Crop Production

AS – 42 – Agronomic evaluation of promising new sugarcane genotypes

1	Objective	:	To work out agronomy of sugarcane genotypes from advance varietal trial (AVT)
2	Year of start	:	2010-11
3	Year of completion	:	Continue
4	Design	:	RBD
5	Treatment	:	3 varieties from early group & 3 from midlate maturity group
6	Plot size	:	6 rows of 6 m length
7	Replication	:	4
8	Date of sowing	:	09.03.2013
9	Date of harvesting	:	15.01.2014

The experiment was conducted on sandy loam soil having initial pH 8.2, EC 0.34 dS/m, OC 0.35%, P_2O_5 22 kg/ha and K_2O 356 kg/ha.

AS 42 a: Effect of different nitrogen levels on growth, yield and quality of early genotypes at Sriganganagar

Treatments	Germination (%)	Tiller (000/ha)	NMC (000/ha)	Cane length (m)	Cane diameter (cm)	Single cane wt (kg)	Cane yield (t/ha)	Sucrose %
Genotypes								
CoPb 09181	38.72	138.27	71.29	2.28	2.81	1.16	87.29	17.39
CoH 09263	41.57	151.29	90.75	1.93	2.32	0.90	73.29	16.24
Co 6617	42.72	154.57	95.62	2.06	2.29	0.96	86.52	17.08
CD at 5%	2.67	4.96	8.29	0.16	0.08	0.07	6.12	0.26
Nitrogen levels (% of recommended 150 kg N/ha)								
75	41.75	141.75	74.27	1.98	2.39	0.92	76.29	17.36
100	41.16	149.32	88.74	2.13	2.69	0.99	84.76	17.21
125	40.87	152.29	93.35	2.19	2.76	1.11	86.53	17.19
CD at 5%	NS	4.96	8.29	0.16	0.08	0.07	6.12	NS

In early group two new genotypes CoPb 09181 and CoH 09263 were tested against local check variety Co 6617. The genotypes recorded significant differents in terms of growth and cane yield. The genotype CoPb 09181 recorded highest cane yield of 87.29 t/ha which was significantly higher over the genotype CoH 09263 (72.29 t/ha) but was comparable to local check Co 6617 (86.52 t/ha). Genotype CoPb 09181 also recorded significantly heavier, thicker and longer canes than both the genotypes. The genotype CoPb 09181 (17.39%) was significantly better in sucrose % than the local check Co 6617 (17.08%) and CoH 09263 (16.24%).

In different N levels, application of either recommended or 125% of the recommended dose of N significantly improved yield and yield attributes as compared to 75% of the recommended dose of nitrogen. However, differences between recommended and 125% N for yield and yield attributes were non significant. Different N levels did not show any significant effect on cane quality. Interaction between genotypes and N levels were also found non significant.

AS 42 b: Effect of different nitrogen levels on growth, yield and quality of mid late genotypes at Sriganganagar

Treatments	Germination (%)	Tiller (000/ha)	NMC (000/ha)	Cane length (m)	Cane diameter (cm)	Single cane wt (kg)	Cane yield (t/ha)	Sucrose %
Genotypes								
Co 09022	36.63	153.83	92.25	2.212	2.29	0.94	86.29	16.98
CoH 09264	39.41	149.57	73.57	2.43	2.48	1.28	98.38	16.62
CoLk 09204	38.76	164.24	106.61	2.38	2.31	0.98	90.47	17.17
CD at 5%	2.51	5.23	7.93	0.14	0.06	0.08	4.36	0.24
Nitrogen levels (% of recommended 150 kg N/ha)								
75	38.14	152.29	84.26	2.19	2.31	0.96	88.29	17.03
100	37.96	158.38	98.39	2.33	2.38	1.17	94.47	16.99
125	37.43	160.71	102.45	2.39	2.41	1.22	96.38	16.93
CD at 5%	NS	5.23	7.93	0.14	0.06	0.08	4.36	NS

In midlate group, three genotypes namely Co 09022, CoH 09264 and CoLk 09204 were tested. All the genotypes showed significant differences in terms of growth, yield and cane quality. The genotype CoH 09264 recorded significantly thicker (2.48 cm) and heavier (1.28 kg) canes as well as higher cane yield (98.38 t/ha) than rest of the genotypes under testing. While the highest tillering and number of millable canes were recorded with variety CoLk 09204. Highest sucrose % was also recorded by the genotype CoLk 09204 (17.17%) but at par with Co 09022 (16.98%).

