SOIL FERTILITY RESEARCH IN SUGARCANE

Brenda S. Tubaña[1], Sonny Viator[2], Jim Wang[1], Allen Arceneaux[1] and Jasper Teboh[1]

[1]School of Plant, Environmental and Soil Sciences
[2]Iberia Research Station

In Cooperation with
Sugar Research Station

Summary

Several fertility trials were conducted in 2008 to evaluate the performance of recent cane varieties as affected by nitrogen (N) rate, time of N fertilizer application, and fertilizer adjuvants. HoCP96-540 and L99-226 cane and sugar yield responded to N fertilizer application, where 40 lbs N ac^{-1} was identified to be the optimum rate. LCP85-384 however, did not respond to N fertilization. Applying N at different times did not affect the performance of the first stubble cane of variety L97-128. Two trials were also conducted to determine the effect of fertilizer adjuvant. While the application of Trimat, PGR, and foliar NPK in addition with spring N and K fertilization had resulted in higher cane and sugar yields of Ho95-988 and L97-128 (2nd stubble cane), and L99-226 and HoCP96-540 (plantcane), these increases were not significant. Trimat application with moderate amount of N at the rate of 40 lbs ac^{-1} tended to increase sugar yield of plantcane varieties L99-226, L99-233, and H0CP96-54. The cane and sugar yields of second stubble cane of variety H95-988 were numerically higher when both Trimat and 120 lbs N ac^{-1} were applied compared with those plots that received 120 lbs N ac^{-1} only. Normalized difference vegetation index readings (NDVI) were collected from these trials from mid-April until the first week of July to determine the feasibility of using canopy reflectance in evaluating sugarcane yield potential and responsiveness to N fertilization. The initial findings showed that: 1) optimum sensing dates fell within the timeframe where spring N fertilization is commonly done, 2) the use of NDVI to predict in-season cane and sugar yield is feasible, and 3) the actual boost in cane and sugar yield due to N fertilization can be predicted using NDVI collected early in the season.

Objectives

This research was designed to provide information on soil fertility in an effort to help cane growers produce maximum economic yields and increase profitability in sugarcane production. This 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

<u>Effect of Nitrogen Rate and Timing on Sugarcane Yield</u>

An experiment was conducted to determine the effect of spring-applied N fertilizer on the yield and yield components of first stubble-cane of three cane varieties on a Commerce silt loam (Table 1). The varieties tested were LCP85-384, HoCP96-540 and L99-226, and the N rates consisted of 0, 40, 80 and 120 lbs N ac^{-1}. Sugarcane variety HoCP96-540 obtained the highest cane (32.2 tons ac^{-1}) and sugar (7888 lbs ac-^{1}) yield. On average across all varieties, N rate had a significant effect on both cane and sugar yield. Application of 40 lbs N ac^{-1} resulted in cane and sugar yields that were statistically the same with 80 and 120 lbs N ac^{-1} application rates. When individual variety was examined, LCP85-384 did not respond to N fertilizer. The variety by N rate interaction effect on yield and yield components was not significant.

Another experiment was established in 2008 to examine the effect of N rate and time of application on cane and sugar yield of the first stubble cane of L97-128 variety (Table 2). The significant effect of N rate on both cane and sugar yields were consistent across all time of application. The time of spring application (15 days interval) did not affect both cane and sugar yields.

<u>Fertilizer Adjuvant Effects on Sugarcane Yield</u>

Two experiments were conducted in 2008 to determine the effect of fertilizer adjuvant (Trimat) on N fertilizer requirement of sugarcane. For the first experiment, treatments were superimposed on an existing field planted with second stubble cane of variety H95-988. While there were no significant differences found among treatment means, plots treated with Trimat and 120 lbs N ac^{-1} numerically obtained the highest cane and sugar yield (Figure 1 and 2). The non-linear plateau model (data not presented), although not significant, suggested that little benefit from N application was observed in plots that received Trimat, i.e. for every unit increase in N it is estimated that only 5.9 unit increase in sugar yield was obtained compared with 20 unit increase in sugar yield when Trimat was not applied. For the second experiments, on top of Trimat application in spring, three N rates (0, 40 and 80 lbs N ac^{-1}) were applied to plantcane varieties L99-226, L99-233 and HoCP96-540. Additional treatments (a check and an 80 lbs N ac^{-1}) were included without the Trimat. There were significant varietal differences in population (Table 3). Theoretical recoverable sugar was significantly affected by the treatment. Lowest TRS recorded was 229 lbs ton^{-1} from plots that received 80 lbs N ac^{-1} in the absence of Trimat. Without N, plots that received Trimat obtained numerically higher cane and sugar yield. These differences however were not statistically significant. With 80 lbs N ac^{-1}, the application of Trimat did not further improve both cane and sugar yield. On the other hand, moderate amount of N at the rate of 40 lbs N ac^{-1} and Trimat application tended to increase sugar yield when compared with plots that receive 80 lbs N ac^{-1} only (Figures 3 and 4).

Two experiments were also conducted to test the effect of fertilizer adjuvants in addition to regular spring N and K fertilization on sugarcane yield and quality parameters. The first experiment used second stubble cane varieties L97-128 and Ho95-988 while the second experiment was performed on the plantcane of two recent cane varieties L99-226 and HoCP96-

540. Population and purity of the two varieties were found to be significantly different (Table 4). There were significant differences in treatment means of population but not the TRS and purity. Ho95-988 has numerically higher cane and sugar yield. Cane and sugar yield tended to increase with fall application of Trimat and plant growth regulator, and with spring application of Trimat, foliar fertilizer and plant growth regulator. Table 5 presents the data on yield quality parameters, and cane and sugar yield as affected by fertilizer adjuvants on plant cane. There were no significant differences noted from the variables measured when looking at the averages of varieties and treatments. However, the effect of treatments was not the same for the two plant cane varieties tested when looking at TRS. The absence of significant differences of the treatments tested was attributed to relatively high variation within replicates.

Using Sugarcane Canopy Reflectance in Estimating Cane and Sugar Yield Potential, and Response to Nitrogen Fertilization

Using a GreenSeeker™ handheld sensor, weekly collection of normalized difference vegetation index (NDVI) was conducted from mid-April until the first week of July from multiple N fertility trials established at LSU AgCenter Sugar and Iberia Research Stations. A total of 12 sensing dates was conducted. This was done to identify the sensing dates where high correlation of NDVI readings with actual cane and sugar yield existed. From October to early December of 2008, cane and sugar yield data were collected.

The NDVI is a good estimate of biomass. The trend of NDVI readings with time shows a rapid increase in sugarcane biomass from mid-April to mid-May at the Sugar Research Station (Figure 5). This result suggests that the window where sensor data can be used to estimate sugarcane yield potential is somewhere between late April to early June which is also the period consider for N fertilization for sugarcane.

