

PART I

Table A: Weekly Weather data for the year 2014 recorded at Meteorological Observatory
Department of Agronomy Dr. PDKV., Akola

Weeks	Dates	T MAX (°C) T Min		BSH (hrs) WS (km/hr)		RH I (%) RH II (%)		Evap (mm)RF(mm)		CRF (mm)	Rainy days
		A	A	A	A	A	A	A	A		A
1	1-7 Jan	29.0	13.0	4.8	1.0	80	31	4.4	0.0	0.0	0.0
2	8-14	28.5	13.9	4.6	2.3	80	34	3.7	0.0	0.0	0.0
3	15-21	29.2	15.8	3.4	2.0	76	33	4.7	0.4	0.4	0.0
4	22-28	28.9	14.5	3.3	1.9	81	31	4.2	0.0	0.4	0.0
5	29-4 Feb	30.0	11.0	8.4	1.7	59	16	5.2	0.0	0.4	0.0
6	5-11	31.9	14.0	7.6	1.7	60	20	5.3	0.0	0.4	0.0
7	12-18	29.4	12.7	7.4	2.3	64	24	6.7	0.0	0.4	0.0
8	19-25	31.7	16.2	5.9	2.0	64	29	6.2	2.0	2.4	0.0
9	26-4 Mar	30.2	15.3	7.5	2.8	76	25	5.7	34.7	37.1	3.0
10	5-11	28.9	16.5	6.0	3.1	83	29	4.4	8.6	45.7	2.0
11	12-18	35.3	18.9	8.7	2.2	70	16	6.5	7.9	53.6	1.0
12	19-25	37.8	20.0	8.7	2.8	43	11	9.7	0.0	53.6	0.0
13	26-1 Apr	39.8	23.7	8.0	2.8	35	11	9.5	0.0	53.6	0.0
14	2-8 Apr	39.9	22.2	8.0	3.1	30	9	10.2	0.0	53.6	0.0
15	9-15	39.3	21.8	7.5	3.5	38	10	10.6	0.0	53.6	0.0
16	16-22	40.4	23.8	8.2	3.5	52	22	10.7	4.2	57.8	1.0
17	23-29	41.5	24.2	8.7	3.8	38	11	12.7	0.0	57.8	0.0
18	30- 6 May	42.6	25.5	8.3	3.2	38	11	11.7	6.4	64.2	1.0
19	7-13	39.3	25.8	6.6	6.4	56	21	10.8	0.8	65.0	0.0
20	14-20	41.2	26.5	7.5	5.1	46	21	11.7	0.0	65.0	0.0
21	21-27	43.3	27.2	7.2	6.7	47	16	13.1	3.2	68.2	0.0
22	28-3 Jun	43.6	28.3	8.3	7.1	48	21	11.8	4.5	72.7	1.0
23	4-10	43.0	29.6	6.5	10.9	49	26	16.6	0.0	72.7	0.0
24	11-17	39.3	25.3	8.5	10.4	66	28	13.2	22.5	95.2	2.0
25	18-24	37.2	26.8	4.7	14.6	63	31	14.3	1.5	96.7	0.0
26	25-1Jul	38.2	26.8	5.2	15.0	61	31	14.3	1.7	98.4	0.0
27	2-8	36.4	26.3	4.1	12.5	74	44	11.9	1.4	99.8	0.0
28	9-15	35.1	24.7	2.8	10.0	84	51	6.8	48.6	148.4	1.0
29	16-22	30.7	23.9	1.5	8.8	88	70	3.8	45.8	194.2	6.0
30	23-29	28.2	22.6	1.2	11.4	90	68	4.7	194.2	388.4	3.0
31	30-5 Aug	31.6	24.2	3.2	7.6	89	66	6.0	16.4	404.8	1.0
32	6-12	32.2	23.6	5.9	11.9	87	48	8.3	13.7	418.5	2.0
33	13-19	33.6	23.6	6.9	9.5	89	46	7.1	6.9	425.4	2.0
34	20-26	33.8	23.6	5.6	1.9	92	57	4.1	28.9	454.3	4.0
35	27-2 Sep	29.1	22.4	2.1	4.1	94	81	5.0	73.6	527.9	5.0
36	3-9	28.8	22.7	3.3	8.7	93	65	7.0	109.2	637.1	3.0
37	10-16	30.3	22.6	4.2	7.3	88	65	5.7	0.7	637.8	0.0
38	17-23	32.5	23.1	6.0	6.4	90	56	5.2	0.5	638.3	0.0
39	24-30	34.5	20.7	8.5	1.0	81	37	4.2	2.0	640.3	0.0
40	1-7 Oct	36.5	21.1	7.4	1.4	73	29	5.2	0.0	640.3	0.0
41	8-14	36.8	20.9	5.6	1.7	66	26	5.4	0.0	640.3	0.0
42	15-21	34.5	21.8	5.6	1.4	76	37	5.6	0.0	640.3	0.0
43	22-28	31.9	18.0	4.3	1.1	77	37	4.0	0.0	640.3	0.0
44	29-4 Nov	33.8	15.9	7.9	1.3	68	21	4.7	0.0	640.3	0.0
45	5-11	33.5	16.6	6.5	1.4	69	28	5.2	0.0	640.3	0.0
46	12-18	30.0	20.4	3.2	2.2	87	46	3.5	20.1	660.4	2.0

