

Research Report 2012-13
Entomology Section, VSI, Pune.

D) ALL INDIA COORDINATED RESEARCH PROGRAMME

- 1. Project no.** : E. 4.1.1 (AICRP'S)
2. Discipline : Agril. Entomology
3. Title of the project : Evaluation of zonal varieties /genotypes for their reaction against major insect pests.
4. Title of experiment : Field screening of sugarcane varieties/genotypes in IVT Early to major pests.
5. Objective : To grade the entries in the trials for their behavior towards damage by key pests in the area.
6. Year of commencement : 1985 – 86 (Continuing)
7. Year of implementation : 2012 -2013(1st year)
8. Source of finance : ICAR/VSI Pune.
9. Project leader and Associate : Shri.R.G.Yadav, Scientific Officer & Head, Entomology
Shri. S.S.Kadam, Agril. Assistant, Entomology
- 10. Details of experiment:**
- a) Treatments** : Eleven (8+3)
1. Co09002, 2.Co09003, 3.Co09004, 4.Co09005, 5.Co09006, 6.Co09007,
7. CoN09071, 8.CoN09072, 9. Co 85004(Std.), 10. Co 94008 (Std.)
and 11.CoC 671 (STD.)
- b) Design** : RBD
c) Replication : Three
d) Type of soil : Heavy
e) Plot size : Gross: 6 m x 6 rows, Net: 5 m x 4 rows.
f) Location : Vasantdada farm, VSI, Pune
g) Date of planting : 09.02.12
h) Date of harvesting : 13.12.12
i) Method of observations:

Early shoot borer: Two middle rows were selected from each plot and total germinated shoots were counted. The shoots affected by early shoot borer showing “dead hearts” were counted. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of dead hearts}}{\text{Total number of shoots}} \times 100$$

The grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 15
Moderately Susceptible (MS)	15.1-30
Highly Susceptible (HS)	above 30

Internode borer: Twenty-five canes were selected randomly from each plot and total no. of internodes and internodes affected due to internode borer in each cane were counted. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Cane})} \times 100$$

$$\% \text{ Intensity} = \frac{\text{Number of affected internodes}}{\text{Total number of internodes}} \times 100$$

$$\text{Infestation index} = \frac{\% \text{ Incidence} \times \% \text{ Intensity}}{100}$$

The grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 20
Moderately Susceptible (MS)	20.1-40
Highly Susceptible (HS)	above 40

Scale insect: Twenty five canes were selected randomly from each plot and affected internodes due to Scale insect in each cane were counted. Calculated the % incidence as per following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Cane})} \times 100$$

Grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 10
Moderately Susceptible (MS)	10.1-35
Highly Susceptible (HS)	above 35

Mealy bug / Spittle bug: Twenty five canes were selected randomly from each plot and affected internodes due to Mealy bug /Spittle bug in each cane were counted. Calculated the %incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Cane})} \times 100$$

Grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 5
Moderately Susceptible (MS)	5.1-30
Highly Susceptible (HS)	above 30

Root borer: Twenty five canes were selected randomly from each plot and counted affected number of canes due to root borer. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Cane})} \times 100$$

Grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 15
Moderately Susceptible (MS)	15.1-30
Highly Susceptible (HS)	above 30

Top shoot borer: At early stage and after four months of planting the observation were recorded as per early shoot borer and root borer, respectively. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Cane})} \times 100$$

Grade of infestation was given as under,

Grade	% Incidence
Less Susceptible (LS)	below 10.00
Moderately Susceptible (MS)	10.1-20.00
Highly Susceptible (HS)	above 20.00

Sugarcane Woolly Aphid: Five canes were selected from each plot and observed incidence of SWA on top, middle and bottom leaf in each cane average percent incidence per leaf was calculated by considering the leaf area covered by nymphs and adults of SWA and given grades viz. No aphids on leaf (0 grade), less than 25% leaf area covered by aphid population (1 grade), 25 % leaf area covered by aphid population (2 grade), 25 to 50 % leaf area covered by aphid population (3 grade)and more than 50 % leaf area covered by aphid population (4 grade).

Grade	% Leaf area covered by aphid colony
0 (Resistant)	Nil
1 (Moderately Resistant)	less than 25
2 (Moderately Susceptible)	25
3 (Susceptible)	25-50
4 (Highly Susceptible)	more than 50

11. Results:

The data presented in table 1 indicated that the % incidence of early shoot borer was above 30 % in Co85004 (44.36%), while in other varieties/genotypes screened it was in the range of 15.0 to 30.0 %. The % incidence of internode borer was maximum 16.67 % in Co09005, while in other varieties / genotypes screened it was bellow 15 %.The

intensity of internode borer was maximum 1.15 % in Co09005, while in other varieties / genotypes screened it was bellow 1.0 %. The infestation index of internode borer was bellow 1.00 in all varieties / genotypes screened.

12. Conclusion:

The % incidence of early shoot borer was above 30 % in Co85004 (44.36%), while in other varieties / genotypes screened it was in the range of 15.0 to 30.0 %. The % incidence and intensity of internode borer was maximum 6.67 % and 1.15 % in Co09005 respectively.