Early growth stage-NDVI readings tended to have a distinct association with cane and sugar yields, May 8 being the sensing date showing the highest association ($r^2>0.45$) at the Sugar Research Station (Figures 6 and 7). On another site (Iberia Research Station), a higher association ($r^2=0.54$) of NDVI with both cane and sugar yield existed until the first week of June (Figures 8 and 9). The use of early-season sensor data for predicting sugarcane yield potential is very promising given that these NDVI data were collected from different cane varieties and crop age. With continuous research, refinement of the equations can be done by identifying parameters to normalize the data from multiple sites in the region in order to cover a wider range of sensor and yield values.

Yield increases attributed to N fertilization can also be estimated using early-season sensor readings. A separate analysis was conducted to determine if early-season sensor readings can be used to estimate (using response index NDVI) the actual boosts in cane and sugar yield that was attributed to spring N fertilization done in early April 2008. High association ($r^2>0.60$, Figures 10 and 11) between response index NDVI and the response index at harvest (for both cane and sugar yield) was obtained.

ACKNOWLEDGEMENTS

The authors wish to express appreciation for the financial support of the American Sugar Cane League, Amino Grow USA, and the Louisiana Experimental Program to Stimulate Competitive Research (EPSCoR – funded by the National Science Foundation and the Board of Regents Support Fund).

Table 1. Effect of nitrogen on the first stubble yield of three cane varieties planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

Treatment		Population 1000/ac	TRS lbs/ton	Purity %	Cane Yield	Sugar Yield
					ton ac^{-1}	lb ac^{-1}
Variety						
	LCP85-384	24.3	234	83.5	23.2	5425
	L99-226	28.7	245	84.5	29.6	7232
	HoCP96-540	33.8	242	84.0	32.6	7888
	Pr>F	***0.0004***	***0.0176***	***0.1004***	***<0.0001***	***<0.0001***
Nitrogen Rate, lb/ac						
	0	26.5	247	85.1	24.8	6110
	40	30.9	238	84.1	28.9	6922
	80	29.1	239	83.4	29.8	7150
	120	29.2	238	83.5	30.2	7212
	Pr>F	***0.2043***	***0.1416***	***0.0078***	***<0.0001***	***<0.0001***
V X Trt	***Pr>F***	***0.2105***	***0.4245***	***0.7367***	***0.4432***	***0.4825***

Table 2. Effect of nitrogen rate and timing of application on the first stubble yield of L97-128 planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

Treatment		Cane Yield	Sugar Yield
		ton ac^{-1}	lb ac^{-1}
Nitrogen Rate			
	0	23 b	5663 b
	40	26 ab	6399 ab
	80	28 a	6528 a
	120	30 a	6873 a
	Pr>F	***0.0014***	***0.0036***
Timing (Time of Application)			
		26 a	6305 a
		27 a	6543 a
		26 a	6237 a
	Pr>F	***0.5090***	***0.3588***
N Rate X Timing	***Pr>F***	***0.2021***	***0.1176***

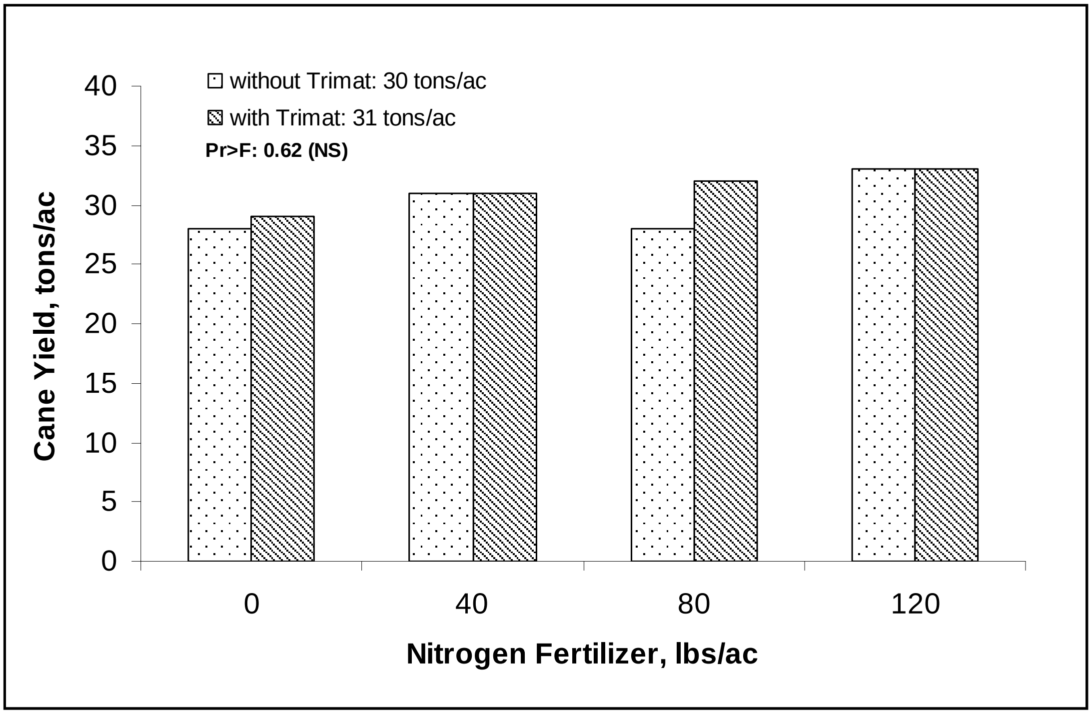

Figure 1. Effect of fertilizer adjuvants and different rates of nitrogen fertilizer on cane yield of second stubble H95-988 variety planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

