

Weekly meteorological data of Akola for the year 2013-14

Met Week	Date	Rainfall (mm)	Temperature (Oc)		RH I %	RH II %
			Max	Min		
1	2	3	4	5	6	7
1	1-7 Jan.12	8.00	29.3	13.0	78	29
2	8-14	0.00	28.0	9.1	68	16
3	15-21	0.00	30.8	13.0	68	28
4	22-28	19.5	27.2	14.2	78	37
5	29-4 Feb.	0.00	30.1	14.9	62	22
6	5-11	0.7	31.5	17.3	72	34
7	12-18	3.5	31.0	16.0	73	27
8	19-25	2.7	31.6	14.4	69	24
9	26-4 Mar.	0.00	34.5	14.6	53	14
10	5-11	0.00	36.6	15.2	40	16
11	12-18	0.00	36.7	20.0	58	28
12	19-25	2.5	37.4	22.3	57	28
13	26-1 Apr.	0.00	39.0	22.8	48	27
14	2-8	0.00	39.7	23.3	33	13
15	9-15	0.00	41.3	26.2	32	14
16	16-22	1.5	38.9	24.5	46	21
17	23-29	0.00	41.0	25.6	43	18
18	30-6 May	0.00	43.9	29.4	28	13
19	7-13	0.00	43.3	29.2	33	13
20	14-20	0.00	43.3	29.9	38	15
21	21-27	0.00	43.6	29.6	45	19
22	28-3 June	0.00	41.4	29.3	54	30
23	4-10	47.3	35.3	24.5	83	47
24	11-17	138.0	31.3	23.7	89	67
25	18-24	31.5	32.6	24.6	86	57
26	25-1 July	50.1	29.2	23.4	91	68
27	2-8	56.0	30.5	23.8	91	65
28	9-15	35.6	30.3	23.5	91	70
29	16-22	48.0	27.4	22.9	94	81
30	23-29	88.4	28.1	22.9	92	78
31	30-5 Aug.	109.0	26.8	22.3	95	89
32	6-12	6.5	29.0	23.1	90	70
33	13-19	7.0	30.4	23.3	88	62
34	20-26	47.9	25.1	21.8	95	89
35	27-2 Sept.	4.5	30.2	22.8	85	53
36	3-9	2.0	32.2	22.6	83	47
37	10-16	44.7	34.2	23.1	86	46
38	17-23	104.3	30.2	22.8	92	69
39	24-30	0.9	31.9	22.8	81	46
40	1-7 Oct.	68.4	31.5	23.1	92	62
41	8-14	15.4	31.4	22.3	90	53
42	15-21	1.0	33.5	20.4	82	37
43	22-28	1.5	31.3	20.3	88	49
44	29-4 Nov.	0.00	32.7	15.9	85	29
45	5-11	0.00	31.6	15.6	85	30
46	12-18	0.00	29.5	13.4	72	26
47	19-25	0.00	31.0	14.5	82	30
48	26-2 Dec.	0.00	30.4	16.3	78	35
49	3-9	0.00	29.6	12.5	81	23
50	10-16	0.00	28.9	8.4	82	17
51	17-23	0.00	29.5	9.8	84	21
52	24-31	0.00	28.8	13.6	84	31

Experiment No. 1

Project code	- AICRP E-4.1
Name of Research Station	- Sugarcane Research Centre, Dr.P.D.K.V., Akola.
Location of Project	- Sugarcane Research Centre, Dr. PDKV, Akola.
Project title	- Evaluation of zonal varieties/ genotypes for their reaction against major insect pests of sugarcane in Initial Varietal Trial Early
Duration of project	- One year
Date of start	- 01/02/2013
Period for which report submitted	- 2013-14
Principal Investigator	-
Name	- Dr. N. S. Satpute
Designation	- Assistant Professor Senior Research Scientist
Address	- Sugarcane Research Centre, Dr. PDKV, Akola.