Title 1: Mean % incidence/ intensity of major insect pests in IVT (Early)

Sr. No.	Variety	Early shoot borer	Internode borer		
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index
1	Co 09002	28.69 (31.91)	3.33 (8.84)	0.22	0.02
2	Co 09003	21.03 (27.27)	3.33 (8.84)	0.21	0.02
3	Co 09004	23.16 (27.60)	6.67 (11.55)	0.41	0.08
4	Co 09005	19.13 (25.88)	16.67 (23.36)	1.15	0.25
5	Co 09006	22.46 (27.82)	3.33 (8.84)	0.20	0.02
6	Co 09007	15.23 (22.90)	6.67 (13.64)	0.37	0.03
7	CoN 09071	15.08 (22.57)	3.33 (8.84)	0.22	0.02
8	CoN 09072	19.65 (25.75)	6.67 (13.64)	0.81	0.07
9	Co 85004 (Std.)	44.36 (41.76)	3.33 (8.84)	0.21	0.02
10	Co 94008 (Std.)	25.04 (29.12)	10.0 (18.43)	0.81	0.07
11	CoC 671 (Std.)	29.51 (32.72)	13.33 (18.56)	0.70	0.21
	SE ±	4.24	5.77		
	CD at 5 %	NS	NS		
	CV				

- 1. Project No** : E 4.1.2
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/ genotypes in AVT Early (I plant) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13 (1st Year)
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant. Entomology
- 10. Details of experiment:**
- a) Treatments** : Five (2+3)
1. Co08001, 2.Co08121, 3. Co85004 (Std.), 4. Co94008 (Std.) and 5. CoC671 (Std.)
- b. Design** : RBD
- c) Replications** : four
- d) Type of soil** : Heavy
- e) Plot size: Gross** : 6M. X 2.4 M² **Net:** 5 M X 2.4 M²
- f) Location** : Vasantdada farm
- g) Date of planting** : 11.02.12
- h) Date of harvesting** : 21.02.13
- i) Method of observations** : The observations were recorded as given in trial E.4.1.1

11. Results:

The data in Table 2 revealed that the per cent incidence of early shoot borer was above 30.0 % in all varieties/genotypes screened and it was minimum 47.48 % in CoC671. The % incidence of internode borer was above 20 % in CoC671 and in other varieties/genotypes screened it was bellow 20.0 %.The % intensity of internode borer was maximum 2.70 % in CoC671, while it was minimum 0.19% in VSI08121. The infestation index of internode borer was maximum 1.42% in CoC671 while in other varieties / genotypes it was bellow 1.00%.

12. Conclusion:

The % incidence of early shoot borer was above 30 % in all varieties / genotypes screened. The % incidence of internode borer was above 20.0 % in CoC671 (27.50%), while in other varieties / genotypes screened it was bellow 20.0 %.

Table 2 : Mean % incidence/ intensity of major pests in AVT (I PL.) Early

Sr. No.	Variety	Early shoot borer	Internode borer		
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index
1	Co 08001	53.20 (46.85)	15.0 (22.50)	1.33	0.22
2	VSI 08121	52.75 (46.36)	2.50 (7.65)	0.19	0.01
3	Co 85004 (Std.)	51.78 (46.64)	10.0 (15.31)	0.72	0.14
4	Co 94008 (Std.)	69.57 (56.56)	10.0 (14.93)	1.18	0.30
5	CoC 671 (Std.)	47.48 (43.80)	27.50 (28.12)	2.70	1.42
	SE ±	5.33	5.17		
	CD at 5 %	NS	NS		
	CV				

- 1. Project No** : E 4.1.3
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/genotypes in AVT Early (II plant) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13 (2nd Year)
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant. Entomology
- 10. Details of experiment:**
- a. Treatments** : Seven (4+3)
1. Co07012, 2.Co07015, 3.CoN07071, 4.PI07131, 5.Co85004 (Std.), 6.Co94008 (Std.) and 7.CoC671 (Std.)
- b. Design** : RBD
- c. Replication** : Three
- d. Type of soil** : Heavy
- e. Plot size** : Gross 6M x 2.4 M² Net 5 M x 2.4 M²
- f. Location** : Vasantdada farm, VSI, Pune
- g) Date of Planting** : 12.02. 12
- h) Date of Harvesting** : 21.02.13
- i) Method of observations:** The observations were recorded as given in trial E.4.1.1

11. Results:

The data presented in table 3 indicated that the % incidence of early shoot borer was above 30 % in Co85004 (33.10 %) and Co94008 (30.67 %), while it was significantly low and bellow 15 % in Co07012 (14.20%), Co7015 (10.97%) and CoC671 (10.85%). The % incidence of inernode borer was maximum 16.67 % in Co07015, CoN07071, PI07131, Co94008 and CoC671, while Co07012 and Co85004 were free from it. The % intensity of internode borer was found maximum 1.42 in PI07131. In all varieties / genotypes screened infestation index of internode borer was bellow 1.0. The % incidence of mealy bug was above 30.0 % in Co 85004 (33.33 %), while it was significantly low in Co07012 (3.33%) and CoN07071 (3.33%), Co94008 (16.67%) and Co07015, PI07131 and CoC671 were free from it.

The pooled data in table 4 reveled that the % incidence of early shoot borer was above 30 % in Co94008 (40.93%), while in other varieties / genotypes screened it was significantly low and bellow 15 % in Co07012 (12.50%) and Co07015 (11.20%).The % incidence of internode borer was bellow 20.00 % in all varieties / genotypes screened. The intensity of internode borer was maximum 1.98 % in PI07131 and minimum 0.27% in Co85004. The infestation index of internode borer was bellow 1.0 in all varieties / genotypes screened. The % incidence of mealy bug was above 30 % in Co85004 (31.11%), While it was minimum 6.67 % in Co94008.

