

Weather and Season

During kharif 2011-12 total rainfall received was 515.8 mm which was 34.62 % less than normal (789 mm). Maximum rains were received during July, 2011 to Sep., 2011. There was shortage of irrigation water during April, May and June it affected the cane growth during these months.

The highest incidence of shoot borer (7.89 %) observed during March due to high temperature. The maximum intensity of scale insect (6.12 %) was observed during July. The maximum intensity of mealy bugs (7.38 %) was observed during July. The incidence of Thrips and Pyrilla were in traces during the season.

Pokkah boeng disease incidence was observed up to 6.81 % on sugarcane variety Co 7219. Mosaic incidence (11.36 %) was observed on sugarcane plant crop variety Co 7219. Other diseases were negligible.

Table 1: Weekly weather data for the year 2011 recorded at Agromet Observatory,
Dr. P.D.K.V., Akola

Met Week	Date	Rainfall (mm)	Temperature (Oc)		RH I %	RH II %
			Max	Min		
1	2	3	4	5	6	7
1	1-7 Jan.10	0.0	30.3	13.7	65	29
2	8-14	0.0	31.0	16.9	75	33
3	15-21	0.0	31.6	15.0	59	21
4	22-28	0.0	33.6	14.0	56	19
5	29-4 Feb.	0.0	34.8	15.9	49	16
6	5-11	0.0	34.4	16.7	43	17
7	12-18	0.0	33.5	15.7	44	18
8	19-25	0.0	36.4	20.7	41	18
9	26-4 Mar.	0.0	38.1	19.0	41	16
10	5-11	0.0	37.9	21.0	34	18
11	12-18	0.8	36.7	20.9	41	22
12	19-25	1.5	38.2	21.2	34	14
13	26-1 Apr.	0.0	39.6	22.3	28	14
14	2-8	0.0	41.1	23.4	28	21
15	9-15	0.0	40.6	21.8	26	16
16	16-22	0.0	43.4	26.7	26	12
17	23-29	0.0	43.0	24.7	24	9
18	30-6 May	0.0	44.9	28.8	30	12
19	7-13	0.0	43.2	29.2	34	13
20	14-20	21.8	41.8	26.9	58	27
21	21-27	20.3	41.7	28.3	57	26
22	28-3 June	0.0	41.7	28.6	51	25
23	4-10	0.0	39.8	28.3	56	31
24	11-17	0.0	41.6	28.9	55	27
25	18-24	2.4	40.8	27.0	60	28
26	25-1 July	143.2	33.6	24.5	82	59
27	2-8	77.1	32.8	24.5	90	65
28	9-15	48.0	30.2	24.1	89	71
29	16-22	57.2	28.6	23.6	86	78
30	23-29	30.0	30.3	23.6	85	60
31	30-5 Aug.	0.0	32.2	24.0	81	52
32	6-12	4.2	32.1	24.0	84	56
33	13-19	0.0	32.8	24.9	77	49
34	20-26	65.7	31.1	22.8	94	73
35	27-2 Sept.	2.9	30.2	23.5	91	68
36	3-9	30.2	30.3	23.3	93	67
37	10-16	0.0	33.2	22.9	85	43
38	17-23	2.1	35.2	22.8	81	34
39	24-30	6.8	34.3	24.5	83	49
40	1-7 Oct.	67.8	32.2	23.7	90	60
41	8-14	0.0	32.9	19.8	90	33
42	15-21	0.0	34.9	17.8	81	23
43	22-28	0.0	33.8	14.7	74	19
44	29-4 Nov.	0.0	34.4	14.3	70	17
45	5-11	5.0	31.0	19.1	81	50
46	12-18	97.8	29.3	21.7	92	58
47	19-25	0.0	27.5	13.1	89	35
48	26-2 Dec.	0.0	28.8	12.2	82	29
49	3-9	0.0	29.6	13.5	85	33
50	10-16	0.0	30.5	15.1	88	34
51	17-23	0.7	29.0	14.7	86	36
52	24-31	14.0	27.4	12.2	76	33

Crop Production

Experiment No. :- 1

Project Code No. : AS-61 (AICRP)
Name of Section/Research station : Sugarcane Res. Centre, Dr.P.D.K.V. Akola
Location of Project : Sugarcane Res. Centre, Dr.P.D.K.V. Akola
Project Title : Optimizing irrigation scheduling in sugarcane under different planting methods

