
**RESEARCH RESULTS OF WORK DONE IN SUGARCANE
CROP PRODUCTION UNDER AICRP'S PROGRAM
2012-2013**

Submitted by

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HIGHLIGHTS OF RESEARCH WORK CONDUCTED DURING 2012-2013

1. AS-42: Agronomic evaluation of promising sugarcane genotypes (Pooled results.)

The field trials over two plant and one ratoon crops was conducted. The pooled results showed that, the genotype CoVSI 03102 recorded significantly higher cane, CCS yields & B:C ratio (106.03, 17.39, 1: 3.11 respectively) than the other genotypes under study. However it was on par with the check variety Co 86032.

Application 125% of recommended fertilizer dose of NPK to suru season sugarcane produced significantly higher cane yield (100.70 t/ha), CCS yield (16.62 t/ha) & B:C ratio (1: 2.89) than the other doses of NPK fertilizer applications.

2. AS - 63: Plant geometry in relation to mechanization in sugarcane.

An experiment on plant geometry in relation to mechanization in sugarcane was conducted for first plant cane and ratoon crop during 2011-12 and 2012-13 at VSI experimental farm. The pooled results of the first plant cane and ratoon crop revealed that, 150 cm row spacing was found superior in terms of sugarcane yield (130.87 t/ha), sugar yield (20.26 t/ha), net monetary returns (Rs. 200928/ha) and B: C ratio (1: 3.01). The performance of CoM0265 and CoVSI03102 was found superior in sugarcane yield, sugar yield, net monetary returns and B: C ratio as compared to Co86032 and CoVSI9805. The highest sugar yield of 21.86 t/ha was found in CoVSI03102 and CoM0265.

3. AS 64: Response of sugarcane crop to different plant nutrients in varied ecological situations

The effect of differential response of sugarcane crop to different nutrients on yield and quality of preseasonal sugarcane was studied in R & D farm of Vasantdada Sugar Institute. The results indicated that there was not individual response to sulphur, Zn and Fe, however, cane yield responses to RDF along with S+Zn (143.52 t/ha), RDF along with S+Zn+Fe (142.79 t ha⁻¹) and RDF along with S+Zn+Fe+Mn (143.83 t ha⁻¹) were on par and significant over only RDF (138.16 t/ha). Application @ RDF (400:170:170) along with sulphur @ 60kg/ha (141.47 t ha⁻¹) and application of RDF along with sulphur @ 60 kg and ZnSO₄ @ 20 kg /ha increased cane yield by 2.39% and 3.92%, respectively over 100% RDF.

Project No. AS-42 (AICRP'S)

Title of the experiment : Agronomic evaluation of promising sugarcane genotypes.

(Two plant and one ratoon crops).

Objective : To work out agronomy of sugarcane genotypes from advanced varietal trial (AVT).

Location : Vasantdada R& D farm.

Time Frame : Three crop seasons (2 plants + 1 ratoon)

Year of commencement : 2011-12

Year of completion : 2012-13

**Date of planting : Ist plant-7/02/2011, IInd plant-14/2/2012,
Ratoon-6/03/2012**

**Date of harvesting : Ist plant-5/03/2012, IInd plant-20/02/2013
Ratoon-24/02/2013**

Soil type : Medium black soil.

Treatment details

Sr. No.	Genotypes	Fertilizer levels
V1	VSI 434	F1- 75% RD of Nitrogen.
V2	Co VSI 9805	F2-100% RD of Nitrogen.
V3	Co VSI 03102	F3-125 % RD of Nitrogen.
V4	Co C 671	
V5	Co. 86032	

Recommended dose of fertilizer for suru sugarcane 250:115:115 kg NPK/ha.

Replications : Three

Design : Factorial R.B.D

Soil analysis :

Year	pH	EC mmhos/cm	Organic. caban%	Av. N kg/ha.	Av.P ₂ O ₅ kg/ha.	Av. K ₂ O kg/ha.
Ist crop	8.38	0.18	0.40	347.47	21.04	600.00
IIInd crop	8.65	0.13	0.55	286.00	35.00	402.00
Ratoon crop	8.66	0.15	0.68	315.00	32.00	482.00

Results:

The pooled data of two plant and one ratoon crops pertaining to cane and CCS yields, growth observations and quality parameters are presented in table 1 & 2.

