AN OVERVIEW OF 2007 ACTIVITIES IN THE LSU AGCENTER SUGARCANE VARIETY DEVELOPMENT PROGRAM

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The primary objective of the LSU AgCenter Sugarcane Variety Development Program is to contribute to the profitability of the Louisiana sugarcane industry by developing improved sugarcane varieties.

Sugarcane variety development in the LSU AgCenter is carried out by a team of scientists (Table 1). The LSU AgCenter sugarcane breeding team and the United States Department of Agriculture (USDA) sugarcane breeding team work independently yet 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 test locations. Outfield testing is conducted by personnel of the LSU AgCenter, the USDA, and the American Sugar Cane League. Seed increase is carried out by the American Sugar Cane League and begins when varieties are introduced to the outfield testing stage. The cooperative efforts of sugarcane breeding are done in accordance with the provisions of the "Three-Way Agreement of 2007." After yield data for one crop cycle (plant-cane, first stubble, and second stubble) are collected in the outfield testing stage, those varieties that show promise are released for commercial production.

Table 1. Members of the LSU AgCenter Sugarcane Variety Development Team in 2006.

Team Member	Budgetary Unit	Responsibility
Kenneth Gravois	Sugar Research Station	Program Leader
Keith Bischoff	Sugar Research Station	Selection
Collins Kimbeng	School of Plant, Soil and Environmental Sciences	Molecular Breeding
Gene Reagan	Entomology	Insect Resistance
Jeff Hoy	Plant Pathology & Crop Physiology	Disease Resistance
Jim Griffin	School of Plant, Soil and Environmental Sciences	Herbicide Tolerance
Sonny Viator	Iberia Research Station	Variety Testing
Michael Pontif	Sugar Research Station	Variety Testing
Gert Hawkins	Sugar Research Station	Sucrose Laboratory
Chris LaBorde	Sugar Research Station	Photoperiod and Crossing
David Sexton	Sugar Research Station	Outfield Testing
Joel Hebert	Sugar Research Station	Farm Manager

Photoperiod treatments to induce flowering began on May 31 and continued until September 10. Flowering in 2007 was good, with 270 crosses being made. Relatively high August and September temperatures were less than conducive to flowering. Germination tests

were conducted in December and January. Seed production for 2007 was more than adequate based on germination test results, with 203,998 true seed produced.

A total of 94,344 seedlings from 177 crosses from the 2006 crossing series were planted in the field in April of 2007. A total of 78,215 seedlings survived transplanting. In addition, 3,827 seedlings were planted in a cross appraisal trial. The majority of the seedlings were from crosses of commercial varieties and elite experimental varieties. Selection will be carried out in 2008 when the seedlings are in the first stubble crop.

In the fall of 2007, individual selection was practiced on first stubble seedlings that represented the 2005 crossing series. The cross appraisal was evaluated and rated prior to selection. Family selection (top 75% in 2007) was utilized based on information from the cross appraisal results. Selection was done during the first through third weeks of September. The seedling populations were only slightly lodged. From this initial population, 2,018 clones were selected and planted to establish the first-line trials.

Established procedures were used to advance superior clones of the 2004 crossing series from first-line trials to second-line trials (467 clones) and of the 2003 crossing series from second-line trials to increase trials (131 clones). Preliminary ratings for cane yield and plant type were done in August. Clones with acceptable ratings were further evaluated for lodging, broken tops, borer damage, diseases, pith/tube, and Brix/sugar per ton.

The best 33 experimental varieties from the 2002 crossing series were assigned permanent variety designations in the fall of 2007. Newly assigned varieties were entered in replicated nursery trials at three locations (Sugar Research Station, USDA-ARS Ardoyne Farm, and Iberia Research Station). "L", "HoCP, or Ho" varieties of the 2007 assignment series were exchanged in the fall of 2007 to plant cooperative infield and off-station nursery tests the following year.

Experimental varieties were replanted in infield and off-station nursery tests (15 varieties of the 2006 series), introduced to the outfield tests (two varieties of the 2005 series), and planted in outfield tests (two experimental varieties of the 2001 assignment series; one experimental variety of the 2003 assignment series; three varieties of the 2004 assignment series). Breeding personnel assisted Dr. Jeff Hoy and Dr. Gene Reagan in entering experimental varieties in the sugarcane smut and sugarcane borer resistance trials, respectively.

The Variety Release Committee met at the American Sugar Cane League Office on April 26, 2007 to consider the release of HoCP 00-950. The vote for release was unanimous. Seed was made available to growers by the American Sugar Cane League.

The decision regarding the further testing and seed increase of candidate experimental varieties was determined at the Variety Advancement Committee meeting. The 2007 meeting was held on August 10, 2007, at the American Sugar Cane League office in Thibodaux, Louisiana. The distribution of "L" experimental clones through stages of testing in 2007 is presented in Table 2.

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.

Table 2. Number of "L" varieties by assignment series at the most advanced stage of testing in 2007.

Series	Stage of Testing	Number of experimental varieties
L 2001	Outfield – Replanted and harvested as plantcane, first stubble, and second stubble	2
L 2002	Outfield – Replanted and harvested as plantcane and first stubble Off-station nurseries and infield – 3rd stubble harvested	0
L 2003	Outfield – Replanted and harvested as plantcane On-station nurseries - 3rd stubble harvested Off-station nurseries and infield – 2nd stubble harvested.	1
L 2004	Outfield – Planted On-station nurseries - 2nd stubble harvested Off-station nurseries and infield - 1st stubble harvested	0
L 2005	Outfield - Introduced On-station nurseries - 1st stubble harvested Off-station nurseries and infield - plantcane harvested.	2
L 2006	On-station nurseries - plantcane harvested Off-station nurseries and infield planted	15
L 2007	Assignment - On-station nurseries planted	33

In 2007, rust continued to be seen at high levels in LCP85-384 throughout the growing season, especially in the plant-cane crop. Smut disease was not as prevalent in 2007 as it was in 2006. Levels of pith and leaf scald in experimental varieties were somewhat below average compared to other years. Sugarcane borer infestations were extremely light at the Sugar Research Station. In fact no insecticide applications were made at the Sugar Research Station in 2007, and bored internodes were few. The growing conditions in 2007 were good as the Louisiana sugar industry rebounded with good yields.

2007 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 2007 crossing season were planted in the fall of 2006. After establishing the plants from the cuttings, the plants were fertilized biweekly with a 200 ppm solution of Peter's 20-20-20. In late January 2007, 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. Three additional applications of dry granular fertilizer (8-24-24, one Tbs/can) were applied to the cans during July, August, and September. 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 36 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, 2007, 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 was slightly below average on the photoperiod carts in 2007 (Tables 1-2). Total flowering percentage for the six bays was 41%, which was comprised from 1,273 stalks. Although the flowering percentage was slightly below average in

2007, successful seed production is comprised of a multitude of factors. An adequate germination rate provided the Variety Development Program with sufficient seed production. In 2007 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 stocks were most compatible. Other hybridization techniques consisted of inflorescences with sterile pollen due to hot water emasculation. Experimentation with hot water emasculation produced viable seed from certain combinations of high pollen varieties that have never been crossed. The hot water emasculation consisted of dipping the inflorescence in 122° F water for duration of 3 minutes. Further DNA analysis will be used to determine the success of the hot water emasculation in the variety development program.

The flowering season in 2007 began during the second 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 second week of September. There can be a slight deviation on when the first flower does appear due to temperature during the photoperiod induction phase, varietal characteristics, and the photoperiod treatments. Crossing began on September 10 and ended on October 24, 2007. A total of 526 tassels of 117 varieties were used to produce 267 crosses producing 204,008 viable seed with 193,666 seed produced from biparental crosses (Table 3). The germination rate is one of two components that measure the success of this stage in the crossing program. The other component is photoperiod induction. Close attention was made once again in maintaining 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. The majority of crosses made were done with the best possible combinations available due to the lack of flowering that we are accustomed to. High temperatures throughout the summer months can result in poor production of sugarcane flowering as is being speculated in 2007. Along with the hot summer months, high temperatures in September can also result in poor seed set within the crossing greenhouse. Temperatures in excess of 100 degrees have adverse effects on pollen viability. Although outside temperatures may be in the 90 degree range, greenhouse temperatures can be anywhere from 10 to 30 degrees hotter. To manage high temperatures the crossing greenhouse is white-washed at the beginning of the crossing season (late August). Along with the shading effect of the white-washed greenhouse, the misting system also has a cooling effect on the greenhouse environment.

Table 1. Summary of the 2007 photoperiod treatments for the LSU AgCenter's sugarcane variety development program.

Bay	Cart	Treatment Start Date	Days of Constant Photoperiod	Date Photoperiod Decline Started	Days of Declining Photoperiod		Mean Flowering Date	Total Stalks	Percent Flowered
					Peak 1	Peak 2			
1	A	16-Jun	44	30-Jul	72	87	279±7	89	54
1	B	16-Jun	44	30-Jul	72	87	280±7	65	42
1	C	16-Jun	44	30-Jul	72	87	278±8	70	30
2	A	16-Jun	44	30-Jul	72	87	275±7	66	85
2	B	16-Jun	44	30-Jul	72	87	276±9	77	56
2	C	16-Jun	44	30-Jul	72	87	277±13	75	13
3	A	30-May	37	6-Jul	87	102	274±9	76	62
3	B	30-May	37	6-Jul	87	102	271±12	70	47
3	C	30-May	37	6-Jul	87	102	269±9	76	29
4	A	30-May	37	6-Jul	87	102	281±11	74	26
4	B	30-May	37	6-Jul	87	102	270±14	68	16
4	C	30-May	37	6-Jul	87	102	260±11	79	27
5	A	30-May	36	10-Jul	82	97	270±8	69	45
5	B	30-May	36	10-Jul	82	97	269±9	76	39
5	C	30-May	36	10-Jul	82	97	270±12	62	35
6	A	30-May	41	10-Jul	82	97	272±11	55	49
6	B	30-May	41	10-Jul	82	97	271±10	69	46
6	C	30-May	41	10-Jul	82	97	269±9	57	46

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----------								
117	289	176	1273	526	4.40±1.26	2.99±1.49	4.90±1.78	75.49±12.53

† 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 2007 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	252	193,666	769±1068	724±1012	93±115
Polycross	11	9,847	895±1081	870±1093	112±136
Self	4	496	124±95	124±95	18±11
Total	267	204,008	764±1062	721±1009	93±115

Table 4. Varietal flowering summary in 2007 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
CP79-348	37	271	88±4	7	4	2	50
CP83-644	39	.	.	.	19	.	.
CP89-2143	41	.	.	.	10	.	.
HO01-564	41	.	.	.	9	.	.
HO05-961	41	.	.	.	3	.	.
HO89-889	41	.	.	.	8	.	.
HO91-572	44	267	62±3	5±1	9	5	56
HO95-988	40	264	80±2	7	31	13	42
HOCP00-927	41±1	.	.	.	11	.	.
HOCP00-930	44	274	71±2	5±1	5	5	100
HOCP00-950	41±1	260	78±2	7	35	23	66
HOCP01-517	41	.	.	.	8	.	.
HOCP01-523	44	.	.	.	4	.	.
HOCP02-610	40±1	267	78±3	3	13	11	85
HOCP02-618	44	281	73±2	5±1	10	4	40
HOCP02-620	41±1	267	75±3	4±1	12	11	92
HOCP02-623	39±1	264	77±1	5±1	9	8	89
HOCP03-704	37	.	.	.	4	.	.
HOCP03-708	37	.	.	.	3	.	.
HOCP03-743	39	.	.	.	9	.	.
HOCP04-803	44	264	56±1	4±1	5	4	80
HOCP04-809	41	257	70±2	6	6	6	100
HOCP04-856	44	.	.	.	9	.	.
HOCP05-902	37	264	87±8	6±1	5	3	60
HOCP05-903	44	.	.	.	4	.	.
HOCP05-904	37	.	.	.	6	.	.
HOCP05-918	44	.	.	.	5	.	.
HOCP05-920	37	.	.	.	3	.	.
HOCP05-923	41	260	72±1	4±1	5	5	100
HOCP05-931	37	274	98±11	7	4	2	50
HOCP20-930	44	283	72	6	1	1	100
HOCP85-845	41	274	92±4	3	29	4	14
HOCP88-739	39	.	.	.	8	.	.
HOCP89-831	40±1	283	99±3	7	6	3	50
HOCP89-846	40±1	260	71±3	6±1	17	7	41
HOCP91-552	42±1	257	60±2	3	13	13	100
HOCP91-555	39±1	.	.	.	15	.	.
HOCP92-618	37	278	91	7	12	1	8
HOCP92-624	41±1	253	64±2	6	22	16	73
HOCP92-648	37	260	74±1	6±1	11	2	18
HOCP93-746	37	274	87	7	5	1	20
HOCP93-749	41	.	.	.	7	.	.
HOCP95-951	37	262	77±1	7	8	6	75
HOCP96-509	42±1	.	.	.	16	.	.
HOCP96-540	42	264	77±1	3	60	42	70
HOCP96-561	38±1	269	87±2	5	10	9	90

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
HOCP97-606	44	.	.	.	4	.	.
HOCP97-609	37	.	.	.	5	.	.
HOCP99-815	41	.	.	.	3	.	.
HOCP99-825	41	257	69±2	7	4	3	75
HOCP99-866	37	.	.	.	9	.	.
L00-266	41	278	87	3	5	1	20
L01-283	40±1	283	101±2	5±1	31	10	32
L01-299	40	260	81±2	5	32	18	56
L02-325	41	271	84±4	5	5	3	60
L03-371	41±1	.	.	.	13	.	.
L03-378	41	.	.	.	5	.	.
L04-408	41	262	73±1	7	5	4	80
L04-410	37	.	.	.	4	.	.
L04-425	41±1	255	62±2	4	9	9	100
L04-434	44	283	75±3	7	10	2	20
L05-442	44	.	.	.	3	.	.
L05-445	44	290	79	5	5	1	20
L05-448	44	274	63±0	3	6	6	100
L05-450	41±1	274	83±3	4±1	10	8	80
L05-451	44	276	67±1	5±1	9	3	33
L05-457	39±1	253	64±1	7	19	19	100
L05-459	44	278	69±1	6±1	5	3	60
L05-460	44	269	60±1	7	5	5	100
L05-466	44	.	.	.	5	.	.
L05-474	44	.	.	.	5	.	.
L06-001	41	281	90±0	3	5	2	40
L06-003	41	257	66±0	5	4	4	100
L06-008	41	.	.	.	6	.	.
L06-009	41	.	.	.	5	.	.
L06-010	38±1	281	96±4	4±1	7	3	43
L06-011	37	.	.	.	4	.	.
L06-015	37	.	.	.	4	.	.
L06-016	41	276	85	4	3	1	33
L06-023	41	281	99±5	4±1	6	3	50
L06-024	41	269	79±1	6	5	3	60
L06-025	41	267	76±0	3	4	4	100
L06-026	41	274	90±6	5±1	3	3	100
L06-027	37	.	.	.	5	.	.
L06-038	44	276	65	7	5	1	20
L06-040	44	276	67±1	6	4	4	100
L89-113	37	295	108±.	3	10	1	10
L91-255	40±1	.	.	.	9	.	.
L91-281	44	274	67±1	7	14	6	43
L94-424	40±1	.	.	.	12	.	.
L94-426	41±2	274	84±5	4±1	22	4	18
L94-428	39±1	274	96±6	3±1	13	4	31
L94-432	39±1	.	.	.	13	.	.

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
L94-433	38±1	285	102±5	5±1	16	3	19
L96-092	41	.	.	.	4	.	.
L97-128	42±1	255	68±1	7	38	32	84
L97-137	41	297	106	5	1	1	100
L98-197	44	281	73±2	5±1	6	5	83
L98-207	44	281	75±5	4±1	21	2	10
L98-209	39±2	281	92±3	7	20	3	15
L99-226	41	262	80±2	3	56	33	59
L99-233	41±1	253	63±1	4	52	35	67
LCP81-010	41±1	264	76±1	5	27	20	74
LCP85-384	40±1	260	85±2	4	57	26	46
LCP86-454	39±1	.	.	.	9	.	.
N27	40±1	269	88±3	7	19	6	32
TUCCP77-042	41±2	288	91±5	5±1	7	6	86
US01-039	41	.	.	.	4	.	.
US01-040	41±1	.	.	.	7	.	.
US02-095	37	.	.	.	4	.	.
US79-010	44	264	62±4	6±1	7	6	86
US80-004	39±1	.	.	.	7	.	.
US93-015	41	274	83	5	9	1	11
US94-9603	44	.	.	.	4	.	.
US96-002	44	.	.	.	1	.	.
US99-002	44	.	.	.	6	.	.
US99-004	44	278	70±3	6±1	4	2	50

Table 5. Crosses and seed made in 2007 sorted by cross number.

Cross	Female	Male	Seed
XL07-001	HOCP92-624	L99-233	2947
XL07-002	L05-457	L99-233	297
XL07-003	HOCP92-624	L99-233	3303
XL07-004	L05-457	L99-233	392
XL07-005	L97-128	L99-233	1542
XL07-006	HOCP92-624	L04-425	2737
XL07-007	HOCP99-825	L99-233	312
XL07-008	HOCP04-809	L99-233	892
XL07-009	L05-457	L99-233	2865
XL07-010	L97-128	L04-425	244
XL07-011	HOCP92-624	L04-425	2260
XL07-012	L05-457	L04-425	1959
XL07-013	HOCP92-624	HOCP91-552	4014
XL07-014	L97-128	HOCP91-552	88
XL07-015	L05-457	HOCP91-552	1509
XL07-016	L06-003	L99-233	1660
XL07-017	HOCP92-624	L99-233	4083
XL07-018	HOCP89-846	LCP85-384	552
XL07-019	HOCP00-950	L99-233	20
XL07-020	HOCP92-648	L99-233	61
XL07-021	L97-128	L99-233	222
XL07-022	HOCP00-950	L99-233	180
XL07-023	HOCP05-923	HOCP04-809	61
XL07-024	L97-128	HOCP04-809	27
XL07-025	HOCP92-624	L01-299	261
XL07-026	HOCP99-825	L01-299	109
XL07-027	L97-128	L01-299	47
XL07-028	HOCP00-950	L99-226	32
XL07-029	HOCP95-951	L99-226	128
XL07-030	L97-128	L99-233	46
XL07-031	L04-408	L99-233	99
XL07-032	HOCP92-648	L99-233	25
XL07-033	HOCP89-846	HOCP96-540	73
XL07-034	HOCP92-624	LCP85-384	4015
XL07-035	LCP81-010	LCP85-384	3350
XL07-036	HOCP95-951	L01-299	1225
XL07-037	L97-128	L01-299	315
XL07-038	US79-010	L01-299	812
XL07-039	L01-299	HOCP96-540	250
XL07-040	HOCP95-951	HOCP96-540	1751
XL07-041	L04-408	HOCP96-540	2801
XL07-042	L05-457	HOCP96-540	951
XL07-043	LCP81-010	HOCP96-540	1965
XL07-044	HOCP95-951	HOCP05-923	441
XL07-045	L97-128	HOCP05-923	242
XL07-046	L01-299	HOCP05-923	30
XL07-047	L97-128	L99-233	424
XL07-048	HO95-988	L99-233	336
XL07-049	HOCP92-624	L99-233	1958
XL07-050	HOCP99-825	L99-233	70
XL07-051	L01-299	L99-233	416
XL07-052	LCP81-010	L99-233	3500
XL07-053	HOCP02-623	L99-226	991
XL07-054	HOCP05-902	L99-226	0
XL07-055	L01-299	L99-226	146
XL07-056	L04-408	HOCP04-803	3047
XL07-057	HOCP02-623	HOCP04-803	259
XL07-058	HOCP02-610	HOCP02-623	294
XL07-059	HOCP00-950	L99-2333	534
XL07-060	HO95-988	L99-233	1232
XL07-061	LCP81-010	L99-233	2812
XL07-062	HOCP00-950	HOCP96-540	318
XL07-063	HO95-988	HOCP96-540	1739
XL07-064	US79-010	HOCP96-540	1602
XL07-065	LCP81-010	HOCP96-540	3411
XL07-066	HO95-988	HOCP02-623	185
XL07-067	HOCP92-624	HOCP02-623	2042
XL07-068	HOCP02-620	HOCP02-623	1318
XL07-069	HOCP04-803	HOCP02-623	404
XL07-070	L99-226	L01-299	14
XL07-071	HOCP92-624	L01-299	1858
XL07-072	L97-128	L01-299	143
XL07-073	L05-457	L01-299	612
XL07-074	HO95-988	LCP81-010	0
XL07-075	L97-128	LCP81-010	189
XL07-076	US97-010	LCP81-010	54
XL07-077	L05-457	LCP81-010	377
XL07-078	HOCP05-902	LCP81-010	227
XL07-079	L06-025	LCP81-010	238
XL07-080	L99-233	L99-226	753
XL07-081	L04-425	L99-226	1279
XL07-082	HOCP96-540	L99-226	5546
XL07-083	HOCP91-552	L99-226	1640
XL07-084	L06-025	HOCP96-540	40
XL07-085	HO91-572	HOCP96-540	398
XL07-086	HOCP00-950	HOCP02-610	104
XL07-087	L05-457	HOCP02-610	1008
XL07-088	L05-460	HOCP02-610	129
XL07-089	HOCP02-620	L99-226	859
XL07-090	HOCP04-809	L99-226	612
XL07-091	L05-457	L99-226	1140
XL07-092	N27	L99-226	1266
XL07-093	HOCP04-803	L99-233	27
XL07-094	L01-299	L99-233	200
XL07-095	HOCP92-624	L99-233	5060
XL07-096	L97-128	L99-233	175

Table 5. Continue.

Cross	Female	Male	Seed
XL07-097	L97-128	HOCP91-552	23
XL07-098	HOCP92-624	LCP85-384	1280
XL07-099	L01-299	LCP85-384	29
XL07-100	HOCP00-950	LCP85-384	0
XL07-101	L05-457	HOCP96-561	476
XL07-102	L06-024	HOCP96-561	77
XL07-103	L01-299	HOCP96-561	67
XL07-104	HOCP92-624	HOCP96-561	1689
XL07-106	L05-460	HOCP91-552	20
XL07-107	L97-128	HOCP91-552	24
XL07-108	HOCP89-846	HOCP91-552	0
XL07-109	L06-024	L99-233	97
XL07-110	HOCP89-846	L99-233	601
XL07-111	L05-460	L99-233	127
XL07-112	HOCP96-540	L02-325	339
XL07-113	L06-024	L02-325	145
XL07-114	L97-128	L02-325	13
XL07-115	L99-226	HO95-988	0
XL07-116	L97-128	HO95-988	0
XL07-117	HOCP92-624	HO95-988	4
XL07-118	HOCP89-846	L99-226	30
XL07-119	HOCP00-950	L99-226	21
XL07-120	L06-026	L99-226	242
XL07-121	N27	L99-226	622
XL07-122	HOCP05-931	HOCP02-610	40
XL07-123	L05-450	HOCP02-610	13
XL07-124	L05-460	HOCP02-610	16
XL07-125	LCP81-010	HOCP02-610	114
XL07-126	HO91-572	HOCP02-610	187
XL07-127	CP79-348	HOCP02-610	1564
XL07-128	L97-128	HOCP02-610	48
XL07-129	LCP81-010	L94-428	167
XL07-130	US93-015	L94-428	132
XL07-131	L97-128	L94-428	49
XL07-132	L05-448	L05-448	93
XL07-133	HOCP02-620	HOCP02-620	239
XL07-134	HO95-988	HOCP96-540	197
XL07-135	L97-128	HOCP96-540	610
XL07-136	L97-128	HOCP85-845	0
XL07-137	HOCP00-930	HOCP85-845	0
XL07-138	L91-281	HOCP96-561	68
XL07-139	HOCP00-950	HOCP96-561	142
XL07-140	L01-299	HOCP96-561	74
XL07-141	L97-128	L99-233	249
XL07-142	HO95-988	L99-233	642
XL07-143	HOCP93-746	L99-233	344
XL07-144	L94-426	LCP85-384	0
XL07-146	HO95-988	LCP85-384	47
XL07-147	HOCP89-846	HOCP96-540	0
XL07-148	L05-450	HOCP96-540	0
XL07-149	L06-038	HOCP96-540	0
XL07-150	HOCP96-561	L99-226	274
XL07-151	L05-450	L99-226	0
XL07-152	L06-026	L99-226	188
XL07-153	HOCP00-950	LCP85-384	141
XL07-154	LCP81-010	LCP85-384	2186
XL07-155	HOCP96-561	LCP85-384	1103
XL07-156	L91-281	HOCP02-620	1522
XL07-157	LCP81-010	HOCP02-620	36
XL07-158	L97-128	L06-016	102
XL07-159	LCP81-010	L06-016	864
XL07-160	HOCP96-561	L06-016	228
XL07-161	L06-016	L06-016	151
XL07-162	HOCP96-561	L01-299	49
XL07-163	L06-040	L01-299	0
XL07-164	HOCP00-950	L01-299	0
XL07-165	L05-451	L05-451	13
XL07-166	HOCP00-950	HOCP96-540	395
XL07-167	HOCP02-610	HOCP96-540	1638
XL07-168	L06-040	HOCP96-540	631
XL07-169	L91-281	LCP85-384	897
XL07-170	N27	LCP85-384	4589
XL07-171	US79-010	LCP85-384	1051
XL07-172	US99-004	LCP85-384	1337
XL07-173	CP79-348	L99-226	1257
XL07-174	N27	L99-226	2883
XL07-175	L91-281	L99-226	143
XL07-176	L05-459	L99-226	573
XL07-177	HO95-988	L00-266	0
XL07-178	LCP81-010	L00-266	0
XL07-179	L94-426	L00-266	0
XL07-180	HOCP00-950	L01-299	68
XL07-181	HO95-988	L01-299	77
XL07-182	L06-040	L01-299	240
XL07-183	HOCP92-618	HOCP02-620	258
XL07-184	LCP81-010	HOCP02-620	4670
XL07-185	L05-450	L99-233	25
XL07-186	L05-451	L99-233	131
XL07-187	HOCP00-950	HOCP96-540	764
XL07-188	HOCP85-845	HOCP96-540	1171
XL07-189	HOCP02-610	HOCP96-540	20
XL07-190	L06-023	HOCP96-540	20
XL07-191	HOCP96-561	L06-001	964
XL07-192	L91-281	L06-001	1985
XL07-193	N27	L06-001	93
XL07-194	HOCP02-618	L06-001	1587

Table 5. Continue.

