

AS 42.1 Effect of genotypes and fertility levels on germination, tiller count, yield and juice quality of sugarcane

AS 42:	Agronomic evaluation of promising sugarcane genotypes
Year of initiation	2012-13
Design	FRBD
Treatments	4 varieties from AVT V ₁ :CoOr 12346; V ₂ : CoOr 10346 ; V ₃ : CoA 12322 and V ₄ : Co6907 3 fertilizer levels : 75, 100 and 125 % RDN
Replication	3
Recommended fertilizer dose	250:100:60 N :P ₂ O ₅ : K ₂ O kg /ha
Plot size	6 x 4.8 m ²
Date of planting	6.02.15
Date of harvest	05.01.16

Treatments	Germination % at 45 DAP	No of tillers (000/ha) at 90 DAP	No of tillers (000/ha) at 120 DAP	NMC (000/ha)	Cane yield (t/ha)	Juice Brix %	Juice Sucrose %	CCS %	CCS yield (t/ha)
Genotypes									
CoOr 12346	53.26	76.97	92.49	90.66	92.54	21.59	17.95	12.04	11.14
CoOr 10346	52.83	90.08	88.68	86.45	89.37	20.69	17.56	11.90	10.63
CoA 12322	51.66	93.83	87.94	87.83	88.91	20.25	17.23	11.69	10.39
Co 6907	50.92	88.41	85.46	79.92	84.53	19.45	16.85	11.54	9.75
SEm ±	5.48	3.400	2.82	2.54	0.387	1.05	0.45	0.29	0.25
CD at 5 %	NS	9.972	6.68	6.92	1.135	NS	NS	NS	1.22
N levels									
75 %	53.86	91.40	88.25	86.62	87.32	20.82	17.54	11.84	10.33
100 %	52.96	92.29	90.85	90.75	90.91	21.44	17.84	11.97	10.88
125 %	49.24	78.27	77.62	80.22	88.27	19.75	17.25	11.86	10.46
SEm ±	4.52	2.945	2.74	2.68	0.33	1.22	0.41	0.24	0.255
CD at 5 %	4.01	8.636	8.63	6.51	0.98	NS	NS	NS	0.747

AS 42.2 Mean table				
	N1	N2	N3	Mean
CoOr 12346	93.613	95.073	88.940	92.54
CoOr 10346	85.020	91.447	91.650	89.37
CoA 12322	88.487	91.223	87.020	88.91
Co 6907	82.180	85.923	85.493	84.53
Mean	87.32	90.91	88.27	88.83
	V	N	V x N	
Sem±	0.39	0.33	0.67	
CD at 5%	1.14	0.98	1.96	
CV	5.30			

The experiment was laid out in factorial randomized block design with three genotypes from AVT namely CoOr 12346, CoOr 10346, Co A 12322 along with one standard check *i.e.* Co 6907 on red laterite soil of the experimental farm of Sugarcane Research Station, Nayagarh. The soil was acidic (pH 5.33) in reaction with electrical conductivity of 0.206 dsm⁻¹. Available N content was in lower range (155 kg/ha), but the soil was medium in available P (19.6 kg/ha) and (K 164 kg/ha) content. Analysis of variance suggested that there is significant variations among the genotypes with respect to cane yield, sucrose %, CCS%, commercial cane sugar recovery (CCS t/ha.), germination %, plant height, cane diameter, single cane weight, number of tillers at 120 days and number of millable canes ('000/ha). The genotype CoOr 12346 produced the highest average cane yield of 95.073 t/ha with application of 100 % RDN and was closely followed by CoOr 10346 (89.37 t/ha) and CoA 12322 (88.91 t/ha).

AS 68:	Impact of integrated application of organics and inorganics in improving soil health and sugarcane productivity
Year of initiation	2014-15
Design	RBD
Treatments	9
Replication	3
Variety	Co Or 08346
Recommended fertilizer dose	250:100:60 N: P ₂ O ₅ : K ₂ O kg /ha
Plot size	6x 4.8 m ²
Date of ratooning	24.2.2015
Date of harvest	20.01.2016

Treatment details:

	Ratoon – 1
T ₁	Application of trash at 10 tonnes/ha + 50 % RDF
T ₂	Application of trash at 10 tonnes/ha + 100 % RDF
T ₃	Application of trash at 10 tonnes/ha+ soil test basis fert (NPK) application
T ₄	Application of FYM/Compost @ 20t/ha+ 50% RDF (inorganic source)
T ₅	Application of FYM/Compost @ 20t/ha+ 100% RDF (inorganic source)
T ₆	Application of FYM/Compost @ 20t/ha+ inorganic nutrient application based on soil test(rating chart)
T ₇	Application of FYM/Compost @ 10t/ha+ biofertilizer (Azotobactor/Acetobactor + PSB) +50% RDF (inorganic source)
T ₈	Application of FYM/Compost @ 10t/ha+ biofertilizer (Azotobactor/Acetobactor + PSB) +100% RDF (inorganic source)
T ₉	Application of FYM/Compost @ 10t/ha+ biofertilizer (Azotobactor/Acetobactor + PSB) + Soil test based fert application (NPK)