Cane and CCS yield -

Effect of genotypes:

Pooled data presented in table 1 revealed that Co 86032 recorded significantly higher cane yield (109.41 t/ha) followed by the genotype Co VSI 03102 (106.03 t/ha). Cane yields of rest of the genotypes i.e. Co VSI 9805 & VSI 434 (87.15 t/ha & 78.64 t/ha respectively) were less than the variety Co C 671 (99.87 t/ha).

CCS yield was significantly higher in genotype Co VSI 03102 (17.87 t/ha) than rest of the genotypes under testing, but at par with the check variety Co 86032 (17.01 t/ha).

Effect of fertilizer levels:

The application of 125 % recommended fertilizer dose of NPK to suru season sugarcane recorded significantly higher cane yield (100.70 t/ha) & CCS yield (16.62 t/ha) than rest of the fertilizer levels. It produced 2.81 & 1.36 t/ha more cane and CCS yields over recommended dose of NPK fertilizers.

Effect of interaction:

The effect of interaction between genotypes & fertilizer levels in respect of pooled cane & CCS yields were non significant.

Growth and yield attributes -

The pooled data regarding growth and yield attributes are presented in table 2.

Effect of genotypes:

All the growth and yield attributes except total height, millable height, girths of cane were found significant. The pooled data revealed that the genotype Co VSI 03102 recorded significantly higher germination (64.33%), single cane weight (1.63 kg), no of internodes (21/cane). While the highest tillering at 90 & 120 DAP (1.69 & 1.84 la/ha), and number of millable canes (0.96 la/ha.) was recorded in variety Co 86032. Maximum cane girth (9.67cm) was observed in genotype Co VSI 9805.

Cost benefit ratio was significantly higher (1: 3.22) in variety Co 86032 followed by the genotype Co VSI 03102 (1: 3.11).

Effect of fertilizer levels:

The pooled data revealed that application of 125% recommended fertilizer dose of NPK to suru season sugarcane, recorded significantly maximum germination (60.49%) tillering at 90 DAP (1.40 l/ha), tillering at 120 DAP (1.55 l/ha), total & millable height (130.06 & 201.66 cm respectively), single cane weight (1.51 kg), cane girth (9.26 cm), no of internodes per cane (20.67) & no of millable canes (0.90 l/ha) than the recommended dose of NPK fertilizers. The B:C ratio was also numerically higher (1: 2.89) in 125% NPK application.

Effect of interaction:

Effect of interaction between genotypes & fertilizer levels in respect of all the pooled growth attributes were found non significant.

Quality parameters:

The pooled data pertaining to juice quality parameters presented in table 3 revealed that the genotype Co VSI 03102 recorded significantly highest brix % (23.86%), than the rest of the genotypes under study. VSI 434 noticed significantly higher sucrose% and CCS% (23.10% & 16.76%), respectively. Which was followed by the genotype Co VSI 03102 (sucrose% 22.65 & CCS 16.38 %).

The pooled data revealed that application of recommended fertilizer dose of NPK to suru season sugarcane recorded higher CCS% & sucrose% (16.34% & 22.52% respectively) than other fertilizer levels however differences were non significant.

Interaction effect between genotypes & fertilizer levels were found non significant.

Conclusion:

The genotype Co VSI 03102 recorded significantly higher cane, CCS yields & B:C ratio (106.03, 17.39, 1: 3.11 respectively) than the other genotypes under study. However it was on par with the check variety Co 86032.

Application 125% of recommended fertilizer dose of NPK to suru season sugarcane produced significantly higher cane yield (100.70 t/ha), CCS yield (16.62 t/ha) & B:C ratio (1: 2.89) than the other doses of NPK fertilizer applications.