The yield and yield attributes were influenced significantly due to different nitrogen levels. Highest cane yield was recorded in 125% N of the recommended (150 kg N/ha) which was significantly higher over 75% of the recommended N but at par with the recommended level of nitrogen. Different nitrogen levels did not show any significant effect on the cane quality recorded at the time of harvesting. Similarly, interaction between genotypes and N levels were also found non significant.

AS - 64 – Response of sugarcane crop to different plant nutrients in varied agro-ecological situations

1	Objective	:	To study differential response of sugarcane crop to different nutrients
2	Year of start	:	2012-13
3	Year of completion	:	2014-15
4	Design	:	RBD
5	Treatment	:	13
6	Plot size	:	6 rows of 8 m length
7	Replication	:	3
8	Date of sowing	:	07.03.2013
9	Date of harvesting	:	17.01.2014

The field experiment was conducted to study the response of sugarcane crop to different plant nutrients with respect to yield and quality of sugarcane. The soil of the experimental field being sandy loam in texture, alkaline in reaction (8.2), tested low in organic carbon (0.34%), medium in available P_2O_5 (22 kg/ha) and high in available K_2O (356 kg/ha). Early maturing variety Co6617 was planted on 07.03.2013 at 75 cm spacing in randomized block design with three replications and harvested on 15.01.2014.

AS 64 : Effect of treatments on growth, yield and quality of sugarcane crop at Sriganganagar.

Treatments	Germination (%)	Tiller (000/ha)	NMC (000/ha)	Cane length (m)	Cane diameter (cm)	Single cane wt (kg)	Cane yield (t/ha)	Sucrose (%) at harvest
T1- Control (No fertilizer)	40.29	118.98	77.29	1.78	2.18	0.85	57.28	17.38
T2- N (150 kg/ha)	38.37	130.94	82.47	2.08	2.24	0.97	75.37	16.48
T3- NP (40 kg P_2O_5/ha)	38.84	142.59	88.38	2.17	2.27	1.04	83.16	17.14
T4- NPK (40 kg K_2O/ha)	39.14	151.92	90.54	2.26	2.31	1.10	87.89	17.36
T5- NPK + S (40 kg/ha)	40.27	157.29	92.61	2.28	2.32	1.16	90.84	17.39
T6- NPK + Zn (25 kg/ha)	40.87	158.34	93.68	2.30	2.34	1.19	95.10	17.41
T7- NPK + Fe (1% foliar)	39.93	153.06	92.73	2.29	2.33	1.18	94.98	17.38
T8- NPK + Mn (5 kg/ha)	39.42	151.29	90.59	2.26	2.29	1.12	88.27	17.36
T9- NPK + S + Zn	40.58	158.38	95.39	2.31	2.34	1.20	95.97	17.43
T10- NPK + S + Zn + Fe	40.63	159.88	96.76	2.32	2.35	1.26	97.08	17.56
T11- NPK + S + Zn + Fe + Mn	40.67	166.21	98.54	2.34	2.37	1.27	98.38	17.58
T12- Soil test based Fert.	39.78	152.38	90.29	2.27	2.32	1.12	89.47	17.38
T13- FYM @ 20 t/ha	40.12	129.86	81.63	1.91	2.22	0.94	72.39	17.40
CD at 5 %	NS	6.29	5.92	0.06	NS	0.12	6.78	0.22

The results indicated that number of tillers, NMC, cane length, single cane weight, cane yield and sucrose % were influenced significantly due to different nutrient treatments while, the effect on germination and cane diameter were non significant. The significant increase in yield and yield attributes was recorded due to application of NPK alone or along with secondary nutrient like sulphur and micronutrients (Zn, Fe & Mn) over control, alone application of nitrogen and FYM @ 20 t/ha. The soil application of $ZnSo_4$ @ 25 kg/ha (T_6) and thrice one per cent foliar spray of $FeSo_4$ at weekly interval during vegetative stage (T_7) along with NPK gave significantly higher cane yield over NPK alone (T_4). The maximum cane yield of 98.38 t/ha was obtained with the combined application of sulphur, Zn, Fe and Mn along with recommended NPK (T_{11}) which was closely followed by T_{10} (NPK, S, Zn, Fe), T_9 (NPK, S, Zn), T_6 (NPK, Zn) and T_7 (NPK, Fe). The combined application of micronutrients and NPK fertilizers significantly increased over T_2 (N) and T_3 (NP) but at par with the rest of the treatments. Data further indicated that soil application of $MnSo_4$ @ 5 kg/ha could not brought significant influence on cane yield as well as sucrose %.