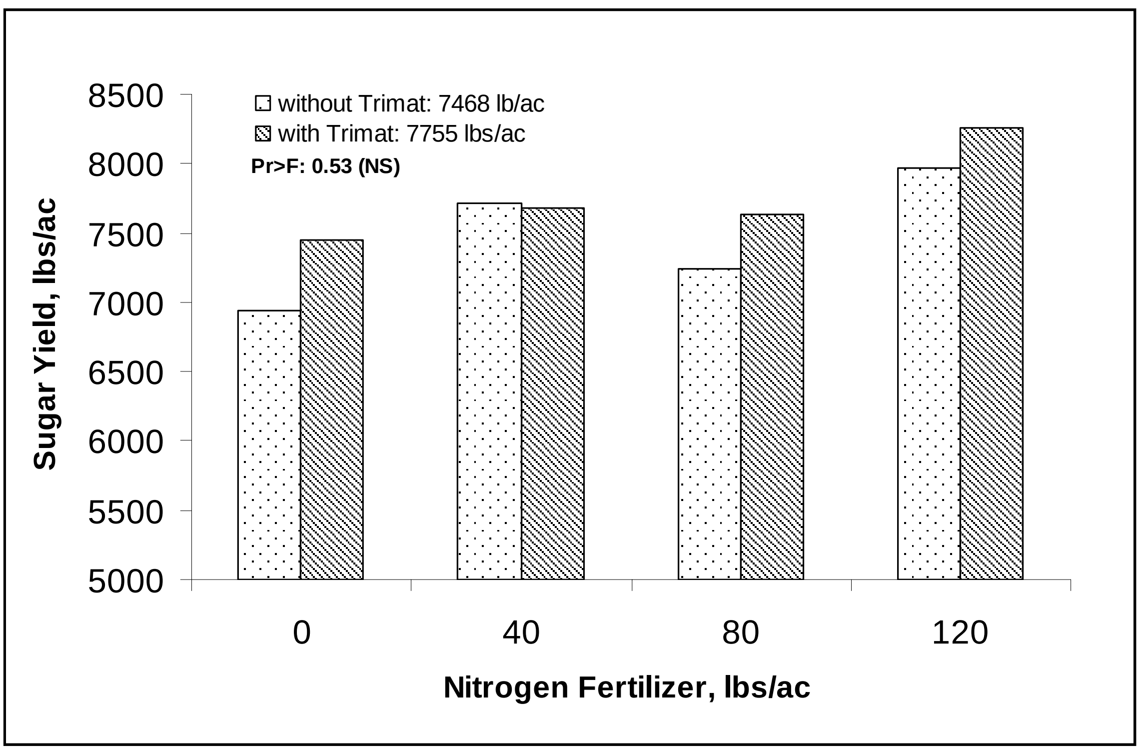

Figure 2. Effect of fertilizer adjuvants and different rates of nitrogen fertilizer on sugar yield of second stubble H95-988 variety planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

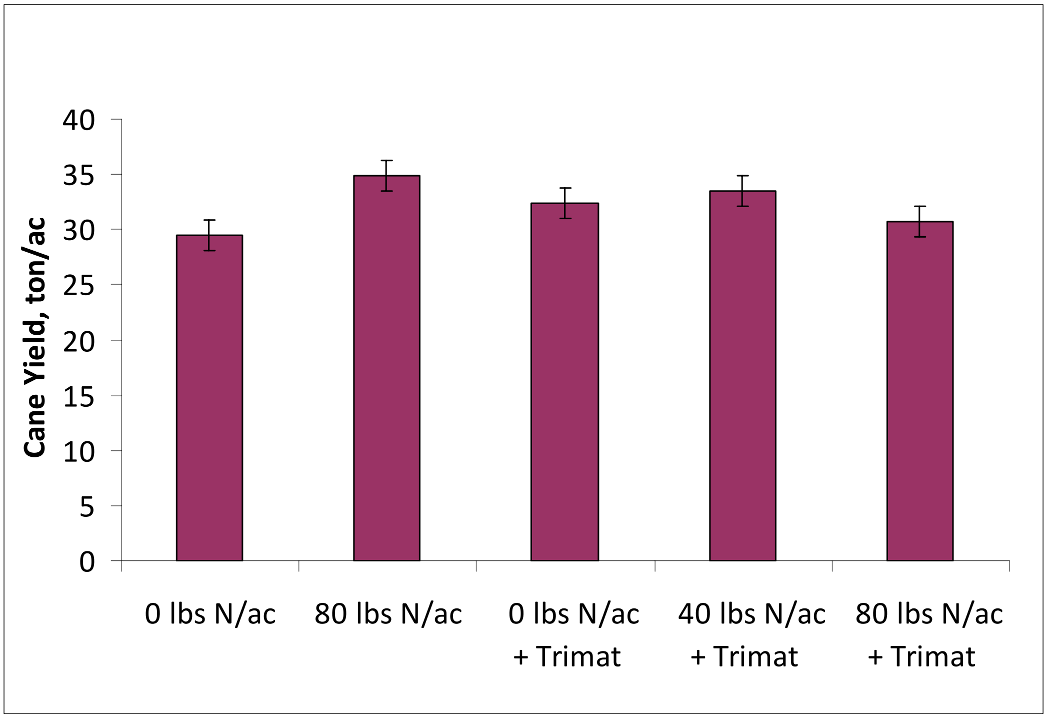

Figure 3. Effect of fertilizer adjuvants and different rates of nitrogen fertilizer on plant cane yield of varieties L99-226, L99-233 and HoCP96-540 planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

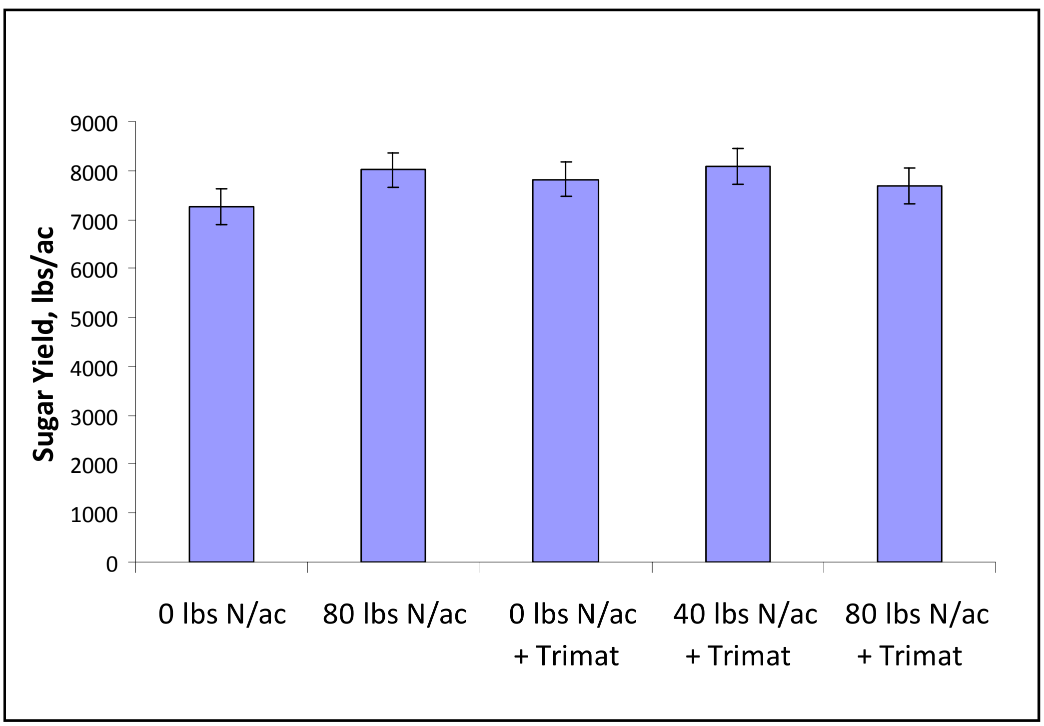

Figure 4. Effect of fertilizer adjuvants and different rates of nitrogen fertilizer on sugar yield of varieties L99-226, L99-233 and HoCP96-540 planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008

Table 3. Effect of fertilizer adjuvant and nitrogen on the first stubble yield of three cane varieties planted on a Commerce silt loam at the Sugar Research Station, St. Gabriel, LA, 2008.

