCP00-930	L00-266	419	8	41	6	87	.	.	.	.
HOCP00-930	L02-353	465	17	74	6	80	.	.	.	.
HOCP00-930	L04-408	874	10	21	7	58	.	.	.	.
HOCP00-950	08P2	648	34	90	9	86	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP00-950	08P4	756	15	44	8	72	.	.	.	.
HOCP00-950	08P6	1070	19	36	5	40	.	.	.	.
HOCP00-950	HOCP96-540	98	5	89	2	93	.	.	.	.
HOCP01-517	L98-207	1261	36	62	23	92	.	.	.	.
HOCP01-523	L98-209	546	17	66	5	66	.	.	.	.
HOCP01-523	L99-233	570	22	77	9	89	.	.	.	.
HOCP01-544	L99-233	540	24	81	6	76	.	.	.	.
HOCP01-558	HOCP92-618	419	10	52	2	41	.	.	.	.
HOCP02-610	08P13	465	16	71	4	63	.	.	.	.
HOCP02-610	08P14	1213	17	26	0	14	.	.	.	.
HOCP02-610	08P15	206	14	95	2	69	.	.	.	.
HOCP02-623	08P13	155	3	41	1	55	.	.	.	.
HOCP02-623	08P28	239	7	62	2	60	.	.	.	.
HOCP02-623	HOCP01-523	451	29	93	15	97	.	.	.	.
HOCP02-623	HOCP91-552	226	4	36	0	14	.	.	.	.
HOCP02-623	HOCP96-540	378	3	19	0	14	.	.	.	.
HOCP03-757	L04-425	210	0	8	0	14	.	.	.	.
HOCP04-827	HO95-988	439	21	86	2	39	.	.	.	.
HOCP04-843	HOCP04-809	233	10	80	4	91	.	.	.	.
HOCP85-845	08P13	575	27	84	23	99	.	.	.	.
HOCP85-845	08P20	709	16	49	6	61	.	.	.	.
HOCP85-845	HOCP96-540	200	6	64	0	14	.	.	.	.
HOCP89-846	08P14	613	21	71	5	59	.	.	.	.
HOCP89-846	08P15	456	5	21	0	14	.	.	.	.
HOCP89-846	HOCP96-540	704	16	49	4	48	.	.	.	.
HOCP91-552	05P2	227	4	36	0	14	.	.	.	.
HOCP92-618	HOCP89-846	207	4	41	0	14	.	.	.	.
HOCP92-618	LCP85-384	657	10	28	0	14	.	.	.	.
HOCP92-624	08P8	1543	19	23	7	39	.	.	.	.
HOCP92-624	08P9	1793	27	28	9	43	.	.	.	.
HOCP92-624	HOCP02-623	245	7	62	1	35	.	.	.	.
HOCP92-624	HOCP04-836	225	6	58	1	38	.	.	.	.
HOCP92-624	HOCP89-846	471	7	28	3	53	.	.	.	.
HOCP92-624	HOCP91-552	195	3	28	1	44	.	.	.	.
HOCP92-624	HOCP96-540	460	7	28	5	74	.	.	.	.
HOCP92-624	HOCP96-561	216	6	60	0	14	.	.	.	.
HOCP92-624	L00-266	379	19	88	4	72	.	.	.	.
HOCP92-624	L01-299	203	6	64	1	42	.	.	.	.
HOCP92-624	L02-316	248	0	8	0	14	.	.	.	.
HOCP92-624	L98-207	395	5	25	0	14	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP92-624	L99-233	1068	14	25	6	47	.	.	.	.
HOCP92-624	LCP85-384	962	17	36	4	36	.	.	.	.
HOCP92-648	HOCP04-836	617	25	78	4	55	.	.	.	.
HOCP92-648	L00-266	857	19	46	3	32	.	.	.	.
HOCP92-648	L04-410	734	18	55	10	84	.	.	.	.
HOCP92-648	L92-312	149	7	84	0	14	.	.	.	.
HOCP92-648	L97-137	224	5	46	3	83	.	.	.	.
HOCP92-648	L99-233	205	15	98	5	96	.	.	.	.
HOCP92-648	LCP85-384	484	23	86	10	93	.	.	.	.
HOCP95-951	08P14	566	6	21	1	30	.	.	.	.
HOCP95-951	08P8	1039	32	66	4	34	.	.	.	.
HOCP95-951	HOCP04-824	199	4	44	0	14	.	.	.	.
HOCP95-951	HOCP96-522	213	0	8	0	14	.	.	.	.
HOCP95-951	HOCP96-540	103	0	8	0	14	.	.	.	.
HOCP96-540	08P1	394	0	8	0	14	.	.	.	.
HOCP96-540	08P4	819	0	8	0	14	.	.	.	.
HOCP96-540	08P6	1356	0	8	0	14	.	.	.	.
HOCP96-540	HOCP02-618	477	0	8	0	14	.	.	.	.
HOCP96-540	HOCP91-552	1379	41	64	8	50	.	.	.	.
HOCP96-540	L02-325	418	0	8	0	14	.	.	.	.
HOCP96-540	L99-226	438	16	74	6	85	.	.	.	.
HOCP96-540	L99-233	1579	40	55	15	68	.	.	.	.
L01-283	08P22	1136	0	8	0	14	.	.	.	.
L01-283	08P25	154	3	41	2	81	.	.	.	.
L01-283	08P28	439	7	32	0	14	.	.	.	.
L01-299	08P1	508	23	82	9	91	.	.	.	.
L01-299	08P29	350	24	95	8	95	.	.	.	.
L01-299	08P6	416	29	96	5	77	.	.	.	.
L01-299	08P8	329	8	52	3	65	.	.	.	.
L01-299	HOCP96-561	148	4	58	1	56	.	.	.	.
L01-315	08P13	226	7	66	3	82	.	.	.	.
L01-315	L05-445	212	13	92	5	95	.	.	.	.
L02-316	08P20	238	21	99	4	90	.	.	.	.
L02-316	08P22	236	15	93	2	61	.	.	.	.
L02-316	HOCP96-540	61	2	69	0	14	.	.	.	.
L02-320	HO95-988	322	7	46	2	52	.	.	.	.
L03-396	HOCP91-552	185	6	67	2	73	.	.	.	.
L03-396	L04-410	245	8	69	2	59	.	.	.	.
L03-396	LCP85-384	231	4	34	3	81	.	.	.	.
L04-407	L99-233	305	16	90	3	69	.	.	.	.
L04-408	HOCP04-807	596	13	46	8	83	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L04-408	HOCP96-540	28	2	97	1	98	.	.	.	.
L04-425	L99-233	276	10	73	3	74	.	.	.	.
L05-445	L05-450	203	9	81	6	97	.	.	.	.
L05-457	L99-233	407	3	18	2	42	.	.	.	.
L06-010	08P23	599	0	8	0	14	.	.	.	.
L06-010	08P24	311	15	86	7	94	.	.	.	.
L07-057	08P22	618	44	97	10	89	.	.	.	.
L07-059	08P28	374	6	32	2	45	.	.	.	.
L93-399	HOCP04-836	134	6	82	1	57	.	.	.	.
L94-426	08P23	399	16	78	5	78	.	.	.	.
L94-426	HO95-988	77	0	8	0	14	.	.	.	.
L94-426	L99-233	212	0	8	0	14	.	.	.	.
L94-428	L05-448	791	21	58	5	52	.	.	.	.
L94-428	LCP85-384	646	2	17	2	32	.	.	.	.
L94-432	L99-233	756	12	32	7	67	.	.	.	.
L97-128	08P8	780	29	74	5	53	.	.	.	.
L97-128	08P9	382	10	56	4	71	.	.	.	.
L97-137	L99-233	777	18	49	1	30	.	.	.	.
L98-197	08P24	351	0	8	0	14	.	.	.	.
L98-197	HOCP96-540	216	0	8	0	14	.	.	.	.
L98-197	L99-226	748	0	8	0	14	.	.	.	.
L98-197	L99-226	889	2	17	1	28	.	.	.	.
L98-197	LCP82-089	342	0	8	0	14	.	.	.	.
L98-207	08P1	879	22	55	8	65	.	.	.	.
L98-207	08P19	380	0	8	0	14	.	.	.	.
L98-207	08P4	985	25	55	6	51	.	.	.	.
L98-207	08P5	332	0	8	0	14	.	.	.	.
L98-207	08P6	199	0	8	0	14	.	.	.	.
L98-207	LCP81-010	540	13	52	4	56	.	.	.	.
L99-233	HOCP96-540	336	9	58	3	63	.	.	.	.
LCP81-010	08P1	737	29	77	7	68	.	.	.	.
LCP81-010	08P4	358	23	93	5	86	.	.	.	.
LCP81-010	HOCP89-846	275	13	84	0	14	.	.	.	.
LCP81-010	HOCP91-552	183	4	46	2	74	.	.	.	.
LCP81-010	HOCP96-561	226	0	8	0	14	.	.	.	.
LCP81-010	L02-316	758	0	8	0	14	.	.	.	.
LCP81-010	L02-316	328	0	8	0	14	.	.	.	.
LCP81-010	L04-410	843	11	25	3	33	.	.	.	.
LCP81-010	L98-207	739	37	88	11	88	.	.	.	.
LCP81-010	L99-233	370	20	91	2	46	.	.	.	.
LCP81-010	L99-233	395	13	69	5	79	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
LCP81-010	L99-233	1251	20	32	5	34	.	.	.	.
LCP81-010	LCP82-089	388	4	19	2	45	.	.	.	.
LCP81-010	LCP85-384	213	0	8	0	14	.	.	.	.
LCP85-384	04P4	687	23	69	8	76	.	.	.	.
LCP85-384	08P2	288	12	79	3	70	.	.	.	.
LCP85-384	08P22	390	7	36	2	44	.	.	.	.
LCP85-384	08P33	158	3	41	2	79	.	.	.	.
LCP85-384	08P5	255	4	32	0	14	.	.	.	.
LCP85-384	HOCP96-540	1541	30	41	9	50	.	.	.	.
N27	L01-299	836	19	49	11	82	.	.	.	.
N27	L99-226	181	11	92	1	47	.	.	.	.
N27	LCP85-384	1055	12	21	3	31	.	.	.	.
US79-010	L99-226	233	8	71	1	37	.	.	.	.
US99-004	L99-226	1392	26	41	8	48	.	.	.	.
2009 Crossing Series										
CP83-644	HO05-961	418	11	63	.	.	.	.	.	.
CP83-644	L01-283	118	0	24	.	.	.	.	.	.
CP83-644	L99-226	399	29	96	.	.	.	.	.	.
HO01-564	HOCP01-517	213	0	24	.	.	.	.	.	.
HO01-564	L01-299	196	13	95	.	.	.	.	.	.
HO01-564	TUCCP77-042	442	7	54	.	.	.	.	.	.
HO05-961	HOCP02-618	139	4	66	.	.	.	.	.	.
HO05-961	HOCP85-845	270	8	67	.	.	.	.	.	.
HO05-961	L01-299	184	1	50	.	.	.	.	.	.
HO05-961	L99-226	177	0	24	.	.	.	.	.	.
HO06-523	L99-233	545	25	80	.	.	.	.	.	.
HO06-523	LCP85-384	131	0	24	.	.	.	.	.	.
HO06-530	HO05-961	184	6	69	.	.	.	.	.	.
HO06-530	HO06-523	162	0	24	.	.	.	.	.	.
HO06-530	L06-038	386	0	24	.	.	.	.	.	.
HO06-537	L99-226	349	17	83	.	.	.	.	.	.
HO06-537	L99-233	388	20	84	.	.	.	.	.	.
HO06-562	L01-283	208	0	24	.	.	.	.	.	.
HO06-562	L01-283	410	17	76	.	.	.	.	.	.
HO06-562	L99-226	302	9	67	.	.	.	.	.	.
HO06-562	L99-226	286	16	87	.	.	.	.	.	.
HO06-562	L99-233	212	0	24	.	.	.	.	.	.
HO06-562	L99-233	369	0	24	.	.	.	.	.	.
HO06-562	LCP85-384	333	10	67	.	.	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HO06-562	TUCCP77-042	389	2	50	.	.	.	.	.	.
HO06-563	HOCP96-540	173	0	24	.	.	.	.	.	.
HO06-563	HOCP96-540	146	0	24	.	.	.	.	.	.
HO06-563	HOCP96-540	363	0	24	.	.	.	.	.	.
HO06-563	L01-299	262	0	24	.	.	.	.	.	.
HO07-613	L99-226	465	21	79	.	.	.	.	.	.
HO07-617	HO06-523	214	4	57	.	.	.	.	.	.
HO95-988	09P21	343	0	24	.	.	.	.	.	.
HO95-988	09P24	122	0	24	.	.	.	.	.	.
HO95-988	HOCP01-523	131	0	24	.	.	.	.	.	.
HO95-988	HOCP96-540	294	0	24	.	.	.	.	.	.
HO95-988	L01-283	445	15	71	.	.	.	.	.	.
HOCP00-930	HOCP96-540	132	0	24	.	.	.	.	.	.
HOCP00-930	HOCP96-540	441	9	58	.	.	.	.	.	.
HOCP00-930	US01-040	170	0	24	.	.	.	.	.	.
HOCP00-950	HO06-562	514	9	55	.	.	.	.	.	.
HOCP00-950	HOCP96-540	1668	41	61	.	.	.	.	.	.
HOCP00-950	HOCP96-540	307	10	69	.	.	.	.	.	.
HOCP00-950	HOCP96-540	392	13	69	.	.	.	.	.	.
HOCP00-950	HOCP97-609	417	16	75	.	.	.	.	.	.
HOCP00-950	L01-283	854	47	86	.	.	.	.	.	.
HOCP00-950	L01-299	1232	34	65	.	.	.	.	.	.
HOCP00-950	L06-001	807	27	69	.	.	.	.	.	.
HOCP00-950	L06-038	396	1	49	.	.	.	.	.	.
HOCP00-950	L06-038	218	9	76	.	.	.	.	.	.
HOCP00-950	L08-076	196	0	24	.	.	.	.	.	.
HOCP00-950	L94-428	218	4	55	.	.	.	.	.	.
HOCP00-950	L94-432	360	0	24	.	.	.	.	.	.
HOCP00-950	L99-226	361	8	59	.	.	.	.	.	.
HOCP00-950	L99-226	132	8	91	.	.	.	.	.	.
HOCP00-950	L99-233	206	2	52	.	.	.	.	.	.
HOCP00-950	LCP85-384	145	0	24	.	.	.	.	.	.
HOCP00-950	LCP85-384	201	0	24	.	.	.	.	.	.
HOCP00-950	LCP86-454	375	18	82	.	.	.	.	.	.
HOCP01-523	LCP85-384	174	0	24	.	.	.	.	.	.
HOCP02-*610	L01-299	424	24	88	.	.	.	.	.	.
HOCP02-610	HO06-562	173	0	24	.	.	.	.	.	.
HOCP02-610	HOCP01-523	163	0	24	.	.	.	.	.	.
HOCP02-610	HOCP96-540	337	0	24	.	.	.	.	.	.
HOCP02-610	HOCP96-540	244	0	24	.	.	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP02-610	HOCP97-609	166	0	24	.	.	.	.	.	.
HOCP02-610	L06-001	217	0	24	.	.	.	.	.	.
HOCP02-610	L06-001	218	0	24	.	.	.	.	.	.
HOCP02-610	L94-432	139	9	95	.	.	.	.	.	.
HOCP02-610	L99-233	573	0	24	.	.	.	.	.	.
HOCP02-618	HOCP92-618	132	0	24	.	.	.	.	.	.
HOCP02-623	HOCP96-540	639	0	24	.	.	.	.	.	.
HOCP02-623	L01-299	320	0	24	.	.	.	.	.	.
HOCP02-623	L08-089	194	0	24	.	.	.	.	.	.
HOCP02-623	L94-428	152	0	24	.	.	.	.	.	.
HOCP92-648	L94-428	175	4	60	.	.	.	.	.	.
HOCP96-540	09P14	155	0	24	.	.	.	.	.	.
HOCP96-540	L99-233	310	0	24	.	.	.	.	.	.
HOCP96-561	HO05-961	145	0	24	.	.	.	.	.	.
HOCP96-561	HOCP96-540	226	0	24	.	.	.	.	.	.
HOCP96-561	L99-226	629	34	85	.	.	.	.	.	.
HOCP96-561	TUCCP77-042	365	2	50	.	.	.	.	.	.
HOCP97-606	L94-426	159	9	88	.	.	.	.	.	.
L01-283	09P13	435	0	24	.	.	.	.	.	.
L01-283	HO06-562	432	0	24	.	.	.	.	.	.
L01-283	HOCP02-610	1106	50	79	.	.	.	.	.	.
L01-283	HOCP06-523	156	0	24	.	.	.	.	.	.
L01-283	L08-076	405	25	92	.	.	.	.	.	.
L01-283	L94-426	602	16	64	.	.	.	.	.	.
L01-283	L94-428	670	28	78	.	.	.	.	.	.
L01-283	L99-226	313	5	54	.	.	.	.	.	.
L01-283	L99-233	788	48	91	.	.	.	.	.	.
L01-283	L99-233	693	32	80	.	.	.	.	.	.
L01-299	09P7	331	9	64	.	.	.	.	.	.
L01-299	TUCCP77-042	192	12	94	.	.	.	.	.	.
L01-315	HOCP96-540	416	12	66	.	.	.	.	.	.
L05-448	L01-283	386	20	84	.	.	.	.	.	.
L05-457	HO01-564	301	0	24	.	.	.	.	.	.
L05-457	HOCP02-623	158	0	24	.	.	.	.	.	.
L05-457	HOCP91-552	154	0	24	.	.	.	.	.	.
L05-457	HOCP96-540	635	7	52	.	.	.	.	.	.
L05-457	L01-283	521	8	53	.	.	.	.	.	.
L05-457	L01-283	401	9	59	.	.	.	.	.	.
L05-457	L01-299	188	0	24	.	.	.	.	.	.
L05-457	L06-038	194	0	24	.	.	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L05-457	L99-226	236	0	24	.	.	.	.	.	.
L05-457	L99-226	239	14	89	.	.	.	.	.	.
L05-457	L99-233	197	0	24	.	.	.	.	.	.
L06-001	L01-299	74	3	76	.	.	.	.	.	.
L08-078	HO05-961	229	0	24	.	.	.	.	.	.
L08-082	HOCP00-610	188	0	24	.	.	.	.	.	.
L08-082	HOCP96-540	352	12	71	.	.	.	.	.	.
L08-082	HOCP96-540	394	0	24	.	.	.	.	.	.
L08-082	LCP86-454	106	0	24	.	.	.	.	.	.
L08-090	L01-299	413	0	24	.	.	.	.	.	.
L08-094	L01-299	472	6	53	.	.	.	.	.	.
L08-094	L01-299	217	0	24	.	.	.	.	.	.
L08-095	HOCP00-930	215	0	24	.	.	.	.	.	.
L94-426	L06-001	192	0	24	.	.	.	.	.	.
L94-426	L99-226	380	0	24	.	.	.	.	.	.
L94-428	L01-299	173	10	89	.	.	.	.	.	.
L94-432	L01-299	358	7	58	.	.	.	.	.	.
L94-433	HO05-961	184	0	24	.	.	.	.	.	.
L94-433	HOCP05-918	303	14	80	.	.	.	.	.	.
L94-433	L01-283	304	7	60	.	.	.	.	.	.
L94-433	L99-226	396	14	72	.	.	.	.	.	.
L97-128	09P17	197	7	73	.	.	.	.	.	.
L97-128	09P3	144	0	24	.	.	.	.	.	.
L97-128	HO01-564	220	8	73	.	.	.	.	.	.
L97-128	HOCP01-517	205	13	94	.	.	.	.	.	.
L97-128	L01-283	182	11	90	.	.	.	.	.	.
L97-128	L01-299	165	0	24	.	.	.	.	.	.
L97-128	L06-038	247	0	24	.	.	.	.	.	.
L97-128	L98-207	227	6	63	.	.	.	.	.	.
L97-128	L99-226	91	3	69	.	.	.	.	.	.
L97-128	L99-233	501	0	24	.	.	.	.	.	.
L98-207	HO05-961	334	12	73	.	.	.	.	.	.
L98-207	HOCP01-517	344	12	72	.	.	.	.	.	.
L98-207	L01-299	121	0	24	.	.	.	.	.	.
L98-207	TUCCP77-042	434	11	61	.	.	.	.	.	.
L98-209	L99-226	912	44	82	.	.	.	.	.	.
L99-233	09P2	409	0	24	.	.	.	.	.	.
L99-233	HOCP96-540	506	59	98	.	.	.	.	.	.
L99-233	L08-093	180	1	51	.	.	.	.	.	.
L99-233	L99-226	944	35	74	.	.	.	.	.	.
LCP81-010	HOCP96-540	386	7	55	.	.	.	.	.	.

Table 6. Continue

			1 st Line		2 nd Line		Increases		Assignments	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
LCP81-010	L01-299	325	0	24	.	.	.	.	.	.
LCP81-010	L06-001	310	0	24	.	.	.	.	.	.
LCP81-010	L06-038	341	13	75	.	.	.	.	.	.
LCP81-010	L99-226	344	19	86	.	.	.	.	.	.
LCP81-010	L99-226	229	15	95	.	.	.	.	.	.
LCP81-010	L99-233	239	0	24	.	.	.	.	.	.
LCP85-384	HOCP96-540	634	26	76	.	.	.	.	.	.
LCP85-384	HOCP96-540	324	0	24	.	.	.	.	.	.
LCP85-384	L01-299	1253	0	24	.	.	.	.	.	.
N-27	L94-428	204	0	24	.	.	.	.	.	.
N-27	L94-432	211	0	24	.	.	.	.	.	.
N-27	L99-226	213	0	24	.	.	.	.	.	.
N-27	L99-226	392	18	80	.	.	.	.	.	.
TUCCP77-042	L01-283	169	9	85	.	.	.	.	.	.
US01-040	HOCP97-609	216	26	99	.	.	.	.	.	.