AS 68.1 Impact of integrated application of organics and in-organics on germination and shoot count at various stages of cane growth

Treatments		Germination %		No of shoots (000/ha)		Length of cane (cm)	Girth of cane (cm)	Weight of cane (kg)	Brix %	NMC (000/ha)	Cane yield (t/ha)
		30 DAP	45 DAP	120 DAP	150 DAP						
T ₁	50% RDF	31.77	34.83	51.26	54.01	2.58	1.80	1.18	18.70	61.63	64.48
T ₂	100% RDF	31.623	37.28	53.25	55.99	2.79	2.24	1.34	19.13	65.61	74.34
T ₃	Soil test based fert. application (NPK)	32.547	42.78	60.82	63.58	3.06	2.33	1.56	18.80	69.08	73.47
T ₄	Application of FYM/Compost @ 20t/ha+ 50% RDF	32.080	40.81	63.77	63.28	2.37	2.54	1.25	18.86	70.37	71.54
T ₅	Application of FYM/Compost @ 20t/ha+ 100% RDF	33.550	43.05	61.74	64.77	2.58	2.41	1.26	19.43	71.63	73.93
T ₆	Application of FYM/Compost @ 20t/ha+ Soil test based fert. application (NPK)	35.547	44.36	63.56	66.52	2.93	2.33	1.30	19.73	73.78	75.47
T ₇	Application of FYM/Compost @ 10t/ha+(Azotobactor+P SB)+50% RDF	39.397	45.35	65.59	67.11	3.29	2.40	1.48	20.13	75.88	81.87
T ₈	Application of FYM/Compost @ 10t/ha+(Azotobactor+P SB)+100% RDF	39.073	42.39	67.64	69.92	3.11	2.46	1.53	20.40	76.71	82.73
T ₉	Application of FYM/Compost @ 10t/ha + Azotobactor + PSB + Soil test based fert application (NPK)	40.840	45.43	68.58	70.98	3.14	2.57	1.52	20.80	77.52	83.93
SEm ±		1.858	2.02	1.71	2.19	1.6	0.09	0.09	0.06	0.423	2.15
CD at 5 %		5.571	6.22	5.29	6.75	4.93	0.27	0.27	0.20	NS	6.65
CV%		7.38	9.96	7.12	6.15	4.33	5.36	5.36	4.76	4.29	5.24

Analysis of variance suggested that application of FYM/Compost @ 10t/ha+(Azotobactor+PSB)+50% RDF (T₇), Application of FYM/Compost @ 10t/ha+(Azotobactor+PSB)+100% RDF (T₈) and Application of FYM/Compost @ 10t/ha + Azotobactor + PSB + Soil test based(NPK) fertilizer application (T₉) recorded higher percentage of germination at 45 DAR i.e. 45.35, 42.39 and 45.43%, respectively. These treatments subsequently performed better than other treatment combinations leading to higher yield parameters and cane yield. The length and girth of the cane were also higher 3.1 & 2.4 cm in T₇, 3.14 & 2.46 cm in T₈ and 3.2 & 2.57 cm in T₉, respectively. The NMC and Cane yield were 75.88'000 & 81.87 t/ha in T₇, 76.71'000 & 82.73 t/ha in T₈ and 77.52'000 & 83.93 t/ha in T₉, respectively. This exhibits the positive effect of organic manures and bio fertilizers on cane yield.

AS 68.2 Impact of integrated application of organics and in-organics on soil fertility status

Treatments		BD (g cm ⁻³)	pH	EC (dsm ⁻¹)	OC%	Available Nutrient (kg/ha)		
						N	P	K
T ₁	50% RDF	1.35	5.7	0.202	0.448	224	15.2	127.1
T ₂	100% RDF	1.34	5.5	0.231	0.442	232	20.8	135.9
T ₃	Soil test based fert. application (NPK)	1.36	5.6	0.298	0.472	248	20.7	138.7
T ₄	Application of FYM/Compost @ 20t/ha+ 50% RDF	1.4	5.8	0.325	0.495	251	22.6	128.2
T ₅	Application of FYM/Compost @ 20t/ha+ 100% RDF	1.42	5.9	0.335	0.508	252	23.5	129.5
T ₆	Application of FYM/Compost @ 20t/ha+ Soil test based fert. application (NPK)	1.42	6.1	0.338	0.514	249	22.4	134.6
T ₇	Application of FYM/Compost@ 10t/ha +(Azotobactor+PSB) + 50% RDF	1.44	5.8	0.332	0.522	254	24.2	133.2
T ₈	Application of FYM/Compost@ 10t/ha +(Azotobactor+PSB)+100% RDF	1.45	6.2	0.31	0.525	253	25.5	134.1
T ₉	Application of FYM / Compost @ 10t/ha + Azotobactor + PSB + Soil test based fert application (NPK)	1.43	6.4	0.324	0.516	251	25.2	135.8

The soil physico-chemical parameters like BD, pH , EC, organic carbon content as well as available N, P and K content exhibited marked improvement upon application of organic source of plant nutrients.