47	19-25	31.7	12.9	7.4	0.9	72	16	4.2	0.0	660.4	0.0	
48	26-2 Dec	32.2	12.4	7.2	0.6	75	15	3.6	0.0	660.4	0.0	
49	3-9	30.8	10.9	8.3	0.9	73	18	4.4	0.0	660.4	0.0	
50	10-16	29.5	14.4	4.7	1.5	74	33	4.6	0.9	661.3	0.0	
51	17-23	26.4	6.9	8.3	1.6	71	16	5.0	0.0	661.3	0.0	
52	24-31	28.6	8.3	8.6	1.5	69	16	5.2	0.0	661.3	0.0	
				TOTAL RFJanuary to Dec						661.3		40
				Total RFJune to Dec						593.1		32

Experiment No. 1

General Information

600	Project code	-	AICRP 1
601.1	Name of Research Station	-	Sugarcane Research Centre, Dr.P.D.K.V, Akola.
601.2	Location of Project	-	Sugarcane Research Centre, Dr. PDKV, Akola.
602	Project title	-	Evaluation of zonal varieties / genotypes for their reaction against major insect pests of sugarcane in Initial Varietal Trial Midlate I plant
603	Priority area – main group		Plant protection
	sub group		Entomology
603.1	Research approach	-	Applied research
604	Specific area	-	Host plant resistance
605	Duration of project	-	One year
605.1	Date of start	-	2013-14
605.3	Period for which report submitted	-	2014-15

Part II Investigation Profile

610	Principal Investigator	-	
610.1	Name	-	Dr. G. K. Lande
610.2	Designation	-	Assistant Professor
	Address	-	Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.
611	Co-investigator		
611. 1	Name		Dr. N.K. Patke
611.2	Designation		Senior Research Scientist
611.3	Department		Sugarcane Research Centre, Dr. PDKV, Akola.
611.4	Location		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.
611.5	Address		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.

Part III Technical Details

620 Introduction and Objectives

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

621 Project technical profile

621.1	Technical details		
	1. Progressive year	-	First (2014-15)
	2. Design	-	Randomized Block Design

- 3. Replication - Three
- 4. Plot size - 6.00x 4.50m²
- 5. Spacing - 90 cm row to row
- 6. Fertilizer - 175 kg N + 100 kg P₂O₅ + 100 kg K₂O ha⁻¹
- 7 Date of planting - 30/12/13
- 8 Date of harvesting - 18/01/15
- 9 Treatments : Sixteen varieties

