

Submitted to Director

Through: Head, Division of Crop Production

I request that the enclosed Annual report of the experiments **AS 42 - Agronomic Evaluation of Promising Sugarcane Genotypes under AICRP - Sugarcane and Impact of integrated application of organics and inorganics in improving soil health and sugarcane productivity** may please be forwarded to Project Co-ordinator - Sugarcane, IISR, Lucknow - 226 002 as well as the PI.

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ANNUAL REPORT FOR 2015-16
ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE
CROP PRODUCTION (AGRONOMY AND SOIL SCIENCE)
Centre: Sugarcane Breeding Institute, Coimbatore - 641 007

Expt. No.AS 42. Agronomic Evaluation of Promising Sugarcane Genotypes

Report

The experiment aims at studying the response of promising sugarcane genotypes to graded levels of Nitrogen application, viz. 75, 100 and 125 % recommended dose. The experiment was planted during January 2015 with a new set of four promising clones (Co 08009, Co 08016, Co 08020 and Co 09004) which performed best in AVT along with Co 86032 and CoC 671 as check. The experiment was laid out in Randomized Block Design with three replications. The experimental field was low in available N (228 kg N/ha) and high in available in P and K. The soil pH was 7.52 and the EC was 0.86 ds/m. Germination and initial crop growth was satisfactory. Data were recorded on growth, juice quality, cane yield and yield attributes. In the plant crop the shoot population showed significant difference due to varieties, wherein, promising early genotype Co 09004 (94033 thousand/ha) recorded significantly higher NMC than the check variety CoC 671(89377 thousand/ha), similarly in case of mid-late genotypes, Co 08009 (125745 thousand /ha) recorded significantly higher NMC than Co 86032.

Juice quality (Brix, sucrose, purity and CCS percent) was studied by collecting cane samples at harvest. Juice Brix and Sucrose at harvest showed significant varietal difference whereas Purity and CCS (%) were found non-significant. In the plant crop Co 09004 recorded significantly highest mean brix of 22.03 than CoC 671 (21.86). The varieties Co 08016 and Co 08009 recorded more than 19 % of juice sucrose and more than 13 % CCS.

Amongst the early genotype Co 09004 was found more promising and recorded significantly higher cane height, cane yield (171.89 t/ha) and numerically higher brix (22.03), sucrose % (21.15), purity per cent (93.69) and CCS % (14.67) over the control Coc 671 (145.58 t/ha). In case of mid late genotypes, Co 08009 recorded the highest yield of 177.07 t/ha of cane yield which was found on par with the other mid-late genotypes such as Co 08020 (171.69 t/ha) and Co 86032 (174.90 t/ha). The effect

application of graded level of Nitrogen on cane yield was significant wherein application of 100 and 125 of recommended dose of nitrogen recorded significantly higher cane yield over 75 % RDN. The effect of nitrogen application on juice quality was non-significant. The post experimental soil sample were collected and analyzed for pH, EC, organic carbon, available nitrogen, phosphorous and potassium.

No. AS- 68. Impact of integrated application of organics and inorganics in improving soil health and sugarcane productivity

Report:

A field experiment with objective of developing nutrient management strategy for sustaining soil health and sugarcane production was laid out in randomized block design on 18 January 2015 with 9 treatments replicated thrice. The experimental field was low in available nitrogen (216.38 N kg/ha) and high in available P and K. Treatment scheduling was done consisting of application of organics and inorganics for nutrient management in sugarcane variety Co 86032 wherein at the time of planting as basal dose full phosphorous and FYM was applied as per the treatments. In two split applications i.e. at the time of partial earthing up (45 DAP) and full earthing up (90 DAP) nitrogen and potassium were applied. The germination and initial crop growth is satisfactory and recorded average germination of 58.83 and 65.64 per cent at 30 and 45 DAP, respectively. The Integrated application of organics and inorganics i.e. application of 10 t FYM+STCR 150+Biofertilizer recorded significantly higher NMC and cane yield of 186.46 t/ha over the control (no fertilizer application) , 20 t/ha FYM (T11) and 10 t/ha (T12) FYM application alone. Sugarcane juice analysis done at 12 months revealed that Brix, Sucrose %, Purity % and CCS % were not influenced significantly by application of organics and inorganics.

1: Effect of improved Genotypes and Nitrogen levels on cane yield and juice quality.

Treatments	Cane Height (Cm)	Girth (mm)	SCW(kg)	NMC	Cane yield (t/ha)	Brix %	Sucrose %	Purity %	CCS %
Improved Genotypes (V)									
V ₁ : Co 08009	265.17	25	1.33	125745	177.07	21.17	19.85	89.93	13.31
V ₂ : Co 08016	227.50	25.26	1.17	134233	143.51	21.86	20.75	91.82	14.14
V ₃ : Co 08020	247.00	29.27	1.56	102906	171.69	20.81	19.54	90.49	13.18
V ₄ : Co 09004	267.91	25.15	1.43	94033	171.89	22.03	21.15	93.69	14.68
V ₅ : CoC 671	245.67	30.02	1.71	89377	145.59	21.86	20.82	92.44	14.28
V ₆ : Co 86032	256.25	28.97	1.63	111188	174.91	20.53	19.38	91.58	13.23
SE (d)	9.32	0.97	0.11	4003.73	8.85	0.41	0.43	0.79	0.39
CD (0.05)	18.76	1.95	0.21	8059.28	17.81	0.82	0.87	1.58	0.79
Nitrogen Levels (N)									
N ₇₅	258.11	26.99	1.51	109413	152.40	21.51	20.25	91.25	13.79
N ₁₀₀	254.39	27.29	1.50	109825	169.89	20.98	19.81	90.90	13.40
N ₁₂₅	248.77	27.83	1.49	109173	171.66	21.58	20.62	92.52	14.13
SE (d)	7.61	0.79	0.09	3269.03	7.22	0.33	0.35	0.64	0.31
CD (0.05)	NS	NS	NS	NS	14.54	NS	NS	NS	NS

2: Impact of integrated application of organics and inorganics on cane yield and juice quality.

Treatments	Cane Height (Cm)	Girth (mm)	SCW(kg)	NMC	Cane yield (t/ha)	Brix %	Sucrose %	Purity %	CCS %
T1 : 50 % RDF	262	27.52	1.42	101.46	151.31	20.9	19.12	91.63	13.45
T2 : 100 % RDF	256	28.23	1.59	112.35	174.07	21.2	19.33	90.99	13.55
T3 : STCR 150	260	30.14	1.64	114.73	184.84	19.7	17.76	89.83	12.38
T4 : 50 % RDF 20 t FYM	254	28.06	1.57	105.86	174.86	21.1	19.43	91.97	13.69
T5 : 100 % RDF 20 t FYM	254	29.20	1.58	116.26	181.90	21.2	19.53	92.13	13.77
T6 : STCR 150 20 t FYM	263	28.75	1.47	114.36	168.65	20.6	18.69	90.85	13.10
T7 : 50 % RDF 10 t FYM BF	256	27.54	1.48	112.24	170.37	21.2	19.43	91.67	13.67
T8 : 100 % RDF 10 t FYM BF	256	29.48	1.46	114.61	171.85	21.1	19.07	90.43	13.33
T9 : STCR 150 10 t FYM BF	263	30.37	1.70	118.82	186.46	20.9	19.10	91.21	13.41
T10 : No	239	26.92	1.33	101.06	137.07	21.3	19.90	93.26	14.11
SE (d)	23.77	1.31	0.17	4.28	8.91	0.66	0.93	2.02	0.77
CD (0.05)	NS	NS	NS	8.78	18.26	NS	NS	NS	NS