ANNUAL RESEARCH REPORT OF SUGARCANE ENTOMOLOGY M.S.R.S., N.A.U. NAVSARI FOR THE YEAR 2012-2013

Project no. E.4.1:

1. **Title** : Evaluation of zonal verities/ genotypes for their reaction against major insect pests
2. **Objective** : To grade the entries in the Zonal Varietal Trials for their behavior towards damage by key pests in the area.
3. **Year of start** : 2012-13
4. **Location** : Main Sugarcane Research Station, Navsari.
5. **No. of replications** : Three
6. **Plot size** : 6.00 X 1.00 M
7. **Date of planting** : 08-01-2012
8. **Verities** : IVT/AVT
9. **Signature of the scientist in charge of the experiment** :
10. **Name and designation** : Dr. Mahesh. B. Patel
    Associate Research Scientist (Ento.)

Methodology:

The IVT/ AVT/ other sugarcane genotypes were planted separately at Main Sugarcane Research Station, Navsari. The experimental plot was kept unsprayed through out the period of observation for insect pest attacking on sugarcane crop. Observations were also recorded in the experimental as well as breeder varietal trials as per details given below for following pests.

Early shoot borer, *Chilo infuscatellus* (S.)

(i) Per cent incidence (based on dead hearts)

(ii) Number of bored plants.

Observations were recorded at,

(a) Post germination phase.

(b) Twice subsequently at 30 days interval (i.e. 30, 60 & 90 days after planting). The data were worked out on per cent basis and were statistically analyzed.

Top borer*:* - *Scirpophaga excerptalis* (Wlk): Per cent incidence during the 5^{th} month, 7^{th} month and at harvest (i.e. 12^{th} months.). The data were worked out on per cent basis and were statistically analyzed.

Root borer: - *Emmalocera depresella* (Swinhoe.): At harvest ten millable canes were dug out and split opened from the different varieties separately in each replication and damage by root borer larvae in each cane was noted. The data were worked out on per cent basis and were statistically analyzed.

Internode borer: - *Chilo sacchariphagous indicus* (Kapur) Ten canes per replication were taken for the observation at harvest, per cent incidence was noted. The data were statistically analyzed.

Mealy bugs:- *Saccharicoccus sacchari* (Cockerell) and **scale insects**, *Melanaspis glomerata* (Green): Ten canes per replication were taken for observation at harvest for both the pests. Per cent incidence and intensity were recorded for scale insect, while for the mealy bugs per cent

incidence and population per internode in each cane were noted. The data were statistically analyzed.

Pyrilla:- *Pyrilla perpusilla* (Wlk**.)** and *Epiricania melanoleuca.* When infestation starts ten canes were selected in each variety. Three leaves were observed from top, middle and bottom portion of plant in each variety. The population of egg mass, nymph and adult of pyrilla as well as population of egg mass and cocoon of *Epiricania melanoleuca* were recorded. The data were worked out on number basis and were statistically analyzed.

Whitefly:- *Aleurolobus barodensis (*M) When infestation starts one plant was randomly selected in each replication. Three leaves were observed in top, middle and lower canopy. The population of nymph and puparia were recorded as number per 10 sq cm leaf area at six places at random per leaf as replication. The data were worked out on per cent basis and were statistically analyzed.

Project E.4.1.1 AVT- II P (Early) trial

Table- 1.1: Screening of sugarcane varieties against ESB in AVT II P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 07012	8.56(2.22)	9.4(2.70)	9.65(2.86)	16.19(7.78)	LS
2	Co 07015	0.40(0.00)	7.5(1.76)	9.03(2.52)	11.94(4.28)	LS
3	CoN 07071	0.40(0.00)	10.7(3.43)	10.71(3.48)	15.23(6.91)	LS
4	PI 07131	7.56(1.75)	10.4(3.23)	9.48(2.71)	16.11(7.69)	LS
5	Co 85004	7.56(1.75)	8.5(2.17)	6.28(1.21)	13.06(5.13)	LS
6	Co 94008	5.86(1.04)	7.5(1.74)	7.68(1.79)	12.33(4.57)	LS
S.Em. ±(T)		**-**	**0.59**	**0.96**	**1.20**	
S.Em. ±(TxP)		**-**	**-**	**-**	**2.17**	
C.D @ 5%(T)		**-**	**1.84**	**2.18**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**NS**	
C.V. %		**-**	**11.29**	**13.65**	**12.47**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values..

Early shoot borer, *Chilo infuscatellus* (S.):

Four varieties of AVT- II P (Early) along with two checks were screened. The ESB infestation at 60 DAP and 90 DAP was found significant while, in pooled analysis it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 07015 (4.28 %), while the maximum infestation was found in Co 07012 (7.78 %) (Table-1.1). All genotypes were categorized in LS grade.

Table- 1.2: Screening of sugarcane varieties against TB in AVT II P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5th month	7th month	At harvest		
1	Co 07012	7.81(1.85)	7.69(1.79)	6.48(1.31)	21.98(4.95)	LS
2	Co 07015	8.90(2.40)	6.01(1.13)	6.41(1.27)	21.32(4.80)	LS
3	CoN07071	9.77(2.92)	8.21(2.04)	7.04(1.52)	25.02(6.48)	LS
4	PI 07131	8.77(2.33)	8.42(2.14)	6.85(1.47)	24.04(5.94)	LS
5	Co 85004	6.35(1.25)	7.73(1.81)	7.90(1.89)	21.98(4.95)	LS
6	Co 94008	7.80(1.85)	7.68(1.79)	7.86(1.88)	23.34(5.52)	LS
S.Em. ±(T)		**0.51**	**0.36**	**0.62**	**0.56**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.51**	
C.D @ 5%(T)		**1.60**	**1.15**	**NS**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.47**	
C.V. %		**10.67**	**8.27**	**15.17**	**11.1**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Top borer, *Scirpophaga excerptalis* (Wlk*)*:

Four varieties of AVT- II P (Early) along with two checks were screened. The top borer, *Scirpophaga excerptalis* (Wlk*)* infestation at 5th, 7th month were found significant while, in harvest and pooled analysis it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 07015 (4.80%), while it was maximum in PI 07131 (5.94 %) (Table-1.2).

Table- 1.3: Screening of sugarcane varieties against INB and root borer in AVT II P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% Incidence	% intensity	Grade	% Incidence	Grade
1	Co 07012	23.86(16.67)	6.75(1.42)	LS	23.86(16.67)	MS
2	Co 07015	23.86(16.67)	6.76(1.43)	LS	26.57(20.00)	MS
3	CoN 07071	23.86(16.67)	7.20(1.61)	LS	21.15(13.33)	MS
4	PI 07131	23.86(16.67)	7.23(1.62)	LS	23.86(16.67)	MS
5	Co 85004	18.44(10.00)	5.31(0.86)	LS	26.57(20.00)	MS
6	Co 94008	21.15(13.33)	6.37(1.26)	LS	28.78(23.33)	MS
S.Em. ±(T)		**2.57**	**0.77**		**2.32**	
C.D @ 5%(T)		**NS**	**NS**		**NS**	
C.V. %		**19.79**	**20.08**		**15.98**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Four varieties of AVT- II P (Early) were screened along with two checks. The per cent incidence and per cent intensity were found non significant. The minimum per cent incidence and per cent intensity were found in Co 85004 (10.00 % and 0.86 %), while maximum per cent incidence was found in Co 07012, Co 07015, PI 07131and CoN 07071 (16.67%) and per cent intensity was found in PI 07131 (1.62 %) (Table -1.3).

Root Borer, *Emmalocera depresella* (Swinhoe.) :

Four varieties of AVT- II P (Early) with two checks were screened. The per cent incidence was found non significant. The minimum per cent incidence was found in CoN 07071 (13.33%), while maximum per cent incidence was found in Co 94008 (23.33 %) (Table-1.3).