Table 7. Advancement summary of crosses in the 2009 crossing series.

Cross	Female	Male	Sugar Per Ton	Fiber	Stalk Weight
			(tons/A)	(%)	(lbs)
XL09-046	HOCP04-838	L06-038	144	11.5	1.42
XL09-096	L08-076	L99-226	182	11.7	1.06
XL09-119	L05-448	L06-001	172	10.8	1.67
XL09-121	HO06-563	L06-001	165	11.2	1.25
XL09-124	HO06-563	HOCP01-523	157	11.0	1.50
XL09-192	HO07-613	HO06-562	174	10.0	1.52
XL09-233	HO01-564	HO06-562	184	11.3	1.40
XL09-234	HO07-613	HO06-562	167	11.0	1.22
XL09-250	HOCP02-610	L99-233	168	12.3	1.44
XL09-267	HOCP05-902	L01-283	184	10.9	1.37
XL09-312	HOCP04-838	HOCP07-615	167	12.1	1.48
XL09-354	L97-128	HOCP01-517	180	11.5	1.54
XL09-361	N-27	L99-226	128	10.5	1.68
XL09-378	HOCP04-838	HOCP05-904	172	12.0	1.29
XL09-383	L05-457	HOCP05-918	163	11.9	1.24
XL09-393	HO06-530	L06-038	164	10.9	1.10
XL09-395	L05-457	L06-038	171	11.5	1.18
XL09-397	LCP81-010	L06-038	171	11.9	1.85
XL09-410	HO06-530	HO06-523	180	12.3	1.48
XL09-436	L97-128	L06-038	177	11.5	1.46
XL09-457	HO06-530	HO05-961	170	11.6	1.28
XL09-463	L08-095	HOCP00-930	183	11.4	1.30
XL09-468	L08-082	HOCP00-610	158	9.4	1.29
XL09-505	HO06-562	L99-233	166	11.9	1.21
XL09-514	L08-078	HO05-961	205	12.3	0.96
XL09-531	L08-094	L01-299	197	11.2	0.91
XL09-581	US01-040	HOCP97-609	148	11.5	1.49
XL09-587	L08-094	L01-299	176	12.7	1.03
XL09-614	L08-093	TUCCP77-042	169	10.0	1.06

2011 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 (Erath). Both the LSU and USDA varieties were planted at each location. The locations, soil types, dates of planting and dates of harvest are listed in Table 1.

The on-station nursery trials were planted in single row (6-foot centers), 16-foot-long plots with 4-foot alleys. The off-station nurseries were planted in single row, 20-foot plots with 4-foot alleys. The infield tests were planted in two-row, 25-foot plots with 5-foot alleys. The experimental design for both nursery and infield tests was a randomized complete block with two replications per location. Five commercial check varieties, HoCP96-540, L99-226, L01-299, L03-371 and HoCP04-838 were planted in all nursery and infield tests for comparison.

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

The 2011 sugarcane crop experienced a wide range of growing conditions. Many parts of the sugarcane growing area in Louisiana experienced a summer drought then average rainfall through the end of the year. The

planting season had average rainfall and all experiments were planted in a timely manner. The majority of the Louisiana crop was harvested by the end of December. Recommended cultural practices were followed at all test locations.

The leading variety grown in Louisiana in 2011 was HoCP96-540, which occupied 47% of the state's sugarcane acreage. Therefore, HoCP96-540 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 HoCP96-540 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. 2011 Location, soil texture, and planting and harvest dates for the nursery and infield tests.

					Harvest Date	Varieties	
Series	Location†	Stage	Soil Texture	Planting Date	2011	No. Planted	No. Harvested
2006	Blackberry Farms	Infield	Commerce silt loam	08/17/07	10/11/11	24	1
2006	Sugarland Acres, Inc.	Infield	Coteau silt loam	09/10/07	10/07/11	24	1
2007	Newton Cane, Inc.	Nursery	Moreland silt loam	08/28/08	10/10/11	19	1
2007	Michael Melancon	Nursery	Baldwin silty clay	09/26/08	10/10/11	19	1
2007	Landry Farms	Nursery	Commerce silt loam	09/29/08	10/17/11	19	1
2008	Sugar Research Station	Nursery	Commerce silt loam	10/10/08	10/20/11	21	3
2008	Ardoyne Farm-U.S.D.A	Nursery	Commerce silt loam	10/16/08	10/17/11	21	3
2008	Iberia Research Station	Nursery	Baldwin silty clay	10/17/08	11/07/11	21	3
2008	Blackberry Farms	Infield	Commerce silt loam	08/10/09	12/12/11	11	4
2008	Newton Cane, Inc.	Nursery	Moreland silt loam	08/18/09	10/10/11	25	5
2008	Michael Melancon	Nursery	Baldwin silty clay	08/12/09	11/07/11	25	6
2008	Landry Farms	Nursery	Commerce silt loam	08/19/09	12/01/11	25	6
2009	Sugar Research Station	Nursery	Commerce silt loam	10/26/09	12/01/11	35	4
2009	Ardoyne Farm– U.S.D.A.	Nursery	Commerce silt loam	11/05/09	11/09/11	35	4
2009	Blackberry Farms	Infield	Commerce silt loam	09/10/10	12/12/11	21	7
2009	Sugarland Acres, Inc.	Infield	Coteau silt loam	08/25/10	12/09/11	21	7
2009	Newton Cane, Inc.	Nursery	Moreland silt loam	08/26/10		43	0
2009	Michael Melancon	Nursery	Baldwin silty clay	08/27/10	12/05/11	43	12
2009	Landry Farms	Nursery	Commerce silt loam	09/15/10	12/01/11	43	12
2010	Sugar Research Station	Nursery	Commerce silt loam	10/14/10	12/07/11	34	14
2010	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	10/13/10	12/08/11	34	14
2010	Iberia Research Station	Nursery	Baldwin silty clay	10/21/10	11/28/11	34	14
2010	Blackberry Farms	Infield	Commerce silt loam	08/26/11		21	
2010	Donnie Vallot Farm	Infield	Patoutville silt loam	09/22/11		21	
2010	Newton Cane, Inc.	Nursery	Moreland silt loam	08/24/11		28	
2010	Michael Melancon	Nursery	Baldwin silty clay	08/18/11		28	
2010	Landry Farms	Nursery	Commerce silt loam	08/29/11		28	
2011	Sugar Research Station	Nursery	Commerce silt loam	10/13/11		25	
2011	Ardoyne Farm – U.S.D.A	Nursery	Commerce silt loam	10/17/11		25	
2011	Iberia Research Station	Nursery	Baldwin silty clay	10/21/11		25	

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

Table 2. Infield third-stubble means of the 2005 "HoCP" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7280	30.2 +	241 -	1.38	43694	12.8 +
Ho95-988	6435	32 +	201 -	1.64	39651	12.3
HoCP96-540	3746	13.8	272	1.15	24630	12
L99-226	7454	27 +	277	1.98	27318	11.6
HoCP05-961	6493	25.2 +	257	1.22	42095	13.1 +

Table 3. Infield third-stubble means of the 2005 "HoCP" assignment series on a Coteau silt loam soil at Sugarland Acres, Inc. in Youngsville, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	2818	12.8	220	1.22	20929	11.8
Ho95-988	3368	14.7	229	1.29	22633	12.2
HoCP96-540	2667	10.4	256	1.27	16759	11.8
L99-226	3542	15.6	226	1.31	24030	12.2
HoCP05-961	3769	15.4	248	1.24	24483	12.6

Table 4. Nursery second-stubble means of the 2007 "Ho" assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	3844	16.4	240	1.07	30129	9.8
L99-226	6185	23.8	263	1.44	33215	10.6
L01-283	5136	20.3	250	1.12	35756	10.9
Ho07-613	4117	15.7	264	1.16	27044	9.6

Table 5. Nursery second-stubble means of the 2007 "Ho" assignment series on a, Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	10648	40.6	262	1.82	44649	10.2
L99-226	14074 +	48.9 +	287 +	2.28	43016	10.9
L01-283	10237	35.1	292 +	1.51	47009	11.2
Ho07-613	9537	37.5	255	1.69	44468	9.1

Table 6. Nursery second-stubble means of the 2007 "Ho" assignment series on a, Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	8763	37	237	1.87	39567	12.7
L99-226	12554	48.1	262	2.33	40838	14 +
L01-283	9522	37.3	256	1.74	43016	12.4
Ho07-613	10824	44.5	244	1.83	48824	10.9 -

Table 7. Nursery second-stubble means of the 2007 "Ho" assignment series across 3 locations (Newton, Melancon, and Landry Farms) in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	7752	31.3	246	1.59	38115	10.9
L99-226	10938 +	40.3 +	271	2.02 +	39022	11.9
L01-283	8298	30.9	266	1.45	41926	11.5
Ho07-613	8159	32.6	254	1.56	40111	9.9

Table 8. Infield first-stubble means of the 2007 "Ho" and 2008 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	7859	29	272	2.03	28527	11.4
L99-226	12496 +	42.6 +	293	1.97	43204 +	12.2
L99-233	11533 +	44 +	262	1.9	46331 +	14.2 +
HoCP00-950	10359	35.4	293	1.88	37847	11.8
L01-283	9239	32.7	283	1.53	42998 +	10.8
Ho07-613	9275	32.6	283	1.9	34345	11.2
L08-088	11156 +	39.2 +	285	1.99	40263 +	12.1
L08-090	13725 +	48.2 +	285	2.1	46070 +	10.2 -

Table 9. Nursery first-stubble means of the 2008 “Ho” and “L” assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	9331	38.6	244	2.03	37471	10.6
L99-226	10900	42.1	258	2.09	40475	10.9
L99-233	8705	40	220	1.71	46183	11.5
HoCP00-950	12271	48.9	254	1.75	55258	11.3
L01-283	5292	23.5	228	1.46	31663	10.5
L08-088	9246	38.4	243	1.63	46646	12.1 +
L08-090	12820	52	249	2.09	49087	10.2
Ho08-709	8481	39	218	1.49	52454	12 +
Ho08-711	8494	36.4	233	1.66	43379	9.4 -
Ho08-717	12145	54.3	222	1.75	61529 +	11.6

Table 10. Nursery first-stubble means of the 2008 “Ho” and “L” assignment series on a, Baldwin silty clay soil at Melancon Farms in Henderson, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	6181	24.2	255	1.72	29403	11.7
L99-226	8731	31.6	276 +	2.13	29766	12.1
L99-233	8167	31.4	259	1.7	36845	13.1 +
HoCP00-950	4754	17.4	272 +	1.36	25410	11.8
L01-283	9808	38	259	2.04	35937	11.3
L08-088	6612	25.6	259	1.64	31218	12.9 +
L08-090	8675	32.7	265	1.86	35211	9.8 -
Ho08-709	6888	27.3	252	1.57	35030	13.6 +
Ho08-711	5595	22.3	250	1.66	26862	10.7
Ho08-717	5144	21.1	244	1.34	31400	12.8 +

Table 11. Nursery first-stubble means of the 2008 “Ho” and “L” assignment series on a, Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	12770	48.4	265	2.39	40475	10.7
L99-226	10823	42.3	255	2.4	35574	10.8
L99-233	11004	44.5	247	1.83 -	48642	12.5
HoCP00-950	8798	36.7	240	2.26	32670	10.7
L01-283	10871	44	248	1.84 -	47916	11.6
L08-088	12541	51.7	244	2.23	46646	11.3
L08-090	13488	52.8	255	2.37	43923	10
Ho08-709	8956	35	257	1.7 -	41382	13
Ho08-711	10561	40.8	260	2.05	39930	10.5
Ho08-717	8411	37.8	221	1.42	52817	11

Table 12. Nursery first-stubble means of the 2009 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	9512	36.5	258	1.82	39930	10.9
L99-226	8590	32.4	264	1.86	34712	11.5
L99-233	9541	39.1	244	1.73	45148	12.9
HoCP00-950	7158	28.2	254	1.8	31309	11.7
L01-283	13465	49.6	271	1.9	52408	11.8
L09-099	8891	36.5	243	1.72	42426	13.4
L09-112	8537	32.6	261	1.85	35166	13
L09-117	13277	47.1	283	1.96	48098	11.2
L09-131	11997	45.5	263	1.88	48551	13.5

Table 13. Nursery plantcane means of the 2010 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	12419	48.5	256	2.4	40384	12.2
L99-226	20583 +	78.5 +	261	3.87 +	40384	12.4
L99-233	11460	46.5	247	2.35	39023	13.7 +
L01-283	9090	35.5	257	2.39	30174	11.5
L01-299	16268	65.4	249	2.69	48551	12.7
L10-132	6655 -	26 -	256	1.86 -	28359	13.6 +
L10-133	7973	31.3	255	1.98	31763	13.8 -
L10-138	12037	46.6	258	2.28	40611	13.2
L10-141	12005	52.3	230 -	3.13 +	33578	12.7
L10-142	11079	44.8	247	2.64	34031	12.6
L10-144	12277	52	236 -	2.52	41518	10.2 -
L10-145	9453	38.1	249	2.14	35619	14.6 +
L10-146	13975	56.4	248	3.07 +	36754	10.7 -
L10-147	14639	60.6	242	2.63	46509	10.9 -
L10-148	8084	35.4	229 -	2.5	28586	11.1 -
L10-150	7791	31.5	247	2.31	27452	13.8 +
L10-151	8802	36.3	244	2.39	30174	11.2
L10-156	11672	53.6	218 -	2.97 +	36300	12.7
L10-163	10787	45.8	236 -	2.31	39703	12.8

Table 14. Nursery plantcane means of the 2010 “L” assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP96-540	11341	43.6	260	2.87	30401	11.2
L99-226	12062	42.8	282 +	2.83	30401	13.1 +
L99-233	15923 +	61.9 +	257	2.3	53996 +	13.4 +
L01-283	12785	46.1	277	2.27	40838	11.4
L01-299	12492	48.4	259	2.39	40838	13 +
L10-132	7992 -	31 -	258	1.92	32670	12.8 +
L10-133	12531	46.2	272	2.36	39023	13.8 +
L10-138	10879	42.8	254	2.39 -	36300	11.7
L10-141	11589	47.4	243	2.95 -	32443	13 +
L10-142	11896	46	259	2.57	35846	12.5 +
L10-144	9076	38	239 -	2.39	31989	10.7
L10-145	8161 -	31.5 -	259	1.88	33578	13.6 +
L10-146	14048	52.7	266	2.99	35166	10.7
L10-147	14701 +	53.8	273	2.73	39476	11
L10-148	9238	37.2	249	2.38	32216	11.5
L10-150	9225	36.7	251	2.32	31763	14.1 +
L10-151	10547	43.9	241	2.17	41291	10.8
L10-156	11288	48.7	232 -	2.55	39023	11.2
L10-163	10092	39.2	257	2.16	36754	11.3

Table 15. Nursery plantcane means of the 2010 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	6645	25.5	260	1.96	26318	11.8
L99-226	9183	34.1	270	2.5	27225	10.8
L99-233	4493	18.3	245	1.98	18604	12.3
L01-283	3633	15	240	1.68	17923 -	10.1 -
L01-299	6949	27.5	253	2.09	26544	12.9 +
L10-132	2881	11.3 -	254	1.14	19965	12.8 +
L10-133	6238	23.9	261	1.46	32443	13.5 +
L10-138	6700	28.9	230	2.07	27906	11.6
L10-141	6419	27.3	235	2.54	21553	11
L10-142	7772	29	267	1.96	29267	11.9
L10-144	5282	21.3	247	2.32	18377	11.1
L10-145	7429	28.5	261	1.79	31536	13.5 +
L10-146	6001	23.5	255	2.29	20646	9.4 -
L10-147	6483	26.2	247	1.97	26771	9.5 -
L10-148	7959	31.5	254	2.15	29494	11.6
L10-150	4746	18.7	254	1.67	22461	13.8 +
L10-151	6066	23.4	262	1.74	26544	12.2
L10-156	7263	28.9	251	2.33	24956	12
L10-163	6526	24.3	269	1.55	31082	12.9 +

Table 16. Nursery first-stubble means of the 2009 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	5170	20.3	256	1.8	22506	10.2
L99-226	6209	23.6	263	1.85	25410	11.2
L99-233	8819 +	33.9 +	261	1.82	37208 +	13.4 +
HoCP00-950	7886 +	28.8 +	274	1.91	30129	11.1
L01-283	9895 +	36.2 +	273	1.91	37934 +	11.3
L09-099	7660	30.9 +	248	1.75	35393 +	13 +
L09-112	7720 +	29.2 +	264	1.86	31400 +	13.3 +
L09-117	5412	20.7	256	1.81	22688	10.3
L09-131	7033	25.9	270	1.91	27044	12.5 +

Table 17. Nursery first-stubble means of the 2009 "L" assignment series across 2 locations (St. Gabriel and U.S.D.A.- Ardoyne Farms) in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	7341	28.4	257	1.81	31218	10.6
L99-226	7400	28	264	1.86	30061	11.4
L99-233	9180	36.5	252	1.78	41178	13.2 +
HoCP00-950	7522	28.5	264	1.85	30719	11.4
L01-283	11680	42.9	272	1.9	45171	11.5
L09-099	8276	33.7	246	1.73	38909	13.2 +
L09-112	8129	30.9	263	1.86	33283	13.1 +
L09-117	9344	33.9	270	1.89	35392	10.8
L09-131	9515	35.7	267	1.89	37797	13 +

Table 18. Nursery second-stubble means of the 2008 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	10005	40.7	248	2.02	40157	13.2
L99-226	11987	47.6	251	2.39	39249	13.7
L01-283	11112	39	285 +	1.74	44921	11.8
L08-088	7211	29.9	241	1.87	31989	12.1
L08-090	10621	43.1	244	2.19	38342	12

Table 19. Nursery second-stubble means of the 2008 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	4668	17.4	268	1.58		11.1
L99-226	7783	27.5	284	1.81		11
L01-283	5137	21	244 -	1.09		10.8
L08-088	6248	23.9	260	1.37		11.7
L08-090	6993	25.7	272	1.61		10.2

Table 20. Nursery second-stubble means of the 2008 “L” assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	6701	27.6	243	2.17	25410	10.9
L99-226	13463 +	52.9 +	254	2.55 +	41518	13.3
L01-283	10370	40.5	256	2.14	37888	11.6
L01-299	10244	42.5 +	241	2.08	41064	12.7
L08-088	5244	21.3	245	1.71 -	25637	11.5
L08-090	10761 +	41.6 +	257	2.2	37888	12.8

Table 21. Infield third-stubble means of the 2005 “Ho” assignment series across 2 locations (Blackberry and Sugarland Acres) in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	5049	21.5	230	1.3	32311	12.3
HoCP96-540	4902	23.3	215	1.46	31142	12.3
L97-128	3207	12.1	264	1.21	20695	11.9
L99-226	5498	21.3	251	1.64	25674	11.9
Ho05-961	5131	20.3	252	1.23	33289	12.9

Table 22. Infield and nursery second-stubble means of the 2007 “Ho” assignment series across 5 locations (Blackberry, Sugarland Acres, Newton, Westfield, and J. Fredericks Farms) in 2011.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
HoCP96-540	7752	31.3	246	1.59	38115	10.9
L99-226	10938 +	40.3 +	271 +	2.02 +	39022	11.9
L01-283	8298	30.9	266 +	1.45	41926	11.5
Ho07-613	8159	32.6	254	1.56	40111	9.9

Table 23. Infield and nursery first-stubble means of the 2007 “Ho” and 2008 “L” and “Ho” assignment series across 5 locations (Blackberry, Sugarland Acres, Newton, Westfield, and J. Fredericks Farms) in 2011.

Variety	Sugar per Acre	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP96-540	9034	35.1	258	2.03	34316	11.1
L99-226	10737	39.6	271	2.14	37255	11.5
L99-233	10034	40.5	248	1.79	45041 +	12.9 +
HoCP00-950	8674	33.2	263	1.81	36658	11.4
L01-283	9283	36.5	255	1.74	41197	11
Ho07-613	8448	32.5	262	1.91	33571	10.9
L08-088	9889	38.7	258	1.87	41193	12.1 +
L08-090	12132	46.2	263	2.1	43706 +	10 -
Ho08-709	8384	33.8	250	1.58 -	43213 +	13 +
Ho08-711	8492	33.2	255	1.78	36982	10.3
Ho08-717	8842	37.7	236 -	1.5 -	48840 +	11.9

Table 24. Nursery second-stubble means of the 2008 “L” assignment series across 3 locations (St. Gabriel, Iberia, and U.S.D.A.- Ardoyne Farms) in 2011.

Variety	Sugar per Acre	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP96-540	7125	28.5	253	1.92	29191	11.7
L99-226	11078 +	42.7	263	2.25 +	37056	12.7
L01-283	8873	33.5	262	1.65 -	40535	11.4
L01-299	9572	39.4	242	1.82	41737	12.5
L08-088	6234	25	249	1.65 -	30779	11.8
L08-090	9458	36.8	258	2	36073	11.7

Table 25. Nursery plantcane means of the 2010 "L" assignment series across 3 locations (St. Gabriel, Iberia and U.S.D.A.- Ardoyne Farms) in 2011.