**Table 1: Mean cane and CCS yield (t/ha) as affected by various treatments
(pooled data)**

Treatment	Cane yield (t/ha)				CCS yield (t/ha)			
	2011-12	2012-13	Ratoon	Pooled mean	2011-12	2012-13	Ratoon	Pooled mean
A) Genotype								
VSI 434	73.8	87.19	75.56	78.64	11.49	14.61	12.28	13.04
Co VSI 9805	75.51	87.23	98.72	87.15	11.78	13.33	16.37	14.07
Co VSI 03102	102.86	118.15	105.72	106.03	16.08	18.57	17.27	17.39
CoC 671	95.35	99.89	94.65	99.87	15.38	6.20	15.48	16.04
Co 86032	102.16	15.94	110.14	109.41	15.13	17.05	17.01	16.62
S.E. ±	5.30	3.96	3.44	4.44	0.54	0.53	0.69	0.77
C.D. at 5 %	12.34	12.91	11.23	14.50	1.25	1.73	2.26	2.53
Fertilizer Level								
75 %	81.11	96.80	91.71	90.07	12.86	14.70	14.54	14.31
100 %	88.29	102.73	96.02	97.89	14.04	16.22	15.57	15.58
125 %	100.03	105.5	103.14	100.70	15.01	16.94	16.93	16.62
S.E. ±	3.70	3.55	3.13	1.86	0.68	0.52	0.57	0.25
C.D. at 5 %	7.73	NS	9.25	5.52	1.42	1.55	1.71	0.76
Interaction								
S.E. ±	8.28	7.60	6.68	5.60	1.15	1.09	1.26	0.90
C.D. at 5 %	NS	NS	NS	NS	NS	NS	NS	NS
General Mean		101.68	96.96	96.22		15.95	15.68	15.50
	11.30	13.55	12.53	7.53	13.34	12.79	14.34	6.46

Table 2: Growth and Yield attributes as affected by various treatments.(Pooled data).

Treatment	Germ .%	Tillering Lac/ha.	Height (cm)	Girth (cm)	NMC 000/ha.	Wt/cane (Kg)	B:C Ratio	CCS %	Sucrose%	Brix %
Genotype										
VSI 434	54.17	1.20	219.66	8.67	0.78	1.28	2.28	16.76	23.10	24.53
CoVSI 9805	62.83	1.27	209.85	9.67	0.75	1.52	2.65	16.15	22.43	23.79
CoVSI 03102	64.33	1.39	209.09	9.37	0.89	1.63	3.11	16.38	22.65	23.86
CoC 671	57.17	1.48	239.05	8.32	0.89	1.30	2.88	16.43	22.62	23.8
Co 86032	59.54	1.84	243.24	8.46	0.96	1.38	3.22	15.29	21.12	22.27
S.E. ±	1.63	0.06	9.67	0.32	0.02	0.04	0.15	0.20	0.26	0.25
C.D. at 5 %	5.34	0.22	NS	NS	0.07	0.16	0.51	0.69	0.87	0.85
Fertilizer Level										
75 %	57.98	1.31	219.73	8.62	0.80	1.35	2.78	16.00	22.35	23.54
100 %	60.34	1.45	222.74	8.81	0.85	1.40	2.82	16.34	22.52	23.70
125 %	60.49	1.55	230.06	9.26	0.90	1.51	2.89	16.27	22.28	23.71
S.E. ±	0.62	0.02	4.36	0.13	0.014	0.01	0.03	0.14	0.17	0.14
C.D. at 5 %	1.84	0.08	NS	1.41	0.05	0.05	NS	NS	NS	NS
Interaction										
S.E. ±	1.99	0.08	12.53	0.41	0.06	0.05	0.16	0.33	0.41	0.38
C.D. at 5 %	6.31	NS	NS	NS	NS	NS	NS	NS	NS	NS
General mean	59.61	1.43	224.18	8.90	0.85	1.42	2.83	16.20	22.38	23.65
	4.07	7.49	7.55	10.14	9.13	5.09	5.62	3.55	3.09	2.50

Experiment No. : **AICRP AS- 63**

Title of the Experiment : Plant geometry in relation to mechanization in sugarcane.

Location : VSI Experimental Farm.

Objectives : 1) To work out optimum plant geometry for use of farm machinery.
2) To study varietal response to different planting geometry.

Time frame : Three crop seasons (Two plant + One ratoon)

Sponsored By : AICRP

Year of commencement : 2011-12

Year of completion : 2013-14

Date of planting/ ratooning : 25-02-2011 10-03-2012

Date of harvesting : 10-03-2012 04-03-2013

Soil : Medium deep black with pH = 8.35, EC= 0.35 mmhos / cm, Organic Carbon - 0.69%, Available N – 246.87 Kg/ha, Available P- 32.51 Kg/ha, Available K – 550.88 kg/ha.

