BILLET PLANTING RESEARCH

J. W. Hoy[1], A. E. Arceneaux[2], and C. F. Savario[1]
[1]Department of Plant Pathology and Crop Physiology
[2]School of Plant Soil and Environmental Sciences

Research continued to develop methods to maximize the chances of success with billet planting. During 2006, results were obtained from a field experiment conducted at the Sugar Research Station at St. Gabriel comparing plant cane yields obtained from billet and whole stalk planting of recently released and experimental varieties (Table 1).

Table 1. Comparison of plant cane yield components for billet and whole stalk plantings for eight varieties in 2006.

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	45.8 B	1.73	215	31.4	6740
	Whole	51.4 A	1.69	217	32.7	7105
Ho 95-988	Billet	42.6 B	2.20	215 B	35.1 B	7560 B
	Whole	47.4 A	2.50	233 A	45.2 A	10509 A
HoCP 96-540	Billet	44.9	2.22	223	41.4	9259
	Whole	46.4	2.31	218	45.1	9880
L 97-128	Billet	36.4 B	2.39	211	37.3 B	7872 B
	Whole	43.1 A	2.66	220	46.2 A	10146 A
L 99-226	Billet	40.8	2.83	232	41.7	9719
	Whole	41.8	2.95	244	43.1	10539
L 99-233	Billet	59.9	1.62	209	38.6	8094
	Whole	57.5	1.79	214	39.0	8368
L 01-283	Billet	57.3	1.87	225	50.9	11473
	Whole	57.8	1.96	224	51.5	11553
L 01-299	Billet	56.0	1.83	223	50.0	11139
	Whole	56.6	2.15	217	52.6	11368

[1]Values of different yield components within a variety followed by different letters were significantly different (P=0.05).

THE INFLUENCE OF FALLOW-PERIOD SOYBEANS ON SUGARCANE PRODUCTIVITY IN THE PLANT CANE CROP

H.P. Viator, J. E. Richard and G. Williams
Iberia Research Station

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.

Plant cane plots were counted for millable stalks and harvested in the fall of 2006. Table 1 below shows that plant cane stands and yields, averaged over planting dates, were superior following a conventional fallow compared to soybeans. Fertilizer at planting produced marginally higher yields.

Table 1. Performance of plant cane 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 with fertilizer	8,203 a	53,579
Conventional fallow without fertilizer	8,018 a	49,949
Soybeans with fertilizer	7,563 b	46,754
Soybeans without fertilizer	7,232 b	46,174

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

The planting date x fallow period management interaction was significant and revealed that the yield of plant cane following soybeans for the initial planting date was equivalent to that following a conventional fallow period (table 2). This was surprising because planting into decomposing soybean residue immediately after soybean harvest was thought to be detrimental to germination and emergence. Indeed, cane following soybeans was adversely affected only at the two later planting dates.

Table 2. Effect of planting date and fallow period management on the performance of sugarcane

Date of planting	Yield, lb sugar/acre		Stalk population	
	Fallow	7,829	Fallow	56.483
September 12, 2005	Soybeans	8,472	Soybeans	52,988
	Fallow	7,800	Fallow	55,466
September 20, 2005	Soybeans	7,256	Soybeans	47,480
	Fallow	8,703	Fallow	43,415
October 3, 2005	Soybeans	6,465	Soybeans	38,768

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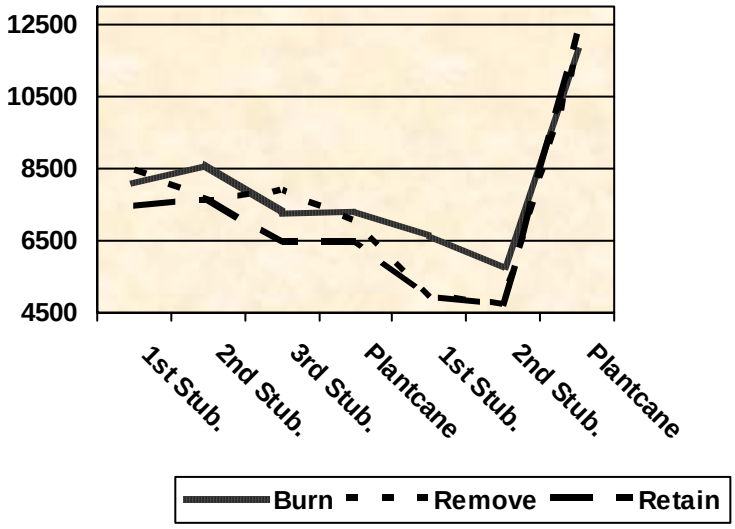
LONG-TERM COMBINE-HARVEST RESIDUE STUDY