Table- 1.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in AVT II P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 07012	10.50(3.33)	3.07(0.29)	LS	33.00(30.00)	1.01(1.07)	MS
2	Co 07015	**14.95(6.67)**	**5.30(0.85)**	LS	10.49(3.33)	0.41(0.16)	LS
3	CoN 07071	10.50(3.33)	3.22(0.31)	LS	39.14(40.00)	1.30(1.69)	HS
4	PI 07131	10.50(3.33)	3.20(0.32)	LS	26.07(16.67)	0.67(0.44)	MS
5	Co 85004	14.95(6.67)	4.36(0.58)	LS	26.07(20.00)	0.83(0.69)	MS
6	Co 94008	0.41(0.00)	0.41(0.00)	LS	10.49(3.33)	0.30(0.09)	LS
S.Em. ±(T)		**0.46**	**0.07**		**2.43**	**0.08**	
C.D @ 5%(T)		**1.17**	**0.22**		**7.66**	**0.21**	
C.V. %		**7.82**	**3.70**		**17.38**	**15.12**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values

Scale insect, (*Melanaspis glomerata* (Green) :

Four varieties of AVT- II P (Early) were screened along with two checks. The per cent incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity were found in Co 94008 (0.00 % and 0.00 %) followed by Co 07012(3.33% and 0.29%), respectively while, maximum per cent incidence and per cent intensity were found in Co 07015 (6.67% and 0.85%) (Table -1.4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell):

Four varieties with two checks were screened. The per cent incidence and population per internode were found significant. The minimum per cent incidence and population per internode were found in Co 94008 (3.33 % and 0.09), respectively followed by Co 07015 (3.33% and 0.16), while maximum per cent incidence and population per internode were found in CoN 07071 (40.00 % and 1.69), respectively (Table-1.4).

Incidence of whitefly and pyrilla was not found under natural condition

Project E.4.1.2 IVT (Early) trial:

Table- 2.1: Screening of sugarcane varieties against ESB in IVT (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 09002	(0.00)	5.18 (0.83)	4.20(0.54)	6.69(1.37)	LS
2	Co 09003	(0.00)	5.00 (0.79)	5.95(1.10)	7.80(1.89)	LS
3	Co 09004	(0.00)	4.57 (0.65)	5.51(0.97)	7.30(1.62)	LS
4	Co 09005	(0.00)	7.98 (1.97)	8.94(2.43)	12.05(4.4)	LS
5	Co 09006	(0.00)	5.00 (0.79)	8.36(2.12)	9.82(2.91)	LS
6	Co 09007	(0.00)	5.35 (0.88)	6.38(1.25)	8.38(2.13)	LS
7	CoN 09071	(0.00)	6.74(1.41)	8.08(2.01)	10.64(3.42)	LS
8	CoN 09072	(0.00)	4.96 (0.79)	7.42(1.68)	9.03(2.47)	LS
9	Co 85004	(0.00)	9.00(2.45)	6.02(1.13)	10.88(3.58)	LS
10	Co 94008	(0.00)	4.70(0.69)	6.32(1.22)	7.90(1.91)	LS
S.Em. ±(T)		**-**	**0.62**	**0.57**	**0.88**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.59**	
C.D @ 5%(T)		**-**	**1.83**	**1.69**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.70**	
C.V. %		**-**	**18.25**	**14.71**	**16.37**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Early shoot borer, *Chilo infuscatellus* (S.):

Eight varieties along with two checks were screened in IVT (Early) for early shoot borer. The ESB infestation at 60 DAP and 90 DAP was observed significant. However, in pooled analysis it was found non significant. There was at 30 DAP early shoot borer infestation was not found. Based on the cumulative total of mean infestation the minimum infestation was found in Co 09002 (1.37%) followed by Co 09004 (1.62%), while the maximum infestation was found in Co 09005 (4.4%) (Table-2.1).

Top borer, ***Scirpophaga excerptalis* (Wlk*)*** :

Eight varieties along with two checks were screened in IVT (Early). The top borer, *Scirpophaga excerptalis* (Wlk*)* infestation at 5th month, 7th month and at harvest was found significant. However, in pooled analysis it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 85004 (2.98 %) followed by PI 08131 (5.31%), while the maximum infestation was found in Co 09005 (7.82 %) (Table- 2.2).

Table- 2.2: Screening of sugarcane varieties against TB in IVT (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5th month	7th month	At harvest		
1	Co 09002	6.32(1.24)	6.97(1.16)	8.03(1.95)	21.32(4.35)	LS
2	Co 09003	5.97(1.11)	7.52(1.72)	7.66(1.78)	21.15(4.61)	LS
3	Co 09004	6.02(1.13)	6.12(1.16)	8.40(2.49)	20.54(4.78)	LS
4	Co 09005	9.74(2.86)	9.45(2.70)	8.62(2.26)	27.81(7.82)	LS
5	Co 09006	6.38(1.25)	6.25(1.24)	8.24(2.06)	20.86(4.55)	LS
6	Co 09007	6.32(1.24)	4.51(0.63)	6.74(1.41)	17.57(3.28)	LS
7	CoN 09071	4.69(0.69)	8.97(2.45)	7.96(1.93)	21.63(5.07)	LS
8	CoN 09072	6.02(1.12)	5.95(1.10)	9.85(2.97)	21.83(5.19)	LS
9	Co 85004	5.19(0.56)	6.12(1.16)	6.39(1.26)	17.70(2.98)	LS
10	Co 94008	6.64(1.35)	6.60(1.33)	6.82(1.43)	20.06(4.11)	LS
S.Em. ±(T)		**0.63**	**0.55**	**0.57**	**0.63**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.59**	
C.D @ 5%(T)		**1.89**	**1.65**	**1.70**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.67**	
C.V. %		**17.38**	**14.02**	**12.56**	**14.51**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Table- 2.3: Screening of sugarcane varieties against INB in IVT (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% Incidence	% intensity	Grade	% Incidence	Grade
1	Co 09002	29.93(26.67)	8.59(2.24)	MS	33.21(30.00)	MS
2	Co 09003	29.93(26.67)	8.83(2.37)	MS	28.78(23.33)	MS
3	Co 09004	28.78(23.33)	8.07(1.99)	MS	28.78(23.33)	MS
4	Co 09005	28.78(23.330	8.68(2.30)	MS	21.15(13.33)	LS
5	Co 09006	28.78(23.33)	8.52(2.23)	MS	23.86(16.67)	MS
6	Co 09007	26.57(20.00)	7.65(1.78)	LS	26.57(20.00)	MS
7	CoN 09071	30.99(26.67)	8.83(2.38)	MS	21.15(13.33)	LS
8	CoN 09072	30.99(26.67)	9.51(2.75)	MS	18.44(10.00)	LS
9	Co 85004	23.86(16.67)	6.31(1.24)	MS	26.57(20.00)	MS
10	Co 94008	28.78(23.33)	8.04(1.96)	MS	18.44(10.00)	LS
S.Em. ±(T)		**2.17**	**0.57**		**1.82**	
C.D @ 5%(T)		**NS**	**NS**		**5.42**	
C.V. %		**13.07**	**11.98**		**12.81**	

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Eight varieties along with two checks were screened in IVT (Early). The internode borer per cent incidence and per cent intensity were found non significant. The minimum per cent incidence and per cent intensity were found in Co 85004 (16.67 % and 1.24 %), while maximum

per cent incidence and per cent intensity were found in CoN 09072 (26.67 % and 2.75 %), respectively (Table -2.3).

Root Borer, *Emmalocera depresella* (Swinhoe.)

Eight varieties along with two checks were screened. The per cent incidence was found significant. The minimum per cent incidence was found in CoN 09072 and Co 94008 (10.00 %), while maximum per cent incidence was found in Co 09002 (30.00 %) (Table-2.3).

Table-2.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in IVT (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 09002	10.50(3.33)	3.18(0.31)	LS	23.85(16.67)	0.95(0.91)	MS
2	Co 09003	10.50(3.33)	3.17(0.31)	LS	28.29(23.33)	0.84(0.73)	MS
3	Co 09004	14.95(6.67)	4.29(0.56)	LS	43.07(46.67)	1.40(1.98)	HS
4	Co 09005	10.50(3.33)	3.26(0.33)	LS	18.44(10.00)	0.54(0.29)	MS
5	Co 09006	10.50(3.33)	3.25(0.32)	LS	45.00(50.00)	1.71(2.96)	HS
6	Co 09007	10.50(3.33)	3.19(0.31)	LS	41.07(43.33)	1.49(2.22)	HS
7	CoN 09071	10.50(3.33)	3.13(0.30)	LS	12.42(6.67)	0.53(0.31)	MS
8	CoN 09072	10.50(3.33)	3.32(0.34)	LS	39.14(40.00)	1.28(1.64)	HS
9	Co 85004	10.50(3.33)	2.89(0.26)	LS	43.07(46.67)	1.15(1.31)	HS
10	Co 94008	10.50(3.33)	3.11(0.30)	LS	26.07(20.00)	0.84(0.78)	MS
S.Em. ±(T)		**0.52**	**0.09**	**-**	**3.64**	**0.11**	**-**
C.D @ 5%(T)		**1.55**	**0.28**	**-**	**10.80**	**0.32**	**-**
C.V. %		**8.27**	**4.80**	**-**	**19.66**	**17.42**	**-**

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Scale insect (*Melanaspis glomerata* (Green)

Eight varieties along with two checks were screened. The incidence of scale insects and intensity were found significant. The minimum per cent incidence and per cent intensity was recorded in Co 85004 (3.33% and 0.26%), respectively. The maximum per cent incidence and per cent intensity was recorded in Co 09004 (6.67% and 0.56%), respectively. All test varieties and checks were observed less susceptible. (Table- 2.4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell)

Eight varieties along with two checks were screened. The per cent incidence and population per internode were found significant. The minimum per cent incidence and population per internode were recorded in Co 09005 (10.00% and 0.29), respectively. The maximum incidence and population per internode were found in Co 09006 (50 % and 2.96), respectively (Table-2.4).