Cross	Female	Male	Seed
XL07-195	HOCP00-950	L06-001	573
XL07-196	HOCP96-561	L05-450	71
XL07-197	L91-281	LCP85-384	345
XL07-198	L97-128	LCP85-384	21
XL07-199	L06-010	LCP85-384	228
XL07-200	L98-207	L94-428	1069
XL07-201	L05-459	L94-428	164
XL07-202	HOCP02-618	L99-226	319
XL07-203	L05-459	L99-226	219
XL07-204	L98-197	L99-226	1891
XL07-205	L06-040	HOCP85-845	93
XL07-206	L98-197	HOCP85-845	288
XL07-207	L05-451	07P1	625
XL07-208	L98-209	07P1	11
XL07-209	L94-426	07P1	94
XL07-210	HOCP96-540	HOCP85-845	116
XL07-211	HOCP96-540	HOCP00-950	1501
XL07-212	LCP85-384	HOCP00-950	405
XL07-213	HOCP96-540	HOCP89-831	2642
XL07-214	HOCP00-930	HOCP02-618	316
XL07-215	HOCP02-620	L99-226	1030
XL07-216	L01-283	L99-226	1394
XL07-217	L02-325	L99-226	3214
XL07-218	L98-209	L99-226	1222
XL07-219	L04-434	L01-299	236
XL07-220	N27	L01-299	3681
XL07-221	L05-450	07P2	1307
XL07-222	L06-010	07P2	3446
XL07-223	L98-197	07P2	2296
XL07-224	HO91-572	07P2	862
XL07-225	HOCP00-930	07P2	392
XL07-226	L99-226	HOCP00-950	193
XL07-227	L97-128	HOCP00-950	33
XL07-228	HOCP00-950	LCP81-010	41
XL07-229	LCP81-010	HOCP00-950	1313
XL07-230	L98-197	L01-299	457
XL07-231	HOCP00-930	07P3	561
XL07-232	L94-433	07P3	127
XL07-233	L01-283	07P3	126
XL07-234	HOCP96-540	HOCP00-950	1372
XL07-235	LCP85-384	HOCP00-950	606
XL07-236	L94-428	LCP85-384	333
XL07-237	L01-283	LCP85-384	950
XL07-238	L06-010	LCP85-384	1229
XL07-239	LCP81-010	HOCP96-540	3642
XL07-240	US79-010	HOCP96-540	1974
XL07-241	L06-010	HOCP96-540	1388
XL07-242	L01-283	TUCCP77-042	214
XL07-243	L04-434	TUCCP77-042	17
XL07-244	HOCP89-831	HOCP96-540	1800
XL07-245	HOCP05-902	L99-226	289
XL07-246	L06-010	L99-226	1636
XL07-247	L98-197	L99-226	2049
XL07-248	L05-445	L05-450	1127
XL07-249	TUCCP77-042	L05-450	177
XL07-250	HOCP02-618	L05-450	319
XL07-251	LCP81-010	L98-207	620
XL07-252	L94-433	L98-207	422
XL07-253	TUCCP77-042	L98-207	40
XL07-254	HOCP89-831	LCP85-384	1583
XL07-255	L97-128	TUCCP77-042	28
XL07-256	LCP81-010	TUCCP77-042	0
XL07-257	L01-283	L99-226	362
XL07-258	L06-026	L99-226	339
XL07-259	LCP85-384	HOCP85-845	69
XL07-260	HOCP05-931	HOCP85-845	6
XL07-261	L94-428	L06-023	579
XL07-262	L01-283	L06-023	39
XL07-263	L01-299	L06-023	48
XL07-264	L05-450	HOCP96-540	42
XL07-265	L89-113	HOCP96-540	192
XL07-266	L94-433	L94-426	82
XL07-267	L97-137	L94-426	10
XL07-268	L98-209	L94-426	0
XL07-269	L05-457	L04-425	33

SELECTIONS, ADVANCEMENTS, AND ASSIGNMENTS OF THE LSU AGCENTER'S SUGARCANE VARIETY DEVELOPMENT PROGRAM FOR 2007

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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 84,307 seedlings from 178 crosses were planted in the field in the spring of 2007. The majority of these seedlings are progeny of crosses among commercial and elite experimental varieties. In the fall of 2007, family selection was practiced on the 50,655 stubble seedlings surviving the winter. This selection resulted in the planting of 2,000 first-line trial plots. At the same time, superior clones were also selected and advanced through subsequent stages (458 to second line trials, 127 to the increase stage). Assignments of permanent "L07" numbers were given to the 33 best clones of the 2002 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 84,307 seedlings from 178 crosses of the 2006 crossing series were planted to the field in the spring of 2007 (Table 1). Many of these seedlings were progeny of crosses among commercial and superior experimental varieties. In the fall of 2007, individual selection was practiced on the 53,025 stubble single stools of the 2005 crossing series that survived the winter. The 2,000 clones selected and advanced from the single stools were planted in 8-foot first-line trial plots. Dates of planting and harvesting of all plots in the selection phase of the program can be found in Table 2.

The 2,334 first-line trial plots of the 2004 crossing series were rated for cane yield and pest resistance in August of 2007 (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 458 clones in single row 16-foot second line trials plots.

Stalk counts were made on the 248 plant-cane second line trial plots of the 2003 crossing series in August 2007. Based on these counts and sucrose lab data collected in 2006, 127 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 2008. Of the 232 candidates from the first stubble crop of the second line trial plots, the best 33 clones from the 2002 crossing series were assigned permanent AL07" numbers (Table 5). These newly assigned AL07" 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 2002 through 2006 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. The results of the 2005 crossing series cross appraisal in 2007 are presented in Table 7.

Table 1. Summary of selections, advancements and assignments made during 2007 by the Louisiana, "L," Sugarcane Variety Development Program's personnel.

Crossing series	Crosses		Plants surviving transplanting	Over-wintered plants	Advanced to			
	Progeny test	Selection program			1st line	2nd line	Increase	On-station Nurseries (L07 Assignments)
			number of clones					
X02	200	192	72061	50951	2742	601	232	33
X03	134	211	92598	70910	1548	248	127	
X04	67	194	93490	76377	2334	458		
X05	60	128	79395	50655	2000			
X06	120	178	84307					

Table 2. Dates of seedling and line trials planted or harvested in 2007.

Crossing Series	Test	Crop	Date Planted	Date Harvested
X06	Seedlings	Planted	4/12 – 4/16/07	
X06	Progeny Test	Planted	4/16/07	
X05	Seedlings	First Stubble	4/17 -4/21/06	
X05	Progeny Test	First Stubble	4/21/06	12/04/07
X05	First Line Trials	Planted	9/07 – 9/17/07	
X04	First Line Trials	Plant-cane	9/08 – 9/22/06	
X03	First Line Trials	First Stubble	9/30/05	11/06/07
X04	Second Line Trials	Planted	9/20/07	
X03	Second Line Trials	Plant-cane	09/26/06	Not Harvested
X02	Second Line Trials	First Stubble	10/10/05	10/03/07
X01	Second Line Trials	Second Stubble	09/22/04	09/26/07
X03	Light Soil Increase	Planted	09/21/07	
X02	Light Soil Increase	Plant-cane	10/03/06	12/10/07
X01	Light Soil Increase	First Stubble	10/19/05	11/06/07
X00	Light Soil Increase	Second Stubble	09/28/04	09/26/07
X03	Heavy Soil Increase	Planted	09/21/07	
X02	Heavy Soil Increase	Plant-cane	10/03/06	Not Harvested
X01	Heavy Soil Increase	First Stubble	10/19/05	10/15/07
X00	Heavy Soil Increase	Second Stubble	09/28/04	09/26/07

Table 3. Numbers of experimental clones dropped for identified faults in the 2004 crossing series first-line trials.

	Fault	
Trait	Frequency	Percent
---------- 2334 clones enter first round of evaluation ----------		
Initial Selection (Rating)	1228	52.6
---------- 617 clones enter second round of evaluation ----------		
Lodged	207	8.9
Pith / Tube	60	2.6
Short	6	0.3
Diameter	11	0.5
Smut	55	2.4
Rust	2	0.1
Other	7	0.3
---------- 398 clones dropped ----------		
----------758 clones enter third round of evaluation ----------		
Brix	300	12.9
Clones advanced	458	19.6

Table 4. Number of experimental clones dropped for identified faults in the 2003 crossing series of the plantcane second line trial prior to advancement to the increase stage.

	Fault	
Trait	Frequency	Percent
---------- 248 clones enter first round of evaluation ----------		
Stalk count <75 per plot	8.0	32.2
Lodged	12.0	4.8
Pith / Tube	4.0	1.6
Diameter	5.0	2.0
Smut	2.0	0.8
Rust	5.0	2.0
Short	13.0	5.2
---------- 121 clones dropped ----------		
Clones advanced to Increase stage	127	51.2

Table 5. Mean yield data of the 2007 “L” assignments made in first-stubble second line trial plots.

Variety	Female	Male	Sugar Per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number
			Lbs/A	Tons/A	Lbs/Ton	Lbs	Stalks/A
LCP85-384	CP77-310	CP77-407	7569	43.7	172	1.60	53769
HO95-988	CP86-941	US89-012	9819	56.3	174	2.47	45602
HOCP96-540	LCP86-454	LCP85-384	8237	52.0	158	2.16	48324
L97-128	LCP81-010	LCP85-384	7235	33.2	218	1.87	35619
L07-041	HOCP96-509	L98-207	9106	43.5	209	2.02	43106
L07-042	HOCP96-509	L98-207	8538	43.5	196	1.42	61256
L07-043	LCP85-384	L00-247	12444	55.3	225	1.67	66248
L07-044	HO95-988	L98-207	12051	53.2	227	1.97	53996
L07-045	HOCP92-624	HOCP98-741	8292	46.8	177	1.75	53543
L07-046	L98-207	L92-321	8003	42.9	187	1.99	43106
L07-047	HOCP98-741	LCP85-384	8113	45.9	177	1.66	55358
L07-048	HO95-988	L98-207	9059	44.0	206	2.52	34939
L07-049	HOCP92-624	L99-226	8491	36.6	232	1.99	36754
L07-050	LCP85-313	L98-209	8087	45.3	179	1.75	51728
L07-051	HO95-988	LCP85-384	7809	39.2	199	1.73	45375
L07-052	HO95-988	LCP85-384	8500	41.0	208	1.48	55358
L07-053	HOCP92-624	L00-266	9077	44.7	203	2.03	44014
L07-054	L01-315	HOCP98-741	8328	44.4	188	1.47	60349
L07-055	HOCP00-905	02P4	8677	49.0	177	2.25	43560
L07-056	HO95-988	L98-207	8013	46.5	172	1.83	50820
L07-057	L01-315	HOCP98-741	9840	53.9	183	1.90	56719
L07-058	HOCP96-509	L98-207	8759	40.0	219	1.68	47644
L07-059	L98-207	02P10	10367	46.0	225	2.05	44921
L07-060	L98-207	02P10	9348	39.5	237	1.54	51274
L07-061	HO95-988	LCP85-384	10063	46.0	219	1.65	55811
L07-062	L93-363	LCP85-384	7850	47.8	164	1.97	48551
L07-063	HO95-988	LCP85-384	8399	43.2	195	1.73	49913
L07-064	LCP85-384	HOCP01-517	7977	40.9	195	1.84	44468
L07-065	LCP85-384	02P11	8626	48.4	178	1.92	50366
L07-066	L98-207	02P10	9300	37.7	247	1.75	43106
L07-067	L91-281	L99-226	9979	61.3	163	2.48	49459
L07-068	L98-207	02P10	10877	51.5	211	1.62	63525
L07-069	HO95-988	L00-266	10132	49.3	206	2.05	48098
L07-070	LCP85-384	HOCP01-517	9322	55.1	169	2.11	52181
L07-071	CP83-644	L99-233	9508	49.7	191	1.89	52635
L07-072	LCP85-384	HOCP01-517	8956	51.0	176	2.08	49005
L07-073	HOCP96-561	L99-226	12851	59.0	218	1.70	69424

Table 6. Advancement summary of crosses in the 2002 through 2005 crossing series.

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
2002 Crossing Series										
CP70-321	LCP85-384	185	2	28	0	21	0	26	0	44
CP77-405	HOCP96-540	454	0	12	0	21	0	26	0	44
CP77-405	L99-233	172	3	31	0	21	0	26	0	44
CP77-405	LCP85-384	234	8	49	0	21	0	26	0	44
CP78-317	L92-312	80	9	96	2	91	0	26	0	44
CP79-318	L91-255	243	10	57	0	21	0	26	0	44
CP79-318	L92-312	222	7	46	0	21	0	26	0	44
CP79-348	HOCP92-618	239	16	78	3	74	2	87	0	44
CP79-348	L98-207	703	89	96	15	87	12	97	0	44
CP79-348	L98-207	237	2	26	.	.	.	.	.	.
CP83-644	02P9	196	4	33	1	52	1	79	0	44
CP83-644	L99-233	465	19	57	6	77	2	69	1	92
CP89-831	HOCP89-846	485	22	63	3	54	0	26	0	44
HO01-566	02P9	481	17	50	3	54	1	57	0	44
HO89-889	HOCP89-846	714	18	38	2	44	0	26	0	44
HO95-988	02P13	239	0	12	0	21	0	26	0	44
HO95-988	HOCP93-767	443	10	36	0	21	0	26	0	44
HO95-988	HOCP96-540	236	0	12	0	21	0	26	0	44
HO95-988	L00-266	249	23	89	2	60	1	66	1	95
HO95-988	L94-432	58	4	81	0	21	0	26	0	44
HO95-988	L98-207	664	41	75	10	81	6	90	3	97
HO95-988	LCP82-089	404	40	93	2	51	1	60	0	44
HO95-988	LCP85-384	464	45	91	8	83	1	58	0	44
HO95-988	LCP85-384	1203	118	92	46	97	17	95	4	94
HOCP00-905	02P3	245	26	94	13	99	5	99	0	44
HOCP00-905	02P4	477	42	87	17	97	7	96	1	91
HOCP00-920	HOCP92-618	138	3	35	0	21	0	26	0	44
HOCP00-920	L99-226	411	0	12	0	21	0	26	0	44
HOCP01-517	02P10	164	5	44	2	72	1	80	0	44
HOCP85-845	02P11	1831	6	24	1	42	1	52	0	44
HOCP85-845	02P15	226	10	62	1	48	0	26	0	44
HOCP85-845	02P3	336	14	59	0	21	0	26	0	44
HOCP85-845	HOCP89-846	234	4	31	1	47	0	26	0	44
HOCP85-845	L98-207	1343	51	53	14	70	4	63	0	44
HOCP91-552	HOCP97-609	466	0	12	0	21	0	26	0	44
HOCP91-552	L98-209	851	26	45	4	50	1	54	0	44
HOCP92-624	02P10	233	2	27	0	21	0	26	0	44
HOCP92-624	02P16	216	17	84	4	84	1	75	0	44
HOCP92-624	HOCP98-741	202	15	82	5	91	2	92	1	98
HOCP92-624	HOCP98-741	316	17	71	.	.	.	.	.	.
HOCP92-624	L00-259	1435	140	92	32	88	11	85	0	44
HOCP92-624	L00-266	711	35	66	9	75	2	61	1	89
HOCP92-624	L91-255	868	76	87	11	75	4	74	0	44
HOCP92-624	L98-209	1149	59	68	9	58	4	64	0	44
HOCP92-624	L99-226	1171	46	54	9	58	4	63	1	88

Table 6. Continue.

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP92-624	LCP85-384	1396	81	74	21	80	5	65	0	44
HOCP92-624	LCP85-384	401	9	35	.	.	.	.	.	.
HOCP92-624	US01-040	230	41	98	9	98	4	97	0	44
HOCP92-624	US01-040	159	0	12	.	.	.	.	.	.
HOCP93-746	L91-255	217	5	36	0	21	0	26	0	44
HOCP93-746	L99-233	463	20	61	3	55	1	58	0	44
HOCP93-749	L00-247	131	2	30	0	21	0	26	0	44
HOCP93-749	L00-266	481	0	12	0	21	0	26	0	44
HOCP93-749	LCP85-384	68	0	12	0	21	0	26	0	44
HOCP93-749	LCP85-384	239	9	53	3	74	0	26	0	44
HOCP93-767	HOCP97-609	213	0	12	0	21	0	26	0	44
HOCP93-767	L99-226	234	33	97	6	92	1	68	0	44
HOCP93-767	L99-226	111	3	41	.	.	.	.	.	.
HOCP94-806	HOCP91-552	212	11	69	2	67	1	77	0	44
HOCP94-806	HOCP93-767	240	11	64	3	73	0	26	0	44
HOCP94-806	HOCP96-540	209	12	73	4	85	0	26	0	44
HOCP95-951	02P2	670	56	87	20	95	9	95	0	44
HOCP96-509	L98-207	1205	76	76	16	79	10	86	3	93
HOCP96-561	HOCP00-905	118	0	12	0	21	0	26	0	44
HOCP96-561	L99-226	466	16	49	6	77	4	89	1	92
HOCP98-741	HOCP85-845	249	7	42	2	60	0	26	0	44
HOCP98-741	L00-249	236	16	80	1	46	1	67	0	44
HOCP98-741	L00-268	214	22	94	2	67	1	76	1	98
HOCP98-741	L91-255	236	10	59	2	62	2	88	0	44
HOCP98-741	L94-432	225	7	45	2	65	0	26	0	44
HOCP98-741	L98-207	178	0	12	0	21	0	26	0	44
HOCP98-741	L98-209	151	0	12	0	21	0	26	0	44
HOCP98-741	L99-226	244	23	89	1	45	0	26	0	44
HOCP98-781	HOCP85-845	423	3	25	0	21	0	26	0	44
HOCP98-781	LCP85-384	684	38	72	4	52	1	54	0	44
HOCP99-866	L01-291	473	0	12	0	21	0	26	0	44
L00-247	02P4	230	13	73	3	79	3	94	0	44
L00-247	HOCP97-609	35	0	12	0	21	0	26	0	44
L00-247	L98-209	80	0	12	0	21	0	26	0	44
L00-247	L99-226	204	4	33	2	68	1	78	0	44
L00-264	L94-432	232	21	88	2	63	1	70	0	44
L00-266	LCP86-454	413	0	12	0	21	0	26	0	44
L00-268	HOCP92-618	435	21	65	3	56	0	26	0	44
L00-268	HOCP96-540	1070	0	12	0	21	0	26	0	44
L00-268	L92-321	217	0	12	0	21	0	26	0	44
L00-270	02P2	426	19	63	3	57	2	76	0	44
L00-270	HOCP96-540	521	3	25	1	43	1	56	0	44
L00-270	HOCP97-609	793	0	12	0	21	0	26	0	44
L00-270	HOCP97-609	19	0	12	.	.	.	.	.	.
L00-270	L00-247	228	10	62	2	64	1	72	1	96
L00-270	L99-226	1089	0	12	0	21	0	26	0	44
L01-315	HOCP96-540	465	23	66	5	71	3	83	0	44

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L01-315	HOCP96-561	232	4	31	0	21	0	26	0	44
L01-315	HOCP98-741	487	20	57	5	69	3	81	2	95
L01-315	HOCP99-825	78	2	39	0	21	0	26	0	44
L01-315	L94-428	188	0	12	0	21	0	26	0	44
L01-315	LCP86-454	240	8	48	1	46	0	26	0	44
L01-315	US01-040	244	0	12	0	21	0	26	0	44
L89-113	LCP85-384	250	20	85	6	89	2	85	0	44
L91-255	HOCP00-905	82	2	37	0	21	0	26	0	44
L91-281	L99-226	761	45	75	6	59	2	60	1	89
L92-312	02P2	442	0	12	0	21	0	26	0	44
L92-312	US80-004	101	0	12	0	21	0	26	0	44
L93-363	L00-259	579	15	39	4	56	2	64	1	91
L93-363	L91-255	208	31	98	4	86	1	77	0	44
L93-363	L99-226	144	12	86	3	86	0	26	0	44
L93-365	L99-233	242	7	43	0	21	0	26	0	44
L93-365	LCP85-384	236	8	49	0	21	0	26	0	44
L93-399	L98-209	229	8	50	2	63	1	71	0	44
L93-399	L98-209	394	17	61	0	21	0	26	0	44
L94-426	HOCP96-540	122	0	12	0	21	0	26	0	44
L94-426	HOCP97-609	225	15	78	1	48	0	26	0	44
L94-426	L98-207	117	2	31	1	62	1	89	0	44
L94-428	02P12	214	2	27	1	50	0	26	0	44
L94-428	HOCP96-540	482	31	78	11	88	3	82	0	44
L94-428	HOCP97-609	41	0	12	0	21	0	26	0	44
L94-428	L00-259	442	21	65	4	66	2	73	0	44
L94-428	L98-207	943	48	68	18	85	4	67	0	44
L94-433	HOCP92-618	174	11	76	0	21	0	26	0	44
L94-433	L94-428	189	0	12	0	21	0	26	0	44
L94-433	L99-226	1280	41	46	6	50	2	55	0	44
L96-040	HOCP97-609	490	0	12	0	21	0	26	0	44
L96-040	L00-268	240	8	48	0	21	0	26	0	44
L96-040	L99-226	664	0	12	0	21	0	26	0	44
L96-092	LCP85-384	463	13	42	5	71	1	58	0	44
L97-128	HOCP91-951	186	5	41	0	21	0	26	0	44
L97-128	HOCP96-540	246	18	82	8	96	3	92	0	44
L97-128	L94-428	146	6	57	0	21	0	26	0	44
L97-128	L98-207	133	7	71	0	21	0	26	0	44
L97-128	L99-233	87	6	81	1	72	0	26	0	44
L97-128	LCP85-384	69	0	12	0	21	0	26	0	44
L98-197	HOCP99-866	226	0	12	0	21	0	26	0	44
L98-207	02P10	1009	96	90	24	89	13	94	4	94
L98-207	02P7	244	0	12	0	21	0	26	0	44
L98-207	02P9	920	0	12	0	21	0	26	0	44
L98-207	L92-321	225	17	83	2	65	1	73	1	97
L98-207	L99-226	461	17	52	8	83	3	83	0	44
L98-209	HOCP97-609	213	0	12	0	21	0	26	0	44
L98-209	L01-299	326	0	12	0	21	0	26	0	44