12. Conclusion:

Out of 7 varieties / genotypes screened Co07012 and Co07015 was less susceptible to early shoot borer. All varieties / genotypes screened were less susceptible to internode borer. Co85004 was highly susceptible to mealy bug, while other varieties / genotypes screened were moderately susceptible to mealy bug.

Title 3: Mean % incidence/intensity of major insect pests in AVT II Plant (Early)

Sr. No.	Variety	Early shoot borer	Internode borer			Mealy Bug
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index	Mean % Incidence
1	Co 07012	14.20 (20.25)	0.0(4.05)	0.0	0.0	3.33(8.84)
2	Co 07015	10.97 (19.26)	16.67 (23.85)	1.57	0.29	0.0 (4.05)
3	CoN 07071	28.22(31.79)	16.67 (23.36)	1.22	0.26	3.33 (8.84)
4	PI 07131	29.01(31.95)	16.67 (21.27)	1.42	0.36	0.0 (4.05)
5	Co 85004 (Std.)	33.10(33.73)	0.0 (4.05)	0.0	0.0	33.33(35.0)
6	Co 94008 (Std.)	30.67(32.92)	16.67 (23.36)	1.55	0.28	16.67(21.27)
7	CoC 671 (Std.)	10.85(18.87)	16.67 (21.27)	1.20	0.29	0.0 (4.05)
	SE ±	3.81	5.93			4.81
	CD at 5 %	11.56 *	NS			14.59***
	CV	24.65				54.52

Title 4: Mean % incidence/ intensity of major insect pests in AVT Early Pooled.

Sr. No.	Variety	Early Shoot borer		Internode borer				Mealy Bug	
		Mean % incidence	Grade	Mean % incidence	Grade	Mean% intensity	Infestation index	Mean % incidence	Grade
1	Co 07012	12.51 (20.52)	LS	4.44 (9.84)	LS	0.39	0.08	17.78 (23.06)	MS
2	Co 07015	11.20 (19.20)	LS	8.89 (16.52)	LS	0.86	0.13	20.0 (23.47)	MS
3	CoN07071	20.79 (26.89)	MS	6.67 (12.88)	LS	0.47	0.09	26.66 (28.98)	MS
4	PI 07131	18.53 (25.11)	MS	12.22 (20.15)	LS	1.98	0.19	11.11 (15.92)	MS
5	Co 85004 (Std.)	20.17 (26.16)	MS	3.33 (9.84)	LS	0.27	0.04	31.11 (39.69)	HS
6	Co 94008 (Std.)	40.93 (39.69)	HS	13.33 (20.39)	LS	1.06	0.24	6.67 (12.88)	MS
7	CoC 671 (Std.)	20.19 (26.33)	MS	14.45 (22.21)	LS	1.20	0.28	13.33 (18.56)	MS
	SE ±	3.49		3.61				6.55	
	CD at 5 %	10.58*		NS				NS	
	CV	23.22							

Note:LS-Less susceptible, MS-Moderately Susceptible and HS-Highly Susceptible

- 1. Project No** : E 4.1.4
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/genotypes in AVT Early (Ratoon) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant. Entomology
- 10. Details of experiment:**
- a. Treatments** : Seven (4+3)
1. Co07012, 2.Co07015, 3.CoN07071, 4.PI07131, 5.Co85004 (Std.), 6.Co94008 (Std.), 7.CoC671 (Std.),
- b. Design** : RBD
- c. Replication** : Three
- d. Type of soil** : Heavy
- e. Plot size** : Gross 7M x 1.8 M² Net 6 M x 1.8 M²
- f. Location** : Vasantdada farm, VSI, Pune
- g) Date of rationing** : 27.02.12
- h) Date of Harvesting** : 16.02.13
- i) Method of observations** : The observations were recorded as given in trial E.4.1.1

11. Results:

The data in Table 5 indicated that % incidence of early shoot borer was above 30 % in Co94008 (40.96%) and bellow 15 % PI 07131(13.75%), CoN07071 (13.74%), Co85004 (10.37%) and Co07012 (7.79%). The % incidence of internode borer was bellow 20 % in all varieties / genotypes screened and Co07012 and Co07071 was free from it. The % intensity of internode borer was noted maximum 1.08% in CoC671, while in other varieties / genotypes screened it was bellow 1.00 %. The infestation index of internode borer was bellow 1.00 in all varieties / genotypes screened. The incidence of mealy bug was maximum 63.33% in Co85004 and minimum 26.67% in Co07015, while Co94008 was free from it.

12. Conclusion:

The % incidence of early shoot borer was bellow 15 % in PI07131 (13.75%), CoN07071 (13.74%), Co 85004 (10.37%) and Co07012 (7.79%). The % incidence of internode borer was bellow 20 % in all varieties / genotypes screened. The incidence of mealy bug was minimum 26.67% in Co07015, while Co94008 was free from it.