Treatment		Population 1000/ac	TRS lbs/ton	Purity %	Cane Yield	Sugar Yield
					ton ac^{-1}	lb ac^{-1}
Variety						
	L99-226	28.9	238	83.2	31.8	7572
	L99-233	36.6	240	84.0	30.7	7394
	HoCP96-540	35.0	246	84.3	34.0	8348
	Pr>F	***0.0002***	***0.1220***	***0.0789***	***0.1219***	***0.0575***
Trt No.						
1	0 lb N/ac	31.9	246	84.3	29.5	4251
2	80 lbs N/ac	36.8	229	82.7	34.9	8009
3	0 lb N/ac + Trimat	32.7	242	84.0	32.4	7824
4	40 lbs N/ac + Trimat	33.1	242	83.8	33.4	8090
5	80 lbs N/ac + Trimat	33.0	249	84.4	30.7	7681
	Pr>F	***0.2043***	***0.0066***	***0.0506***	***0.0668***	***0.5177***
V X Trt	***Pr>F***	***0.2105***	***0.2751***	***0.6760***	***0.5603***	***0.3251***

Table 4. Effect of fertilizer adjuvant on the second stubble yield of two cane varieties on a Cancienne silty clay loam soil at the Sugar Research Station, St. Gabriel, LA, 2008.

Treatment		Population 1000/ac	TRS lbs/ton	Purity %	Cane Yield	Sugar Yield
					ton ac^{-1}	lb ac^{-1}
Variety						
	L97-128	24.3	232	82.1	20.3	4712
	Ho95-988	29.8	238	83.9	21.4	5064
	Pr>F	***0.0004***	***0.1144***	***0.0001***	***0.1848***	***0.0625***
Trt No.‡	Fall TRT – Spring TRT					
1	Control – Control	27.9	235	82.6	20.2	4779
2	T & PGR – T, PGR & F	28.0	236	83.4	22.5	5274
3	T – T, PGR & F	26.8	232	82.9	20.6	4752
4	T – Control	25.5	237	83.1	20.0	4744
	Pr>F	***0.0004***	***0.7793***	***0.2869***	***0.1238***	***0.1321***
V X Trt	***Pr>F***	***0.8129***	***0.8255***	***0.3082***	***0.5644***	***0.6584***

T – Trimat
PGR – Growth Regulator
F – Foliar NPK

Table 5. Effect of fertilizer adjuvant on the plant cane yield of two cane varieties planted on a Cancienne silty clay loam at the Sugar Research Station, St. Gabriel, LA, 2008.

Treatment		Population 1000/ac	Purity %	Cane Yield	Sugar Yield
				ton ac^{-1}	lb ac^{-1}
Variety					
	L99-226	27.9	85.1	40.1	10220
	HoCP96-540	34.5	85.5	42.6	11187
	Pr>F	***<0.0001***	***0.1936***	***0.1201***	***0.0262***
Trt No.[‡]	Fall TRT – Spring TRT				
1	Control – Control	32.3	85.7	41.1	10714
2	T & PGR – T, PGR & F	29.6	85.4	40.4	10539
3	T – T, PGR & F	31.1	85.1	43.5	11196
4	T – Control	31.6	85.1	40.5	10367
	Pr>F	***0.4955***	***0.5034***	***0.4659***	***0.5170***
V X Trt	***Pr>F***	***0.1499***	***0.1443***	***0.8321***	***0.7075***

T – Trimat
PGR – Growth Regulator
F – Foliar NPK

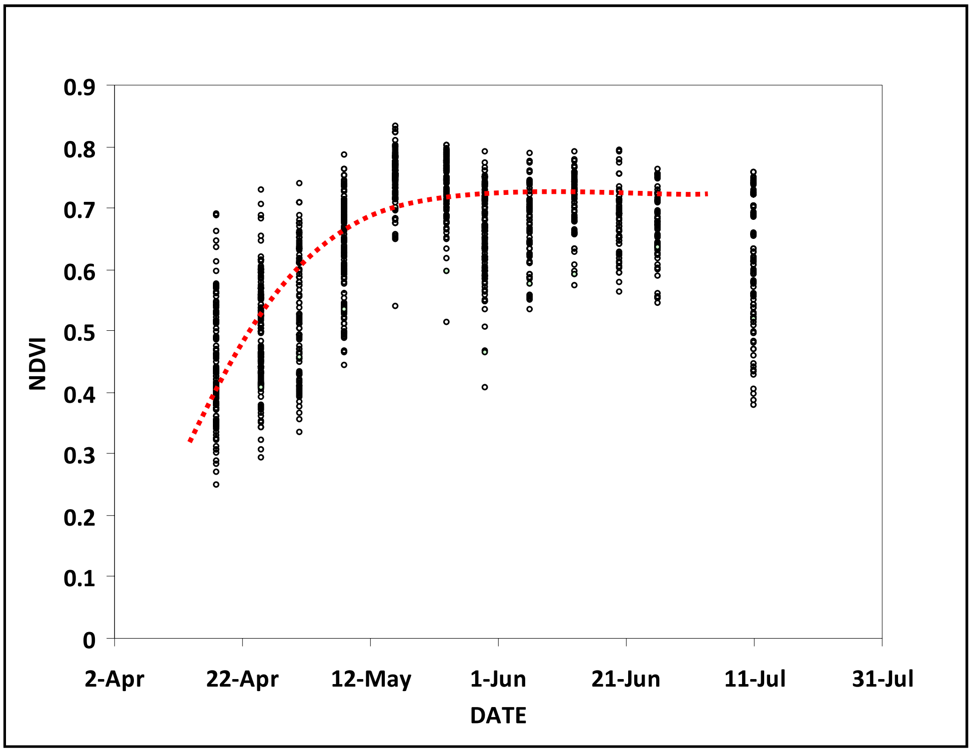

Figure 5. Normalized difference vegetation index readings of sugarcane collected at different dates from different fertility trials at the Sugar Research Station, St. Gabriel, LA, 2008.