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L99-233	02P18	232	10	61	6	92	1	70	0	44
L99-233	HOCP98-741	216	0	12	0	21	0	26	0	44
L99-233	L99-226	248	9	51	2	61	1	66	0	44
LCP81-010	HOCP96-540	673	54	85	11	82	2	62	0	44
LCP81-010	L92-312	462	14	44	1	44	1	58	0	44
LCP81-010	L99-233	162	11	80	4	90	2	93	0	44
LCP81-010	LCP85-384	226	12	71	1	48	1	72	0	44
LCP81-10	02P19	223	9	55	0	21	0	26	0	44
LCP82-089	02P3	445	0	12	0	21	0	26	0	44
LCP82-089	02P4	410	0	12	0	21	0	26	0	44
LCP85-313	HOCP92-618	137	2	30	0	21	0	26	0	44
LCP85-313	HOCP97-609	159	9	73	0	21	0	26	0	44
LCP85-313	L98-209	623	31	67	8	76	4	82	1	90
LCP85-313	LCP82-089	109	4	52	1	66	1	91	0	44
LCP85-384	02P11	1105	22	33	7	55	3	61	1	88
LCP85-384	02P17	145	14	91	0	21	0	26	0	44
LCP85-384	02P3	200	0	12	0	21	0	26	0	44
LCP85-384	02P4	244	18	82	7	94	2	86	0	44
LCP85-384	HOCP01-517	444	49	95	20	98	9	98	3	99
LCP85-384	HOCP01-517	456	9	33	.	.	.	.	.	.
LCP86-454	02P11	1033	0	12	0	21	0	26	0	44
LCP86-454	02P14	233	12	69	3	77	1	69	0	44
LCP86-454	L98-207	374	3	26	0	21	0	26	0	44
LCP86-454	LCP85-384	1366	34	38	7	52	1	53	0	44
LCP86-454	LCP85-384	483	0	12	.	.	.	.	.	.
LH083-153	HOCP92-618	92	0	12	0	21	0	26	0	44
N-27	HOCP96-540	383	38	93	11	94	2	79	0	44
N-27	HOCP96-540	347	14	55	.	.	.	.	.	.
N-27	L94-428	185	6	46	3	82	1	80	0	44
N-27	L98-209	657	18	41	4	53	1	55	0	44
N-27	LCP85-384	252	16	76	7	93	5	98	0	44
N-27	LCP85-384	420	17	55	.	.	.	.	.	.
TucCP77-042	LCP85-384	476	24	67	6	74	4	88	0	44
US79-010	HOCP96-540	131	17	97	4	95	1	84	0	44
US79-010	L01-299	216	17	84	3	80	1	75	0	44
US79-010	L98-207	245	10	57	0	21	0	26	0	44
US79-010	LCP85-384	102	19	99	1	68	1	91	0	44
US96-002	L01-299	185	2	28	0	21	0	26	0	44
2003 Crossing Series										
CP65-357	HO95-988	238	0	38	0	39	0	41	.	.
CP65-357	LCP85-384	1235	0	38	0	39	0	41	.	.
CP65-357	LCP85-384	964	0	38	0	39	0	41	.	.
CP73-351	HOCP96-540	457	0	38	0	39	0	41	.	.
CP77-310	HOCP91-552	231	0	38	0	39	0	41	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
CP83-644	HOCP97-606	244	0	38	0	39	0	41	.	.
HO01-564	L99-226	425	29	84	5	87	3	90	.	.
HO01-564	LCP85-384	238	0	38	0	39	0	41	.	.
HO89-889	L98-209	209	0	38	0	39	0	41	.	.
HO95-988	L99-226	182	0	38	0	39	0	41	.	.
HO95-988	L99-233	274	0	38	0	39	0	41	.	.
HO95-988	LCP85-384	243	27	91	3	87	1	86	.	.
HOCP00-905	HOCP00-930	154	28	99	11	99	8	99	.	.
HOCP00-905	HOCP92-618	175	0	38	0	39	0	41	.	.
HOCP00-905	HOCP96-540	222	0	38	0	39	0	41	.	.
HOCP00-905	HOCP97-609	248	0	38	0	39	0	41	.	.
HOCP00-905	L91-281	500	0	38	0	39	0	41	.	.
HOCP00-905	L94-432	377	56	97	18	98	11	98	.	.
HOCP00-905	LCP85-384	251	0	38	0	39	0	41	.	.
HOCP00-905	LCP85-384	452	0	38	0	39	0	41	.	.
HOCP00-930	HOCP91-552	478	36	86	10	94	7	95	.	.
HOCP00-930	HOCP91-552	418	0	38	.	.	.	.	.	.
HOCP00-930	HOCP96-540	490	0	38	0	39	0	41	.	.
HOCP00-942	L00-266	242	0	38	0	39	0	41	.	.
HOCP00-946	LCP85-384	236	0	38	0	39	0	41	.	.
HOCP00-950	HOCP01-506	212	24	92	6	96	1	89	.	.
HOCP00-950	HOCP01-506	228	0	38	0	39	0	41	.	.
HOCP00-950	HOCP01-506	124	0	38	.	.	.	.	.	.
HOCP00-950	HOCP91-552	668	6	77	1	80	0	41	.	.
HOCP00-950	HOCP91-552	446	0	38	0	39	0	41	.	.
HOCP00-950	HOCP96-540	934	71	87	12	89	5	89	.	.
HOCP00-950	L00-266	249	0	38	0	39	0	41	.	.
HOCP00-950	L99-226	240	23	89	2	85	0	41	.	.
HOCP01-523	HO91-572	240	0	38	0	39	0	41	.	.
HOCP01-523	LCP85-384	234	0	38	0	39	0	41	.	.
HOCP01-523	LCP85-384	243	16	84	2	84	1	86	.	.
HOCP01-525	03P12	235	0	38	0	39	0	41	.	.
HOCP01-525	HOCP01-506	244	26	90	4	91	2	91	.	.
HOCP01-525	LCP85-384	213	31	96	5	95	3	95	.	.
HOCP01-528	03P15	175	0	38	0	39	0	41	.	.
HOCP01-541	HOCP96-540	153	0	38	0	39	0	41	.	.
HOCP01-544	L98-197	244	0	38	0	39	0	41	.	.
HOCP01-558	HOCP00-905	241	0	38	0	39	0	41	.	.
HOCP01-561	03P12	490	64	94	10	93	6	94	.	.
HOCP01-561	03P13	256	0	38	0	39	0	41	.	.
HOCP01-561	LCP85-384	172	0	38	0	39	0	41	.	.
HOCP85-845	03P22	232	32	94	4	92	2	92	.	.
HOCP85-845	HOCP01-506	483	0	38	0	39	0	41	.	.
HOCP85-845	L02-328	247	25	89	7	96	3	93	.	.
HOCP85-845	L02-328	477	13	78	.	.	.	.	.	.
HOCP85-845	L98-207	727	68	88	9	88	4	90	.	.
HOCP85-845	L98-209	741	0	38	0	39	0	41	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP85-845	LCP85-384	467	0	38	0	39	0	41	.	.
HOCP88-739	LCP85-384	683	0	38	0	39	0	41	.	.
HOCP89-831	03P12	489	0	38	0	39	0	41	.	.
HOCP89-831	LCP85-384	491	0	38	0	39	0	41	.	.
HOCP89-846	HOCP96-540	796	0	38	0	39	0	41	.	.
HOCP89-846	HOCP96-540	245	0	38	0	39	0	41	.	.
HOCP89-846	L02-328	241	0	38	0	39	0	41	.	.
HOCP89-846	L98-209	442	0	38	0	39	0	41	.	.
HOCP89-846	LCP85-384	244	0	38	0	39	0	41	.	.
HOCP91-552	03P16	183	0	38	0	39	0	41	.	.
HOCP91-552	L99-226	393	44	91	19	99	12	99	.	.
HOCP92-618	L02-333	231	0	38	0	39	0	41	.	.
HOCP92-624	03P1	641	0	38	0	39	0	41	.	.
HOCP92-624	03P2	247	0	38	0	39	0	41	.	.
HOCP92-624	HOCP00-905	235	0	38	0	39	0	41	.	.
HOCP92-624	HOCP85-845	239	0	38	0	39	0	41	.	.
HOCP92-624	HOCP91-552	355	0	38	0	39	0	41	.	.
HOCP92-624	HOCP91-552	228	33	95	3	89	2	92	.	.
HOCP92-624	HOCP96-540	497	0	38	0	39	0	41	.	.
HOCP92-624	L02-320	234	0	38	0	39	0	41	.	.
HOCP92-624	L02-323	208	31	97	6	97	5	97	.	.
HOCP92-624	L91-281	502	0	38	0	39	0	41	.	.
HOCP92-624	L96-092	494	0	38	0	39	0	41	.	.
HOCP92-624	L98-209	1114	0	38	0	39	0	41	.	.
HOCP92-624	L98-209	501	0	38	0	39	0	41	.	.
HOCP92-624	L99-226	250	0	38	0	39	0	41	.	.
HOCP92-624	LCP85-384	222	0	38	0	39	0	41	.	.
HOCP92-624	LCP85-384	473	0	38	0	39	0	41	.	.
HOCP92-624	LCP85-384	498	26	82	2	81	1	84	.	.
HOCP92-624	LCP85-384	315	0	38	0	39	0	41	.	.
HOCP92-648	HOCP96-540	215	0	38	0	39	0	41	.	.
HOCP92-648	L98-209	482	0	38	0	39	0	41	.	.
HOCP92-648	L98-209	487	0	38	0	39	0	41	.	.
HOCP92-648	L99-233	437	49	91	10	94	8	96	.	.
HOCP92-648	L99-233	236	40	98	.	.	.	.	.	.
HOCP92-648	LCP85-384	1199	0	38	0	39	0	41	.	.
HOCP92-648	LCP85-384	256	0	38	0	39	0	41	.	.
HOCP92-648	LCP85-384	247	0	38	0	39	0	41	.	.
HOCP93-746	HOCP85-845	438	0	38	0	39	0	41	.	.
HOCP93-746	LCP85-384	437	0	38	0	39	0	41	.	.
HOCP93-749	L99-226	246	0	38	0	39	0	41	.	.
HOCP95-951	03P1	254	21	87	2	84	0	41	.	.
HOCP96-540	03P11	1587	0	38	0	39	0	41	.	.
HOCP96-540	03P12	474	0	38	0	39	0	41	.	.
HOCP96-540	03P18	195	0	38	0	39	0	41	.	.
HOCP96-540	03P18	127	0	38	.	.	.	.	.	.
HOCP96-540	03P19	200	0	38	0	39	0	41	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP96-540	03P6	251	0	38	0	39	0	41	.	.
HOCP96-540	03P8	249	0	38	0	39	0	41	.	.
HOCP96-540	03P9	1376	0	38	0	39	0	41	.	.
HOCP96-540	HOCP01-506	674	0	38	0	39	0	41	.	.
HOCP96-540	L02-316	1218	0	38	0	39	0	41	.	.
HOCP96-540	L98-209	435	0	38	0	39	0	41	.	.
HOCP96-540	L99-226	1435	0	38	0	39	0	41	.	.
HOCP96-561	03P19	247	43	98	4	91	2	91	.	.
HOCP96-561	L02-341	306	0	38	0	39	0	41	.	.
HOCP97-606	HOCP96-540	592	0	38	0	39	0	41	.	.
HOCP97-606	L98-209	239	0	38	0	39	0	41	.	.
HOCP97-609	03P13	365	0	38	0	39	0	41	.	.
HOCP97-609	03P15	247	0	38	0	39	0	41	.	.
HOCP97-609	HOCP96-540	805	0	38	0	39	0	41	.	.
HOCP98-741	L02-320	383	0	38	0	39	0	41	.	.
HOCP98-781	03P9	438	0	38	0	39	0	41	.	.
HOCP98-781	L98-207	481	0	38	0	39	0	41	.	.
HOCP98-781	LCP85-384	208	0	38	0	39	0	41	.	.
L01-281	03P9	428	0	38	0	39	0	41	.	.
L01-283	HOCP91-552	476	15	79	3	83	2	87	.	.
L01-283	LCP85-384	160	0	38	0	39	0	41	.	.
L01-299	LCP85-384	646	0	38	0	39	0	41	.	.
L01-299	LCP85-384	677	0	38	0	39	0	41	.	.
L02-233	L96-092	241	23	88	3	88	0	41	.	.
L02-319	HOCP96-540	407	0	38	0	39	0	41	.	.
L02-320	HOCP85-845	229	0	38	0	39	0	41	.	.
L02-320	HOCP96-540	487	0	38	0	39	0	41	.	.
L02-320	L99-226	243	12	81	4	92	1	86	.	.
L02-322	HOCP85-845	240	0	38	0	39	0	41	.	.
L02-322	HOCP96-540	132	0	38	0	39	0	41	.	.
L02-322	L99-226	211	0	38	0	39	0	41	.	.
L02-328	HO91-572	223	0	38	0	39	0	41	.	.
L02-328	HOCP91-552	224	0	38	0	39	0	41	.	.
L02-328	HOCP91-552	204	0	38	0	39	0	41	.	.
L02-328	L99-226	896	53	83	8	86	3	85	.	.
L02-328	L99-233	711	0	38	0	39	0	41	.	.
L02-333	HOCP96-540	748	0	38	0	39	0	41	.	.
L02-336	POLY	227	0	38	0	39	0	41	.	.
L02-341	HOCP91-552	381	42	90	12	97	7	96	.	.
L02-341	HOCP91-552	208	10	80	3	90	2	93	.	.
L02-341	HOCP96-540	428	0	38	0	39	0	41	.	.
L02-351	LCP85-384	242	0	38	0	39	0	41	.	.
L91-255	HOCP96-540	471	0	38	0	39	0	41	.	.
L91-255	L00-266	437	0	38	0	39	0	41	.	.
L91-255	LCP85-384	245	0	38	0	39	0	41	.	.
L94-426	HOCP91-552	356	0	38	0	39	0	41	.	.
L94-428	HOCP96-540	246	0	38	0	39	0	41	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L94-432	03P24	458	0	38	0	39	0	41	.	.
L94-432	LCP85-384	419	0	38	0	39	0	41	.	.
L94-433	HO91-572	460	0	38	0	39	0	41	.	.
L94-433	LCP85-384	1087	54	81	6	83	1	83	.	.
L96-040	HOCP00-905	241	0	38	0	39	0	41	.	.
L96-040	L94-432	477	0	38	0	39	0	41	.	.
L96-040	L99-226	1105	0	38	0	39	0	41	.	.
L96-040	LCP85-384	212	0	38	0	39	0	41	.	.
L97-128	HO91-572	186	0	38	0	39	0	41	.	.
L97-128	HOCP91-552	207	0	38	0	39	0	41	.	.
L97-128	HOCP91-552	166	0	38	0	39	0	41	.	.
L97-128	L98-197	166	0	38	0	39	0	41	.	.
L97-128	L98-207	435	31	85	7	90	2	88	.	.
L97-128	L98-209	153	23	97	5	98	4	98	.	.
L97-128	L99-226	74	0	38	0	39	0	41	.	.
L97-128	LCP85-384	188	0	38	0	39	0	41	.	.
L97-128	POLY	371	0	38	0	39	0	41	.	.
L97-137	L94-432	440	0	38	0	39	0	41	.	.
L97-137	L96-092	486	0	38	0	39	0	41	.	.
L98-207	HOCP01-553	721	0	38	0	39	0	41	.	.
L98-209	HOCP91-552	362	0	38	0	39	0	41	.	.
L98-209	HOCP96-540	229	0	38	0	39	0	41	.	.
L98-209	L98-207	1190	0	38	0	39	0	41	.	.
L99-226	03P10	233	0	38	0	39	0	41	.	.
L99-226	03P13	238	0	38	0	39	0	41	.	.
L99-226	HOCP92-618	850	44	82	7	84	1	83	.	.
L99-226	HOCP96-540	764	64	88	8	87	2	85	.	.
L99-226	L98-197	1172	0	38	0	39	0	41	.	.
L99-226	L99-233	920	0	38	0	39	0	41	.	.
L99-233	L96-092	396	0	38	0	39	0	41	.	.
LCP02-337	03P14	243	0	38	0	39	0	41	.	.
LCP02-337	03P18	342	0	38	0	39	0	41	.	.
LCP02-337	HOCP96-540	440	0	38	0	39	0	41	.	.
LCP02-337	L99-226	1160	0	38	0	39	0	41	.	.
LCP02-344	HOCP96-540	395	0	38	0	39	0	41	.	.
LCP02-345	HOCP96-540	450	0	38	0	39	0	41	.	.
LCP02-345	L99-226	190	0	38	0	39	0	41	.	.
LCP81-010	03P15	1323	0	38	0	39	0	41	.	.
LCP81-010	HO91-572	487	0	38	0	39	0	41	.	.
LCP81-010	HOCP91-552	242	13	83	1	82	1	87	.	.
LCP81-010	L02-320	226	0	38	0	39	0	41	.	.
LCP81-010	L98-197	786	0	38	0	39	0	41	.	.
LCP81-010	L98-207	238	0	38	0	39	0	41	.	.
LCP81-010	L98-207	694	0	38	0	39	0	41	.	.
LCP81-010	L98-207	1152	83	85	4	81	2	84	.	.
LCP81-010	L98-207	1768	59	79	.	.	.	.	.	.
LCP81-010	LCP85-384	908	0	38	0	39	0	41	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
LCP81-010	LCP85-384	956	0	38	0	39	0	41	.	.
LCP81-010	LCP85-384	705	41	83	.	.	.	.	.	.
LCP82-089	LCP85-384	708	0	38	0	39	0	41	.	.
LCP85-384	03P10	866	37	80	1	79	0	41	.	.
LCP85-384	03P22	95	0	38	0	39	0	41	.	.
LCP85-384	03P24	248	0	38	0	39	0	41	.	.
LCP85-384	03P8	666	0	38	0	39	0	41	.	.
LCP86-454	03P8	246	0	38	0	39	0	41	.	.
MISC	MISC	489	0	38	0	39	0	41	.	.
N-27	HO95-988	233	30	94	1	82	1	88	.	.
N-27	HO95-988	1536	0	38	.	.	.	.	.	.
N27	03P22	466	66	95	12	95	6	94	.	.
TucCP77-042	POLY	245	0	38	0	39	0	41	.	.
US01-039	HO91-572	481	0	38	0	39	0	41	.	.
US01-039	HOCP96-540	444	0	38	0	39	0	41	.	.
US01-039	LCP85-384	489	58	93	1	80	0	41	.	.
US01-039	LCP85-384	150	11	86	0	39	0	41	.	.
US01-039	LCP85-384	469	14	78	.	.	.	.	.	.
US01-040	HO91-572	172	0	38	0	39	0	41	.	.
US02-096	HOCP01-553	230	42	99	2	86	0	41	.	.
US02-096	HOCP01-553	452	0	38	.	.	.	.	.	.
US02-096	LCP85-384	210	0	38	0	39	0	41	.	.
US99-002	LCP85-384	242	28	93	5	93	5	97	.	.
US99-004	LCP85-384	222	0	38	0	39	0	41	.	.
2004 Crossing Series										
CP65-357	HO95-988	238	8	69	0	27	.	.	.	.
CP65-357	L02-316	488	29	87	9	95	.	.	.	.
CP65-357	L98-207	693	0	21	0	27	.	.	.	.
CP65-357	L99-233	684	18	60	10	91	.	.	.	.
CP73-351	L98-207	956	0	21	0	27	.	.	.	.
CP79-318	L02-316	247	0	21	0	27	.	.	.	.
CP79-318	LCP85-384	724	16	54	3	63	.	.	.	.
HO01-564	HOCP91-552	238	11	80	0	27	.	.	.	.
HO01-564	L99-226	444	0	21	0	27	.	.	.	.
HO01-564	TucCP77-042	743	47	89	6	77	.	.	.	.
HO91-572	04P1	234	0	21	0	27	.	.	.	.
HO95-988	HOCP89-846	251	6	57	2	76	.	.	.	.
HO95-988	HOCP91-552	941	17	51	4	65	.	.	.	.
HO95-988	HOCP91-552	498	0	21	0	27	.	.	.	.
HO95-988	L98-207	1126	27	57	8	74	.	.	.	.
HO95-988	LCP85-384	732	0	21	0	27	.	.	.	.
HOCP00-930	HO95-988	480	2	42	0	27	.	.	.	.
HOCP00-930	HOCP89-846	706	0	21	0	27	.	.	.	.
HOCP00-930	HOCP91-552	243	0	21	0	27	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP00-930	HOCP91-552	455	16	71	5	83	.	.	.	.
HOCP00-930	L00-266	496	46	97	14	98	.	.	.	.
HOCP00-930	L02-353	450	13	63	5	83	.	.	.	.
HOCP00-930	L99-233	834	85	98	32	99	.	.	.	.
HOCP00-930	TucCP77-042	188	15	96	3	93	.	.	.	.
HOCP00-950	HOCP89-846	249	0	21	0	27	.	.	.	.
HOCP00-950	L98-209	244	0	21	0	27	.	.	.	.
HOCP00-950	LCP85-384	360	0	21	0	27	.	.	.	.
HOCP01-517	L98-207	985	43	79	8	77	.	.	.	.
HOCP01-523	L02-316	248	17	93	3	85	.	.	.	.
HOCP01-523	L98-209	491	0	21	0	27	.	.	.	.
HOCP01-523	LCP85-384	470	43	97	7	92	.	.	.	.
HOCP01-529	L99-226	243	0	21	0	27	.	.	.	.
HOCP01-541	HOCP92-618	239	0	21	0	27	.	.	.	.
HOCP01-544	L99-233	202	0	21	0	27	.	.	.	.
HOCP01-553	L99-233	825	41	84	14	94	.	.	.	.
HOCP01-558	HOCP92-618	152	0	21	0	27	.	.	.	.
HOCP01-558	HOCP97-609	252	0	21	0	27	.	.	.	.
HOCP01-558	LCP82-089	225	5	54	1	67	.	.	.	.
HOCP01-561	L97-137	248	10	75	1	61	.	.	.	.
HOCP01-561	L99-226	738	15	52	4	71	.	.	.	.
HOCP01-588	TucCP77-042	244	0	21	0	27	.	.	.	.
HOCP85-384	HO95-988	221	6	61	0	27	.	.	.	.
HOCP85-845	HO95-988	479	16	67	0	27	.	.	.	.
HOCP85-845	HOCP89-846	239	0	21	0	27	.	.	.	.
HOCP85-845	HOCP92-618	251	0	21	0	27	.	.	.	.
HOCP85-845	LCP82-089	423	18	78	0	27	.	.	.	.
HOCP85-845	LCP85-384	1383	35	59	4	59	.	.	.	.
HOCP89-831	LCP85-384	464	53	99	13	98	.	.	.	.
HOCP89-846	HO95-988	462	0	21	0	27	.	.	.	.
HOCP89-846	HO95-988	233	4	49	0	27	.	.	.	.
HOCP89-846	HOCP85-845	247	0	21	0	27	.	.	.	.
HOCP89-846	HOCP85-845	250	0	21	0	27	.	.	.	.
HOCP89-846	HOCP97-609	252	0	21	0	27	.	.	.	.
HOCP89-846	L02-316	428	4	44	1	56	.	.	.	.
HOCP89-846	LCP81-010	482	18	72	0	27	.	.	.	.
HOCP91-552	04P2	240	0	21	0	27	.	.	.	.
HOCP91-555	L98-209	245	0	21	0	27	.	.	.	.
HOCP91-555	LCP85-384	487	0	21	0	27	.	.	.	.
HOCP92-618	HO95-988	1455	0	21	0	27	.	.	.	.
HOCP92-618	HOCP89-846	122	2	48	0	27	.	.	.	.
HOCP92-618	HOCP97-609	502	0	21	0	27	.	.	.	.
HOCP92-618	LCP85-384	500	0	21	0	27	.	.	.	.
HOCP92-618	LCP85-384	252	0	21	0	27	.	.	.	.
HOCP92-624	04P16	247	10	75	1	61	.	.	.	.
HOCP92-624	HOCP85-845	502	10	52	0	27	.	.	.	.
HOCP92-624	HOCP89-846	126	1	43	1	76	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP92-624	HOCP91-552	473	18	74	10	97	.	.	.	.
HOCP92-624	HOCP91-552	205	5	57	0	27	.	.	.	.
HOCP92-624	HOCP96-540	1119	30	61	3	58	.	.	.	.
HOCP92-624	HOCP96-561	498	17	69	7	90	.	.	.	.
HOCP92-624	L00-266	479	0	21	0	27	.	.	.	.
HOCP92-624	L02-316	905	0	21	0	27	.	.	.	.
HOCP92-624	L02-353	253	8	66	0	27	.	.	.	.
HOCP92-624	L92-312	501	12	57	1	55	.	.	.	.
HOCP92-624	L94-428	496	8	48	0	27	.	.	.	.
HOCP92-624	L97-128	218	0	21	0	27	.	.	.	.
HOCP92-624	L98-207	1462	70	82	7	70	.	.	.	.
HOCP92-624	L98-209	842	43	85	4	70	.	.	.	.
HOCP92-624	L99-226	1184	67	87	17	90	.	.	.	.
HOCP92-624	L99-226	482	18	72	5	82	.	.	.	.
HOCP92-624	L99-233	1206	38	66	18	92	.	.	.	.
HOCP92-624	L99-233	1196	57	82	12	81	.	.	.	.
HOCP92-624	LCP82-089	876	20	55	6	74	.	.	.	.
HOCP92-624	LCP85-384	1294	98	95	16	86	.	.	.	.
HOCP92-624	LCP85-384	1844	94	85	.	.	.	.	.	.
HOCP92-648	HOCP89-846	447	0	21	0	27	.	.	.	.
HOCP92-648	HOCP91-552	243	7	63	1	63	.	.	.	.
HOCP92-648	L00-266	480	31	90	1	55	.	.	.	.
HOCP92-648	L02-316	503	8	48	0	27	.	.	.	.
HOCP92-648	L97-137	117	0	21	0	27	.	.	.	.
HOCP92-648	L99-233	457	13	62	0	27	.	.	.	.
HOCP92-648	LCP85-384	174	7	75	2	84	.	.	.	.
HOCP92-648	LCP85-384	256	19	94	2	75	.	.	.	.
HOCP95-951	L02-325	463	11	57	4	80	.	.	.	.
HOCP95-951	L99-233	433	0	21	0	27	.	.	.	.
HOCP96-509	CP77-310	244	3	46	0	27	.	.	.	.
HOCP96-509	L00-266	229	15	91	1	67	.	.	.	.
HOCP96-509	L02-316	245	0	21	0	27	.	.	.	.
HOCP96-509	LCP85-384	471	0	21	0	27	.	.	.	.
HOCP96-540	04P3	679	7	45	0	27	.	.	.	.
HOCP96-540	04P5	966	0	21	0	27	.	.	.	.
HOCP96-540	04P7	1078	0	21	0	27	.	.	.	.
HOCP96-540	HOCP91-552	224	0	21	0	27	.	.	.	.
HOCP96-540	L02-325	471	0	21	0	27	.	.	.	.
HOCP96-540	L99-233	469	0	21	0	27	.	.	.	.
HOCP96-549	HOCP01-517	232	0	21	0	27	.	.	.	.
HOCP96-561	L99-226	242	0	21	0	27	.	.	.	.
HOCP97-609	HO95-988	206	0	21	0	27	.	.	.	.
HOCP97-609	HOCP91-552	343	10	63	1	59	.	.	.	.
HOCP97-609	HOCP92-618	241	6	59	1	63	.	.	.	.
HOCP97-609	LCP85-384	239	0	21	0	27	.	.	.	.
HOCP97-609	LCP85-384	674	0	21	.	.	.	.	.	.
HoCP85-845	HOCP91-552	254	0	21	0	27	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HoCP96-540	OP13	221	0	21	0	27	.	.	.	.
L01-281	04P3	484	20	77	3	72	.	.	.	.
L01-283	LCP81-010	415	8	51	1	57	.	.	.	.
L01-299	04P3	233	17	94	3	88	.	.	.	.
L01-299	HOCP91-552	247	11	79	6	97	.	.	.	.
L01-299	L97-128	227	8	71	1	67	.	.	.	.
L01-299	LCP85-384	248	0	21	0	27	.	.	.	.
L02-316	HO95-988	465	0	21	0	27	.	.	.	.
L02-316	HOCP91-552	243	5	53	0	27	.	.	.	.
L02-320	LCP85-384	370	0	21	0	27	.	.	.	.
L02-325	HO95-988	689	0	21	0	27	.	.	.	.
L02-325	HOCP91-552	804	0	21	0	27	.	.	.	.
L02-325	HOCP92-618	468	0	21	0	27	.	.	.	.
L02-325	LCP81-010	221	0	21	0	27	.	.	.	.
L02-336	TucCP77-042	241	26	98	5	96	.	.	.	.
L02-342	HO95-988	234	12	85	2	79	.	.	.	.
L02-342	HOCP92-618	252	0	21	0	27	.	.	.	.
L02-342	L98-209	237	0	21	0	27	.	.	.	.
L02-353	HOCP91-552	233	16	93	4	94	.	.	.	.
L02-353	HOCP92-618	244	0	21	0	27	.	.	.	.
L02-353	L98-209	236	15	89	1	64	.	.	.	.
L02-353	LCP85-384	195	13	91	4	96	.	.	.	.
L89-113	LCP85-384	249	0	21	0	27	.	.	.	.
L91-281	HOCP85-845	499	0	21	0	27	.	.	.	.
L91-281	L02-325	495	35	93	6	85	.	.	.	.
L91-281	L99-226	404	9	54	2	70	.	.	.	.
L94-426	HOCP89-846	243	10	77	1	63	.	.	.	.
L94-426	L99-233	453	8	51	3	73	.	.	.	.
L94-426	LCP85-384	233	8	69	1	65	.	.	.	.
L94-428	HOCP89-846	464	0	21	0	27	.	.	.	.
L94-428	LCP85-384	249	0	21	0	27	.	.	.	.
L94-432	04P16	225	0	21	0	27	.	.	.	.
L94-432	L02-316	246	9	72	2	77	.	.	.	.
L94-433	TucCP77-042	474	40	96	7	91	.	.	.	.
L97-128	04P10	466	24	86	6	88	.	.	.	.
L97-128	HOCP85-845	228	2	44	0	27	.	.	.	.
L97-128	HOCP89-846	443	22	84	4	81	.	.	.	.
L97-128	L01-299	242	0	21	0	27	.	.	.	.
L97-128	L91-255	236	0	21	0	27	.	.	.	.
L97-128	L98-209	475	30	89	8	93	.	.	.	.
L97-128	L99-226	231	14	88	3	89	.	.	.	.
L97-128	L99-226	927	34	72	5	71	.	.	.	.
L97-128	L99-233	1356	46	69	17	86	.	.	.	.
L97-128	LCP81-010	453	12	60	0	27	.	.	.	.
L97-128	LCP85-384	941	45	82	6	73	.	.	.	.
L97-128	LCP85-384	367	24	90	4	82	.	.	.	.
L97-137	L99-233	485	24	83	3	72	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L98-197	L99-226	957	0	21	0	27	.	.	.	.
L98-207	HOCP85-845	246	0	21	0	27	.	.	.	.
L98-209	HO95-988	242	0	21	0	27	.	.	.	.
L98-209	HOCP89-846	242	0	21	0	27	.	.	.	.
L99-226	04P3	223	3	46	1	69	.	.	.	.
L99-226	HOCP85-845	453	18	75	1	56	.	.	.	.
L99-226	HOCP89-846	495	0	21	0	27	.	.	.	.
L99-226	LCP85-384	435	0	21	0	27	.	.	.	.
L99-226	LCP85-384	676	21	65	2	60	.	.	.	.
L99-226	LCP85-384	234	16	92	3	87	.	.	.	.
L99-233	HOCP85-845	468	22	81	4	79	.	.	.	.
L99-233	HOCP91-552	417	14	69	3	75	.	.	.	.
L99-233	LCP85-384	226	5	54	1	67	.	.	.	.
LCP81-010	HO95-988	1206	21	49	4	60	.	.	.	.
LCP81-010	HO95-988	241	0	21	0	27	.	.	.	.
LCP81-010	HOCP89-846	760	30	74	3	61	.	.	.	.
LCP81-010	L02-316	225	6	61	3	89	.	.	.	.
LCP81-010	L02-316	218	0	21	0	27	.	.	.	.
LCP81-010	L97-128	244	0	21	0	27	.	.	.	.
LCP81-010	L98-207	793	23	63	9	84	.	.	.	.
LCP81-010	L98-209	241	8	67	0	27	.	.	.	.
LCP81-010	L99-226	468	0	21	0	27	.	.	.	.
LCP81-010	L99-233	320	17	86	4	86	.	.	.	.
LCP81-010	LCP82-089	117	2	49	0	27	.	.	.	.
LCP81-010	LCP85-384	960	5	43	1	54	.	.	.	.
LCP82-089	HOCP85-845	240	0	21	0	27	.	.	.	.
LCP85-384	04P4	676	28	77	6	80	.	.	.	.
LCP86-454	04P7	1132	86	95	22	95	.	.	.	.
N27	LCP85-384	1240	19	47	3	57	.	.	.	.
TucCP77-042	04P16	226	7	65	1	67	.	.	.	.
US79-010	HO95-988	240	0	21	0	27	.	.	.	.
US79-010	L02-316	235	8	69	1	65	.	.	.	.
US79-010	LCP85-384	248	2	43	0	27	.	.	.	.
US96-002	04P1	202	0	21	0	27	.	.	.	.
US99-002	CP77-310	216	0	21	0	27	.	.	.	.
US99-002	LCP85-384	242	11	79	0	27	.	.	.	.
2005 Crossing Series										
CP83-644	L02-316	930	15	52	.	.	.	.	.	.
HO91-572	HOCP96-540	723	0	25	.	.	.	.	.	.
HO91-572	HOCP96-540	464	0	25	.	.	.	.	.	.
HO95-988	HOCP02-623	122	7	80	.	.	.	.	.	.
HO95-988	HOCP96-540	665	0	25	.	.	.	.	.	.
HOCP00-930	05P4	237	0	25	.	.	.	.	.	.
HOCP00-930	HOCP02-610	974	0	25	.	.	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
HOCP00-930	L99-226	146	0	25	.	.	.	.	.	.
HOCP00-930	LCP82-089	217	0	25	.	.	.	.	.	.
HOCP02-618	L04-425	180	0	25	.	.	.	.	.	.
HOCP02-618	L99-226	910	78	91	.	.	.	.	.	.
HOCP02-618	L99-233	379	76	99	.	.	.	.	.	.
HOCP02-620	L94-426	110	8	86	.	.	.	.	.	.
HOCP02-623	HOCP98-781	173	0	25	.	.	.	.	.	.
HOCP02-652	HOCP02-610	68	0	25	.	.	.	.	.	.
HOCP03-757	L04-425	141	0	25	.	.	.	.	.	.
HOCP89-846	HOCP91-552	153	10	83	.	.	.	.	.	.
HOCP89-846	L02-316	330	0	25	.	.	.	.	.	.
HOCP89-846	L94-426	444	16	69	.	.	.	.	.	.
HOCP91-552	05P1	798	1	50	.	.	.	.	.	.
HOCP91-552	05P2	374	12	64	.	.	.	.	.	.
HOCP91-552	05P3	253	0	25	.	.	.	.	.	.
HOCP91-552	L99-233	1021	0	25	.	.	.	.	.	.
HOCP92-624	HOCP02-610	657	19	63	.	.	.	.	.	.
HOCP92-624	HOCP02-623	537	0	25	.	.	.	.	.	.
HOCP92-624	HOCP89-846	718	0	25	.	.	.	.	.	.
HOCP92-624	HOCP91-552	2620	68	59	.	.	.	.	.	.
HOCP92-624	HOCP96-540	1633	58	69	.	.	.	.	.	.
HOCP92-624	L02-316	214	0	25	.	.	.	.	.	.
HOCP92-624	L99-226	465	39	90	.	.	.	.	.	.
HOCP92-624	L99-233	1060	45	74	.	.	.	.	.	.
HOCP92-624	L99-233	2199	89	71	.	.	.	.	.	.
HOCP92-624	LCP85-384	221	6	61	.	.	.	.	.	.
HOCP92-648	HOCP02-623	168	0	25	.	.	.	.	.	.
HOCP92-648	LCP85-384	216	4	54	.	.	.	.	.	.
HOCP95-951	L99-233	142	27	98	.	.	.	.	.	.
HOCP95-951	L99-233	379	26	84	.	.	.	.	.	.
HOCP96-540	HOCP89-846	1006	0	25	.	.	.	.	.	.
HOCP96-540	L99-226	1565	0	25	.	.	.	.	.	.
HOCP96-540	L99-233	1116	30	61	.	.	.	.	.	.
HOCP96-561	HOCP02-652	204	0	25	.	.	.	.	.	.
HOCP96-561	HOCP98-781	403	0	25	.	.	.	.	.	.
HOCP96-561	L99-226	204	0	25	.	.	.	.	.	.
HOCP96-561	L99-233	449	28	82	.	.	.	.	.	.
L01-299	HOCP89-846	184	13	85	.	.	.	.	.	.
L01-299	HOCP91-552	228	12	79	.	.	.	.	.	.
L01-299	HOCP96-540	203	21	95	.	.	.	.	.	.
L02-316	HOCP96-540	434	0	25	.	.	.	.	.	.
L02-316	HOCP98-781	170	0	25	.	.	.	.	.	.
L02-316	L04-410	77	0	25	.	.	.	.	.	.
L02-316	L99-226	121	0	25	.	.	.	.	.	.
L03-387	L99-226	1589	53	66	.	.	.	.	.	.
L03-387	US01-040	183	4	56	.	.	.	.	.	.
L03-396	HOCP96-540	128	0	25	.	.	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
L03-396	L99-233	159	12	88	.	.	.	.	.	.
L04-425	HOCP02-610	630	0	25	.	.	.	.	.	.
L91-281	HOCP96-540	654	26	71	.	.	.	.	.	.
L91-281	L01-299	245	20	89	.	.	.	.	.	.
L92-312	L99-226	362	0	25	.	.	.	.	.	.
L94-433	05P3	450	42	93	.	.	.	.	.	.
L94-433	HOCP92-618	735	0	25	.	.	.	.	.	.
L94-433	HOCP96-540	291	0	25	.	.	.	.	.	.
L94-433	L99-226	1368	0	25	.	.	.	.	.	.
L94-433	L99-233	206	9	76	.	.	.	.	.	.
L97-128	HOCP02-618	145	0	25	.	.	.	.	.	.
L97-128	HOCP02-652	101	0	25	.	.	.	.	.	.
L97-128	HOCP89-846	243	18	87	.	.	.	.	.	.
L97-128	HOCP91-552	205	9	76	.	.	.	.	.	.
L97-128	HOCP96-540	542	0	25	.	.	.	.	.	.
L97-128	HOCP96-540	485	55	96	.	.	.	.	.	.
L97-128	L02-316	214	0	25	.	.	.	.	.	.
L97-128	L03-374	418	0	25	.	.	.	.	.	.
L97-128	L04-410	534	0	25	.	.	.	.	.	.
L97-128	L99-226	1063	107	94	.	.	.	.	.	.
L97-128	L99-226	868	37	75	.	.	.	.	.	.
L97-128	L99-233	1693	147	92	.	.	.	.	.	.
L97-128	L99-233	1050	42	71	.	.	.	.	.	.
L97-128	LCP82-089	88	0	25	.	.	.	.	.	.
L97-128	US01-040	217	9	73	.	.	.	.	.	.
L98-209	HOCP91-552	735	14	54	.	.	.	.	.	.
L98-209	LCP82-089	187	0	25	.	.	.	.	.	.
L99-226	05P2	240	28	97	.	.	.	.	.	.
L99-226	HOCP96-540	615	0	25	.	.	.	.	.	.
L99-226	L94-426	312	0	25	.	.	.	.	.	.
L99-233	05P1	293	0	25	.	.	.	.	.	.
L99-233	05P3	337	8	57	.	.	.	.	.	.
LCP81-010	HOCP03-757	656	22	67	.	.	.	.	.	.
LCP81-010	HOCP89-846	273	1	50	.	.	.	.	.	.
LCP81-010	HOCP91-552	346	0	25	.	.	.	.	.	.
LCP81-010	L03-374	434	0	25	.	.	.	.	.	.
LCP81-010	L04-410	1148	31	61	.	.	.	.	.	.
LCP81-010	L99-233	2545	83	66	.	.	.	.	.	.
LCP85-384	HOCP02-610	264	0	25	.	.	.	.	.	.
LCP85-384	HOCP03-757	102	0	25	.	.	.	.	.	.
LCP85-384	L99-226	277	9	64	.	.	.	.	.	.
LCP85-384	LCP82-089	1381	0	25	.	.	.	.	.	.
TucCP77-042	L99-226	228	11	78	.	.	.	.	.	.
TucCP77-042	POLY	462	6	51	.	.	.	.	.	.
US01-040	L99-226	935	23	58	.	.	.	.	.	.
US01-040	US01-040	342	0	25	.	.	.	.	.	.
US79-010	HOCP96-540	920	53	81	.	.	.	.	.	.