Treatment Details

A. Plant Geometry

T1: 120 cm row distance

T2: 150 cm row distance

T3: 30 x 150 cm row distance

T4: 100 cm row distance

B. Genotypes

V1: CoVSI 9805 V3: CoM 0265

V2: C0 86032 V4: CoVSI 03102

Design : Split plot design

Replications : Four

Plot Size : Gross –12 m X 15 m, Net plot – 9 m X 13 m

Results and Discussion

Cane yield

The significant variation in cane yield was observed among the treatments of different furrow spacing. The highest cane yield of 132.76 t/ha was observed under the 30 x 150 cm row spacing (T3) followed by 130.87 t/ha under furrow spacing of 150 cm (T2). The lowest yield of 117.80 t/ha was observed in 100 cm row spacing (T4). The yield obtained in treatments T3 and T2 was statistically significant as compared to control i.e. treatment T4. The increase in cane yield in treatments of 30 x 150 cm row spacing (T3) and 150 cm row spacing (T2) were 12.70 and 11.09 % respectively as compared to 100 cm row spacing (T4). The yield obtained in 120 cm row spacing was 121.15 t/ha and which was on par with control.(Table1).

Among the different genotypes the significant differences in cane yield were observed. The highest cane yield of 148.69 t/ha was observed with CoM0265 followed by 126.43 t/ha of CoVSI03102. The yield obtained with CoM0265 and CoVSI03102 were statistically significant as compared to yields of CoVSI9805 (112.89 t/ha) and Co86032 (114.17 t/ha). (Table1).

The interaction of different furrow spacing and genotypes did not show significant differences in cane yield.

C.C.S

The data on C.C.S. % and sugar yield t/ha recorded at harvest is presented in Table-1. The highest C.C.S. % of 16.49% was recorded in variety CoVSI03102, which was significant to all other varieties. The C.C.S. % in CoVSI9805 (15.52%) and Co86032 (15.39%) were significantly superior to variety COM0265 (14.71%).

The sugar yield in 150 cm row spacing was highest (20.26 t/ha) followed by 20.23 t/ha in row spacing of 30 x 150 cm and these were statistically significant to row spacing of 100 and 120 cm. In sub-treatments, the highest sugar yield of 21.86 t/ha was observed in variety CoVSI03102 and CoM0265 and they were significantly superior to sugar yields in CoVSI9805 (17.49 t/ha) and Co86032 (17.59 t/ha).

The interaction of different row spacing and genotypes did not show significant differences in sugar yield

Millable cane population

The significant variation in millable cane population at harvest was observed in main and sub-treatments. The highest millable cane population of 104908 per ha was observed under furrow spacing of 30 x 150 cm, followed by 91266 per ha under furrow spacing of 100 cm and 91104 per ha under furrow spacing of 150 cm and were statistically significant to millable cane population in 120 cm row spacing (85652).

As regards the genotypes, there was significant difference in millable cane population. The highest cane population of 104908 per ha was observed in CoM0265 followed by 91266 in CoVSI03102, 90266 in Co86032 and 72020 in CoVSI9805. The millable cane population in CoM0265 was significantly higher than all other genotypes. (Table1).

The interaction of different row spacing and genotypes did not show significant differences in plant population at harvest.

Growth observations at harvest

The growth observations like millable cane height; cane girth and number of internodes were recorded at the time of harvest. As regards to main treatments, the millable cane height (256.19 cm) and number of internodes (23.50) were highest in furrow spacing of 150 cm.

As regards the genotypes, the highest millable cane height of 271.20 cm was recorded in CoM0265 followed by 250.66 cm in CoVSI03102, 241.41 cm in Co86032 and 238.73 cm in CoVSI9805. The millable cane height in CoM0265 and CoVSI03102 were significantly superior to CoVSI9805 and Co86032. The highest numbers of internodes (24.50) were observed in CoM0265 followed by 23.75 in CoVSI03102 and were significantly superior as compared to Co86032 (22.50) and CoVSI9805 (21.88). The cane girth in CoM0265, CoVSI03102 and CoVSI9805 was 10.40 cm, 10.65 cm and 10.37 cm respectively and was significantly superior to Co86032 (8.60 cm).