Incidence of whitefly and pyrilla was not found under natural condition.

Project E.4.1.3 AVT- I P (Early) trial:

Table- 3.1: Screening of sugarcane varieties against ESB in AVT I P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 08001	(0.00)	6.87(1.46)	7.63(1.76)	10.31(3.22)	LS
2	Co 08006	(0.00)	5.18(0.83)	5.46(0.95)	7.62(1.78)	LS
3	Co 08071	(0.00)	6.91(1.47)	4.17(0.53)	8.11(2.00)	LS
4	PI 08131	(0.00)	6.98(1.52)	5.87(1.08)	9.23(2.60)	LS
5	CoVSI 08121	(0.00)	6.92(1.48)	6.63(1.35)	9.63(2.83)	LS
6	Co 85004	(0.00)	7.02(1.53)	6.19(1.18)	9.39(2.71)	LS
7	Co 94008	(0.00)	8.16(2.02)	6.40(1.25)	10.42(3.27)	LS
8	CoC 671	(0.00)	6.78(1.43)	6.26(1.21)	10.31(3.22)	LS
S.Em. ±(T)		**-**	**0.72**	**0.59**	**0.49**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.66**	
C.D @ 5%(T)		**-**	**NS**	**1.79**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**NS**	
C.V. %		**-**	**18.26**	**16.79**	**17.66**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Early shoot borer, *Chilo infuscatellus* (S.):

Five varieties along with three checks were screened for ESB in AVT- I P (Early). The ESB infestation at 90 DAP was found significant while, 60 DAP and in pooled analysis, it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 08006 (1.78 %), while the maximum infestation was found in Co 94008 (3.27 %) (Table-3.1).

Top borer, *Scirpophaga excerptalis* (Wlk*)* :

Five varieties along with three checks were screened for top borer. The top borer, *Scirpophaga excerptalis* (Wlk*)* infestation was at 5th month, 7th month, at harvest it was found significant while in pooled analysis it was found non significant. Based on the cumulative total of mean minimum infestation was found in Co 08071 (3.00%), while it was maximum in PI 08131 (5.86 %) (Table-3.2).

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Five varieties of AVT-I P (Early) were screened along with three checks. The per cent internode borer incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity were found in CoC 671 (16.67 % and 1.24 %), while maximum per cent incidence and per cent intensity were found in PI 08131 (30.00 % and 2.81 %), respectively. (Table -3.3).

Root Borer, *Emmalocera depresella* (Swinhoe.) :

Five varieties of AVT-I P (Early) with three checks were screened. The per cent incidence was found non significant. The minimum per cent incidence was found in Co 08001, PI 08131 and

Co 85004 (13.33%), while maximum per cent incidence was found in Co 08006, Co 08071 and CoVSI 08121 (20.00%) (Table-3.3).

Table-3.2: Screening of sugarcane varieties against TB in AVT I P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5th month	7th month	At harvest		
1	Co 08001	6.11(1.14)	6.302(1.23)	6.16(1.17)	18.58(3.54)	LS
2	Co 08006	5.76(1.04)	5.758(1.04)	7.47(1.69)	18.98(3.77)	LS
3	Co 08071	5.22(0.57)	7.665(1.78)	4.58(0.65)	17.46(3.00)	LS
4	PI 08131	8.85(2.39)	5.893(1.08)	8.87(2.39)	23.61(5.86)	LS
5	CoVSI 121	6.58(1.34)	9.113(2.56)	6.58(1.34)	22.28(5.24)	LS
6	Co 85004	6.35(1.26)	6.239(1.21)	6.30(1.23)	18.90(3.70)	LS
7	Co 94008	5.99(1.12)	5.893(1.08)	6.09(1.15)	17.97(3.35)	LS
8	CoC 671	8.91(2.42)	7.630(1.77)	6.39(1.27)	22.94(5.46)	LS
S.Em. ±(T)		**0.79**	**0.71**	**0.58**	**0.70**	
S.Em. ±(TxP)		**-**	**-**	-	**0.70**	
C.D @ 5%(T)		**2.40**	**2.14**	**1.77**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.99**	
C.V. %		**20.43**	**17.97**	**15.46**	**18.11**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Table- 3.3: Screening of sugarcane varieties against INB and root borer in AVT I P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% Incidence	% intensity	Grade	% Incidence	Grade
1	Co 08001	31.00(26.67)	8.99(2.46)	MS	21.15(13.33)	LS
2	Co 08006	23.86(16.67)	6.74(1.41)	LS	26.57(20.00)	MS
3	Co 08071	31.00(26.67)	8.83(2.39)	MS	26.57(20.00)	MS
4	PI 08131	33.21(30.00)	9.64(2.81)	MS	21.15(13.33)	LS
5	CoVSI 08121	33.21(30.00)	9.11(2.51)	MS	26.57(20.00)	MS
6	Co 85004	31.00(26.67)	8.79(2.38)	MS	21.15(13.33)	LS
7	Co 94008	26.57(20.00)	7.29(1.61)	LS	23.86(16.67)	MS
8	CoC 671	23.86(16.67)	6.34(1.24)	LS	23.86(16.67)	LS
S.Em. ±(T)		**2.03**	**0.58**		**2.00**	
C.D @ 5%(T)		**6.16**	**1.76**		**NS**	
C.V. %		**12.05**	**12.27**		**15.10**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Table- 3.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in AVT I P (Early) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 08001	14.95(6.67)	5.48(0.91)	LS	11.0(3.33)	0.29(0.09)	LS
2	Co 08006	10.50(3.33)	3.11(0.29)	LS	41.2(43.33)	1.34(1.80)	HS
3	CoN 08071	14.95(6.67)	4.48(0.61)	LS	45.0(50.00)	1.25(1.56)	HS
4	PI 08131	10.50(3.33)	3.28(0.33)	LS	45.0(50.00)	1.25(1.56)	HS
5	CoVSI 08121	18.44(10.00)	9.28(2.62)	LS	33.2(20.00)	0.85(0.73)	MS
6	Co 85004	10.50(3.33)	3.24(0.31)	LS	39.1(40.00)	1.28(1.67)	HS
7	Co 94008	10.50(3.33)	2.92(0.26)	LS	10.5(3.33)	0.29(0.09)	LS
8	CoC 671	10.50(3.33)	3.01(0.28)	LS	18.4(10.00)	0.47(0.22)	MS
S.Em. ±(T)		**0.49**	**0.21**		**1.44**	**0.05**	
C.D @ 5%(T)		**1.48**	**0.63**		**4.38**	**0.13**	
C.V. %		**6.68**	**8.25**		**8.20**	**8.78**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Mean per cent scale insect and Mealy bugs

Scale insect, (*Melanaspis glomerata* (Green):

Five varieties of AVT-I P (Early) were screened along with three checks. The mean per cent scale insect incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity were found in Co 94008(3.33% and 0.26%), respectively while maximum per cent incidence and per cent intensity were found in CoVSI 08121 (10.00% and 2.62%), respectively (Table -4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell):

Five varieties of AVT-I P (Early) with three checks were screened. The per cent incidence and population per internode were found significant. The minimum per cent incidence and population per internode were found in Co 08001 and Co 94008 (3.33% and 0.09), respectively. While maximum per cent incidence was found in CoN 08071 and PI 08131 (50.00%), but maximum population per internode was found in Co 08006 (1.80) (Table-4).