Objectives

Immediate objectives	- To screen the sugarcane varieties in AICRP Trials for their reactions to major pests.
Specific objectives	- To identify resistant varieties to major pests of sugarcane

Project technical profile

Technical details

1. Progressive year	- First (2013-14)		
2. Design	- Randomized Block Design		
3. Replication	- Three		
4. Plot size	- 6.00x 4.50m ²		
5. Spacing	- 90 cm row to row		
6. Fertilizer	- 175 kg N + 100 kg P ₂ O ₅ + 100 kg K ₂ O ha ⁻¹		
7 Date of planting	- 01/02/2013		
8 Date of harvesting	- 14-01-2014		
9 Treatments :Fifteen varieties			
1. Co 10004	2. Co 10005	3. Co 10006	4. Co 10024
5. Co 10026	6. Co 10027	7. CoM 10081	8. CoM 10082
9.CoN 10071	10. CoN 10072	11. CoT 10366	12. CoT 10367
13. Co 85004 (C)	14. Co 94008 (C)	15. CoC 671 (C)	

Observations recorded

For shoot borer:

1. Per cent incidence (based on dead hearts)
2. No. of bored plants / ha
3. Observations to be recorded in post germination phase at 30 days interval up to 120 days

For top borer:

Per cent incidence during the 3rd and 4th broods (July, Aug, and Sept.) in North West, North Central and North East zones during 5th and 7th Months and at harvest in peninsular and East coast zones

For stalk and internodes borers:

1. At harvest both per cent incidence and per cent intensity (25 canes /replications may be recorded. The infestation index may also be computed as follows.

$$\text{Infestation index} = \frac{\% \text{ incidence} \times \% \text{ intensity}}{100}$$

2. The yield and quality parameters are also to be recorded in both healthy and bored canes and CCS /plot calculated separately.

For Pyrilla:

Population of nymph, adults and egg masses be recorded from a unit of 10 canes (20 leaves) and average per leaf be reported.

For White fly:

Population of nymph and puparia be recorded from a unit of 10 canes (20 leaves) from proximal, middle and distal region. Average population / 2.5 cm² be reported.

For white grub:

Grub as well as adults population be recorded by digging 1 square meter area at 5 sites in the field. Population / ha be calculated and reported.

Observations also to be recorded on termites, thrips and mites infestation and broad categorization be made as less susceptible, susceptible and highly susceptible.

Grades of insect pests infestation:

Pests	LS	MS	HS
Early shoot borer	Below 15 .0	15.1-30.0	Above 30.0
Inter node borer	Below 20.0	20.1 – 40.0	Above 40.0
Scale insect	Below 10.0	10.1 – 35.0	Above 35.0
Mealy bug	Below 05.0	5.1 – 30.0	Above 30.0
Root borer	Below 15.0	15.1 – 30.0	Above 30.0
Top borer	Below 10.0	10.1 – 20.0	Above 20.0
Pyrilla	Below 05.0	05.1-20	Above 20.0
White fly	Below 02.0	2.1 – 5.0	Above 05.0
Stalk borer	Below 02.0	2.1-5.0	Above 05.0

Woolly aphid:

- 0 Resistant – Free
- 1 (MR) less than 25% leaf area covered
- 2 (MS) 25 % leaf area covered
- 3 (S) 25 – 50 % leaf area covered
- 4 (HS) More than 50 % leaf area covered

Table 1 Reaction of Sugarcane varieties/genotypes to major pests in IVT Early

Sr. No.	Genotypes	Early shoot borer	
		Average % Infestation	Reaction
1	Co 10004	6.64	LS
2	Co 10005	8.16	LS
3	Co 10006	8.03	LS
4	Co 10024	9.06	LS
5	Co 10026	10.70	LS
6	Co 10027	7.23	LS
7	CoM 10081	7.39	LS
8	CoM 10082	6.58	LS
9	CoN 10071	6.90	LS
10	CoN 10072	4.47	LS
11	CoT 10366	6.35	LS
12	CoT 10367	6.32	LS
13	Co 85004 (C)	9.42	LS
14	Co 94008 (C)	9.16	LS
15	CoC 671 (C)	10.04	LS

LS = Less susceptible, MS= Moderately susceptible and HS = Highly susceptible.