The interaction of different row spacing and genotypes did not show significant differences in growth observations at harvest.

Economics

The highest monetary returns of Rs. 305337 were obtained in furrow spacing of 30 x 150 cm followed by Rs. 300992 in furrow spacing of 150 cm and they were statistically significant to furrow spacing of 120 cm (Rs. 278645) and in 100 cm row spacing (Rs. 270937). The highest net monetary returns of Rs. 200928 were obtained in furrow spacing of 150 cm, while lowest net

monetary returns of Rs. 177583 were obtained in planting at 100 cm row spacing. The highest B: C ratio of 1: 3.01 was observed in furrow spacing of 150 cm and it was significant as compared to furrow spacing of 120 cm and 30 x 150 cm.

As regards to different varieties, the highest monetary returns of Rs. 341976 were obtained in CoM0265 followed by Rs. 290786 in CoVSI03102. The highest B: C ratio of 1:3.39 was observed in CoM0265 followed by 1: 2.88 in CoVSI03102.

The data on net monetary returns and B: C ratio with different furrow spacing and genotypes was not significant.

17. Conclusions

1. Mechanized farming at 150 cm row spacing was found superior in terms of sugarcane yield, sugar yield, net monetary returns and B: C ratio.
2. The performance of CoM0265 and CoVSI03102 was found superior in sugarcane yield, sugar yield, net monetary returns and B: C ratio as compared to Co86032 and CoVSI9805. The highest sugar yield of 21.86 t/ha was found in CoVSI03102 and CoM0265.
3. The use of mechanical sugarcane planter and earthing up equipment is found beneficial in sugarcane cultivation in plant cane.

Table- 1: Cane and sugar yield contributing characters (Pooled data of First plant cane and ratoon crop)

Treatments	Cane Yield t/ha	Sugar Yield t/ha	NMC/ ha	Millable height cm	No. of Internodes	Girth cm	C.C.S. % at harvest
Furrow Spacing							
T1: 120 cm row spacing	121.15	18.82	85652	252.16*	23.81*	10.36*	15.55*
T2: 150 cm row spacing	130.87*	20.26*	91104*	256.19*	23.50*	9.96	15.54*
T3: 30 x 150 cm row spacing	132.76*	20.23*	104908*	246.67	22.93*	9.93	15.25
T4: 100 cm row spacing	117.80	18.50	91266	246.99	22.19	9.76	15.77*
S. E ±	2.09	0.35	1349.14	1.68	0.22	0.08	0.05
C.D. at 5%	6.68	1.10	4303.41	5.35	0.71	0.27	0.17
Genotypes							
V1: CoVSI9805	112.89	17.49	72020	238.73	21.68	10.37	15.52*
V2: Co86032	114.57	17.59	90266*	241.41	22.50	8.60	15.39*
V3: CoM0265	148.69*	21.86*	104908*	271.20*	24.50*	10.40	14.71
V4: CoVSI03102	126.43*	21.86*	91266*	250.66*	23.75*	10.65	16.49*
S. E ±	2.82	0.45	1308.72	1.73	0.19	0.08	0.05
C.D. at 5%	8.10	1.29	3743.43	4.96	0.56	0.25	0.16
Interaction	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
S. E ±	5.33	0.85	3719	3.44	0.57	0.25	0.15
C.D. at 5%	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

Table- 2: Economics of Mechanized farming and varieties (Pooled data of First plant cane and ratoon crop)

Treatments	Cost of cultivation including drip system (Rs. /ha)	Cane Yield (t/ha)	Monetary returns (Rs./ha) @ Rs. 2300/t	Net Monetary returns (Rs./ha)	B: C Ratio
Furrow Spacing					
T1: 120 cm row spacing	101043	121.15	278645	177602	2.76
T2: 150 cm row spacing	100064	130.87*	300992*	200928*	3.01*
T3: 30 x 150 cm row spacing	109480	132.76*	305337*	195858*	2.79
T4: 100 cm row spacing	93355	117.80	270937	177583	2.90
S. E ±	-----	2.09	4812.76	4812.76	0.05
C.D. at 5%		6.68	15351.87	15531.87	0.15
Genotypes					
V1: CoVSI9805	100986	112.89	259638	158653	2.57
V2: Co86032	100986	114.57	263513	162527	2.60
V3: CoM0265	100986	148.69*	341976*	240991*	3.39*
V4: CoVSI03102	100986	126.43*	290786*	189800*	2.88*
S. E ±	-----	2.82	6515.38	6515.38	0.06
C.D. at 5%		8.10	18633.55	18633.55	0.18
Interaction	-----	N.S.	N.S.	N.S.	N.S.
S. E ±	-----	5.33	12268	12268	0.12
C.D.at 5%		N.S.	N.S.	N.S.	N.S.

