BILLET PLANTING RESEARCH

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Research continued to develop methods to maximize the chances of success with billet planting. During 2007, results were obtained from three field experiments conducted at the Sugar Research Station at St. Gabriel comparing yields obtained from billet and whole stalk planting of recently released and experimental varieties. Differences were detected among varieties in tolerance to billet planting.

Multiple yield components were compared for billet and whole stalk plantings of eight varieties in plantcane (Table 1). Millable stalk population, cane tonnage and total sugar per acre were yield components for which differences were detected between billet and whole stalk plantings for some varieties. Cold and wet winter conditions resulted in lower yields for billet plantings in multiple varieties. The two experimental (unreleased) varieties, L 01-283 and L 01-299, were the only ones with equivalent yields for billet and whole stalk plantings for all yield components.

Table 1. Comparison of yield components for billet and whole stalk plantings of eight varieties in plantcane during 2007.

Variety	Treatment	Stalks/acre (x1000)[1]	Stalk wt. (lbs.)	Sugar/ton (lbs.)[1]	Tons cane per acre[1]	Sugar/acre (lbs.)[1]
LCP 85-384	Billet	38.9 B	1.95	181	29.0 B	5227
	Whole	53.3 A	2.00	167	37.5 A	6231
Ho 95-988	Billet	34.5 B	2.42	186	32.7 B	6094 B
	Whole	44.9 A	2.56	180	46.7 A	8429 A
HoCP 96-540	Billet	38.0 B	2.25	181	38.8 B	9259
	Whole	50.7 A	2.20	187	53.8 A	9880
L 97-128	Billet	29.0 B	2.66	177	33.6 B	5941 B
	Whole	40.3 A	2.53	187	48.9 A	8573 A
L 99-226	Billet	40.6	2.84	193	41.0 B	7918 B
	Whole	40.3	2.92	191	50.6 A	9650 A
L 99-233	Billet	53.2	2.00	180	42.7	7657 B
	Whole	56.9	2.10	188	46.7	8729 A
L 01-283	Billet	59.4	1.82	190	48.7	9241
	Whole	57.3	2.06	194	49.5	9608
L 01-299	Billet	50.4	1.90	183	46.9	8576
	Whole	48.0	2.09	189	45.4	8599

[1]Values of different yield components for billet and whole stalk comparisons within a variety followed by different letters were significantly different (P=0.05).

First ratoon yield results were obtained from another experiment for the same eight varieties. Following a mild winter, plantcane tonnage and total sugar yields for billet plantings were only lower in two varieties, Ho 95-988 and L 97-128, and the 2007 first ratoon yields for billet and whole stalk plantings were equivalent for all varieties (Table 2).

Table 2. Comparison of yield components for billet and whole stalk plantings for eight varieties in 2006 plantcane and 2007 first ratoon.

		Plantcane		First ratoon	
Variety	Treatment	Tons cane per acre[1]	Sugar/acre (lbs.)[1]	Tons cane per acre[1]	Sugar/acre (lbs.)[1]
LCP 85-384	Billet	31.4	6740	31.1	5535
	Whole	32.7	7105	34.1	6450
Ho 95-988	Billet	35.1 B	7560 B	41.6	8677
	Whole	45.2 A	10509 A	40.6	8650
HoCP 96-540	Billet	41.4	9259	34.4	6635
	Whole	45.1	9880	39.3	7730
L 97-128	Billet	37.3 B	7872 B	32.6	6656
	Whole	46.2 A	10146 A	37.1	7786
L 99-226	Billet	41.7	9719	38.5	7878
	Whole	43.1	10539	39.0	8301
L 99-233	Billet	38.6	8094	39.3 A	7557
	Whole	39.0	8368	34.0 B	6845
L 01-283	Billet	50.9	11473	44.5	8933
	Whole	51.5	11553	44.7	9268
L 01-299	Billet	50.0	11139	46.6	9276
	Whole	52.6	11368	51.3	10118

[1]Values of different yield components for billet and whole stalk comparisons within a variety followed by different letters were significantly different (P=0.05).

Second ratoon yields were obtained for an experiment with seven varieties that experienced severe drought conditions after planting. Cane tonnage and total sucrose yields were lower in billet plantings for five of seven varieties in plantcane, but yields were lower for only two varieties in first ratoon and one variety in second ratoon (Table 3).