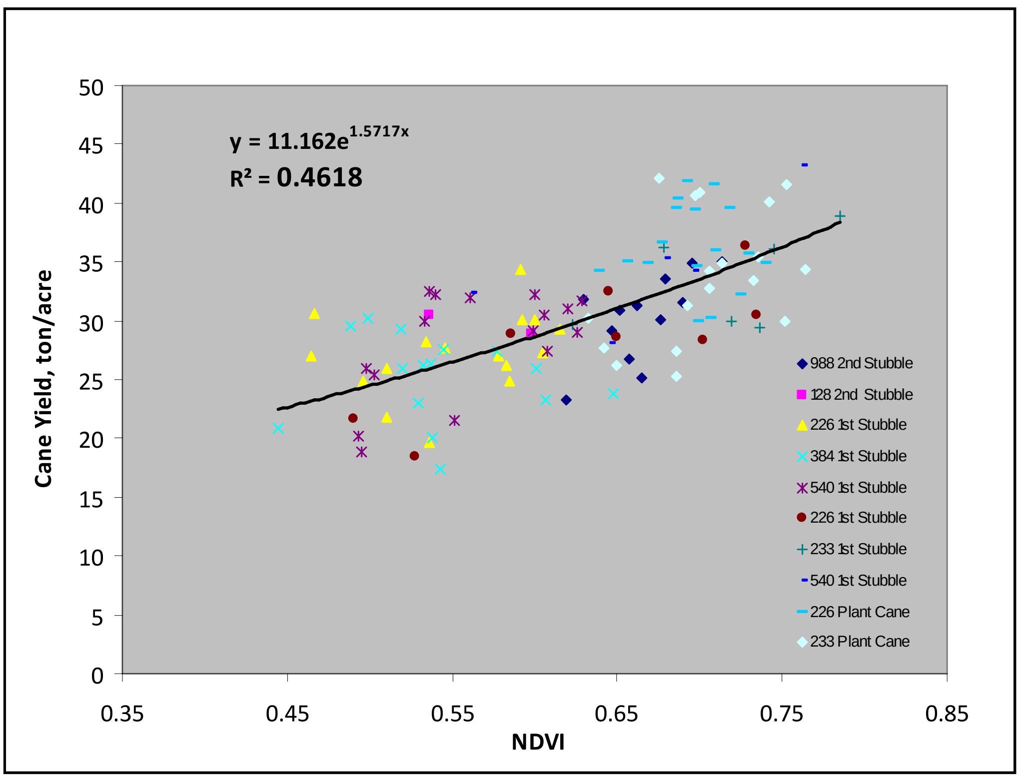

Figure 6. Relationship of normalized difference vegetation index and cane yield six weeks after spring N fertilization (May 8, 2008). Data were collected from several fertility trials established at the Sugar Research Station, St. Gabriel, LA, 2008.

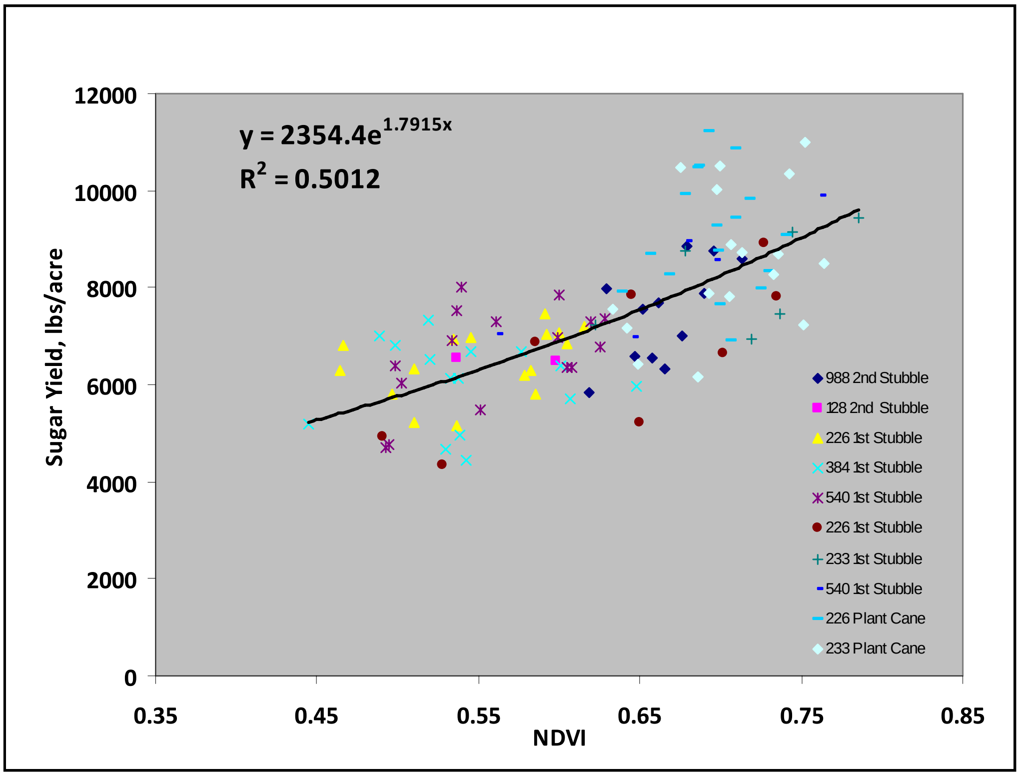

Figure 7. Relationship of normalized difference vegetation index and sugar yield six weeks after spring N fertilization (May 8, 2008). Data were collected from several fertility trials established at the Sugar Research Station, St. Gabriel, LA, 2008.