- 1. Project number** : AS 64
- 2. Title of the project:** Response of sugarcane crop to different plant nutrients in varied ecological situations
- 3. Objectives** : To study differential response of sugarcane crop to different nutrients.
- 4. Location** : VSI Farm
- 5. Year of start** : 2011 -2012
- 6. Year of completion** : 2013 -2014
- 7. Planting season** : Preseason
- 8. Design** : RBD
- 9. Replication** : Three
- 10. Variety** : Co 86032
- 11. Planting date** : 19/11/2011
- 12. Plot Size** : Gross plot 8 m x 7.2 m
- 13. Treatments** : T 1- Control
T 2 - N
T 3 - NP
T 4 - NPK
T 5 - NPK + S
T 6 - NPK + Zn
T 7 - NPK + Fe
T 8 - NPK + Mn
T 9 - NPK + S + Zn
T 10 - NPK + S + Zn + Fe
T 11 - NPK + S + Zn + Fe + Mn
T12 – Soil test based fertilizer application

Results

The field experiment was conducted to study the Response of sugarcane crop to different plant nutrients in varied ecological situations on yield and quality of sugarcane. The data regarding cane yield, sugar yield, growth and biometric parameters are reported in Table 2 to 4 and soil properties in table 1 and 6

Cane yield

The effect of differential response with respect to sugarcane yield to different nutrients reported in Table 2. The cane yield was significantly increased 138.16 t/ha at recommended NPK treatment over absolute control (130.10 t/ha). There was numerical increase in cane yield due to addition of Fe, Zn, and Mn however, there was significant cane yield response (141.47 t/ha) due to addition of sulphur 60kg/ha. The maximum cane yield of 143.83 t/ha was obtained due to the combine application of sulphur, Zn, Fe, and Mn along with recommended NPK followed by 143.52 t/ha due combine application of sulphur and Zn with RDF which were found on par. Therefore, the results revealed that sugar cane responded to the recommended dose of NPK (400:170: 170), Sulphur @ 60 kg /ha and ZnSO₄ @ 20 kg/ha.

CCS Yield

The Commercial Cane Sugar yield was found highest 20.81 t ha⁻¹ in treatment of NPK + Zn followed by 20.19 t ha⁻¹ in the treatment of NPK + Fe. There was significant response to individual nutrient elements S (19.94), Zn (20.81) , Fe (20.19) , Mn (19.73) compared to only RDF (18.16)

Plant population

The plant population presented in Table 2 showed that maximum significant plant population 110.35 thousand ha⁻¹ was recorded in treatment T11 of recommended NPK + S+ Zn + Fe +Mn. The treatment T5,T9, T10 and T11 were found on par.

Growth observation

The growth parameters viz. milliable cane height and girth of cane were numerically increased in all treatments but not significantly differed. The maximum milliable cane height (256 cm) was found in treatment T11 of NPK. + S+ Zn + Fe +Mn. Cane girth and number of internodes were remained more or less same in all the treatments.

Biometric observation

The germination at 45 days after planting varied from 74.33 – 69 %. The data of germination percentage was found to be statistically non significant. The tillering ratio varied from 4.43 – 3.9 showed insignificant difference.

Juice quality

The juice quality parameters with respect to Brix, Pol, Purity and CCS percent are presented in Table. 4 indicated that the juice quality was not affected

Conclusion

The effect of differential response of sugarcane crop to different nutrients on yield and quality of preseasonal sugarcane was studied in R & D farm of Vasantdada Sugar Institute. The results concluded that the application @ 100% recommended dose of fertilizer (400:170:170), 25 kg/ha FeSO₄ , 20 kg /ha ZnSO₄ ,10 kg MnSo₄ ,60 kg Sulphur increased cane yield by 10.55 %.

