

Annual Report (Crop Production) of Faridkot for 2011-12

There were following four experiments at Faridkot during 2011-12:

Experiment (AS 42): Agronomical evaluation of promising new sugarcane genotypes

- A. Early Genotypes
- B. Midlate genotypes

Experiment (AS 61): Optimizing irrigation schedule in sugarcane under different planting methods

Experiment (AS 64): Response of sugarcane to different plant nutrients in varied agro ecological situations

EXPERIMENT WISE RESULTS:

Experiment (AS 42): Agronomical evaluation of promising new sugarcane genotypes

A. Early Genotypes

Treatments:

Genotypes: 3 (CoPb 09181, CoH 05265 and CoJ 64)

Fertilizer levels (kg N/ha): 3 (N₁: 112.5; N₂: 150.0 and N₃: 187.5)

Date of Planting: 05.02.2011

Design: Factorial randomized block design

Initial Soil Status:

Sandy Loam, pH: 7.7, EC: 0.32 m mhos/cm, OC: 0.31%

P₂O₅: 5.75 kg per ha, K₂O: 350 kg per ha

Results:

Genotypes

Co Pb 09181 was significantly better in cane yield (103.9 t/ha), cane weight (1459 g), cane length (252 cm), cane diameter (2.95 cm) and sugar yield (13.19 t/ha) than genotype CoH 05265 (91.0 t/ha and 1081 g, 202 cm, 2.76 cm and 11.57 t/ha) and CoJ 64 (82.5 t/ha, 1014 g, 201 cm, 2.47 cm and 10.73 t/ha) (Table 1). Number of millable cane was the highest in CoH 05265 followed by CoJ 64 and CoPb 09181. Sucrose and CCS% was at par in all three genotypes.

N Levels

Cane yield and cane diameter was increased significantly upto 100% recommended N. All other characters were at par at three N levels.

Table 1: Agronomical evaluation of promising sugarcane genotypes (Early) at Faridkot during 2011-12

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	14 December 2011		
								Sucrose (%)	CCS (%)	CCS (t/ha)
Genotypes										
CoPb 09181	32.4	193.3	97.9	252	2.95	1459	103.9	17.88	12.68	13.19
CoH 05265	32.4	186.2	128.6	202	2.76	1081	91.0	18.00	12.74	11.57
CoJ 64	32.5	187.7	120.1	201	2.47	1014	82.5	18.38	13.01	10.73
CD (5%)	NS	NS	11.6	20	0.12	96	8.7	NS	NS	1.4
N levels (kg N/ha)										
112.5	32.6	171.1	107.3	205	2.59	1124	85.7	18.08	12.86	11.02
150.0	32.6	194.3	118.4	222	2.82	1198	94.5	18.09	12.87	12.11
187.5	32.1	201.8	121.0	227	2.77	1232	97.2	18.10	12.70	12.36
CD (5%)	NS	NS	NS	NS	0.12	NS	8.7	NS	NS	NS

B. Midlate Genotypes:

Treatments:

Genotypes: 3 (CoPant 05224 and CoPb 06219, CoS 8436)

Fertilizer levels (kg N/ha): 3 (N₁: 112.5; N₂: 150 and N₃: 187.5)

Date of Planting: 05.02.2011

Design: Factorial randomized block design

Initial Soil Status:

Sandy Loam, pH: 7.8, EC: 0.38 m mhos/cm, OC: 0.34%

P₂O₅: 9.25 kg per ha, K₂O: 317.5 kg per ha

Results:

Genotypes

CoPb 06219 was significantly better in cane yield (98.8 t/ha) than other two genotypes CoPt 05224 (88.4 t/ha) and CoS 8436 (73.1 t/ha). Number of millable canes and number of shoots were also significantly higher in CoPb 06219 than other genotypes. Sucrose and CCS% was the highest in CoS 8436 which was at par with CoPt 05224 and was significantly higher than CoPb 06219. CoPt 05224 was having the highest sugar yield, cane length and cane weight (Table 2).

N Levels

There was increase in number of shoots, cane length, cane weight cane yield upto 125% recommended N but statistically significant increase was there with 100% recommended N. The sugar yield was increased significantly upto 125% of recommended N.