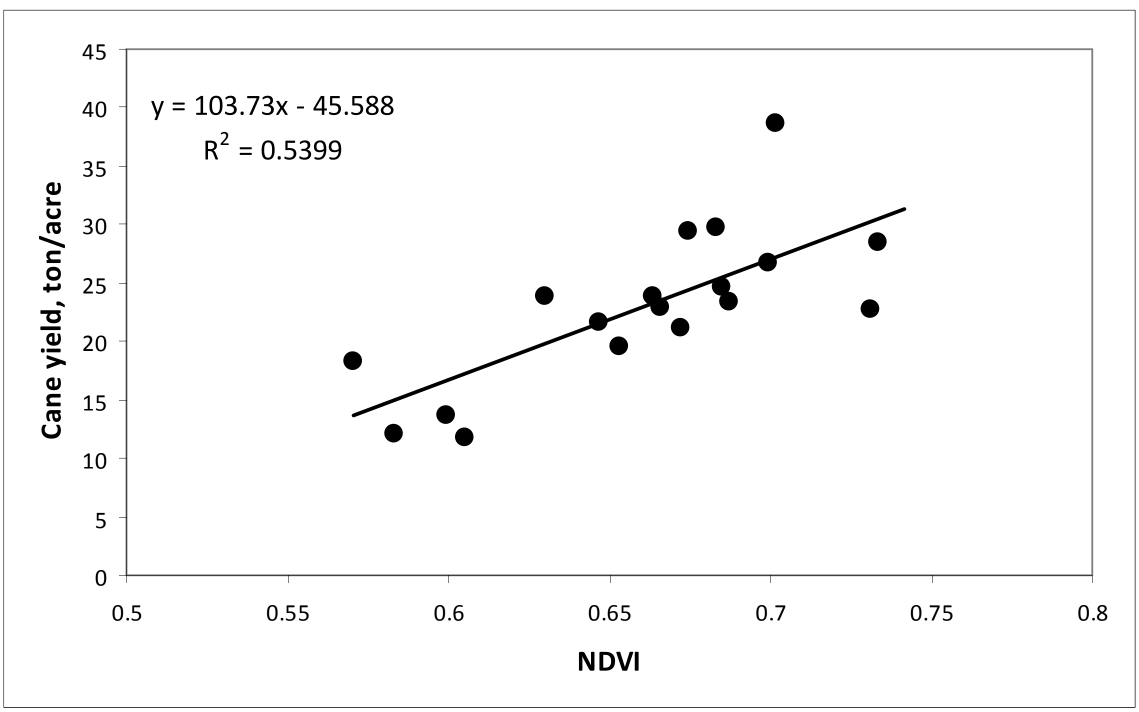

Figure 8.Relationship of normalized difference vegetation index and cane yield four weeks after spring N fertilization at the Iberia Research Station, Jeanerette, LA, 2008. Data were collected from an N response trial using HoCP-950, second stubble cane.

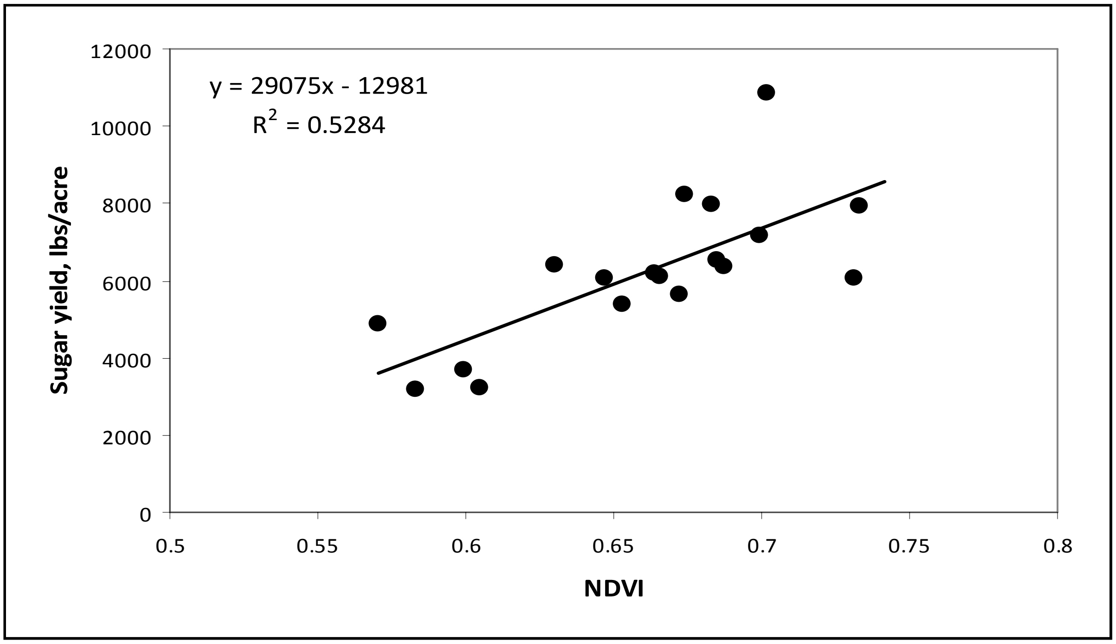

Figure 9. Relationship of normalized difference vegetation index and sugar yield four weeks after spring N fertilization at the Iberia Research Station, Jeanerette, LA, 2008. Data were collected from an N response trial using HoCP-950, second stubble cane.

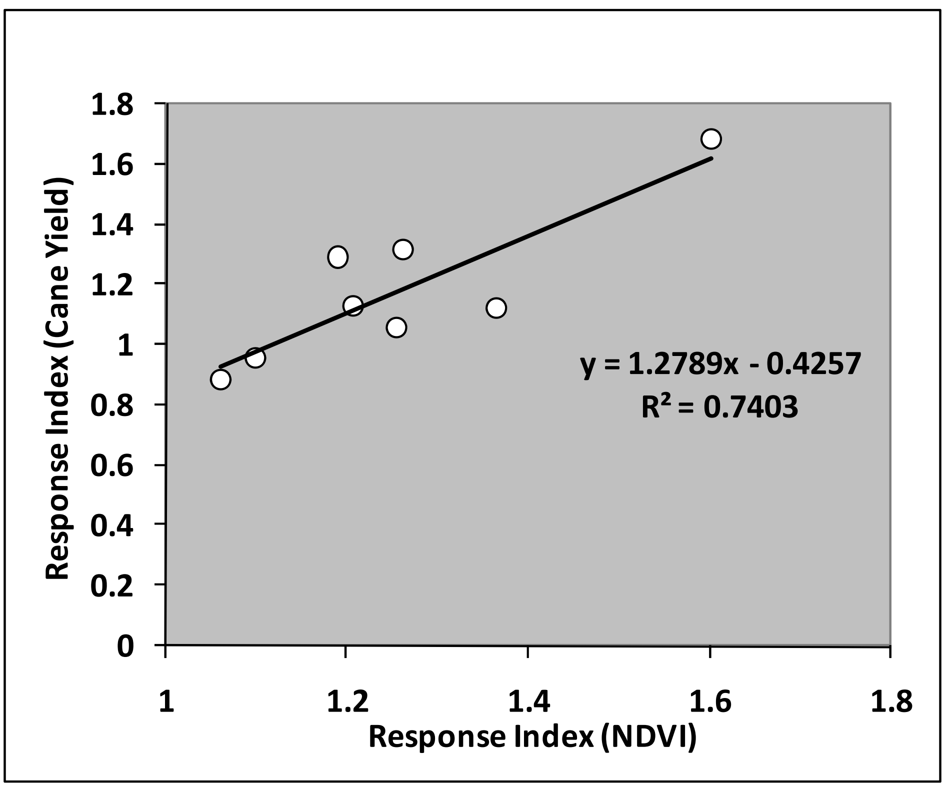

Figure 10. Relationship of estimated boost in cane yield (response index NDVI) and actual boost in cane yield (response index cane yield) attributed to nitrogen fertilization. Data were collected from several fertility trials established at the Sugar Research Station, St. Gabriel, LA, 2008.