Incidence of whitefly and pyrilla was not found under natural condition

Project E.4.1.4 AVT- I P (Midlate) trial:

Table- 4.1: Screening of sugarcane varieties against ESB in AVT I P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 08007	(0.00)	9.18(2.54)	5.66(1.00)	10.84(3.54)	LS
2	Co 08008	(0.00)	7.24(1.62)	6.30(1.23)	9.64(2.85)	LS
3	Co 08009	(0.00)	7.07(1.55)	7.49(1.70)	10.36(3.25)	LS
4	Co 08016	(0.00)	7.29(1.65)	6.50(1.30)	9.87(2.95)	LS
5	Co 08018	(0.00)	7.09(1.55)	6.22(1.18)	9.47(2.73)	LS
6	Co 08019	(0.00)	7.07(1.55)	9.33(2.64)	11.76(4.19)	LS
7	Co 08020	(0.00)	6.83(1.45)	7.23(1.58)	10.01(3.03)	LS
8	CoJn 08091	(1.85)	8.11(1.99)	9.22(2.57)	14.67(6.41)	LS
9	CoM 08081	(0.00)	8.93(2.44)	7.11(1.53)	11.48(3.97)	LS
10	CoN 08072	(0.00)	8.58(2.24)	7.87(1.88)	11.69(4.12)	LS
11	CoSnk 08101	(1.59)	9.37(2.66)	9.00(2.54)	15.07(6.79)	LS
12	CoVc 08061	(1.67)	6.80(1.43)	6.04(1.12)	11.82(4.22)	LS
13	CoVc 08063	(0.00)	12.53(4.71)	9.68(2.85)	15.95(7.56)	LS
14	CoVc 08064	(1.19)	10.50(3.32)	9.18(2.57)	15.41(7.08)	LS
15	CoVSI 08122	(0.00)	9.16(2.55)	6.68(1.37)	11.38(3.92)	LS
16	CoVSI 08123	(1.19)	7.34(1.68)	8.39(2.14)	12.89(5.01)	LS
17	Co 86032	(0.00)	9.86(2.94)	7.67(1.79)	12.57(4.73)	LS
18	Co 99004	(0.00)	7.61(1.81)	10.03(3.05)	12.71(4.86)	LS
S.Em. ±(T)		**-**	**0.66**	**0.55**	**0.74**	
S.Em. ±(TxP)		**-**	**-**	**-**	**1.24**	
C.D @ 5%(T)		**-**	**1.89**	**1.59**	**2.08**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**NS**	
C.V. %		**-**	**13.63**	**12.35**	**12.99**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Early shoot borer, *Chilo infuscatellus* (S.):

Sixteen varieties along with two checks were screened for ESB in AVT I P (Midlate). The ESB infestation at 60 DAP, 90 DAP and in pooled analysis were found significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 08018 (2.73 %), while the maximum infestation was found in CoVc 08063 (7.56 %) (Table-4.1).

Table- 4.2: Screening of sugarcane varieties against TB in AVT I P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5th month	7th month	At harvest		
1	Co 08007	6.28(1.21)	6.16(1.17)	6.30(1.22)	18.74(3.60)	LS
2	Co 08008	7.44(1.68)	5.76(1.04)	6.04(1.13)	19.24(3.85)	LS
3	Co 08009	5.90(1.07)	5.79(1.04)	6.13(1.17)	17.82(3.28)	LS
4	Co 08016	6.08(1.16)	7.68(1.79)	6.44(1.28)	20.19(4.23)	LS
5	Co 08018	6.55(1.33)	6.22(1.19)	6.58(1.35)	19.35(3.87)	LS
6	Co 08019	9.17(2.55)	6.37 (1.26)	8.13(2.00)	23.67(5.81)	LS
7	Co 08020	7.82(1.86)	7.84(1.86)	6.46(1.28)	22.12(5.00)	LS
8	CoJn 08091	7.56(1.73)	5.89(1.09)	6.18(1.19)	19.63(4.01)	LS
9	CoM 08081	5.63(0.99)	7.14(1.54)	5.82(1.06)	18.59(3.59)	LS
10	CoN 08072	7.96(1.92)	7.85(1.87)	6.63(1.36)	22.44(5.15)	LS
11	CoSnk08101	8.14(2.01)	9.31(2.62)	6.62(1.35)	24.07(5.98)	LS
12	CoVC 08061	8.79(2.35)	4.13(0.52)	6.35(1.25)	19.27(4.12)	LS
13	CoVC 08063	7.68(1.79)	6.12(1.16)	7.73(1.81)	21.53(4.76)	LS
14	CoVC 08064	7.45(1.69)	6.91(1.47)	8.90(2.40)	23.27(5.56)	LS
15	CoVSI08122	8.16(2.02)	6.54(1.32)	6.71(1.39)	21.40(4.73)	LS
16	CoVSI8123	10.49(3.32)	8.05(1.96)	8.30(2.09)	26.84(7.37)	LS
17	Co 86032	7.75(1.82)	6.01(1.13)	6.49(1.30)	20.25(4.25)	LS
18	Co 99004	9.65(2.84)	8.12(2.00)	5.01(0.78)	22.78(5.62)	LS
S.Em. ±(T)		**0.45**	**0.52**	**0.58**	**0.61**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.52**	
C.D @ 5%(T)		**1.31**	**1.51**	**1.68**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.47**	
C.V. %		**10.24**	**13.43**	**15.06**	**12.85**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Top borer, ***Scirpophaga excerptalis*** **(Wlk*)*:**

Sixteen varieties along with two checks were screened in AVT-I P (Midlate) for top borer. The top borer, *Scirpophaga excerptalis* (Wlk*)* infestation at 5th month, 7th month and at harvest was found significant, while in pooled analysis it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 08009 (3.28 %) followed by Co 08007 (3.60 %), while the maximum infestation was found in CoVSI8123 (7.37 %) (Table-4.2). All test varieties and checks of AVT- I P (Midlate) were observed less susceptible grade.

Table- 4.3: Screening of sugarcane varieties against INB and root borer in AVT I P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% Incidence	% intensity	Grade	% Incidence	Grade
1	Co 08007	26.57(20.00)	7.10(1.53)	LS	23.86(16.67)	MS
2	Co 08008	23.86(16.67)	6.80(1.44)	LS	28.78(23.33)	MS
3	Co 08009	26.57(20.00)	7.48(1.70)	LS	26.57(20.00)	MS
4	Co 08016	28.78(23.33)	8.23(2.06)	MS	26.5720.00)	MS
5	Co 08018	28.78(23.33)	8.38(2.15)	MS	23.86(16.67)	MS
6	Co 08019	23.86(16.60)	6.92(1.49)	LS	23.86(16.67)	MS
7	Co 08020	23.86(16.67)	6.80(1.43)	LS	23.86(16.67)	MS
8	CoJn 08091	23.86(16.67)	6.82(1.45)	LS	31.00(26.67)	MS
9	CoM 08081	23.86(16.67)	6.65(1.37)	LS	28.78(23.33)	MS
10	CoN 08072	21.15(13.33)	6.35(1.26)	LS	23.86(16.67)	MS
11	CoSnk 08101	26.57(20.00)	7.26(1.60)	LS	31.00(26.67)	MS
12	CoVC 08061	28.78(23.33)	8.05(1.99)	MS	23.86(16.67)	MS
13	CoVC 08063	23.86(16.67)	7.03(1.53)	LS	26.57(20.00)	MS
14	CoVC 08064	23.86(16.67)	7.68(1.85)	LS	28.78(23.33)	MS
15	CoVSI 08122	23.86(16.67)	6.74(1.41)	LS	28.78(23.33)	MS
16	CoVSI 08123	26.57(20.00)	7.57(1.73)	LS	28.78(23.33)	MS
17	Co 86032	33.21(30.00)	9.43(2.69)	MS	28.78(23.33)	MS
18	Co 99004	23.86(16.67)	6.56(1.33)	LS	26.57(20.00)	MS
S.Em. ±(T)		**2.27**	**0.64**		**2.19**	
C.D @ 5%(T)		**NS**	**NS**		**NS**	
C.V. %		**15.36**	**15.10**		**14.09**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Sixteen varieties were screened along with two checks. The per cent incidence and per cent intensity were found non significant. The minimum per cent incidence and per cent intensity were found in CoN 08072 (13.33% and 1.26 %) , while maximum per cent incidence and per cent intensity was found in Co 86032 (30.00% and 2.69 %), respectively (Table -4.3).

Root Borer *Emmalocera depresella* (Swinhoe.) :

Sixteen varieties with two checks were screened. The per cent incidence was found non significant. The minimum per cent incidence was found in Co 08007, Co 08018 , Co 08019, Co 08020, CoN 08072 and CoVc 08061 (16.67%), while maximum per cent incidence was found in CoJn 08091 and CoSnk 08101 (26.67 %) (Table-4.3).