Table 6. Continue

			1st Line		2nd Line		Increase		Assignment	
Female	Male	Survive	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile	No	Rank Percentile
US79-010	L99-226	721	48	83	.	.	.	.	.	.
US99-002	HOCP96-540	242	5	55	.	.	.	.	.	.
US99-004	L04-425	659	0	25	.	.	.	.	.	.
US99-004	L99-226	784	0	25	.	.	.	.	.	.

Table 7. Plant weight and rank summary tatistics from the 2005 crossing series first stubble cross appraisal test at the Sugar Research Station in 2007.

Cross	Female	Male	Plant Weight	
			Kg/Plant	Pcnt'l
XL05-060	HOCP91-552	05P3	12.5	98
XL02-463	LCP81-010	LCP85-384	11.4	97
XL05-225	L04-434	HOCP02-610	11.1	95
XL05-110	US79-010	L99-226	10.8	94
XL05-050	HOCP91-552	05P2	10.3	93
XL05-154	L97-128	US01-040	10.1	91
XL05-053	LCP81-010	L04-410	10.1	90
XL05-052	L99-226	05P2	9.9	89
XL05-136	L91-281	HOCP96-540	9.8	87
XL05-142	US99-004	L04-425	9.8	86
XL05-153	US79-010	HOCP96-540	9.7	84
XL05-098	HOCP96-540	L99-233	9.6	83
XL05-065	LCP81-010	HOCP91-552	9.6	82
XL03-131	HOCP92-648	L99-233	9.5	80
XL05-041	L99-233	05P1	9.5	79
XL05-226	HOCP00-930	HOCP02-610	9.5	78
XL05-176	HOCP02-652	HOCP02-610	9.5	76
XL05-104	HOCP95-951	L99-233	9.3	75
XL04-064	HO95-988	LCP85-384	9.3	73
XL05-062	L94-433	05P3	9.2	72
XL05-021	LCP81-010	L99-233	9.1	71
XL03-204	LCP81-010	L98-207	9.0	69
XL05-043	HOCP92-624	L99-233	9.0	68
XL05-145	CP83-644	L02-316	9.0	67
XL05-019	HOCP95-951	L99-233	8.8	65
XL05-114	L97-128	HOCP02-652	8.8	64
XL05-087	LCP81-010	HOCP03-757	8.7	63
XL05-081	L97-128	L99-226	8.7	61
XL05-111	US99-004	L99-226	8.6	60
XL05-196	HO91-572	HOCP96-540	8.6	58
XL05-194	HOCP00-930	L99-226	8.6	57
XL05-162	US01-040	L99-226	8.5	56
XL05-202	L94-433	L99-226	8.4	54
XL03-190	LCP81-010	LCP85-384	8.4	53
XL05-048	HOCP92-624	HOCP96-540	8.4	52
XL05-208	LCP85-384	HOCP02-610	8.3	50
XL03-163	HOCP01-525	HOCP01-506	8.1	49
XL05-039	HOCP91-552	05P1	8.1	47
XL05-084	HO91-572	HOCP96-540	8.1	46

Table 7. Continue.

Cross	Female	Male	Plant Weight	
			Kg/Plant	Pcnt'l
XL03-203	L02-341	HOCP91-552	8.0	45
XL05-179	L97-128	L02-316	7.9	43
XL05-200	LCP85-384	L99-226	7.8	42
XL02-501	LCP85-384	HOCP01-517	7.8	41
XL03-200	HOCP00-930	HOCP91-552	7.7	39
XL05-228	HOCP00-930	LCP82-089	7.6	38
XL05-121	HOCP96-561	HOCP03-757	7.5	36
XL05-240	L94-433	HOCP92-618	7.3	35
XL05-101	HOCP92-624	HOCP89-846	7.2	34
XL05-064	L99-233	05P3	7.2	32
XL03-193	HOCP01-525	LCP85-384	7.2	31
XL05-007	HOCP92-624	HOCP91-552	7.2	30
XL05-130	HOCP92-624	HOCP02-623	7.0	28
XL05-137	L01-299	HOCP96-540	7.0	27
XL05-127	L99-226	L94-426	6.8	26
XL05-239	HOCP02-625	HOCP92-618	6.7	24
XL02-009	HOCP92-624	HOCP98-741	6.7	23
XL05-125	HOCP02-620	L94-426	6.6	21
XL02-160	HO95-988	L00-268	6.4	20
XL05-230	L98-209	LCP82-089	6.1	19
XL05-206	L04-425	05P4	6.0	17
XL03-218	L02-328	L99-226	5.9	16
XL03-305	US02-096	HOCP01-553	5.9	15
XL05-222	L91-281	L03-374	5.9	13
XL05-091	HOCP96-540	L99-226	5.8	12
XL04-113	HOCP96-540	HOCP91-552	5.7	10
XL05-216	L97-128	L03-374	5.3	9
XL04-274	HOCP97-609	LCP85-384	5.2	8
XL05-191	LCP85-384	LCP82-089	5.1	6
XL05-076	HOCP96-561	HOCP98-781	4.9	5
XL05-138	L03-396	HOCP96-540	4.8	4
XL05-004	HOCP91-552	L99-233	4.1	2
XL05-075	HOCP02-623	HOCP98-781	3.8	1

2007 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. There are three off-station nurseries, Newton Cane, Inc. (Bunkie), Justin Fredrick Farm (Cecelia), and Landry Farms (Paincourtville), along with the two infield trial locations at Blackberry Farms (Vacherie) and Sugarland Acres, Inc. (Youngsville). 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. Four commercial check varieties, LCP85-384, Ho 95-988, HoCP96-540, and L99-226 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 SpectraCane 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 2007 sugarcane crop experienced more ideal growing conditions. The planting season had normal rainfall with all experiments planted in a timely manner. The harvest season was dry. The crop was lodged. The sugarcane crop did not experience freezing temperatures. Recommended cultural practices were followed at all test locations.

LCP85-384 has been the leading variety in Louisiana since 1998. Approximately 46% of Louisiana's harvested sugarcane acreage was in LCP85-384 for 2007. The second leading variety grown in Louisiana in 2007 was HoCP96-540, which occupied 31% of the state's sugarcane acreage. Because of its increasing popularity, 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. 2007 Location, soil texture, and planting and harvest dates for the nursery and infield tests.

					Harvest Date	Varieties	
Series	Location†	Stage	Soil Texture	Planting Date	2006	No. Planted	No. Harvested
2003	Ardoyne Farm-U.S.D.A	Nursery	Commerce silt loam	10/16/03	10/04/07	35	1
2003	Iberia Research Station	Nursery	Baldwin silty clay	10/21/03	11/04/07	35	1
2003	Blackberry Farms	Infield	Commerce silt loam	08/17/04	10/29/07	40	1
2003	D & N Farm	Nursery	Baldwin silty clay	08/26/04	10/04/07	14	1
2003	Sugarland Acres, Inc.	Infield	Coteau silt loam	08/19/04		40	2
2003	Landry Farms	Nursery	Commerce silt loam	08/18/04	10/30/07	40	1
2004	Blackberry Farms	Infield	Commerce silt loam	08/12/05	11/28/07	50	3
2004	Landry Farms	Nursery	Commerce silt loam	08/18/05	11/07/07	50	3
2004	Sugarland Acres, Inc.	Infield	Coteau silt loam	08/19/05	12/19/07	50	3
2004	Newton Cane, Inc.	Nursery	Moreland silt loam	08/25/05	11/27/07	50	3
2005	Sugar Research Station	Nursery	Commerce silt loam	10/25/05	11/19/07	35	2
2005	Ardoyne Farm-U.S.D.A	Nursery	Commerce silt loam	10/26/05	12/04/07	35	2
2005	Iberia Research Station	Nursery	Baldwin silty clay	10/28/05	11/15/07	35	2
2005	Sugarland Acres, Inc.	Infield	Coteau silt loam	08/15/06	12/19/07	25	5
2005	Blackberry Farms	Infield	Commerce silt loam	08/16/06	11/28/07	25	5
2005	Newton Cane, Inc.	Nursery	Moreland silt loam	08/22/06	11/27/07	43	11
2005	Justin Frederick Farms	Nursery	Baldwin silty clay	08/24/06	10/31/07	43	11
2005	Landry Farms	Nursery	Commerce silt loam	09/29/06	11/29/07	43	11
2006	Sugar Research Station	Nursery	Sharkey clay	10/10/06	11/26/07	40	15
2006	Ardoyne Farm-U.S.D.A	Nursery	Commerce silt loam	10/25/06	12/04/07	40	15
2006	Iberia Research Station	Nursery	Baldwin silty clay	11/01/06	11/30/07	40	15
2006	Blackberry Farms	Infield	Commerce silt loam	08/17/07		24	
2006	Sugarland Acres, Inc.	Infield	Coteau silt loam	09/10/07		24	
2006	Newton Cane, Inc.	Nursery	Moreland silt loam	08/15/07		45	
2006	Justin Frederick Farms	Nursery	Baldwin silty clay	08/28/07		45	
2006	Landry Farms	Nursery	Commerce silt loam	08/21/07		45	
2007	Sugar Research Station	Nursery	Commerce silt loam	10/10/07		33	
2007	Ardoyne Farm-U.S.D.A	Nursery	Commerce silt loam	10/16/07		33	
2007	Iberia Research Station	Nursery	Baldwin silty clay	10/15/07		33	

† Ardoyne-U.S.D.A. Ardoyne Farm (Chacahoula), Blackberry Farms (Vacherie), Iberia Research Station (Jeanerette), Newton Cane, Inc. (Bunkie), Sugar Research Station (St. Gabriel), D & N Farm (Cecelia), Justin Frederick Farms (Cecelia), Sugarland Acres Inc. (Youngsville), Landry Farms (Paincourtville).

Table 2. Nursery third-stubble means of the 2003 “L” assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	10086	48.5	208 -	1.48	65567 +
HoCP91-555	8652	36.3 -	238 +	1.32	55131
HoCP96-540	10094	45.8	220	1.60	57399
L03-371	14272 +	59.1 +	241 +	2.01 +	58987

Table 3. Nursery second-stubble means of the 2003 “L” assignment series on a Baldwin silty clay soil at D& N Farm in Cecilia, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	2939	16.3	180	1.60	20510 -
HoCP91-555	4619	21.1	217	1.52	27770
Ho95-988	7744	37.2	206	1.58	47190
HoCP96-540	5720	26.9	213	1.50	35937
L97-128	6697	31.0	215	1.68	36300
L03-371	6633	33.9	195	1.89	36663

Table 4. Infield second-stubble means of the 2003 “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	8013	33.2	242	1.23 -	53762	11.0
HoCP91-555	9879	38.4	257	1.54 -	50181	12.7
Ho95-988	10165	40.1	255	2.14	37641	12.6
HoCP96-540	9598	36.9	260	2.31	32489	12.7
L97-128	11054	42.8	258	2.23	38731	12.5
L03-371	9423	36.6	254	1.82	39795	10.8

Table 5. Nursery second-stubble means of the 2003 “L” assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	9733	48.9	197	1.59	61710	9.4 -
HoCP91-555	9779	37.0	264	1.64	45012	12.2
Ho95-988	10690	47.2	226	1.73	52998	12.0
HoCP96-540	12093	50.7	239	1.81	56265	12.1
L97-128	15371	60.0	254	2.07	57354	13.0
L03-371	9373	44.1	216	1.88	46101	9.1 -

Table 6. Infield first-stubble means of the 2004 “HoCP” and “L” assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7897 -	28.8 -	274	1.59	36330	11.4
Ho95-988	12471	45.1	277	2.35	38476	10.8
HoCP96-540	11415	42.6	269	2.29	37582	11.9
L97-128	10350	42.2	246	2.38	35477	13.2
HoCP04-814	10692	39.5	270	2.52	32364	10.5
HoCP04-838	11166	46.8	239 -	2.17	43119	14.8 +
HoCP04-847	12571	49.7 +	253	2.39	41823	12.6

Table 7. Nursery first-stubble means of the 2004 “HoCP” and “L” assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	8365	34.8	240	1.77	39749	12.7
Ho95-988	15251	58.7	262	2.56	46101	11.9
HoCP96-540	12985	53.4	243	2.50	42290	11.3
L97-128	16308	66.5	245	2.87	46283	12.9
HoCP04-814	13565	53.5	251	2.67	39749	9.8
HoCP04-838	12185	49.3	247	2.09	47553	14.3
HoCP04-847	12332	55.7	226	2.92	37752	11.3

Table 8. Infield first-stubble means of the 2004 "HoCP" and "L" assignment series on a Coteau silt loam soil at Sugarland Acres, Inc. in Youngsville, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10703	39.8	270	2.00 -	40539	12.8
Ho95-988	11730	45.2	260	2.34	38730	13.4
HoCP96-540	13362	48.5	276	2.58	37590	12.6
L97-128	11983	46.4	258	2.62	35448	14.2
HoCP04-814	9434	34.4	274	2.59	26726	11.5
HoCP04-838	12358	49.4	251	2.17	45580	14.6
HoCP04-847	12001	46.9	256	2.85	32894	12.2

Table 9. Nursery first-stubble means of the 2004 "HoCP" and "L" assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10741	43.7	246	1.90	45920	11.8
Ho95-988	11171	46.8	238	2.04	45557	11.4
HoCP96-540	9854	40.9	242	1.94	42471	11.9
L97-128	12046	44.6	270 +	1.89	47372	13.7 +
HoCP04-814	10076	42.5	237	2.49	33941	10.9 -
HoCP04-838	10456	41.0	255	1.80	45920	13.5 +
HoCP04-847	10569	46.1	243	1.99	46464	11.3

Table 10. Nursery first-stubble means of the 2005 "L" assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10343 -	44.0 -	236	1.65 -	53316	11.8
Ho95-988	13791	54.8	251	2.53	43333	11.8
HoCP96-540	14324	57.2	251	2.54	45375	13.0
L97-128	15002	56.8	264	2.46	46283	13.4
L05-457	14614	56.5	258	1.91 -	59895	14.3
L05-459	13300	57.3	232	1.94 -	59214	13.1

Table 11. Nursery first-stubble means of the 2005 "L" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10736	45.3	237	1.59	57173 +	12.9
Ho95-988	10501	40.5	258 +	1.71	46963	12.8
HoCP96-540	10944	47.4	231	2.15	44014	12.4
L97-128	12013	45.7	261 +	2.14	42199	13.4
L05-457	9824	39.4	250 +	1.49	52862 +	13.9
L05-459	10062	41.9	240	1.68	49913	12.6

Table 12. Nursery first-stubble means of the 2005 "L" assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10583	49.2	214	2.03	48324	12.5
Ho95-988	13463	57.4	234	2.91	39476	11.5 -
HoCP96-540	13187	61.8	224	2.90	42652	13.0
L97-128	16561	70.4	234	2.98	46736	12.9
L05-457	10585	44.9	235	2.31	38796	13.6
L05-459	11863	57.0	204 -	1.97	57853 +	11.1 -

Table 13. Infield plantcane means of the 2004 "HoCP" and 2005 "L" assignment series on a Commerce silt loam soil at Blackberry Farms in Vacherie, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	8126 -	31.8 -	255	1.86 -	34103	12.0
HoCP96-540	10488	41.9	251	2.31	36506	13.4
L97-128	8354 -	34.4 -	242	2.17	31700	13.0
L99-226	11039	40.6	272	2.41	34017	12.5
HoCP04-814	9277	36.3	255	2.55	28489 -	10.7 -
HoCP04-838	9266	38.4	241	2.09	36869	15.1
HoCP04-847	10336	42.4	244	2.97 +	28688	12.1
L05-457	9815	41.9	235	1.65 -	50953 +	13.3
L05-459	6812 -	27.9 -	244	1.68 -	33415	11.2 -

Table 14. Nursery plantcane means of the 2005 "HoCP" and "L" assignment series on a Moreland silt loam soil at Newton Cane, Inc. in Bunkie, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7324	30.5 -	240	1.61 -	37934	10.7
HoCP96-540	10690	42.7	250	2.58	32670	11.6
L97-128	10474	43.9	237	2.53	34485	13.2
L99-226	14519 +	55.1 +	263	2.72	40656 +	12.8
L05-457	10894	44.8	243	1.96 -	45920 +	13.3
L05-459	8329	36.1	230	1.81 -	40293 +	11.9
HoCP05-902	14149 +	52.1	272	1.91 -	54632 +	10.1
HoCP05-903	11948	44.8	266	2.61	34485	10.2
HoCP05-904	11036	47.1	235	2.56	36845	10.9
HoCP05-918	10000	41.3	242	2.00 -	41564 +	11.4
HoCP05-920	9986	44.5	224	2.43	36663	12.2
HoCP05-923	8200	35.2	233	2.58	27406	11.7
HoCP05-931	9873	41.7	237	2.01 -	41382 +	11.6
HoCP05-937	10371	42.4	245	2.16	39567	11.9
HoCP05-961	9850	40.6	243	2.31	35211	13.0

Table 15. Nursery plantcane means of the 2005 "HoCP" and "L" assignment series on a Baldwin silty clay soil at D& N Farm in Cecilia, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	9964	44.6	223	2.15 -	41564	11.0
HoCP96-540	9953	46.0	218	2.99	30674	11.6
L97-128	9658	44.5	217	2.82	31581	12.8
L99-226	12568	55.9	224	3.46	32307	12.2
L05-457	9466	44.2	215	2.03 -	43923	14.0 +
L05-459	7191	36.2	199	1.88 -	39749	11.6
HoCP05-902	10733	46.8	222	2.25 -	41019	9.8 -
HoCP05-903	9475	47.5	198	2.66	35756	8.5 -
HoCP05-904	8955	42.1	209	2.02 -	41564	10.1 -
HoCP05-918	9581	42.2	226	2.18 -	38841	11.2
HoCP05-920	9836	46.0	214	2.50	37752	11.4
HoCP05-923	7519	34.7	216	2.28 -	31037	9.3 -
HoCP05-931	10395	44.9	232	2.01 -	44649	13.0 +
HoCP05-961	7685	34.2	225	2.22 -	31037	12.0

Table 16. Infield plantcane means of the 2005 "HoCP" and "L" assignment series on a Coteau silt loam soil at Sugarland Acres, Inc. in Youngsville, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7550 -	28.4 -	266	1.85 -	30516	12.9
HoCP96-540	11655	43.9	266	2.73	32245	12.6
L97-128	8344 -	34.3	243 -	2.30	29815	13.2
L99-226	12664	45.4	279 +	2.79	32806	13.0
HoCP04-814	9182	35.1	262	2.67	26282	11.6
HoCP04-838	12662	49.4	257	2.38	43309	13.6
HoCP04-847	10255	40.1	256 -	2.66	30186	12.1
L05-457	9114	38.0	239 -	1.77 -	43204	15.5 +
L05-459	6142 -	24.2 -	254 -	1.69 -	28563	12.9

Table 17. Nursery plantcane means of the 2005 "HoCP" and "L" assignment series on a Commerce silt loam soil at Landry Farms in Paincourtville, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	9745	43.4	224	1.65 -	52272	9.7 -
HoCP96-540	13275	51.7	255	2.41	42834	12.1
L97-128	12076	58.7	207	2.25	52272	12.2
L99-226	15191	60.3	252	3.09 +	39204	13.1
L05-457	12733	56.8	224	2.03	56265 +	13.2
L05-459	5814	32.4 -	177	1.51 -	42653	9.8 -
HoCP05-902	12005	59.3	200	2.04	58262 +	9.5 -
HoCP05-903	13754	61.6	222	2.90	42471	9.7 -
HoCP05-904	16204	71.5 +	226	2.48	57536 +	11.0
HoCP05-918	12971	59.5	218	2.39	49913	11.8
HoCP05-920	15151	70.6 +	215	2.27	62255 +	11.3
HoCP05-923	15147	68.4	222	2.82	48642	10.8
HoCP05-931	11093	47.7	230	2.16	44105	12.2
HoCP05-961	14455	62.9	229	2.26	55721 +	12.0

Table 18. Nursery plantcane means of the 2006 “L” assignment series on a Commerce silt loam soil at U.S.D.A-Ardoyne Farm in Chacahoula, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	6155 -	25.7 -	235	1.82 -	27679	11.7
HoCP96-540	12505	54.7	229	3.15	34712	12.7
L97-128	16038	66.7	243	3.13	41745	13.5
L99-226	16372	65.4	250	3.51	37661	12.9
L06-001	10369	38.0	273 +	3.22	23595	13.3
L06-003	13849	58.5	237	2.77	42653	12.0
L06-008	12230	50.1	244	2.22 -	45148	14.6 +
L06-009	10174	42.9	237	2.51	34258	11.7
L06-010	12810	49.8	257 +	2.38	41972	12.2
L06-011	17862	72.3	247	3.35	43106	13.9
L06-016	18299 +	74.7	245	2.41	61937 +	13.2
L06-023	13002	50.8	256 +	2.48	41064	13.5
L06-024	9600	45.3	212	1.92 -	47417 +	12.1
L06-025	11274	49.3	229	2.09 -	48098 +	13.4
L06-026	11122	51.9	214	2.49	42199	14.0
L06-027	14462	59.0	245	2.26 -	51954 +	10.5 -
L06-028	13683	59.8	227	2.58	47190 +	12.6
L06-038	10673	44.5	240	2.74	32216	11.7
L06-040	15220	62.5	243	3.06	40838	13.9

Table 19. Nursery plantcane means of the 2006 “L” assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7164	29.9	240	1.68	35619	10.4
HoCP96-540	8726	36.8	238	2.23	33578	11.2
L97-128	6356 -	27.0 -	235	2.31	23368 -	12.0
L99-226	10842	42.6	255 +	2.69	32443	11.5
L06-003	7626	32.8	232	1.93	34258	11.8
L06-008	9687	39.3	247	1.90	41518 +	13.5 +
L06-009	7055	28.7	246	1.89	30401	11.4
L06-010	8025	30.2	266 +	2.05	29494	11.9
L06-011	7204	30.2	238	2.24	26998	12.1
L06-016	7600	32.9	231	1.78	36981	12.1
L06-023	10351	42.6	243	2.20	38796	11.9
L06-024	5952 -	24.8 -	240	1.34 -	36754	10.9
L06-025	5585 -	24.1 -	232	1.56 -	30855	11.8
L06-026	7524	33.9	223	2.04	34031	13.2 +
L06-027	7172	30.5	235	2.11	29040	9.7 -
L06-028	6548 -	28.1	233	2.12	26544	10.9
L06-038	9148	35.9	256 +	2.27	31082	12.1
L06-040	9037	38.3	236	2.46	31309	13.0 +