H. P. Viator, J. E. Richard and G. Williams
Iberia Research Station

Summary

Plant cane of the third cane production cycle of a long-term study of the effects of combine trash management was harvested in 2006. Of particular interest are the changes in soil fertility over time and the effects of residue management on successive crop cycles (plant cane through final stubble). Cycle no. three plant cane yields were 11,695, 11,722 and 12,200 pounds of sugar/acre for the standing burn, physical trash removal from row tops and full trash retention treatments, respectively. The ranking of the treatment means was not consistent with the trend established with the first two production cycles using LCP 85-384. Cycle no. three was planted to HoCP 96-540 and, unlike previous crop cycles, the highest yielding plots were for residue retention, though mean differences were not statistically significant. These plots were in plant cane and, therefore, did not have to contend with harvest residue from the previous crop, but rather were following a conventional fallow period. 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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CULTURAL PRACTICES RESEARCH IN SUGARCANE IN 2006

C. W. Kennedy and A. E. Arceneaux
School of Soil, Plant and Environmental Sciences

In cooperation with
Sugar Research Station

Summary:

Five field experiments were conducted in 2006 to test the effects of management practices on yield and yield components of sugarcane. The newer cane varieties released from the breeding program were included in the experiments. Results from the test on planting practices showed that plant cane yields were highest from planting in August and lowest from planting in October. The three and five stalk rates produced similar yields. Results from depth of cover and quality of seed source (plant cane vs first stubble) showed the 4-5 inch cover depth lower yields. The plant cane seed source produced a higher yield than first stubble seed. Silica added to the soil before planting seed cane increased the yield of the second stubble crop.

Results from the date of harvest experiment showed sugar yields across varieties in plant cane and the subsequent first stubble crop increased when plant cane and first stubble was harvested in December. First stubble yields increased 17.3 % by harvesting the plant cane crop in December.

Results from a residue management experiment showed that removing the residue by burning increased the yield by 6.5 %.

Objectives:

This research is designed to provide information on cultural practices in an effort to help cane growers to produce maximum economic yields and to increase profitability in sugarcane production. The annual progress report is presented to provide the latest available data on certain practices and not as a final recommendation for growers to use all of these practices. Recommendations are based on several years of research data.

Results:

Date and Rate of Planting:

An experiment was initiated to test the effects of planting dates and rates on three varieties of sugarcane. The dates tested were August 17, September 1, and September 14, 2005 and the varieties were Ho 95-988, HoCP 96-540, and L 97-128. Each variety was planted on each date at the planting rate of three and five whole stalks.

The data obtained on planting dates and rates in plant cane in 2006 are reported in table 1. The yields of Ho 95-988 and L 97-128 were higher from planting on August, 17 than September, 1 and September, 14. The yields of HoCP 96-540 were higher from planting on August, 17 and September, 1 than the September, 14 planting date. As an average, the yields were highest for

the August, 17 planting and lowest from the September, 14 planting. As an average, yields were not increased by the five stalk planting rate.

Depth of Cover:

An experiment was initiated to test the effects of depth of cover and seed source on the plant cane yield of variety L 97-128. Each seed source (plant cane and first stubble) was planted at a planting rate of three whole stalks and covered with 2-3, 3-4, and 4-5 inches of packed soil.

The data obtained on depth of cover and seed source in plant cane are reported in table 2. The plant cane seed source produced a higher tons/acre then the first stubble seed source. The yields of depth cover treatments were not significantly different, but the 4-5 inch cover depth was lower in stalk population.

Silica:

An experiment was initiated in 2002 to test the effects of silica applied to seed cane on the subsequent yields of billet planted sugarcane. Silica at the rates of 0, 2, 4, and 6 tons/acre was applied and incorporated in the soil before planting in the fall of 2002. Variety LCP 85-384 was planted at a planting rate of three whole stalks. In the fall of 2003, seed cane from each silica rate was planted at rate of 4-6 billets.

The data obtained on silica application to seed cane in second stubble are reported in table 3. The seed cane treated with the 4 ton/acre rate of silica produced a higher tons/acre yield than the 0 ton/acre rate.