Table 2 Reaction of Sugarcane varieties/genotypes to major pests in IVT Early

Sr. No.	Genotypes	Scales			Mealybugs		
		% incidence	% intensity	Reaction	% incidence	% intensity	Reaction
1	Co 10004	20.00	2.12	MS	13.33	2.12	MS
2	Co 10005	13.33	1.05	MS	0.00	0.00	LS
3	Co 10006	0.00	0.00	LS	0.00	0.00	LS
4	Co 10024	6.66	0.38	LS	6.66	0.76	MS
5	Co 10026	26.66	5.45	MS	0.00	0.00	LS
6	Co 10027	20.00	1.28	MS	0.00	0.00	LS
7	CoM 10081	46.66	7.89	HS	6.66	0.31	MS
8	CoM 10082	73.33	33.70	HS	13.66	2.20	MS
9	CoN 10071	13.33	0.66	MS	0.00	0.00	LS
10	CoN 10072	6.66	1.07	LS	0.00	0.00	LS
11	CoT 10366	13.33	0.64	MS	13.33	0.96	MS
12	CoT 10367	6.66	0.85	LS	0.00	0.00	LS
13	Co 85004(C)	0.00	0.00	LS	0.00	0.00	LS
14	Co 94008(C)	20.00	2.15	MS	6.66	0.36	MS
15	CoC 671 (C)	66.66	21.37	HS	26.66	2.20	MS

LS = Less susceptible, MS= Moderately susceptible and HS = Highly susceptible.

Results :

Early Shoot Borer: The data (Table 1 revealed that all the sixteen entries were found less susceptible to early shoot borer.

Scales The entries Co 10004, Co 10005, Co 10026, Co 10027, CoN 10071, CoT 10366 and Co 94008 (C) were found moderately susceptible to scale insects whereas, the genotypes CoM 10081, CoM 10082, and CoC 671 (C) were found highly susceptible. The genotypes Co 10006, Co 10024, CoN 10072, CoT 10367 and Co 85004 (C) were found less susceptible (Table 4).

Mealybugs: In case of mealybugs, the genotypes Co 10004, Co 10024, CoM 10081, CoM 10082, CoT 10366 Co 94008 (C) and CoC 671 (C) were found moderately susceptible to mealybugs while the entries Co 10005, Co 10006, Co 10026, Co 10027, CoN 10071, CoN 10072, CoT 10367 and Co 85004 (C) were less susceptible.

Utility of results obtained so far

The genotypes showing tolerant/resistant reaction to different insect pests will be utilized in resistant breeding programme in future.

Experiment No 2

Project code	- AICRP E-4.1
Name of Research Station	- Sugarcane Research Centre, Dr. PDKV, Akola.
Location of Project	- Sugarcane Research Centre, Dr. PDKV, Akola.
Project title	- Evaluation of zonal varieties / genotypes for their reaction against major insect pests of sugarcane in Initial Varietal Trial Midlate
Duration of project	- One year
Date of start	- 23/01/13
Period for which report submitted	- 2013-14
Principal Investigator Name	- Dr. N. S. Satpute
Designation	- Assistant Professor
Address	- Sugarcane Research Centre, Dr. PDKV, Akola.

