

**Season and crop interaction and season and pest/disease incidence
during Kharif 2016-17**

Weather and Season Report (Sugarcane crop)

Total rainfall of 805.6 mm (104.23 % of annual Normal) was received in 46 rainy days during 2016 at Akola. However, distribution of rainfall was uneven. Unseasonal rainfall of 51.4 mm in 1st MW facilitates better germination of suru sugarcane. Higher temperature and low Relative humidity during 16th to 23rd MW affects stem elongation in sugarcane. Minimum temperature during maturity phase was slightly lower than normal. It has no significant effect on juice quality and recovery of sugarcane. Overall sugarcane yield was satisfactory.

The incidence of early shoot borer was initiated during 7th meteorological week i.e. 12th Feb 2016 (12.96 % dh) and it was continued up to 30th MW. The maximum damage due to early shoot borer was observed during 7th MW and lowest damage was observed during 30th MW (1.52 % dh)

The medium incidence of scales was observed during 37th MW and it was continued up to 52nd MW. The incidence of pyrilla was initiated during 30th MW (0.96 per leaf) and it lasts up to 43rd MW. The maximum pyrilla per leaf was observed on 35th MW (1.38 per leaf).

The incidence of Pokkah boeng disease was not noticed. The acute incidence of yellow leaf disease, grassy shoot and mosaic was observed during the season.

AGRONOMY

Technical Programme for the Year 2015-16 (Approved by AICRP (Sugarcane))

1. **AS-42** : Agronomic evaluation of promising sugarcane varieties. .**
2. **AS-67** : Optimization of fertigation schedule for sugarcane through micro irrigation technique under different Agro climatic conditions **
3. **AS-68** : Impact of integrated application of organics and inorganic in improving soil health and sugarcane productivity**.

Note : ** Experiments could not be conducted.

Project code : AS-69

Title : **Use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane**

Period for which report submitted : 2016-2017

Objectives

1. To study effect of PGR on cane and sugar yield of Sugarcane.
2. To increase the productivity of cane and sugar in the region.

Project Technical Details :

Design : RBD

Treatments Details :

T1: Conventional planting/farmers Practice (3 Bud Setts)

T2: Planting of Setts after overnight soaking in water

T3: Planting of Setts after overnight soaking in 50 ppm ethrel solution

T4: Planting of Setts after overnight soaking in 100 ppm ethrel solution

T5: T1 + GA3 spray (35 ppm) at 90, 120 and 150 DAP

T6: T2 + GA3 spray (35 ppm) at 90, 120 and 150 DAP

T7: T3 + GA3 spray (35 ppm) at 90, 120 and 150 DAP

T8: T4 + GA3 spray (35 ppm) at 90, 120 and 150 DAP

Variety : CO 86032

Plot size : 6.00 X 5.40 m²

No. of replications : Three

Date of planting : 28/01/2016

Date of harvesting : 28/12/2016

Fertilizer : 175:100:100 N, P₂O₅ and K₂O kg ha⁻¹

Previous Crop : Green gram

Climatic parameters : Weather and season report enclosed separately

Soil Type : Medium deep black soil, low in organic carbon, N & P, Medium in K

pH : Moderate alkaline (pH- 8.28)

Salinity : Normal (0.125 dS m⁻¹)

Germination:

Significantly higher germination percentage was recorded in treatment T₈ i. e. Planting of Setts after overnight soaking in 100 ppm ethrel solution + GA3 spray (35 ppm) at 90, 120 and 150 DAP. However, it was at par with all other treatments except T₁ i.e. Conventional planting /farmers Practice (3 Bud Setts).