Duration of project : 3 years
Date of start : January 2010-2011.
Date of completion of project : January 2012-2013
Period for which report submitted : 2011-12

Principal Investigator :
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Immediate objectives : To enhance water and crop productivity in sugarcane

Technical programme :

1. Project Title : Optimizing irrigation scheduling in sugarcane under different planting methods
2. Progressive year : 2011-12
3. Design : FRBD
4. **Treatments** :
 - A. Planting Methods** :- 3
:- P₁: Conventional planting (at 90 cm row spacing)
:- P₂: Paired row planting (at 30:150 cm row spacing)
:- P₃: Paired row trench planting (at 30:150 row spacing)
 - I. irrigation Scheduling (IW/CPE ratio)** :- 3
I₁: 0.6
I₂: 0.9
I₃: 1.2

Note : **IW = 8.0 cm**

5. Variety : Co 86032
 6. Plot size : 6.00 X 4.50 m²
 7. Seed rate : 25000 Setts ha⁻¹
 8. No. of replications : Three
 2011-12
 9. Date of planting : 28/01/2011
 10. Date of harvesting : 22/01/2012
 .
 11. Initial Soil Status :
- | | | | | | |
|---|-----------------------------|-------------------|--------------------------|----------------|--------|
| N | : 238 kg ha ⁻¹ | Soil Texture | : vertisol | Field Capacity | : 38 % |
| p | : 22.11 kg ha ⁻¹ | BD | : 1.14 g/cm ³ | PWP | : 21 % |
| K | : 451 kg ha ⁻¹ | Infiltration rate | : 11 mm/hr | | |
- Results : Results are given in Table 1 to 7

Results :

A. Cane yield, sugar yield and water use efficiency

During 2011-12, the Table 1 revealed that significant differences in cane yield were recorded with different methods of planting. Conventional Planting method i.e. 90 cm row spacing registered significantly higher cane yield (90.38 t ha⁻¹) than paired row planting in 30 : 150 cm (66.58 t ha⁻¹) and paired row trench planting in 30 : 150 cm (90.21 t ha⁻¹). However, Conventional Planting method i.e. 90 cm row spacing and paired row trench planting in 30 : 150 cm were found to be at par.

Irrigation scheduling (I₃) i.e. 1.2 IW/CPE ratio gave significantly higher cane yield (100.14 t ha⁻¹) at par with (I₂) i.e. 0.9 IW/CPE ratio treatments (98.77 t ha⁻¹). The same trends were observed in respect of sugar yield regarding planting methods but Irrigation scheduling (I₃) i.e. 1.2 IW/CPE ratio gave significantly higher cane yield (13.91 t ha⁻¹) than rest of both treatments.

In respect of water use efficiency paired row cum trench planting in 30 : 150 cm i.e. 54.04 kg/ha/mm were found to be at par Conventional planting (at 90 cm row) i.e. 53.02 kg/ha/mm. The treatment I₂ i.e. 0.9 IW/CPE ratio (39.53 kg/ha/mm) was found significantly superior than rest of the treatments

Table 1: Cane, Sugar yield, Water use efficiency and economics as influenced by various treatments