Title 5: Mean % incidence/ intensity of major insect pests in AVT Ratoon (Early)

Sr. No.	Variety	Early shoot borer	Internode borer			Mealy bug
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index	Mean % incidence
1	Co 07012	7.79 (15.9)	0.00 (4.05)	0.0	0.0	36.67 (36.14)
2	Co 07015	16.55 (23.22)	6.67 (13.64)	0.57	0.05	26.67 (30.79)
3	CoN 07071	13.54 (20.79)	0.00 (4.05)	0.0	0.0	33.33 (33.93)
4	PI 07131	13.75 (21.12)	6.67 (13.64)	0.55	0.05	30.0 (29.34)
5	Co 85004(Std.)	10.35 (18.27)	3.33 (8.84)	0.24	0.02	63.33 (53.86)
6	Co 94008(Std.)	40.96 (36.99)	3.33 (8.84)	0.23	0.02	0.00 (4.05)
7	CoC 671(Std.)	22.65 (28.17)	10.0 (16.35)	1.08	0.19	30.0 (29.43)
	SE₊	6.63	4.51			8.17
	CD at 5 %	NS	NS			NS
	CV					

- 1. Project no.** : E. 4.1.5 (AICRP'S)
- 2. Discipline** : Agril. Entomology
- 3. Title of the project** : Evaluation of zonal varieties /genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties in IVT Midlate to major pests.
- 5. Objective** : To grade the entries in the trials for their behavior towards damage by key pests in the area.
- 6. Year of commencement** : 1985 – 86 (Continuing)
(Change of varieties as per AICRP'S programme)
- 7. Year of implementation** : 2012 -2013(1st year)
- 8. Source of finance** : ICAR/VSI Pune.
- 9. Project leader and Associate** : Shri.R.G.Yadav, Scientific Officer & Head, Entomology
Shri.S.S.Kadam, Agril.Assistant, Entomology
- 10. Details of experiment:**
- a) Treatments** : Twelve (10+2)
1. Co09009, 2.Co09010, 3. Co09012, 4. Co09013, 5. Co09014, 6. Co02040, 7.CoN 09073, 8.CoN09074, 9.CoSnk05102, 10. CoVSI09121, 11. Co86032 (Std.) and 12. Co99004 (Std.)
- b) Design** : RBD
- c) Replication** : Three
- d) Type of soil** : Heavy
- e) Plot size** : Gross 6 m x 6 rows, Net 5 m x 4 rows .
- f) Location** : Vasantdada farm/VSI,Pune
- g) Date of planting** : 10.02.12
- h) Date of harvesting** : 20.02.13
- i) Method of observations:** The observations were recorded as given in trial E.4.1.1

11. Results:

The data presented in Table 6 indicated that % incidence of early shoot borer was maximum in CoN09074 (40.74%) and CoN09073 (34.65%), while it was significantly low and bellow 15.0 % in CoSnk05102 (13.41%), Co99004 (12.36%) and Co09012 (6.35%). The % incidence of internode borer was above 20 % in Co09010 (26.67%), while Co09009 and CoN09074 were free from it. The intensity of internode borer was found maximum 1.70% in Co09010. The infestation index of internode borer was bellow 1.00 in all varieties/ genotypes screened.

12. Conclusion:

The % incidence of early shoot borer was significantly low and bellow 15.0 % in CoSnk05102 (13.41%), Co99004 (12.36%) and Co09012 (6.35%). The varieties viz. Co09009 and CoN09074 was free from internode borer infestation.

Title 6: Mean % incidence/ intensity of major insect pests in IVT (Midlate)

Sr. No.	Variety	Early shoot borer	Internode borer		
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index
1	Co 09009	21.09 (27.18)	0.0 (4.05)	0.00	0.0
2	Co 09010	21.13(57.32)	26.67 (30.29)	1.7	0.56
3	Co 09012	6.35 (14.03)	20.0 (22.49)	1.2	0.53
4	Co 09013	19.38 (25.93)	3.33 (8.84)	0.21	0.02
5	Co 09014	28.19 (32.00)	13.33 (19.06)	1.49	0.09
6	Co 02040	15.46 (22.91)	16.67 (21.27)	0.97	0.25
7	CoN 09073	34.65 (35.83)	6.67 (11.55)	0.38	0.08
8	CoN 09074	40.80 (39.42)	0.0 (4.05)	0.0	0.0
9	CoSnk 05102	13.41(20.77)	10.0 (16.35)	1.01	0.16
10	CoVSI 09121	20.05(26.30)	13.33 (21.14)	1.18	0.15
11	Co 86032 (Std.)	33.92 (35.56)	6.67 (11.55)	0.46	0.09
12	Co 99004 (Std.)	12.36 (19.72)	6.67 (11.55)	0.44	0.09
	SE \pm	3.46	6.59		
	CD at 5 %	10.14**	NS		
	CV	21.99			

- 1. Project No** : E 4.1.6
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/genotypes in AVT Midlate (I plant) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13 (1st Year)
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant. Entomology
- 10. Details of experiment:**
- a) Treatments** : **Seven (5+2)**
1. Co08008, 2.Co08009, 3.Co08016, 4.Co08020, 5.Snk08101, 6.Co86032(Std.) and 7.Co99004 (Std.)
- b) Design** : RBD
- c) Replication** : Three
- d) Type of soil** : Heavy
- e) Plot size** : Gross 6M x 2.4 M²Net 5 M x 2.4 M²
- f) Location** : Vasantdada farm, VSI, Pune
- g) Date of Planting** : 11.02.12
- h) Date of Harvesting** : 21.02.13
- i) Method of observations** : The observations were recorded as given in trial E.4.1.1

11. Results:

The data presented in Table 7 indicated that the % incidence of early shoot borer was maximum in Co08009 (51.98%) and Co08008 (51.62%), while in other varieties / genotypes it was above 30.0%. The % incidence of internode borer was bellow 20.0% in all varieties / genotypes screened, while Co08016 was free from it. The intensity of internode borer was maximum 1.22 % in Co099004, while in other varieties / genotypes screened it was bellow 1.0%. The infestation index of internode borer was bellow 1.0 in all varieties / genotypes screened.