Table 1 : Initial Soil characteristics under experimental plot

Soil characteristics	Analytical Value Initial
pH	8.15
Electrical Conductivity (dSm ⁻¹)	0.23
Organic carbon (%)	0.52
Available Nitrogen (kg ha ⁻¹)	320
Available Phosphate(kg ha ⁻¹)	34.5
Available Potash (kg ha ⁻¹)	485
Soil Texture	Clay
DTPA extractable Cu (ppm)	12.5
DTPA extractable Fe (ppm)	13.0
DTPA extractable Mn (ppm)	23.5
DTPA extractable Zn (ppm)	2.17

Table 2: Response of sugarcane crop to different nutrients. on Cane yield, CCS yield and No. Milliable canes

Treatments	Cane yield (t ha ⁻¹)	CCS yield (t ha ⁻¹)	No. of Milliable canes ('000 ha ⁻¹)
T1	130.10	18.12	104.91
T2	133.40	17.80	107.29
T3	136.70	19.57	108.10
T4	138.16	18.16	108.21
T5	141.47	19.94	110.24
T6	139.89	20.81	108.15
T7	138.27	20.19	107.17
T8	138.99	19.73	107.46
T9	143.52	20.00	110.12
T10	142.79	19.30	110.12
T11	143.83	20.07	110.35
T12	137.94	19.34	108.32
SE +- CD at 5%	1.27 3.7	0.55 1.62	0.63 1.85

Table 3: Response of sugarcane crop to different nutrients on Biometric and growth observation

Treatments	Milliable cane height (cm)	Cane Girth (cm)	Internodes/ cane	Germination (%)	Tillering Ratio
T1	242.67	8.93	21.33	70	3.9
T2	247.67	9.10	23.00	70	3.9
T3	250.33	9.10	22.33	74.33	3.9
T4	251.67	9.13	23.33	73.67	3.8
T5	247.00	9.23	23.67	71.00	4.4
T6	247.00	9.10	22.00	70.00	4.1
T7	249.00	9.00	22.67	71	3.9
T8	250.33	9.07	24.33	72.67	3.5
T9	250.00	9.23	23.67	71.33	4.0
T10	254.66	9.20	24.00	69	4.1
T11	256.00	9.20	23.67	73.33	4.0
T12	254.66	9.06	23.67	70.33	4.0
SE +- CD at 5%	4.50 NS	0.056 0.16	0.51 1.51	2.00 5.89	0.13 NS

Table 4: Response of sugarcane crop to different nutrients on Cane juice quality

Treatments	Brix (%)	Pol (%)	Purity (%)	Commercial Cane Sugar (%)
T1	20.65	19.35	93.70	13.93
T2	20.63	18.77	91.03	13.34
T3	21.73	20.04	92.22	14.32
T4	19.57	18.47	91.41	13.15
T5	21.55	19.77	91.74	14.10
T6	20.89	20.43	94.64	15.01
T7	21.85	20.37	93.25	14.60
T8	21.16	19.78	93.52	14.20
T9	21.36	19.56	91.57	13.93
T10	20.69	18.97	91.69	13.52
T11	21.86	19.50	92.52	13.96
T12	20.22	19.32	94.50	14.02
SE +- CD at 5%	0.57 NS	0.47 NS	0.98 NS	0.35 NS

Table 5: Response of sugarcane crop to different nutrients on economic evaluation

Treatments	Cane yield (t/ha)	Gross monetary return	Cost of cultivation	Net profit	BC ratio
T1	130.10	299222.33	104305	194917.33	2.87
T2	133.40	306536.33	109513	197023.33	2.80
T3	136.70	313865.67	117584	196281.67	2.67
T4	138.16	317760.33	120883	196877.33	2.63
T5	141.47	325381.00	121883	203498.00	2.67
T6	139.89	321739.33	121696	200042.58	2.64
T7	138.27	318028.67	121408	196620.67	2.62
T8	138.99	319677.00	121293	198384.00	2.64
T9	143.52	330103.67	122696	207406.92	2.69
T10	142.79	328417.00	123221	205195.25	2.67
T11	143.83	330816.67	123631	207184.92	2.68
T12	137.94	317277.33	120883	196394.33	2.62
SE +- CD at 5%	1.27 3.7	2921.21 8568.16		2921.21 8568.16	0.024 0.07

