Annual Report of Crop Production
(2015-16)
All India Co-ordinated Research Project (Sugarcane)

Experiment No. 1 **AS-42**

Title: Agronomic evaluation of promising sugarcane genotypes

Objective: To work out agronomy of sugarcane genotypes of advance varietal trial (AVT)

Location: Shahjahanpur
Year of start: 2007-08
Year of completion: Continuing
Treatments:

A. Genotypes	
V_1	CoS 03251
V_2	CoS 07240
V_3	CoS 03261
B. Fertilizer levels	
N_1	75 % of recommended N
N_2	100 % of recommended N
N_3	125 % of recommended N

Design: Factorial RBD
Replication: 3
Plot size : 8.0 x 5.4 m^2

The soil of experimental field was low in organic carbon (0.36%), medium in phosphorus (20.40 kg/ha) and potash (162 kg/ha) with pH 6.5. Experimental ratoon crop was started on 01.02.2015 and harvested on.11.12.2016

Experimental results (Table-1) revealed that genotype CoS 07240 produced significantly higher ratoon cane yield (74.9 t/ha) than that of genotype CoS 03261 (55.3t/ha) and CoS 03251 (46.5). Regarding nitrogen levels significantly higher ratoon cane yield (65.6 t/ha) was recorded with 125 % of recommended dose of N (225kg/ha) than that of 75 % of recommended N (135kg/ha) and 100 % recommended N (180 kg/ha) . CCS % in ratoon cane were more or less similar under various treatments.

Summary

Genotype CoS 07240 gave significantly higher ratoon cane yield (74.9 t/ha) followed by genotype CoS 03261 (55.3 t/ha) and CoS 03251 (46.5 t/ha). Regarding different nitrogen levels significantly higher ratoon cane yield (65.6 t/ha) was obtained with 125 % of recommended N than that of 75 % and 100% recommended N.

Experiment No. 3 **AS-68**

Title: Impact of integrated application of organics and inorganics in improving soil health and sugarcane productivity

Objective: To develop nutrient management strategy for sustaining soil health and sugarcane production

Location: Shahjahanpur

Year of start: 2014-15

Year of completion: 2016-17

Treatments:

T_1	Application of trash @ 10 tonnes/ha + 50% RDF
T_2	Application of trash @ 10 tonnes/ha + 100% RDF
T_3	Application of trash @ 10 tonnes/ha + soil test basis (NPK application)
T_4	Application FYM @ 20 tonnes/ha +50% RDF(inorganic source)
T_5	Application FYM @ 20 tonnes/ha +100% RDF(inorganic source)
T_6	Application FYM @ 20 tonnes/ha + inorganic nutrient application based on soil test (NPK)
T_7	Application FYM @ 10 tonnes/ha+ bio-fertilizers (Azotobactor +PSB)+ 50% RDF
T_8	Application FYM @ 10 tonnes/ha+ bio-fertilizers (Azotobactor + PSB)+ 100% RDF
T_9	Application FYM @ 10 tonnes/ha+ bio-fertilizers (Azotobactor + PSB)+ soil test basis (NPK)

Design: RBD

Replication: 3

Plot size: 8.0 x 5.4 m^2

Variety: CoS 08279

The soil of experimental field was low in organic carbon (0.36%), medium in phosphorus (20.40 kg/ha) and potash (162 kg/ha) with pH 6.5. Experimental first ratoon crop was started on05.03.2015 and harvested on 08.03.2016.

Experimental data given in table-2 showed that application of FYM @ 10 tones/ha + bio-fertilizers (Azotobactor + PSB) @ 10 kg/ha each + soil test basis NPK (T_9) produced significantly higher ratoon cane yield (98.84 t/ha) than that of other treatments except application FYM @ 20 tones/ha + inorganic nutrient application based on soil test (T_6) which was at par with T_9 treatment. CCS % in cane was not significantly affected with different treatments. Maximum benefit cast ratio (1.96) was also obtained in T_9 treatment.

Summary:

Application of FYM @ 10 tones/ha + bio-fertilizers (Azotobactor + PSB) + soil test basis NPK (T_9) produced significantly higher ratoon cane yield (98.84t/ha) followed by application FYM @ 20 tones/ha + inorganic nutrient application based on soil test (T_6). Maximum benefit cast ratio (1.96) was also obtained in T_9 treatment.

Experiment No. 3 **AS – 69**

Title: Use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane

Objectives:

1- To accelerate rate and extent of sugarcane germination through the use of PGRs
2- To assess the effect of PGRs on sugarcane growth, yield and juice quality.