Variety	Sugar per Acre	Cane Yield (tons/A)	Sugar Per Ton (lbs/ton)	Stalk Weight (lbs)	Stalk Number (stalks/A)	Fiber (%)
HoCP96-540	10135	39.2	259	2.41	32367	11.7
L99-226	13943 +	51.8 +	271	3.07 +	32670	12.1
L99-233	10625	42.2	250	2.21	37207	13.1 +
L01-283	8503	32.2	258	2.11	29645	11
L01-299	11903	47.1	254	2.39	38644	12.9 +
L10-132	5843 -	22.8 -	256	1.64 -	26998	13.1 +
L10-133	8914	33.8	262	1.93 -	34409	13.7 +
L10-138	9872	39.4	247	2.24	34939	12.2
L10-141	10004	42.4	236 -	2.87 +	29191	12.3
L10-142	10249	39.9	258	2.39	33048	12.3
L10-144	8879	37.1	241 -	2.41	30628	10.7 -
L10-145	8348	32.7	256	1.93 -	33577	13.9 +
L10-146	11341	44.2	256	2.78 +	30855	10.3 -
L10-147	11941	46.9	254	2.44	37586	10.5 -
L10-148	8427	34.7	244	2.34	30099	11.4
L10-150	7254	29	251	2.1	27225	13.9 +
L10-151	8472	34.5	249	2.1	32670	11.4
L10-156	10074	43.7	234 -	2.61	33426	11.9
L10-163	9135	36.4	254	2 -	35846	12.3

2011 LOUISIANA "Ho" NURSERY AND INFIELD VARIETY TRIALS

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Scientists with the Sugarcane Research Unit (SRU)'s sugarcane breeding program assign permanent "HoCP" or "Ho" numbers to varieties advanced for further testing three years after selection from single-stools in the seedling stage. Researchers then plant these varieties in replicated nursery trials at the SRU's Ardoyne Farm in Schriever and at the LSU AgCenter's Iberia Research Station in Jeanerette and Sugar Research Station in St. Gabriel. The year after assignment, varieties advanced for further testing are planted in nursery trials on commercial sugarcane farms located in Paincourtville, Cecilia, and Bunkie, each representing a different region of the sugarcane belt. Two years after assignment, active varieties are planted in three infield (weighed yield) tests. One test is planted at Ardoyne Farm, the other two are located on commercial farms in Vacherie and Youngsville. Because there were no weighed yield tests in the southwestern area of the sugarcane industry, a test normally planted in Youngsville was planted in Erath in 2011. In addition, two years after assignment, varieties are introduced to primary stations and outfield locations for testing by the SRU, LSU AgCenter, and the American Sugar Cane League.

The SRU's nursery test plots planted during the year of assignment utilize a randomized complete block design with two replications. Plots are sixteen-feet long by six feet (one row) wide with a four-foot alleyway between plots. A minimum of three commercial varieties are planted in each test for comparison purposes. In addition to experimental commercial varieties, clones from the SRU's Recurrent Selection for Borers (RSB) program are included in nursery trials. Yield data collected on RSB clones give breeders necessary agronomic information to assist in deciding what crosses to make with these borer-resistant clones. The year after assignment, varieties from the SRU'S program are combined with varieties from the LSU program and planted in nurseries on commercial farms. The plot length in these tests is increased to 20 feet.

Nursery test plots are rated for agronomic traits such as population, height, etc.in the spring and summer. Stalk counts of mature, millable stalks are made in late July or August. A ten-stalk sample is hand-cut from plots of active varieties during the harvest season. Samples from USDA nurseries are taken to the Juice and Milling Quality Laboratory at the USDA Ardoyne Farm, where they are weighed to determine stalk weight and processed for sucrose analysis. Brix and pol values are used to estimate the yield of theoretical recoverable sugar (TRS) per ton of cane. Estimated yields of cane and sugar per acre, and number of stalks per acre are calculated based on results from juice analyses, mature millable stalk counts, and mean stalk weight. Varieties with acceptable yields (both cane tonnage and sugar per ton) and disease and insect resistance are advanced for further testing.

Infield evaluations on commercial farms are conducted cooperatively with the LSU AgCenter sugarcane variety personnel. Infield tests are established 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 twenty-four 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 they are weighed and processed through the pre-breaker/press for sucrose and fiber analysis. Brix and pol values are then used to estimate the yield of theoretical recoverable sugar (TRS) per ton of cane. Plots are weighed with a tractor-pulled weigh-wagon equipped with electronic load cells mounted in the axles and hitch. The weight of harvested cane in each plot, stalk weights, and sucrose content are used to estimate sugar per acre, tons of cane per acre, sugar per ton of cane, and number of stalks per acre.

Table 1 lists planting and harvest dates of USDA nursery and infield evaluations. Results of infield and nursery trials are found in Tables 2 to 17. Statistical analyses were conducted for each test and for each series combined across locations using PROC MIXED procedures in SAS (version 9.1). For purposes of comparison, HoCP 96-540 is highlighted in each table. Yield values which are significantly higher or lower (P=0.05) than values for HoCP 96-540 are noted with a '+' or '-', respectively.

Table 1. Planting and harvest dates of "Ho" nursery & infield tests in 2011.

Series	Location[1/]	Soil Texture [2/]	Test type	Planting Date	Harvest Dates			
					2008	2009	2010	2011
2005	BLK	Csl	Infield	8/17/07	12/03	11/03	11/01	10/11
2005	SUG	Cosl	Infield	9/10/07	12/12	11/18	10/07	10/07
2007	AFH	Sc	Infield	8/27/09			11/22	11/02
2007	BLK	Csl	Infield	8/10/09			12/09	12/12
2008	AFL	Csl	Nursery	10/31/08		12/11	11/18	11/01
2008	IRS	Bsc	Nursery	10/29/08		11/13	10/29	11/03
2008	STG	Sc	Nursery	10/30/08		11/24	10/28	11/22
2009	AFL	Csl	Nursery	10/22/09			12/09	11/08
2009	STG	Csl	Nursery	11/06/09			12/10	11/22
2008	AFH	Sc	Infield	9/29/10				11/07
2008	BLK	Csl	Infield	9/10/10				12/12
2008	SUG	Cosl	Infield	8/25/10				12/09
2010	AFL	Csl	Nursery	10/15/10				12/13
2010	IRS	Bsc	Nursery	10/21/10				11/17
2010	STG	Sc	Nursery	10/19/10				12/02
2009	AFH	Sc	Infield	9/28/11				
2009	BLK	Csl	Infield	8/26/11				
2009	VAL	Pasl	Infield	9/22/11				
2011	AFH	Csl	Nursery	10/20/11				
2011	IRS	Bsc	Nursery	10/21/11				
2011	STG	Sc	Nursery	10/25/11				

[1/] AFH = Ardoyne Farm heavy soil, AFL = Ardoyne Farm Light soil in Schriever, BLK = Blackberry Farms in Vacherie, , IRS = Iberia Research Station in Jeanerette, STG = St. Gabriel Research Station in St. Gabriel, SUG = Sugarland Farms in Youngsville, VAL = Vallot Farm in Erath.

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

Table 2. Infield first-stubble means of the 2007 “Ho” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, Louisiana in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)	Stalks/ acre (no.)	Fiber (%)	
HoCP 96-540	9598		38.3		251		2.09	36882	12.3	
L 99-226	9245		36.9		251		2.20	34172	12.4	
L 99-233	7783	-	34.3	-	227	-	2.03	33978	14.0	
HoCP 00-950	8360	-	29.5	-	283	+	1.67	36631	11.8	
L 01-283	10159		38.3		265		1.63	47100	11.7	
Ho 07-613	9553		36.6		261		2.02	36916	10.8	

Table 3. Infield first-stubble means of the 2007 “Ho” and 2008 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)		Fiber (%)	
HoCP 96-540	7859		29.0		272	2.03	28527		11.4	
L 99-226	12496	+	42.6	+	293	1.97	43204	+	12.2	
L 99-233	11533	+	44.0	+	262	1.90	46331	+	14.2	+
HoCP 00-950	10359		35.4		293	1.88	37847		11.8	
L 01-283	9239		32.7		283	1.53	42998	+	10.8	
Ho 07-613	9275		32.6		283	1.90	34345		11.2	
L 08-088	11156	+	39.2	+	285	1.99	40263	+	12.1	
L 08-090	13725	+	48.2	+	285	2.10	46070	+	10.2	-

Table 4. Infield first-stubble means of the 2007 “Ho” assignment series across two locations (Ardoyne Farm in Schriever & Blackberry Farms in Vacherie, Louisiana) in 2011.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)	Fiber (%)	
HoCP 96-540	8728	33.6	262		2.06		32704	11.8	
L 99-226	10870	39.7	272		2.08		38688	12.3	
L 99-233	9658	39.2	244		1.96		40155	14.1	+
HoCP 00-950	9360	32.5	288	+	1.78		37239	11.8	
L 01-283	9699	35.5	274		1.58	-	45049	11.2	
Ho 07-613	9414	34.6	272		1.95		35630	11.0	

Table 5. Nursery second-stubble means of the 2008 "Ho" assignment series on a Commerce silt loam soil at the Ardoyne Farm in Schriever, Louisiana in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk		Stalks/ acre	
	(lbs.)		(tons)		(lbs.)		(lbs.)		(no.)	
HoCP 96-540	12171		49.4		247		2.15		45829	
L 99-226	15991		54.7		293		2.54		43107	
L 01-283	15586		53.7		290		1.79		60122	+
Ho 08-709	16065		57.3		281		2.09		55358	
Ho 08-711	9618		44.4		206		1.82		48552	
Ho 08-717	13691		59.3		228		1.88		63072	+
Ho 08-9616 [3/]	10023		40.7		247		1.68	-	48552	
Ho 08-9617 [3/]	6544		28.4	-	232		1.32	-	42880	
Ho 08-9618 [3/]	8559		37.6		221		1.41	-	52636	

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

Table 6. Nursery second-stubble means of the 2008 "Ho" assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, Louisiana in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk	Stalks/ acre	
	(lbs.)		(tons)		(lbs.)		(lbs.)	(no.)	
HoCP 96-540	5888		21.1		279		1.38	31082	
L 99-226	9188	+	29.0		318	+	1.48	39477	
L 01-283	3689	-	12.6		292		0.94	27225	
Ho 08-709	7859		28.7		274		1.33	48778	+
Ho 08-711	5892		22.1		268		1.28	34939	
Ho 08-717	9006	+	35.6	+	255		1.11	64433	+
Ho 08-9616 [3/]	6038		21.8		277		1.12	39023	
Ho 08-9617 [3/]	2988	-	11.6	-	260		1.19	19285	
Ho 08-9618 [3/]	3375	-	13.0		259		0.90	28813	

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

Table 7. Nursery second-stubble means of the 2008 "Ho" assignment series on a Sharkey clay soil at the Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk		Stalks/ acre	
	(lbs.)		(tons)		(lbs.)		(lbs.)		(no.)	
HoCP 96-540	13753		47.6		289		2.00		47417	
L 99-226	12958		41.5		313		2.51	+	33578	
L 01-283	12420		40.7		306		1.62		50140	
Ho 08-709	13434		46.1		292		1.58		58761	
Ho 08-711	13089		47.9		274		2.07		46510	
Ho 08-717	11911		42.2		281		1.44	-	57400	
Ho 08-9616 [3/]	11569		40.8		282		1.49	-	53543	
Ho 08-9617 [3/]	1899	-	8.9	-	191	-	1.53	-	11344	-
Ho 08-9618 [3/]	8634		36.0		233		1.65		42880	

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

Table 8. Nursery second-stubble means of the 2008 "Ho" assignment series across locations (Ardoyne Farm in Schriever, Iberia Research Station in Jeanerette, and Sugar Research Station in St. Gabriel) in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk		Stalks/ acre	
	(lbs.)		(tons)		(lbs.)		(lbs.)		(no.)	
HoCP 96-540	10604		39.3		272		1.84		41443	
L 99-226	12712		41.7		308	+	2.17		38720	
L 01-283	10565		35.7		296		1.45	-	45829	
Ho 08-709	12655		44.2		286		1.73		54299	
Ho 08-711	9533		38.1		249		1.72		43333	
Ho 08-717	11536		45.7		255		1.48	-	61635	+
Ho 08-9616 [3/]	9210		34.4		268		1.43	-	47039	
Ho 08-9617 [3/]	3810	-	16.3	-	227	-	1.34	-	24503	-
Ho 08-9618 [3/]	6856	-	28.9		238	-	1.32	-	41443	

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

Table 9. Infield plant-cane means of the 2008 “Ho” and “L” assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, Louisiana in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)		Fiber (%)	
HoCP 96-540	7998		35.8		223		1.98		36339		10.5	
L 99-226	9689		40.5		240	+	2.71	+	30539		12.9	+
L 99-233	8679		37.2		233		2.18		34174		13.0	+
L 01-283	9063		34.4		264	+	1.65		42471		10.8	
L 01-299	10048		42.2		239	+	2.42		34878		12.9	+
L 08-088	7495		32.6		230		1.83		36224		11.7	
L 08-090	9006		34.4		261	+	2.46		27937		11.1	
Ho 08-709	7684		33.1		233		1.85		36241		12.0	
Ho 08-711	8992		36.7		245	+	2.46		30115		9.3	
Ho 08-717	9311		40.8		229		1.92		42677		11.6	

Table 10. Infield plant-cane means of the 2008 “Ho” assignment series across three locations (Ardoyne Farm in Schriever, Blackberry Farms in Vacherie, and Sugarland Acres in Youngsville, Louisiana) in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)		Fiber (%)	
HoCP 96-540	8475		33.2		258		2.25		29655		11.2	
L 99-226	11574	+	42.8	+	269		2.55		33600		12.1	
L 99-233	10704	+	43.9	+	243		2.02		42998	+	13.4	+
L 01-283	9080		33.1		273		1.70	-	38663		11.3	
L 01-299	10634	+	41.1	+	261		2.09		39780	+	12.6	+
Ho 08-709	9314		37.5		247		1.96		37961		12.8	+
Ho 08-711	9668		36.8		263		2.62	+	27976		9.7	-
Ho 08-717	9674		41.2	+	234	-	1.99		41165	+	12.6	+

Table 11. Nursery first-stubble means of the 2009 "Ho" assignment series on a Commerce silt loam soil at the Ardoyne Farm in Schriever, Louisiana in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)	
HoCP 96-540	12917		45.8		282		2.08		44468	
L 99-226	17627		62.0		285		2.85	+	43560	
L 99-233	16224		62.8		252		2.25		56038	
L 01-283	23214	+	79.0	+	294		2.50		63298	+
HoCP 09-800	16566		58.3		284		2.22		52409	
HoCP 09-804	19137		67.4		283		2.23		60122	+
HoCP 09-810	16656		65.7		253		2.72	+	48552	
HoCP 09-814	21937	+	76.6	+	288		2.92	+	52635	
Ho 09-832	12877		47.5		271		2.09		45602	
Ho 09-840	17797		61.2		291		1.68		73054	+
HoCP 09-846	19071		66.0		290		2.07		63526	+
Ho 09-9401	13785		57.4		241	-	1.76		65340	+
Ho 09-9619 [3/]	10052		47.2		211	-	2.27		41065	
Ho 09-9620 [3/]	13337		57.2		234	-	2.09		55131	
Ho 09-9621 [3/]	5374	-	21.8	-	244		1.85		23141	-
Ho 09-9622 [3/]	10226		51.4		198	-	1.98		51274	
Ho 09-9623 [3/]	13955		57.5		237	-	2.17		52408	

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

Table 12. Nursery first-stubble means of the 2009 "Ho" assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton		Weight/ stalk		Stalks/ acre	
	(lbs.)		(tons)		(lbs.)		(lbs.)		(no.)	
HoCP 96-540	18599		63.3		294		2.70		46963	
L 99-226	20051		64.4		312		3.41	+	37888	
L 99-233	15680		54.0		291		2.14	-	50594	
L 01-283	13600		44.5		306		1.97	-	45375	
HoCP 09-800	16922		61.9		274		2.55		48552	
HoCP 09-803	12572		39.7	-	317		1.53	-	51955	
HoCP 09-804	18565		62.6		297		2.10	-	59669	+
HoCP 09-810	16161		60.6		267		2.61		46510	
HoCP 09-814	23431		85.7	+	269		3.10		54450	
Ho 09-832	17571		62.6		281		2.50		50140	
Ho 09-840	13712		46.7		293		1.96	-	47417	
HoCP 09-846	13883		46.1		302		2.06	-	44695	
Ho 09-9401	14254		59.0		244	-	2.03	-	57853	+
Ho 09-9619 [3/]	13667		54.5		251	-	2.25		48098	
Ho 09-9620 [3/]	15239		64.6		237	-	1.86	-	69424	+
Ho 09-9621 [3/]	7190	-	31.2	-	231	-	1.61	-	38796	
Ho 09-9622 [3/]	8973	-	42.0		213	-	2.45		34485	
Ho 09-9623 [3/]	12066		46.3		261	-	1.64	-	56719	

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

Table 13. Nursery first-stubble means of the 2009 "Ho" assignment series across locations (Ardoyne Farm in Schriever and Sugar Research Station in St. Gabriel) in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)
HoCP 96-540	15758		54.5		288		2.39		45715
L 99-226	18839		63.2		298		3.13	+	40724
L 99-233	15952		58.4		271		2.19		53316
L 01-283	18407		61.7		300		2.23		54337
HoCP 09-800	16744		60.1		279		2.38		50480
HoCP 09-803	12572		39.7		312		1.53	-	51728
HoCP 09-804	18851		65.0		290		2.16		59895
HoCP 09-810	16408		63.2		260	-	2.66		47531
HoCP 09-814	22684	+	81.1	+	278		3.01	+	53543
Ho 09-832	15224		55.0		276		2.29		47871
Ho 09-840	15754		53.9		292		1.82	-	60235
HoCP 09-846	16477		56.0		296		2.07		54110
Ho 09-9401	14019		58.2		242	-	1.89		61597
Ho 09-9619 [3/]	11859		50.8		231	-	2.26		44581
Ho 09-9620 [3/]	14288		60.9		235	-	1.97		62278
Ho 09-9621 [3/]	6282	-	26.5	-	238	-	1.73	-	30968
Ho 09-9622 [3/]	9599	-	46.7		205	-	2.21		42880
Ho 09-9623 [3/]	13010		51.9		249	-	1.90		54564

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

Table 14. Nursery plant cane means of the 2010 "Ho" assignment series on a Commerce silt loam soil at the Ardoyne Farm in Schriever, Louisiana in 2011.

Variety	Sugar/ acre		Tons/ acre		Sugar/ ton	Weight/ stalk		Stalks/ acre	
	(lbs.)		(tons)		(lbs.)	(lbs.)		(no.)	
HoCP 96-540	13745		48.2		285	2.74		35166	
L 99-226	13798		45.6		303	3.07		29948	
L 99-233	12789		45.6		281	1.99	-	46056	+
L 01-283	10823	-	36.7	-	295	2.01	-	36527	
L 01-299	11404		40.4		283	2.49		32444	
HoCP 10-900	11344		39.4		288	2.30		34712	
HoCP 10-901	13705		47.2		291	2.21	-	42880	+
Ho 10-908	12857		46.0		280	2.24		41065	
HoCP 10-909	11127		38.6	-	289	2.01	-	38342	
Ho 10-912	12531		43.8		286	2.16	-	40611	
Ho 10-915	10042	-	36.5	-	275	2.06	-	35620	
HoCP 10-917	15899		54.2		294	2.30		47190	+
Ho 10-922	9549	-	35.9	-	267	1.84	-	38796	
Ho 10-925	11491		40.6		283	1.93	-	42199	+
Ho 10-927	8368	-	28.1	-	299	1.63	-	34485	
Ho 10-931	10531	-	38.5	-	274	2.49		30855	
Ho 10-937	11561		39.5		293	2.56		31082	
HoL 10-938	11144		37.6	-	297	1.85	-	40611	
Ho 10-9624 [3/]	11019		39.1		282	2.02	-	38796	
Ho 10-9625 [3/]	12690		45.2		281	2.68		33805	
Ho 10-9626 [3/]	10809	-	38.1	-	284	2.12	-	35847	

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

Table 15. Nursery plant-cane means of the 2010 "Ho" assignment series on a Baldwin silty clay soil at the Iberia Research Station in Jeanerette, Louisiana in 2011.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
HoCP 96-540	8099	27.5	294	2.47	22461
L 99-226	12553	41.6	303	2.99	27679
L 99-233	9442	34.0	278	2.17	30401
L 01-283	8888	31.9	278	1.97	32670
L 01-299	4995	18.4	273 -	1.49 -	25410
HoCP 10-900	8855	29.6	299	2.22	26318
HoCP 10-901	7816	28.5	274 -	2.00	28587
Ho 10-908	6628	24.3	273 -	2.09	24049
HoCP 10-909	4794	17.2	280	1.48 -	23369
Ho 10-912	8288	29.5	281	1.67 -	35393
Ho 10-915	7058	25.0	283	1.65 -	30175
HoCP 10-917	10314	34.5	299	2.25	30855
Ho 10-922	4370	16.2	270 -	1.15 -	28133
Ho 10-925	2783 -	9.7	286	1.44 -	13840
Ho 10-927	5907	20.1	295	1.35 -	30175
Ho 10-931	8943	32.1	279	2.45	25864
Ho 10-937	6710	24.4	276 -	2.30	21100
HoL 10-938	6401	22.4	285	1.48 -	30175
Ho 10-9624 [3/]	5525	20.1	275 -	1.51 -	26772
Ho 10-9625 [3/]	4812	17.9	269 -	1.92	17696
Ho 10-9626 [3/]	7918	27.2	291	1.69 -	32217

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

Table 16. Nursery plant cane means of the 2010 "Ho" assignment series on a Commerce silt loam soil at the Sugar Research Station in St. Gabriel, Louisiana in 2011.