12. Conclusion:

The % incidence of early shoot borer was above 30 % in all varieties / genotypes screened. The % incidence of internode borer was bellow 20 % in all varieties / genotypes screened.

**Title 7: Mean % incidence/ intensity of major insect pests in
AVT I Plant (Midlate)**

Sr. No.	Variety	Early shoot borer	Internode borer		
		Mean % incidence	Mean % incidence	Mean % intensity	Infestation index
1	Co 08008	51.62 (45.92)	10.0 (13.77)	0.72	0.21
2	Co 08009	51.98 (46.06)	3.33 (8.84)	0.28	0.03
3	Co 08016	46.08 (42.06)	0.0 (4.05)	0.0	0.0
4	Co 08020	35.75 (35.46)	10.0 (16.35)	0.53	0.13
5	CoSnk 08101	42.55 (40.69)	3.33 (8.84)	0.22	0.02
6	Co 86032 (Std.)	49.48 (44.68)	3.33 (8.84)	0.27	0.02
7	Co 99004 (Std.)	51.21 (45.69)	10.0 (16.35)	1.22	0.22
	SE +	4.55	6.36		
	CD at 5 %	NS	NS		
	CV				

- 1. Project No** : E 4.1.7
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/genotypes in AVT Midlate (II plant) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant, Entomology
- 10. Details of experiment** :
- a) Treatments** : **Eight (6+2)**
1. Co07006, 2. Co07007 , 3.Co07008, 4.Co07009, 5.Co07010, 6.CoSnk07103, 7.Co86032 (Std.) & Co99004 (Std.).
- b) Design** : RBD
- c) Replication** : Three
- d) Type of soil** : Heavy
- e) Plot size** : Gross 6M x 2.8 M²Net 5 M x 2.4 M²
- f) Location** : Vasantdada farm, VSI, Pune
- g) Date of Planting** : 12.02.12
- h) Date of Harvesting** : 21.02.13
- i) Method of observations:** The observations were recorded as given in trial E.4.1.1

11. Results:

The data presented in table 8 indicated that the % incidence of early shoot borer was maximum in Co07006 (44.27 %) and CoSnk07103 (42.20%), while it was minimum in Co07009 (28.13%) and Co86032 (29.62%). The % incidence of internode borer was bellow 20.0% in all varieties/genotypes screened. The intensity of internode borer was maximum in CoSnk07103 (1.12%) and Co07006 (1.01%), while in other varieties / genotypes it was bellow 1.0%. The infestation index of internode borer was bellow 1.00 in all varieties / genotypes screened. The incidence of mealy bug was maximum 10.0% in CoSnk07103, while it was minimum 3.33 in Co07007, Co86032 and Co99004.

The pooled data in table 9 shows that incidence of early shoot borer was maximum in Co 86032 (27.63%) and Co07008 (25.02%), while it was minimum in Co99004 (15.88%) and Co07010 (15.37%). The % incidence of internode borer was bellow 20.0% in all varieties /genotypes screened. The % intensity of internode borer was maximum in Co07010(1.66%) and Co07009 (1.05%), while in other varieties / genotypes screened it was bellow 1.0%.The infestation index of internode borer was bellow 1.0 in all varieties / genotypes screened. The incidence of mealy bug was maximum 33.33 in Co07010, while it was minimum 6.67% in CoSnk07103 and Co86032.

12. Conclusion:

All 8 varieties / genotypes screened were moderately susceptible to early shoot borer and less susceptible internode borer. Co07010 was highly susceptible to mealy bug, while other varieties / genotypes screened were moderately susceptible to mealy bug.

Title 8: Mean % incidence/ intensity of major insect pests in AVT II Plant (Midlate)

Sr. No.	Variety	Early shoot bore	Internode borer			Mealy Bug
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index	Mean % Incidence
1	Co 07006	44.27(41.64)	13.33(21.14)	1.01	0.15	6.67(11.55)
2	Co 07007	38.80 (38.44)	6.67 13.64)	0.47	0.04	3.33 (8.84)
3	Co 07008	33.14 (35.030)	10.0(13.77)	0.69	0.21	6.67 13.64)
4	Co 07009	28.13 (32.02)	6.67 11.55)	0.45	0.09	6.67(11.55)
5	Co 07010	33.05 (34.41)	10.0(16.35)	0.65	0.10	6.67(13.64)
6	CoSnk 07103	42.20 (40.35)	10.0 16.35)	1.12	0.16	10.0(16.35)
7	Co 86032 (Std.)	29.62 (32.16)	13.33(21.14)	0.94	0.14	3.33 (8.84)
8	Co 99004 (Std.)	30.78 (33.16)	13.33 (21.14)	0.98	0.14	3.33 (8.84)
	SE ±	4.65	5.98			5.75
	CD at 5 %	NS	NS			NS
	CV					

Title 9: Mean % incidence/ intensity of major insect pests in AVT (Midlate) Pooled