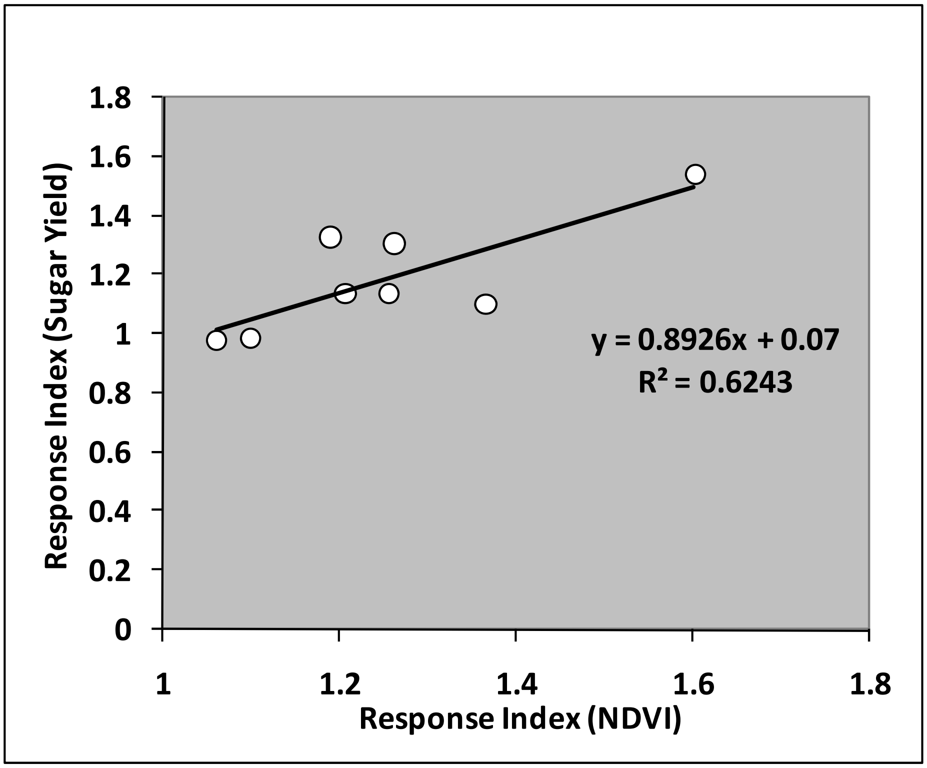

Figure 11. Relationship of estimated boost in sugar yield (response index NDVI) and actual boost in sugar yield (response index sugar yield) attributed to nitrogen fertilization. Data were collected from several fertility trials established at the Sugar Research Station, St. Gabriel, LA, 2008.

THE RESPONSE OF SWEET SORGHUM TO NITROGEN FERTILIZER RATES

Howard P. Viator and Greg Williams
Iberia Research Station

PRELIMINARY RESULTS:

Three sweet sorghum varieties, M-81E, Topper 76-6 and Theis, were evaluated for their response to varying nitrogen fertilizer rates (0, 40, 60, 80 and 100 lb/acre) on a Baldwin silty clay loam in 2008. The variety by nitrogen application rate interaction was not significant for all production traits. As an average of the three varieties, the 0 N rate produced significantly less cane and sugar yield than the other applied rates. Brix was not affected by N application. Theis exhibited significantly lower plant population causing it to yield lowest of the three cultivars for both cane and sugar yield. The test was quite variable, with relatively high CV's for cane and sugar yield. Additional data are scheduled for collection this growing season.

Table 1. Performance of sweet sorghum varieties at varying fertilizer N rates at Jeanerette, LA in 2008.

N rate (lb/a)	Brix	Tons of millable stalks/a	Stalk population/a	Tons of fermentable sugar/a
0	16.1	10.6 b	21746 b	1.42 b
40	15.8	20.0 a	28322 a	2.87 a
60	16.0	21.3 a	28225 a	3.04 a
80	16.0	20.6 a	28290 a	2.97 a
100	15.8	20.2 a[1]	27701 a	2.88 a
P =	NS	.0001	.003	.0001
CV =	4.3%	25.0%	16.8%	24.9%

[1]Nitrogen rate means, averaged over the three varieties, in columns followed by a common letter are not significantly different at P=0.05. The variety x N rate interaction for all variables was not significant.

Table 2. Evaluation of sweet sorghum varieties at varying fertilizer N rates at Jeanerette, LA in 2008.

Variety	N rate (lb/a)	BRIX	Tons of millable stalk/a	Population/a	Tons of fermentable sugar/a
M-81E	0	15.23	11.4	25208	1.57
	40	15.80	23.4	33154	3.35
	60	15.95	21.6	34727	3.09
	80	15.28	24.8	34606	3.40
	100	15.65	21.1	32210	2.97
	Variety mean	*15.6 b*[1]	*20.5 a*	*31981 a*	*2.87 a*
Topper 76-6	0	16.00	13.3	25657	1.91
	40	16.10	21.8	30952	3.17
	60	16.13	20.9	29354	3.03
	80	16.85	24.6	32694	3.72
	100	16.13	26.1	32017	3.79
	Variety mean	*16.2 a*	*21.3 a*	*30135 a*	*3.12 a*
Theis	0	16.10	5.3	14373	0.80
	40	15.55	15.3	18997	2.13
	60	15.85	17.5	20885	2.49
	80	15.75	14.6	17376	2.06
	100	16.45	14.5	20643	2.15
	Variety mean	*15.9 a*	*13.4 b*	*18455 b*	*1.92 b*
P =		NS	.0001	.003	.0001
CV =		4.3%	25.0%	16.8%	25.0%

[1]Varietal means, averaged over N rates, in columns followed by a common letter are not significantly different at the P=0.05. The variety x N rate interaction for all variables was not significant.

Research supported in part by a grant from the American Sugar Cane League.

EVALUATION OF NITROGEN FERTILIZER RATES ON HoCP 00-950

Howard P. Viator and Greg Williams
Iberia Research Station
Richard M. Johnson
USDA-ARS, Sugarcane Research Laboratory

SUMMARY:

With the realization that the once dominant cultivar, LCP 85-384, required less fertilizer nitrogen than was previously recommended, an effort has been made to evaluate the N needs of all newly released cultivars. During the growing season of 2008 a second stubble crop of the cultivar HoCP 00-950 received four rates of applied UAN 32% fertilizer, 40, 80, 120 and 160 lb/acre, plus a check treatment. The soil type was a Jeanerette silt loam.

Nitrogen rate affected cane and sugar yield as well as plant population. In spite of significantly lower stalk number, cane receiving the 40 lb N/acre rate of application was not significantly lower in yield than cane benefitting from higher application rates. TRS was not influenced by changes in N rate.

These results are somewhat surprising because older stubble crops normally require higher rates of N fertilizer for optimum productivity. The high coefficients of variation for cane and sugar yield indicate relatively high variability for the test.

Table 1. Response of HoCP 00-950 to varying rates of fertilizer N.