Treatment	Cane yield (t ha ⁻¹)	Sugar yield (t ha ⁻¹)	Water Use efficiency kg/ha/mm	Cane yield (t ha ⁻¹)	Sugar yield (t ha ⁻¹)	Water Use efficiency kg/ha/mm
	2010-11			2011-12		
A. Effect of Planting Methods						
P ₁ : Conventional planting (at 90 cm row)	118.60	17.58	61.54	90.38	12.29	53.02
P ₂ : Paired row planting (at 30:150 cm row)	87.46	13.01	45.84	66.58	9.42	39.53
P ₃ : Paired row trench planting (at 30:150 row)	117.85	17.71	62.34	90.21	12.38	54.04
'F' Test	Sig	Sig	Sig	Sig	Sig	Sig
S. Em. ±	0.77	0.13	0.40	0.55	0.10	0.36
CD at 5%	2.30	0.39	1.19	1.66	0.29	1.07
C.V. %	6.40	7.30	6.32	6.05	7.59	6.60
I. irrigation Scheduling (IW/CPE ratio)						
I ₁ : 0.6	63.20	9.47	49.37	48.27	6.74	43.10
I ₂ : 0.9	129.43	19.22	67.41	98.77	13.44	58.79
I ₃ : 1.2	131.28	19.60	52.94	100.14	13.91	44.71
'F' Test	Sig	Sig	Sig	Sig	Sig	Sig
S. Em. ±	0.77	0.13	0.40	0.55	0.10	0.36
CD at 5%	2.30	0.39	1.19	1.66	0.29	1.07
C.V. %	6.40	7.30	6.32	6.05	7.59	6.60
Interaction effect (Planting Methods x Irrigation Scheduling (IW/CPE ratio))						
'F' Test	Sig	Sig	Sig	Sig	NS	Sig
SEm±	3.99	0.68	2.06	2.88	0.50	1.86
CD at 5%	11.96	2.03	6.18	8.62	--	5.58
C.V. %	6.40	7.30	6.32	6.05	7.59	6.60
G. Mean	107.97	16.10	56.57	82.39	13.08	48.86

B. Interaction effect

Interaction effect (P₁ X I₃) i.e. Conventional Planting method i.e. 90 cm row spacing and 1.2 IW/CPE ratio (147.06 t ha⁻¹) was found to significantly superior in respect of cane yield and being at par with P₁ X I₂ (Conventional Planting method i.e. 90 cm row spacing and 0.9 IW/CPE ratio), P₃ X I₃ (Paired row cum trench planting in 30 : 150 cm and 1.2 IW/CPE ratio) and P₃ X I₂ (Paired row cum trench planting in 30 : 150 cm and 0.9 IW/CPE ratio). Similar trend were observed in case of Sugar yield, GMR (Rs ha⁻¹) and NMR (Rs ha⁻¹). Regarding water use efficiency interaction effect of P₁ X I₂ (Conventional Planting method i.e. 90 cm row spacing and 0.9 IW/CPE ratio) i.e. 75.53 kg/ha/mm were observed significantly superior than rest of the treatments and at par with P₃ X I₂ (Paired row cum trench planting in 30 : 150 cm and 0.9 IW/CPE ratio) i.e. 72.17 kg/ha/mm. The

Table 2: Interaction effect planting methods x irrigation Scheduling (IW/CPE ratio) as influenced by various treatment

Treatment	Cane yield (t ha ⁻¹)							
	2010-11				2011-12			
	I ₁ :0.6	I ₂ : 0.9	I ₃ : 1.2	Mean	I ₁ :0.6	I ₂ :0.9	I ₃ :1.2	Mean
P1	63.72	145.02	147.06	118.60	48.41	110.28	112.46	90.38
P2	51.37	104.70	106.31	87.46	39.08	80.42	80.25	66.58
P3	74.51	138.57	140.48	117.85	57.31	105.61	107.71	90.21
Mean	63.20	129.43	131.28		48.27	98.77	100.14	
S. Em.±	3.99				2.88			
CD at 5%	11.96				8.62			
C.V. %	6.40				6.05			

Treatment	Water Use efficiency kg/ha/mm							
	2010-11				2011-12			
	I ₁ :0.6	I ₂ : 0.9	I ₃ : 1.2	Mean	I ₁ :0.6	I ₂ :0.9	I ₃ :1.2	Mean
P1	49.78	75.53	59.30	61.54	43.23	65.64	50.21	53.02
P2	40.14	54.53	42.87	45.84	34.90	47.87	35.83	39.53
P3	58.21	72.17	56.64	62.34	51.17	62.86	48.09	54.04
Mean	49.37	67.41	52.94		43.10	58.79	44.71	
S. Em.±	2.06				1.86			
CD at 5%	6.18				5.58			
C.V. %	6.32				6.60			

C. Economics as influenced by various treatments

The Table 3 revealed that significant differences in GMR were recorded with different methods of planting. Conventional Planting method i.e. 90 cm row spacing registered significantly higher GMR (144614 Rs.) than paired row planting in 30 : 150 cm (106536 Rs.) and paired row trench planting in 30 : 150 cm (144337 Rs.). However, Conventional Planting method i.e. 90 cm row spacing and paired row trench planting in 30 : 150 cm were found to be at par. Regarding NMR Conventional Planting method i.e. 90 cm row spacing registered significantly higher (76,469 Rs.) than paired row planting in 30 : 150 cm (37,043 Rs.) and paired row trench planting in 30 : 150 cm (73497 Rs.).