AS 69:	Use of plant growth regulators for enhanced yield and quality of sugarcane
Year of initiation	2015-16
Design	RBD
Treatments	8
Replication	3
Variety	Co Or 03151
Recommended fertilizer dose	250:100:60 N: P ₂ O ₅ : K ₂ O kg /ha
Plot size	6x 4.8 m ²
Date of ratooning	24.2.2015
Date of harvest	10.01.2016

Treatment details:

1. Conventional planting/ Farmers practice (3 bud setts).
2. Planting of setts after overnight soaking in water.
3. Planting of setts after overnight solution in 50 PPM ethrel solution.
4. Planting of setts after overnight solution in 100 PPM ethrel solution.
5. T₁ + GA₃ spray at 90, 120 & 150 DAP.
6. T₂ + GA₃ spray at 90, 120 & 150 DAP.

7. T₃ + GA₃ spray at 90, 120 & 150 DAP.

8. T₄ + GA₃ spray at 90, 120 & 150 DAP.

AS 69.1 Effect of plant growth regulators on germination and shoot count at various stages of cane growth

Treatments		Germination%			Plant height (cm)		No of shoots (000/ha)	
		20 DAP	30 DAP	40 DAP	120 DAP	At harvest	120 DAP	180 DAP
T ₁	Conventional planting/ Farmers practice (3 bud setts)	11.59	40.23	50.47	123.80	280.57	80.37	83.57
T ₂	Planting of setts after overnight soaking in water	11.45	40.83	52.50	122.27	282.87	82.47	82.90
T ₃	Planting of setts after overnight solution in 50 PPM ethrel solution	11.60	43.40	54.67	126.93	279.37	78.13	82.43
T ₄	Planting of setts after overnight solution in 100 PPM ethrel solution	11.72	44.27	55.18	131.97	292.80	79.07	83.10
T ₅	T ₁ + GA ₃ spray at 90, 120 & 150 DAP	11.23	45.67	54.69	126.93	294.80	81.93	85.93
T ₆	T ₂ + GA ₃ spray at 90, 120 & 150 DAP	11.43	41.60	55.27	125.13	296.30	83.27	87.10
T ₇	T ₃ + GA ₃ spray at 90, 120 & 150 DAP	12.25	44.97	57.87	132.93	309.27	84.63	84.83
T ₈	T ₄ + GA ₃ spray at 90, 120 & 150 DAP	13.34	47.00	58.18	131.37	314.20	85.23	86.37
SEm±		0.297	1.438	1.547	2.368	4.581	1.55	0.988
CD at 5 %		0.900	4.360	4.692	7.183	13.895	4.7	2.996
CV%		4.34	5.72	4.88	3.21	2.7	3.26	4.42

AS 69.2 Effect of plant growth regulators on yield parameters of cane

Treatments		Length of cane (cm)	Girth of cane (cm)	Weight of cane (kg)
T ₁	Conventional planting/ Farmers practice (3 bud setts)	280.57	2.55	1.36
T ₂	Planting of setts after overnight soaking in water	282.87	2.67	1.37
T ₃	Planting of setts after overnight solution in 50 PPM ethrel solution	279.37	2.47	1.49
T ₄	Planting of setts after overnight solution in 100 PPM ethrel solution	292.80	2.63	1.54
T ₅	T ₁ + GA ₃ spray at 90, 120 & 150 DAP	294.80	2.78	1.52
T ₆	T ₂ + GA ₃ spray at 90, 120 & 150 DAP	296.30	2.55	1.54
T ₇	T ₃ + GA ₃ spray at 90, 120 & 150 DAP	309.27	2.95	1.57
T ₈	T ₄ + GA ₃ spray at 90, 120 & 150 DAP	314.20	2.81	1.56
SEm±		4.58	0.21	0.048
CD at 5 %		13.89	0.63	0.146
CV%		6.97	10.56	5.57