Table 1: Cane yield, Sugar yield and ancillary data as influenced by different treatments

SN	Treatments	Cane yield t ha ⁻¹	Millable canes ha ⁻¹	Sugar yield t ha ⁻¹	Height (cm)	Internodes (No.)	Cane Diameter (cm)
T ₁	Conventional planting /farmers Practice (3 Bud Setts)	87.28	77407	9.63	204	18.00	2.73
T ₂	Planting of Setts after overnight soaking in water	92.07	81234	10.35	209	18.20	2.64
T ₃	Planting of Setts after overnight soaking in 50 ppm ethrel solution	95.66	84321	10.80	214	18.53	2.78
T ₄	Planting of Setts after overnight soaking in 100 ppm ethrel solution	100.63	87778	11.64	222	18.67	2.73
T ₅	T1 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	96.39	84568	11.23	212	18.33	2.78
T ₆	T2 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	102.26	88395	11.71	221	18.40	2.75
T ₇	T3 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	107.48	89630	12.57	238	19.00	2.77
T ₈	T4 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	105.13	89876	12.34	240	19.33	2.75
	SE (m)	3.24	2176	0.41	7.69	0.48	0.04
	CD at 5%	9.83	6599	1.25	23.32	NS	NS

Cane and Sugar Yield:-

Planting of Sugarcane Setts after overnight soaking in 50 ppm ethrel solution + GA3 spray (35 ppm) at 90, 120 and 150 DAP (T7) recorded significantly higher cane (107.48/ha) & Sugar yield (12.57 t/ha).

Ancillary Growth Character:-

In respect of millable canes Planting of Setts after overnight soaking in 50 ppm ethrel solution + GA3 spray (35 ppm) at 90, 120 and 150 DAP (T8) (102777 ha⁻¹ & 21.90) recorded significantly higher millable cane (89876). Data regarding No. of internodes, Plant height and Cane diameter showed non-significant results.

Juice quality:

All juice quality parameters viz Brix reading, Pol %, CCS % and Purity % showed non-significant results.

Economics:

Higher cost of cultivation and GMR was recorded in Treatment T₈ (Rs. 97878 /-) and Treatment T₇ (Rs 1,77,345). Whereas, higher NMR and B:C ratio was recorded in treatment T₆ i.e. Planting of Setts after overnight soaking in water + GA3 spray (35 ppm) at 90, 120 and 150 DAP (Rs. 96568/- & 2.34).

Table 2: Sugarcane Juice quality at harvest as influenced by different treatments

SN	Treatments	Brix	Pol %	C.C.S. %	Purity %
T ₁	Conventional planting /farmers Practice (3 Bud Setts)	23.30	17.45	11.03	74.93
T ₂	Planting of Setts after overnight soaking in water	23.48	17.73	11.27	75.55
T ₃	Planting of Setts after overnight soaking in 50 ppm ethrel solution	23.50	17.77	11.29	75.72
T ₄	Planting of Setts after overnight soaking in 100 ppm ethrel solution	23.29	17.99	11.58	77.23
T ₅	T1 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	22.62	17.86	11.65	79.11
T ₆	T2 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	23.42	17.89	11.45	76.39
T ₇	T3 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	23.46	18.14	11.69	77.35
T ₈	T4 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	23.55	18.21	11.73	77.34
	SE (m)	0.33	0.28	0.30	1.65
	CD at 5%	NS	NS	NS	NS

Table3: Cost of cultivation, GMR, NMR and B:C ratio of Sugarcane as influenced by various treatments.

SN	Treatments	Cane yield (t/ha.)	COC (Rs/ha)	GMR (Rs/ha)	NMR (Rs/ha)	B:C ratio
T ₁	Conventional planting /farmers Practice (3 Bud Setts)	87.28	65313	144012	78699	2.20
T ₂	Planting of Setts after overnight soaking in water	92.07	65673	151917	86244	2.31
T ₃	Planting of Setts after overnight soaking in 50 ppm ethrel solution	95.66	78528	157832	79304	2.01
T ₄	Planting of Setts after overnight soaking in 100 ppm ethrel solution	100.63	91383	166041	74658	1.82
T ₅	T1 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	96.39	71808	159045	87237	2.21
T ₆	T2 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	102.26	72168	168736	96568	2.34
T ₇	T3 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	107.48	85023	177345	92322	2.09
T ₈	T4 + GA3 spray (35 ppm) at 90, 120 and 150 DAP	105.13	97878	173459	75581	1.77
	SE (m)	3.24	-	5345	5345	-
	CD at 5%	9.83	-	16213	16213	-