Conclusion:

In early genotypes CoPb 09181 was promising in cane and sugar yield. In midlate group CoPb 06219 was better in cane yield and CoPt 05224 was better in sugar yield. The response to N fertilizer was upto 100% recommended dose.

Table 2: Agronomical evaluation of promising sugarcane genotypes (Midlate) at Faridkot during 2011-12

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	19 December 2011		
								Sucrose (%)	CCS (%)	CCS (t/ha)
Genotypes										
CoPant 05224	30.4	173.5	101.6	216	2.8	1221	88.4	15.42	10.78	9.54
CoPb 06219	29.3	272.3	129.1	188	2.5	867	98.8	12.80	8.79	8.64
CoS 8436	30.2	148.5	113.8	171	2.8	918	73.1	15.54	10.83	7.91
CD (5%)	NS	16.3	9.4	15	0.1	97	8.5	0.69	0.56	0.86
N levels (kg N/ha)										
112.5	29.7	183.8	108.6	180	2.6	888	79.3	14.63	10.16	8.01
150.0	29.8	204.1	116.8	196	2.7	1050	87.5	14.40	9.96	8.62
187.5	30.4	206.5	119.2	198	2.7	1068	93.4	14.73	10.27	9.46
CD (5%)	NS	16.3	NS	15	NS	97	8.5	NS	NS	0.86

AS 61: Optimizing irrigation schedule in sugarcane under different planting methods

Date of Planting: 04.02.2011

Objectives: To enhance water and crop productivity in sugarcane

Soil Status: SL, pH= 7.6, EC= 0.29, OC%= 0.39, P₂O₅: 13.25 kg per ha, K₂O: 520 kg per ha

Treatments:

- (i) **Planting methods:** 3
 - 1. Conventional planting (at 75 cm row spacing)
 - 2. Paired row planting (at 30 : 120 cm row spacing)
 - 3. FIRB method (75 cm row spacing)
 - (ii) Irrigation schedule (IW/CPE ratio) : 3
 - 1. 0.50
 - 2. 0.75
 - 3. 1.00
- IW = 8.0 cm

Results: FIRB and paired row trench planting methods were better in millable canes, cane and sugar yield than conventional planting. Cane yield, sugar yield and NMC were better when irrigation was applied at 1.0 IW/CPE ratio but was at par when irrigation was applied at 0.75 IW/CPE ratio (Table 3a).

Although interaction in planting methods and irrigation schedule was non- significant but paired row trench planting and FIRB method performed better at each irrigation level than conventional method (Table 3b). The increase in cane and sugar yield in paired row trench planting and FIRB method is less when frequency of irrigation is increased from 0.75 to 1.0 IW/CPE ratio as compared to the increase in frequency from 0.50 to 075 IW/CPE ratio. So there are possibilities of saving irrigation water by applying irrigation at 0.75 instead of 1.0 IW/CPE ratio in FIRB and paired row trench planting method.

Table 3a- Growth, yield and quality of sugarcane under different irrigation schedule and different planting methods at Faridkot during 2011-12

Treatments	Ger. (%)	Tillers 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	20 December 2011		
								Sucrose (%)	CCS (%)	CCS (t/ha)
Planting methods										
Conventional	29.9	192.5	89.0	210	2.7	931	74.6	18.74	13.14	9.76
Paired row planting	37.9	195.6	98.6	212	2.8	962	83.5	18.59	13.08	10.92
FIRB method	30.5	205.1	94.2	212	2.7	953	83.9	18.36	12.92	10.83
CD (5%)	3.0	NS	6.2	NS	NS	NS	5.9	NS	NS	0.67
Irrigation schedule (IW/CPE ratio)										
0.50	32.2	183.7	85.4	202	2.7	912	74.2	18.43	12.87	9.52
0.75	32.4	197.1	96.9	222	2.7	963	81.5	18.65	13.17	10.70
1.00	33.7	212.5	99.5	211	2.8	972	86.4	18.62	13.10	11.29
CD (5%)	NS	NS	6.2	15	NS	39	5.9	NS	NS	0.67