The field experiments comparing billet and whole stalk planting yields demonstrate that varieties vary in the tolerance of billet planting and that environmental stress affects the amount of yield reduction compared to whole stalk planting. Ho 95-988 appears to be intolerant to billet planting. A group of varieties, LCP 85-384, HoCP 96-540, L 97-128, and L 99-226, experience yield reductions in billet plantings when stressful environmental conditions occur, and the newer varieties, L 99-233, L 01-283, and L 01-299 have thus far exhibited tolerance to billet planting.

Table 3. Comparison of plantcane yield components for billet and whole stalk plantings of four varieties in 2005 plantcane, 2006 first ratoon, and 2007 second ratoon.

		Plantcane		First ratoon		Second ratoon	
Variety	Billet vs. whole	Tons per acre	Sucrose (lbs/acre)	Tons per acre	Sucrose (lbs/acre)	Tons per acre	Sucrose (lbs/acre)
LCP85-384	Billet	28.4 B	5756 B	25.7	5401	28.6	4812
	Whole	40.2 A	8297 A	31.6	6474	33.5	5812
Ho95-988	Billet	18.6 B	3511 B	21.8 B	4361 B	20.4 B	3820 B
	Whole	35.2 A	7231 A	33.7 A	6668 A	36.5 A	6932 A
HoCP96-540	Billet	39.4 B	8241 B	34.2	7040	38.0	6354
	Whole	47.3 A	10018 A	36.2	7809	39.4	6691
L97-128	Billet	33.6	7298	30.6	6258	29.9	5548
	Whole	39.5	8256	29.8	6534	31.4	5780
L99-226	Billet	35.5 B	6973 B	34.5	7393	40.2	6911
	Whole	50.5 A	10401 A	37.3	8032	42.5	7123
L99-233	Billet	43.6	9212	31.6 B	6569 B	39.2	6827
	Whole	48.2	9844	36.9 A	7890 A	39.7	6781
L00-266	Billet	30.6 B	5652 B	36.6	7558	36.0	6134
	Whole	40.5 A	7761 A	37.8	7394	38.6	6491

Values of different yield components for billet and whole stalk comparisons within a variety followed by different letters were significantly different (P=0.05).

LONG-TERM COMBINE-HARVEST RESIDUE STUDY

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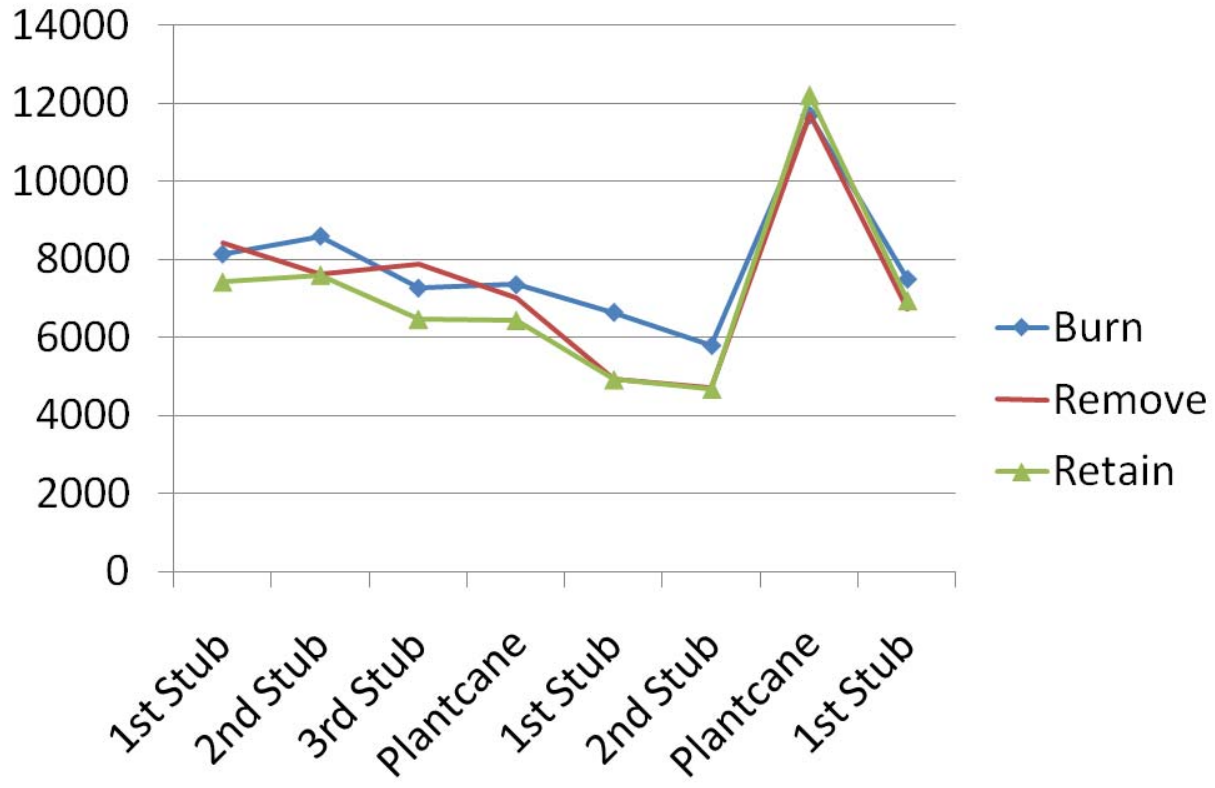
Summary:

First stubble of the third cane production cycle of a long-term study of the effects of combine trash management was harvested in 2007. Of particular interest are the changes in soil fertility over time and the effects of residue management on successive crop cycles (plantcane through final stubble). Cycle no. three first stubble yields were 7,493, 6,734 and 6,944 pounds of sugar/acre for the standing burn, physical trash removal from row tops and full-trash retention treatments, respectively. Cycle no. three was planted to HoCP 96-540 and, unlike previous crop cycles, the yield lines are close together indicating small treatment differences. The variety HoCP 96-540 is know to be somewhat intolerant of residue, so the yield lines are expected to separate over time. The chart below clearly shows the rejuvenation restored by switching to a variety other than LCP 85-384, whose performance in this study echoed that of its performance in the industry the last few years.



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THE INFLUENCE OF FALLOW-PERIOD SOYBEANS ON SUGARCANE PRODUCTIVITY IN THE FIRST STUBBLE CROP

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Summary:

Sugarcane growers often plant immediately following soybean harvest to accommodate the rapidly approaching mill openings. While the adverse effects on yield for plantings made directly into the decomposing residue of green manure soybeans have been documented, such is not the case for sugarcane planted behind soybeans grown for seed harvest. A study designed to evaluate the influence of fallow-period soybeans on sugarcane seedling emergence and productivity was planted in the fall of 2005. Three plantings, spaced one to two weeks apart, were made following soybean harvest and a conventional fallow period, each with and without fertilizer (N-P-K lb/acre rate = 15-45-45). Delayed plantings were designed to help minimize the direct effects of decomposing soybean residue on seed germination and fertilizer was applied to mitigate the adverse effects of the incorporated residue.

Plots were counted for millable stalks and harvested in the fall of 2007. Table 1 below shows that first stubble and yields, averaged over planting dates, were superior following a conventional fallow compared to soybeans. Fertilizer at planting produced marginally higher yields in the first stubble crop but that effect was not significant. It is disturbing that the negative effects of occupying the fallow period with soybeans grown for harvest carried over to the stubble phase. The difference is sugar yield per acre was accounted for primarily by cane weight differences (33.6 vs. 28.1 tons/acre), as TRS was not influenced by fallow management.

Table 1. Performance of first stubble after a conventional fallow period and soybeans, both with and without fertilizer applied at planting, averaged over planting dates.

Cane planted after	Yield, lb sugar/acre[1]	Stalk population
Conventional fallow	8,430 a	49,650 a
Soybeans for harvest	7,054 b	49,892 a

[1]Means followed by the same letter are not significantly different (P=.05)

First stubble yield was also influenced by the date at which the plots were planted in the fall of 2005 (table 2). The latest planted plots produced the lowest yield in both plantcane and first stubble. It doesn't appear that there existed an interaction with soybean residue decomposition and planting date. Differences appear to be a simple planting date effect.

Table 2. Effect of planting date on the performance of first stubble plots.

Date of Planting	Yield, lb sugar/acre
September 12, 2005	7,637 ab
September 20, 2005	8,144 a
October 3, 2005	7,398 b

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