Location: Shahjahanpur

Year of start: 2014-15

Year of completion: 2017-18

Treatments-

T_1- Conventional planting/ farmers practices (3 budded setts)
T_2- Planting of setts after overnight soaking in water.
T_3- Planting of setts after overnight soaking in 50 ppm ethral solution.
T_4- planting of setts after overnight soaking in 100 ppm ethral solution.
T_5- T_1 + GA_3 spray (35 ppm) at 90,120 and 150 DAP.
T_6 - T_2 + GA_3 spray (35 ppm) at 90,120 and 150 DAP.
T_7 – T_3 + GA_3 spray (35 ppm) at 90,120 and 150 DAP.
T_8 – T_4 + GA_3 spray (35 ppm) at 90,120 and 150 DAP.

This experiment was conducted at research farm of Shahjahanpur to find out the extent of sugarcane germination , yield and quality through the use of plant growth regulators like ethral and gibbrelic acid in randomized block design with three replications using test variety CoS 03251. The soil of the experimental field was sandy loam in texture, low in organic carbon (0.36 %), phosphorus (6.0kg/ha) and potassium (112kg/ha) with soil P^H 6.8. The experimental crop was planted on 30.03.15 and harvested on 11.03.2016.

The experimental results (Table 3) showed that significantly higher leaf area , root dry weight , plant height , number of tillers, millable canes and cane yield were observed with planting of setts after overnight soaking in 100 ppm ethral solution + Gibbrelic acid (35 ppm) spray at 90, 120 and 150 DAP than that of other treatments. Germination % recorded at different stages under overnight soaking in 100 ppm ethral solution were significantly superior to conventional and overnight soaking in water but it was at par with overnight soaking in 50 ppm ethral solution. CCS % in cane was not significantly affected with various treatments.

Summary:

Planting of setts after overnight soaking in 100 ppm ethral solution + Gibbrelic acid (35 ppm) resulted significantly higher leaf area , root dry weight , plant height , tillers, millable canes and cane yield than that of other treatments. Germination % recorded at different stages under overnight soaking in 100 ppm ethral solution were significantly superior to conventional and overnight soaking in water but it was at par with overnight soaking in 50 ppm ethral solution.

Table –1: Effect of treatments on stubbles, mother shoots, shoots, NMC, cane yield and CCS% in ratoon cane

Treatments	Stubles (000ha)	M. Shoots (000ha)	Shoots (000ha)	NMC (000ha)	Cane Yield (t/ha)	CCS (%)
A - Varieties						
V_1 -CoS 03251	16.32	40.82	130.87	70.91	46.5	11.19
V_2 -CoS 07240	22.03	55.09	160.84	105.13	74.9	11.40
V_3 -CoS 03261	21.03	52.58	159.38	75.08	55.3	11.30
SE±	1.93	1.54	2.65	1.33	0.34	0.11
CD (5%)	NS	3.28	5.64	2.84	0.72	NS
B - Fertilizer levels:						
F_1 - 75% RDN	19.02	47.57	140.67	78.20	50.8	11.24
F_2 - 100% RDN	19.98	49.86	151.39	84.49	60.3	11.21
F_3 - 125% RDN	20.37	50.96	158.49	88.39	65.6	11.41
SE±	1.92	1.54	2.65	1.33	0.34	0.11
CD (5%)	NS	NS	5.64	2.84	0.72	NS

Table 2: Effect of treatments on stubbles, mother shoots, shoots, NMC, cane yield, CCS% and B: C ratio in first ratoon cane

Treatments	Stubles (000ha)	M. Shoots (000ha)	Shoots (000ha)	NMC (000ha)	Cane Yield (t/ha)	CCS %	B:C ratio
T_1	21.64	35.65	159.26	93.98	74.19	12.53	1.72
T_2	21.18	35.19	161.81	97.22	83.56	12.54	1.83
T_3	23.15	38.66	149.42	103.01	82.41	12.26	1.82
T_4	23.03	37.85	159.84	96.06	79.74	12.16	1.40
T_5	24.07	39.93	162.62	104.05	78.01	12.32	1.36
T_6	23.95	39.47	151.04	107.06	94.21	12.52	1.74
T_7	22.11	36.34	149.54	103.59	81.83	12.69	1.70
T_8	21.53	35.76	148.15	108.72	88.77	12.68	1.72
T_9	23.26	39.58	165.79	111.11	98.84	12.44	1.96
SE±	1.21	1.35	6.03	2.83	4.23	0.15	-
CD (5%)	NS	2.87	NS	6.04	8.97	0.31	-