Variety	Sugar/ acre (lbs.)	Tons/ acre (tons)	Sugar/ ton (lbs.)	Weight/ stalk (lbs.)	Stalks/ acre (no.)
HoCP 96-540	14179	57.2	250	2.60	44014
L 99-226	14705	56.2	260	2.78	40157
L 99-233	13849	54.7	254	2.16 -	50820
L 01-283	15027	55.2	271	2.32	47644
L 01-299	10770	43.8	246	2.03 -	43334
HoCP 10-900	14867	52.6	283	2.66	39703
HoCP 10-901	15788	60.2	263	2.65	45375
Ho 10-908	14063	55.8	251	2.46	45375
HoCP 10-909	13004	50.7	257	2.19	46283
Ho 10-912	12845	49.5	255	2.00 -	48779
Ho 10-915	12325	51.4	244	2.31	44241
HoCP 10-917	12803	46.8	276	2.30	40384
Ho 10-922	9971	38.0 -	263	1.88 -	40384
Ho 10-925	9159	38.5 -	239	1.62 -	47644
Ho 10-927	11557	40.1 -	289	1.86 -	43107
Ho 10-931	10020	40.4 -	249	2.37	34031 -
Ho 10-937	14786	55.7	266	3.07 +	36074 -
HoL 10-938	9476	42.7	217	1.70 -	50140
Ho 10-9624 [3/]	7511	30.6 -	246	1.71 -	35620 -
Ho 10-9625 [3/]	12673	49.5	257	2.32	42653
Ho 10-9626 [3/]	11873	48.0	248	2.08 -	46283

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

Table 17. Nursery plant cane means of the 2010 "Ho" assignment series across locations (Ardoyne Farm in Schriever, Iberia Research Station in Jeanerette, and Sugar Research Station in St. Gabriel) in 2011.

Variety	Sugar/ acre (lbs.)		Tons/ acre (tons)		Sugar/ ton (lbs.)		Weight/ stalk (lbs.)		Stalks/ acre (no.)	
HoCP 96-540	12007		44.3		276		2.60		33880	
L 99-226	13685		47.8		288		2.94	+	32594	
L 99-233	12026		44.7		271		2.11	-	42426	+
L 01-283	11579		41.3		281		2.10	-	38947	
L 01-299	9056	-	34.2	-	267		2.00	-	33729	
HoCP 10-900	11688		40.5		290		2.39		33578	
HoCP 10-901	12436		45.3		276		2.28		38947	
Ho 10-908	11182		42.0		268		2.26	-	36829	
HoCP 10-909	9641		35.5	-	275		1.89	-	35998	
Ho 10-912	11221		40.9		274		1.94	-	41594	+
Ho 10-915	9808		37.6		267		2.01	-	36678	
HoCP 10-917	13005		45.1		289		2.28		39476	
Ho 10-922	7963	-	30.0	-	267		1.62	-	35771	
Ho 10-925	7811	-	29.6	-	269		1.66	-	34561	
Ho 10-927	8611	-	29.4	-	294	+	1.61	-	35922	
Ho 10-931	9831		37.0		267		2.44		30250	
Ho 10-937	11019		39.9		278		2.64		29418	
HoL 10-938	9007	-	34.2	-	266		1.68	-	40308	
Ho 10-9624 [3/]	8018	-	29.9	-	268		1.74	-	33729	
Ho 10-9625 [3/]	10058		37.5		269		2.31		31384	
Ho 10-9626 [3/]	10200		37.8		274		1.96	-	38115	

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

2011 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 2010 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, 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 variety in Louisiana in 2011 was HoCP96-540, occupying 43% of the state's acreage. Accordingly for comparison, HoCP96-540 is used as the check variety in all comparisons 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 used least square mean probability differences (P=0.05). Varieties that are significantly higher or lower than HoCP96-540 are denoted by a plus (+) or minus (-), respectively, next to the value for each trait.

Four experimental varieties representing the 2009 assignment series were introduced to outfield locations for seed increase in 2011 (Table 1). Eight experimental and seven commercial varieties were planted at 12 outfield locations. Thirty-eight tests were harvested in 2011 including ten plantcane, eleven first-stubble, eleven second-stubble, and six third-stubble crops (Table 2).

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

The dry weather experienced for most of the 2010 season provided for drought conditions for most of the growing season. The Louisiana sugar industry experienced tropical activity in 2011 when Tropical Storm Lee made landfall on September 4, which relieved drought conditions for 2011. Conditions after the tropical system were dry, and favorable for dry harvesting conditions. All tests were harvested by the third week of December 2011. The Louisiana sugar industry did not experience any severe freezes during harvest. The last raw sugar factory ended its processing season on December 30,2012.

Ho 05-961 was harvested in plantcane through second stubble crops in 2011 and will be considered for release in the spring of 2012. The experimental variety Ho 07-613 was harvested in the plant-cane trials and will be eligible to go secondary increase stations in 2012.

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 2010.

Commercial Varieties		Experimental Varieties		Experimental Varieties Introduced to the Outfield		
HoCP96-540	L01-299	Ho05-961	Ho08-717	L09-099	Ho09-832	HoCP09-810
L99-226	L03-371	Ho07-613	L08-088	L09-112	Ho09-840	HoCP09-814
L99-233	HoCP04-838	Ho08-709	L08-090	L09-117	HoCP09-800	HoCP09-846
HoCP00-950		Ho08-711	L08-092	L09-131	HoCP09-804	

Table 2. Harvest and planting dates for all outfield locations harvested in 2011.

Location	Parish	Plantcane			First-stubble		Second-stubble		Third-stubble	
		2011 Planting Date	2011 Harvest Date	2010 Planting Date	2011 Harvest Date	2009 Planting Date	2011 Harvest Date	2008 Planting Date	2011 Harvest Date	2007 Planting Date
A. Landry	Iberville	08/11	**	08/16	**	*	**	10/07	**	08/27
Allains	St. Mary	08/31	12/01	09/17	12/01	11/19	10/19	10/15	**	10/05
Alma	Pointe Coupee	09/14	11/14	09/13	10/03	08/31	10/03	09/29	**	10/22
Bon Secour	St. James	09/13	12/13	09/15	12/13	09/03	10/27	09/24	10/27	09/06
Brunswick	Pointe Coupee	09/09	11/22	09/02	11/22	08/27	10/17	09/22	10/17	09/15
F. Martin	St. Mary	09/15	12/14	09/10	10/21	09/04	10/18	10/13	**	09/28
Glenwood	Assumption	09/01	11/28	09/20	11/28	09/02	10/18	10/02	10/18	09/12
Lanaux	St. John	08/31	12/02	09/23	12/02	09/01	10/20	09/24	10/20	09/11
Levert-St. John	St. Martin	09/02	**	09/09	11/30	08/20	10/19	09/23	10/19	09/19
Magnolia	Terrebonne	09/21	11/01	09/16	11/01	09/03	11/01	10/17	**	09/07
Mary	Lafourche	10/11	11/23	09/24	10/12	10/21	10/12	10/09	**	09/20
R. Hebert	Iberia	09/16	11/29	09/01	11/29	09/22	10/13	10/13	10/13	09/27

* No test planted at this location.

** No test harvested at this location.

Table 3. Plantcane sugar per acre for eight commercial and two experimental varieties at ten outfield locations in 2011.

	Heavy						Light				
Variety	Allains	Alma	Magnolia	F. Martin	Mary	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)										
HoCP96-540	7302	8820	5794	7768	9168	8400	15711	9741	10825	13518	9705
L99-226	8423	7942	4991	8292	8715	9290	17992	8831	9361	12812	9665
L99-233	7879	7530	4581	9167 +	9510	7267 -	11641	7758	8956	10263 -	8454
HoCP00-950	6305	6644 -	4561	8244	10776	8340	14719	8607	10859	-------	8986
L01-283	6177	6031 -	4630	7103	10873	8416	15110	8396	10417	11409	8856
L01-299	7829	6784 -	4351	8461	10859	8750	13209	8147	10943	10400 -	8973
L03-371	7456	8391	5175	10195 +	12332 +	10100 +	14043	7872	9441	10766 -	9590
HoCP04-838	9186 +	7410	6319	7967	10657	9131	14284	8038	11447	10434 -	9457
Ho05-961	8500	8759	5782	8703	12474 +	8560	12726	8426	8905	9790 -	9274
Ho07-613	8966 +	8768	4009	7618	11433 +	9231	14169	9065	9566	10643 -	9347

Table 4. Plantcane cane yield for eight commercial and two experimental varieties at ten outfield locations in 2011.

	Heavy						Light				
Variety	Allains	Alma	Magnolia	F. Martin	Mary	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)										
HoCP96-540	23.4	31.9	21.4	25.6	32.8	30.3	52.3	34.1	37.1	47.3	33.6
L99-226	26.9	29.8	18.7	26.0	33.0	30.4	56.1	28.2	30.2	45.9	32.5
L99-233	26.4	29.3	17.6	30.8 +	35.3	27.4 -	43.6	27.8	31.8	43.4	31.4
HoCP00-950	19.2	22.8 -	15.8 -	26.3	35.9	28.4	46.9	27.6	35.1	-------	29.7
L01-283	19.5	22.2 -	16.6	24.1	36.3	27.7 -	47.6	27.9	34.8	40.2	29.7
L01-299	25.1	26.1 -	17.9	28.8	38.1	30.4	44.2	28.3	36.2	39.8 -	31.5
L03-371	22.7	29.4	18.2	32.6 +	38.6	33.3 +	46.9	27.0	29.9	39.0 -	31.8
HoCP04-838	29.3 +	27.4	23.5 +	28.2	36.4	33.1 +	49.5	27.9	38.8	39.2 -	33.3
Ho05-961	27.1	29.7	20.3	29.8 +	42.9	29.3	43.5	29.6	30.0	36.5 -	31.9
Ho07-613	28.7	31.6	14.5 -	25.1	41.9	32.7 +	49.1	30.9	32.4	37.4 -	32.4

Table 5. Plantcane sugar per ton for eight commercial and two experimental varieties at ten outfield locations in 2011.

	Heavy						Light				
Variety	Allains	Alma	Magnolia	F. Martin	Mary	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)										
HoCP96-540	314	277	271	304	279	277	300	287	291	286	289
L99-226	314	266	269	318 +	266	306 +	320	313	313	277	296
L99-233	300	257 -	260	297	270	264	261 -	278	281	236	270 -
HoCP00-950	329	289	288	314	301	294	314	312	309	287	304 +
L01-283	317	271	279	295	299	304 +	318	300	300	284	297
L01-299	311	260	241 -	294	284	288	298	290	303	262	283
L03-371	329	286	284	313	320 +	303	301	293	317	272	302 +
HoCP04-838	304	271	270	283 -	292	276	289	289	296	266	284
Ho05-961	314	295	283	293	290	292	294	285	300	272	292
Ho07-613	312	277	277	304	273	282	285	293	297	285	289

Table 6. Plantcane stalk weight for eight commercial and two experimental varieties at ten outfield locations in 2011.

	Heavy						Light				
Variety	Allains	Alma	Magnolia	F. Martin	Mary	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)										
HoCP96-540	1.96	2.89	1.70	2.04	2.47	2.33	2.69	2.48	2.33	2.85	2.37
L99-226	2.63 +	2.64	2.12	2.38 +	2.62	3.14 +	2.66	2.88	2.42	2.96	2.64 +
L99-233	2.06	1.67 -	1.97	1.93	1.94	1.74 -	1.61 -	2.00	1.98	2.09 -	1.90 -
HoCP00-950	1.88	1.80 -	1.66	1.85	2.19	1.93 -	2.00 -	2.09	1.92	2.33 -	1.96 -
L01-283	1.72	1.92 -	1.64	1.81	2.28	1.99 -	2.14 -	2.28	2.05	2.30 -	2.01 -
L01-299	1.89	1.95 -	1.89	2.07	2.26	2.39	1.84 -	1.96 -	2.04	2.08 -	2.04 -
L03-371	2.28	1.94 -	1.79	2.11	2.35	2.61	2.10 -	2.14	1.97	1.80 -	2.11 -
HoCP04-838	1.97	1.88 -	1.81	1.81	2.17	2.63	1.98 -	1.96 -	1.97	2.12 -	2.03 -
Ho05-961	1.91	2.29 -	1.66	1.91	2.33	2.37	2.00 -	2.34	2.19	2.35 -	2.14 -
Ho07-613	2.05	2.25 -	1.78	2.17	2.34	2.38	2.40	2.21	2.69	2.19 -	2.25

Table 7. Plantcane stalk number for eight commercial and two experimental varieties at ten outfield locations in 2011.

	Heavy						Light				
Variety	Allains	Alma	Magnolia	F. Martin	Mary	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)										
HoCP96-540	24073	22619	25237	25673	26668	26358	38599	27454	32031	33104	28182
L99-226	20464	22722	19849	22327	25562	19564 -	42655	19758	25233	31293	24943 -
L99-233	25683	35153	17986	32770	36488	31614 +	54998	29264	32367	41732 +	33755 +
HoCP00-950	20610	25230	19332	28439	32744	29506	48296	27347	37411	-------	30553
L01-283	22714	23164	20185	26739	32501	28086	44444	25175	34746	34963	29272
L01-299	26585	28187	18951	27894	33701	25548	47953	29122	35772	38764	31248 +
L03-371	19981	31727	20296	30919	32974	25577	45742	25018	30967	43589	30706
HoCP04-838	30862 +	29189	25923	31968	33621	25211	50044	28982	40614	37393	33276 +
Ho05-961	28406	26100	24815	31370	36642	24821	44720	25478	26600	31112	30180
Ho07-613	28230	28039	16672	23189	37692	27636	41051	28717	23694	34426	28935

Table 8. First-stubble sugar per acre for one experimental and seven commercial varieties at eleven outfield locations in 2011.

	Heavy						Light					
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	10689	6965	8266	6551	9904	8779	7128	9157	9702	9182	9326	8695
L99-226	10559	------	7440	8001	9163	7819	9526 +	14884 +	9660	12608 +	8631	9616 +
L99-233	7665 -	5111	6137 -	5267	8166	6475 -	8214	9586	9219	8495	10073	7678 -
HoCP00-950	5842 -	6648	7398	5687	7198	6130 -	9256 +	11081	9323	9811	9052	7934
L01-283	9225	6522	6523 -	5947	10098	8438	8403	13754 +	10727	9903	10866	9128
L03-371	------	6827	6968 -	6568	------	------	9362 +	14119 +	10360	8649	9365	8952
HoCP04-838	8039 -	5671	7070 -	5401	8191	7473	8619 +	11545 +	9511	10124	8583	8203
Ho05-961	8514 -	5112	6139 -	5132	7762	7268 -	8467	12180	8848	8745	8997	7924

Table 9. First-stubble cane yield for one experimental and seven commercial varieties at eleven outfield locations in 2011.

	Heavy					Light					
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	33.5	28.5	28.9	19.7	33.1	27.5	25.3	29.1	31.9	28.9	35.9	29.3
L99-226	32.8	------	25.4 -	23.1	29.3	24.7	31.1	48.7 +	31.0	37.7	29.7	31.0
L99-233	26.7 -	22.8	23.2 -	17.1	29.1	21.8	30.8	33.3	31.9	29.6	37.5	27.6
HoCP00-950	18.2 -	24.8	23.9 -	15.9	23.3	19.2	29.3	36.1	29.8	29.8	31.2	25.6 -
L01-283	29.8	26.5	21.9 -	18.3	32.7	26.2	27.7	45.4 +	33.7	31.3	38.9	30.2
L03-371	------	26.6	23.1 -	18.9	------	------	30.7	44.1 +	32.8	27.6	34.0	29.2
HoCP04-838	27.1 -	25.1	23.9 -	15.8	27.5	25.8	30.1	38.6	31.5	31.5	31.0	28.0
Ho05-961	27.1 -	20.7	21.2 -	15.3	25.7	24.4	28.3	40.2 +	31.2	27.5	31.7	26.7

Table 10. First-stubble sugar per ton for one experimental and seven commercial varieties at eleven outfield locations in 2011.

	Heavy					Light					
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	319	244	285	333	299	320	280	316	303	317	260	298
L99-226	322	------	291	346	313 +	317	306 +	305	311	334 +	290 +	308 +
L99-233	286 -	224	264 -	311 -	281 -	298 -	268	288 -	289	287 -	268	279 -
HoCP00-950	322	269 +	310 +	358 +	308	319	316 +	307	313	329	292 +	313 +
L01-283	310	246	298	325	308	322	304 +	303	319	317	278 +	303
L03-371	------	255 +	301	346	------	------	305 +	320	315	313	276 +	307 +
HoCP04-838	297 -	225	296	341	297	291 -	287	299 -	302	322	277 +	294
Ho05-961	314	247	289	334	301	298 -	299	304	285	318	284 +	298

Table 11. First-stubble stalk weight for one experimental and seven commercial varieties at eleven outfield locations in 2011.

	Heavy					Light						
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	2.07	2.07	1.93	1.73	1.76	1.97	2.24	2.04	3.06	2.01	2.44	2.12
L99-226	2.39	------	2.22	1.83	1.9	2.08	2.89 +	2.27	2.89	2.52	2.95 +	2.39 +
L99-233	1.74	1.62 -	1.75	1.00 -	1.47	1.67	1.89	1.74	1.95 -	1.84	1.97	1.69 -
HoCP00-950	1.46 -	1.73 -	1.69	1.3 -	1.55	1.59	2.28	1.62	2.39 -	1.77	2.18	1.78 -
L01-283	1.91	1.84	1.53	1.32 -	1.70	1.78	2.13	1.82	2.33 -	1.87	2.10	1.85 -
L03-371	------	1.98	1.76	1.47 -	------	------	2.47	2.23	2.52 -	1.67	2.48	2.01
HoCP04-838	1.65 -	1.74 -	1.59	1.32 -	1.85	1.74	2.07	1.98	2.46 -	1.75	2.05	1.83 -
Ho05-961	1.61 -	1.94	1.98	1.06 -	1.72	1.85	2.31	1.86	2.52 -	1.86	2.35	1.92 -

Table 12. First-stubble stalk number for one experimental and seven commercial varieties at eleven outfield locations in 2011.

	Heavy					Light						
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	32404	27573	30202	22844	37693	28106	22714	31269	20919	29318	29497	28413
L99-226	27465	------	23016	25599	31646	24408	21649	43404	21444	29841	20389 -	26602
L99-233	31079	28177	28142	34607	39494	26932	32489 +	38334	33619 +	32665	38794 +	33091 +
HoCP00-950	25039	28966	28587	24684	30342	24418	25654	46997	25043	34277	26532	29316
L01-283	31873	29154	29563	27618	38746	29488	25974	50021	28911 +	35076	37727	33105 +
L03-371	------	26855	26485	25447	------	------	25034	39881	26078	33159	27573	29062
HoCP04-838	32948	29021	29971	24253	29585	29882	29253 +	43404	26358	35927	30237	30977
Ho05-961	33964	21310	21591	29344	30052	26516	24500	43019	25063	30162	27147	28424

Table 13. Second-stubble sugar per acre for one experimental seven commercial varieties at seven outfield locations in 2011.

	Heavy					Light						
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	7107	6795	6823	6391	4324	7735	5910	8737	6843	6598	10020	7026
L99-226	7719	6083	7527	8477 +	5985	7765	8747 +	9478	7596	7177	9547	7828 +
L99-233	5421 -	4695 -	5661 -	6997	5782	6261	7330 +	9869	8587 +	6208	8092	6809
HoCP00-950	6699	6868	6684	5972	5422	6301	6839	8327	8056	6003	7548 -	6802
L01-283	5801	7640	6623	7838 +	7020	8335	9444 +	10616 +	10368 +	5737	10597	8184 +
L03-371	6885	6109	7378	7466	5900	-------	7651 +	8958	9182 +	5856	-------	7425
HoCP04-838	7202	6086	7416	7463	5541	6437	7590 +	9487	7609	5697	9139	7242
Ho05-961	5190 -	5965	5707 -	6190	3720	5923	8751 +	10187 +	7775	6835	8333	6780

Table 14. Second-stubble cane yield for one experimental seven commercial varieties at seven outfield locations in 2011.

	Heavy					Light						
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
	(lbs/tons)											
HoCP96-540	24.4	29.4	20.6	19.8	13.5	27.4	22.3	34.1	25.8	25.4	39.7	25.7
L99-226	24.9	24.2 -	23.0	24.5 +	18.2	27.0	29.3 +	34.8	28.5	26.5	38.0	27.2
L99-233	19.5 -	21.1 -	19.4	22.6	19.7	25.5	30.0 +	37.0	32.6 +	24.7	34.5	26.1
HoCP00-950	20.3	26.8	20.5	17.6	17.1	21.9	23.0	28.8 -	27.5	20.9 -	27.7	22.9 -
L01-283	19.3 -	30.9	22.2	25.1 +	21.9	29.2	31.9 +	38.9 +	34.6 +	20.4 -	42.0	28.8 +
L03-371	23.0	24.2 -	22.7	23.7 +	17.9	-------	28.3 +	32.7	31.8 +	20.9 -	-------	26.1
HoCP04-838	23.7	25.3 -	24.2 +	23.2	17.9	25.4	26.8 +	35.2	27.7	20.9 -	35.6	26.0
Ho05-961	17.2 -	23.2 -	17.9	19.6	13.0	22.6	29.3 +	35.1	25.0	23.8	31.5	23.5 -

Table 15.Second-stubble sugar per ton for one experimental seven commercial varieties at seven outfield locations in 2011.

	Heavy						Light											
Variety	Allains		Alma		Magnolia	F. Martin		Mary		St. John		Bon Secour		Glenwood		Lanaux		R.Hebert		Brunswick	Mean	
	(lbs/tons)																					
HoCP96-540	290		230		331	323		319		283		265		258		266		260		252	280	
L99-226	310	+	253		328	347	+	326		287		298	+	273		267		271		253	292	+
L99-233	278		222		292	-	309		290	-	241	-	245		266		263		249		233	263	-
HoCP00-950	330	+	257	+	326	338		315		288		297	+	291		293	+	288		274	300	+
L01-283	300		247		298	-	312		321		284		296	+	273		300	+	278		251	287	
L03-371	299		252		325	315		330		-------		271		274		289	+	279		-------	288	
HoCP04-838	304	+	241		306	-	322		309		253	+	283		269		275		272		257	281	
Ho05-961	301		256	+	319	315		287	-	262		299	+	291		311	+	288		263	290	+

Table 16. Second-stubble stalk weight for one experimental seven commercial varieties at seven outfield locations in 2011.