1. Co 11005	2. Co 11007	3. Co 11012	4. Co 11019
5. Co 11020	6. Co 11021	7. Co 11022	8. Co 11023
9. Co 11024	10. CoM 11085	11. CoM 11086	12. CoM 11087
13. CoN 11073	14. CoN 11074	15. Co 86032	16. Co 99004

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 Midlate

Sr. No.	Genotypes	Early shoot borer	
		Average % Infestation	Reaction
1	Co 11005	4.66	LS
2	Co 11007	2.76	LS
3	Co 11012	6.88	LS
4	Co 11019	5.68	LS
5	Co 11020	8.05	LS
6	Co 11021	2.59	LS
7	Co 11022	2.65	LS
8	Co 11023	4.82	LS
9	Co 11024	4.37	LS
10	CoM 11085	5.00	LS
11	CoM 11086	9.39	LS
12	CoM 11087	2.97	LS
13	CoN 11073	11.02	LS
14	CoN 11074	8.45	LS
15	Co 86032	7.08	LS
16	Co 99004	9.17	LS

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

Grades

LS = Below 15.0
 MS= 15.1 to 30.0
 HS = above 30.0

Table 2: 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 11005	3.33	0.62	LS	3.33	0.41	LS
2	Co 11007	13.33	1.92	LS	3.33	0.38	LS
3	Co 11012	0	0	LS	0	0	LS
4	Co 11019	10.00	0.96	LS	0	0.00	LS
5	Co 11020	0	0	LS	10.00	1.15	LS
6	Co 11021	10.00	1.37	LS	3.33	0.39	LS
7	Co 11022	6.67	0.97	LS	0	0	LS
8	Co 11023	6.67	1.03	LS	3.33	0.41	LS
9	Co 11024	6.67	0.75	LS	13.33	1.31	LS
10	CoM 11085	6.67	0.91	LS	10.00	0.91	LS
11	CoM 11086	0.00	0	LS	13.33	2.03	LS
12	CoM 11087	13.33	2.16	LS	3.33	0.39	LS
13	CoN 11073	0	0	LS	10.00	1.17	LS
14	CoN 11074	13.33	1.79	LS	10.00	1.19	LS
15	Co 86032	16.66	0.42	LS	10.00	1.05	LS
16	Co 99004	3.33	2.30	LS	3.33	0.44	LS

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

Results :

Early Shoot Borer: The data (Table 4) revealed that all the sixteen entries were found less susceptible to early shoot borer.

Scales The data (Table 5) revealed that all the sixteen entries were found less susceptible to scales.

Mealy bugs: The data (Table 5) revealed that all the sixteen entries were found less susceptible to mealy bugs.

The early shoot borer infestation was low ranging from 2.59 to 11.02 % indicating the genotypes are less susceptible

The infestation of scales and mealy bugs was also low recording less than 5 % intensity indicating the genotypes to be less susceptible

Conclusions

622.4 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

General Information

600	Project code	-	AICRP E-2
601.1	Name of Research Station	-	Sugarcane Research Centre, Dr. PDKV, Akola.
601.2	Location of Project	-	Sugarcane Research Centre, Dr. PDKV, Akola.
602	Project title	-	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in IVT Early
603	Priority area – main group	-	Plant protection
	sub group	-	Entomology
603.1	Research approach	-	Applied research
604	Specific area	-	Host plant resistance
605	Duration of project	-	One year
605.1	Date of start	-	2013-14
605.3	Period for which report submitted	-	2014-15

Part II Investigation Profile

610	Principal Investigator	-	
610.1	Name	-	Dr. G. K. Lande
610.2	Designation	-	Assistant Professor
610.3	Address	-	Sugarcane Research Centre, Dr. PDKV, Akola.
611	Co-investigator		
611.1	Name		Dr. N.K.Patke
611.2	Designation		Senior Research Scientist
611.3	Department		Sugarcane Research Centre, Dr. PDKV, Akola.
611.4	Location		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.
611.5	Address		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.