Irrigation scheduling (I₃) i.e. 1.2 IW/CPE ratio gave significantly higher GMR (160224 Rs.) at par with (I₂) i.e. 0.9 IW/CPE ratio treatments (158032 Rs.). The similar trend was observed in case of NMR.

Regarding C : B ratio were found more by P₁ (Conventional Planting method i.e. 90 cm row spacing) i.e. 2.11 followed by P₃ (paired row cum trench planting in 30 : 150 cm) i.e. 2.03 and P₂ (paired row cum trench planting in 30 : 150 cm) i.e. 1.52 in respect of irrigation scheduling I₃ (1.2 IW/CPE ratio) was found more C : B ratio followed by I₂ (0.9 IW/CPE ratio) and I₁ (0.6 IW/CPE ratio) i.e. 2.27, 2.24 and 1.14 respectively.

Table 3: Economics as influenced by various treatments

Treatment	GMR (Rs)	NMR (Rs)	C : B Ratio	GMR (Rs)	NMR (Rs)	C : B Ratio
	2010-11			2011-12		
A. Effect of Planting Methods						
P ₁ : Conventional planting (at 90 cm row)	177662	107644	2.52	144614	76469	2.11
P ₂ : Paired row planting (at 30:150 cm row)	131013	56659	1.75	106536	37043	1.52
P ₃ : Paired row trench planting (at 30:150 row)	176539	100865	2.32	144337	73497	2.03
'F' Test	Sig	Sig		Sig	Sig	
S. Em. ±	1151	1151		886	886	
CD at 5%	3449	3449		2655	2655	
C.V. %	6.40	11.72		6.05	12.79	
I. irrigation Scheduling (IW/CPE ratio)						
I ₁ : 0.6	94673	24120	1.34	77231	9694	1.14
I ₂ : 0.9	193883	120470	2.65	158032	87562	2.24
I ₃ : 1.2	196658	120577	2.59	160224	89753	2.27
'F' Test	Sig	Sig		Sig	Sig	
S. Em. ±	1151	1151		886	886	
CD at 5%	3449	3449		2655	2655	
C.V. %	6.40	11.72		6.05	12.79	
Interaction effect (Planting Methods x Irrigation Scheduling (IW/CPE ratio))						
'F' Test	Sig	Sig		Sig	Sig	
SEm±	5979	5979		4603	4603	
CD at 5%	17923	17923		13797	13797	
C.V. %	6.40	11.72		6.05	12.79	
G. Mean	161738	88389		131829	62336	

* Prices : Sugarcane : Rs 1600/- Rs t⁻¹

D. Interaction effect

Interaction effect (P₁ X I₃) i.e. Conventional Planting method i.e. 90 cm row spacing and 1.2 IW/CPE ratio (179936 Rs) was found to significantly superior in respect of GMR and being at par with P₁ X I₂ (Conventional Planting method i.e. 90 cm row spacing and 0.9 IW/CPE ratio), P₃ X I₃ (Paired row cum trench planting in 30 : 150 cm and 1.2 IW/CPE ratio) and P₃ X I₂ (Paired row cum trench planting in 30 : 150 cm and 0.9 IW/CPE ratio). The similar trend was observed in case of Net Monetary Return.

C : B ratio were found more by P₁ X I₃ (Conventional Planting method i.e. 90 cm row spacing and 1.2 IW/CPE ratio) i.e. 2.60 followed by P₁ X I₂ (Conventional Planting method i.e. 90 cm row spacing and 0.9 IW/CPE ratio) i.e. 2.55, P₃ X I₃ i.e. paired row cum trench planting in 30 : 150 cm and 1.2 IW/CPE ratio (2.40) and P₃ X I₂ i.e. paired row cum trench planting in 30 : 150 cm and 0.9 IW/CPE ratio (2.35).