Table- 4.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in AVT I P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr. No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 8007	14.95(6.67)	5.79(1.02)	LS	31.07(26.67)	1.21(0.95)	MS
2	Co 08008	10.50(3.33)	3.23(0.32)	LS	28.85(23.33)	1.16(0.87)	MS
3	Co 08009	14.95(6.67)	4.36(0.58)	LS	23.85(16.67)	0.97(0.42)	MS
4	Co 08016	**18.44(10.00)**	**8.86(2.37)**	LS	**0.40(0.00)**	**0.70(0.00)**	LS
5	Co 08018	10.50(3.33)	3.17(0.31)	LS	30.78(26.67)	1.18(0.91)	MS
6	Co 08019	10.50(3.33)	3.10(0.29)	LS	28.78(23.33)	1.15(0.82)	MS
7	Co 08020	14.95(6.67)	7.22(1.58)	LS	28.78(23.33)	1.10(0.71)	MS
8	CoJn 08091	10.50(3.33)	3.10(0.29)	LS	28.78(23.33)	1.16(0.84)	MS
9	CoM 08081	10.50(3.33)	3.03(0.28)	LS	**41.07(43.33)**	**1.66(2.29)**	HS
10	CoN 08072	10.50(3.33)	3.23(0.32)	LS	41.15(43.33)	1.53(1.84)	HS
11	CoSnk 08101	**10.50(3.33)**	**2.98(0.27)**	LS	43.07(46.67)	1.46(1.64)	HS
12	CoVc 08061	10.50(3.33)	3.09(0.29)	LS	41.07(43.33)	1.37(1.40)	HS
13	CoVc 08063	10.50(3.33)	3.21(0.32)	LS	43.07(46.67)	1.52(1.82)	HS
14	CoVc 08064	14.95(6.67)	5.83(1.04)	LS	41.15(43.33	1.40(1.49)	HS
15	CoVSI 08122	14.95(6.67)	5.35(0.87)	LS	41.15(43.33)	1.61(2.13)	HS
16	CoVSI 08123	10.50(3.33)	3.06(0.29)	LS	43.07(46.67)	1.60(2.04)	HS
17	Co 86032	14.95(6.67)	5.61(0.96)	LS	28.78(23.33)	1.08(0.69)	MS
18	Co 99004	10.50(3.33)	3.03(0.28)	LS	**10.49(3.33)**	**0.83(0.20)**	LS
S.Em. ±(T)		**0.44**	0.16		2.29	0.03	
C.D @ 5%(T)		**1.26**	0.47		6.59	0.13	
C.V. %		**6.10**	6.67		12.42	5.77	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Scale insect, (*Melanaspis glomerata* (Green):

Sixteen varieties were screened along with two checks. The per cent incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity were found in CoSnk 08101 (3.33% and 0.27%), respectively, while maximum per cent incidence and per cent intensity were found in Co 08016 (10.00% and 2.37 %), respectively (Table -4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell):

Sixteen varieties with two checks were screened. The per cent incidence and population per internode were found significant. The minimum per cent incidence and population per internode were found in Co 08016 (0.00% and 0.00), respectively followed by Co 99004 (3.33% and 0.20), while maximum per cent incidence and population per internode were found in CoM 08081 (43.33 % and 2.29), respectively (Table-4).

Incidence of whitefly and pyrilla was not found under natural condition

Project E.4.1.5 AVT- II P (Midlate) trial

Table- 5.1: Screening of sugarcane varieties against ESB in AVT II P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 07006	(0.00)	7.07(1.55)	6.87(1.12)	9.97(2.67)	LS
2	Co 07007	(0.00)	10.89(3.58)	7.23(1.59)	13.13(5.17)	LS
3	Co 07008	(0.00)	9.39(2.67)	6.68(1.38)	11.60(4.05)	LS
4	Co 07009	(0.00)	7.41(1.71)	9.31(2.65)	12.05(4.36)	LS
5	Co07010	(0.00)	9.95(2.99)	9.41(2.70)	13.78(5.69)	LS
6	Co 86032	(1.67)	8.79(2.34)	8.06(1.97)	14.15(5.98)	LS
7	Co 99004	(0.00)	9.79(2.91)	8.84(2.37)	13.25(5.28)	LS
S.Em. ±(T)		**-**	**0.60**	**0.57**	**0.65**	
S.Em. ±(TxP)		**-**	**-**	**-**	**1.02**	
C.D @ 5%(T)		**-**	**1.84**	**1.76**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**NS**	
C.V. %		**-**	**11.44**	**12.31**	**11.88**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Early shoot borer, *Chilo infuscatellus* (S.):

Five varieties including two checks were screened for ESB in AVT-II (Midlate). The ESB infestation was found significant at 60 DAP and 90 DAP. But in pooled analysis, it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 07006 (2.67%), while the maximum infestation was found in Co 86032 (5.98 %) (Table-5.1).

Table- 5.2: Screening of sugarcane varieties against TB in AVT II P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5^{th} month	7^{th} month	At harvest		
1	Co 07006	8.96(2.43)	8.88(2.41)	6.43(1.28)	24.27(6.12)	LS
2	Co 07007	5.91(1.08)	6.19(1.19)	6.03(1.12)	18.13(3.39)	LS
3	Co 07008	8.22(2.05)	8.11(1.99)	6.74(1.41)	23.07(5.45)	LS
4	Co 07009	10.23(3.15)	9.19(2.89)	7.10(1.57)	26.52(7.61)	LS
5	Co07010	7.73(1.81)	6.19(1.19)	6.16(1.18)	20.08(4.18)	LS
6	Co 86032	9.18(2.56)	6.30(1.22)	6.44(1.28)	21.92(5.06)	LS
7	Co 99004	8.96(2.22)	6.78(1.43)	8.61(2.24)	24.35(5.89)	LS
S.Em. ±(T)		**0.36**	**0.64**	**0.69**	**0.54**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.58**	
C.D @ 5%(T)		**1.11**	**1.98**	**NS**	**1.65**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.67**	
C.V. %		**7.45**	**15.09**	**17.58**	**13.42**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Top borer, ***Scirpophaga excerptalis*** **(Wlk*)*** :

Five varieties including two checks of AVT-II P (Midlate) were screened against top borer. The top borer, *Scirpophaga excerptalis* (Wlk*)* infestation was found significant at 5th month, 7th month and in pooled analysis it was found significant while at harvest it was found non significant. Based on the cumulative total of mean infestation the significantly minimum infestation was found in Co 07007 (3.29%), while significantly the highest infestation was found in Co 07009 (7.61 %). (Table-5.2). All the test entries were found in less susceptible.

Table- 5.3: Screening of sugarcane varieties against INB and root borer in AVT II P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% Incidence	% intensity	Grade	% Incidence	Grade
1	Co 07006	18.44(10.00)	5.34(0.86)	LS	28.78(23.33)	MS
2	Co 07007	18.44(10.00)	5.51(0.92)	LS	26.07(20.00)	MS
3	Co 07008	21.15(13.33)	6.75(1.43)	LS	23.86(16.67)	MS
4	Co 07009	28.78(23.33)	8.05(1.97)	MS	33.21(30.00)	MS
5	Co07010	23.86(16.67)	6.58(1.34)	MS	26.57(20.00)	MS
6	Co 86032	26.57(20.00)	7.59(1.74)	MS	23.86(16.67)	MS
7	Co 99004	28.78(23.33)	7.84(1.89)	MS	31.00(26.67)	MS
S.Em. ±(T)		**1.99**	**0.65**		**2.63**	
C.D @ 5%(T)		**6.12**	**1.72**		**NS**	
C.V. %		**14.52**	**14.19**		**16.49**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Five varieties were screened along with two checks. The per cent incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity was found in Co 07006 (10.00 % and 0.86 %), while maximum per cent incidence and per cent intensity was found in Co 07009 (23.33% and 1.97%), respectively (Table -5.3).

Root Borer, *Emmalocera depresella* (Swinhoe.) :

Eleven varieties with two checks were screened. The per cent incidence was found significant. The minimum per cent incidence was found in Co 06015 (10.00%), while maximum per cent incidence was found in Co 06012 (21.67%) (Table-5.3).

Table- 5.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in AVT II P (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr. No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 07006	0.41(0.00)	0.41(0.00)	LS	26.56(20.00)	1.13(0.78)	MS
2	Co 07007	14.95(6.67)	5.57(0.94)	LS	43.07(46.67)	1.52(1.80)	HS
3	Co 07008	10.50(3.33)	3.41(0.36)	LS	43.07(46.67)	1.43(1.58)	HS
4	Co 07009	18.44(10.00)	5.34(0.87)	LS	14.95(6.67)	0.80(0.16)	MS
5	Co07010	10.50(3.33)	4.16(0.53)	LS	0.40(0.00)	0.70(0.00)	LS
6	Co 86032	0.41(0.00)	0.41(0.00)	LS	31.00(26.67)	1.33(1.27)	MS
7	Co 99004	14.95(6.67)	4.13(0.52)	LS	0.40(0.00)	0.70(0.00)	LS
S.Em. ±(T)		**0.30**	0.16		1.31	0.09	
C.D @ 5%(T)		**0.93**	0.50		4.03	0.26	
C.V. %		**5.24**	8.37		9.93	13.19	

Scale insect, (*Melanaspis glomerata* (Green) :

Five varieties were screened along with two checks. The per cent incidence and per cent intensity were found significant. The incidence of scale insects was not found in Co 07006 and Co 86032. The minimum per cent incidence and per cent intensity was found in Co 07008 (3.33 % and 0.36 %), respectively. The maximum per cent incidence was found in Co 07009 (10.00 %) and per cent intensity was found in Co 07007 (0.94 %), respectively (Table -5.4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell):

Five varieties with two checks were screened. The per cent incidence and population per internode were found significant. The incidence of mealy bugs was not found in Co 07010 and Co 99004.The minimum per cent incidence and population per internode were found in Co 07009 (6.67 % and 0.16), respectively. The maximum per cent incidence and population per internode were found in Co 07007 (46.67 % and 1.80), respectively (Table-4).