Part III Technical Details

620 Introduction and Objectives

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

621 Project technical profile

621.1	Technical details		
1.	Progressive year	-	First (2014-2015)
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 P₂O₅ + 100 kg K₂O ha⁻¹
 7. Date of planting - 02/01/14
 8. Date of harvesting - 18/01/15

9. Treatment : Sixteen Genotypes

- | | | | |
|--------------|---------------|----------------|----------------|
| 1. Co 11001 | 2. Co 11004 | 3. Co 11016 | 4. Co 11017 |
| 5. Co 11018 | 6. CoM 11081 | 7. CoM 11082 | 8. CoM 11083 |
| 9. CoM 11084 | 10. CoN 11071 | 11. CoN 11072 | 12. CoT 11366 |
| 13. PI 11131 | 14. CoC 671 © | 15. Co 94008 © | 16. Co 85004 © |

Observations recorded

As per experiment No 2

Table 3: Reaction of Sugarcane varieties / genotypes to borers in IVT Early plant

Sr. No.	Genotypes	Early shoot borer	
		Avg. % Infestation	Reaction
1	Co 11001	2.09	LS
2	Co 11004	2.65	LS
3	Co 11016	10.20	LS
4	Co 11017	1.33	LS
5	Co 11018	1.74	LS
6	CoM 11081	7.85	LS
7	CoM 11083	8.44	LS
8	CoM 11082	15.50	MS
9	CoM 11084	3.54	LS
10	CoN 11071	13.90	LS
11	CoN 11072	8.82	LS
12	CoT 11366	8.13	LS
13	PI 11131	2.69	LS
14	CoC 671 ©	4.33	LS
15	Co 94008 ©	2.68	LS
16	Co 85004 ©	8.16	LS

LS = Less susceptible, MS= moderately susceptible and HS = highly susceptible.

Grades

LS = Below 15.0

MS= 15.1 to 30.0

HS = above 30.0

Table 4: Reaction of Sugarcane varieties / genotypes to major pests in IVT Early plant

Sr. No.	Genotypes	Scales			Mealy Bugs		
		% incidence	% intensity	Reaction	% incidence	% intensity	Reaction
1	Co 11001	3.33	0.20	LS	3.33	0.41	LS
2	Co 11004	13.33	1.66	LS	0.00	0.00	LS
3	Co 11016	6.67	0.82	LS	3.33	0.41	LS
4	Co 11017	10.00	1.23	LS	0.00	0.00	LS
5	Co 11018	13.33	2.03	LS	10.00	1.22	LS
6	CoM 11081	6.67	0.80	LS	3.33	0.20	LS
7	CoM 11082	0.00	0.00	LS	3.33	0.40	LS
8	CoM 11083	13.33	1.38	LS	10.00	1.19	LS
9	CoM 11084	3.33	0.63	LS	6.67	0.84	LS
10	CoN 11071	6.67	0.81	LS	3.33	0.41	LS
11	CoN 11072	0.00	0.00	LS	13.33	1.62	LS
12	CoT 11366	13.33	1.86	LS	0.00	0.00	LS
13	PI 11131	10.00	1.00	LS	6.67	0.80	LS
14	CoC 671	0.00	0.00	LS	10.00	0.82	LS
15	Co 94008	0.00	0.59	LS	6.67	0.39	LS
16	Co 85004	6.67	1.02	LS	0.00	0.00	LS

Results :

Early Shoot Borer: The Data (Table 6) revealed that all the entries were found less susceptible to early shoot borer except one entry i.e. CoM11082 which showed moderately susceptible reaction.

Scales The data in Table 7 revealed that all the entries showed less susceptible reactions to scales.