Table 4: Interaction effect planting methods x irrigation Scheduling (IW/CPE ratio) as influenced by various treatment

Treatment	GMR (Rs)							
	2010-11				2011-12			
	I ₁ :0.6	I ₂ : 0.9	I ₃ : 1.2	Mean	I ₁ :0.6	I ₂ :0.9	I ₃ :1.2	Mean
P1	95451	217241	220294	177662	77460	176446	179936	144614
P2	76957	156835	159246	131013	62533	128677	128398	106536
P3	111609	207573	210435	176539	91699	168973	172337	144337
Mean	94673	193883	196658		77231	158032	160224	
S. Em.±	5979				4603			
CD at 5%	17923				13797			
C.V. %	6.40				6.05			

Treatment	NMR (Rs)							
	2010-11				2011-12			
	I ₁ :0.6	I ₂ : 0.9	I ₃ : 1.2	Mean	I ₁ :0.6	I ₂ :0.9	I ₃ :1.2	Mean
P1	28229	147159	147544	107644	11271	107323	110813	76469
P2	5399	82417	82160	56659	-5004	58207	57928	37043
P3	38731	131835	132029	100865	22815	97155	100519	73497
Mean	24120	120470	120577		9694	87562	89753	
S. Em.±	5979				4603			
CD at 5%	17923				13797			
C.V. %	11.72				12.79			

Treatment	C : B Ratio							
	2010-11				2011-12			
	I ₁ :0.6	I ₂ : 0.9	I ₃ : 1.2	Mean	I ₁ :0.6	I ₂ :0.9	I ₃ :1.2	Mean
P1	1.42	3.10	3.03	2.52	1.17	2.55	2.60	2.11
P2	1.08	2.11	2.07	1.75	0.93	1.83	1.82	1.52
P3	1.53	2.74	2.68	2.32	1.33	2.35	2.40	2.03
Mean	1.34	2.65	2.59		1.14	2.24	2.27	

E. Juice quality at 300 DAP :

Regarding Brix % P₁ (Conventional planting (at 90 cm row) planting method recorded significantly higher i.e. 21.12 % than rest of the planting methods, the similar trend were observed in case of Pol %, CCS %. The Purity % did not influenced by the various planting methods and irrigation scheduling treatment. P₁ (Conventional planting (at 90 cm row) planting method recorded numerically more than rest of the treatments.

In case of irrigation scheduling practice did not reach up to the level of significance.

Interaction effect were found to be non significant.

Table 5: Sugarcane Juice quality at 300 DAP as influenced by various treatments.

Treatment	Brix	Pol %	C.C.S. %	Purity %
A. Effect of Planting Methods				
P ₁ : Conventional planting (at 90 cm row)	21.12	18.33	12.57	88.14
P ₂ : Paired row planting (at 30:150 cm row)	20.41	17.25	11.67	84.40
P ₃ : Paired row trench planting (at 30:150 row)	20.59	17.72	12.10	86.48
'F' Test	Sig	Sig	Sig	NS
S. Em.±	0.06	0.07	0.07	0.34
CD at 5%	0.17	0.22	0.20	-
I. irrigation Scheduling (IW/CPE ratio)				
I ₁ : 0.6	20.64	17.67	12.03	86.64
I ₂ : 0.9	20.68	17.62	11.97	85.40
I ₃ : 1.2	20.80	18.02	12.35	86.99
'F' Test	NS	NS	NS	NS
S. Em.±	0.06	0.07	0.07	0.34
CD at 5%	-	-	-	-

F. Juice quality at harvest :

Juice quality at harvest different planting methods as well as the irrigation scheduling practices did not affected the juice quality.

Interaction effect were found to be non significant.

Table 6: Sugarcane Juice quality at harvest.

Treatments	Brix	Pol %	C.C.S.%	Purity %
A. Effect of Planting patterns				
P ₁ : Conventional planting (at 90 cm row)	22.67	19.87	13.69	86.75
P ₂ : Paired row planting (at 30:150 cm row)	22.73	20.34	14.14	89.51
P ₃ : Paired row trench planting (at 30:150 row)	22.66	19.90	13.73	87.30
'F' Test	NS	NS	NS	NS
SEm±	0.06	0.07	0.07	0.33
CD at 5%	0.17	0.22	0.20	0.98
I. irrigation Scheduling (IW/CPE ratio)				
I ₁ : 0.6	22.93	20.24	13.99	88.14
I ₂ : 0.9	22.54	19.83	13.68	87.10
I ₃ : 1.2	22.58	20.04	13.89	88.33
'F' Test	NS	NS	NS	NS
S. Em.±	0.06	0.07	0.07	0.33
CD at 5%	0.17	0.22	0.20	0.98