Sr. No	Variety	Early Shoot borer		Internode borer				Mealy Bug	
		Mean % incidence	Grade	Mean % incidence	Grade	Mean% intensity	Infestation index	Mean % incidence	Grade
1	Co 07006	21.96 (26.31)	MS	13.33 (20.98)	LS	0.97	0.31	25.56 (28.84)	MS
2	Co 07007	24.30 (28.58)	MS	11.11 (19.26)	LS	0.78	0.11	21.11 (25.62)	MS
3	Co 07008	25.02 (29.87)	MS	6.67 (14.63)	LS	0.43	0.10	13.33 (20.98)	MS
4	Co 07009	19.88 (25.95)	MS	12.22 (18.85)	LS	1.05	0.25	18.89 (24.91)	MS
5	Co 07010	15.37 (21.06)	MS	8.89 (16.78)	LS	1.66	0.19	33.33 (33.66)	HS
6	CoSnk 07103	21.58 (26.55)	MS	7.78 (14.63)	LS	0.62	0.09	6.67 (14.63)	MS
7	Co 86032 (Std.)	27.63 (31.60)	MS	7.78 (14.63)	LS	0.49	0.06	6.67 (12.88)	MS
8	Co 99004 (Std.)	15.88 (22.48)	MS	8.89 (16.78)	LS	0.63	0.09	8.89 (15.86)	MS
	SE ±	3.00		3.39				4.19	
	CD at 5 %	NS		NS				12.71 *	
	CV							32.73	

Note : LS-Less susceptible, MS-Moderately Susceptible and HS-Highly Susceptible

- 1. Project No** : E 4.1.8
- 2. Discipline** : Agril Entomology
- 3. Title of project** : Evaluation of zonal varieties/ genotypes for their reaction against major insect pests.
- 4. Title of experiment** : Field screening of sugarcane varieties/ genotypes in AVT Midlate (Ratoon) to major pests.
- 5. Objective** : To grade the entries in the trial for their behavior towards damage by key pest in the area.
- 6. Year of commencement** : 1982 – 83
(Change of varieties as per AICRP'S Programme)
- 7. Year of implementation** : 2012-13
- 8. Source of finance** : ICAR/VSI, Pune
- 9. Project leader and Associate** : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
Shri. Kadam S.S., Agril Assistant. Entomology
- 10. Details of experiment:**
- a) Treatments** : Eight (6+2)
1. Co07006, 2. Co07007, 3. Co07008, 4. Co07009, 5. Co07010, 6. CoSnk07103, 7. Co86032 (Std.) & 8. Co99004 (Std.).
- b) Design** : RBD
- c) Replication** : Three
- d) Type of soil** : Heavy
- e) Plot size** : Gross 7M x 1.8 M²Net 6 M x 1.8 M²
- f) Location** : Vasantdada farm, VSI, Pune
- g) Date of Rationing** : 27.02.12
- h) Date of Harvesting** : 16.02.13
- i) Method of observations** : The observations were recorded as given in trial E.4.1.1

11. Results:

The data presented in table 10 indicated that the % incidence of early shoot borer was above 30.0% in Co86032 (32.79%) and bellow 15.0% in Co07008 (11.48%), Co07010 (10.53%), CoSnk07103 (9.60%) and Co99004 (9.00%). The % incidence of internode borer was bellow 20.0% in all varieties/genotypes screened, while CoSnk 07103 and Co86032 was free from it. The % intensity of internode borer was maximum 1.13 % in Co07007, while in other varieties/genotypes screened it was bellow 1.0%. The infestation index of internode borer was bellow 1.00 in all varieties/ genotypes screened. The incidence of mealy bug was found maximum in Co07010 (60.00%) and Co07006 (50.00 %), while it was minimum in CoSnk07103 (6.67%).

12. Conclusion:

The % incidence of early shoot borer was found bellow 15.0% in Co07008 (11.48%), Co07010 (10.53%), CoSnk07103 (9.60%) and Co99004 (9.00%). The % incidence of internode borer was bellow 20 % in all varieties/genotypes screened. The incidence of mealy bug was minimum 6.67 % in CoSnk07103.

Title 10: Mean % incidence/ intensity of major insect pests in AVT Ratoon (Midlate)

Sr. No.	Variety	Early shoot borer	Internode borer			Mealy Bug
		Mean % incidence	Mean % incidence	Mean% intensity	Infestation index	Mean % Incidence
1	Co 07006	16.08 (22.55)	6.67 (13.64)	0.22	0.02	50.0 (45.29)
2	Co 07007	25.92 (30.48)	13.33 (21.14)	1.13	0.17	33.33 (34.14)
3	Co 07008	11.48 (19.27)	3.33 (8.84)	0.20	0.02	20.0 (23.49)
4	Co 07009	22.33 (27.01)	3.33 (8.84)	0.25	0.02	30.0 (33.00)
5	Co 07010	10.53 (21.35)	3.33 (8.84)	0.22	0.02	60.0 (51.14)
6	CoSnk 07103	9.60 (17.18)	0.0 (4.05)	0.0	0.0	6.67 (13.64)
7	Co 86032 (Std.)	32.79 (33.97)	0.0 (4.05)	0.0	0.0	16.67 (23.86)
8	Co 99004 (Std.)	9.00 (17.22)	10.0 (16.35)	0.73	0.12	20.0 (22.50)
	SE₊	5.38	4.05			7.87
	CD at 5 %	NS	NS			NS
	CV					

1. **Project no.** : E. 28 (AICRP's)
 2. **Discipline** : Agril. Entomology
 3. **Title of the project** : Survey and surveillance of sugarcane insect pests.
 4. **Title of experiment** : Survey and surveillance of sugarcane insect pests.
 5. **Objective** : To identify the key insect pests of sugarcane in the area and their natural enemies..
 6. **Year of commencement** : 2003-04
 7. **Year of implementation** : 2012 –2013
 8. **Source of finance** : ICAR/VSI, Pune.
 9. **Project leader and Associate** : Shri.R.G.Yadav, Scientific Officer & Head, Entomology. Shri.S.S.Kadam, Agril.Assistant, Entomology

10. Method of observations:

Termite: Extent of damage recorded by digging 5% row length of two rows and data on % sett damaged, bud damaged, sett end damaged, shoots /cane damaged was reported.