Table-3a: Effect of treatments on germination at 20, 30, 40 and 50 DAP

Treatments	Germination%			
	20 DAP	**30 DAP**	**40 DAP**	**50 DAP**
T_1	3.96	8.79	16.67	30.55
T_2	6.15	15.92	23.98	33.19
T_3	10.21	19.07	30.52	37.77
T_4	12.29	34.44	37.27	42.88
T_5	5.21	8.88	18.33	27.50
T_6	6.00	14.90	22.67	34.58
T_7	11.29	18.37	30.83	38.05
T_8	13.02	32.40	36.35	45.80
SE±	1.50	3.96	4.28	4.33
CD(5%)	3.21	8.48	9.17	9.28

Table-3b: Effect of treatments on leaf area (cm^2) at 90,120,150 and 180 DAP

Treatments	Leaf area (cm^2)			
	90 DAP	**120 DAP**	**150 DAP**	**180 DAP**
T_1	275.2	285.6	293.8	298.3
T_2	342.7	349.5	357.2	366.4
T_3	371.4	342.3	391.3	399.1
T_4	396.7	402.7	412.5	419.2
T_5	327.3	288.3	296.7	303.5
T_6	342.1	357.4	365.1	372.6
T_7	345.1	390.8	399.3	406.7
T_8	369.0	409.7	418.2	423.7
SE±	28.58	2.91	3.68	4.18
CD(5%)	61.30	6.25	7.89	8.96

Table-3c: Effect of treatments on root dry weight / clump (gm) at 90,120,150 and 180 DAP

Treatments	Root dry weight / clump (gm)			
	90 DAP	**120 DAP**	**150 DAP**	**180 DAP**
T_1	2.17	4.71	6.80	7.69
T_2	4.17	6.77	9.26	11.05
T_3	6.47	10.53	13.15	12.35
T_4	10.21	13.36	15.16	15.69
T_5	4.61	7.37	9.49	12..55
T_6	7.95	10.72	13.18	16.69
T_7	11.30	15.22	16.13	19.72
T_8	14.15	18.42	19.09	21.69
SE±	0.33	0.37	0.86	1.28
CD(5%)	0.71	0.79	1.85	2.75

Table-3d: Effect of treatments on plant height (cm) at 90,120,150 and 180 DAP

Treatments	Plant height (cm)			
	90DAP	**120DAP**	**150DAP**	**180DAP**
T_1	86.9	105.3	125.2	132.1
T_2	87.8	107.6	127.4	133.4
T_3	88.8	112.4	133.3	140.2
T_4	101.3	123.5	142.5	148.5
T_5	82.4	110.8	134.2	141.6
T_6	86.8	115.3	138.7	145.8
T_7	92.2	126.6	145.5	154.6
T_8	113.3	135.7	156.8	197.7
SE±	7.01	4.40	1.13	3.69
CD (5%)	15.03	9.45	2.42	7.93

Table-3e: Effect of treatments on tillers at 90,120,150 and 180 DAP

Treatments	Tillers (000/ha)			
	90DAP	**120DAP**	**150DAP**	**180DAP**
T_1	57.09	75.15	80.09	76.69
T_2	68.67	86.88	91.36	87.96
T_3	78.09	94.14	98.61	95.06
T_4	114.19	123.92	128.39	125.15
T_5	55.71	81.48	86.27	83.33
T_6	62.65	91.36	95.37	92.59
T_7	70.37	98.46	103.55	100.31
T_8	101.69	130.55	135.55	131.79
SE±	11.23	2.98	2.31	1.75
CD(5%)	24.10	6.40	4.96	3.76

Table-3f: Effect of treatments on germination, tillers, NMC, Cane Yield and CCS % in cane

Treatments	Germination (%) at 50 DAP	Tillers (ooo/ha) at 150 DAP	NMC (ooo/ha)	Cane Yield (t/ha)	CCS %
T_1	30.55	80.09	65.277	48.9	13.22
T_2	33.19	91.36	76.388	53.5	13.46
T_3	37.77	98.61	83.333	62.5	13.44
T_4	42.88	128.39	112.653	78.8	13.64
T_5	27.50	86.27	71.759	51.4	13.47
T_6	34.58	95.37	80.555	60.5	13.56
T_7	38.05	103.55	88.425	67.7	13.48
T_8	45.80	135.55	118.826	83.2	13.81
SE±	4.33	2.31	1.86	1.20	0.23
CD (5%)	9.28	4.96	3.99	2.58	NS