Selling price of Cane : Rs. 1650/tonne

Conclusion:

Planting of Sugarcane Setts after overnight soaking in 50 ppm ethrel solution + GA3 spray (35 ppm) at 90, 120 and 150 DAP recorded significantly higher cane & Sugar yield. However, higher NMR and B:C ratio was recorded in treatment T₆ i.e. Planting of Setts after overnight soaking in water + GA3 spray (35 ppm) at 90, 120 and 150 DAP.

Technical Programme for the Year 2017-18 (Approved by AICRP (Sugarcane) and implemented at Akola Centre

1	Use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane
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Appendix I

Table A: Weekly Weather data for the year 2016 recorded at Meteorological Observatory Department of Agronomy Dr. PDKV., Akola

		Actual				2016								Normal				1971-2010		
MW	Dates	T MAX (°C)		T MIN (°C)		BSH (hrs)		WS (km/hr)		RH I (%)		RH II (%)		Evap (mm)		RF (mm)		CRF (mm)	Rainy Days	
		N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A		N	A
1	1-7 Jan	29.0	32.3	10.3	10.7	8.7	9.2	4.9	0.7	78	66	30	21	4.2	4.9	1.7	0.0	0.0	0.2	0.0
2	8-14	29.2	31.4	11.3	10.9	8.6	8.1	6.3	1.0	71	60	30	23	4.5	4.6	3.4	0.0	0.0	0.2	0.0
3	15-21	29.9	29.9	11.6	13.7	8.9	7.6	5.4	2.6	69	70	28	29	4.8	5.4	0.9	0.0	0.0	0.1	0.0
4	22-28	30.8	29.5	11.8	8.5	9.1	9.4	5.5	1.2	67	52	27	16	5.2	5.1	1.1	0.0	0.0	0.2	0.0
5	29-4 Feb	31.1	33.7	12.1	12.6	9.3	9.7	5.8	1.9	61	58	25	21	5.6	6.2	2.8	0.0	0.0	0.2	0.0
6	5-11	31.3	32.8	11.9	14.5	9.1	9.3	5.6	2.3	59	51	23	25	5.9	6.1	4.9	0.0	0.0	0.4	0.0
7	12-18	32.5	33.9	13.4	15.9	9.4	9.2	6.1	2.9	56	51	22	21	6.6	7.4	0.1	0.0	0.0	0.0	0.0
8	19-25	33.0	36.1	13.8	17.6	9.5	8.3	6.5	2.1	57	53	22	26	7.3	6.7	3.3	0.0	0.0	0.5	0.0