Shoot Borer: i) Per cent incidence (based on dead hearts)

Internode borer: Per cent incidence recorded by examining 100 canes at five places.

Top shoot borer: Per cent incidence at 5th and 7th month after planting and at harvest.

Pyrilla: Population of nymph, adult and egg mass recorded from a unit of 10 canes (30 leaves), and calculated average per leaf.

White fly: Population of nymph and puparia recorded from a unit of 10 canes (30 leaves), and calculated average population cm².

Sugarcane woolly aphid: Ten canes were selected from each plot and observed incidence of SWA on top, middle and bottom leaf in each cane and average per cent incidence per leaf was calculated by considering the per cent leaf area covered by nymphs and adults of SWA as per grades viz. no aphids on leaf (0 grade), less than 25 % (1 grade), 25% (2 grade), 25 to 50 % (3 grade) and more than 50 % (4 grade).

Scale insect / Mealy bug: Per cent incidence / intensity was calculated by examining 100 canes at five places.

White grub: Recorded grub population by digging one square meter area. Calculated population per ha.

11. Results

The % incidence of early shoot borer was in the range of 0.0 to 28.92 %. The % incidence and intensity of mealy bug was found 40.0 % and 5.73% respectively in ratoon crop of Co86032 variety. The % incidence and intensity of Scale insect was noticed maximum 60.00 % and 37.70 % respectively in ratoon crop of Co86032 variety. The % incidence and intensity of internode borer was in the range of 0.00 to 20.00 % and 0.00 to 3.22 % respectively (Table11).

12. Conclusion:

Early shoot borer, Mealy bug, Scale insect and Internode borer were noticed as major pests of sugarcane ratoon crop in the area of operation of Karmyogi Shankarrao Patil SSK ltd. Indapur Dist Pune.

Table 11: % incidence /intensity of major pests at Karmyogi Shankarrao Patil SSK ltd. Indapur, Dist. Pune.

Sr. No.	Name of the Farmer	Village	Variety	Date of planting/ ratoon	Name of the Pest							
					Early shoot borer	Mealy bug		Scale insect		Internode borer		
						% Inci.	% inci.	% inten.	% inci.	% inten.	% inci.	% inten.
1	Sh. Narute Sahdev Sopan	Shirsodi	Co 86032	Jan13 (R)	0.0							
2	Shu. Bhalekar Aashadevi Haridas	Sugaon	Co 86032	16.12.12 (R)		40.0	5.73	60.0	37.70	20.0	0.81	
3	Shu. Jadhav Sulochana Aanta	Sugaon	Co 86032	Nov 12 (R)	2.79							
4	Sou. Devkar Vatsala Kundalik	Sugaon	CoC 671	20.11.11				60.0	11.02			
5	Sh. Devkar Madhav Vaman	Sugaon	Co 86032	16.11.12 (R)	25.0							
6	Sh. Patil Harshvardhan	Kalashi	Co 86032	Nov 12 (R)	5.21							
7	Sh. Patil Harshvardhan	-do-	CoM265	Nov.12 (R)	1.85							
8	Sh. Shiryawaishi	-do-	Co 86032	Oct.12	1.75							
9	Sh. Bongane Bharat Manik	Gangav alan	Co 86032	15.07. 12		0	0	0	0	20.0	2.29	
10	Sh. Kale Shubhash B.	Gagoti, Kalthan	Co 86032	Nov.12	2.84							
11	Sh. Jadhav Tukaran Pandurang	Kalthan	Co 86032	15.07.12		0	0	0	0	10.0	1.28	
12	Sh. Jadhav Tukaran Pandurang	Kalthan	Co 86032	Dec.12 (R)	28.92							
13	Sh. Misal Laxman Satva	Babhulg aon	CoC 671	08.12.12	1.28							
14	Sh.Aasabe Satish Devchand	-do-	Co86032	15.07.12		0	0	0	0	20.0	3.22	
15	Sh. Gurgude Bhaskar Shubhash	-do-	CoVSI 03102	Nov.12	19.10							
16	Sh. Gurguda Vikas Narayan	-do-	Co86032	18.07.12		0	0	0	0	0	0	
17	Sh. Devkar Balbhim Pandurang	-do-	Co 86032	July 12		0	0	0	0	0	0	
18	Sh. Devkar Sharad Bramhdev	Hingan gaon	Co 86032	Nov.12	0.00							
19	Sh. Devkar Sharad Bramhdev	Hingan gaon	Co 86032	15.07.12		0	0	0	0	0	0	
20	Sh. Sarde Vaman Ravsaheb	Sardew adi	CoVSI 03102	Nov 12	3.01							

1. No. of experiment : E. 30 (AICRP's)
2. Discipline : Agril. Entomology
3. Title of the project : Monitoring of insect pests and bio agents in sugarcane agro- ecosystem.
4. Title of experiment : Monitoring of insect pests and bio agents in sugarcane agro-ecosystem.
5. Objective : To monitor the key insect pests and natural enemies in the area.
6. Year of commencement : 2006-2007
7. Year of implementation : 2012 –2013
8. Source of finance : ICAR/VSI Pune.
9. Project leader and Associate : Shri.R.G.Yadav, Scientific Officer & Head, Entomology
Shri.S.S.Kadam, Agril.Assistant, Entomology
10. Details of Experiment
- a. Location : Vasantdada Farm, VSI, Pune
- b. Variety : CoM0265
- c. Date of Planting : 06.02.12
- d. Date of Harvesting : Jan.13 (for Seed)