AS 69.2 Effect of plant growth regulators on yield parameters of cane

Treatments		Length of cane (cm)	Girth of cane (cm)	Weight of cane (kg)
T ₁	Conventional planting/ Farmers practice (3 bud setts)	280.57	2.55	1.36
T ₂	Planting of setts after overnight soaking in water	282.87	2.67	1.37
T ₃	Planting of setts after overnight solution in 50 PPM ethrel solution	279.37	2.47	1.49
T ₄	Planting of setts after overnight solution in 100 PPM ethrel solution	292.80	2.63	1.54
T ₅	T ₁ + GA ₃ spray at 90, 120 & 150 DAP	294.80	2.78	1.52
T ₆	T ₂ + GA ₃ spray at 90, 120 & 150 DAP	296.30	2.55	1.54
T ₇	T ₃ + GA ₃ spray at 90, 120 & 150 DAP	309.27	2.95	1.57
T ₈	T ₄ + GA ₃ spray at 90, 120 & 150 DAP	314.20	2.81	1.56
SEm±		4.58	0.21	0.048
CD at 5 %		13.89	0.63	0.146
CV%		6.97	10.56	5.57

AS 69.3 Effect of plant growth regulators on juice quality and yield of cane

Treatments	Brix %	Sucrose %	Purity %	NMC (000/ha)	Cane yield (t/ha)	CCS %	CCS (t/ha)
T ₁ Conventional planting/ Farmers practice (3 bud setts)	19.8	17.2	86.8	70.46	100.52	11.8	11.86
T ₂ Planting of setts after overnight soaking in water	19.5	17.0	87.1	71.47	98.53	11.68	11.5
T ₃ Planting of setts after overnight solution in 50 PPM ethrel solution	20.4	17.6	86.27	73.80	109.20	12.0	13.1
T ₄ Planting of setts after overnight solution in 100 PPM ethrel solution	20.5	17.5	85.36	75.53	109.47	11.9	13.14
T ₅ T ₁ + GA ₃ spray at 90, 120 & 150 DAP	19.8	16.9	85.3	73.80	108.54	11.5	12.48
T ₆ T ₂ + GA ₃ spray at 90, 120 & 150 DAP	19.7	16.5	83.7	78.13	109.84	11.4	12.68
T ₇ T ₃ + GA ₃ spray at 90, 120 & 150 DAP	20.7	17.8	86.0	81.37	111.26	12.15	13.5
T ₈ T ₄ + GA ₃ spray at 90, 120 & 150 DAP	21.2	18.1	85.37	82.47	112.45	12.3	13.8
SEm±	0.49	0.38	2.78	1.711	3.58	0.34	0.29
CD at 5 %	NS	NS	NS	5.188	6.34	NS	1.42
CV%	4.82	4.46	5.12	3.9	5.72	5.22	3.52

Out of the eight treatments, Planting of setts after soaking in 100 PPM ethrel solution along with GA₃ spray at 90, 120 & 150 DAP performed better with highest number of net millable canes (82.47 th/ha), cane (114.45 t/ha) and CCS yield (11.45t/ha). The treatment next in order was T₇ where Planting of setts after soaking in 50 PPM ethrel solution along with GA₃ spray at 90, 120 & 150 DAP produced NMC of 81.37 ('000 /ha) with cane and CCS yield of 111.26 and 10.84 t/ha, respectively. Planting of setts after overnight soaking in water along with GA₃ spray at 90, 120 & 150 DAP produced NMC of 78.13 ('000 /ha) cane and CCS yield of 111.2 and 10.64 t/ha, respectively. These three treatments were at par. The higher yield parameters i.e. number of shoots/ha, length and girth of cane in the above mentioned treatments were the factors of higher cane and CCS yield.

**ALL INDIA CO-ORDINATED RESEARCH PROJECT ON SUGARCANE
SUGARCANE RESEARCH STATION
(ORISA UNIVERSITY OF AGRICULTURE & TECHNOLOGY)
AT: PANIPOILA , PO :BALUGAON , Dist : NAYAGARH**

No. 163 / SRS Dt. 31 .05.2016

From :

Dr. P. K. Nayak, Ph.D.
Officer-in-Charge

To

The Principal Investigator (Crop Production)
AICRP on Sugarcane
Indian Institute of Sugarcane Research,
Lucknow (UP)

Sub : Submission of data sheet 2015-16 (Crop Production)

Sir,

In inviting a kind reference to the subject cited above I am herewith submitting the data sheet 2015-16 of crop Production discipline of AICRP on Sugarcane, S.R.S. Nayagarh along with soft copy for your kind perusal and inclusion in the Annual Report.

This is for favour of your kind information and necessary action

With regards

yours faithfully

Encl. : As above

Sd/- P.K.Nayak
OFFICER-IN-CHARGE
AICRP(S) S.R.S., NAYAGARH

Memo No. **164** / SRS **Dt 31.05. 2016**

Copy along with data sheet and C.D. submitted to the Project Coordinator, AICRP(S), IISR , Lucknow ,UP for favour of information and necessary action .

Sd /- P.K.Nayak
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