Objectives

Immediate objectives	- To screen the sugarcane varieties in AICRP Trials for their reactions to major pests.
Specific objectives	- To identify resistant varieties to major pests of sugarcane

Technical details

1. Progressive year	- First (2013-2014)		
2. Design	- Randomized Block Design		
3. Replication	- Three		
4. Plot size	- 6.00 x 4.50 m ²		
5. Spacing	- 90 cm row to row		
6. Fertilizer	- 175 kg N + 100 kg P ₂ O ₅ + 100 kg K ₂ O ha ⁻¹		
7. Date of planting	- 23-01-2013		
8. Date of harvesting	- 14-01-2014		
9. Treatment : Sixteen Genotypes			
1. Co 10015	2. Co 10017	3. Co 10031	4. Co 10033
5. CoM 10083	6. CoM 10084	7. CoN 10073	8. CoT 10368
9. CoT 10369	10. CoVC 10061	11. CoVSI 10121	12. CoVSI 10122
13. PI 10131	14. PI 10132	15. Co 86032 (C)	16. Co 99004 (C)

Observations recorded

As per experiment No 1

Table 3 Reaction of Sugarcane varieties / genotypes to borers in IVT Midlate

Sr. No.	Genotypes	Early shoot borer	
		Avg. % Infestation	Reaction
1	Co 10015	13.31	LS
2	Co 10017	11.90	LS
3	Co 10031	7.41	LS
4	Co 10033	9.61	LS
5	CoM 10083	9.30	LS
6	CoM 10084	9.06	LS
7	CoN 10073	10.34	LS
8	CoT 10368	9.37	LS
9	CoT 10369	7.69	LS
10	CoVC 10061	9.15	LS
11	CoVSI 10121	7.24	LS
12	CoVSI 10122	8.33	LS
13	PI 10131	10.71	LS
14	PI 10132	8.10	LS
15	Co 86032 (C)	9.06	LS
16	Co 99004 (C)	7.35	LS

LS = Less susceptible, MS= Moderately susceptible and HS = Highly susceptible.

Table 4 Reaction of Sugarcane varieties / genotypes to major pests in IVT Midlate

Sr. No.	Genotypes	Scales			Mealy Bugs		
		% incidence	% intensity	Reaction	% incidence	% intensity	Reaction
1	Co 10015	6.66	1.56	LS	0.00	0.00	LS
2	Co 10017	53.33	20.69	HS	0.00	0.00	LS
3	Co 10031	0.00	0.00	LS	6.66	1.14	MS
4	Co 10033	6.66	2.05	LS	0.00	0.00	LS
5	CoM 10083	40.00	7.82	HS	6.66	1.30	MS
6	CoM 10084	0.00	0.00	LS	0.00	0.00	LS
7	CoN 10073	6.66	1.30	LS	6.66	0.87	MS
8	CoT 10368	0.00	0.00	LS	6.66	28.69	MS
9	CoT 10369	6.66	0.02	LS	46.66	8.92	HS
10	CoVC 10061	0.00	0.00	LS	6.66	1.77	MS
11	CoVSI 10121	20.00	3.73	MS	6.66	0.83	MS
12	CoVSI 10122	20.00	3.45	MS	0.00	0.00	LS
13	PI 10131	6.66	0.39	LS	6.66	1.16	MS
14	PI 10132	33.33	10.55	MS	46.66	15.19	HS
15	Co 86032 (C)	0.00	0.00	LS	20.00	4.25	MS
16	Co 99004 (C)	6.66	1.63	LS	0.00	0.00	LS

Results :

Early Shoot Borer: The Data (Table 3 revealed that all the entries were found less susceptible to early shoot borer.

Scales The data in Table 4 revealed that the entries Co 10017 and CoM 10083 were found moderately susceptible to scale insect while the entries CoVSI 10121, CoVSI 10122, and PI 10132 were found highly susceptible to scales

Mealy bugs Entries Co 10031, CoM10083, CoN10073, CoT 10368, CoVC 10061, CoVSI 10121, PI 10131 and Co 86032 (h) were found moderately susceptible to mealy bugs while the entries CoT 10369, and PI 10132 were found highly susceptible to mealy bugs. The rest of the entries were found less susceptible to mealy bugs.