9	26-4 Mar	34.7	35.8	14.8	19.2	9.6	8.9	7.0	2.3	50	70	17	32	8.1	6.9	3.4	0.0	0.0	0.3	0.0
10	5-11	36.1	36.5	16.7	19.0	9.6	9.0	6.8	3.3	44	48	18	20	9.0	7.9	2.1	0.0	0.0	0.3	0.0
11	12-18	37.3	36.8	17.5	20.2	9.6	9.3	6.9	3.3	42	44	17	20	9.5	8.5	2.5	0.4	0.4	0.3	0.0
12	19-25	38.5	39.0	18.3	20.2	9.6	9.5	6.9	4.4	37	29	13	11	10.5	9.6	0.3	0.0	0.4	0.1	0.0
13	26-1 Apr	39.0	40.4	19.7	22.2	9.6	8.4	7.6	2.8	36	32	15	15	11.3	9.8	2.9	0.0	0.4	0.3	0.0
14	2-8 Apr	40.1	41.2	21.1	25.4	9.8	8.4	7.9	2.0	36	37	15	18	11.7	9.8	0.6	0.0	0.4	0.1	0.0
15	9-15	40.8	41.8	22.5	24.9	9.9	9.7	9.3	3.6	34	33	12	17	13.4	13.0	0.3	0.0	0.4	0.1	0.0
16	16-22	41.7	44.0	23.5	27.5	10.2	9.8	9.1	4.8	34	34	14	14	13.7	13.9	0.3	0.0	0.4	0.0	0.0
17	23-29	42.1	41.7	24.8	25.6	10.1	10.0	10.2	8.1	37	38	14	18	14.4	14.8	0.0	0.0	0.4	0.1	0.0
18	30- 6 May	42.7	42.9	26.0	27.6	9.9	9.3	11.4	6.1	38	37	14	14	15.4	14.1	0.3	0.0	0.4	0.2	0.0
19	7-13	42.6	40.7	26.5	26.1	10.1	8.4	12.7	3.7	43	50	17	17	16.4	10.7	0.3	19.9	20.3	0.1	1.0
20	14-20	42.6	45.2	27.3	30.7	9.7	8.9	14.6	4.1	48	33	18	12	17.3	13.9	1.8	0.6	20.9	0.2	0.0
21	21-27	42.4	42.0	27.4	29.4	9.8	10.0	15.7	18.8	50	52	20	21	17.0	19.5	4.1	0.0	20.9	0.5	0.0
22	28-3 Jun	41.9	41.4	27.6	29.9	9.7	10.0	16.2	14.2	56	51	23	21	16.3	15.2	5.7	0.0	20.9	0.5	0.0
23	4-10	39.0	41.2	25.8	28.0	8.0	6.5	14.9	8.5	62	56	30	27	13.4	11.5	18.3	8.6	29.5	1.2	2.0
24	11-17	38.2	38.9	25.5	29.0	7.5	7.7	15.4	16.0	71	55	42	28	11.1	16.5	43.3	0.0	29.5	2.0	0.0
25	18-24	35.3	34.5	24.9	24.7	7.1	5.8	15.1	5.3	76	83	50	47	9.1	6.1	52.3	88.0	117.5	2.2	4.0
26	25-1Jul	34.1	32.8	24.2	24.6	5.3	3.5	13.4	8.3	80	80	55	58	7.3	5.5	38.2	49.9	167.4	2.3	2.0