Harvest Date on Subsequent Yields:

An experiment was initiated in 2004 to test the effects of harvest dates in plant cane on the yield of plant cane and the subsequent stubble crop the following year. Varieties Ho 95-988 and L 97-128 were harvested in plant cane on October 1 and December 1 in 2005 and in first stubble cane on October 1, November 1, and December 1, 2006, in cane that was harvested on each date in plant cane. The effects of harvest dates in plant cane and first stubble in 2006 are reported in table 4.

The results show that plant cane yields of each variety in 2005 were higher when plant cane was harvested in December than in October. The first stubble cane yields in 2006 were higher when plant cane was harvested in December than in October. The November and December first stubble harvest dates in 2006 produced higher yields than the October harvest date.

Residue Management:

An experiment was initiated in 2004 to test the effects of residue management on four varieties of sugarcane. Varieties LCP 85-384, Ho 95-988, HoCP 96-540, and L 97-128 were planted in the fall of 2004. The treatments of residue undisturbed and burn were applied to each variety after harvest in 2005 and 2006. The data obtained from residue management for first stubble cane are reported in table 5.

Each variety except HoCP 96-540 produced higher yields when the residue was removed by burning.

Table 1. Effects of date and rate of planting on three varieties of plant cane on Commerce soil on the Sugar Research Station, 2006.

Variety Of Cane	Date Of Planting 2005	Rate Of Planting Stalks	Plant cane – 2006 Cane Yield T/A	Stalk No. 1000A	Stalk Wt. Lbs.	Normal Sucrose %	Sugar Yield Lbs/A
Ho 95-988	Aug. 17	3	43.3	35.7	2.53	15.3	9565
		5	43.2	36.4	2.52	15.2	9525
	Sept. 1	3	42.5	36.2	2.50	15.0	9229
		5	40.5	37.1	2.38	14.9	8562
	Sept. 14	3	37.5	35.2	2.41	13.9	7400
		5	35.8	33.6	2.50	15.2	7851
HoCP 96-540	Aug. 17	3	45.5	33.9	2.92	14.9	9806
		5	48.9	41.5	2.49	15.3	10859
	Sept. 1	3	46.6	40.0	2.48	15.4	10389
		5	45.7	39.9	2.44	15.1	9985
	Sept. 14	3	37.3	30.5	2.70	14.3	7622
		5	36.3	31.2	2.48	14.3	7143
L 97-128	Aug. 17	3	45.9	35.4	2.70	14.0	9157
		5	43.0	41.1	2.17	14.5	8930
	Sept. 1	3	40.2	38.7	2.38	13.9	7953
		5	43.9	42.3	2.28	14.5	9106
	Sept. 14	3	38.5	36.3	2.53	13.4	7256
		5	38.8	36.9	2.52	13.6	7498
LSD .05			3.8	3.6	0.40	1.1	947
			Mean Effect				
Date	Aug. 17		45.0	37.3	2.56	14.9	9640
	Sept. 1		43.2	39.0	2.41	14.8	9219
	Sept. 14		37.4	33.9	2.52	14.1	7507
LSD .05			1.6	1.5	NS	0.5	386
Rate		3	41.9	35.8	2.57	14.5	8709
		5	41.8	37.8	2.42	14.7	8869
LSD .05			NS	1.2	0.14	NS	NS

Planted with each rate on each date in 2005 and harvested as plant cane in 2006.

Table 2. Effects of depth of cover and seed source on variety L 97-128 plant cane on Commerce soil on the Sugar Research Station, 2006.

			Plant cane - 2006				
Seed Source	Depth Of cover	Cane Yield	------ Stalk ------ No.	Wt.	--- Normal Juice --- Brix	Sucrose	Sugar Yield
	Inches	T/A	1000/A	Lbs.	%	%	Lbs./A
Plant cane	2-3	41.2	34.8	2.54	16.9	14.0	8241
	3-4	41.5	32.8	2.73	17.0	14.2	8392
	4-5	40.7	32.2	2.60	16.8	13.9	8050
1st stubble	2-3	40.1	34.7	2.43	17.0	14.2	8150
	3-4	40.7	33.2	2.63	17.0	14.1	8193
	4-5	39.5	32.5	2.53	16.6	13.8	7708
LSD .05		1.8	NS	NS	NS	NS	610
				Mean Effect			
Plant cane		41.2	33.5	2.62	16.9	14.0	8227
1st stubble		40.1	33.2	2.53	16.9	14.0	8017
LSD .05		1.0	NS	NS	NS	NS	NS
	2-3	40.7	34.7	2.49	16.9	14.1	8196
	3-4	41.1	33.0	2.68	17.0	14.1	8292
	4-5	40.1	32.5	2.57	16.7	13.8	7879
LSD .05		NS	2.0	NS	NS	NS	NS

Planted with a three whole stalk rate and harvested as plant cane in 2006.