G. Ancillary growth:

In respect of ancillary growth characters the data revealed that millable canes ha⁻¹ P₁ (Conventional planting at 90 cm row) spacing was found significantly more than rest of the treatment i.e. 85802 ha⁻¹ followed by P₃ (Paired row cum trench planting at 30:150 row) spacing i.e. 83642 ha⁻¹. The single cane wt. of cane significantly more in P₃: Paired row trench planting (at 30:150 row) than rest of the methods. Regarding plant height planting method P₁: Conventional planting (at 90 cm row) found significantly higher than rest of the treatment. The similar trend was observed in case of number of internodes. Cane diameter of various planting methods and irrigation scheduling practices also did not influenced the ancillary growth characters.

In case of irrigation scheduling practice the table revealed that the millable canes ha⁻¹ Irrigation scheduling (I₃) i.e. 1.2 IW/CPE ratio gave significantly higher i.e. 93025 ha⁻¹ and at par with the (I₂) i.e. 0.9 IW/CPE ratio treatments (91543 ha⁻¹). The similar trend was observed in case of number of internodes per cane. In respect of single cane wt. the treatment (I₂) i.e. 0.9 IW/CPE ratio treatments (1.08 kg.) found significantly more and at par with Irrigation scheduling (I₃) i.e. 1.2 IW/CPE ratio gave significantly higher i.e. 1.07 kg.

Table 7: Ancillary growth data

Treatment	Millable canes (ha ⁻¹)	Single Cane wt. (kg)	Height (cm)	Internodes (No.)	Cane diameter (cm)
A. Effect of Planting Methods					
P ₁ : Conventional planting (at 90 cm row)	85802	1.02	217	25	2.84
P ₂ : Paired row planting (at 30:150 cm row)	76584	0.85	198	23	3.01
P ₃ : Paired row trench planting (at 30:150row)	83642	1.06	196	23	2.91
'F' Test	Sig	Sig	Sig	Sig	NS
S. Em. ±	589	0.01	1.38	0.13	0.02
CD at 5%	1767	0.02	4.13	0.39	-
C.V. %	6.47	4.77	6.10	4.96	4.68
I. irrigation Scheduling (IW/CPE ratio)					
I ₁ : 0.6	61461	0.78	192	22	2.99
I ₂ : 0.9	91543	1.08	205	24	2.91
I ₃ : 1.2	93025	1.07	213	25	2.85
'F' Test	Sig	Sig	Sig	Sig	NS
S. Em. ±	589	0.01	1.38	0.13	0.02
CD at 5%	1767	0.02	4.13	0.39	-
C.V. %	6.47	4.77	6.10	4.96	4.68
Interaction effect (Planting Mehtods x Irrigation Scheduling (IW/CPE ratio))					
'F' Test	NS	NS	NS	NS	NS
SEm±	3063	0.03	7.16	0.68	0.08
CD at 5%	-	-	-	-	-
C.V. %	6.47	4.77	6.10	4.96	4.68
G. Mean	82010	0.98	204	23.81	2.92

H. Interaction effect

Interaction effect (Planting Mehtods x Irrigation Scheduling (IW/CPE ratio) of growth parameter were found non significant result

Experiment No. :-2

University /Project Code No. : AS-64 (AICRP)
Name of Section/Research station : Sugarcane Res. Centre, Dr.P.D.K.V. Akola
Location of Project : Sugarcane Res. Centre, Dr.P.D.K.V. Akola
Project Title : Response of sugarcane crop to different plant nutrients in varied agro-ecological situation

Duration of project : one year
Date of start : January 2011-2012.
Date of completion of project : January 2013-2014
Period for which report submitted : 2011-12

Principal Investigator :
Name : Dr. M. S. Khakare, S.R.S. Sugarcane
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Co-investigator
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Location : C.R.S. Dr.P.D.K.V. Akola
Address : Sugarcane Research Centre,Dr.P.D.K.V. Akola