Table A: Weekly Weather data for the year 2016 recorded at Meteorological Observatory Department of Agronomy Dr. PDKV., Akola

Weeks	Dates	Actual				2015				Normal				1971-2010								
		T MAX (°C)		T MIN (°C)		BSH (hrs)		WS (km/hr)		RH I (%)		RH II (%)		Evap (mm)		RF (mm)		CRF (mm)	Rainy Days			
		N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A		N	A		
27	2-8	33.5	30.7	24.4	24.8	5.2	1.1	12.9	10.0	81	86	58	70	6.8	4.7	34.7	53.1	220.5	2.4	3.0		
28	9-15	32.3	28.1	23.7	23.6	3.8	2.3	12.0	11.6	84	90	62	73	5.5	3.9	52.2	212.8	433.3	2.8	6.0		
29	16-22	32.0	31.5	23.9	24.9	3.3	4.7	11.2	7.3	84	83	65	62	5.6	4.3	58.6	5.7	439.0	2.6	1.0		
30	23-29	31.7	29.8	23.3	23.6	4.3	2.5	11.9	4.7	85	91	64	72	5.3	3.8	44.2	104.5	543.5	2.6	6.0		
31	30-5 Aug	31.1	29.4	23.1	23.9	3.6	2.3	11.7	7.5	88	86	66	71	4.6	4.0	49.3	65.3	608.8	2.5	4.0		
32	6-12	30.2	30.4	22.9	24.0	3.5	3.6	11.6	6.6	87	84	69	66	4.2	4.0	59.9	10.5	619.3	2.9	2.0		
33	13-19	30.5	31.0	22.8	23.4	4.4	5.3	11.7	11.5	86	85	66	58	4.5	5.6	40.6	0.0	619.3	2.2	0.0		
34	20-26	30.5	30.0	22.6	23.4	4.3	5.8	11.0	4.1	88	83	66	64	4.3	4.0	46.7	13.7	633.0	2.0	2.0		
35	27-2 Sep	30.4	31.9	22.7	24.5	4.4	4.5	10.6	4.5	86	85	64	62	4.2	3.9	47.1	6.5	639.5	2.4	1.0		
36	3-9	31.1	31.3	22.5	22.6	5.7	8.5	9.1	8.4	85	85	61	47	4.7	6.2	28.5	1.5	641.0	1.5	0.0		
37	10-16	32.2	31.8	22.4	23.6	7.1	3.4	9.0	5.5	85	86	56	59	5.1	4.2	18.9	28.5	669.5	1.1	3.0		
38	17-23	33.4	30.9	22.3	23.3	7.2	4.3	8.5	2.8	83	94	53	70	5.3	3.4	24.6	62.9	732.4	1.4	3.0		
39	24-30	33.7	30.8	21.9	23.0	7.6	6.0	5.4	4.9	83	92	50	71	4.9	4.4	24.4	30.3	762.7	1.5	1.0		
40	1-7 Oct	33.9	29.1	20.2	22.8	8.1	4.6	7.5	1.8	81	92	45	73	5.5	3.2	21.8	61.5	824.2	1.1	4.0		
41	8-14	34.1	31.2	18.7	21.3	4.2	7.6	4.1	3.0	76	90	40	59	5.3	4.1	16.0	29.0	853.2	0.9	1.0		
42	15-21	33.9	32.9	18.1	16.5	8.4	8.9	4.4	0.4	74	80	36	29	5.5	4.4	3.1	0.0	853.2	0.4	0.0		
43	22-28	33.1	32.4	18.5	15.8	8.4	8.4	4.1	0.9	73	80	36	34	5.3	4.7	10.0	0.0	853.2	0.6	0.0		
44	29-4 Nov	33.0	31.4	15.8	14.3	8.7	8.7	4.7	0.4	72	81	31	34	5.3	4.4	2.3	0.0	853.2	0.3	0.0		
45	5-11	32.4	31.4	14.8	11.2	8.6	8.6	4.5	0.3	70	77	30	27	5.2	3.8	3.7	0.0	853.2	0.3	0.0		
46	12-18	31.7	30.3	13.7	11.9	8.6	8.3	4.6	0.4	70	84	30	33	4.9	3.7	1.1	0.0	853.2	0.2	0.0		
47	19-25	31.0	30.7	13.1	9.7	8.6	8.4	4.4	0.3	71	85	30	32	4.6	3.6	10.1	0.0	853.2	0.3	0.0		
48	26-2 Dec	30.3	31.9	12.4	10.9	8.8	8.9	4.6	0.2	71	85	31	31	4.3	3.8	6.8	0.0	853.2	0.3	0.0		
49	3-9	29.8	30.1	11.2	10.7	8.7	8.0	4.7	0.8	70	88	29	35	4.3	3.5	1.3	0.0	853.2	0.2	0.0		
50	10-16	29.4	30.2	10.3	10.7	8.8	8.0	4.5	1.2	70	79	27	32	4.2	4.2	1.3	0.0	853.2	0.2	0.0		
51	17-23	29.5	29.2	10.6	8.6	8.7	8.5	4.7	0.5	69	85	29	35	4.3	3.5	0.9	0.0	853.2	0.1	0.0		
52	24-31	29.2	29.5	10.7	8.4	8.6	8.5	4.8	0.5	70	83	31	29	4.3	3.4	2.6	0.0	853.2	0.2	0.0		
										TOTAL RF January to Dec						805.6	853.2				46	
										Total RF June to Dec												45.0