Table 3. Effects of silica applied to the seed source on billet planted LCP 85-384 second stubble on Commerce soil on Sugar Research Station, 2006.

	Second stubble - 2006					
Treatment Silica	Cane Yield	------ Stalk ------ No.	Wt.	---- Normal Juice ---- Brix	Sucrose	Sugar Yield
T/A	T/A	1000/A	Lbs.	%	%	Lbs./A
0	26.6	36.3	1.64	16.0	12.8	4767
2	28.7	35.3	1.84	16.5	13.5	5472
4	31.0	36.1	1.81	15.5	12.6	5460
6	27.7	35.0	1.77	15.6	12.5	4811
LSD .05	2.9	NS	NS	0.9	0.9	NS

Silica applied and incorporated before planting seed cane in 2002. Seed source used to mechanically plant billets in 2003.

Table 4. Effects of date of harvesting plant and stubble cane on the yield of the subsequent stubble cane yield in 2006 in two varieties on the Sugar Research Station.

Cane Variety	2005 Harvest Date	2006 Harvest Date	First stubble cane – 2006				
			Cane Yield	Stalk		Normal Sucrose	Sugar Yield
				No.	Wt.		
			T/A	1000/A	Lbs.	%	Lbs./A
Ho 95-988	Oct.1	Oct. 1	35.5	35.6	1.99	11.7	5683
		Nov. 1	36.8	33.3	2.20	15.1	8013
		Dec. 1	39.6	36.4	2.62	14.5	8231
	Dec. 1	Oct. 1	42.5	44.3	2.14	13.0	7751
		Nov. 1	43.4	43.2	2.67	14.3	8912
		Dec. 1	43.7	35.6	2.61	15.4	9772
L 97-128	Oct. 1	Oct. 1	36.7	31.8	2.25	12.1	6130
		Nov. 1	38.8	34.0	2.28	14.3	7970
		Dec. 1	39.7	33.9	2.40	14.9	8530
	Dec. 1	Oct. 1	44.7	36.5	2.38	12.2	7526
		Nov. 1	45.5	40.3	2.78	14.6	9542
		Dec. 1	47.5	33.2	2.90	15.1	10351
LSD .05			3.3	5.0	0.41	0.8	974
			Mean effects				
	Oct. 1		37.9	34.2	2.29	13.8	7426
	Dec. 1		44.6	38.9	2.58	14.1	8976
LSD .05			1.3	2.1	0.17	0.3	398
		Oct. 1	39.9	37.1	2.19	11.2	6772
		Nov. 1	41.1	37.7	2.48	14.6	8609
		Dec. 1	42.6	34.8	2.63	15.0	9221
LSD .05			1.6	2.5	0.21	0.4	487

Plant cane was harvested on two dates in 2005, and first stubble was harvested on the same plots in October, November, and December, 2006.

Table 5. Effects of residue management on the first stubble yield of four varieties on Commerce soil on Sugar Research Station, 2006.

		First stubble cane – 2006					
Cane Variety	Residue Treat.	Cane Yield	----- Stalk ----- No.	Wt.	--- Normal Juice --- Brix	Sucrose	Sugar Yield
		T/A	1000/A	Lbs.	%	%	Lbs./A
LCP 85-384	Check	27.2	32.5	1.88	16.6	14.1	5443
	Burn	29.8	34.9	1.90	16.6	14.0	5921
Ho 95-988	Check	32.3	31.4	2.33	17.2	14.7	6816
	Burn	34.6	33.1	2.40	17.3	14.6	7245
HoCP 96-540	Check	35.0	29.1	2.59	17.4	14.7	7374
	Burn	36.7	31.3	2.68	17.5	14.7	7736
L 97-128	Check	31.8	28.3	2.61	17.6	14.9	6837
	Burn	34.3	31.4	2.60	17.6	14.9	7391
LSD .05		2.2	3.5	0.48	0.7	0.8	415

Residue is left undisturbed for the check treatment. Burn treatment was applied in December 2005 immediately after harvest.