Table 6 : Soil analysis at earthing up

Treatment	pH	EC (dSm ⁻¹)	% OC	Available Nitrogen (kg ha ⁻¹)	Available Phosphate (kg ha ⁻¹)	Available Potash (kg ha ⁻¹)	DTPA extractable Micronutrient (ppm)			
							Cu	Fe	Mn	Zn
T1	7.99	0.22	0.55	342	31	516	9.8	12.9	20.1	3.0
T2	8.07	0.23	0.50	341	29	505	9.9	13.5	23.7	2.3
T3	8.11	0.23	0.51	343	31	506	10.2	13.6	22.2	2.2
T4	8.20	0.23	0.49	347	30	478	8.9	15.4	24.3	2.2
T5	8.12	0.24	0.59	349	32	483	9.9	12.1	21.9	2.3
T6	8.14	0.23	0.42	349	31	498	9.4	13.0	23.4	2.3
T7	8.11	0.25	0.48	349	33	525	10.1	13.4	23.6	2.6
T8	8.14	0.25	0.49	347	35	515	12.5	13.1	22.1	2.4
T9	8.08	0.26	0.50	337	30	515	10.3	13.7	22.2	2.0
T10	8.18	0.26	0.55	356	31	469	11.1	14.6	26.6	3.1
T11	8.13	0.24	0.46	342	32	561	11.3	13.0	22.8	2.8
T12	8.17	0.24	0.55	346	31	498	10.5	12.9	19.8	2.7

Table 6 : Soil analysis at harvest

Treatment	pH	EC (dSm ⁻¹)	% OC	Available Nitrogen (kg ha ⁻¹)	Available Phosphate (kg ha ⁻¹)	Available Potash (kg ha ⁻¹)	DTPA extractable Micronutrient (ppm)			
							Cu	Fe	Mn	Zn
T1	8.17	0.22	0.47	341	33	344	8.12	13.20	21.30	2.17
T2	8.15	0.24	0.49	343	32	340	7.13	11.17	20.22	2.65
T3	8.15	0.25	0.42	347	34	338	8.25	13.16	23.60	2.20
T4	8.22	0.24	0.50	347	32	352	6.27	14.29	22.65	2.10
T5	8.11	0.24	0.52	349	33	351	5.11	13.20	23.10	2.19
T6	8.13	0.24	0.40	351	33	345	6.35	13.19	22.55	2.63
T7	8.18	0.25	0.45	341	33	344	8.13	13.27	22.00	2.70
T8	8.12	0.25	0.49	337	31	353	11.20	14.20	21.69	2.11
T9	8.14	0.22	0.48	343	32	334	9.27	14.11	23.10	2.19
T10	8.20	0.27	0.49	347	32	353	12.20	13.65	20.66	3.12
T11	8.13	0.24	0.45	345	31	342	10.26	13.20	20.10	2.85
T12	8.15	0.24	0.50	345	33	340	10.75	12.07	19.11	2.05

VSI/CP/Agro //

/2013-14

Date: June 1/2013

To,

**Dr. O. K. Sinha,
Project Co-coordinator,
AICRP on Sugarcane,
Indian Institute of Sugarcane Research,
Rae Bareli Road, Post- Dilkusha,
Lucknow - 226 002 (Uttar Pradesh)**

Sub.: Submission of annual research report of AICRP on sugarcane Crop Production and Audit Utilization certificate 2012-13

Sir,

The research work in Sugarcane Crop Production under AICRP program was conducted as per the technical programme during 2012-13. A report of research work done has been enclosed herewith for inclusion in the proceedings. A copy of the same has also been sent through E-mail. Audit utilization certificate of the contingency grant for the year 2012-13 is also enclosed herewith. No front Line demonstrations and Breeder seed production program was allotted to this centre.

This is submitted for compilation and further need full please.

Thanking you,

Yours faithfully,

Encl.: 1) One hard copy of research work 2012-13
2) Audit Utilization Certificate. 2012-13

(D.B.Phonde)
Senior Scientist &
Head, Soil Science Section

Copy to:

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