Table 20. Nursery plantcane means of the 2006 "L" assignment series on a Commerce silt loam soil at Sugar Research Station in St. Gabriel, Louisiana in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	9151	40.7 -	223	2.19 -	36981	11.6
HoCP96-540	12588	59.0	213	3.18	37208	11.3
L97-128	10974	51.5	214	2.80	36754	12.5
L99-226	14131	57.9	244 +	3.38	34485	13.0
L06-001	16240	67.6	240	3.41	39703	12.5
L06-003	9929	45.4	219	2.79	32443	11.2
L06-008	9194	40.8 -	225	1.87 -	43787	13.5 +
L06-009	10855	46.6	233	2.26 -	41291	12.7
L06-010	13368	52.1	258 +	2.56 -	40384	11.8
L06-011	10096	44.0	227	2.70 -	32216	12.4
L06-016	9175	46.8	193	2.16 -	42199	10.8
L06-023	12831	55.3	232	2.20 -	50366	12.6
L06-024	6537 -	38.8 -	168 -	1.71 -	45602	10.4
L06-025	6939 -	32.7 -	211	1.79 -	36527	12.8
L06-026	9673	51.5	188	2.39 -	43106	13.1
L06-027	13929	62.9	221	2.83	44694	10.3
L06-028	10269	53.9	190	2.08 -	52408	11.3
L06-040	13200	60.8	217	2.79	43787	13.2

Table 21. Infield and nursery second-stubble means of the 2003 "L" assignment series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	6895	32.8	206 -	1.47	45327	10.2 -
HoCP91-555	8092	32.2	246	1.57	40987	12.4
Ho95-988	9533	41.5	229	1.81	45943	12.3
HoCP96-540	9137	38.2	237	1.87	41564	12.4
L97-128	11041	44.6	242	1.99	44128	12.7
L03-371	8476	38.2	222	1.86	40853	9.9 -

Table 22. Infield and nursery first-stubble means of the 2004 "HoCP" and "L" assignment series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	9426	36.8 -	257	1.81 -	40634	12.2
Ho95-988	12656	48.9	259	2.32	42216	11.9
HoCP96-540	11904	46.4	257	2.33	39983	11.9
L97-128	12672	49.9	255	2.44	41145	13.5 +
HoCP04-814	10942	42.5	258	2.57	33195 -	10.7 -
HoCP04-838	11541	46.6	248	2.06	45543	14.3 +
HoCP04-847	11924	49.6	244	2.54	39733	11.9

Table 23. Nursery first-stubble means of the 2005 "L" assignment series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	10554 -	46.2	229	1.76 -	52937	12.4
Ho95-988	12585	50.9	248 +	2.38	43257	12.1
HoCP96-540	13028	55.5	235	2.53	44014	12.8
L97-128	14525	57.6	253 +	2.52	45073	13.2
L05-457	11674	46.9	247 +	1.90 -	50518	13.9 +
L05-459	11742	52.1	226	1.86 -	55660	12.3

Table 24. Infield plantcane means of the 2004 "HoCP" series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7838 -	30.1 -	260	1.85 -	32310	12.5
HoCP96-540	11072	42.9	258	2.52	34376	13.0
L97-128	8349 -	34.4 -	242 -	2.23	30758	13.1
L99-226	11851	43.0	275 +	2.60	33411	12.7
HoCP04-814	9230	35.7	259	2.61	27386 -	11.2 -
HoCP04-838	10964	43.9	249	2.23	40089	14.3 +
HoCP04-847	10296	41.3	250	2.81	29437	12.1

Table 25. Infield and nursery plantcane means of the 2005 "HoCP" and "L" assignment series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	8542 -	35.7 -	242	1.82 -	39278	11.3 -
HoCP96-540	11212	45.2	248	2.60	34986	12.2
L97-128	9781	43.2	229 -	2.41	35971	12.9
L99-226	13196 +	51.5	258	2.89 +	35798	12.7
L05-457	10404	45.2	231 -	1.89 -	48053 +	13.9 +
L05-459	6858 -	31.3 -	221 -	1.71 -	36934	11.5
HoCP05-902	11837	49.1	241	2.02 -	49058 +	10.1 -
HoCP05-903	11267	47.7	238	2.67	35325	9.8 -
HoCP05-904	11607	50.0	233	2.30	43069 +	10.9 -
HoCP05-918	10392	44.1	238	2.14 -	41193	11.8
HoCP05-920	11199	50.1	227 -	2.35	43311 +	11.9
HoCP05-923	9830	42.5	233	2.51	33449	10.9 -
HoCP05-931	9995	41.1	242	2.01 -	41133	12.6
HoCP05-937	10309	43.7	238	2.15	40891	11.9
HoCP05-961	10205	42.3	242	2.21 -	38410	12.6

Table 26. Nursery plantcane means of the 2006 "L" assignment series across locations in 2007.

Variety	Sugar per Acre	Cane Yield	Sugar Per Ton	Stalk Weight	Stalk Number	Fiber
		(tons/A)	(lbs/ton)	(lbs)	(stalks/A)	(%)
LCP85-384	7490 -	32.1	233	1.90 -	33426	11.2
HoCP96-540	11273	50.1	226	2.85	35166	11.7
L97-128	11123	48.4	231	2.75	33956	12.7 +
L99-226	13782	55.3	249 +	3.19 +	34863	12.5
L06-001	12012	46.6	261 +	3.15	28851	12.7 +
L06-003	10468	45.6	229	2.50 -	36451	11.7
L06-008	10370	43.4	239	1.99 -	43484	13.9 +
L06-009	9361	39.4	239	2.22 -	35317	11.9
L06-010	11401	44.0	260 +	2.33 -	37283	12.0
L06-011	11721	48.8	237	2.76	34107	12.8 +
L06-016	11691	51.4	223	2.12 -	47039 +	12.0
L06-023	12061	49.6	244 +	2.29 -	43409	12.7 +
L06-024	7363 -	36.3	207 -	1.65 -	43258	11.2
L06-025	7933	35.4	224	1.81 -	38493	12.7 +
L06-026	9440	45.8	208 -	2.30 -	39779	13.4 +
L06-027	11854	50.8	234	2.40 -	41896	10.2 -
L06-028	10166	47.3	216 -	2.26 -	42048	11.6
L06-038	10099	42.4	240	2.56	32849	11.8
L06-040	12486	53.9	232	2.77	38644	13.4 +

2007 LOUISIANA AHoCP@ NURSERY & INFIELD VARIETY TRIALS

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Three years after selection in single-stools at the seedling stage, experimental varieties advanced for further testing are assigned permanent AHoCP@ or AHo@ numbers. These newly assigned varieties are planted in replicated nursery trials at three locations (Ardoyne Farm in Schriever, Iberia Research Station in Jeanerette, and Sugar Research Station in St. Gabriel). The year after assignment, varieties advanced for further testing are replanted in nursery trials located on three commercial sugarcane farms, each representing a different region of the sugarcane belt. Two years after assignment, active varieties are replanted in three infield tests (Ardoyne Farm and two additional farms). In addition, two years after assignment, varieties are introduced to outfield locations and primary stations.

USDA nursery test plots are planted during the year of assignment and consist of two replications with sixteen-foot, single-row plots. There is a four-foot alleyway between plots. A minimum of three commercial varieties (LCP 85-384, CP 96-540, Ho 95-988, L 97-128 or L 99-226) are planted in each test for comparison purposes. In addition to experimental commercial varieties, clones from the USDA Recurrent Selection for Borers (RSB) program are included in nursery trials. Yield data collected on RSB clones give breeders needed agronomic information to aid in deciding what crosses should be made with these borer-resistant clones. The year after assignment, varieties from the USDA program, combined with varieties from the LSU program, are planted in nurseries on commercial farms. Plots in these tests are increased to twenty-feet long.

Nursery test plots are routinely rated for agronomic traits in the spring and summer each year. Stalk counts of mature, millable stalks are made in July or August. A ten-stalk sample is hand-cut from each plot 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 and processed for sucrose analysis. Brix and pol are used to estimate the yield of theoretical recoverable sugar (TRS) per ton of cane. Results from these analyses, combined with mature millable stalk counts and mean stalk weight, are used to calculate estimated yields of cane and sugar per acre, and number of stalks per acre. Varieties with acceptable yields (both cane tonnage and sugar per ton) and disease and insect resistance are advanced for further testing.

Infield variety tests are planted at three locations (Ardoyne Farm & two commercial farms) two years after assignment. Tests on commercial farms are conducted cooperatively with the LSU Ag Center sugarcane variety program. Infield tests are planted in a randomized complete block design with two replications, and include a minimum of four commercial varieties (LCP 85-384, Ho 95-988, HoCP 96-540, L 97-128, or L 99-226) for use as checks. Plot size in infield tests are two rows wide (twelve feet) by twenty-four feet long. A 10-stalk sample is hand-cut from each plot just prior to harvesting and sent to the sucrose lab at Ardoyne Farm for processing for sucrose and fiber analysis. Plots are weighed with a tractor-pulled weigh-wagon equipped with electronic load cells mounted in the axles and hitch. Plot weights and sucrose analysis are used to estimate sugar per acre, tons of cane per acre, sugar per ton of cane, mean stalk weight, and number of stalks per acre. An estimate of fiber percentage is also obtained.

Planting and harvest dates of USDA infield and nursery tests can be found in Table 1. Results from infield and nursery trials can be found in Tables 2 to 14. Statistical analyses were conducted for each test and for each series 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 A+@ or A-@ respectively.

Table 1. 2007 Planting and harvest dates of "HoCP@ nursery & infield tests.

					Harvest Dates		
Series	Location[2/]	Soil Texture [3/]	Test type	Planting Date	2005	2006	2007
2003	AFH	Sc	Infield	9/14/05		11/07	11/07
2004	AFL	Csl	Nursery	10/20/04	11/22	10/26	10/04
2004	IRS	Bsc	Nursery	10/27/04	11/28	11/28	10/15
2004	STG	Sc	Nursery	10/21/04	12/01	11/29	10/12
2004	AFH	Sc	Infield	10/05/06			11/14
2005	AFL	Csl	Nursery	10/26/05		12/01	10/25
2005	IRS	Bsc	Nursery	10/28/05		12/08	11/13
2005	STG	Sc	Nursery	10/27/05		12/12	11/08
2005	AFH	Sc	Infield	9/21/07			
2006	AFL	Csl	Nursery	10/25/06			11/19
2006	IRS	Bsc	Nursery	11/01/06			11/20
2006	STG	Sc	Nursery	11/14/06			--- [4/]
2007	AFL	Csl	Nursery	10/16/07			
2007	IRS	Bsc	Nursery	10/15/07			
2007	STG	Sc	Nursery	10/12/07			

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

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

[4/] Not harvested in 2007.

Table 2. Infield first-stubble means of the 2003 "HoCP" assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
LCP 85-384	8120	32.0	254	1.65	38752	11.7
Ho 95-988	10820	44.2	245	2.63 +	33571	11.7
HoCP 96-540	7955	32.4	245	1.78	36484	11.7
L 97-128	8809	33.3	264	2.21 +	30062	13.2
L 03-371	9309	36.8	253	1.87	39504	11.0

Table 3. Nursery second-stubble means of the 2004 "HoCP" assignment series on a Commerce silt loam soil at Ardoyne Farm in Schriever, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	9199	42.6	215 +	1.61 -	52635
LCP 91-555	12137	54.5	223 +	1.83 -	59668
Ho 95-988	10398	49.1	212 +	1.96	49913
HoCP 96-540	10112	53.0	192	2.18	48324
L 97-128	12847	54.9	234 +	2.17	50593
HoCP 04-814	12677	59.7	212 +	2.54 +	46963
HoCP 04-838	11613	49.1	237 +	2.04	48098
HoCP 04-847	12134	54.9	221 +	2.05	53769

Table 4. Nursery second-stubble means of the 2004 "HoCP" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	9428	40.5	232	1.30	63071
LCP 91-555	8853	37.7	235	1.20	62844
Ho 95-988	10383	41.8	250	1.61	51728
HoCP 96-540	10373	45.3	229	1.65	54904
L 97-128	10371	41.7	249	1.69	49232
HoCP 04-814	7785	36.5	212	1.81	40384
HoCP 04-838	7885	33.0	240	1.47	44921
HoCP 04-847	10053	40.3	248	1.76	45375
US 04-9601	6170	41.0	150 -	1.56	52635
US 04-9602	4910	30.3	162 -	1.34	44014
US 04-9603	8271	39.8	208	1.23	65340

Table 5. Nursery second-stubble means of the 2004 "HoCP" assignment series on a Sharkey clay soil at Sugar Research Station in St. Gabriel, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	8706	46.6	187	1.61 -	57853
LCP 91-555	11290	50.5	222	1.53 -	65794
Ho 95-988	8739	40.4	214	1.64 -	48778
HoCP 96-540	13353	67.5	198	2.27	59441
L 97-128	12220	51.7	236	2.13	48551
HoCP 04-814	10247	55.6	185	2.40	46509
HoCP 04-838	11194	50.1	219	1.89 -	53316
HoCP 04-847	12180	56.6	215	2.16	52408
US 04-9601	7100	51.9	136 -	1.54 -	67382
US 04-9602	6848	39.4	171	1.50 -	52635
US 04-9603	8974	54.0	167	1.56 -	68970

Table 6. Nursery second-stubble means of the 2004 "HoCP" assignment series across locations in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	9111 -	43.2 -	212	1.51 -	57853
LCP 91-555	10760	47.6	227 +	1.52 -	62769 +
Ho 95-988	9840	43.8 -	225 +	1.74 -	50139
HoCP 96-540	11279	55.3	206	2.03	54223
L 97-128	11813	49.4	240 +	2.00	49459
HoCP 04-814	10236	50.6	203	2.25	44619 -
HoCP 04-838	10231	44.1 -	232 +	1.80 -	48778
HoCP 04-847	11456	50.6	228 +	1.99	50518

Table 7. Infield plant-cane means of the 2004 "HoCP" assignment series on a Sharkey clay soil at Ardoyne Farm in Schriever, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre	Fiber
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)	(%)
LCP 85-384	9386	41.6 -	223	2.68	30945	11.9
HoCP 96-540	12709	56.6	225	2.94	38485	10.9
L 97-128	10870	45.5 -	239	2.94	31071	12.4 +
1999226	10888	51.6	211	3.02	35032	11.8
HoCP 04-814	9845	46.3 -	213	3.48	26628	10.5
HoCP 04-838	11227	50.7	222	2.72	37288	13.7 +
HoCP 04-847	12406	57.6	215	3.32	34739	10.9
US 06-9701	8639	36.5 -	237	2.91	25483	11.3

Table 8. Nursery first-stubble means of the 2005 "HoCP" assignment series on a Commerce silt loam soil at Ardoyne Farm in Schriever, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	13632	57.8	235	2.13	54450
Ho 95-988	14483	61.4	237	2.49	49232
HoCP 96-540	12690	58.4	217	2.27	51954
L 97-128	18355 +	69.3	265 +	2.50	55584
HoCP 05-902	13932	63.3	220	2.37	56492
HoCP 05-903	12277	54.0	227	2.16	49913
HoCP 05-904	13192	61.9	213	1.92	64433
HoCP 05-918	12428	53.6	233	1.80	59668
HoCP 05-920	13946	65.2	214	1.92	68063 +
HoCP 05-923	12236	53.5	233	2.13	50139
HoCP 05-931	16576 +	66.4	249	2.26	58988
Ho 05-937	13584	57.4	236	1.88	61256
Ho 05-961	17282 +	64.2	270 +	2.22	57626
US 05-9604	8940 -	44.8	198	1.44 -	62844
US 05-9605	7651 -	48.1	159 -	1.88	51501
US 05-9606	10269	54.6	188	1.35 -	81221 +

Table 9. Nursery first-stubble means of the 2005 "HoCP" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	12765	47.2	269	1.69	56038 +
Ho 95-988	16732 +	55.7 +	300 +	2.15	51954
HoCP 96-540	11158	41.6	269	1.87	44694
L 97-128	9891	35.2	283	1.88	37434
HoCP 05-902	13474	43.4	311 +	1.54	56265 +
HoCP 05-903	13230	50.2	263	2.38 +	44468
HoCP 05-904	13481	48.2	280	1.81	53543 +
HoCP 05-918	10506	36.1	292	1.65	43787
HoCP 05-920	14002 +	51.0	275	1.91	53316 +
HoCP 05-923	9649	38.2	253	1.87	40838
HoCP 05-931	9165	34.0	269	1.63	41745
Ho 05-937	13288	45.0	295 +	1.58	57173 +
Ho 05-961	12307	39.5	312 +	1.72	45829
US 05-9604	11080	40.4	274	1.42 -	56946 +
US 05-9605	4695 -	21.4 -	220 -	1.40 -	31763 -
US 05-9606	6776 -	33.7	201-	1.33 -	51501

Table 10. Nursery first-stubble means of the 2005 "HoCP" assignment series on a Sharkey clay soil at Sugar Research Station in St. Gabriel, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	14072	59.4	237	2.12	56038
Ho 95-988	11599	48.7	238	2.04	47871
HoCP 96-540	10184	44.5	230	2.02	42199
L 97-128	10309	40.9	252	2.26	35846
HoCP 05-902	19758 +	72.5	273 +	2.35	62618 +
HoCP 05-903	13861	61.0	227	2.29	53543
HoCP 05-904	12430	54.8	227	1.97	55811
HoCP 05-918	12004	50.8	234	2.12	47417
HoCP 05-920	12978	61.1	213	2.36	51728
HoCP 05-923	13048	53.8	246	2.14	49686
HoCP 05-931	10263	42.6	242	1.63	52635
Ho 05-937	11165	45.5	244	1.78	51047
Ho 05-961	15304 +	53.4	286 +	2.19	49005
US 05-9604	10309	46.3	221	1.42 -	65567 +
US 05-9605	6952	40.7	171 -	2.00	40838
US 05-9606	11168	58.8	191 -	1.48 -	79633 +

Table 11. Nursery first-stubble means of the 2005 “HoCP” assignment series across locations in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	13490	54.8	247	1.98	55509
Ho 95-988	14271	55.3	258	2.22	49686
HoCP 96-540	11344	48.2	239	2.05	46283
L 97-128	12852	48.5	267 +	2.21	42955
HoCP 05-902	15721 +	59.7 +	268 +	2.08	58458 +
HoCP 05-903	13101	56.0	234	2.25	49308
HoCP 05-904	13035	55.0	240	1.90	57929 +
HoCP 05-918	11646	46.8	253	1.85	50291
HoCP 05-920	13642	59.1	234	2.06	57702 +
HoCP 05-923	11644	48.5	244	2.04	46888
HoCP 05-931	12001	47.7	253	1.84	51123
Ho 05-937	12679	49.3	258	1.74 -	56492 +
Ho 05-961	14964 +	52.4	289 +	2.04	50820
US 05-9604	10110	43.9	231	1.42 -	61786 +
US 05-9605	6432 -	36.7 -	183 -	1.76	41367
US 05-9606	9404	49.0	193 -	1.38 -	70785 +

Table 12. Nursery plantcane means of the 2006 "HoCP" assignment series on a Commerce silt loam soil at Ardoyne Farm in Schriever, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	7603	29.7	255	2.25 -	26544
Ho 95-988	10681	44.1	242	2.72	32216
HoCP 96-540	9931	41.2	241	2.91	28359
L 97-128	11637	45.3	257	2.78	32670
HoCP 06-502	12264	43.0	287 +	2.52	33804
HoCP 06-504	10268	44.5	231	2.52	35393
HoCP 06-505	9112	39.7	230	2.74	29040
HoCP 06-512	11510	47.5	243	2.88	33124
HoCP 06-513	11570	49.1	236	2.80	35166
Ho 06-523	20830 +	80.8 +	258	3.58 +	45602 +
Ho 06-525	8901	41.6	215	2.35 -	35393
Ho 06-528	9437	40.1	235	2.39 -	33578
Ho 06-529	8098	32.4	250	2.91	22234
Ho 06-530	11269	47.2	239	2.61	36300
Ho 06-531	10381	39.9	257	1.73 -	45602 +
Ho 06-532	9245	38.1	243	2.38 -	31989
Ho 06-535	8857	39.4	225	3.02	26091
Ho 06-536	9628	38.3	251	3.00	25637
Ho 06-537	10495	42.7	248	2.72	31309
Ho 06-539	10180	42.5	241	2.39 -	35619
Ho 06-543	7987	29.4	272 +	2.26 -	26091
Ho 06-546	12938	53.3	243	2.87	37208
Ho 06-549	9942	37.7	263	2.53	30174
Ho 06-552	9513	34.4	276 +	2.45 -	28133
Ho 06-554	6514 -	30.8	212 -	2.48	26091
Ho 06-557	8425	38.2	221	2.09 -	36754
Ho 06-558	8620	37.5	230	2.00 -	37661
Ho 06-559	13405 +	65.1 +	207 -	3.22	40384 +
Ho 06-560	8760	35.7	243	2.46	28813
Ho 06-562	14046 +	54.0	261	2.27 -	47644 +
Ho 06-563	12401	51.9	239	2.82	36981
Ho 06-564	10268	41.0	251	2.52	32670
Ho 06-565	8331	31.9	261	2.76	23141
Ho 06-566	7308	26.9 -	271 +	1.76 -	30401
US 06-9609	6925	38.6	179 -	2.58	29948
US 06-9610	10983	49.6	225	2.86	34485

Table 13. Nursery plantcane means of the 2006 "HoCP" assignment series on a Baldwin silty clay soil at Iberia Research Station in Jeanerette, Louisiana in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	7998	29.0	276 +	2.02 -	28813
Ho 95-988	10661	38.5	276 +	2.41	31989
HoCP 96-540	10332	40.9	253	2.55	31989
L 97-128	8010	30.9	259	2.57	24729
HoCP 06-502	7884	26.6 -	296 +	1.84 -	28813
HoCP 06-504	8242	31.6	261	1.94 -	32670
HoCP 06-505	9191	35.1	261	2.28	30855
HoCP 06-512	11079	40.7	274 +	2.76	29267
HoCP 06-513	9498	35.1	270	2.08	33578
Ho 06-523	9390	34.0	275 +	2.47	27452
Ho 06-525	10634	41.2	258	2.46	33351
Ho 06-528	9684	35.1	276 +	2.06	34031
Ho 06-529	11384	41.1	277 +	2.05 -	40384 +
Ho 06-530	11591	44.7	259	2.14	41972 +
Ho 06-531	8084	28.8 -	281 +	1.52 -	37888
Ho 06-532	7223 -	27.8 -	260	1.79 -	31082
Ho 06-535	9698	38.2	254	2.49	30855
Ho 06-536	11211	40.6	276 +	2.71	29948
Ho 06-537	10125	38.8	261	2.19	35619
Ho 06-539	9427	35.4	266	2.24	31536
Ho 06-543	7279	25.5 -	285 +	1.88 -	27225
Ho 06-546	8535	31.8	266	2.35	27452
Ho 06-549	9197	33.7	273 +	2.00 -	33804
Ho 06-552	8570	30.4	282 +	2.05 -	30174
Ho 06-554	6446 -	26.2 -	246	1.74 -	30174
Ho 06-557	6506 -	25.8 -	250	1.39 -	36754
Ho 06-558	9285	34.9	267	1.75 -	39703
Ho 06-559	8316	32.8	253	1.97 -	33351
Ho 06-560	7420	28.2 -	264	1.94 -	29267
Ho 06-562	12899	44.1	294 +	1.84 -	48098 +
Ho 06-563	10684	42.4	252	2.38	35619
Ho 06-564	8336	29.7	279 +	1.93 -	31309
Ho 06-565	9383	34.3	273 +	2.08	33124
Ho 06-566	7186 -	25.3 -	284 +	1.47 -	34712
US 06-9607	9859	36.9	268	2.29	32216
US 06-9608	8188	34.9	239	1.83 -	37208
US 06-9609	4868 -	24.2 -	202 -	1.87 -	25637
US 06-9610	7130 -	27.5 -	260	2.08	26318

Table 14. Nursery plantcane means of the 2006 “HoCP” assignment series across locations in 2007.

Variety	Sugar/ acre	Tons/ acre	Sugar/ ton	Weight/ stalk	Stalks/ acre
	(lbs.)	(tons)	(lbs.)	(lbs.)	(no.)
LCP 85-384	7800	29.3	265 +	2.13 -	27679
Ho 95-988	10671	41.3	259	2.56	32103
HoCP 96-540	10132	41.0	247	2.73	30174
L 97-128	9823	38.1	258	2.67	28700
HoCP 06-502	10074	34.8	292 +	2.18 -	31309
HoCP 06-504	9255	38.0	246	2.23 -	34031
HoCP 06-505	9152	37.4	245	2.51	29948
HoCP 06-512	11294	44.1	258	2.82	31195
HoCP 06-513	10534	42.1	253	2.44	34372
Ho 06-523	15110 +	57.4	267 +	3.03	36527
Ho 06-525	9767	41.4	236	2.41	34372
Ho 06-528	9561	37.6	255	2.23 -	33804
Ho 06-529	9741	36.8	263 +	2.48	31309
Ho 06-530	11430	46.0	249	2.37	39136 +
Ho 06-531	9232	34.4	269 +	1.62 -	41745 +
Ho 06-532	8234	32.9	251	2.09 -	31536
Ho 06-535	9278	38.8	240	2.75	28473
Ho 06-536	10420	39.5	263 +	2.85	27792
Ho 06-537	10310	40.7	255	2.46	33464
Ho 06-539	9803	38.9	254	2.31 -	33578
Ho 06-543	7633	27.4	278 +	2.07 -	26658
Ho 06-546	10736	42.5	255	2.61	32330
Ho 06-549	9570	35.7	268 +	2.27 -	31989
Ho 06-552	9042	32.4	279 +	2.25 -	29153
Ho 06-554	6480 -	28.5	229 -	2.11 -	28133
Ho 06-557	7465	32.0	236	1.74 -	36754
Ho 06-558	8953	36.2	249	1.87 -	38682
Ho 06-559	10861	48.9	230 -	2.59	36867
Ho 06-560	8090	31.9	254	2.20 -	29040
Ho 06-562	13473	49.1	277 +	2.05 -	47871 +
Ho 06-563	11543	47.1	245	2.60	36300
Ho 06-564	9302	35.4	265 +	2.22 -	31989
Ho 06-565	8857	33.1	267 +	2.42	28133
Ho 06-566	7247	26.1	277 +	1.62 -	32557
US 06-9609	5896 -	31.4	191 -	2.22 -	27792
US 06-9610	9056	38.6	243	2.47	30401

2007 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 commercial 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 2007 outfield tests. Included are multi-year yield analyses for appropriate test varieties (tables 27-29).

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. To reflect industry practices, all locations were harvested with a combine harvester. 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 are 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.

LCP85-384 has been the leading variety in Louisiana since 1998 with 46% of the sugarcane acreage in 2007 grown to this variety. The second leading variety grown in Louisiana in 2007 was HoCP96-540. It comprised 31% of the sugarcane harvested in 2007, which is the largest increase for any of the new varieties. HoCP96-540 will likely be the most widely grown

variety in Louisiana for the 2008 crop. Accordingly for comparison, HoCP96-540 is now 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 9.0, 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.

Ten experimental varieties representing the 2005 assignment series were introduced to outfield locations for seed increase in 2007 (Table 1). Six experimental and eight commercial varieties were planted at 12 outfield locations. Twenty-two tests were harvested in 2007 including seven plantcane, seven first-stubble, six second-stubble, and two third-stubble crops (Table 2).

Variety yields are reported by crop and trait with overall means and individual location data in the same table (Table 3-22) and in summary tables by crop (Tables 23-26). Tables 27-29 provide combined analysis of plantcane, first-stubble, second-stubble, and third-stubble crops averaged over several years that is used to evaluate commercial and experimental varieties.

Better growing conditions were experienced in 2007, as the industry rebounded from poorer growing conditions experience in the 2006 crop. The weather during planting was near optimal with good conditions experienced at all sites. The harvest of 2007 was marked by less than average rainfall.