Utility of results obtained so far

As per experiment No 1

Experiment No 3

Project code	- AICRP E-4.1
Name of Research Station	- Sugarcane Research Centre, Dr. PDKV, Akola.
Location of Project	- Sugarcane Research Centre, Dr. PDKV, Akola.
Project title	- Evaluation of zonal varieties / genotypes for their reaction against major insect pests of sugarcane in Advance Varietal Trial Midlate II plant
Duration of project	- One year
Date of start	- 22-01-2013
Period for which report submitted	- 2013-2014
Principal Investigator Name	- Dr. N. S. Satpute
Designation	- Assistant Professor
Address	- Sugarcane Research Centre, Dr. PDKV, Akola.

Objectives

Immediate objectives	- To screen the sugarcane varieties in AICRP Trials for their reactions to major pests.
Specific objectives	- To identify resistant varieties to major pests of sugarcane

Project technical profile

Technical details	
Progressive year	- First (2013-2014)
Design	- Randomized Block Design
Replication	- Three
Plot size	- 6.00 x 4.50 m ²
Spacing	- 90 cm row to row
Fertilizer	- 175 kg N + 100 kg P ₂ O ₅ + 100 kg K ₂ O ha ⁻¹
Date of Ratooning	- 22-01-2013
Date of harvesting	- 25-01-2014
Treatments : seven genotypes	1) Co 08008 5) CoSnk 08101 2) Co 08009 6) Co 86032 (Ch) 3) Co 08016 7) Co 99004 (Ch) 4) Co 08020

Observations to be recorded

As per experiment No 1.

Table 5: Reaction of Sugarcane varieties/genotypes to major pests in AVT Midlate II Plant

Sr. No.	Genotypes	Early shoot borer		Mealy Bugs			Scales		
		Avg. % Infestation	Reaction	% incidence	% intensity	Reaction	% incidence	% intensity	Reaction
1	Co 08008	18.53	MS	6.66	0.62	MS	26.66	1.55	MS
2	Co 08009	10.93	LS	6.66	0.29	MS	6.66	0.58	LS
3	Co 08016	17.28	MS	0.00	0.00	LS	6.66	0.31	LS
4	Co 08020	9.44	LS	0.00	0.00	LS	20.00	1.56	MS
5	CoSnk 08101	13.15	LS	0.00	0.00	LS	60.00	26.44	HS
6	Co86032(C)	16.99	MS	6.66	0.97	MS	66.66	56.17	HS
7	Co 99004(C)	16.67	MS	46.66	12.85	HS	6.66	1.20	LS

LS = Less susceptible, MS= Moderately susceptible and HS = Highly susceptible.

Results :

Early Shoot Borer: The Data (Table 5) revealed that the entries Co 08008, Co 08016, Co 86032 (C), and Co 99004 (C) were found moderately susceptible to early shoot borer.

Scale insect: The entries Co 08008, Co 08009, and Co 86032 (C) were found moderately susceptible to scale insect while the genotype Co 94008 (C) was found highly susceptible to Scales

Mealy Bugs: The entries Co 08008 and Co 08020 were found moderately susceptible to mealy bugs while the genotypes Cosnk 08101 and Co 86032 (C) were found highly susceptible to mealy bugs.

Utility of results obtained so far

As per experiment No 1

Experiment No 4

Project code	- AICRP E-30
Name of Research Station	- Sugarcane Research Centre, Dr. PDKV, Akola.
Location of Project	- Sugarcane Research Centre, Dr. PDKV, Akola.
Project title	- Monitoring of insect pests and bio-agents in sugarcane agro ecosystem
Duration of project	- Long term
Date of start	- 21-01-2013
Period for which report submitted	- 2013-2014

Principal Investigator

Name	- Dr. Niraj Satpute
Designation	- Assistant Professor of Entomology
Address	- Sugarcane Research Centre, Dr. PDKV, Akola.

Objectives

Immediate objectives	- To monitor the key insect pests and natural enemies in the area.
Specific objectives	- To monitor new pests and natural enemies in the area.