N rate lb/acre	Tons cane/acre	TRS lb/ton	Pounds sugar/acre	Stalks/acre
0	13.2b	269	3540b	30526c
40	21.8a	268	5814a	35083b
80	22.8a	275	6270a	40285a
120	26.6a	270	7189a	40567a
160	27.2a	274	7480a	41374a
LSD 0.05	7.46	NS	2171	3467
CV %	21.7	2.3	23.3	6.0

Research supported in part by a grant from the American Sugar Cane League

RESPONSE OF DIFFERENT SUGARCANE VARIETIES TO POTASSIUM FERTILIZATION

Jim J. Wang, Allen Arceneaux, and Chuck Kennedy
School of Plant, Environmental and Soil Sciences

SUMMARY

Field experiments were conducted in 2008 at two sites to determine response of different sugarcane varieties to potassium (K) fertilization. The study was carried out in a random variety by fertilizer design in Sharkey silt clay and Commerce silt loam. Second stubble cane yield increased by 17.9% and 20.0% whereas sugar yield increased by with 20.2% and 23.9%, respectively at K2O rate of 60 lbs/A for L97-128 and Ho-95-988, respectively. Application of K2O at 60 lb/A did increase sugar yield by 7.7% for L99-233 plant cane whereas it required K2O at 240 lb/A to reach a statistical increase in sugar yield for HoCP 96-540 plant cane (14.5%). There was no significant difference in cane or sugarcane yield between the two varieties compared at each site.

INTRODUCTION

Sugarcane requires more K than many other row crops during growth season. Also, the K content of sugarcane shoots often increases steadily with time, which suggests the requirement of a steady K supply. For last few years, new sugarcane varieties have been released and some have gained increasing acres in Louisiana. Fertilization practices for these varieties have not been extensively validated. This study addresses K fertilization for some of these varieties.

OBJECTIVE

This research was designed to obtain fertilization rate for new varieties of L97-128 and Ho95-988 as well as L 99-233 and HoCP 96-540.

MATERIALS AND METHOD

Field experiment for L97-128 and Ho95-988 was established in September 2005 on a Sharkey silty clay soil. Field experiment for L 99-233 and HoCP 96-540 was established in August, 2007 on a Commerce silt loam soil. Both experiments were conducted at the Sugar Research Station and were planted with whole stalks in a variety by fertilizer experimental design. For both sites, three rows by 50 feet long plots were established, and K fertilizer treatments consists of 0 (check), 60, 120 and 240 lbs/A. The potassium fertilizer treatments were applied on March 26, 2008. Composite soil test results before fertilization for Sharkey silt clay site are: pH 5.84, Mehlich 3-extractable K 191 ppm (medium) and Mehlich 3-extractable P 39 ppm. Composite soil test results for Commerce silt loam site are: pH 6.04, Mehlich 3-extractable K 152 ppm (medium) and Mehlich 3-extractable P 27 ppm. All plots also received 120 lbs N/A. All ground treatments were applied to the inner off-bar of each plot row. All treatments were replicated 4 times. The plots were harvested on October 27, 2008 and November 24, 2008 for second stubble (Sharkey site) and plant cane (Commerce site), respectively. The numbers of millable stalks in each sugarcane plot were counted. Ten stalks were randomly selected from each plot to measure average stalk weight and commercially recoverable sugar (CRS).

RESULTS AND DISCUSSION

Results for second stubble cane of L97-128 and Ho-95-988 grown on Sharkey silty clay soil are shown in Tables 1 and 2. Both varieties responded to fertilizer application. Cane yield increased by 17.9% and 20.0% whereas sugar yield increased by with 20.2% and 23.9%, respectively at K2O rate of 60 lbs/A for L97-128 and Ho-95-988, respectively. There was no significant difference in cane or sugarcane yield between the two varieties in this second stubble cane crop. This result was slightly different from last year's comparison in which L97-128 showed greater response to K application for the first stubble cane.

Results for plant cane of L99-233 and HoCP 96-540 grown on Commerce silt loam are shown in Tables 3 and 4. There was no statistical difference among major yield constituents and cane yield between the check and different rates of K2O application except for sugar yield. Application of K2O at 60 lb/A did increase sugar yield by only 7.7% for L99-233 whereas it required K2O at 240 lb/A to reach a statistical increase in sugar yield for HoCP 96-540 (14.5%). There was also no significant difference in cane or sugarcane yield between the two varieties in this plant cane.

Table 1. Effect of K fertilizer on L97-128 second stubble cane grown in Sharkey silt clay.

Treatment	**Pop.**	**Stalk wt.**	**CRS**	**Cane yield**	**Sugar yield**
Lbs K_2O/A	1000/A	lbs/stalk	lbs/T	T/A	lbs/A
Check	24.4a	1.72a	189.3a	20.7a	3,912a
60	27.5a	1.80a	193.1a	24.4b	4,703b
120	26.4a	1.78a	177.0b	23.5bc	4,167ab
240	25.7a	1.79a	184.2ab	22.9c	4,217ab
LSD 0.05	NS	NS	10.9	1.2	408

Table 2. Effect of K fertilizer on Ho95-988 second stubble cane grown in Sharkey silty clay.

Treatment	**Pop.**	**Stalk wt.**	**CRS**	**Cane yield**	**Sugar yield**
Lb K_2O/A	1000/A	lb/stalk	lb/T	T/A	lb/A
Check	28.8a	1.32a	188.9a	19.0a	3,582a
60	30.7a	1.48ab	194.8a	22.8b	4,437b
120	30.4a	1.51ab	192.7a	22.8b	4,382b
240	27.6a	1.65b	191.4a	22.7b	4,337b
LSD 0.05	NS	0.26	NS	1.85	572

Table 3. Effect of K fertilizer on L 99-233 plant cane grown in Commerce silt loam.

Treatment	**Pop.**	**Stalk wt.**	**CRS**	**Cane yield**	**Sugar yield**
Lb K_2O/A	1000/A	lb/stalk	lb/T	T/A	lb/A
Check	33.3a	2.07a	200.3a	34.4a	6,886a
60	35.1a	2.03a	208.9a	35.5a	7,421b
120	34.0a	2.18a	198.7a	36.4a	7,223ab
240	33.1a	2.14a	201.2a	35.4a	7,109ab
LSD 0.05	NS	NS	NS	NS	492

Table 4. Effect of K fertilizer on HoCP 96-540 plant cane grown in Commerce silt clay loam.

Treatment	**Pop.**	**Stalk wt.**	**CRS**	**Cane yield**	**Sugar yield**
Lb K_2O/A	1000/A	lb/stalk	lb/T	T/A	lb/A
Check	27.2a	2.50a	202.1a	33.7a	6,803a
60	29.4a	2.48a	206.7a	36.4a	7,502a
120	29.0a	2.55a	207.2a	36.5a	7,570a
240	29.7a	2.55	208.0a	37.7a	7,821b
LSD 0.05	NS	NS	NS	NS	852