Table 3b- Cane and sugar yield of sugarcane under different irrigation schedule and different planting methods at Faridkot during 2011-12

IW/CPE Ratio	Planting Methods						Average	
	Conventional		Paired row trench planting		FIRB method		Cane Yield (t/ha)	Sugar Yield (t/ha)
	Cane Yield (t/ha)	Sugar Yield (t/ha)	Cane Yield (t/ha)	Sugar Yield (t/ha)	Cane Yield (t/ha)	Sugar Yield (t/ha)		
0.50	66.8	8.57	74.8	9.73	80.9	10.26	74.2	9.52
0.75	73.2	9.74	86.9	11.13	84.4	11.24	81.5	10.89
1.00	83.7	10.97	88.9	11.91	86.5	11.00	86.4	11.12
Average	74.6	9.76	83.5	10.93	83.9	10.85		

AS 64: Response of sugarcane to different plant nutrients in varied agro ecological situations

Year of start: 2011-12

Variety: CoH 119

Date of Planting: 14.02.2011

Initial Soil Status:

OC=0.39%, P = 9.03 kg/acre, K= 232 kg/acre, S= 100 ppm, Zn= 3.5 ppm, Fe= 11.3 ppm, Mn= 3.9 ppm

Treatments:

T1: Control (No fertilizer)

T2: N (150 kg/ha) (Half N sowing)

T3: NP

T4: NPK

T5: NPK +S

T6: NPK +Zn

T7: NPK +Fe

T8: NPK +Mn

T9: NPK +S +Zn

T10: NPK +S +Zn +Fe

T11: NPK +S +Zn +Fe + Mn

T12: Soil test based fertilizer application

(FYM @ 20 t/ha as common to all treatments, P= 60 kg P₂O₅/ha , K= 60 kg K/ha, S= 40 kg/ha elemental sulphur, Zn= 25 kg ZnSO₄/ha, Fe= 5 kg FeSO₄, Mn= 5 kg MnSO₄/ha)

Results: Cane and sugar yield in all the nutritional treatments was at par with each other and was significantly better than control (Table 4a). The highest yield was with soil test based nutrient application. The soil was having sufficient micro nutrients and 20 t/ha FYM was also applied to all the treatments so there was no effect of micro nutrients. Growth character in all the treatments were at par with each other (Table 4b)

Table 4a: Yield and quality of sugarcane during 2011-12 under various treatments

Treatments	Cane yield (t/ha)	23 December 2011		
		Sucrose (%)	CCS%	CCS (t/ha)
T ₁	82.4	16.07	11.16	9.16
T ₂	102.4	16.47	11.61	11.90
T ₃	103.7	16.23	11.47	11.85
T ₄	102.6	15.90	11.21	11.48
T ₅	104.6	15.77	10.96	11.46
T ₆	103.7	15.90	11.14	11.58
T ₇	101.5	16.67	11.69	11.85
T ₈	101.8	13.37	11.55	11.75
T ₉	100.4	16.10	11.16	11.20
T ₁₀	101.8	16.20	11.32	11.52
T ₁₁	103.9	16.15	11.08	11.51
T ₁₂	107.8	15.96	11.23	12.09
CD (5%)	11.1	NS	NS	1.24

Table 4b: Growth characters of sugarcane during 2011-12 under various treatments

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)
T ₁	52.0	202.6	72.2	220	2.9	1150
T ₂	53.0	211.5	95.0	243	3.1	1317
T ₃	54.7	245.6	92.5	244	3.0	1333
T ₄	52.7	209.3	93.1	241	3.1	1242
T ₅	54.3	252.2	95.6	238	3.1	1260
T ₆	54.3	253.7	92.8	241	3.1	1333
T ₇	52.7	212.9	92.8	240	3.1	1290
T ₈	52.3	230.4	93.3	244	3.1	1217
T ₉	50.0	241.5	92.8	239	3.0	1233
T ₁₀	54.0	205.6	93.9	240	3.1	1283
T ₁₁	53.0	212.7	92.5	243	3.1	1233
T ₁₂	54.3	223.3	98.3	248	3.0	1292
CD (5%)	NS	NS	NS	NS	NS	NS