HoCP00-950 was in plantcane, first stubble, second stubble, and third stubble tests in 2007. This new variety was released on April 26, 2007 and produced some of the highest levels of sugar per ton of cane in each crop. Seed of HoCP00-950 was provided to growers from the secondary increase stations in the fall of 2007.

Two experimental varieties of the 2001 assignment series were tested in the plantcane through second stubble crops: L01-283 and L01-299. Each of these varieties performed well in the outfield tests. L01-283 was increased on the secondary seed increase stations, and L01-299 was sent from the primary seed increase stations to the secondary increase stations. L01-283 and L01-299 will be eligible for release in 2008 and 2009, respectively.

L03-371 was harvested in plantcane tests in 2007. The variety had sugar per acre values equal to HoCP96-540 with significantly higher sugar per ton of cane.

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 2007.

Commercial Varieties		Experimental Varieties		Experimental Varieties Introduced to the Outfield		
LCP85-384	L99-226	L01-283	HoCP04-814	L05-457	HoCP05-904	HoCP05-931
Ho95-988	L99-233	L01-299	HoCP04-838	L05-459	HoCP05-918	Ho05-961
HoCP96-540	HoCP00-950	L03-371	HoCP04-847	HoCP05-902	HoCP05-920	
L97-128	CP89-2143			HoCP05-903	HoCP05-923	

Table 2. Harvest and planting dates for all outfield locations harvested in 2007.

Location	Parish	Plantcane			First-stubble		Second-stubble		Third-stubble	
		2007 Planting Date	2007 Harvest Date	2006 Planting Date	2007 Harvest Date	2005 Planting Date	2007 Harvest Date	2004 Planting Date	2007 Harvest Date	2003 Planting Date
A. Landry	Iberville	08/27	11/14	09/07	11/14	09/15	***	09/09	***	09/17
Allains	St. Mary	10/05	10/29	10/04	***	09/21	10/29	09/01	***	09/12
Alma	Pointe-Coupee	10/22	11/02	09/21	12/08	09/16	***	09/20	***	09/11
Bon Secour	St. James	09/06	12/17	09/26	12/03	09/08	11/06	09/08	11/06	09/05
Brunswick*	Pointe-Coupee	09/15								
F. Martin*	St. Mary	09/28								
Glenwood	Assumption	09/12	12/11	08/16	10/31	09/13	10/30	09/10	***	08/27
Lanaux	St. John	09/11	11/20	08/29	11/20	09/14	10/11	08/25	***	09/03
Levert-St. John	St. Martin	09/19	***	08/30	***	09/09	10/16	08/26	***	08/26
Magnolia	Terrebonne	09/07	***	10/10	12/18	10/06	***	09/10	***	10/09
Mary*	Lafourche	09/20								
R. Hebert	Iberia	09/27	12/04	09/12	11/30	09/12	10/17	09/13	10/17	09/12

* New location; *** No test harvested at this location.

Table 3. Plantcane sugar per acre for eight commercial and three experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Allains	Alma	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	4989 -	5451 -	10035	8233 -	10221 -	7354 -	7305 -	7655 -
CP89-2143	7640	9509		8642	8395 -	8485 -	8347	8680 -
Ho95-988	7005	7808	11670	10618	11144 -	9329	10495	9724
HoCP96-540	7795	8041	12510	9869	13922	10793	10495	10489
L97-128	5722 -	7938	12606	11790 +	12655	9265	11285	10180
L99-226	8691	9009	13158	9601	13865	9768	11006	10728
L99-233	9074	6801	8623	10846	12147 -	9764	11213	9781
HoCP00-950	9089	9423	12973	11180	13078	8327 -	13034 +	11015
L01-283	8826	7447	12918	11767 +	15542	11169	10226	11128
L01-299	7427	8233	11385	11501 +	13060	7113 -	11039	9965
L03-371	8635	8264	10964	11437 +	12979	9970	10464	10388

Table 4. Plantcane cane yield for eight commercial and three experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Allains	Alma	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	21.0 -	20.4 -	36.8	28.5 -	35.6 -	26.2 -	26.2 -	27.8 -
CP89-2143	33.1	37.1		32.7	33.6 -	31.5 -	31.7	33.8 -
Ho95-988	29.3	30.1	42.5	36.7	39.2 -	33.8 -	35.8	35.4 -
HoCP96-540	33.4	31.6	44.9	36.8	52.9	39.9	35.7	39.3
L97-128	22.1 -	31.3	45.0	43.7 +	44.2 -	35.7	40.3	37.4
L99-226	35.3	33.8	44.2	36.6	46.4 -	32.0 -	35.0	37.6
L99-233	39.8	29.2	36.5	42.5 +	45.9 -	38.5	40.7	39.0
HoCP00-950	30.9	33.5	42.2	37.7	45.9 -	30.9 -	43.9 +	37.9
L01-283	32.7	31.6	45.8	40.3	52.2	39.9	37.4	40.0
L01-299	30.9	32.1	44.6	40.7	44.9 -	28.6 -	38.1	37.1
L03-371	34.8	29.5	37.8	40.6	44.2 -	37.1	34.6	37.0

Table 5. Plantcane sugar per ton for eight commercial and three experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Allains	Alma	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	239	266	274	289 +	287	280	279	273
CP89-2143	231	259		264	250	269	262	256
Ho95-988	239	259	275	290 +	285	276	293	274
HoCP96-540	234	254	278	268	264	271	292	266
L97-128	261 +	253	281	270	287	260	280	270
L99-226	246	267	297	264	299 +	305 +	314	284 +
L99-233	229	233	233	255	264	253	275	249 -
HoCP00-950	295 +	282	305	296 +	284	270	297	290 +
L01-283	270 +	238	284	292 +	297 +	280	273	276
L01-299	240	258	256	283	291 +	249 -	290	267
L03-371	249	279	291	281	294 +	269	302	281 +

Table 6. Plantcane stalk weight for eight commercial and three experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Allains	Alma	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	1.80 -	2.03 -	1.50 -	2.10 -	1.73 -	2.13	2.07	1.91 -
CP89-2143	2.57	2.55		3.30	2.50 +	3.07 +	3.20 +	2.88 +
Ho95-988	2.13	2.23	2.13	2.53	2.70 +	2.73	2.60	2.44
HoCP96-540	2.27	2.70	2.27	3.07	2.10	2.23	2.57	2.46
L97-128	1.97	2.60	2.27	2.83	2.83 +	2.30	2.73	2.50
L99-226	2.87 +	2.93	2.50	3.13	3.13 +	3.07 +	3.50 +	3.02 +
L99-233	2.33	2.07 -	1.43 -	2.20 -	1.80	1.83	2.03 -	1.96 -
HoCP00-950	2.20	2.50	2.20	2.80	2.20	2.23	2.63	2.40
L01-283	2.10	2.13 -	1.97	2.50	2.23	2.60	2.33	2.27
L01-299	1.90	2.03 -	1.73 -	2.57	1.97	2.53	2.57	2.19 -
L03-371	2.40	2.33	2.03	2.67	2.03	2.40	2.60	2.36

Table 7. Plantcane stalk number for eight commercial and three experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Allains	Alma	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	23457	20116	48984	27048	41188 -	24872 -	25711	30196
CP89-2143	25804	28861		19981	26995 -	21469 -	19765 -	23515 -
Ho95-988	27596	26970	40050	28943	29050 -	24806 -	27730	29307
HoCP96-540	29591	23413	39558	24073	50595	36597	27860	33098
L97-128	22538	24100	40621	30925	31280 -	31315	29467	30035
L99-226	24732	23272	35752	23483	29737 -	20989 -	19950 -	25417 -
L99-233	34254	28989	51959	40525 +	51021	42383	40258 +	41341 +
HoCP00-950	28084	26924	38888	27318	42015 -	27949	33477	32094
L01-283	31494	30759	46530	33917 +	47782	30880	33971	36476
L01-299	32550	34873	51667	31894	45794	22721 -	29676	35596
L03-371	29555	25539	37383	31325	43738	31521	26784	32263

Table 8. First-stubble sugar per acre for eight commercial and two experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Alma	Magnolia	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	6581 -	6459 -	11202	8412	9066	8743	9720	8597
CP89-2143	7199 -	8355	9936	8512	9629	6709	8801	8448 -
Ho95-988	8328 -	8828	11274	11126 +	10321	7680	10125	9669
HoCP96-540	10289	7594	12082	8044	9385	9963	9417	9539
L97-128	10265	7634	11546	9834 +	8727	8059	8833	9271
L99-226	10309	8906	11894	11173 +	9664	8753	12536 +	10462
L99-233	7793 -	7614	11928	10461 +	9578	8694	9853	9417
HoCP00-950	10182	7199	9976	11313 +	9478	9382	9962	9642
L01-283	10334	8916	11742	11232 +	10430	8656	10052	10195
L01-299	10272	7899	11118	11695 +	10943	7609	11525 +	10152

Table 9. First-stubble cane yield for eight commercial and two experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Alma	Magnolia	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	25.0 -	21.5 -	35.7	29.9	33.3	31.2	31.4	29.7 -
CP89-2143	28.8 -	29.7	33.2	31.9	37.1	24.9	30.5	30.9
Ho95-988	31.5 -	29.6	37.1	38.3 +	36.6	26.8	34.6	33.5
HoCP96-540	37.3	26.0	38.6	29.7	34.9	36.1	32.5	33.6
L97-128	37.8	27.1	36.1	34.3	31.8	28.3	31.6	32.4
L99-226	33.7 -	29.6	36.4	35.2 +	35.3	29.3	39.8 +	34.2
L99-233	31.3 -	25.9	38.4	38.0 +	36.2	31.7	32.8	33.5
HoCP00-950	34.9	22.4	29.8	36.1 +	32.5	30.6	31.0	31.0
L01-283	36.9	30.3	36.8	38.7 +	37.0	29.4	32.2	34.5
L01-299	38.2	27.3	35.2	40.4 +	40.6	27.6	39.6 +	35.6

Table 10. First-stubble sugar per ton for eight commercial and two experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Alma	Magnolia	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	263	299	314	281	273	280	309 +	288
CP89-2143	250	282	300	267	260	265	288	273 -
Ho95-988	264	298	304	290	282	285	293	288
HoCP96-540	276	292	313	272	269	275	290	284
L97-128	272	281	320	287	274	285	280	286
L99-226	306	300	327	317 +	274	299 +	314 +	305 +
L99-233	251	294	310	276	265	272	301	281
HoCP00-950	292	321	333 +	314 +	292	307 +	321 +	311 +
L01-283	280	295	319	290	282	295	312 +	296 +
L01-299	269	290	315	290	270	275	291	286

Table 11. First-stubble stalk weight for eight commercial and two experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Alma	Magnolia	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	1.57 -	2.10	1.87	1.77 -	1.83	2.00	2.10	1.89 -
CP89-2143	3.03	2.67	2.73 +	2.90 +	2.23	2.70	2.80	2.72 +
Ho95-988	2.47	2.40	2.23	2.37	2.17	2.27	2.47	2.34
HoCP96-540	2.57	2.33	2.23	2.27	1.93	2.53	2.33	2.31
L97-128	2.77	2.47	2.10	2.50	2.30	2.53	2.50	2.45
L99-226	3.20	3.23 +	2.67 +	2.90 +	2.27	2.30	3.27 +	2.83 +
L99-233	2.10	1.97	1.87	2.00	1.77	1.50 -	1.97	1.88 -
HoCP00-950	2.67	2.17	2.13	2.23	2.00	2.17	2.33	2.24
L01-283	2.37	2.03	2.00	1.77 -	1.90	2.07	1.93	2.01 -
L01-299	2.33	2.17	1.87	1.80 -	1.73	1.80 -	2.30	2.00 -

Table 12. First-stubble stalk number for eight commercial and two experimental varieties at seven outfield locations in 2007.

	Heavy			Light				
Variety	Alma	Magnolia	Landry	Bon Secour	Glenwood	Lanaux	R. Hebert	Mean
	(lbs/tons)							
LCP85-384	33016	20494	38337	33941 +	36313	31982	32540	32375
CP89-2143	19068 -	22408	24332	22170	33306	18092 -	22707	23155 -
Ho95-988	25598	24744	33291	32399 +	33775	23703	28644	28879
HoCP96-540	33204	22416	34522	26518	36177	28713	28177	29961
L97-128	27378	22031	34686	27668	27833 -	22333	25426	26765
L99-226	21068 -	18313	27425	24418	31764	25490	24356	24690 -
L99-233	30257	26685	43259	38181 +	41361 +	42678 +	34352	36682 +
HoCP00-950	26235	20648	27984	32252 +	32327	28278	26890	27802
L01-283	31202	30806 +	38503	44195 +	39399	28708	33329	35163 +
L01-299	33124	25260	38194	44866 +	46955 +	31044	35389	36404 +

Table 13. Second-stubble sugar per acre for eight commercial and two experimental variety at six outfield locations in 2007.

	Heavy	Light					
Variety	Allains	Bon Secour	Glenwood	Lanaux	R. Hebert	Levert St. John	Mean
				(stalks/A)			
LCP85-384	6366	7025	7270	5268	6685	4927	6257
HoCP91-555	7709	8706+	8686	5966+	6961	7009	7506+
Ho95-988	7678	8370+	9288+	6425+	6927	7573	7710+
HoCP96-540	7603	6566	7518	4194	7104	6719	6617
L97-128	5926	7226	9117	6376+	6118	7026	6966
L99-226	7972	9732+	9111	6331+	7217	7381	7957+
L99-233	6019	8678+	9589+	7397+	7578	6379	7616+
HoCP00-950	8033	10189+	9997+	5865+	8856+	9188+	8688+
L01-283	7236	9125+	10420+	5772+	8751+	9046+	8391+
L01-299	8230	9167+	10098+	6304+	9545+	7737	8513+

Table 14. Second-stubble cane yield for eight commercial and two experimental variety at six outfield locations in 2007.

	Heavy	Light					
Variety	Allains	Bon Secour	Glenwood	Lanaux	R. Hebert	Levert St. John	Mean
				(stalks/A)			
LCP85-384	25.9	26.9	27.1	22.6	28.2-	20.2	25.2
HoCP91-555	29.1	30.8+	32.4	23.5	29.4	26.3	28.6
Ho95-988	29.5	31.7+	32.5	26.3+	26.8-	28.2	29.2
HoCP96-540	30.7	24.4	30.6	18.7	33.6	28.4	27.7
L97-128	24.6	26.1	33.7	24.3	25.4-	27.7	26.9
L99-226	30.1	34.6+	32.5	24.0	28.2-	25.6	29.2
L99-233	27.3	35.8+	37.2+	32.5+	30.8	26.3	31.7+
HoCP00-950	27.7	34.4+	33.4	21.8	31.9	32.5	30.3
L01-283	26.7	31.9+	38.2+	23.1	33.3	32.7	31.0
L01-299	34.0	33.4+	40.1+	25.4+	39.0+	31.8	33.9+

Table 15. Second-stubble sugar per ton for eight commercial and two experimental variety at six outfield locations in 2007.

Variety	Heavy	Light					Mean
	Allains	Bon Secour	Glenwood	Lanaux	R. Hebert	Levert St. John	
				(stalks/A)			
LCP85-384	248	263	268	233	238	243	249
HoCP91-555	265	283	268	254+	238	268+	263+
Ho95-988	259	265	286+	245+	259	272+	264+
HoCP96-540	248	269	246	219	210	236	238
L97-128	240	276	271+	261+	246	253	258+
L99-226	265	280	280+	265+	255	289+	272+
L99-233	220	243-	258	227	246	242	239
HoCP00-950	289+	296+	298+	270+	279	283+	286+
L01-283	274	285	273+	248+	264	276+	270+
L01-299	242	274	252	249+	246	244	251+

Table 16. Second-stubble stalk weight for eight commercial and two experimental variety at six outfield locations in 2007.

Variety	Heavy	Light					Mean
	Allains	Bon Secour	Glenwood	Lanaux	R. Hebert	Levert St. John	
				(stalks/A)			
LCP85-384	1.17-	1.57	1.37-	1.87	1.77	1.63	1.56-
HoCP91-555	1.90	1.80	1.60	1.83	1.63-	1.63	1.73
Ho95-988	2.10	1.97	1.83	2.47+	1.97	1.93	2.04+
HoCP96-540	1.80	1.90	1.90	1.60	2.03	1.70	1.82
L97-128	1.67	1.76	2.43+	1.97+	1.83	1.93	1.93
L99-226	2.33+	2.33+	2.00	2.67+	2.53+	2.37+	2.37+
L99-233	1.60	1.62	1.43-	1.77	1.63-	1.67	1.62
HoCP00-950	1.77	2.03	2.00	2.17+	1.93	1.73	1.94
L01-283	1.50	1.93	1.63	1.73	1.70	1.73	1.71
L01-299	1.77	1.87	1.67	1.70	1.63-	1.83	1.74

Table 17. Second-stubble stalk number for eight commercial and two experimental variety at six outfield locations in 2007.

Variety	Heavy	Light					Mean
	Allains	Bon Secour	Glenwood	Lanaux	R. Hebert	Levert St. John	
				(stalks/A)			
LCP85-384	44706+	34706+	40098	24436	33012	24934	33649
HoCP91-555	30803	34507+	40658	25717	36079	32299	33344
Ho95-988	28275	32219+	35374	21306	27249	29195	28936
HoCP96-540	33956	25664	33238	23268	33668	33633	30571
L97-128	29526	30194	28147	24863	27659	28915	28304
L99-226	25800	29769	33281	18368	22316-	22289-	25304-
L99-233	34335	44780+	52506+	37482+	37869	31628	39677+
HoCP00-950	31655	33849+	34302	19953	33080	38030	31812
L01-283	35746	33192+	46860+	27202	39233	37948	36697+
L01-299	39562	35624+	48453+	29941	48025+	35645	39542+

Table 18. Third-stubble sugar per acre for seven commercial varieties at two outfield locations in 2007.

Variety	Light		Mean
	Bon Secour	R. Hebert	
		(tons/A)	
LCP85-384	6633-	5850	6241-
HoCP91-555	8701	6616	7659
HoCP96-540	9044	6504	7774
L97-128	8161	6922	7541
L99-226	8318	7685	8002
L99-233	8186	7569	7878
HoCP00-950	10067	7861	8964

Table 19. Third-stubble cane yield for seven commercial varieties at two outfield locations in 2007.

	Light		
Variety	Bon Secour	Lanaux	Mean
		(tons/A)	
LCP85-384	26.3-	25.1	25.7
HoCP91-555	31.2	26.4	28.8
HoCP96-540	35.0	26.7	30.8
L97-128	28.0-	27.5	27.8
L99-226	30.7-	27.6	29.2
L99-233	32.3	32.1	32.2
HoCP00-950	32.7	27.8	30.2

Table 20. Third-stubble sugar per ton for seven commercial varieties at two outfield locations in 2007.

	Light		
Variety	Bon Secour	Lanaux	Mean
		(tons/A)	
LCP85-384	252	233	242
HoCP91-555	279+	250	265
HoCP96-540	259	245	252
L97-128	291+	253	272
L99-226	271	278+	275
L99-233	254	236	245
HoCP00-950	308+	284+	296+

Table 21. Third-stubble stalk weight for seven commercial varieties at two outfield locations in 2007.

	Light		
Variety	Bon Secour	Lanaux	Mean
		(tons/A)	
LCP85-384	1.50-	1.60	1.55
HoCP91-555	1.73	1.63	1.68
HoCP96-540	1.90	1.57	1.73
L97-128	1.87	1.80	1.83
L99-226	2.17	1.90	2.03+
L99-233	1.63	1.53	1.58
HoCP00-950	1.80	1.57	1.68

Table 22. Third-stubble stalk number for seven commercial varieties at two outfield locations in 2007.

Variety	Light		Mean
	Bon Secour	Lanaux	
	(tons/A)		
LCP85-384	35338	31314	33326
HoCP91-555	36339	32382	34360
HoCP96-540	36940	35784	36362
L97-128	30117-	30471	30294
L99-226	28879-	30070	29474-
L99-233	39604	42568	41086
HoCP00-950	36604	35320	35962

Table 23. Plantcane means from seven outfield locations in 2007: Allains, Alma, Landry, Bon Secour, Glenwood, Lanaux, and R. Hebert.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	7655-	27.8-	273	1.91-	30196
CP89-2143	8680-	33.8-	256	2.82+	25160-
Ho95-988	9724	35.4-	274	2.44	29307
HoCP96-540	10489	39.3	266	2.46	33098
L97-128	10180	37.4	270	2.50	30035
L99-226	10728	37.6	284+	3.02+	25417-
L99-233	9781	39.0	249-	1.96-	41341+
HoCP00-950	11015	37.9	290+	2.40	32094
L01-283	11128	40.0	276	2.27	36476
L01-299	9965	37.1	267	2.19-	35596
L03-371	10388	37.0	281+	2.35	32263

Table 24. First-stubble means from seven outfield locations in 2007: Alma, Magnolia, Landry, Bon Secour, Glenwood, Lanaux, and R. Hebert.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	8597	29.7-	288	1.89-	32375
CP89-2143	8448-	30.9	273-	2.72+	23155-
Ho95-988	9669	33.5	288	2.34	28879
HoCP96-540	9539	33.6	284	2.31	29961
L97-128	9271	32.4	286	2.45	26765
L99-226	10462	34.2	305+	2.83+	24690-
L99-233	9417	33.5	281	1.88-	36682+
HoCP00-950	9642	31.0	311+	2.24	27802
L01-283	10195	34.5	296+	2.01-	35163+
L01-299	10152	35.6	286	2.00-	36404+

Table 25. Second-stubble means from six outfield locations in 2007: Allains, Bon Secour, Glenwood, Lanaux, R. Hebert and Levert St. John farms.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	6257	25.2	249	1.56-	33649
HoCP91-555	7506+	28.6	263+	1.73	33344
Ho95-988	7716+	29.2	264+	2.04+	28936
HoCP96-540	6617	27.7	238	1.82	30571
L97-128	6966	26.9	259+	1.93	28304
L99-226	7957+	29.2	272+	2.37+	25304-
L99-233	7691+	31.6+	239	1.62-	39677+
HoCP00-950	8688+	30.3	286+	1.94	31812
L01-283	8391+	31.0	270+	1.71	36697+
L01-299	8513+	33.9+	251+	1.74	39542+

Table 26. Third-stubble means from two outfield locations in 2007: Bon Secour and Lanaux farms.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	6241	25.7	242	1.55	33326
HoCP91-555	7659	28.8	265	1.68	34360
HoCP96-540	7774	30.8	252	1.73	36362
L97-128	7541	27.8	272	1.83	30294
L99-226	8002	29.2	275	2.03+	29474-
L99-233	7878	32.2	245	1.58	41086
HoCP00-950	8964	30.2	296+	1.68	35962

Table 27. Combined plantcane means across outfield locations from 2004 to 2007.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	7453-	27.5-	271	1.83-	30563
HoCP95-988	9038-	33.0-	273	2.30	29039
HoCP96-540	9689	35.0	277	2.36	30283
L97-128	8985-	32.7-	275	2.38	27654-
L99-226	10210+	35.0	292+	2.76+	25932-
L99-233	9330	34.9	267-	1.88-	37824+
HoCP00-950	9879	33.4-	296+	2.14-	31544

Table 28. Combined first-stubble means across outfield locations from 2005 to 2007.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	7559-	27.3-	276-	1.67-	33625+
HoCP95-988	8773	31.4	279	2.11	30071
HoCP96-540	8804	31.1	283	2.10	30343
L97-128	8340	30.0	277-	2.19	27846-
L99-226	9810+	32.7	299+	2.53+	26401-
L99-233	8576	31.2	274-	1.72-	37464+
HoCP00-950	8923	29.6	302+	1.94-	31146

Table 29. Combined second-stubble means across outfield locations from 2006 to 2007.

Variety	Sugar per Acre	Cane Yield	Sugar per Ton	Stalk Weight	Stalk Number
	(lbs/A)	(tons/A)	(lbs/ton)	(lbs)	(stalks/A)
LCP85-384	6789-	26.6-	255	1.60-	34696
HoCP95-988	8399	30.5	274+	2.07	29858
HoCP96-540	7734	30.1	254	1.93	31600
L97-128	7958	29.4	270+	2.02	29288
L99-226	8621+	30.4	283+	2.27+	28013
L99-233	8256	32.1	256	1.68-	38816+
HoCP00-950	9266+	31.9	290+	1.94	33684

SUCROSE LABORATORY AT THE SUGAR RESEARCH STATION

Gert Hawkins and Kenneth Gravois
Sugar Research Station

The Sugar Research Station sucrose laboratory processed 2256 samples during the 2007 harvest season (Table 1). Standard laboratory procedures were used to analyze 430 samples. These procedures included the use of Octapol® for clarification, and Brix was measured by a refractometer and pol was measured by saccharimeter (Autopol 880). The juice was extracted via a three-roller mill for 430 samples. Sucrose percent and theoretical recoverable sugar (lbs/ton of cane) was calculated based on the Brix and pol values. The sucrose laboratory processed samples from September 2007 to December 2007.

A total of 1,826 samples were analyzed using the Spectracane FT-NIR instrument. The sample was prepared using a Dedini shredder that was then fed into the Spectracane unit that uses NIR technology to analyze the sample for Brix, pol, fiber, moisture, purity, and theoretical recoverable sugar. Biolabs supplied the instrument along with beginning calibrations for each variable measured. At the start, parallel wet chemistry was run on the first 400 samples. These measurements were used to fine tune the calibrations. Afterwards, every tenth sample was run in parallel wet chemistry. Samples that were spectral outliers were automatically sent into a bin and reanalyzed with wet chemistry procedures. These values were also used to improve the calibrations for the NIR instrumentation. The overall performance of the instrument was excellent.

Table 1. Number of sugarcane samples processed at the Sugar Research Station sucrose laboratory during the 2007 harvest season.

Unit/Project Area	Leader	Number of Samples
School of Plant, Environmental, and Soil Sciences	James Griffin	31
	Brenda Tubana	169
	Magdi Selim	24
	Jim Wang	50
Iberia Research Station	Howard Viator	216
Plant Pathology and Crop Physiology	Jeff Hoy	384
LCES	Ben Legendre	390
Sugar Research Station/Variety Development	Line Trials	243
	Increase	104
	Nursery	303
	Genetics	30
Contract Services		216
Dean Lee Research Station (Sweet Sorghum)	Steve Moore	24
LCES (Sweet Sorghum)	Jerry Whatley	16
Macon Ridge Research Station (Sweet Sorghum)	Don Boquet	40
Rice Research Station (Sweet Sorghum)	Dustin Harrell	16
TOTAL		2256

LAES SUGARCANE TISSUE CULTURE LABORATORY

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

During the 2007-2008 production season, about 35,000sugarcane plantlets were regenerated in the Louisiana Agricultural Experiment Station Sugarcane Tissue Culture Laboratory. A total of 31,105 plantlets 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
L99-233	792
Ho98-988	1,296
HoCP96-540	3,672
HoCP00-950	6,030
L99-226	3,888
L01-283	1,771
L01-299	5,256
HoCP91-552	8,400
TOTAL	31,105

THE 2007 LOUISIANA SUGARCANE VARIETY SURVEY

Benjamin L. Legendre and Kenneth A. Gravois
Sugar Research Station

INTRODUCTION

A sugarcane variety survey was conducted during the summer of 2007 by the county agents in the 23 sugarcane-growing parishes (counties) of Louisiana to determine the variety makeup and distribution across the industry in the state. There was no parish survey report from Evangeline Parish where there was less than 1,000 acres grown in 2006. Further, the number of parishes in the state decreased by one in 2007 as sugarcane was no longer grown in East Baton Rouge Parish. The information presented in this report was summarized from those individual parish surveys.

Agents in each sugarcane-producing parish collected acreage figures by variety and crop from growers in their respective parishes. Eight varieties, LCP 85-384, HoCP 85-845, HoCP 91-555, Ho 95-988, HoCP 96-540, L 97-128, L 99-226 and L 99-233 were listed along with "Others" in the survey. The category of others included, but was not limited to, small acreages of CP 65-357, CP 70-321, CP 72-370, LCP 82-89, LHo 83-153, CP 89-2143 and the newly released variety, HoCP 00-950. There was also a small acreage of L 01-283 on the secondary stations; this variety is eligible for commercial release in 2008. 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 Farm Service Agency (FSA) offices.