Mealy bugs The data in Table 7 revealed that all the entries showed less susceptible reactions to mealy bugs

Conclusions The early shoot borer infestation was low ranging from 1.33 to 15.50 % As regards ESB infestation, all genotypes falls in the category of Less Susceptible except CoM 11082 this was found moderately susceptible. Sucking pests infestation was low indicating the genotypes tested were less susceptible

622.4 Utility of results obtained so far

As per experiment No 2

Experiment No 3

General Information

600	Project code	-	AICRP E-4.1
601.1	Name of Research Station	-	Sugarcane Research Centre, Dr. PDKV, Akola.
601.2	Location of Project	-	Sugarcane Research Centre, Dr. PDKV, Akola.
602	Project title	-	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in AVT Early plant
603	Priority area – main group	-	Plant protection
	sub group	-	Entomology
603.1	Research approach	-	Applied research
604	Specific area	-	Host plant resistance
605	Duration of project	-	One year
605.1	Date of start	-	2013-14
605.3	Period for which report submitted	-	2014-2015

Part II Investigation Profile

610	Principal Investigator	-	
610.1	Name	-	Dr. G. K. Lande
610.2	Designation	-	Assistant Professor
610.3	Address	-	Sugarcane Research Centre, Dr. PDKV, Akola.
611	Co-investigator		
611. 1	Name		Dr. N.K.Patke
611.2	Designation		Senior Research Scientist
611.3	Department		Sugarcane Research Centre, Dr. PDKV, Akola.
611.4	Location		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.
611.5	Address		Senior Research Scientist Sugarcane Research Centre, Dr. PDKV, Akola.

Part III Technical Details

620 Introduction and Objectives

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

621 Project technical profile

621.1	Technical details		
	1. Progressive year	-	First (2014-2015)
	2. Design	-	Randomized Block Design

3. Replication - Three
4. Plot size - 6.00 x 4.50 m²
5. Spacing - 90 cm row to row
6. Fertilizer - 175 kg N + 100 kg P₂O₅ + 100 kg K₂O ha⁻¹
7. Date of Planting - 21/12/13
8. Date of harvesting - 22-01-2015
9. Treatments : Six genotypes

1) Co 9004	5) Co 94008
2) CoN 9072	6) CoC 671
3) Co 9007	
4) Co 85004	

Observations to be recorded

As per experiment No 2.

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

Sr. No.	Genotypes	Early shoot borer		Mealy Bugs			Scales		
		Avg. % Infestation	Reaction	% incidence	% intensity	Reaction	% incidence	% intensity	Reaction
1	Co 9004	4.21	LS	0.00	0.00	LS	6.67	0.79	LS
2	CoN 9072	8.44	LS	6.67	0.83	LS	13.33	1.24	LS
3	Co 9007	16.91	MS	3.33	0.42	LS	6.67	0.84	LS
4	Co 85004	0.94	LS	3.33	0.21	LS	10.00	1.45	LS
5	Co 94008	8.05	LS	0.00	0.00	LS	6.67	0.79	LS
6	CoC 671	8.63	LS	6.67	0.60	LS	10.00	0.99	LS

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

Scale and Mealy bug

ESB Grades

Grades

LS = Below 15.0

LS = Below 05.0

MS= 15.1 to 30.0

MS= 5.1 to 30.0

HS = above 30.0

HS = above 30.0

Results :

Early Shoot Borer: The Data (Table 8) revealed that all the entries were found less susceptible to early shoot borer except one entry i.e. Co9007 this was moderately susceptible.

Scale insect: The Data (Table 8) revealed that all the entries were found less susceptible to scale insects.

Mealy Bugs: The Data (Table 8) revealed that all the entries were found less susceptible to mealy bugs.

Conclusion

The early shoot borer infestation was low ranging from 0.94 to 16.91 % As regards ESB infestation; all genotypes were found less Susceptible except Co 9007 which was found moderately susceptible.

Sucking pests infestation was low indicating the genotypes tested were less susceptible

622.4 Utility of results obtained so far

As per experiment No 2

PART II

List of ongoing projects to be undertaken during 2015-16.

Project Code	Title of the Projects / Experiments
E-1	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in IVT Early Plant
E-2	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in AVT Early I Plant
E-3	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in AVT Early II Plant
E-4	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in IVT Midlate Plant
E-5	Evaluation of zonal varieties for their reaction against major insect pests of sugarcane in AVT Midlate I Plant