Project technical profile

Technical details

1. Progressive year - Fifth (2013-2014)
2. Duration - Long term
3. Plot size - 0.5 acre
4. Spacing - 90 cm row to row
5. Fertilizer - 175 kg N + 100 kg P₂O₅ + 100 kg K₂O ha⁻¹
6. Variety - Co 86032
7. Date of planting - 21-01-2013
8. Date of harvesting - 15-01-2014
9. Methodology -
 1. Planting of sugarcane variety recommended for the region.
 2. All recommended practices to be followed except application of insecticide.

Observations recorded :

1. Observations on incidence of borers was recorded by examining 100 canes at 5 places (four corners and in middle) sucking pests by examining 20 canes and others as mentioned in technical programme of E 4.1
2. Meteorological data (Weekly average) was recorded on temp. (max and min) relative humidity, no of rainy days and total rain fall.

Table 6: Monitoring of Insect pests and bio- agents in sugarcane agro ecosystem during 2013-14.

Months	Fortnight	Early shoot borer % infestation	Per cent intensity of Scales	Mealy bugs % intensity	Bio- agents/ cane	
					Lady bird beetle	Spiders
1	2	3		6	8	9
Feb 2013	I	00.00	00.00	00.00	00.00	00.00
	II	00.00	00.00	00.00	00.00	00.00
Mar 2013	I	00.00	00.00	00.00	00.00	00.00
	II	1.83	00.00	00.00	00.00	00.00
April 2013	I	3.26	00.00	00.00	00.00	00.00
	II	6.33	00.00	00.00	00.00	01.50
May 2013	I	9.16	00.00	00.00	02.00	00.50
	II	13.59	00.00	00.00	01.00	00.00
Jun 2013	I	6.62	00.00	00.00	03.00	01.50
	II	3.45	00.00	00.00	00.00	01.50
July 2013	I	00.00	00.00	00.00	02.00	01.66
	II	00.00	00.00	00.00	00.50	02.00
Aug 2013	I	00.00	00.00	00.00	02.00	02.50
	II	00.00	0.31	00.00	02.00	02.00
Sept 2013	I	00.00	3.70	0.89	02.33	02.00
	II	00.00	5.90	1.43	00.00	00.50
Oct 2013	I	00.00	7.28	1.62	00.50	00.50
	II	00.00	11.41	1.90	02.50	00.50
Nov 2013	I	00.00	11.98	2.05	02.50	00.50
	II	00.00	16.19	3.52	00.00	00.00
Dec 2013	I	00.00	36.46	2.81	00.00	00.00
	II	00.00	42.92	3.35	00.00	00.00

Results :

Early Shoot Borer: From the data (Table 6) revealed that the incidence of early shoot borer was observed first in 2nd fortnight of Mar'2013 and it was continued up to 2nd fortnight of June 2013. The maximum infestation was observed in 2nd fortnight (13.59 %) of May 2013.

Mealy bugs: The incidence of mealy bugs was initiated in 1st fortnight of Sept, 2013 and it was continued up to 2nd fortnight of December 2013. The highest intensity (3.52 %) was observed in 2nd fortnight of November 2013.

Scales: The incidence of scales was initiated in 2nd fortnight of August, 2013 and it was continued up to 2nd fortnight of December 2013. The highest intensity (42.92 %) was observed in 2nd fortnight of December 2013.

In sugarcane eco-system the population of natural enemies like lady bird beetle and spiders were observed during the year 2013-14.

Utility of results obtained so far

Monitored the key pest and natural enemies in the area

PART V

List of ongoing projects to be undertaken during 2014-15.

1. Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in IVT Early
2. Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in IVT Midlate
3. Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in AVT Midlate II Plant
4. Monitoring of insect pests and bio-agents in sugarcane agro ecosystem

(For office use only)

**DR PANJABRAO DESHMUKH KRISHI
VIDYAPEETH, AKOLA**

**ANNUAL REPORT OF RESEARCH WORK DONE
ON SUGARCANE ENTOMOLOGY**

2013-2014

**Submitted to
ALL INDIA COORDINATED RESEARCH PROJECT
ON SUGARCANE**



Submitted by

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