	Heavy						Light											
Variety	Allains		Alma		Magnolia	F. Martin		Mary		St. John		Bon Secour		Glenwood		Lanaux		R.Hebert		Brunswick	Mean	
	(lbs/tons)																					
HoCP96-540	1.40		2.05		1.42	1.51		1.12		2.18		1.74		2.19		2.01		1.67		1.77	1.73	
L99-226	1.98	+	1.96		1.66	1.78		1.60	+	2.37		2.35	+	2.27		2.02		2.14	+	2.32	2.04	+
L99-233	1.24		1.34	-	1.50	1.47		1.21		1.44	-	1.55		1.56	-	1.55		1.67		1.83	1.49	-
HoCP00-950	1.45		1.88		1.46	1.12		1.33		1.88		1.48		1.93		1.57		1.52		1.88	1.59	-
L01-283	1.29		1.52	-	1.40	1.38		1.33		1.72	-	1.88		1.41	-	1.70		1.53		1.87	1.55	-
L03-371	1.58		1.69	-	1.44	1.40		1.42	+	-------		1.82		1.84		1.83		1.76		-------	1.69	
HoCP04-838	1.47		1.55	-	1.44	1.29		1.18		1.66	-	1.65		1.61	-	1.73		1.83		1.97	1.58	-
Ho05-961	1.29		1.57	-	1.42	1.35		1.00		1.65	-	1.89		1.56	-	1.48		1.85		1.61	1.52	-

Table 17. Second-stubble stalk number for one experimental seven commercial varieties at seven outfield locations in 2011.

	Heavy					Light						
Variety	Allains	Alma	Magnolia	F. Martin	Mary	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
						(lbs/tons)						
HoCP96-540	35045	28745	29555	26842	24044	25367	26099	32037	25902	30468	45058	29924
L99-226	25262	24613	27797	27623	23062	22822	24979	31703	28738	24712	33116 -	26766
L99-233	31393	32245	26467	31234	32552	35269 +	39027 +	48021 +	42591 +	29776	38253	35166 +
HoCP00-950	28125	28687	28678	32362	26405	24073	31839	30931	35144	27480	30019 -	29490
L01-283	30508	41272 +	32108	37071	33228	33917 +	34337 +	55599 +	41986 +	26625	45072	37429 +
L03-371	29150	28631	31686	34440	25247	-------	31150	35882	35714 +	24698	-------	31031
HoCP04-838	32534	32726	33830	36427	30351	31144	32394	43929 +	32164	23574	36625	33245 +
Ho05-961	26727	29732	25919	29259	26927	27557	31658	45284 +	33791	25769	38774	31036

Table 18. Third-stubble sugar per acre for eleven commercial varieties at six outfield locations in 2011.

	Light						
Variety	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
LCP85-384	4700	5949	6690	4333	5201	6236 +	5518
Ho95-988	5669	6208	5431	5854 +	6449	5858 +	5912
HoCP96-540	4953	6304	7167	3136	6332	3878	5295
L97-128	5021	6740	7494	5905 +	5583	6901 +	6274 +
L99-226	5141	6882	9186	5880 +	7168	5775 +	6672 +
L99-233	5635	6770	7709	6398 +	5909	6915 +	6556 +
HoCP00-950	5739	6522	7818	6311 +	6196	7312 +	6650 +
L01-283	------	8754 +	8304	8282 +	7581	9250 +	8258 +
L01-299	6423	9049 +	9633 +	6402 +	8035 +	8730 +	8045 +
L03-371	5905	7839 +	9337	4593	4987	6907 +	6604 +
HoCP04-838	4246	5640	6969	4183	5604	6248 +	5482

Table 19. Third-stubble cane yield for eleven commercial varieties at six outfield locations in 2011.

	Light						
Variety	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
LCP85-384	17.9	23.9	24.2	16.2	21.9	25.2 +	21.5
Ho95-988	19.9	24.0	20.9	21.4 +	24.6	24.2 +	22.5
HoCP96-540	18.0	24.4	24.7	11.4	26.4	17.4	20.4
L97-128	18.3	25.1	27.2	21.8 +	22.4	27.0 +	23.6 +
L99-226	18.1	25.4	30.4	21.2 +	26.0	23.3 +	24.1 +
L99-233	22.0	27.6	28.7	23.8 +	24.6	31.4 +	26.4 +
HoCP00-950	18.8	23.1	23.4	21.5 +	21.8	27.5 +	22.7
L01-283	------	29.9 +	30.3	26.5 +	28.1	33.6 +	28.8 +
L01-299	24.4	32.5 +	32.1 +	22.4 +	29.7	34.9 +	29.3 +
L03-371	20.2	27.9 +	30.7	18.5 +	19.2 -	29.4 +	24.2 +
HoCP04-838	14.8	22.3	24.9	17.6	21.0 -	25.5 +	21.0

Table 20. Third-stubble sugar per ton for eleven commercial varieties at six outfield locations in 2011.

	Light						
Variety	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
LCP85-384	262	249	276	265	238	248	256
Ho95-988	282	261	260	271	262	243	263
HoCP96-540	276	258	290	274	240	222	260
L97-128	274	269	274	270	251	255	265
L99-226	284	271	303	277	275 +	248	276 +
L99-233	256	244	268	268	240	219	249
HoCP00-950	305	283 +	354	290	285 +	264	297 +
L01-283	------	293 +	275	313 +	269 +	275	287 +
L01-299	265	278	299	287	271 +	250	275 +
L03-371	293	282	305	251	260	234	272
HoCP04-838	284	253	281	236 -	266 +	246	261

Table 21. Third-stubble stalk weight for eleven commercial varieties at six outfield locations in 2011.

	Light						
Variety	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
LCP85-384	1.22 -	1.64	1.19 -	1.36	1.55	1.30	1.38 -
Ho95-988	1.24 -	1.61	1.69	1.43	1.57	1.59	1.52
HoCP96-540	1.71	1.81	1.72	1.68	1.69	1.45	1.68
L97-128	1.42	1.72	1.62	1.59	1.59	1.86 +	1.64
L99-226	1.49	1.95	1.86	2.16 +	1.84	2.34 +	1.94 +
L99-233	1.35 -	1.23	1.46	1.59	1.40 -	1.70	1.46 -
HoCP00-950	1.33 -	1.40	1.47	1.62	1.62	1.56	1.50 -
L01-283	------	1.52	1.26 -	1.37	1.67	1.71	1.47 -
L01-299	1.21 -	1.64	1.51	1.64	1.50	1.77	1.55
L03-371	1.60	1.67	1.59	1.81	1.59	1.99 +	1.70
HoCP04-838	1.40	1.74	1.45	1.69	1.25 -	1.75	1.55

Table 22. Third-stubble stalk number for eleven commercial varieties at six outfield locations in 2011.

	Light						
Variety	St. John	Bon Secour	Glenwood	Lanaux	R.Hebert	Brunswick	Mean
LCP85-384	29546	30283	41608 +	23530 +	28284	39873 +	32187 +
Ho95-988	31755 +	29914	24992	29884 +	31470	30738	29792 +
HoCP96-540	21161	27485	28576	13713	31401	24664	24500
L97-128	26454	29220	34090	28028 +	27987	29487	29211 +
L99-226	24369	26453	32655	19755	28552	20198	25330
L99-233	33230 +	45231 +	39976	30042 +	37827	37116 +	37237 +
HoCP00-950	28708	33045	31341	26477 +	27162	36060 +	30465 +
L01-283	------	39804 +	47773 +	38641 +	33696	40504 +	39714 +
L01-299	41082 +	40342 +	43438 +	27178 +	39836	39478 +	38559 +
L03-371	25191	33792	39010	19874	24350	29741	28679
HoCP04-838	21175	25622	35261	20276	33683	29523	27590

Table 23. Plantcane means from ten outfield locations in 2011: Allains, Alma, Brunswick, Bon Secour, F. Martin, Glenwood, Lanaux, Magnolia, Mary 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	9705	33.6	289	2.37	28182
L99-226	9665	32.5	296	2.64 +	24943 -
L99-233	8454	31.4	270 -	1.90 -	33755 +
HoCP00-950	8986	29.7	304 +	1.96 -	30553
L01-283	8856	29.7	297	2.01 -	29272
L01-299	8973	31.5	283 -	2.04 -	31248 +
L03-371	9590	31.8	302 +	2.11 -	30706
HoCP04-838	9457	33.3	284	2.03 -	33276 +
Ho05-961	9274	31.9	292	2.14 -	30180
Ho07-613	9347	32.4	289	2.25	28935

Table 24. First-stubble means from eleven outfield locations in 2011: Allains, Alma, Brunswick, Bon Secour, F. Martin, Glenwood, Lanaux, Magnolia, Mary, R. Hebert and St. John.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	8695	29.3	298	2.12	28413
L99-226	9616 +	31.0	308 +	2.39 +	26602
L99-233	7678 -	27.6	279 -	1.69 -	33091 +
HoCP00-950	7934	25.6 -	313 +	1.78 -	29316
L01-283	9128	30.2	303	1.85 -	33105 +
L03-371	8952	29.2	307 +	2.01	29062
HoCP04-838	8203	28.0	294	1.83 -	30977
Ho05-961	7924	26.7	298	1.92 -	28424

Table 25. Second-stubble means from eleven outfield locations in 2011: Allains, Alma, Brunswick, Bon Secour, F. Martin, Glenwood, Lanaux, Magnolia, Mary, R. Hebert and St. John.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	7026	25.7	280	1.73	29924
L99-226	7828 +	27.2	292 +	2.04 +	26766
L99-233	6809	26.1	263 -	1.49 -	35166 +
HoCP00-950	6802	22.9 -	300 +	1.59 -	29490
L01-283	8184 +	28.8 +	287	1.55 -	37429 +
L03-371	7425	26.1	288	1.69	31031
HoCP04-838	7242	26.0	281	1.58 -	33245 +
Ho05-961	6780	23.5 -	290 +	1.52 -	31036

Table 26. Third-stubble means from six outfield locations in 2011: Bon Secour, Brunswick, Glenwood, Lanaux, 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)
LCP85-384	5518	21.5	256	1.38 -	32187 +
Ho95-988	5912	22.5	263	1.52	29792 +
HoCP96-540	5295	20.4	260	1.68	24500
L97-128	6274 +	23.6 +	265	1.64	29211 +
L99-226	6672 +	24.1 +	276 +	1.94 +	25330
L99-233	6556 +	26.4 +	249	1.46 -	37237 +
HoCP00-950	6650 +	22.7	297 +	1.50 -	30465 +
L01-283	8258 +	28.8 +	287 +	1.47 -	39714 +
L01-299	8045 +	29.3 +	275	1.55	38559 +
L03-371	6604 +	24.2 +	272	1.70	28679
HoCP04-838	5482	21.0	261	1.55	27590

Table 27. Combined plantcane means across outfield locations from 2007 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	9705	33.6	289	2.37	28182
L99-226	9665	32.5	296	2.64 +	24943 -
L99-233	8449	31.4	270 -	1.90 -	33751 +
HoCP00-950	8994	29.7 -	304 +	1.96 -	30564
L01-283	8856	29.7 -	297	2.01 -	29272
L01-299	8973	31.5	283	2.04 -	31248 +
L03-371	9592	31.8	302 +	2.11 -	30725
HoCP04-838	9448	33.3	283	2.03 -	33240 +
Ho05-961	9276	31.9	292	2.14 -	30243

Table 28. Combined first-stubble means across outfield locations from 2008 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	8695	29.3	298	2.12	28413
L99-226	9616 +	31.0	308 +	2.39 +	26602
L99-233	7678 -	27.6	279 -	1.69 -	33091 +
HoCP00-950	7934	25.6 -	313 +	1.78 -	29316
L01-283	9128	30.2	303	1.85 -	33105 +
L03-371	8952	29.2	307 +	2.01	29062
HoCP04-838	8203	28.0	294 -	1.83 -	30977
Ho05-961	7924	26.7	298	1.92 -	28424

Table 29. Combined second-stubble means across outfield locations from 2009 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	7026	25.7	280	1.73	29924
L99-226	7828 +	27.2	292 +	2.04 +	26766
L99-233	6809	26.1	263 -	1.49 -	35166 +
HoCP00-950	6802	22.9 -	300 +	1.59 -	29490
L01-283	8184 +	28.8 +	287	1.55 -	37429 +
L03-371	7425	26.1	288	1.69	31031
HoCP04-838	7242	26.0	281	1.58 -	33245 +
Ho05-961	6780	23.5 -	290 +	1.52 -	31036

Table 30. Combined third-stubble means across outfield locations from 2010 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	5295	20.4	260	1.68	24500
L97-128	6274 +	23.6 +	265	1.64	29211 +
L99-226	6672 +	24.1 +	276	1.94 +	25330
L99-233	6556 +	26.4 +	249	1.46 -	37237 +
HoCP00-950	6650 +	22.7	297 +	1.50 -	30465 +
L01-283	8238 +	28.8 +	287 +	1.47 -	39630 +
L01-299	8045 +	29.3 +	275	1.55	38559 +
L03-371	6605 +	24.2 +	272	1.70	28634
HoCP04-838	5482	21.0	261	1.55	27590

Table 31. Combined plantcane means for Ho05-961 across outfield locations from 2009 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	9705	33.6	289	2.37	28182
L99-226	9665	32.5	296	2.64 +	24943 -
L99-233	8449	31.4	270 -	1.90 -	33751 +
HoCP00-950	8994	29.7 -	304 +	1.96 -	30564
L01-283	8856	29.7 -	297	2.01 -	29272
L01-299	8973	31.5	283	2.04 -	31248 +
L03-371	9592	31.8	302 +	2.11 -	30725
HoCP04-838	9448	33.3	283	2.03 -	33240 +
Ho05-961	9276	31.9	292	2.14 -	30243

Table 32. Combined first-stubble means for Ho05-961 across outfield locations from 2010 to 2011.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
HoCP96-540	8695	29.3	298	2.12	28413
L99-226	9616 +	31.0	308 +	2.39 +	26602
L99-233	7678 -	27.6	279 -	1.69 -	33091 +
HoCP00-950	7934	25.6 -	313 +	1.78 -	29316
L01-283	9128	30.2	303	1.85 -	33105 +
L03-371	8952	29.2	307 +	2.01	29062
HoCP04-838	8203	28.0	294	1.83 -	30977
Ho05-961	7924	26.7	298	1.92 -	28424

SUCROSE LABORATORY AT THE SUGAR RESEARCH STATION

Gert Hawkins, Michael Pontif and Collins Kimbeng
Sugar Research Station

The Sugar Research Station sucrose laboratory processed 2,758 samples during the 2011 harvest season (Table 1). Standard laboratory procedures were used to analyze 88 samples of which 72 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). The juice was extracted via a three-roller mill for 16 samples. Sucrose percent and theoretical recoverable sugar (lbs/ton of cane) was calculated based on the Brix and pol values. In addition 133 samples including 13 sweet sorghum samples and 120 energy cane samples were analyzed for brix only. The juice was extracted via a three-roller mill. The sucrose laboratory processed samples from August 2011 to December 2011.

A total of 2,537 samples were analyzed using the Spectracane FT-NIR instrument. 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 2011 harvest season.

Unit/Project Area	Leader	Number of Samples
School of Plant, Environmental, and Soil Sciences	James Griffin	16
	Magdi Selim	6
	Brenda Tubana	629
	Jim Wang	12
Iberia Research Station	Sonny Viator	30
Plant Pathology and Crop Physiology	Jeff Hoy	309
Entomology	Gene Reagan	21
LCES	Albert Orgeron	478
LCES (Energy Cane)	Kenneth Gravois	140
LCES (Sugarcane)	Kenneth Gravois	16
Sugar Research Station/Variety Development	Line Trials	408
	Increase	104
	Nursery	345
	Genetics	195
Contract Services		36
Entomology (Sweet Sorghum)	Gene Reagan	13
TOTAL		2758

LAES SUGARCANE TISSUE CULTURE LABORATORY

Q.J.Xie[1], J.L Flynn[1], and K.A.Gravois[2]
[1]Certis USA, LLC and [2]Sugar Research Station

During the 2011-2012 production season, about 29,000 sugarcane plantlets regenerated in the Louisiana Agricultural Experiment Station Sugarcane Tissue Culture Laboratory, were turned over to Certis USA, LLC, Kleentek Div., for transplanting into the greenhouse at Houma. The number of plantlets transplanted for each cultivar are listed in Table one.

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

Cultivar	Number of plantlets
HoCP 96-540	5,256
L 03-371	4,320
HoCP 00-950	4,320
L 99-226	5,314
L 01-299	5,472
Ho 05-961	2,628
HoCP 85-845	1,998
TOTAL	29,308

THE 2011 LOUISIANA SUGARCANE VARIETY SURVEY

Kenneth A. Gravois[1] and Benjamin L. Legendre[2]
[1] Sugar Research Station, [2] Audubon Sugar Institute

Each year a sugarcane variety survey is conducted by the county agents in the 23 sugarcane-growing parishes of Louisiana to determine the variety makeup and distribution across the state. There were no parish survey reports from Acadia, Calcasieu, Cameron, Evangeline, Jeff Davis, or St. Landry Parishes. The information presented in this survey was summarized from 17 individual parish reports. According to USDA-FSA, there were 407,613 acres planted to sugarcane in Louisiana in 2011. This survey was based on 96.9 percent of the acres reported by USDA-FAS.

Agents in each sugarcane-producing parish collected acreage according to variety and crop. Twelve sugarcane varieties, LCP 85-384, HoCP 85-845, Ho 95-988, HoCP 96-540, L 97-128, L 99-226, L 99-233, HoCP 00-950, L 01-283, L 01-299, L 03-371, and HoCP 04-838 were listed along with "Others" in the survey. The category of others included, but was not limited to, small acreages of CP 70-321, CP 89-2143, HoCP 91-555 and small increase acreages devoted to the experimental variety Ho 05-961, which was grown on primary and secondary seed-increase stations. The crop was divided into four categories, which included plant-cane, first-stubble, second-stubble and third-stubble and older crops. Additional information regarding parish acreage was collected as needed from the local and state Farm Service Agency (FSA) offices.

Total State and Regional Acreage. Actual area surveyed for each parish, region and the statewide total are shown in Table 1. Statewide, the area planted to sugarcane in 2011 was 407,613 acres according to state USDA-FSA records. A total of 401,213 acres comprised the sample for the 2011 variety survey. According to the LSU AgCenter's Ag Summary, sugarcane was grown on less acreage than the 2009 and 2010 crops. An estimated 381,118 acres were available for harvest for sugar, assuming 6.5% of the total acres were used for seed-cane.

The total sugarcane acreage was highest for the River-Bayou region (166,928 acres); followed by the Teche region (164,086 acres); then the Northern region at 70,199 acres. It is interesting to note the increase in sugarcane acreage in Pointe Coupee parish. In 2000, the parish produced sugarcane on 25,479 acres. In 2011, sugarcane was grown on 38,476 acres, making Pointe Coupee the third largest sugarcane producing parish in Louisiana.

Sugarcane Distribution by Variety and Crop. The estimated statewide sugarcane acreage in percent by variety and crop is shown in Table 2. The leading variety for 2011 was HoCP 96-540, which occupied 43% of the Louisiana sugarcane acreage. This was five percentage points less than HoCP 96-540's acreage in 2010 (Gravois and Legendre, 2011). L 99-226 was next in total acreage as it was planted on 19% of the state's acreage. The varieties planted in the next largest areas were L 99-233, L 01-283, L 97-128, HoCP 00-950, and L 01-299 with 11%, 8%, 6%, 6%, and 3%, respectively. All other varieties in the survey had each 1% or less of the planted area for 2011. LCP 85-384, released to the industry in 1993, continued to decrease in acreage as it occupied less than 1% of the Louisiana acreage in 2011. LCP 85-384 attained peak acreage in 2004 when it was grown on 91% of the state's acreage.

Sugarcane Distribution by Region and Crop. In 2011, 13.7% of the state's acreage was grown as third and older stubble crops, which was 0.1 percentage point lower than 2010 (Table 3). In 2011, many growers continued to keep some acreage devoted to older stubble cane in an effort to take advantage of higher than normal sugar prices; however since this was done in the two previous years, more sugarcane was planted in 2011. In 2011, 31.0% of the state's acreage was in the plant-cane crop, with lower percentages in the first and second stubble crops, 29.4 and 25.9%, respectively. In the era of LCP 85-384, the acreage in second and older stubble was typically over 50% of the total acreage; now it is only 39.6%.

During the era when LCP 85-384 was the leading sugarcane variety grown in Louisiana, there was a trend to plant less cane each year and keep more acres in older stubble crops due to the superior stubbling ability of LCP 85-384 (Table 4). As HoCP 96-540 replaced acreage planted to LCP 85-384 that trend changed as growers kept less acreage devoted to second-, third- and older stubble-crops.

For the current survey, the Northern region had the greatest percentage of third and older stubble crops, but the variation between regions was not great (Table 3). The percentage in plant cane increased from 29.1% in 2010 to 31.0% in 2011; in first stubble the percentage increased from 29.0% to 29.4% from 2010 to 2011; second stubble area decreased from 28.0% in 2010 to 25.9% in 2011. Crop rotations in all areas of the state were similar, except for the increase in plant-cane acres in the northern region that reflects a slight sugarcane expansion in this area.

Sugarcane Distribution by Variety and Crop for the Three Regions. HoCP 96-540 continued as the leading variety in all crops (plant-cane through third and older stubble crops) for all regions in 2011 (Tables 5-7). HoCP 96-540 led the way in planted acreage with 38%, 38%, and 43% of the plant-cane crop in the Bayou Teche, River-Bayou Lafourche and Northern regions, respectively. The percentages for L 99-226 increased in the plant-cane crop for the three regions as it was planted at 22, 13, and 12%, respectively, in the three regions. The popularity of HoCP 91-555, Ho 95-988, and L 97-128 decreased as growers discontinued planting of these older varieties. It is interesting to note that there is some renewed interest in

HoCP 85-845 and LCP 85-384, more so in certain areas along the Mississippi River and Bayou Lafourche. The brown rust problems in early 2012 should curtail further interest in LCP 85-384.