620.1 Immediate objectives : To increase the productivity of cane and sugar in the region

621.1 Technical programme :

1. Project Title : Response of sugarcane crop to different plant nutrients in varied agro-ecological situation

2. Progressive year : 2011-12

3. Design : RBD

4. Variety : Co 86032

5. **Treatments Details** : 12

6

T1	:	Control (No Fertiliser)
T2	:	N
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

NOTE :

- 1 FYM should be applied @ 20 t ha⁻¹ as common to all treatments
- 2 S : 60 kg ha⁻¹ elemental sulphur
- 3 Zn : 50 kg ZnSO₄ ha⁻¹
- 4 Fe : 20 kg FeSO₄ ha⁻¹
- 5 Mn : 10 kg MnSO₄ ha⁻¹
- 6 NPK : As per recommendations (175:100:100) ha⁻¹

Soil Nitrogen **SN** : : 205.18 kg ha⁻¹

Soil Phosphorous **SP** : : 19.00 kg ha⁻¹

Soil Potassium **SK** : : 351.50 kg ha⁻¹

S : 11.30 ppm

Zn : 0.3394 ppm

Fe : 3.79 ppm

Mn : 9.44 ppm

6. Plot size : 6.00 X 5.40 m²
7. Seed rate : 25000 Setts ha⁻¹
8. No. of replications : Three
9. Date of planting : 25/02/2011
10. Date of harvesting : 30/01/2012
11. Results : Results are given in Table 8 to 10

Results :

I. Cane yield, sugar yield, millable canes and Economics

Table 8 revealed that, the treatment T₁₁ i.e. NPK+S+Zn+ Fe+Mn (123.00 t ha⁻¹) recorded significantly superior than the rest of all treatments and at par with T₁₂ i.e. Soil test based fertilizer application (116.55 t ha⁻¹) and T₁₀ i.e. NPK +S+Zn +Fe. Regarding Sugar yield the treatment T₁₁ i.e. NPK+S+Zn+ Fe+Mn (22.00 t ha⁻¹) recorded significantly superior than the rest of all treatments and at par with T₁₂ i.e. Soil test based fertilizer application (20.37 t ha⁻¹). In respect of millable canes ha⁻¹ the significantly more recorded by treatment T₁₁ i.e. NPK+S+Zn+ Fe+Mn (1,06,584 ha⁻¹) and found at par with T₁₂ (1,01,131 ha⁻¹), T₁₀, T₉, T₈, T₇, T₆ and T₅.

In case of GMR T₁₁ (1,96,801 Rs.) recorded significantly superior than the rest of all treatments and at par with T₁₂ (1,86,483 Rs.) and T₁₀ (1,71,833 Rs.). The similar trend was observed in case of Net Monetary Return.

C : B ratio were found more by T₁₁ i.e. 2.54 followed by T₁₂, T₁₁ i.e. 2.25 , T₈ (2.17), T₇ (2.16), T₆ (2.07), T₉ (2.06), T₅ (1.96), T₃ (1.94), T₄ (1.91), T₂ (1.82) and T₁ (1.67).

Table 8: Cane yield, Sugar yield and Economics influenced by treatments

Sr No	Treatments	Cane yield (t ha ⁻¹)	Millable canes (ha ⁻¹)	Sugar yield (t ha ⁻¹)	GMR (Rs)	NMR (Rs)	C:B Ratio
1	T ₁ :Control (No Fertiliser)	67.11	87242	11.93	107371	42930	1.67
2	T ₂ : N	76.04	88065	13.75	121669	54901	1.82
3	T ₃ : NP	84.13	96707	14.39	134602	65236	1.94
4	T ₄ : NPK	83.88	96501	15.19	134214	63876	1.91
5	T ₅ : NPK + S	89.39	97530	15.00	143021	70043	1.96
6	T ₆ : NPK + Zn	94.17	97427	16.66	150669	77856	2.07
7	T ₇ : NPK + Fe	96.33	99382	17.57	154132	82804	2.16
8	T ₈ : NPK + Mn	96.92	100514	15.93	155078	83640	2.17
9	T ₉ : NPK + S + Zn	97.22	100822	16.55	155555	80102	2.06
10	T ₁₀ : NPK +S+Zn +Fe	107.40	101131	17.79	171833	95390	2.25
11	T ₁₁ : NPK+S+Zn+ Fe+Mn	123.00	106584	22.17	196801	119258	2.54
12	T ₁₂ : Soil test based fertilizer application	116.55	101131	20.37	186483	103675	2.25
	'F' Test	Sig	Sig	Sig	Sig	Sig	
	SEm±	6636	3308	1.27	10617	10617	
	CD at 5%	19460	9701	3.73	31136	31136	
	C.V. %	12.18					

J. Juice quality at harvest

Regarding Brix, Pol %, CCS % and Purity % were found non significant result

Table 9: Sugarcane Juice quality at harvest.