11. Method of observation:

Early shoot borer: Selected 10 meters length, 3 rows at random and counted total number of shoots and shoots affected by early shoot borer (dead hearts). Calculated % incidence as per following formula.

$$\% \text{ Incidence} = \frac{\text{Number of dead hearts}}{\text{Total number of shoots}} \times 100$$

Internode borer: Twenty five canes were selected randomly from each plot and total no. of internodes and internodes affected due to internode borer in each cane were counted. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Canes})} \times 100$$

$$\% \text{ Intensity} = \frac{\text{Number of affected Internodes}}{\text{Total no of internodes}} \times 100$$

$$\text{Infestation index} = \frac{\% \text{ Incidence} \times \% \text{ Intensity}}{100}$$

Mealy bug: Twenty five canes were selected randomly from each plot and total no. of internodes and internodes affected due to internode borer in each cane were counted. Calculated the % incidence as per the following formula,

$$\% \text{ Incidence} = \frac{\text{Number of affected canes}}{25(\text{Canes})} \times 100$$

$$\% \text{ Intensity} = \frac{\text{Number of affected Internodes}}{\text{Total no of internodes}} \times 100$$

12. Results and Discussion

The per cent incidence of early shoot borer was maximum 17.10 % in April 2012 (Table12) .The incidence of internode borer was maximum 12.00% in July12 & August 12.The intensity of internode borer was maximum 3.57 % in July 12 and infestation index of internode borer was maximum 0.43 in July 12.The incidence of mealy bug was observed 8.00% only in December 12 and intensity of mealy bug was observed 0.38% only in December 12.

13. Conclusion

The % incidence of early shoot borer noticed maximum 17.10 % in April 12. The % incidence of internode borer was noticed maximum 12.00% in the month of July12 & August 12. The incidence and intensity of mealy bug was observed 8.00% and 0.38 % respectively only in December 2012.

Table 12: The % incidence / intensity of major insect pests during 2012-13.

Sr. No.	Month	Early shoot borer	Internode borer			Mealy bug	
		% incidence	% incidence	% intensity	Infestation index	% incidence	% intensity
1	March 12	0.73					
2	April 12	17.10					
3	May 12	12.49					
4	June 12	13.39					
5	July 12		12.00	3.57	0.43		
6	August 12		12.00	1.20	0.14		
7	Sep. 12		8.00	0.63	0.05		
8	October 12		8.00	0.42	0.03		
9	Nov. 12		4.00	0.19	0.007		
10	Dec. 12		4.00	0.19	0.007	8.0	0.38
11	January 13		4.00	0.21	0.008		

- 1. Project No** : E.32
2. Discipline : Agril Entomology
3. Title of the project : Population dynamics of sugarcane borers (early shoot borer, top borer, internode borer, and stalk borer) through pheromone traps
4. Location : VSI, Pune
5. Project leader and Associate : Shri. R.G. Yadav, Scientific Officer & Head, Entomology
 Associate : Shri. S.S.kadam, Agril Assistant, Entomology
6 Objective : To study the population dynamics of sugarcane borers through pheromone traps and influence of weather parameters on moth catches

The trial was not conducted because we have not received pheromone lures from PCI, ltd. Banglore.

- 1. Project No** : E.33
2. Discipline : Agril Entomology
3. Title of the project : Bioefficacy of insecticides against mealy bugs in sugarcane
4. Tital of experiment : Bioefficacy of insecticides against mealy bugs in sugarcane
5. Objective : To evaluate efficacy of insecticides against mealy bugs in sugarcane

The trial was vitiated because there was negligible incidence of mealy bug in sugarcane

RESEARCH PROGRAM
2013-14 (2012-13 Planting)
Entomology Section

I. RESEARCH SPONSERED BY ICAR

ALL INDIA COORDINATED RESEARCH PROGRAMME

- Project No** : E 4.1
Title : Evaluation of zonal varieties / genotypes for their reaction against major insect pests.
- Project No** : E 4.1.1
Title : Field screening of sugarcane varieties/genotypes in IVT Early to major pests
- Project No** : E 4.1.2
Title : Field screening of sugarcane varieties/genotypes in AVT Early (II plant) to major pests
- Project No** : E 4.1.3
Title : Field screening of sugarcane varieties/genotypes in AVT Early (Ratoon) to major pests
- Project No** : E 4.1.4
Title : Field screening of sugarcane varieties/genotypes in IVT Midlate to major pests
- Project No** : E 4.1.5
Title : Field screening of sugarcane varieties/genotypes in AVT Midlate (II plant) to major pests.
- Project No** : E 4.1.6
Title : Field screening of sugarcane varieties/genotypes in AVT Midlate (Ratoon) to major pests
- Project No** : E.28
Title : Survey and surveillance of sugarcane insect pests in Maharashtra \ State.
- Project No** : E.30
Title : Monitoring of insect pests and bio-agents in sugarcane agro-ecosystem.
- Project No** : E.33
Title : Bio-efficacy of insecticide against mealy bug in sugarcane.
- Project No** : E.34
Title : Standardization of simple, cost effective techniques for mass multiplication of sugarcane bioagents
- Project No** : E.36
Title : Management of borers complex of sugarcane through lures.
- Project No** : E.37
Title : Bioefficacy of new insecticides for the control of sugarcane early shoot borer