L 99-233 was planted more widely by growers in the River-Bayou Lafourche region, mainly for its ability to stubble in heavy clay soils. This variety was only planted on 8% of the Teche and Northern growing regions, but occupied 15% of the River-Bayou Lafourche region. Growers in the Bayou Teche region increased the planting of L 99-226 more so than its expansion in other growing regions. HoCP 00-950 was more widely planted in the Northern region compared to the more southerly growing regions. This variety is more suited to the better drained sandier soils in the northern region, plus growers like the early maturity of the variety.

Variety Trends. Since its peak acreage of 91% in 2004, the total acreage planted to LCP 85-384 decreased from the previous year (Table 8). In 2011, LCP 85-384 was planted on less than 1% of the states sugarcane acreage.

HoCP 96-540, released for commercial planting in 2003, now occupies 43% of the state's acreage, which is a decrease of 5 percentage points between 2010 and 2011. This variety performed well in the droughty conditions of 2011, and the reduced brown rust levels in the state in 2011 helped. However, rust has been rampant in HoCP 56-540 in early 2012, primarily in early planted and seed-cane fields. That may be a "shot across the bow" for HoCP 96-540, and growers will likely plant less acreage in 2012.

L 97-128 has served its purpose and acreage devoted to the variety has decreased to 6% of the Louisiana acreage in 2011. Ho 95-988 is also decreasing in acreage and was grown on only 1% of the acreage.

L 99-226 increased in acreage by 2 points, with a larger increase in the Bayou Tech growing region. The stubbling ability of L 99-226 allows the variety withstand tough harvesting conditions and some of the more recent cold winters and springs. It good field yields and excellent sugar recoveries in the factories continued in 2011. L 99-226 is susceptible to brown rust and can have low levels of smut. L 99-226 exhibits an added attribute of having some resistance to the sugarcane borer. The acreage of L 99-226 is likely increase again for the 2012 crop.

Many growers continued to plant L 99-233 in their heavy land because of excellent stubbling ability, and this trend was much more evident in the River-Bayou Lafourche growing region. For the 2011 harvest, field yields of L 99-233 were not as good as the plant growth indicated, and the drought of 2011 took its toll on the variety, especially with respect to tillering. L 99-233 does respond to ripeners as well as HoCP 96-540, and as expected its sugar recoveries were not as high as other varieties. L 99-233 is resistant to brown rust and a little more susceptible to smut than L 99-226. Both L 99-226 and L 99-233 show rapid deterioration after

subfreezing conditions and are classified as susceptible.

HoCP 00-950 was released for commercial planting in 2007 and its increase has been slow (6% of the acreage). This variety has high sugar per ton of cane and is considered one of the earliest maturing varieties released for commercial planting in Louisiana. The height of HoCP 00-950 at planting worries many growers, but when harvest arrives, the field yields are good and factory sugar recoveries excellent, even in the absence of a ripener. Others have noted that the variety does not grow as well in poorly drained areas and seems better suited to the sandier soils in the sugar belt. Growers should be cautious with HoCP 00-950 because there were a large percentage of broken tops after Hurricane Gustav.

L 01-283 was released for commercial planting in 2008 with great expectations and it was the variety with the largest increase in acreage from the previous year (+4 percentage point increase from 2010). It has good yield of tons cane per acre and sugar per ton of cane. L 01-283 is early maturing and is generally erect and well suited to both whole-stalk and combine harvesting systems. It is generally resistant to all major diseases affecting sugarcane with the exception of ratoon stunting disease and some susceptibility to brown rust. Naturally occurring, environmentally induced off-types have been increasing in L 01-283. Growers are cautioned to watch the variety closely before making too rapid of an expansion.

L 01-299 was grown on 3% of the state's acreage. This variety was released in 2009 after superior sugar yields were obtained in second and third stubble outfield tests. The variety had been dropped from active testing due to high levels of smut in the inoculated disease trials. Visual observation of L 01-299 in the field indicated lesser amounts of smut, and it was deemed a worthwhile risk to release the variety. The variety should be isolated from L 97-128 and L 99-233 in order to keep smut levels down. It is also wise to obtain healthy seed-cane of L 01-299 from one of the tissue culture seed-cane companies. L01-299 was widely planted in 2011 where adequate seed-cane was available. This variety will likely be widely planted again in 2012.

L 03-371, released in 2010, was modestly expanded in the industry during the 2011 planting season. Outfield testing indicated the variety to have excellent sugar and cane yields (Waguespack et al., 2011) to accompany a good disease package. The new variety will continue to be expanded more widely in 2012.

The most recent sugarcane variety release was HoCP 04-838 in 2011. Seed-cane was distributed by the American Sugar Cane League. This new variety has very good sugar and cane yield potential, with its most notable attribute being cold tolerance. HoCP 04-838 will be expanded more widely in 2012.

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). A similar scenario may be taking place now with HoCP 96-540. The fortunate aspect this time is the fact that HoCP 96-540 has been 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 and will make its replacement and easier task compared to the experience with LCP 85-384. With the release of 11 new sugarcane varieties since 2003, growers are encouraged to plant a more balanced mix of varieties.

ACKNOWLEDGMENTS

We acknowledge the assistance of the county agents for conducting the sugarcane variety survey in their parishes. We also want to thank the sugarcane growers and/or their consultants who took the time and effort to respond to the survey from their agents. We would also like to acknowledge the assistance of the various 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, 2011.[12]

Bayou Teche		River-Bayou Lafourche		Northern	
Parish	**Acres**	**Parish**	**Acres**	**Parish**	**Acres**
Acadia	NAR	Ascension	18,168	Avoyelles	7,924
				Evangeline	NAR
Calcasieu	NAR	Assumption	40,391	Pointe Coupee	38,476
Cameron	NAR				
Iberia	54,215	Iberville	34,653	Rapides	9,871
Jeff Davis	NAR	Lafourche	28,406	St. Landry	NAR
Lafayette	11,668	St. Charles	1,276	West Baton Rouge	13,928
St. Martin	26,662	St. James	27,798		
St. Mary	42,107	St. John	7,002		
Vermilion	29,435	Terrebonne	9,234		
Total	164,086	Total	166,928	Total	70,199

Total all regions: 401,153

[1] Acreage based on information obtained in variety surveys from 17 parishes by the county agents in 2011

[2] NAR = No acres reported

Table 2. Estimated statewide sugarcane acreage percentage by variety and crop, all regions, 2011.[1]

Variety	Plant-cane	First-stubble	Second-stubble	Third-stubble and older	Total
	----------%----------				
LCP 85-384	<1	<1	<1	2	<1
HoCP 85-845	<1	<1	1	2	1
Ho 95-988	<1	<1	1	4	1
HoCP 96-540	39	41	46	49	43
L 97-128	2	3	8	17	11
L 99-226	16	21	22	17	17
L 99-233	12	14	11	5	10
HoCP 00-950	7	7	5	1	6
L 01-283	15	9	3	<1	8
L 01-299	6	2	1	<1	3
L 03-371	1	<1	<1	0	1
HoCP 04-838	<1	<1	0	0	<1
Other	<1	1	1	2	1
Total acres	124,381	117,916	104,073	54,842	401,213
Percent of total crop	31.0	29.4	25.9	13.7	

[1] Based on information obtained in variety surveys from 17 parishes by county agents in 2011.

Table 3. Estimated sugarcane distribution by region and crop, 2011.[1]

Crop	Bayou Teche	River-Bayou Lafourche	Northern	State Total
Plant-cane Area (acres) Percent (%)	49,632 30.2	52,160 31.2	22,590 32.2	124,381 31.0
First-stubble Area (acres) Percent (%)	48,777 29.7	49,375 29.6	19,765 28.2	117,916 29.4
Second-stubble Area (acres) Percent (%)	45,276 27.6	41,627 24.9	17,170 24.5	104,074 25.9
Third-stubble and older Area (acres) Percent (%)	20,402 12.4	23,766 14.2	10,674 15.2	54,842 13.7
Total area (acres) Percent (%)	164,086 43.8	166,928 40.0	70,199 16.2	401,213

[1] Based on information obtained in variety surveys from 17 parishes by county agents in 2011.

Table 4. Percent of the Louisiana sugarcane crop in third-stubble and older crops from 2003 – 2011.

Year	Third Stubble & Older Crops (%)	LCP 85-384 (%)	HoCP 96-540 (%)
2003	26.9	88	-
2004	22.7	91	1
2005	20.0	89	3
2006	16.7	73	14
2007	11.1	46	31
2008	10.0	22	44
2009	10.8	6	50
2010	13.8	1	48
2011	13.7	<1	43

Table 5. Estimated area planted to sugarcane in percent by variety and crop for the Bayou Teche region, 2011.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	0	0	0	<1	<1
HoCP 85-845	<1	<1	<1	<1	<1
Ho 95-988	<1	<1	1	4	1
HoCP 96-540	38	39	44	46	41
L 97-128	2	4	9	20	7
L 99-226	22	28	25	17	24
L 99-233	10	10	8	4	8
HoCP 00-950	8	8	4	1	6
L 01-283	9	9	4	<1	7
L 01-299	7	1	1	<1	3
L 03-371	2	<1	<1	0	<1
HoCP 04-838	<1	<1	<1	0	<1
Others	<1	<1	<1	<1	<1
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 5 parishes by county agents in 2011.

Table 6. Estimated area planted to sugarcane in percent by variety and crop for the River/Bayou Lafourche region, 2011.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	<1	<1	<1	4	1
HoCP 85-845	<1	<1	<1	1	<1
Ho 95-988	<1	1	1	4	1
HoCP 96-540	38	43	46	49	43
L 97-128	2	4	9	16	6
L 99-226	13	17	20	16	16
L 99-233	17	19	14	6	15
HoCP 00-950	4	4	7	1	4
L 01-283	18	8	2	1	9
L 01-299	6	2	1	<1	3
L 03-371	1	<1	<1	0	<1
HoCP 04-838	<1	<1	0	0	<1
Others	<1	1	1	2	1
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 8 parishes by county agents in 2011.

Table 7. Estimated area planted to sugarcane in percent by variety and crop for the Northern region, 2011[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	<1	0	0	0	<1
HoCP 85-845	0	0	0	0	0
Ho 95-988	<1	1	1	4	1
HoCP 96-540	43	45	55	53	48
L 97-128	<1	1	3	15	4
L 99-226	12	15	20	18	16
L 99-233	6	11	9	7	8
HoCP 00-950	12	13	8	2	10
L 01-283	21	11	3	1	11
L 01-299	4	2	<1	<1	2
L 03-371	1	<1	<1	0	<1
HoCP 04-838	<1	<1	0	0	<1
Others	<1	<1	<1	<1	<1
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 4 parishes by county agents in 2011.

Table 8. Louisiana sugarcane variety trends, by variety and years, all regions, 2007- 2011[1]

	Area planted to sugarcane by variety and years (%)					
Variety	**2007**	**2008**	**2009**	**2010**	**2011**	**1 yr. Change**
LCP 85-384	46	22	6	1	<1	-1
HoCP 85-845	2	1	<1	1	1	0
Ho 95-988	4	5	5	2	1	-1
HoCP 96-540	31	44	50	48	43	-5
L 97-128	12	17	17	11	6	-5
L 99-226	1	5	11	17	19	+2
L 99-233	<1	2	6	10	11	+1
HoCP 00-950	0	1	2	4	6	+2
L 01-283	0	0	<1	4	8	+4
L 01-299	0	0	<1	1	3	+2
L 03-371	0	0	0	<1	1	+1
Others	1	1	2	1	<1	-1
Totals	100	100	100	100	100	

[1] Based on annual variety surveys from 17 parishes by county agents, 2007-2011.

THE EFFECT OF NATURALLY OCCURRING OFF-TYPES ON SUGAR YIELD AND YIELD COMPONENTS IN L 01-283 – First Stubble Crop

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Yield Trial II was planted on August 24, 2009 at the Sugar Research Station at St. Gabriel, Louisiana. Off-type seed-cane was collected from the farm of Jim and Ross Harper in Cheneyville, Louisiana. Normal stalks were collected from the Sugar Research Station. Three-stalk planting rates were used that ranged from all normal stalks to mixtures of stalk types, to all off-type stalks. For the fungicide treatments, stalks were dipped for 20 minutes in a solution that contained Stratego (trifloxystrobin & propiconzole) (20 oz./acre) and Quadris (azoxystrobin) (10 oz./acre). The trial was planted as a randomized complete block design (three replications). Plot dimensions were two rows (six foot) that were 25 feet long and separated by a five foot alley. Treatments were as follows:

Treatment	Number of Normal Stalks:Off-Type Stalks	Fungicide
1	3:0	NO
2	2:1	NO
3	1:2	NO
4	0:3	NO
5	0:3	YES
6	3:0	YES

Standard cultural practices were followed during the 2011 growing seasons. Millable stalk counts were made in early August and used to estimate stalk population (#/acre). In addition, off-types were assessed on August 9, 2011. Plots were combine-harvested and weighed to determine cane yield (tons/acre), which was done on November 15, 2011. A 15-stalk sample was hand-cut out of each plot and weighed to determine stalk weight (lbs). Afterwards, all 15 stalks were visually analyzed for the presence or absence of off-type characteristics. Seven stalks were measured with a caliper to determine stalk diameter (mm), and height of each stalk was measured (cm). Each sample was then sent to the laboratory to determine sucrose content and fiber content via NIR technology (SpectraCane). Sugar per acre was estimated as the product of sucrose content and cane yield.

Data were analyzed with SAS (v9) software. Replication was considered a random effect; stalk type was considered a fixed effect. To adjust for any missing or unbalanced data, least square means were estimated. Least square means were tested for statistical significance (P=0.05) with the PDIFF option of PROC MIXED.

Table 1. First stubble data obtained from a field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2011†.

Treatment	Sugar Yield	Cane Yield	Sugar Content	Stalk Population	Stalk Weight	Diameter	Fiber
	lbs/ac	tons/ac	lbs/ac	#/acre	lbs	mm	%
3 Normal: 0 Off-Type	8463 A	31.7 A	268 A	33942 B	1.89 A	20.6 A	10.8 A
2 Normal: 1 Off-Type	8793 A	33.2 A	266 A	36856 A	1.80 A	20.0 A	11.1 A
1Normal: 2 Off-Type	7991 A	29.7 A	268 A	33804 A	1.79 B	20.3 B	11.0 A
0 Normal: 3 Off-Type	7898 A	29.7 A	266 A	32603 A	1.88 AB	20.2 A	10.7 A
All OT – Fungicide	7980 A	30.2 A	265 A	30596 A	1.98 A	20.8 A	10.8 A
All OT – No Fungicide	7898 A	29.7 A	266 A	32603 A	1.88 A	20.2 A	10.7 A

† Means followed by the same letter are not significantly different from each other.

Table 2. First stubble data obtained from a field trial conducted at the Sugar Research Station in St. Gabriel, Louisiana in 2011†.

Treatment	Height		Off-Type July		Off-Type December	
	cm		%		%	
3 Normal: 0 Off-Type	239	A	9.4	A	17.8	A
2 Normal: 1 Off-Type	237	A	15.0	A	34.3	A
1Normal: 2 Off-Type	218	A	27.9	A	48.9	A
0 Normal: 3 Off-Type	219	A	34.2	A	68.3	A
All OT – Fungicide	231	A	30.4	A	37.8	A
All OT – No Fungicide	219	A	34.2	A	68.3	A

† Means followed by the same letter are not significantly different from each other.

YIELD AND FIBER CONTENT OF HIGH-FIBER SUGARCANE CLONES

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

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

Standard cultural practices were followed during the 2009, 2010, and 2011 growing seasons. The field trial was harvested on December 16, 2009 for the plant-cane crop; December 2, 2010 for the first stubble crop; December 15, 2011 for the second stubble crop. Plots were combine-harvested and weighed to determine cane yield (tons/acre). A 10-stalk sample was hand-cut out of each plot for a quality analysis. Each sample was then sent to the laboratory to determine Brix by refractometer and fiber content was determined by the pre-breaker press method.

Data were analyzed with SAS (v9.2) software. Replication was considered a random effect; variety was considered a fixed effect. Least square means were estimated and tested for statistical significance (P=0.05) with the PDIFF option of PROC MIXED.

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

Variety	Cane Yield	Brix	Fiber Content	Dry Weight	Brix Weight
	tons/ac	%	%	tons/ac	tons/ac
Ho 02-144	30.5 B	12.5 A	20.6 B	6.27 C	3.86 AB
Ho 02-147	44.2 A	10.7 B	17.8 C	7.87 AB	4.72 A
Ho 06-9001	28.9 B	10.7 B	26.4 A	7.58 ABC	3.10 BC
Ho 06-9002	25.5 B	10.1 BC	25.3 A	6.44 BC	2.56 C
HoCP 72-114	42.8 A	9.2 C	20.7 B	8.84 A	3.96 AB

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

Variety	Cane Yield	Brix	Fiber Content	Dry Weight	Moisture Content
	tons/ac	%	%	tons/ac	%
Ho 02-144	25.0 C	16.6 A	25.9 B	6.49 D	61.8 C
Ho 02-147	47.0 A	16.9 A	19.5 D	9.15 A	66.9 A
Ho 06-9001	26.0 C	14.1 C	29.7 A	7.70 BC	60.4 D
Ho 06-9002	24.4 C	14.5 BC	29.6 A	7.22 CD	60.2 D
HoCP 72-114	35.8 B	15.1 B	24.0 C	8.58 AB	64.5 B

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

Variety	Cane Yield		Brix		Fiber Content		Dry Weight		Moisture Content	
	tons/ac		%		%		tons/ac		%	
Ho 02-144	55.3	A	15.6	A	23.6	B	13.0	B	64.5	BC
Ho 02-147	72.4	B	16.0	A	18.4	D	13.2	AB	68.6	A
Ho 06-9001	57.2	A	13.5	BC	28.7	A	16.4	A	61.7	C
Ho 06-9002	50.7	A	12.8	C	28.3	A	14.4	AB	62.6	C
HoCP 72-114	57.1	A	14.4	B	22.6	C	12.9	B	66.2	AB

GENETIC DIVERSITY AND *SACCHARUM SPONTANEUM* LINEAGE OF THE LOUISIANA SUGARCANE CULTIVARS AND BREEDING POOL

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Introduction

The genus *Saccharum* L. consists of four cultivated species, *S. officinarum* L., *S. barberi* Jeswiet, *S. sinense* Roxb. Amend. Jeswiet, and *S. edule* Hassk., along with two wild species, *S. spontaneum* L. and *S. robustum* Brandes & Jeswiet ex Grassl (Purseglove, 1979). *Saccharum officinarum*, which accumulates high concentration of sucrose in the stem, presumably evolved from the sweet forms of *S. robustum* (Daniels and Roach, 1987). *Saccharum barberi* and *S. sinense* are believed to be interspecific hybrids of *S. officinarum* and *S. spontaneum* (Lu et al., 1994) or intergeneric hybrids resulting from interbreeding of *S. officinarum* with other genera within the *Saccharum* complex (Daniels and Roach, 1987). *Saccharum spontaneum*, a very atypical member of the genus distinguished by its thinner canes and narrow inflorescence, is genetically diverse and exists in a wide range of habitats in the tropics and in temperate regions (Panje and Babu, 1960; Tai and Miller, 2001).

In the early 1900s, breeders in Indonesia and India made crosses among a few clones of *S. officinarum*, *S. sinense*, *S. barberi*, and *S. spontaneum*, which provided the genetic base of sugarcane breeding worldwide (Stevenson, 1965). Hence, modern sugarcane cultivars are complex interspecific hybrids with varying levels of aneuploidy and somatic chromosome numbers ranging from about 100 to 130 (Sreenivasan et al., 1987; Burner and Legendre, 1994). Because hybridization has been focused between *S. officinarum* and *S. spontaneum*, hybrid cultivars are mostly descended from these two species (Roach, 1978; Bull & Glasziou, 1979). Repeated backcrossing to *S. officinarum* for introgression of desirable traits associated with sugar production resulted in hybrids having *S. officinarum* in a greater portion of their genome (Sreenivasan et al., 1987). Molecular marker and genomic *in-situ* hybridization studies suggested that about 80-85% and 10-20% of their nuclear genome constitution is contributed by *S. officinarum* and *S. spontaneum*, respectively; 5-11% consists of recombinant chromosomes (D'Hont et al., 1996; Hoarau et al., 2001; Cuadrado et al., 2004; Reffay et al., 2005).

Sugarcane is considered genetically well buffered due to high polyploidy and heterozygosity (Schultz-Scaeffer, 1980); concerns, however, were raised over the relatively narrow genetic base of the breeding programs worldwide (Deren, 1995). To expand the genetic base of Louisiana commercial sugarcane germplasm, wide hybridization was made as an important component of the basic breeding program of USDA-ARS Sugarcane Research Unit at Houma, LA (Dunckelman and Breaux, 1972). Genes for greater ratooning ability and resistance to biotic and abiotic stresses are introgressed into cultivars from related genera and from wild species of *Saccharum*. A notable outcome of the base-broadening program was the successful transfer of

resistance to sugarcane mosaic virus from the *S. spontaneum* clone US56-15-8 to the Louisiana commercial sugarcane cultivars LCP85-384 and HoCP85-845 (Milligan et al., 1994; Legendre et al., 1994).
The present study was undertaken with an objective to determine the genetic composition of Louisiana commercial hybrids and the contribution of the progenitor species to their allelic constitution. To this end, genetic diversity was assessed among forty-eight sugarcane hybrids from the Louisiana commercial breeding program alongside selected clones of *S. officinarum* and *S. spontaneum* using simple sequence repeats (SSRs or microsatellite).