Incidence of whitefly and pyrilla was not found under natural condition

Project E.4.1.6 IVT (Midlate) trial

Table- 6.1: Screening of sugarcane varieties against ESB in IVT (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent ESB incidence			Total	Grade
		30 DAP	60 DAP	90 DAP		
1	Co 09009	(0.00)	8.03(2.00)	8.09(1.98)	11.49(3.98)	LS
2	Co 09010	(0.00)	8.19(2.03)	6.20(1.18)	10.32(3.21)	LS
3	Co 09012	(0.00)	10.53(3.34)	9.71(2.84)	14.40(6.18)	LS
4	Co 09013	(0.00)	11.96(4.30)	6.85(1.44)	13.86(5.74)	LS
5	Co 09014	(0.00)	8.31(2.08)	11.07(3.70)	13.91(5.78)	LS
6	CoN 09073	(0.00)	9.77(2.89)	8.08(1.97)	12.73(4.86)	LS
7	CoN 09074	(0.00)	7.10(1.56)	7.45(1.69)	10.35(3.25)	LS
8	CoSnk 05102	(0.00)	9.86(2.95)	9.13(2.53)	13.51(5.48)	LS
9	CoVSI 09121	(0.00)	8.78(2.33)	8.23(2.07)	12.09(4.40)	LS
10	Co 02040	(0.00)	7.50(1.76)	7.76(1.84)	10.86(3.60)	LS
11	Co 86032	(0.00)	6.84(1.45)	9.66(2.82)	11.90(4.27)	LS
12	Co 99004	(0.00)	10.98(3.64)	8.04(1.96)	13.67(5.60)	LS
S.Em. ±(T)		**-**	**0.58**	**0.42**	**1.08**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.51**	
C.D @ 5%(T)		**-**	**1.70**	**1.22**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.44**	
C.V. %		**-**	**11.20**	**8.65**	**10.11**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Early shoot borer, *Chilo infuscatellus* (S.):

Ten varieties including two checks were screened for ESB in IVT (Midlate). The ESB infestation at 60 DAP and 90 DAP were found significant while, in pooled analysis it was found non significant. There was at 30 DAP early shoot borer infestation was not found. Based on the cumulative total of mean infestation the minimum infestation was found in Co 09010 (3.38 %), while the maximum infestation was found in Co 09012 (6.18 %) (Table-6.1).

Top borer, ***Scirpophaga excerptalis* (Wlk*)***:

Ten varieties including two checks were screened for top borer in IVT (Midlate). It was observed that the top borer, *Scirpophaga excerptalis* (Wlk*)* infestation was found significant at 5th month, 7th month, and harvest while in pooled analysis it was found non significant. Based on the cumulative total of mean infestation the minimum infestation was found in Co 86032 (4.10 %), while the maximum infestation was found in Co 02040 (10.22 %) (Table- 6.2).

Table-6. 2: Screening of sugarcane varieties against TB in IVT (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Mean per cent top borer incidence			Total	Grade
		5th month	7th month	At harvest		
1	Co 09009	6.50(1.31)	7.93(1.90)	6.42(1.28)	20.85(4.49)	LS
2	Co 09010	9.08(2.51)	6.43(1.28)	6.51(1.30)	22.02(5.09)	LS
3	Co 09012	7.26(1.65)	7.10(1.57)	9.40(2.67)	23.76(5.89)	LS
4	Co 09013	8.47(2.19)	8.22(2.06)	6.46(1.28)	23.15(5.53)	LS
5	Co 09014	7.10(1.56)	6.90(1.47)	8.62(2.25)	22.62(5.28)	LS
6	CoN09073	9.41(2.70)	8.00(1.94)	6.60(1.35)	24.01(5.99)	LS
7	CoN09074	7.76(1.83)	6.28(1.22)	7.85(1.87)	21.89(4.92)	LS
8	CoSnk05102	8.37(2.21)	7.19(1.57)	5.89(1.07)	21.45(4.85)	LS
9	CoVSI09121	6.75(1.41)	6.23(1.20)	9.43(2.71)	22.41(5.32)	LS
10	Co 02040	8.89(2.39)	15.00(6.70)	5.98(1.11)	29.87(10.20)	MS
11	Co 86032	6.22(1.19)	7.54(1.72)	6.22(1.19)	19.98(4.10)	LS
12	Co 99004	6.63(1.36)	6.45(1.29)	8.11(1.99)	21.19(4.64)	LS
S.Em. ±(T)		**0.64**	**0.57**	**0.52**	**1.04**	
S.Em. ±(TxP)		**-**	**-**	**-**	**0.58**	
C.D @ 5%(T)		**1.88**	**1.67**	**1.53**	**NS**	
C.D @ 5 % (TxP)		**-**	**-**	**-**	**1.64**	
C.V. %		**14.40**	**12.72**	**12.42**	**13.24**	

Table- 6.3: Screening of sugarcane varieties against INB and root borer in IVT (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr.No.	Variety	Internode borer			Root borer	
		% incidence	% intensity	Grade	% Incidence	Grade
1	Co 09009	23.86(16.67)	7.18(1.60)	LS	23.86(16.67)	MS
2	Co 09010	23.86(16.67)	6.77(1.42)	LS	31.00(26.67)	MS
3	Co 09012	21.15(13.33)	6.11(1.17)	LS	21.15(13.33)	LS
4	Co 09013	33.21(30.00)	9.79(2.89)	MS	26.57(20.00)	MS
5	Co 09014	33.21(30.00)	9.69(2.83)	MS	33.21(30.00)	MS
6	CoN 09073	31.00(26.67)	9.22(2.59)	MS	26.57(20.00)	MS
7	CoN 09074	28.78(23.33)	9.01(2.47)	MS	23.86(16.67)	MS
8	CoSnk 05102	35.22(33.33)	9.63(2.82)	MS	28.78(23.33)	MS
9	CoVSI 09121	33.21(30.00)	9.78(2.89)	MS	28.78(23.33)	MS
10	Co 02040	31.00(26.67)	9.05(2.49)	MS	23.86(16.67)	MS
11	Co 86032	33.21(30.00)	9.12(2.51)	MS	33.21(30.00)	MS
12	Co 99004	31.00(26.67)	8.66(2.29)	MS	23.86(16.67)	MS
S.Em. ±(T)		**1.94**	**0.52**		**2.15**	
C.D @ 5%(T)		**5.71**	**1.52**		**6.29**	
C.V. %		**11.29**	**10.40**		**13.74**	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Internode borer, *Chilo sacchariphagous indicus* (Kapur):

Ten varieties including two checks were screened for internode borer in IVT (Midlate). The per cent incidence and per cent intensity were found significant. The minimum per cent incidence and per cent intensity were found in Co 09012 (13.33% and 1.17 %), respectively. while maximum per cent incidence and per cent intensity was found in Co 09013 and CoVSI 09121 (30.00 % and 2.89 %), respectively (Table -6.3).

Root Borer, *Emmalocera depresella* (Swinhoe.) Ten varieties along with two checks were screened. The per cent incidence was found significant. The minimum per cent incidence was found in Co 09012 (13.33 %), while maximum per cent incidence was found in Co 09014 and Co 86032 (30.00 %) (Table-6.3).

Table- 6.4: Screening of sugarcane varieties against Scale insect and Mealy bugs in IVT (M) trial at Main Sugarcane Research Station, Navsari (2012-13).