Total State and Regional Acreage. Actual area planted to sugarcane included in this survey for each parish, region and the statewide total are shown in Table 1. Statewide, the area planted to sugarcane in 2007 was 418,382 acres. This compares to 434,316 acres planted in 2006, a decrease of 15,934 acres from 2006, a reduction of 3.7% (Legendre & Gravois 2007). Figure 1 shows the parishes where sugarcane is grown in the state. Total area planted to sugarcane for the three regions, Bayou Teche, River-Bayou Lafourche and Northern, and list of parishes by regions are also shown in Table 1. The Bayou Teche region has the largest area planted to sugarcane, with 181,456 acres reported (43.4% of the total acreage), followed by the River-Bayou Lafourche region with 156,646 acres (37.4%) and the Northern area with 80,280 acres (19.2%). Those parishes with the largest acreage in sugarcane are: Teche region - Iberia, St. Mary, St. Martin and Vermilion; River-Bayou Lafourche region - Assumption, Iberville, Lafourche and St. James; and, Northern region - Pointe Coupee, Avoyelles, West Baton Rouge and St. Landry.

The total area planted to sugarcane in all regions declined in 2007 when compared to 2006, particularly in the Teche and Northern regions. Overall, the drop has been approximately 60,000 acres over the last 5-year period. The main reasons for this decline in recent years are a low return on investment due to low sugar prices, high grain prices that have enticed growers to switch commodities (especially in the Northern region) and urban encroachment (especially in the Teche region).

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 2007 continued to be LCP 85-384, with 46% of the total acreage followed by HoCP 96-540 (31%), L 97-128 (12%), Ho 95-988 (4%), HoCP 91-555 (3%) and HoCP 85-845 (2%). All other varieties in the survey were planted on 1% or less of the area. LCP 85-384 and HoCP 91-555 are listed as two of the older varieties being released to the industry in 1993 and 1999, respectively (Legendre 2001). The acreage of LCP 85-384 continued to decrease with only 5% of the plant-cane area while the acreage planted to HoCP 96-540 and L 97-128 continued to increase with 55% and 26% of the plant-cane area, respectively. Growers, concerned with the decline in yield of LCP 85-384, have switched to other varieties, namely HoCP 96-540 and L 97-128. They have continued to plough out much of their older stubble of LCP 85-384 in order to plant the newer varieties. Other options for 2007 were Ho 95-988 (8%), L 99-226 (2%) and L 99-233 (1%). CP 70-321, the leading variety prior to the release of LCP 85-384 in 1993, occupied less than 1% of the total acreage in 2007. The new variety, HoCP 00-950 was released to the industry in the fall of 2007 with only limited acreage on the secondary increase stations. Most of the seed cane on the secondary stations was distributed to the industry for planting. There was one additional variety, L 01-283, on the secondary increase stations during 2007 that will be a candidate for commercial release in 2008 .

The majority of the Louisiana sugarcane crop has been harvested by cane combine since 2000 when over 70% of the crop was planted to LCP 85-384 (Legendre & Gravois 2006), presumably to take advantage of the variety's superior yield potential. However, with the lower yields experienced since 2003, especially in the older stubble crops, many growers, especially in the Bayou Teche region, have switched back to the whole-stalk "soldier" system for harvesting their crop. This is mainly due to the lower costs of operating the whole-stalk system. The yield of LCP 85-384 rebounded somewhat in 2006 and 2007; however, the superior yield potential of the newer varieties, especially HoCP 96-540, have had many growers abandon LCP 85-384.

Sugarcane Distribution by Region and Crop. With the prominence of LCP 85-384, there had been a trend to plant less cane each year and keep more acres in older stubble crops; however, because of the poor performance of LCP 85-384, especially in the older stubble crops, that trend changed in 2004 and continued into 2007 when more acres were replanted in all regions than had been reported in previous years (Table 3). In 2007, there was an increase in plantcane acreage to 31.3% while the acreage of third and older stubble decreased to only 11.1%, a decrease of 5.6 percentage points or 33.5% when compared to 2006. As recently as 2003, the acreage in second and older stubble was over 50% of the total acreage; now it is only 38.4%.

For the current survey, the Northern region, which has routinely kept older stubble, had only 14.3% in third and older stubble in 2007, a decrease from 22.0% when compared to 2006 (Table 3). The percentage in plantcane increased from 27.6% in 2006 to 31.1% in 2007. The River-Bayou Lafourche region tends to plant more cane each year, with less of its area devoted to stubble crops. In this region, there was only 10.6% of the acreage in third- and older stubble crops and 31.7% in the plant-cane crop in 2007. The trend for less stubble and more plantcane was also evident for the Bayou Teche region. With increased planting, the amount of older stubble decreased from 15.6% in 2006 to 10.0% in 2007 while plantcane increased from 29.7% in 2006 to 31.0% in 2007.

Sugarcane Distribution by Variety and Crop for the Three Regions. With regards to crop from plant-cane through third- and older stubble crops, LCP 85-384 remained the leading variety

in all regions in 2007 (Tables 4, 5 and 6). Although LCP 85-384 was the dominant variety when total acreage was considered, its preference in plantcane diminished significantly with the new variety, HoCP 96-540, occupying 58.8, 48.1 and 59.8% of the plantcane crop in the Bayou Teche, River/Bayou Lafourche and Northern regions, respectively. The percentages for LCP 85-384 in the plant-cane crop for the three regions dropped to 2.2, 9.7 and 3.3%, respectively. There was also a significant increase in the planting of L 97-128 in all regions. The popularity of the older varieties, namely CP 70-321, HoCP 85-845 and HoCP 91-555, continued to loose favor by growers in all regions. HoCP 85-845 was grown on only 2.0% or less of the planted area, regardless of regions. The acreage planted to HoCP 91-555 remained virtually unchanged at approximately 3.0% across crop year and regions. The area planted to the new variety, Ho 95-988, increased only slightly in 2007 as it appeared that growers favored HoCP 96-540 and L 97-128. Growers were concerned with the flare up of brown rust in this variety and, consequently, decided to limit its plantings.

Variety Trends. For the second consecutive year the acreage planted to LCP 85-384 decreased from the previous year (Table 7). The drop in acreage was 27% from 2006. LCP 85-384 reached its maximum utilization in 2004 when 91% of the Louisiana acreage was planted to this variety. CP 70-321 which occupied 49% of the planted acreage as late as 1995 is now planted on less than 1% of the State's sugarcane area. Only one other variety, CP 65-357, released in 1973, reached more than 70% of the total acreage in the state with a high of 71% in 1980. HoCP 96-540, released for commercial planting in 2003, and Ho 95-988 and L 97-128, released in 2004, have all gained in popularity with increases of 17, 8 and 2 percentage points, respectively. According to Robert et al. (2007), the three new varieties, Ho 95-988, HoCP 96-540 and L 97-128, are generally superior to LCP 85-384 in yield of sugar per acre throughout the crop cycle. Ho 95-988 has good stubbling ability; HoCP 96-540 has excellent yield of cane per acre; and L 97-128 has early, high sucrose content to go along with its early maturity classification. Ho 95-988 is classified as resistant to mosaic and leaf scald and moderately susceptible to smut and susceptible to brown rust and the sugarcane borer. HoCP 96-540 is classified as resistant to smut and mosaic, moderately resistant to rust and leaf scald and moderately susceptible to the sugarcane borer. However, more rust has been seen in HoCP 56-540 in recent years and its resistance may break down as the area planted to the variety increases as was the case with LCP 85-384. L 97-128 is classified as resistant to mosaic, moderately resistant to leaf scald and rust, moderately susceptible to smut and susceptible to the sugarcane borer. All three varieties are more erect than LCP 85-384; hence, losses associated with mechanical harvesting should be less when compared to LCP 85-384.

There were two additional new varieties released to the industry in 2006, L 99-226 and L 99-233, with superior yield of both cane and sugar per acre. Both varieties have adequate resistance to the major disease complexes with L 99-226 exhibiting an added attribute of having resistance to the sugarcane borer. Each variety was planted on approximately 1% of the total acreage in 2007 and it is expected that both varieties will gain in popularity with time. Although LCP 85-384 held on as the top variety in 2007, it is anticipated that it will loose its hold on the top spot in 2008 when HoCP 96-540 will take its place as the predominant variety. HoCP 00-950 was released for commercial planting in 2007 and is expected to gain favor with growers in the future because of its superior yields of both sugar per ton of cane and per acre. During the development phase, HoCP 00-950 had the highest level of sugar per ton of cane and was considered as one of the earliest maturing varieties ever released for commercial planting in Louisiana. With the release of six new varieties since 2003 and more promising experimental clones on the horizon, it is believed that the Louisiana sugarcane industry should have a more

balanced mix of varieties.

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Concern Over the Dependence of a Single Variety (Monoculture). Occasionally, expectations outweigh potential risk considerations to the planting of a single variety (Tew, 1987). Hoy (2005) reported that LCP 85-384 was susceptible to common brown rust, and this disease can have a significant negative impact on both cane and sugar yield in areas of severe rust infection. He reported that rust can be controlled by fungicides; however, the best control option at this point is to plant the new varieties which have shown a greater degree of resistance. However, one new variety, Ho 95-988, is now considered susceptible to brown rust and has not been widely adapted by the industry. Further, in 2007 there were many fields of HoCP 96-540 that showed symptoms of brown rust but the severity of infection was not considered serious. However, as the industry increases the planting of this variety, there might be an increase in severity. Again, the message is to diversify and not rely on one variety. During the 2007 crop year, a new disease, orange rust, was discovered in Florida but not in Louisiana. Although orange rust is not considered a serious disease to most sugarcane industries around the world, it has been responsible for the demise of several varieties in other countries. It appears that one of Florida's major varieties, CP 80-1743, is susceptible to this new disease and its future is questionable.

Another disease was found in LCP 85-384 in recent years, *sugarcane yellow leaf* disease (Grisham et al. 2001); it appears that the variety is tolerant to this disease. However, it is entirely possible that this new virus is also taking its toll on yield of this and other varieties.

In a continuing effort to lessen the dependence of the industry on one variety, the Louisiana variety development program has developed six new high yielding varieties since 2003, namely, Ho 95-988, HoCP 96-540, L 97-128, L 99-226, L 99-233 and HoCP 00-950. However, from the most recent variety survey, many growers are planting only two varieties, HoCP 96-540 and L 97-128, which could mean that the industry will again rely on only one or two varieties. Monocultures were common to the Louisiana sugarcane industry prior to the introduction of interspecific hybrids in the 1920s. However, the Louisiana sugarcane industry can no longer afford to rely upon a single variety today as it did with LCP 85-384; therefore, we want to emphasize the need to plant several varieties to help to spread the risk of crop failure for any one variety.

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Table 1. Total area planted to sugarcane in Louisiana by region and parish (county), 2007.[1]

Bayou Teche		River-Bayou Lafourche		Northern	
Parish	**Acres**	**Parish**	**Acres**	**Parish**	**Acres**
Acadia	2,230	Ascension	14,220	Avoyelles	11,835
Calcasieu	3,354	Assumption	39,211	Pointe Coupee	32,272
Cameron	326	Iberville	32,329	Rapides	12,039
Iberia	54,808	Lafourche	28,959	St. Landry	9,497
Jeff Davis	2,722	St. Charles	1,705	West Baton Rouge	14,637
Lafayette	13,240	St. James	23,654		
St. Martin	31,000	St. John	6,429		
St. Mary	42,399	Terrebonne	10,139		
Vermilion	31,377				
Total	181,456	Total	156,646	Total	80,280

Total all regions: 418,382

[1] Acreage based on information obtained in variety surveys from 22 parishes by the county agents in 2007.

Table 2. Estimated statewide sugarcane acreage percentage by variety and crop, all regions, 2007.[1]

Variety	Plant-cane	First-stubble	Second-stubble	Third-stubble and older	Total
	----------%----------				
LCP 85-384	5	44	80	84	46
HoCP 85-845	<1	2	2	3	2
HoCP 91-555	<1	2	4	9	3
Ho 95-988	8	3	<1	<1	4
HoCP 96-540	55	37	10	2	31
L 97-128	26	11	2	<1	12
L 99-226	2	<1	<1	0	<1
L 99-233	1	<1	<1	0	<1
Other	1	<1	<1	2	1
Total acres Percent of total crop	130,898 31.3	126,931 30.3	114,299 27.3	46,254 11.1	418,382

[1] Based on information obtained in variety surveys from 22 parishes by county agents in 2007.

Table 3. Estimated sugarcane distribution by region and crop, 2007.[1]

Crop	Bayou Teche	River-Bayou Lafourche	Northern	State Total
Plant-cane Area (acres) Percent (%)	56,160 30.9	49,704 31.7	25,033 31.1	130,897 31.3
First-stubble Area (acres) Percent (%)	54,350 30.0	50,187 32.0	22,395 27.9	126,932 30.3
Second-stubble Area (acres) Percent (%)	52,780 29.1	40,132 25.6	21,387 26.6	114,299 27.3
Third-stubble and older Area (acres) Percent (%)	18,166 10.0	16,623 10.6	11,465 14.3	46,254 11.1
Total area (acres) Percent (%)	181,456 43.4	156,646 37.4	80,280 19.2	418,382

[1] Based on information obtained in variety surveys from 22 parishes by county agents in 2007.

Table 4. Estimated area planted to sugarcane in percent by variety and crop for the Bayou Teche region, 2007.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	2	36	78	74	42
HoCP 85-	<1	2	3	5	2
HoCP 91-	<1	2	5	15	4
Ho 95-988	7	3	<1	<1	3
HoCP 96-	59	43	10	3	34
L 97-128	27	12	2	0	12
L 99-226	2	<1	<1	0	<1
L 99-233	1	<1	<1	0	<1
Others	2	1	2	3	2
Totals	100	100	100	100	100

[1] Based on information obtained in variety surveys from 9 parishes by county agents in 2007.

Table 5. Estimated area planted to sugarcane in percent by variety and crop for the River/Bayou Lafourche region, 2007.[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	10	51	83	91	50
HoCP 85-	<1	2	2	3	2
HoCP 91-	<1	2	2	3	2
Ho 95-988	7	3	<1	<1	3
HoCP 96-	48	29	9	2	27
L 97-128	28	11	2	<1	13
L 99-226	3	<1	<1	0	1
L 99-233	1	<1	<1	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 2007.

Table 6. Estimated area planted to sugarcane in percent by variety and crop for the Northern region, 2007[1]

Variety	Plant-cane crop (%)	First-stubble crop (%)	Second-stubble crop (%)	Third-stubble crop & older (%)	Total (%)
LCP 85-384	3	45	81	90	48
HoCP 85-	2	<1	0	0	<1
HoCP 91-	<1	3	4	7	3
Ho 95-988	10	4	<1	0	4
HoCP 96-	60	39	13	<1	33
L 97-128	21	9	1	<1	9
L 99-226	2	<1	0	0	<1
L 99-233	<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 5 parishes by county agents in 2007.

Table 7. Louisiana sugarcane variety trends, by variety and years, all regions, 2003-2007[1]

	Area planted to sugarcane by variety and years (%)					
Variety	2003	2004	2005	2006	2007	1 yr. Change
CP 70-321	3	2	1	<1	<1	0
LCP 85-384	88	91	89	73	46	-27
HoCP 85-845	4	3	2	1	2	+1
HoCP 91-555	4	3	4	5	3	-2
Ho 95-988	-	<1	<1	2	4	+2
HoCP 96-540	<1	1	3	14	31	+17
L 97-128	-	<1	1	4	12	+8
L 99-226	-	-	-	-	1	+1
L 99-233	-	-	-	-	<1	+1
Others	<1	<1	<1	<1	1	+1
Totals	100	100	100	100	100	

[1] Based on annual variety surveys from 22 parishes by county agents, 2003-2007.

Figure 1. Parishes (counties) in Louisiana where sugarcane is grown.

SUGARCANE TASSELING UNDER ARTIFICIAL PHOTOPERIOD CONDITIONS AS AFFECTED BY NITROGEN RATE AND TEMPERATURE

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Optimizing flowering in the LSU AgCenter's Sugarcane (*Saccharum* spp. hybrids) Breeding Program is an important step in the variety development program. The effect of nitrogen and ambient air temperature in pot cultured sugarcane were examined as a means of improving sugarcane flowering. The experiment was conducted on agronomic and reproductive traits of sugarcane at the Sugar Research Station, St. Gabriel, LA, on sugarcane clones subjected to artificial photoperiod regimes. The potting media consisted of equal parts of washed sand, Canadian peat moss, and a Commerce silt loam soil (*fine-silty, mixed, nonacid, thermic aeric Fluvaquents*). Early nitrogen (22.4-22.4-22.4 kg ha^{-1}), in addition to a high nitrogen potting media (>200 mg kg-1) was necessary for adequate vegetative growth and stalk numbers for tasseling. Leaf macronutrient levels were examined at reproductive growth stages as affected by pre-photoperiod nitrogen fertilizers (22.4-22.4-22.4 kg ha-1 and 0-22.4-22.4 kg ha-1). Since tasseling in nitrogen and no-nitrogen treatments were 77% and 25%, respectively, the critical leaf nutrient level for nitrogen at the vegetative stage for sugarcane intended for tasseling should be 12.4 g kg-1. A chlorophyll meter was used to collect chlorophyll readings from the same leaves that were sampled for plant analysis. The initiation stage was the only stage that both leaf nitrogen (r = -0.34) and chlorophyll meter readings (r = 0.80) showed significant associations. A chlorophyll index level (34.53) was developed as a maximum threshold level for sugarcane breeding genotypes at the initiation stage.

Averaged daily maximum temperatures during certain time periods namely**,** May 30 – June 14, June 15 – June 30, and August 16-September 10, was examined using regression analysis to determine their effect on percent tasseling. These time periods correspond to certain developmental stages during the transition from vegetative to reproductive growth of sugarcane subjected to artificial photoperiod treatments in Louisiana. The response variable, percent tasseling, was drawn from three artificial photoperiod regimes namely, early, late and overall which combined the early and late data sets. Only the regression model using the overall tasseling proved to be reliable for interpretation because sample sizes were too small for tasseling percent drawn from the early and late data sets. A complete model was fitted to the overall tasseling data set. The complete model was reduced by certain variable selection techniques (R-Square, Backward elimination, Forward selection, and Stepwise) until the reduced model was optimum (Freund and Wilson 2003). The complete model for the overall tasseling regime was significant (P=0.06). When a reduced model was fitted to the overall tasseling data, the model accounted for 60% of the variation in tasseling percentage. The C(p) values for both the maximum model (7.00) and the reduced model (5.16) is an indication that this was an adequate model. The reduced model (P=0.02) specified three specific variables in the overall model, May 30 – June 14, June 15 – June 30, and August 16-September 10, to be the most responsible for the tasseling response observed in the data. The three variables coincided with the vegetative transition May 30 – June 14, late vegetative to early initiation June 15 – June 30, and post-initiation August 16- September 10 phases of

vegetative to reproductive growth. The results indicate that the percent tasseling is expected to increase 4.19 percent when the May 30 – June 14 variable goes up by one degree above 31.9° C, decrease by 4.36 percent when the June 15- June 30 variable goes up by one degree above 32.1° C, and decrease by 4.69 percent when the August 16– September 10 variable goes up by one degree above 33.1° C. The time period August 16– September 10 is rarely mentioned in the literature with regards to suppression of sugarcane tasseling. This post-initiation timeframe from August 16 – September 10 may be a key unknown factor inhibiting the tasseling of some sugarcane clones in the LSU AgCenter's Sugarcane Breeding Program. For the one year (2002) that did conform to all of the critical temperatures for each time period, excellent tasseling (73%) was achieved. For the one year (2005) that did not conform to any of the critical temperatures for each time period, poor tasseling was achieved (27%). All of the other years in the study were combinations of critical temperatures for the various time periods. The study showed that daily maximum ambient temperatures affected the outcome of sugarcane tasseling in the LSU AgCenter's Sugarcane Breeding Program. The inability to control daytime highs (temperature) at certain time periods during the artificial photoperiod treatment can be a factor limiting genotypes from expressing their full tasseling potential.

IDENTIFICATION OF MOLECULAR MARKERS ASSOCIATED WITH SUGAR RELATED TRAITS IN A *SACCHARUM* INTERSPECIFIC CROSS

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Cultivated sugarcane (*Saccharum* spp. hybrid) is one crop for which interspecific hybridization involving wild germplasm has provided a major breakthrough in its improvement. However, very few clones were used in the initial hybridization giving sugarcane a narrow genetic base. This narrow genetic base has been cited as one of the factors responsible for the limited progress being experienced by some sugarcane breeding programs. In Louisiana, an active basic breeding program exists alongside the commercial breeding program which utilizes *Saccharum* germplasm for sugarcane cultivar development. Molecular breeding would facilitate identification and introgression of novel alleles/genes from the basic germplasm into cultivated sugarcane.

In this study, we report identification of molecular markers associated with sugar-related traits using a F_1 population derived from a *S. officinarum* 'Louisiana Striped' x *S. spontaneum* 'SES 147B' cross. Genetic linkage maps of *S. officinarum* and *S. spontaneum* were produced using the AFLP, SRAP and TRAP molecular marker techniques. The mapping population was evaluated for sugar-related traits namely, Brix (B), pol (P) and sucrose (S) at the early (E) and late (L) plant growing season in the plant (04) and first ratoon (05) cane crops (04EB, 04LB, 04LS, 04LP, 05EB, 05ES and 05EP). Composite interval mapping quantitative trait loci (CIM-QTL) analysis was performed to identify marker-trait associations. For *S. officinarum*, combined across all the traits a total of 41 QTLs were observed with LOD scores ranging from 2.51 to 7.64 (Table 1). The phenotypic variation (adj. R^2) explained by all QTLs per trait ranged from 15.9% (04LP) to 48.4% (04EB). For *S. spontaneum*, a total of 21 QTLs were observed with LOD scores ranging from 2.56 to 7.51 with the phenotypic variation explained ranging from 6.5% (04LP) to 43.5% (04LB) (Table 2). Fourteen digenic interactions (*i*QTL) were observed in *S. officinarum* whereas only two were observed in *S. spontaneum* (Tables 3). Most of the QTLs observed in *S. officinarum* were positive as expected, although a few negative QTLs were also found (Table 1). On the contrary, mostly negative QTLs were observed for *S. spontaneum*, but interestingly, a few positive QTLs were also found (Table 2). Two positive marker-QTLs (EM1286 on LG L6 and EM475 on LG L8) in *S. officinarum* and one marker-QTL (PM0983 on LG S5) in *S. spontaneum* were repeatedly observed for Brix and sucrose both at the early and late plant growing seasons and across crop-years. Such positive and consistent markers observed from

S. officinarum and *S. spontaneum* would serve as a good starting point for a marker assisted selection (MAS) program to introgress novel alleles/genes into cultivated sugarcane while concurrently selecting against the deleterious alleles with negative effects. This study also validated the potential of two new molecular marker techniques, SRAP and TRAP, for use in QTL tagging in sugarcane. Lastly, the QTL results were further corroborated by non-parametric discriminant analysis (DA). Most of the DA-identified markers were either identical to or in the vicinity of QTL-identified markers (Tables 4 and 5; Figure 1). DA also identified markers which failed to form linkage groups and therefore were unidentifiable by CIM-QTL analysis (Table 6). The results imply that DA could be used as a complementary approach to traditional QTL analysis in a crop like sugarcane for which saturated linkage maps are unavailable and difficult to obtain.

Table 1. Putative markers identified in *S. officinarum* 'Louisiana Striped' based on composite interval mapping (CIM) QTL analysis in an interspecific cross between *S. officinarum x S. spontaneum*. The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plantcane, 04) and 2005 (first ratoon, 05)

Trait	LG[†]	Marker	LOD score[‡]	partial $R^{2§}$	Additive effect
04EB	L6	EM1286	4.62	21.2	0.109
		EM1186	7.48	34.3	-0.168
	L8	EM475	4.42	11.3	0.058
	L15	EM11714	4.56	3.0	0.053
	L35	EM287	2.92	15.1	-0.068
	L40	EM486	4.60	17.4	0.092
	L49	PM05810	4.56	15.9	0.088
				Adj.$R^{2¶}$ = 48.4	
04LB	L3	EM7717	4.32	9.8	-0.238
	L6	EM1286	5.07	6.9	0.258
		EM1186	7.05	27.2	-0.397
	L8	EM475	3.11	12.1	-0.135
	L20	EM886	3.44	4.4	0.150
	L49	PM05810	2.76	15.1	0.152
				Adj.R^2 = 35.5	
04LS	L1	EM5814	4.84	14.3	-0.364
		EM588	5.25	9.6	0.390
		EM5717	2.68	8.0	0.161
	L6	EM1286	3.50	11.4	0.167
		EM1186	7.36	21.9	-0.318
	L8	EM475	4.14	22.7	-0.191
	L20	EM886	3.32	0.2	0.081
	L33	sus41	2.61	2.8	-0.177
	L37	PM0882	3.80	10.3	-0.214
	L41	PM06714	2.51	4.4	0.150
				Adj.R^2 = 28.4	
04LP	L3	EM7710	2.73	7.3	-1.8
	L4	EM12811	3.44	7.4	2.00
	L6	EM1186	3.21	9.8	-2.08
	L36	EM274	2.58	12.5	2.05
				Adj.R^2 = 15.9	
05EB	L6	EM1286	4.08	21.6	0.114
		EM1186	6.35	32.2	-0.173
	L8	EM475	4.22	11.0	-0.061
	L15	EM11714	4.37	1.5	0.061
	L35	EM287	2.65	16.7	-0.049
	L40	EM486	3.88	19.8	0.095
	L49	PM05810	2.98	14.4	0.077
				Adj.R^2 = 47.4	
05ES	L6	EM1286	5.59	23.5	0.127
		EM1186	7.64	30.9	-0.175

Table 1. Continue

Trait	LG[†]	Marker	LOD score[‡]	partial $R^{2§}$	Additive effect
	L8	EM475	3.22	12.0	-0.055
	L15	EM11714	4.87	4.4	0.057
	L35	EM287	3.24	17.5	-0.059
	L40	EM486	3.86	17.0	0.090
	L49	PM05810	4.57	15.9	0.092
				Adj.R^2= 47.8	
				Avg. Adj.R^2 = 41.4	

[†]The construction of linkage groups (LG) was described in Alwala et al. 2008b
[‡]The threshold LOD score was 3.01 as detected by 1000 run permutation tests and the QTLs with > 3.01 LOD score were deemed putative.
[§]Proportion of phenotypic variation explained by individual QTLs.
[¶]Proportion of total phenotypic variation explained by all QTLs in the final model after adjusting for number of terms in the multiple regression model.

Table 2. Putative markers identified in *S. spontaneum* 'SES 147B' based on composite interval mapping (CIM) QTL analysis in an interspecific cross between *S. officinarum x S. spontaneum*. The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plantcane, 04) and 2005 (first ratoon, 05).

Trait	LG[†]	Marker	LOD score[‡]	partial $R^{2§}$	Additive effect
04EB	S5	PM0972	3.56	7.0	0.122
	S33	EM1477	3.77	4.8	-0.093
				Adj.$R^{2¶}$=31.3	
04LB	S5	PM0983	3.97	15.1	0.308
	S12	sr416	2.62	8.1	-0.140
	S36	PM0781	2.96	3.8	0.115
				Adj.R^2=43.0	
04LS	S3	EM888	3.31	10.7	0.247
	S8	EM575	5.87	17.9	-0.465
		EM577	2.86	2.9	-0.187
		EM589	3.44	15.4	0.355
	S35	PM0886	2.56	9.0	0.225
				Adj.R^2=23.6	
04LP	S4	cd55	2.87	1.8	1.8
	S21	sr424	3.07	6.4	-2.0
	S33	EM1477	2.61	7.6	-1.4
				Adj.R^2=6.5	
05EB	S33	EM1477	2.91	2.7	-0.073
				Adj.R^2=23.0	
05ES	S5	PM0981	3.65	6.2	-0.125
		PM0983	7.59	25.6	0.254
	S8	EM575	3.10	9.0	-0.129
	S30	EM979	2.61	5.6	-0.103
	S33	EM1477	3.62	10.5	-0.097
	S38	PM0375	3.25	11.0	0.145
				Adj.R^2=43.5	
05EP	S1	EM11720	3.19	9.0	-1.02
				Adj.R^2=7.0	
				Avg. Adj.R^2 = 41.4	

[†]The construction of linkage groups (LG) was described in Alwala et al. 2008b.
[‡]The threshold LOD score was 2.90 as detected by 1000 run permutation tests and the QTLs with > 2.90 LOD score were deemed putative.
[§]Proportion of phenotypic variation explained by individual QTLs.
[¶]Proportion of total phenotypic variation explained by all QTLs in the final model after adjusting for number of terms in multiple regression model.