Materials and Methods

Sixty-four clones including 48 sugarcane hybrids, two clones of *S. officinarum*, and 14 clones of *S. spontaneum* (Table 1), were included for genetic fingerprinting. The hybrids US01-040 and US79-010 are experimental lines, and N27, Nco310, and TucCP77-42 are foreign commercial cultivars that are used in sugarcane breeding at Louisiana. Forteen clones of *S. spontaneum* represented seven clusters identified in a previous AFLP-based study involving 51 *S. spontaneum* accessions (Andru, 2009). The *S. spontaneum* SES147B is a progenitor of TucCP77-42 and HoCP05-961, while US56-15-8 is a progenitor of 27 cultivars (Table 1, 2). Fifty-two pairs of SSR primers (Cordeiro et al., 2000), which included eleven cold-responsive expressed sequence tag (EST)-derived SSRs (Bernaola, 2012) were used for polymerase chain reaction (PCR). Forward primers were end-labeled with IRDye 700 or IRDye 800. was carried out in 10 µL volume of mixture containing 1X reaction buffer, 3.25 mM $MgCl_2$, 0.05 unit of DNA Polymerase, 300 µM of dNTP Mix, 0.075 µM each of forward and reverse primer, and 5 ng of genomic DNA as the template. Thermal profile was as follows: (i) 95°C for 5 min; (ii) 95°C for 45 sec, 58°C for 45 sec, 72°C for 1 min, for 36 cycles; (iii) 72°C for 5 min. Amplification products were electrophoresed in 6.5% KB^{Plus} Gel Matrix on the 4300 DNA Analyzer (Li-Cor Biosciences, Lincoln, NE). Genotype data were manually scored in a binary matrix format from digital images of gels. A band on the gel was scored as "1" for its presence (dominant) regardless of the intensity or allele dosage, and "0" for absence (null). Polymorphism information content (PIC) of each SSR marker was calculated using the formula, $PIC = 1 - \Sigma fi2$, where fi is the frequency of the ith allele (Weir, 1990). Genetic similarity among 64 clones, and subsequent clustering were estimated using SIMQUAL and UPGMA modules, respectively within NTSYSpc v2.2. A 3-dimensional plot was also constructed through principal coordinates analysis (PCoA) using the *eigen* module in NTSYS. Variance components attributed to the differences among and within major clusters of genotypes were determined from analysis of molecular variance (AMOVA; Excoffier and Lischer, 2010). The robustness of the clusters was tested by bootstrap analysis with 1,000 iterations using DBOOT (Coelho, 2000).

Results and Discussion

Polymorphism at Microsatellite Loci

A total of 1,601 alleles at 52 microsatellite loci (41 genomic and 11 EST-SSRs) were collectively identified in 64 clones consisting of 48 hybrid cultivars of sugarcane (1120 alleles), two clones of *S. officinarum*, and 14 clones of *S. spontaneum* (1228 alleles). The number of amplified fragments varied largely with SSR marker and ranged from two to over a hundred, with fragment size from 80 to 360 bp. A higher number of fragments could denote multicopy SSR markers that amplified alleles at more than one specific region of each genome. The average polymorphism information content (PIC) of the SSR markers was 0.200 with a range from 0.079 to 0.433.

Lower PIC values were attributable to major and monomorphic alleles that were present in most and in all genotypes, respectively, as well as to rare alleles that were present in very few genotypes. Although most of the sugarcane SSR markers detected several alleles, many markers had less than midpoint PIC values, which was mainly due to the prevalence of rare alleles among the cultivars and among the *S. spontaneum* clones.

A large number of SSR fragments identified in the sugarcane cultivars were rare alleles, which were almost evenly distributed among the cultivars. Of the 1,120 alleles detected, 195, 141, 97, and 89 alleles were present in only one, two, three, and four cultivars, respectively (Fig. 1a). Thus, 46.6% of the alleles, including 63 alleles at EST-SSR loci, had low frequencies (2.1-8.3%) in the cultivars analyzed. A larger number of rare alleles were identified in the *S. spontaneum* where 490 out of 1,228 alleles were present in only one clone (Fig. 1b). This corroborated the complex origin of the sugarcane genome and suggested that valuable genes from specific progenitors could be present in a few related sugarcane hybrids. In the context of a germplasm, a multitude of rare alleles constitute an inconspicuous genetic resource for breeders that can be addressed through allele mining strategies. For instance, EST-SSRs, which are known to have high transferability across plant taxa, can be examined for their association with important traits among sugarcane cultivars, experimental lines, and the progenitor species.

Total number of alleles in a sugarcane cultivar ranged from 237 in CP52-068 to 332 in LCP81-010 (Table 3). The cultivars were grouped according to decade of establishment and decade averages and ranges were compared. Cultivars developed during the 1970s had less number of alleles than those developed in subsequent decades, whereas decade means for the 1980s, 1990s, and 2000s were not significantly different. This was supported by the Benferroni t test ($P < 0.0001$). The seven cultivars representing the 1970s are not fully related but they have parentage in common with some cultivars established in the following decades. For example, CP52-068, CP65-357, and CP61-037 are either parents or grandparents of some cultivars representing the 1970s through 2000s. Moreover, CP72-370, CP77-407, CP79-318, and CP79-348 are either parents or grandparents of some cultivars representing the 1980s through 2000s. Aneuploidy lowered the allele count in some cultivars and thus may have canceled out when decade means were compared. The obvious increase in cultivar heterozygosity (presence of different alleles at homologous SSR loci located in different chromosome fragments) during the 1980s could be attributed to the base-broadening program that was actively initiated in 1965 (Dunckelman and Breaux, 1972). This resulted in an influx of new alleles into the Louisiana commercial sugarcane germplasm where hybrids with *S. spontaneum* and *S. robustum* ancestry, as well as intergeneric hybrids and lines having parentage of foreign commercial sugarcane varieties were created. Many backcross generation cultivars that were developed subsequently are derivatives of such hybrids; a classic example is the introgression of US56-15-8 (Table 2) which led to the development of several commercial clones that were included in this study. Aside from being highly duplicated, the genomes of interspecific sugarcane hybrids are known to maintain the genomes of progenitor species separately.

The heterozygosity of a cultivar would depend on its ancestry and on the selection which favors only a few segregants from a cross. Relative allele counts based on randomly sampled genotype data cannot be readily associated with one particular unique or wild parent. However, early hybrids such as F_1 and BC_1 derivatives would have larger number of the unique alleles than would later backcross generation derivatives have. The three foreign commercial sugarcane cultivars N27, Nco310, and TucCP77-42 had high allele counts of 302, 316, and 298, respectively (Table 3). The cultivar TucCP77-42 has CP parentage and is a grand-offspring of CP52-068, as it was produced from a cross made by USDA-ARS breeders in 1975 although the

selection was made in Tucuman, Argentina where it was commercially released in 1989 (Mariotti et al., 1991). TucCP77-42 is a BC_1 derivative of SES147B, which accounted for the larger number of unique alleles in TucCP77-42 compared with those in the seven Louisiana cultivars established in the 1970s. The South African cultivars N27 and NCo310 are closely related to the hybrid founders of sugarcane breeding. NCo310 is a maternal grandparent of N27, and its parentage includes Co421, POJ2878, Co285, Co312, Co213, and Co244. Co285 is a progeny of Indian *S. spontaneum*, Co213 is a progeny of the *S. barberi* clone Kansar and a grand-offspring of the *S. barberi* clone Chunnee, and Co244 is a grand-offspring of Chunnee and Indian *S. spontaneum*. Co331, the other maternal grandparent of N27, is a progeny of Co213 and Co214, the latter being a grand-offspring of *S. barberi* and Indian *S. spontaneum*. This explains the high non-*S. officinarum* allele counts in NCo310 and N27. Interestingly, CP52-068, which had the lowest count of 237 alleles among the cultivars analyzed, is also closely related to the hybrid founders. Its parentage includes CP38-034, Co421, CP27-156, Co281, CP29-320, and CP27-034 (the last two clones are great grand-offsprings of a few foundation clones of sugarcane breeding). CP52-068 was commercially released in 1958 and has been frequently used as a parent in the Louisiana breeding program. Besides being a progeny of advanced commercial clones, it must have passed through a stringent selection process especially for sugar traits that selected out many alleles. Therefore, varying selection parameters among different breeding programs are a major factor that determines allele frequencies and heterozygosity in the commercial sugarcane cultivars.

Common and Genotype-specific Alleles

Variation in total number of alleles among the 64 clones corresponded with the range of chromosome numbers reported in each class of genotypes: 237-332 alleles were detected in a sugarcane cultivar ($2n$ = 100-130), 190 and 228 alleles in La Stripe and Badila, respectively (*S. officinarum*, $2n$ = 80), and 189-360 alleles in an *S. spontaneum* ($2n$ = 40-128). The difference between La Stripe and Badila shows allele count may vary largely between clones with same chromosome number. The distribution of 1,601alleles among the three classes of genotypes was indicative of shared ancestry and genetic relationships based on the breeding history of the modern sugarcane cultivars (Fig. 2). A total of 199 alleles were detected in all three genotypes denoting their common lineage. As expected, *S. officinarum* and the sugarcane cultivars shared two hundred and fifty alleles of which 21.2 % were present in only 1-4 cultivars (rare alleles); 55 alleles were monomorphic among the cultivars. As the recurrent parent, substantial genomic composition of *S. officinarum*, both nuclear and cytoplasmic, had been tapped in the development of hybrid cultivars. On the other hand, a large number (454) of unique alleles in *S. spontaneum* suggested an abundant allelic diversity that can be further exploited for genetic enrichment of cultivated sugarcane. An equally large number of *S. spontaneum* alleles (557) were detected in the cultivars, 45.6% of which were present in only 1-4 cultivars. Genetically diverse clones of *S. spontaneum* were employed to identify as many ancestral *S. spontaneum* alleles as actually present in the cultivars (Andru, 2009). Therfore, most of the genetic diversity observed in the sugarcane cultivars must be due to the allele contribution of *S. spontaneum*, which is far more diverse than *S. officinarum* (Jannoo et al., 1999; Aitken et al., 2006). Our study showed that 90.2% of *S. officinarum* alleles (250 out of 277) were collectively present in the cultivars, which was also in agreement with the studies of Jannoo et al. (1999) and Aitken et al. (2006) where the authors reported that 80-90% of allelic diversity in *S. officinarum* was already captured in the cultivars. This implies *S. officinarum* with depleted genetic variability may no longer be a good source of alleles for modern sugarcane breeding. Our data showed that only

45.4% of allelic diversity of the 14 *S. spontaneum* was represented in Louisiana sugarcane cultivars, which is substantial considering *S. spontaneum* a non-recurrent parent and that only very few *S. spontaneum* clones have been used in the development of Louisiana cultivars. Three hundred and thirteen alleles were identified in the sugarcane cultivars (Fig. 2), which largely (68.7 %) consisted of rare alleles.. The likely origin of these alleles are the other progenitor species like *S. sinense*, *S. barberi*, and *S. robustum*, in addition to *S. officinarum* and *S. spontaneum*. At least three clones of *S. robustum* were documented in the CP sugarcane pedigree database. For example, Mol1231, NG57-208, and 28NG251 were crossed to POJ2878, CP55-030, and D74 and Crystalina (both *S. officinarum*), respectively. The crosses involving 28NG251 produced CP31-518 and CP36-138 (F_1 progeny), and several backcross generation cultivars; eighteen that consisted of BC_3 to BC_7:28NG251 derivatives were used in the present study. A more recent molecular investigation of interrelationships among *Saccharum* species indicated that *S. barberi* and *S. sinense* are less related to the main germplasm pool, suggesting that their ancestry involved introgression from other genera as hypothesized previously and that these two species may have significant sources of less related germplasm for increasing variability in commercial sugarcane cultivars (Brown et al., 2007). *S. barberi*, an important breeding cane, has notable resistance to gumming, mosaic, and downy mildew.Genetic contribution of *S. barberi* and *S. sinense* to the Louisiana commercial sugarcane germplasm and their relevance to the breeding program needs to be evaluated.
Some alleles identified in the sugarcane cultivars may have arisen from recent mutation events. Length changes in sequence repeats are known to occur during meiotic recombination or as a result of unrectified slipped strand mispairing during DNA replication. Slippage during PCR may result in incorrect amplification of microsatellites. Genome instability associated with high polyploidy and aneuploidy may lead to certain levels of point and gross mutations during the development of sugarcane hybrids. Amplification of non-parental SSR alleles in sugarcane F_1 progenies and variant alleles among vegetative clones of a sugarcane cultivar, amplified using TRAP and RAPD markers, are indicative of somatic mutation.

Major Clusters of Genotypes

Pairwise comparisons of 64 clones based on 1,601 alleles at 52 SSR loci classified the clones into three major clusters corresponding to three genotypic classes (Fig. 3). As anticipated, the *S. spontaneum* clones (cluster I) was highly diverse with low genetic similarity (GS) coefficients (23-34.5%). They also shared a low mean GS of 21% with the *S. officinarum* clones (cluster II) and sugarcane cultivars (cluster III). The *S. officinarum* clones La Stripe and Badila were 51% similar and were more related to the cultivars (31.5% mean GS). The 48 sugarcane cultivars formed several subclusters and had a relatively narrow genetic diversity with GS of 40-61%. The clustering was based on 26.9% and 73.1% genetic variation among and within the major clusters, respectively, as determined from the analysis of molecular variance ($P = 0.00000$). Robustness of the clustering was achieved by performingbootstrap analysis at different points as more SSR markers were added to the genotype data. The average coefficient of variation (CV) was 11.1 for an initial data set of 259 alleles, butit was 3.5 when the number of alleles totaled 1,601. At this point, no significant changes were observed in genotype clustering and the similarity coefficients, which suggested that number of loci was adequate to guarantee good precision of genetic similarity estimates. Random coverage of genetic loci was also indicated in the percent distribution of EST-SSR alleles among the three genotypic classes, which mirrored the percent distribution of the total alleles in the genotype data (Fig. 2).
Principal coordinate analysis (PCoA; Fig. 4) was also done to depict genetic relationships among

the 64 clones (Fig. 4). PCoA plot showed distribution of genotypes similar to that observed in the dendrogram. The cultivars were not placed between *S. officinarum* and *S. spontaneum* as would be expected for hybrids of these two species; the apparent reason is that different genomic segments of *S. spontaneum* and different amounts of these segments were transmitted to the hybrids. *S. spontaneum* contributed substantially to allelic diversity, unique alleles from other progenitor species increased the estimates of genetic divergence of the cultivars from the *S. spontaneum*.

The PCoA revealed distinctiveness selection activities in the Louisiana commercial sugarcane breeding program. Five hybrids (clones 44-48), purposely used as outliers, were clearly distinguished from others. The experimental clones US01-040 and US79-010 (clones 47 and 48, respectively), which have CP parentage but did not pass through selection cycles unlike advanced Louisiana commercial clones, were placed closer to the *S. officinarum*. Incidentally, the male parent of US79-010 is the *S. officinarum* Benda Sel. The foreign commercial sugarcanes N27, NCo310, and TucCP77-42 (clones 44, 45, and 46, respectively) were also segregated from the Louisiana cultivars. The close relationship between TucCP77-42 and its progeny HoCP05-961 (clone 17) was not explained in the PCoA plot. Some earlier bred Louisiana cultivars such as CP52-068, CP72-370, CP74-383, and CP83-644 (clones 1, 2, 3, and 8, respectively) were placed in the plot where ohter cultivars were clustered. These results indicated that Louisiana cultivars, over the years, were bred to suit their cultivation in Louisiana.

Diversity among Sugarcane Cultivars

Genetic similarity among the 48 sugarcane cultivars ranged from 40 to 61% (Fig. 3). Similarity coefficient of 40% delineated the genetic boundary separating the cultivars that were selected and developed in the Louisiana breeding program (cluster IIIB) from the foreign cultivars N27, NCo310, TucCP77-42 and experimental clones US01-040 and US79-010 (cluster IIIA). Similarity coefficients among the hybrids in cluster IIIA were consistent with their pedigree data. NCo310 and N27 were 58% similar because of their close relationship, NCo310 being a maternal grandparent of N27. On the otherhand, Co331, the other maternal grandparent of N27, is a progeny of Co213 which is a paternal grandparent of NCo310. The Louisiana cultivar CP52-068 is a maternal grandparent of both TucCP77-42 and US79-010. The female parent of NCo310 which is Co421 is a paternal grandparent of CP52-068. US01-040 and US79-010 do not have a common parent or grandparent.

Cluster III-B comprised of Louisiana commercial clones which included elite parental lines and released cultivars. Their clustering pattern was also consistent with their pedigree data, although clones with recent unique or wild ancestors often showed divergence from their relatives. For instance, Ho95-988 and L06-001 (Fig. 3; cluster B-1) were the least similar (43%) to other cultivars. All four grandparents (US80-024, CP79-348, CP78-304, and CP76-356) of Ho95-988 have recent unique ancestors such as the *S. spontaneum* US56-15-8, the *S. robustum* 28NG251, and the Hawaiian cultivar H49-3646, thus conferring Ho95-988 with unique genetic attributes (Tew et al., 2005). The four grandparents are BC_2:US56-15-8, BC_3:28NG251, BC_3:US56-15-8, and BC_5:28NG251/BC_3:H49-3646 derivatives, respectively. Released in 2004, Ho95-988 is a good ratooning cultivar with high cane and sugar yields and resistance to mosaic and leaf scald diseases. Likewise, the grandparents of L06-001 namely CP78-304, LCP81-030, LCP86-454, and LCP85-384 are BC_3:US56-15-8, BC_4:28NG251, BC_5:US56-15-8, and BC_4:US56-15-8 derivatives, respectively. Ho95-988 and L06-001 are grand-offsprings of CP78-304, and they are related to a few clones used in the present study. L06-001 is a progeny of HoCP96-540 (cluster B-7) which is a BC_5:US56-15-8 derivative commercially released in 2003. Four cultivars, **L05-466** and **LCP85-376** (cluster B-4) and **HoCP 00-950** and **L01-281** (cluster B-6) clearly

separated from the others. These four cultivars do not have a common parent and grandparent. The hybrid **L05-466** had its female parent CP83-644 and half-siblings L03-371 (BC_6:28NG251 derivative) and HoCP05-961 (BC_2:SES147B derivative) placed in clusters B-7 and 8. The relatives of **LCP85-376** (a polycross product and BC_4:US56-15-8 derivative) are HoCP04-838 (BC_5:US56-15-8/BC_6:28NG251 derivative) and its half-sibling HoCP85-845 (BC_4:US56/BC_5:28NG251 derivative), which were placed in cluster B-8. The relatives of **HoCP00-950** are its grandparent LCP81-030 (BC_4:28NG251 derivative) and L99-226 (BC_5:US56-15-8/BC_5:28NG251 derivative and progeny of LCP81-030), which were placed in cluster B-2. **HoCP00-950**, commercially released in 2007, is odd being a progeny of the full-siblings HoCP93-750 and HoCP92-676 that are BC_5:28NG251 derivatives. **L01-281,** a progeny of LCP86-429 and LCP85-384 (both BC_4:US56-15-8 derivatives), had its several relatives placed in different clusters..

Wild ancestry set higher ranges of genetic variation (numbered nodes in the dendogram) among the sugarcane cultivars, which was consistent with the information conveyed by the SSR genotype data (Fig. 2). Wild ancestry makes calculation of coefficient of relatedness based on pedigree complicated, especially when it involves early backcross generation derivatives and progenies of two wild-derived parents. The highest genetic divergence among the Louisiana cultivars was noted in the dendogram at 43% GS (cluster B-1), which was close to the GS (40%) that delineated non-Louisiana commercial clones. This further established that selection was, in fact, delimiting genetic diversity among Louisiana commercial clones. The extent of diversity in different decades was comparable indicating that a ceiling point or limit has already been reached. Among the cultivars established in the 1970's, CP79-348 in cluster B-5 was the least similar (45% GS) to the other clones which were placed in cluster B-8. Among the cultivars established in the 1980's, 43.2% GS was shared between clones in clusters B-2 & 3 and clones in clusters B-4, 7, & 8 while 44% GS was shared between clones in cluster B-2 and LCP81-010 in cluster B-3. Among the cultivars established in the 1990's, 43% GS was shared between Ho95-988 in cluster B-1 and clones in clusters B-2, 3, 5, & 7 while 43.2% GS was shared between clones in clusters B-2 & 3 and clones in cluster B-5,7. Among cultivars established in the 2000's, 43% GS was shared between L06-001 in cluster B-1 and clones in clusters B-4,5,6,7,8 while 44.5% GS was shared between L05-466 in cluster B-4 and clones in clusters 5,6,7,8.

Sixteen clones used in this study were released cultivars (Table 1) and they occupied all numbered clusters within cluster IIIB in the dendogram except cluster B-4. These released cultivars therefore represent the range of genetic diversity in the Louisiana cultivars that was revealed in this analysis. Except for CP52-068, CP74-383, CP79-318, and LCP86-454, these released cultivars were derived from the *S. spontaneum* US56-15-8 and/or the *S. robustum* 28NG251 substantiating the contribution of these wild progenitors to achieve genetic gains in the breeding program.

While being moderately efficient at establishing overall similarity and relationships among genotypes, SSRs are known to be powerful markers at distinguishing individual genotypes and tracking progenitor alleles. Furthermore, SSRs are also suitable markers for genetic fingerprinting and verifying parentage of sugarcane cultivars. Therefore, the present study of understanding the genetic structure of existing Louisiana sugarcane hybrids by the use of SSR markers will have significant impact on the future breeding program, especially in selecting parents for the crossing program aimed at development of improved sugarcane cultivars.

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Table 1. Description of the sixty four clones (including parentage of the hybrid cultivars) used for fingerprinting by SSR markers.
1-48: *Saccharum* hybrids, 49-50: *S. officinarum*, 51-64: *S. spontaneum*. Twenty-seven cultivars having lineage of *S. spontaneum* US 56-15-8 are noted as backcross (BC) derivatives.