Sr. No.	Variety	Scale insects			Mealy bugs		
		% Incidence	% intensity	Grade	% Incidence	Population per internode	Grade
1	Co 09009	0.41(0.00)	0.41(0.00)	LS	35.22(33.33)	1.22(1.00)	HS
2	Co 99004	10.50(3.33)	3.01(0.28)	LS	0.40(0.00)	0.70(0.00)	LS
3	Co 09012	14.95(6.67)	4.36(0.58)	LS	0.40(0.00)	0.70(0.00)	LS
4	Co 09013	0.41(0.00)	0.41(0.00)	LS	0.40(0.00)	0.70(0.00)	LS
5	Co 09014	14.95(6.67)	5.54(0.94)	LS	0.40(0.00)	0.70(0.00)	LS
6	CoN 09073	14.95(6.67)	5.58(0.95)	LS	10.49(3.33)	0.77(0.09)	LS
7	CoN 09074	14.95(6.67)	5.82(1.04)	LS	14.95(6.67)	0.85(0.27)	MS
8	CoSnk 05102	14.95(6.67)	5.27(0.85)	LS	14.95(6.67)	0.82(0.20)	MS
9	CoVSI 09121	10.50(3.33)	4.48(0.62)	LS	14.95(6.67)	0.80(0.13)	MS
10	Co 02040	18.441(10.00)	6.31(1.21)	LS	14.95(6.67)	0.81(0.18)	MS
11	Co 86032	18.44(10.00)	0.41(1.17)	LS	10.49(3.33)	0.77(0.09)	LS
12	Co 99004	14.95(6.67)	0.41(0.86)	LS	45.00(50.00)	1.51(1.78)	HS
S.Em. ±(T)		**0.35**	0.22		0.66	0.06	
C.D @ 5%(T)		**1.02**	0.66		1.93	0.18	
C.V. %		**4.88**	11.07		8.44	12.29	

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Scale insect, (*Melanaspis glomerata* (Green):

Ten varieties including two checks were screened for Mean per cent scale insect in IVT (Midlate). The per cent incidence and per cent intensity were found significant. The incidence of scale insects was not found in Co 09009 and Co 09013.The minimum per cent incidence and per cent intensity were found in Co 99004 (3.33 % and 0.28 %), respectively. while maximum per cent incidence and per cent intensity was found in Co 02040 (10.0 % and 1.21 %), respectively (Table -6.4).

Mealy bugs, *Saccharicoccus sacchari* (Cockerell):

Ten varieties including two checks were screened for Mean per cent mealy bugs in IVT (Midlate). The per cent incidence and population per internode were found significant. The incidence of mealy bugs was not found in Co 99004, Co 09012, Co 09013, and Co 09014.The minimum per cent incidence was found in CoN 09073 and Co 86032 (3.33 % and 0.09) while maximum per cent incidence was found in Co 99004 (50 % and 1.78) (Table-6.4).

Incidence of whitefly and pyrilla was not found under natural condition

Project E.28:

Title	:	Survey and surveillance of Sugarcane insect pests.
Objectives	:	To identify key insect pests of Sugarcane in the area.
Duration	:	Long term.
Year of start	:	2012-2013
Location	:	Main Sugarcane Research Station N.A.U, Navsari and South Gujarat area.
Methodology		Roving Survey was carried out of sugarcane fields. Observations on incidence of sugarcane borer pests and sucking pests were recorded.

Table 1: Survey and surveillance of insect pests of sugarcane in South Gujarat during 2012-13.

Name of pest	Varieties	Location	Incidence(%)
Top borer	Co 86032 Co 97009	Tankal Ta. Chikhali Di: Navsari (Gandevi Sugar), Unn Ta. Navsari Dist. Navsari	10-12%
Root borer	Co 99004, Co 86032	Jokha, Ta. Kamrej (Chalthan sugar), Nemani Farm Umra Ta. Mahua Dist. Surat, Unn Ta. Navsari Dist. Navsari	5-6 %
White fly	Co 86032 CoM 0265	Epidemic infestation was found in Bardoli, Chalthan and Kamrej sugar factory area, Asundar Ta. Jalapore Dist. Navsari	16-20%
Yellow mite	Co 97009	Nagdhara(Puni) Ta: Navsari (Gandevi Sugar)	4-5%
Scale insect	Co86032, CoN 05071	Velanpur,Zervavra Ta: Mahuva Di: Surat (Gandevi: Sugar)	8-10%
Mealy bugs	Co 86032 CoN 05071	Bilakhadi, Gopla Ta: Mahuva Di: Surat (Mahua Sugar factory).	16-20%
Rodents	Co 86032, CoN 05071	Sisodara Ganesh Ta. Navsari Dist. Navsari (Gandevi Sugar)	6-7%

Note: pyrilla was found in trace in above villages.

Result:-

In South Gujarat insect pest incidence was moderate to traces. The incidence of top borer was10-12% on Co 86032 and Co 97009, root borer incidence was 5-6 on Co 99004 and Co 86032, White fly incidence 16-20% on Co 86032 and CoM 0265, incidence of yellow mite was 4-5% on Co 97009, the incidence of scale insect 8-10% on Co 86032 and CoN 05071, incidence of mealy bugs was 16-20% on Co 86032 and CoN 05071 and the rodent damage was 6-7% on Co 86032 and CoN 05071. The early shoot borer, thrips and pyrilla were found in traces.

Project No. 30

Title	**:** Monitoring of insect pests and bio-agents in sugarcane agro- ecosystem.
Objective	**:** To monitor the key insect pests and natural enemies in the area.
Locations	**:** Main Sugarcane Research Station , N.A.U., Navsari
Year of start	**:** 2012-13
Duration	**:** Long term
Date of Planting	**:** 08-01-2012
Variety	**:** CoN 05071
Methodology	**:** 1. Planting of sugarcane variety recommended for the region in 0.2 ha area. **:** 2. All recommended practices was followed except application of insecticide
Observations were recorded	**:** 1. Observations on incidence of borers were recorded by examining 20 canes at five places (four corners and in the middle), sucking pests by examining 25 canes. 2. Observations for all the bio-agents were recorded.

Monitoring of insect pests and bio-agents in Sugarcane

Name of the pest	Mean per cent incidence	Larva/egg mass collected	Parasitized larva	Bio-agents observed	Per cent parasitism
ESB *Sesamia sp.*	4.28%	83(L)	4	*Technidae*	4.82%
Chilo sp.		65(L)	4	*Apantelis sp.*	6.15%
Top borer	5.03%	122(E)	5	*Telonomus sp.*	4.10%
Internode borer	23-25%	-	-	-	-
Root borer	19-20	-	-	-	-
Scale insect	5.24%	-	-	-	-
Mealy bugs	23.33%	-	-	*Chrysoperla carnea*	-
Pyrilla	Very low	30(E) 50(N+Adult)	7 10	*Tetrasticus pyrillae* *Epericania melanoleuca*	23.33% 20.00%
White fly	Very low	-	-	Lady bird beetle	-

Result:

Percent larval parasitism by the *Technidae spp*. (8.82%) was found on *Sesamia spp*.(ESB), while by the *Apantelis spp*.(6.15%) was found on *Chilo spp.* On top borer egg parasitism (4.10%) was found by the *Telonomus spp*. bio agents. The percent parasitism on internode borer, Root borer and Scale insect was not found by the natural enemies. Per cent parasitism was found by the *Tetrasticus pyrillae* and *Epericania melanoleuca* on pyrilla eggs, nymph and adult (23.33 % and 20.00 %), respectively. Lady bird beetle predator was seen on whitefly nymph and eggs.

Project No. E. 33

Project Title **: Bio-efficacy of insecticides against mealy bugs, *Saccharicoccus sacchari* in sugarcane.**
Objective **:** To evaluate efficacy of insecticide against mealy bugs in sugarcane.
Year of start **:** 2012-13
Variety **:** CoN 05071
Location **:** Main Sugarcane Research Station, NAU, Navsari
Date of planting **:** 23-12-2011
Design **:** RBD.
Replications **:** Three.

No. of treatments **:** Nine.

T1: Sett treatment of Imidacloprid 70 WG/SP 25 g a.i./ ha+ spraying of Imidacloprid 17.8SL 0.005 %.

T2: Sett treatment of Imidacloprid 70 WG/SP 25 g a.i./ ha+ spraying of Thiamethoxam 25 WG 0.004 %.

T3: Sett treatment of Imidacloprid 70 WG/SP 25 g a.i./ ha+ spraying of Clothianidin 50 WSG 0.004 %.

T4: Sett treatment of Imidacloprid 70 WG/SP 25 g a.i./ ha+ spraying of Acetamiprid 20 SP 0.004 %.

T5: Sett treatment of Thiamethoxam 70 WG/SP 10 g a.i./ ha+ spraying of Imidacloprid 17.8SL 0.005 %.

T6: Sett treatment of Thiamethoxam 70 WG/SP 10 g a.i./ ha+ spraying of Thiamethoxam 25 WG 0.004 %.

T7: Sett treatment of Thiamethoxam 70 WG/SP 10 g a.i./ ha+ spraying of Clothianidin 50 WSG 0.004 %.

T8: Sett treatment of Thiamethoxam 70 WG/SP 10 g a.i./ ha+ spraying of Acetamiprid 20 SP 0.004 %.

T9: Untreated control.