Table 3. The linear x linear digenic interacting QTL (*i*QTL) detected in *S. officinarum* 'Louisiana Striped' and *S. spontaneum* 'SES 147B' parental species. The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plantcane, 04) and 2005 (first ratoon, 05).

Trait	Number of interacting QTL[†]	Range of partial $R^{2‡}$	Adjusted $R^{2§}$	Range *P*[¶] values
		S. officinarum		
04LB	2	5.1 – 9.6	12.7	0.01 – 0.03
04LS	9	2.7 – 5.8	31.3	0.0001 – 0.05
04LP	1	6.8	6.8	0.01
05EB	2	4.0 – 3.8	5.3	0.03 – 0.05
		S. spontaneum		
04LP	1	4.8	3.6	0.04
05ES	1	3.9	2.6	0.03

[†]Linear x Linear digenic interacting QTLs as observed from multiple regression analysis.
[‡]Proportion of phenotypic variation explained by individual interacting QTLs.
[§]Proportion of total phenotypic variation explained by all interacting QTLs in the final model after adjusting for number of terms in multiple regression.
[¶]The *P* values are significant at the 0.05 level.

Table 4. Markers identified in *S. officinarum* 'Louisiana Striped' by discriminant analysis (DA) based on differentiation at 2 standard deviations of genotypes from an interspecific cross between *S. officinarum x S. spontaneum* into three groups (low, medium, high). The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plant cane, 04) and 2005 (first ratoon, 05).

Traits	DA selected markers[†]	Percent classification for DA identified markers[‡]		
		15	10	5
04EB	***sr2211***, sr572, **sr546,** sr124, EM5810, EM287, **EM1182**, EM1273, EM1572, cd23	100	99.98	82.50
04LB	sr259, sr576, EM473, EM779, EM1186, EM1277, cd91, PM0171, PM0376, PM0383	100	99.98	72.58
04LS	sr622, sr632, sr612, sr132, *EM5819*, **EM1182**, EM1184, cd144, PM08811, PM08713	100	99.97	75.42
04LP	sr329, EM572, EM986, **EM1182**, EM12715, EM12720, EM11718, EM14811, cd143, PM02817	100	99.35	80.06
05EB	***sr2211***, EM774, EM578, EM279, EM12716, EM1487, EM1572, cd59, cd141, sr624	100	100	68.53
05ES	sr229,**sr546**, sr634, sr643, EM5713, EM9713, EM1485, sus41, PM02712, PM03712	99.99	99.98	68.83
05EP	PM0374, EM1476, EM1575, EM1573, EM1288, EM11718, EM988, EM7714, *EM5819*, EM588	100	100	84.91

[†]Markers were denoted in bold, italics, and or underlined to visually depict markers that were repeated across growing seasons and crop-years.

[‡] Denotes the percent of genotypes that were correctly assigned into their respective groups (low, medium or high) for a particular trait when using 5, 10 or 15 markers identified by DA.

Table 5. Markers identified in *S. spontaneum* 'SES 147 B' by discriminant analysis (DA) based on differentiation at 2 standard deviations of genotypes from an interspecific cross between *S. officinarum x S. spontaneum* into three groups (low, medium, high). The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plantcane, 04) and 2005 (first ratoon, 05).

Trait	DA selected markers[†]	Percent classification of genotypes into groups using DA-identified markers[‡]		
		15	10	5
04EB	sr356, ***sr157***, ***EM872***, EM873, EM273, **cd54**, sai34, **PM0284**, PM0384, PM06711	100	99.98	82.50
04LB	sr344, sr381, EM975, EM1172, EM1173, sai24, PM0883, PM0678, PM0586, PM0372	100	99.98	72.58
04LS	sr333, sr341, *sr532*, sr556, sr641, sr381, *EM1272*, cd27, PM0586, **PM0284**	100	99.97	75.42
04LP	***EM872***, EM2712, EM14710, **sus43**, PM0176, PM0686, PM0586, cd53, PM03711, PM0577	100	100	94.31
05EB	sr325, ***sr157***, sr126, ***EM872***, EM11712, *EM1272*, EM1473, **sus43**, **cd54**, PM02714	100	100	68.53
05ES	sr4210, sr566, EM771, EM282, cd21, sus21, **cd56**, PM0177, PM0684, **PM0284**	99.99	99.98	68.83
05EP	sr442, sr646, sr661, *sr532*, EM2711, EM1174, **cd56,** PM0972, PM0887, PM0276	100	100	83.65

[†]Markers were denoted in bold, italics, and/or underlined to visually depict markers that were repeated across growing season and crop-years.

[‡] Denotes the percent of genotypes that were correctly assigned into their respective groups (low, medium or high) for a particular trait when using 5, 10 or 15 markers identified by DA.

Table 6. Markers identified by discriminant analysis (DA) but not QTL analysis in the *S. officinarum* 'Louisiana Striped' and *S. spontaneum* 'SES 147B' parents. The traits measured include Brix (B), sucrose (S) and pol (P) evaluated at the early (E) and late (L) growing seasons in the years 2004 (plantcane, 04) and 2005 (first ratoon, 05).

Trait	*S. officinarum*		*S. spontaneum*	
	A[†]	B[‡]	A[†]	B[‡]
04EB	sr546 (L24), EM5810 (L1)	EM1273, sr2211, sr572, sr124, EM1572, cd23	EM872 (S29)	sr356, sr157, EM273, cd54, sai34, PM0284, PM0384, PM06711
04LB	EM473 (L9), PM0376 (L38), PM0383 (L43)	sr259, sr576, EM1277, cd91, PM0171	sr344 (S24), EM1172 (S1), EM1173 (S1)	sr381, EM975, sai24, PM0586, PM0883, PM0678, PM0372
04LS		sr622, sr612, sr632, sr132, EM5819, cd144, PM08811, PM08713	sr333 (S40), sr341 (S44)	sr532, sr556, sr641, sr381, EM1272, cd27, PM0586, PM0284
04LP	sr329 (L30), EM986 (L16), EM12715 (L4)	EM572, EM12720, EM14811, cd143, PM02817	EM872 (S29), PM0686 (S37), PM03711 (S4)	EM2712, sus43, PM0176, PM0586, PM0577, cd53
05EB	EM279 (L12), EM12716 (L4), EM1487 (17), cd59 (L26)	sr2211, EM578, cd141, EM1572, sr624	sr325 (S39), sr126 (S25), EM872 (S29), EM11712 (S1), PM02714 (22)	sr157, EM1272, EM1473, sus43, cd54
05ES	sr546 (L24), sr634 (L44), EM1485 (L18)	sr229, sr643, EM5713, EM9713, PM02712, PM03712	sr4210 (S31), EM282 (S28)	sr566, EM771, cd21, sus21, cd56, PM0177, PM0684, PM0284
05EP	EM1476 (L17)	PM0374, EM1575, EM1573, EM988, EM7714, EM5819	sr442 (S44), sr661 (S45), EM2711, EM1174, PM0972, PM0276	sr646, sr532, cd56, PM0887

[†] Markers identified by DA but not QTL analysis.
[‡]Markers identified by DA which remained unlinked on the genetic linkage map.

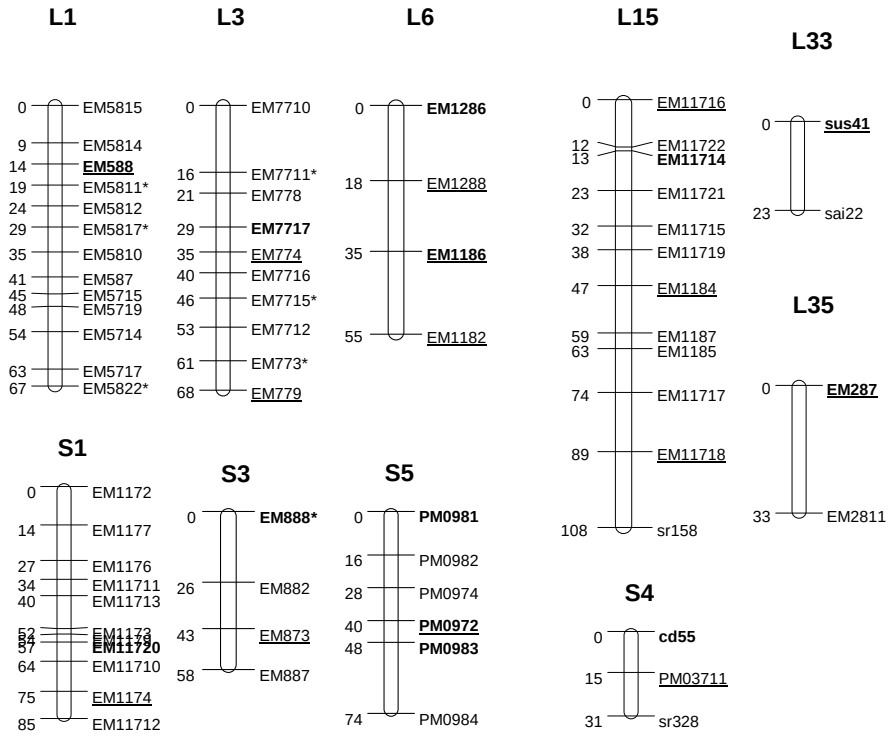

Figure 1. Linkage group locations of markers identified by discriminant analysis (DA) and the composite interval mapping (CIM) QTL analysis approaches. The DA-identified markers are indicated as underlined, CIM QTL-identified markers are represented in bold and the markers commonly identified by DA and CIM QTL analyses are represented as both bold and underlined. L1, L3, L6, L15. L33 and L35 are the linkage groups from *S. officinarum* whereas S1, S3, S4 and S5 are from *S. spontaneum.* The asterix (*) on markers indicate a segregation distorted marker.

SEQUENCE-RELATED AMPLIFIED POLYMORPHISM (SRAP) MARKERS FOR ASSESSING GENETIC RELATIONSHIPS AND DIVERSITY IN SUGARCANE GERMPLASM COLLECTIONS

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Characterization of wild germplasm provides essential information on genetic diversity that breeders utilize for crop improvement. The potential of the sequence-related amplified polymorphism (SRAP) technique, which preferentially amplifies gene-rich regions, was evaluated to assess the genetic relationships among members of the *Saccharum* species. A panel of 31 SRAP primer combinations (Table 1) were used to score 30 genotypes (Table 2) of *S. officinarum*, *S. spontaneum*, *S. robustum*, *S. sinense*, *S. barberi*, and sugarcane hybrids, with *Miscanthus* and *Erianthus* included as outgroups. The amplifications produced 1364 DNA fragments for an average of 44 per primer combination, with 83% (1135) being polymorphic (Table 3), and 8.7% (119) being species-specific (Table 4). Based on the Dice index, all 30 genotypes were differentiated from each other with genetic similarity (GS) estimates ranging from 0.60 to 0.96 (mean=0.79). Both the dendrogram (obtained by the unweighted pairgroup method with arithmetic mean or UPGMA) (Fig. 1) and the non-metric multi-dimensional scaling (NMDS) method (Fig. 2) grouped the genotypes according to their phylogenetic relationships. *Erianthus* and *Miscanthus* were separated as two outgroups (at GS levels of 0.56 and 0.72, respectively) to two major clusters: Cluster I separated the *S. robustum*, *S. sinense*, *S. barberi*, and hybrids as different subgroups with each one including some *S. officinarum* clones, while Cluster II included the *S. spontaneum* clones, exclusively. A *S. officinarum*-*S. spontaneum* sequence comparison of some of the monomorphic and polymorphic bands revealed 65 to 90% homology with rice, corn, or sugarcane sequences deposited in databases (Table 5). The possibility that most of the amplicons may be amplifying gene-rich regions of the genome coupled with a high discriminatory power makes SRAP a potentially robust tool for genetic mapping aimed at marker-assisted selection in sugarcane.

Table 1. The forward and reverse SRAP primer sequences used in the genotyping the *Saccharum* germplasm.

Forward	
SRAP Primer	**Sequence (5'-3')**
SF1	TGAGTCCAAACCGGATA
SF2	TGAGTCCAAACCGGAGC
SF3	TGAGTCCAAACCGGAAT
SF4	TGAGTCCAAACCGGACC
Reverse	
T1	GACTGCGTACGAATTAAT
T2	GACTGCGTACGAATTTGC
T3	GACTGCGTACGAATTGAC
T4	GACTGCGTACGAATTTGA
T5	GACTGCGTACGAATTAAC
T6	GACTGCGTACGAATTGCA
T7	GACTGCGTACGAATTCAA
T8	GACTGCGTACGAATTCAC

Table 2. Description of 30 genotypes of the *Saccharum* complex (made up of five *Saccharum* species and related genera) used in a SRAP marker analysis.

Serial Number	Genotype name	Genera or species[a]	Code
1	Kalingpong	*Erianthus*	Er
2	Dwarf1	*Saccharum* species hybrid (mutant)	DW1
3	Dwarf2	*Saccharum* species hybrid (mutant)	DW2
4	16 Low	*Saccharum* species hybrid (F_1)	Hy1
5	40 High	*Saccharum* species hybrid (F_1)	Hy2
6	POJ2878	*Saccharum* species hybrid (cultivar)	Cu1
7	LCP 85-384	*Saccharum* species hybrid (cultivar)	Cu2
8	CP 77-310	*Saccharum* species hybrid (cultivar)	Cu3
9	CP 77-407	*Saccharum* species hybrid (cultivar)	Cu4
10	LCP 85-845	*Saccharum* species hybrid (cultivar)	Cu5
11	Miscanthus	*Miscanthus*	Mi
12	Ganapathy	*S. barberi*	Sb1
13	Chin	*S. barberi*	Sb2
14	La Stripe	*S. officinarum*	So1
15	La Purple	*S. officinarum*	So2
16	Cuba	*S. officinarum*	So3
17	IN84-064A	*S. officinarum*	So3
18	NG 57-54	*S. robustum*	Sr1
19	NG 57-159	*S. robustum*	Sr2
20	Molokai 5573	*S. robustum*	Sr3
21	IMP72-232	*S. robustum*	Sr4
22	NG 77-218	*S. robustum*	Sr5
23	Chukche	*S. sinense*	Ssi
24	SES 147b	*S. spontaneum*	Ssp1
25	Coimbatore	*S. spontaneum*	Ssp2
26	MPTH 97-213	*S. spontaneum*	Ssp3
27	MPTH 97-200	*S. spontaneum*	Ssp4
28	MPTH 97-107	*S. spontaneum*	Ssp5
29	PIN 84-B	*S. spontaneum*	Ssp6
30	Molokai1032B	*S. spontaneum*	Ssp7

[a] Original sugarcane cultivars (e.g. POJ 2878) were derived from crossing mainly between *S. officinarum* and *S. spontaneum* followed by several generations of backcrosses to *S. officinarum*. Present-day cultivars are selections derived from cultivar x cultivar crosses.

Table 3. Polymorphism and PIC values for 31 SRAP primer combinations used in genotyping 30 genotypes representing the *Saccharum* complex (made up of five *Saccharum* species and related genera).

Primer combinations	Total no. amplified bands	Polymorphic bands		PIC[a]
		no.	%	
SF1/T1	47	36	76.60	0.19
SF1/T2	89	68	76.40	0.18
SF1/T3	43	35	81.40	0.28
SF1/T4	67	46	68.66	0.19
SF1/T5	50	35	70.00	0.17
SF1/T6	30	29	96.67	0.25
SF1/T7	39	28	71.79	0.16
SF1/T8	32	18	56.25	0.25
SF2/T1	48	43	89.58	0.22
SF2/T2	40	39	97.50	0.16
SF2/T3	43	34	79.07	0.17
SF2/T4	44	39	88.64	0.18
SF2/T5	47	38	80.85	0.32
SF2/T6	36	35	97.22	0.19
SF2/T8	24	19	79.17	0.23
SF3/T1	36	33	91.67	0.26
SF3/T2	89	77	86.52	0.18
SF3/T3	67	56	83.58	0.25
SF3/T4	42	31	73.81	0.26
SF3/T5	40	38	95.00	0.26
SF3/T6	38	34	89.47	0.27
SF3/T7	31	29	93.55	0.19
SF3/T8	32	28	87.50	0.21
SF4/T1	43	36	83.72	0.23
SF4/T2	92	84	91.30	0.19
SF4/T3	32	24	75.00	0.21
SF4/T4	45	34	75.56	0.20
SF4/T5	37	34	91.89	0.25
SF4/T6	21	19	90.48	0.32
SF4/T7	22	19	86.36	0.26
SF4/T8	18	17	94.44	0.25
Total	1364	1135		
Average	44	36.61	83.21	0.22

[a] PIC = polymorphism information content.

Table 4. Number of species-specific markers amplified by 31 SRAP primer combinations among three *Saccharum* species. [a]

Primer combinations	*S. officinarum*	*S. spontaneum*	*S. robustum*	Across species
SF1/T1	0	3	0	3
SF1/T2	0	1	0	1
SF1/T3	0	8	0	8
SF1/T4	0	6	0	6
SF1/T5	0	3	1	4
SF1/T6	0	2	0	2
SF1/T7	0	5	0	5
SF1/T8	0	0	2	2
SF2/T1	0	8	0	8
SF2/T2	2	2	1	5
SF2/T3	1	1	0	2
SF2/T4	0	0	0	0
SF2/T5	0	2	2	4
SF2/T6	0	2	1	3
SF2/T8	0	1	0	1
SF3/T1	3	6	2	11
SF3/T2	2	3	2	7
SF3/T3	2	6	0	8
SF3/T4	0	3	0	3
SF3/T5	2	3	0	5
SF3/T6	0	4	0	4
SF3/T7	0	0	0	0
SF3/T8	0	0	2	2
SF4/T1	1	1	1	3
SF4/T2	0	10	0	10
SF4/T3	0	1	0	1
SF4/T4	2	1	0	3
SF4/T5	0	1	1	2
SF4/T6	0	2	0	2
SF4/T7	0	4	0	4
SF4/T8	0	0	0	0
Total	15	89	15	119

[a] Markers that were present in at least two genotypes of a species and completely absent in other species were regarded as species-specific.

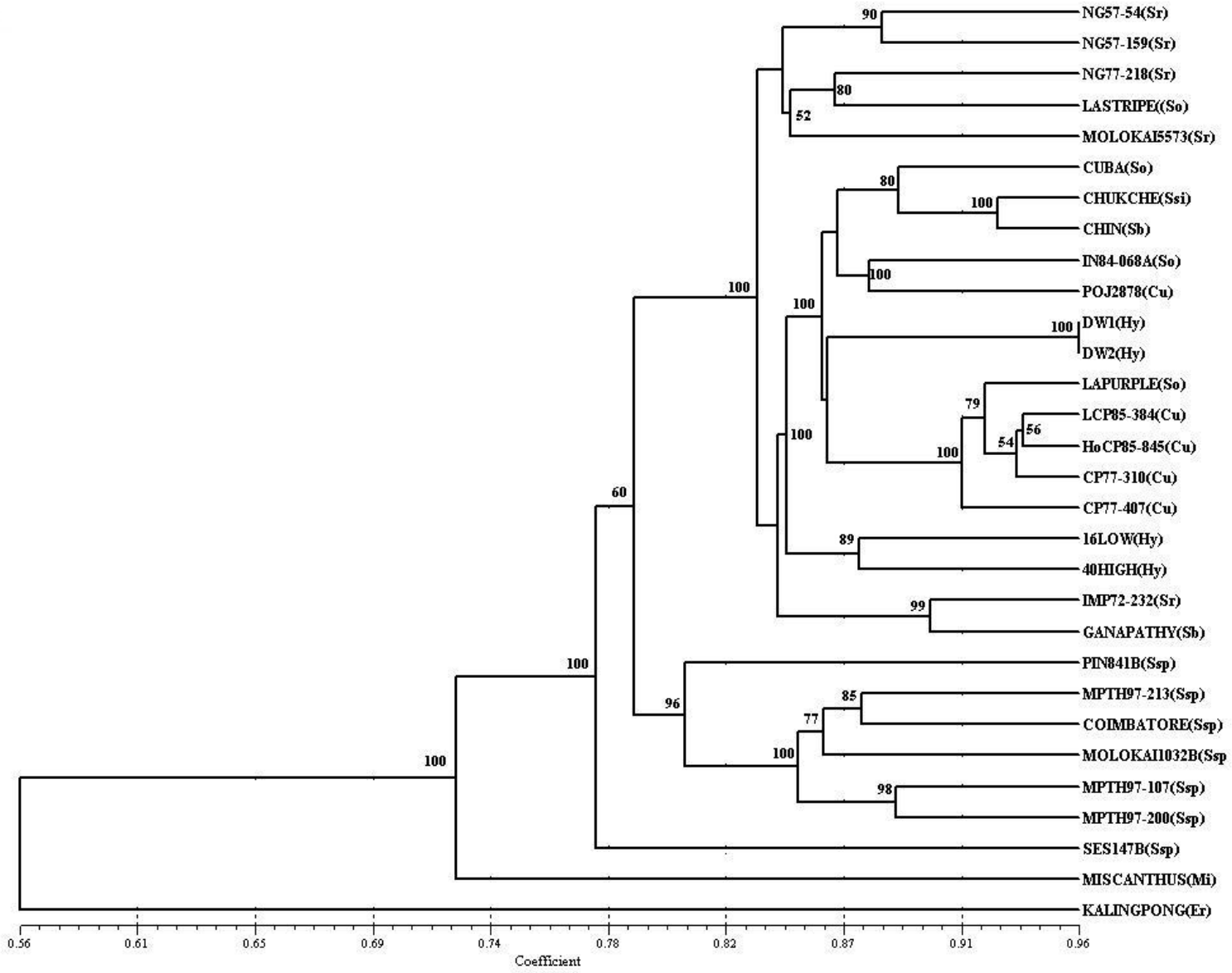

Fig. 1. UPGMA dendrogram showing relationships among 30 genotypes of the *Saccharum* complex, represented by *Erianthus*, *Miscanthus*, five *Saccharum* species, and cultivars. So= *S. officinarum*; Sr = *S. robustum*; Ssp = *S. spontaneum*; Sb = *S. barberi*; Ssi = *S. sinense*; Cu = cultivars; DW = dwarf genetic mutants derived from the cultivar LCP 81-137; Hy = low and high-sucrose hybrids derived from a cross between La Stripe (*S. officinarum*) x SES 147b (*S. spontaneum*).

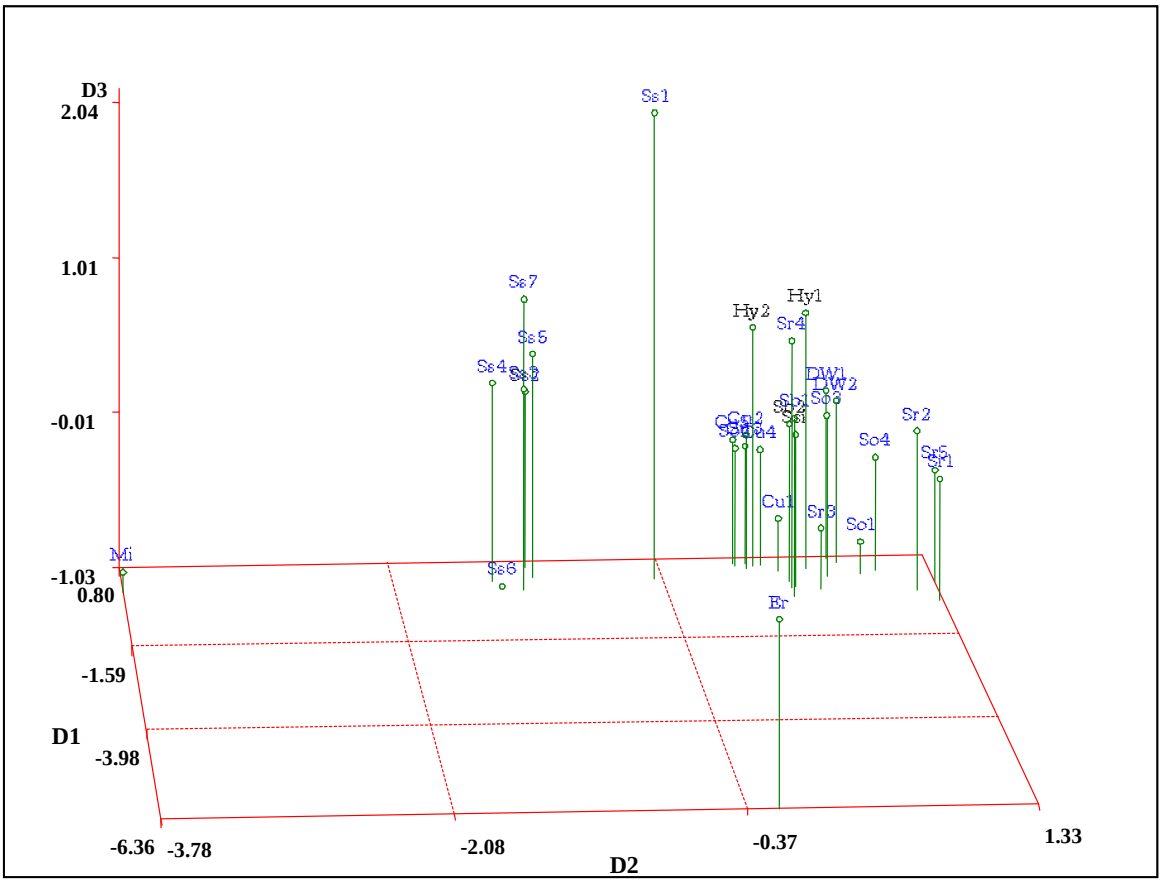

Fig. 2. A non-metric multi-dimensional scaling plot for 30 genotypes of the *Saccharum* complex based on the SRAP markers.

Table 4. Sequence analysis of SRAP DNA fragments amplified from a *S. officinarum* (La Striped) and *S. spontaneum* (SES 147b) genotype.

Sequence code	Primer pair	Fragment source	Fragment size (bp)	GC content (%)	% homology [a]	Blastn score (% identity)	Blastn score (E- value)	TIGR[b] accession number	Source of accession
				Monomorphic fragments					
1	SF1+T3	*S. spontaneum*	101	45					
2	SF1+T3	*S. officinarum*	99	47	81	69	4.3	CR286450	Rice
3	SF1+T3	*S. spontaneum*	184	58					
4	SF1+T3	*S. officinarum*	173	44	76	70	0.20	TC368808	Maize
7	SF2+T3	*S. spontaneum*	140	46					
8	SF2+T3	*S. officinarum*	140	41	83	75	0.0054	TC63158	*S. officinarum*
11	SF3+T3	*S. spontaneum*	163	44	-	84	8.6e-18	TC71562	*S. officinarum*
				Polymorphic fragments					
5	SF1+T3	*S. officinarum*	145	44	-	65	0.044	CA214874	*S. officinarum*
6	SF1+T3	*S. spontaneum*	148	52	-	93	4.1e-22	CA210227	S. *officinarum*
9	SF2+T3	*S. officinarum*	100	44	-	66	1.4	TC3400008	Rice
10	SF2+T3	*S. spontaneum*	97	41	-	71	1.3	CX118790	Rice

[a] Monomorphic fragments pairs were 1,2; 3,4; and 7,8. The corresponding pair for 11 failed to amplify.
[b] For monomorphic fragments, the segment displaying the most homology was used for a Blastn search of The Institute for Genomic Research (TIGR) database.