Sr. No.	Treatment	Brix	Pol %	C.C.S.%	Purity %
1	T ₁ :Control (No Fertiliser)	23.40	21.18	14.82	91.23
2	T ₂ : N	22.87	21.21	15.00	89.75
3	T ₃ : NP	22.57	20.36	14.22	88.89
4	T ₄ : NPK	22.37	21.15	15.09	93.84
5	T ₅ : NPK + S	22.90	20.23	13.99	87.42
6	T ₆ : NPK + Zn	23.10	21.15	14.87	91.63
7	T ₇ : NPK + Fe	23.10	21.43	15.15	94.41
8	T ₈ : NPK + Mn	21.70	19.60	13.69	87.55
9	T ₉ : NPK + S + Zn	22.33	20.27	14.20	88.26
10	T ₁₀ : NPK +S+Zn +Fe	22.00	19.57	13.58	88.06
11	T ₁₁ : NPK+S+Zn+ Fe+Mn	23.37	21.36	15.00	91.45
12	T ₁₂ : Soil test based fertilizer application	22.70	20.74	14.56	91.23
	'F' Test	NS	NS	NS	NS
	SEm±	0.44	0.65	0.61	2.67
	CD at 5%	--	--	--	--

K. Ancillary growth parameter at harvest

The T₁₂ i.e. Soil test based fertilizer application recorded (1.15 kg) significantly more than rest of all treatments and found at par with T₁₁ (NPK+S+Zn+Fe+Mn) i.e. 1.15 kg and T₁₀ i.e. (NPK +S+Zn +Fe) i.e. 1.06 kg. Regarding cane height, number of internodes per cane and cane diameter recorded non-significant result not reach up to the level of significance.

Table 10: Ancillary growth parameter at harvest.

Sr. No.	Treatment	Single Cane wt. (kg)	Height (cm)	Internodes (No.)	Cane diameter (cm)
1	T ₁ :Control (No Fertiliser)	0.77	248	22.33	2.55
2	T ₂ : N	0.87	228	22.87	2.88
3	T ₃ : NP	0.87	237	22.93	2.93
4	T ₄ : NPK	0.87	250	23.47	3.05
5	T ₅ : NPK + S	0.92	246	20.20	2.66
6	T ₆ : NPK + Zn	0.96	228	22.73	2.75
7	T ₇ : NPK + Fe	0.96	243	22.27	2.84
8	T ₈ : NPK + Mn	0.96	245	22.33	2.78
9	T ₉ : NPK + S + Zn	0.96	251	23.20	2.87
10	T ₁₀ : NPK +S+Zn +Fe	1.06	243	21.87	2.60
11	T ₁₁ : NPK+S+Zn+ Fe+Mn	1.15	240	22.27	2.83
12	T ₁₂ : Soil test based fertilizer application	1.15	246	21.20	2.91
	'F' Test	Sig	Non Sig	Non Sig	Non Sig
	SEm±	0.06	9.22	0.98	0.11
	CD at 5%	0.17	-	-	-

Part V

On going and new Research Programme to be under taken during 2012-2013

1. Optimising irrigation schedule in sugarcane under different planting methods. **
2. Response of sugarcane crop to different plant nutrients in varied agro-ecological stitution. **

Note : ** The experiments could not conducted during 2012-13 due to the shortage of irrigation water

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A REPORT
OF
THE RESEARCH WORK DONE
ON
SUGARCANE CROP PRODUCTION

DURING 2011-12

Submitted to

**ALL INDIA COORDINATED RESEARCH PROJECT
ON SUGARCANE**



Submitted by

**SENIOR RESEARCH SCIENTIST
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