Plot size **:** 6.0 m x 5.4 m.

Method of application **:** Dose of a.i. is based on 35000 three eye bud setts. Sett treatment was given at the time of planting. Spraying was not done due to not observing mealy bugs infestation.

Observations recorded **:** Germination percentage at 30 and 45 DAP.

Randomly selected 10 canes from 3 meter row length and count number of infested internodes out of total number of internodes.

1. before spraying and 7, 15 and 30 DAS and at harvest.
2. Yield (t/ha) and quality parameters at harvest was recorded.

Results:

Sett treatment was given at the time of planting in this trial. Spraying was not done due to not observing mealy bugs infestation.There was significant variation of mealy bugs infestation among different treatments in the sett treatment at harvest. At harvest the lowest (10.00%) mean per cent incidence of mealy bugs was found in treatment T5 and it was at par with treatment T2 (13.33%), treatment T3(16.67%) was at par with T2, T8(20.00%) and T6(23.33%).The maximum per cent intensity was found in untreated control treatment T9(40.00%). (Table:1)

Table: 1 Bio-efficacy of insecticides against mealy bugs, *Saccharicoccus sacchari* in sugarcane, trial at Main Sugarcane Research Station, Navsari (2012-13)

Treatment	Per cent incidence at harvest				Mean per cent incidence
	R-I	R-II	R-III	Total	
T1	30.00	30.00	20.00	80.00	31.00(26.67)
T2	10.00	20.00	10.00	40.00	21.15(13.33)
T3	20.00	20.00	10.00	50.00	23.85(16.67)
T4	40.00	30.00	30.00	100.00	35.22(33.33)
T5	10.00	10.00	10.00	30.00	18.44(10.00)
T6	20.00	20.00	30.00	70.00	28.78(23.33)
T7	30.00	30.00	30.00	90.00	33.22(30.000
T8	20.00	20.00	20.00	60.00	26.56(20.00)
T9	40.00	40.00	40.00	120.00	39.24(40.00)
Total	220.00	220.00	200.00	640.00	
S.Em. ±(T)					**1.79**
C.D @ 5 %(T)					**5.37**
C.V. %					**10.84**

Note: Figures in parentheses are original values and those outside are arcsine transformed values.

Table: 2 Yield and Quality Parameters

Treatment	Yield (t/ha)	Quality parameters			
		Brix%	Sucrose %	Purity %	C.C.S %
T1	95.61	19.67	17.70	89.98	12.35
T2	103.25	**20.33**	18.23	89.69	12.70
T3	101.89	19.33	17.60	90.97	12.34
T4	90.70	20.17	18.45	91.50	12.97
T5	107.53	**20.33**	**18.66**	**91.77**	**13.13**
T6	94.25	19.83	17.57	88.63	12.17
T7	93.47	19.50	17.47	89.63	12.17
T8	99.28	19.67	17.64	89.69	12.29
T9	75.56	18.17	16.55	91.06	11.62
S.Em. ±(T)	**4.15**	**0.56**	**0.54**	**0.83**	**0.39**
C.D @ 5 %(T)	**12.45**	**NS**	**NS**	**NS**	**NS**
C.V. %	**7.52**	**4.91**	**5.24**	**1.58**	**5.56**

Yield and Quality parameters viz., Brix %, Sucrose %, Purity %, C.C.S %

The highest millable cane yield of sugarcane was recorded in T5 (107.52 t/ha) treatment and it was at par with treatment T2 (103.25 t/ha), T3 (101.88 t/ha), T8 (99.27 t/ha) and T1 (98.61 t/ha). The significantly lowest millable cane yield was found in untreated control T9 (75.55 t/ha) treatment.

The brix per cent, sucrose per cent, purity per cent and commercial cane sugar (C.C.S.) per cent were found non significant. The higher brix per cent (20.33%), sucrose per cent (18.66%), purity per cent (91.77%) and C.C.S. (13.13%) were found in sett treatment of thiamethoxam 70 WG (T5). The minimum brix, sucrose and C.C.S per cent was found in untreated control treatment (18.17%, 16.55%, 11.62), respectively (Table:2).

Project No. E. 36

Project Title : Management of borer complex of sugarcane through lures

Objective : To manage sugarcane borers (Early shoot borer, top borer, and internode borer) through pheromone traps and influence of weather parameters on moth catches.

Year of start : 2012-2013

Variety : Co 86032

Location : Main Sugarcane Research Station, NAU, Navsari

Date of planting : 08-01-2012

Treatments : Pheromone lures of sugarcane early shoot borer, top borer, and internode borer

Plot size : 1 acre

Methodology : The test insect- pests were early shoot borer, top borer, and internode borer. Three pheromone traps for each pest were installed in the second fortnight of the February till harvest of crop in one acre of sugarcane crop. The pheromone lure was changed after 2 months.

Observation to be recorded :

1. Observation on number of moths trapped was recorded at weekly interval.
2. The mean number of moth capture was worked out.
3. The correlation and regression of moth captures was worked out with weekly meteorological parameters.
4. Infestation of each borer was recorded in both blocks.

Results:

Top borer (TB):

Maximum catches of top borer (1.33) was recorded in 2012-13 of 7th (12-18 Feb) met. week. From the Table-1 it is observed that there is positive correlation between top borer moth catches and maximum temperature (0.25), while minimum temperature (-0.13), rainfall (-0.18), number of rainy days (-0.27), sunshine hours (0.01), morning relative humidity (0.20) and evening relative humidity (-0.30) showed negative correlation from that evening relative humidity showed significantly negative correlation with moth catches of top borer (Table-1).

Table: 1 Correlation of moth catches with weather parameters (2012-2013)

pest	Temperature ^{0}C		Relative Humidity %		Rain-Fall (mm)	No.of rainydays	Sun shine hours
	Maxi.	Mini.	Morning	Evening			
ESB	-0.01477	-0.35526*	-0.22545	-0.23903	-0.27775*	-0.42646*	0.46002*
TB	0.204636	-0.12781	-0.20215	-0.29518*	-0.17984	-0.26638	-0.00774
INB	0.15250	-0.20363	-0.25920	-0.22221	-0.22604	-0.34587*	0.09081

Early shoot borer (ESB):

Maximum catches of Early shoot borer (1.33) was recorded in 2012-13 of 4th (22-28 Jan.) met. week. From the Table-1 it is observed that there is negative correlation between early shoot borer moth catches with maximum temperature (-0.01), relative humidity morning (-0.23), and relative humidity evening (-0.24), while minimum temperature (-0.36), rainfall (-0.28) and number of rainy days (-0.43) showed significantly negative correlation. Whereas, It showed significant positive correlation with sunshine hours (0.46) (Table 1).

Internode borer (INB):

Maximum catches of Internode borer (1.33) was recorded in 2012-13 of 9th, 23rd and 44th (26-4 Feb-march, 4-10 June and 29-4 Oct-Nov.) met week. From the Table-1 it is observed that there is negative correlation between internode borer moth catches with minimum temperature (-0.20), morning relative humidity (-0.26), evening relative humidity (-0.22) and rainfall (-0.23). while, No. of rainy days (-0.35) had significant negative correlation with internode borer moth catches. Whereas, Maximum temperature (0.15), and sunshine hours (0.09) showed positive correlation with internode borer incidence but it was non significant (Table-1).

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No. RSRS/Ento./H-1/AICRP/ /2013 Date : 10 - 06 – 2013

To,
Dr. G. G. Radadia
Principal Investigator
AICRP on sugarcane,
Professor of Entomology
N.M. College of Agriculture
N.A, U., Navsari-396 450

Sub: Annual Report of AICRP on Sugarcane Entomology for the year 2012-2013

Ref: Project Coordinator letter No. F.No. 17-33/2013-PCS Lucknow dated 08-05-2013

Respected Sir,

With reference to the above cited subject, I am submitting herewith an annual report and it's E-mail of All India Co-ordinated Research Project on Sugarcane, sub centre Navsari, Entomology discipline for the year 2012-2013 and oblige.

Thanking you.

Yours sincerely

Encl: As above

(D.U. Patel)
Research Scientist (S'cane)

Copy FWCS to :
Project Co-ordinator (Sugarcane),All India Co-ordinated Research Project on sugarcane,Indian Institute of Sugarcane Research, P.O. Dilkhusa, LUCKNOW-226 002 U.P. for information please.

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ANNUAL REPORT

ALL INDIA CO-ORDINATED RESEARCH PROJECT (AICRP)

ON

SUGARCANE (ENTOMOLOGY)

2012-2013

NAVSARI AGRICULTURAL UNIVERSITY

REGIONAL SUGARCANE RESEARCH STATION

NAVSARI AGRICULTURAL UNIVERSITY,

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