	Clone Name	*Commercial Release*	*Female Parent*	*Maternal Grandparents*	*Male Parent*	*Paternal Grandparents*
1	CP 52-068	1958	CP 29-320	Co 281, CP 27-034	CP 38-034	Co 421, CP 27-156
2	CP 72-370	1980	CP 61-037	CP 48-103, CP 55-038	CP 52-068	CP 29-320, CP 38-034
3	CP 74-383	1982	CP 65-357	CP 52-068, CP 53-017	L 65-069	CP 52-001, CP 48-103
4	CP 77-405 (BC_3)		CP 52-068	CP 29-320, CP 38-034	CP 71-424	CP 48-103, CP 63-561
5	CP 77-407 (BC_3)		CP 71-421	CP 63-566, CL 47-083	CP 66-315	CP 52-068, CP 53-017
6	CP 79-318	1987	CP 65-357	CP 52-068, CP 53-017	L 65-069	CP 52-001, CP 48-103
7	CP 79-348		CP 74-398	CP 65-357, CP 57-614	US 70-16-3	US 65-64-45, CP 57-603
8	CP 83-644		CP 74-385	CP 65-357, L 65-069	CP 63-588	CL 54-1910, CP 57-120
9	CP 85-830 (BC_4)		CP 74-387	CP 65-357, L 65-069	CP 77-407	CP 71-421, CP 66-315
10	Ho 89-889 (BC_3)		CP 79-318	CP 65-357, L 65-069	US 80-024	US 74-069, L 62-096
11	Ho 95-988 (BC_4)	2004	CP 86-941	CP 76-356, CP 78-304	US 89-012	CP 79-348, US 80-024
12	HoCP 00-930 (BC_5)		CP 89-831	CP 72-370, CP 76-331	LCP 85-384	CP 77-310, CP 77-407

13	HoCP 00-950	2007	HoCP 93-750	CP 84-722, LCP 81-030	HoCP 92-676	CP 84-722, LCP 81-030
14	HoCP 02-610 (BC_5)		HoCP 85-845	CP 72-370, CP 77-403	HoCP 92-648	CP 72-370, LCP 82-089
15	HoCP 02-618 (BC_5)		CP 89-831	CP 72-370, CP 76-331	LCP 85-384	CP 77-310, CP 77-407
16	HoCP 04-838 (BC_5)		HoCP 85-845	CP 72-370, CP 77-403	LCP 85-384	CP 77-310, CP 77-407
17	HoCP 05-961		CP 83-644	CP 74-385, CP 63-588	TucCP 77-42	CP 71-321, US 72-019
18	HoCP 85-845 (BC_4)	1993	CP 72-370	CP 61-037, CP 52-068	CP 77-403	CP 71-404, CP 69-338
19	HoCP 89-846 (BC_4)		CP 81-325	CP 71-318, CP 73-343	CP 78-304	CP 65-357, CP 71-441
20	HoCP 96-540 (BC_5)	2003	LCP 86-454	CP 77-310, CP 69-380	LCP 85-384	CP 77-310, CP 77-407
21	L 01-281 (BC_5)		LCP 86-429	CP 74-2013, CP 77-418	LCP 85-384	CP 77-310, CP 77-407
22	L 01-283 (BC_5)	2008	L 93-365	CP 78-304, CP 72-2086	LCP 85-384	CP 77-310, CP 77-407
23	L 01-299 (BC_5)	2009	L 93-365	CP 78-304, CP 72-2086	LCP 85-384	CP 77-310, CP 77-407
24	L 03-371		CP 83-644	CP 74-385, CP 63-588	LCP 82-089	CP 52-068, CP 72-370
25	L 05-466		CP 83-644	CP 74-385, CP 63-588	HoCP 97-609	LCP85-384, CP70-321
26	L 06-001 (BC_5)		HoCP 92-618	CP 78-304, LCP 81-030	HoCP 96-540	LCP 86-454, LCP 85-384
27	L 07-057(BC_6)		L 01-315	HoCP 93-746, LCP 85-384	HoCP 98-741	LCP 81-010, CP 83-632
28	L 07-068 (BC_6)		L 98-207	LCP 86-454, LCP 85-384	02P10	Polycross
29	L 09-105 (BC_6)		HoCP 00-930	CP 89-831, LCP 85-384	L 99-233	CP 79-348, HoCP 91-552
30	L 09-118 (BC_6)		HoCP 01-517	HoCP 92-631, CP 84-1198	L 98-207	LCP 86-454, LCP 85-384
31	L 94-426		CP 81-332		LCP 81-010	CP 74-328, CP 70-1133
32	L 94-432		LCP 81-010	CP 74-328, CP 70-1133	LCP 82-089	CP 52-068, CP 72-370
33	L 97-128 (BC_5)	2004	LCP 81-010	CP 74-328, CP 70-1133	LCP 85-384	CP 77-310, CP 77-407
34	L 98-207 (BC_5)		LCP 86-454	CP 77-310, CP 69-380	LCP 85-384	CP 77-310, CP 77-407
35	L 98-209 (BC_5)		LCP 86-454	CP 77-310, CP 69-380	LCP 85-384	CP 77-310, CP 77-407
36	L 99-226 (BC_5)	2006	HoCP 89-846	CP 81-325, CP 78-304	LCP 81-030	CP 61-037, CP 73-351
37	L 99-233	2006	CP 79-348	CP 74-398, US 70-16-3	HoCP 91-552	LCP 81-010, CP 72-356
38	LCP 81-010		CP 74-328	CP 65-357, L 62-086	CP 70-1133	CP 56-063, CP 67 Poly 06
39	LCP 81-030		CP 61-037	CP 48-103, CP 55-038	CP 73-351	CP 65-357, L 65-069
40	LCP 82-089	1990	CP 52-068	CP 29-320, CP 38-034	CP 72-370	CP 61-037, CP 52-068

41 LCP 85-376 (BC_4)		CP 77-403	CP 71-404, CP 69-338	Polycross	
42 LCP 85-384 (BC_4)	1993	CP 77-310	CP 52-068, L 65-069	CP 77-407	CP 71-421, CP 66-315
43 LCP 86-454	1995	CP 77-310	CP 52-068, L 65-069	CP 69-380	CP 51-024, CP 53-005
44 N 27		NiN 2	Co 331, NCo 310	N 52-219	NCo 339, NM 214
45 NCo 310		Co 421	POJ 2878, Co 285	Co 312	Co 213, Co 244
46 TucCP 77-42		CP 71-321	CP 52-068, CP 62-258	US 72-019	CP 64-313, SES 147B
47 US 01-040 (BC_6)		HoCP 93-775	CP 86-916, CP 85-830	US 93-016	LCP 84-222, CP 85-843
48 US 79-010		CP 65-357	CP 52-068, CP 53-017	Benda Sel (*S. officinarum*)	
49 LA Stripe					
50 Badila					
51 S 6684A					
52 MPTH 97-107					
53 MPTH 97-213					
54 MOL 1032					
55 MPTH 97-204					
56 IMP 9068					
57 Coimbatore					
58 US 56-15-8					
59 SH 249					
60 SES 323A					
61 SES 205A					
62 SES 147B					
63 IND 81-161					
64 Guangxi 8721					

Table 2. Descent of 27 sugarcane cultivars (boxed) from *S. spontaneum* US 56-15-8; shaded entries appear twice in the table.

	F_1		BC_1		BC_2		BC_3		BC_4		BC_5		BC_6
US 56-15-8 X L 60-25	US 66-56-4	X CL 47-083	US 74-069	X L 62-96	US 80-24	X CP 79-318	Ho 89-889						
						X CP 79-348	US 89-12	X CP 86-941	Ho 95-988				
US 56-15-8 X CP 52-001	US 60-8-3	X CL 54-134	CP 63-571	X CL 47-083	CP 71-404	X CP 69-338	CP 77-403	X Polycross	LCP 85-376				
								X CP 72-370	HoCP 85-845	X HoCP 92-648	HoCP 02-610		
					CP 71-441	X CP 65-357	CP 78-304	X CP 72-2086	L 93-365				
								X CP 76-356	CP 86-941				
								X CP 81-325	HoCP 89-846	X LCP 81-030	L 99-226		
								X LCP 81-030	HoCP 92-618	X HoCP 96-540	L 06-001		
		X CP 57-101	CP 63-561	X CP 48-103	CP 71-424	X CP 52-068	CP 77-405						
			CP 63-566	X CL 47-083	CP 71-419	X CP 69-380	CP 77-418	X CP 74-2013	LCP 86-429	X LCP 85-384	L 01-281		
					CP 71-421	X CP 66-315	CP 77-407	X CP 74-387	CP 85-830	X CP 86-916	HoCP 93-775	X US 93-016	US 01-040
								X CP 77-310	LCP 85-384	X LCP 81-010	L 97-128		
										X HoCP 85-845	HoCP 04-838		
										X L 93-365	L 01-283		
											L 01-299		
										X CP 89-831	HoCP 02-618		
											HoCP 00-930	X L 99-233	L 09-105
										X LCP 86-454	HoCP 96-540		
											L 98-209		
											L 98-207	X O2P10	L 07-068
												X HoCP 01-517	L 09-118
										X HoCP 93-746	L 01-315	X HoCP 98-741	L 07-057

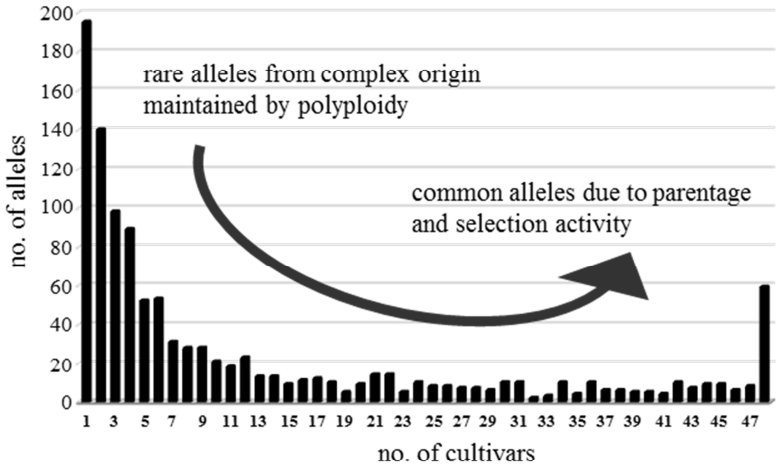

Fig. 1a. Frequency distribution of 1,120 alleles in 48 sugarcane cultivars.

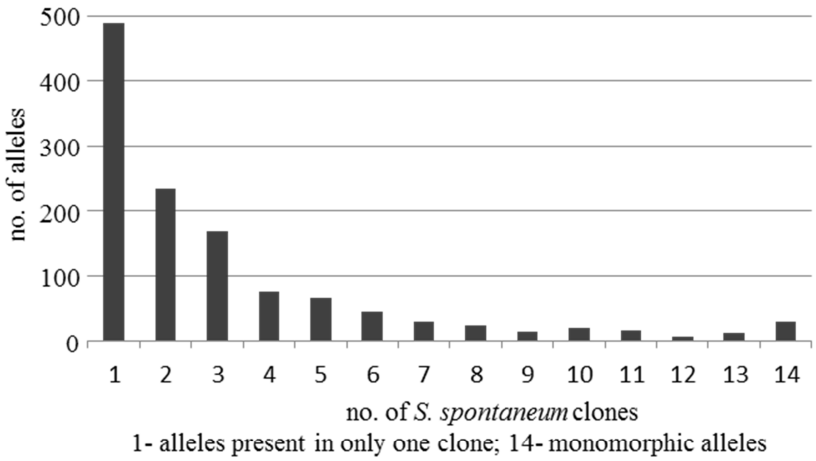

Fig. 1b. Frequency distribution of 1,228 alleles in 14 *S. spontaneum* clones.

Table 3. Total number of alleles detected in each sugarcane cultivar (grouped by decade).

CP 52-068	237	1950s
CP 72-370	242 (2)†	1970s
CP 74-383	274	decade
CP 77-405	254 (29)†	avg.:
CP 77-407	266	267
CP 79-318	276	
CP 79-348	278	range:
US 79-010	279	242-279
LCP 81-010	332	
LCP 81-030	292	
LCP 82-089	293	1980s
CP 83-644	291	decade
LCP 85-376	281	avg.:
LCP 85-384	263	295
CP 85-830	258	
HoCP 85-845	319	range:
LCP 86-454	315	258-332
HoCP 89-846	316	
Ho 89-889	290	
L 94-426	286	
L 94-432	290	1990s
Ho 95-988	290 (5)†	decade
HoCP 96-540	284	avg.:
L 97-128	309	293
L 98-207	282	
L 98-209	297	range:
L 99-226	303	282-309
L 99-233	293	
HoCP 00-930	289	
HoCP 00-950	289	
L 01-281	310	
L 01-283	283	
L 01-299	315	
US 01-040	293	2000s
HoCP 02-610	312	decade
HoCP 02-618	302	avg.:
L 03-371	293	296
HoCP 04-838	294	
L 05-466	268	range:
HoCP 05-961	306	268-315
L 06-001	300	
L 07-057	285	
L 07-068	291	
L 09-105	301	
L 09-118	304	
N 27	302	foreign
NCo 310	316	cvs.
TucCP 77-42	298	

† Number of bands not scored due to missing data is in parentheses.

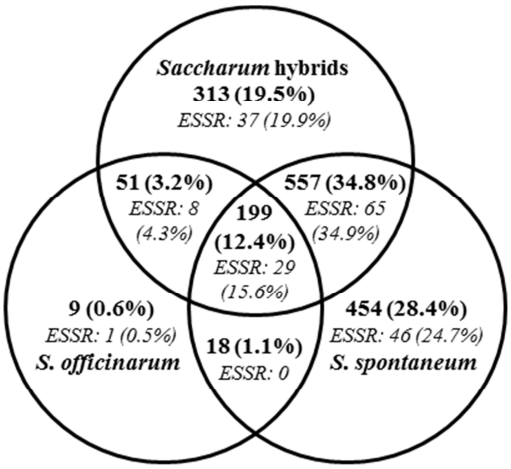

Fig. 2. Distribution of 1,601 alleles (including 186 alleles at 11 loci), among 48 sugarcane cultivars, two clones of *S. officinarum*, and 14 clones of *S. spontaneum*.

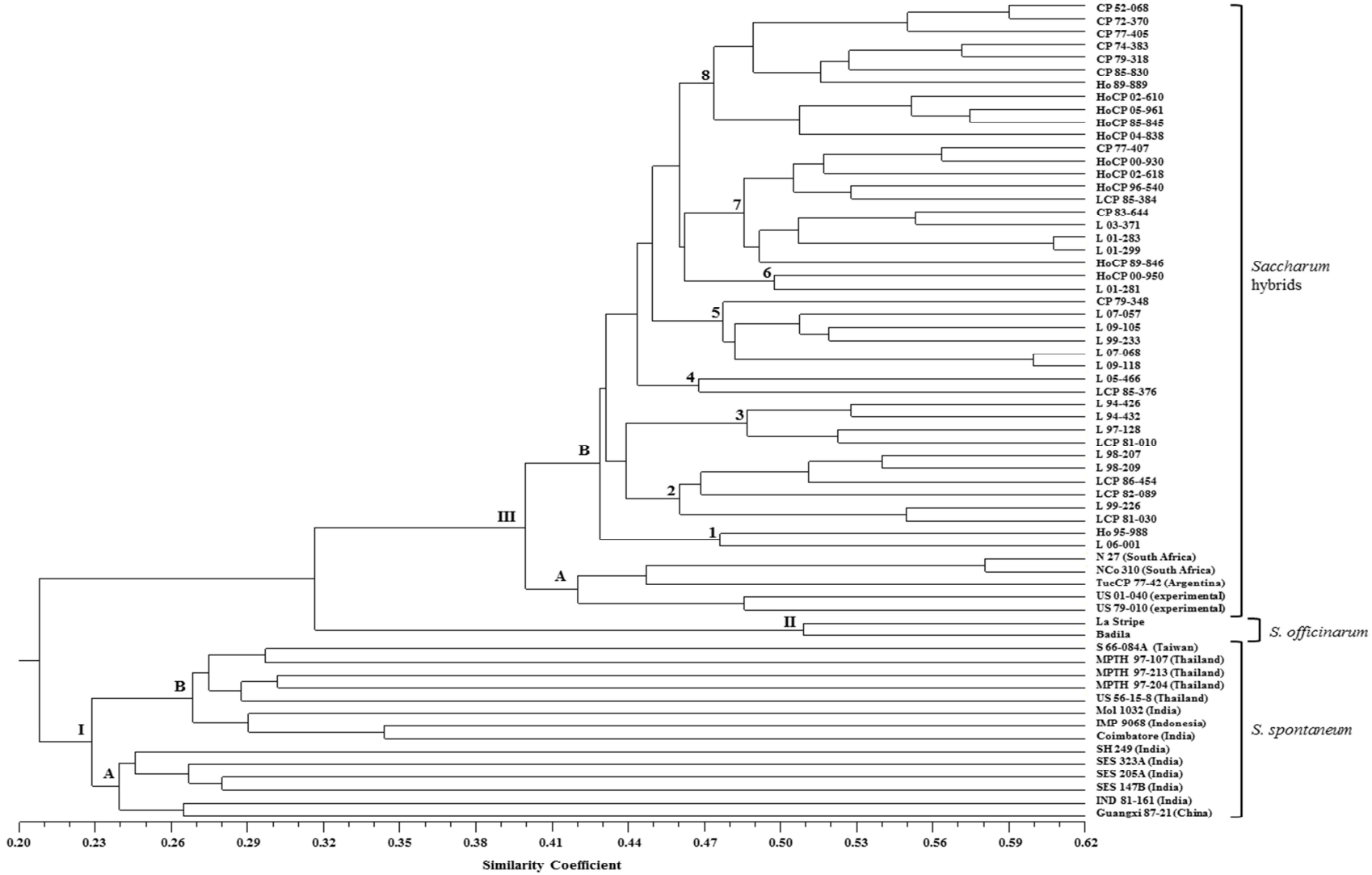

Fig. 3. Dendogram showing clustering of 48 sugarcane cultivars, two clones of *S. officinarum*, and 14 clones of *S. spontaneum* based on 1,601 alleles at 52 SSR loci.

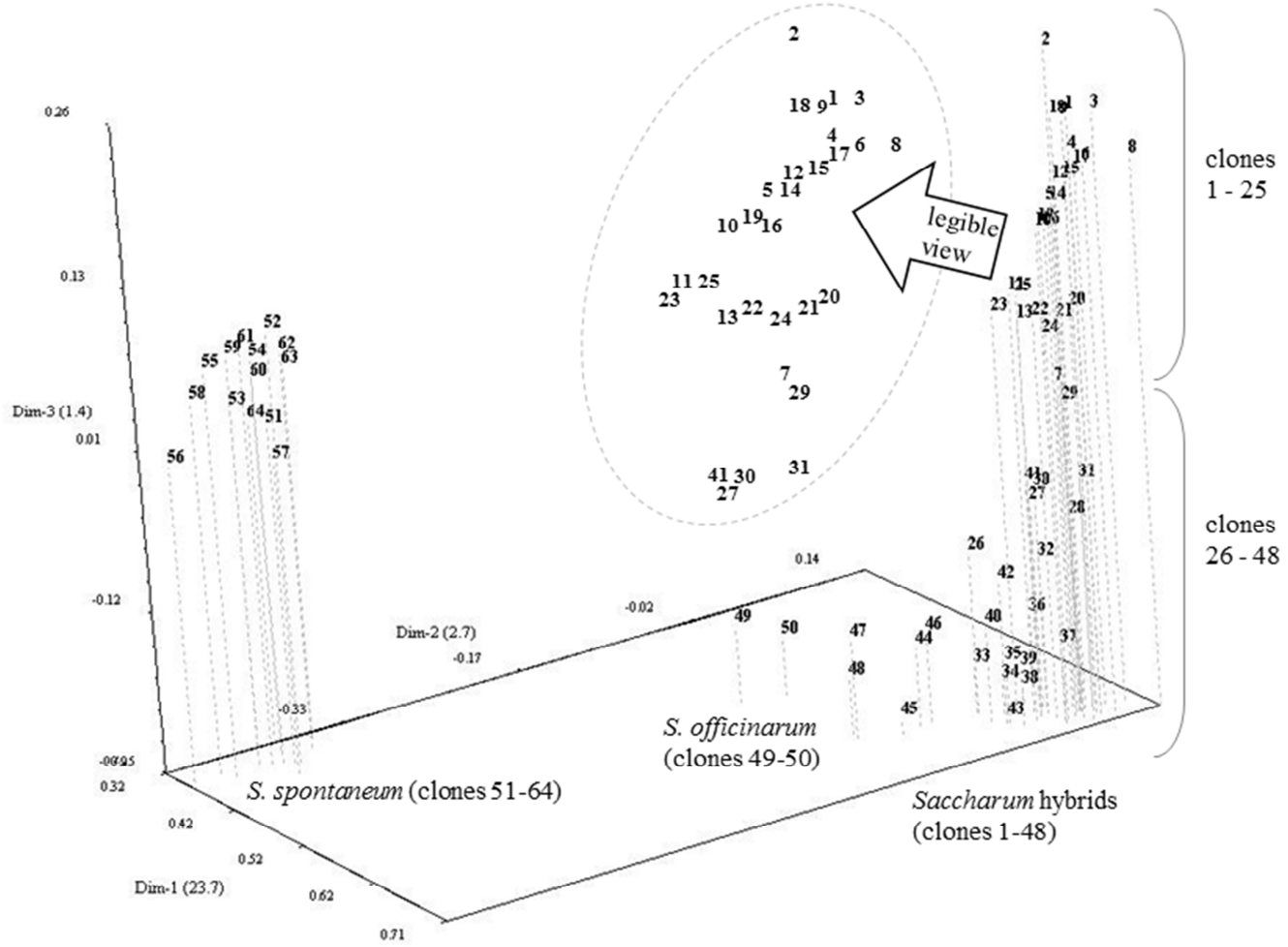

Fig. 4. Principal coordinate analysis plot showing genetic relationship among 48 sugarcane cultivars, two clones of *S. officinarum*, and 14 clones of *S. spontaneum* based on 1,601 alleles at 52 SSR loci; clones are numbered as listed in Table 1.