

ENTOMOLOGY (AICRP on Sugarcane), MANDYA CENTRE

Experiment – E.4.1

1. Title of the Experiment: Evaluation of Zonal Entries / Genotypes for their reaction against Major Insect pests.

2. Objectives: To grade the entries in the Zonal varietal trials for their behavior towards damage by key pests in the area.

3. Experimental details:

a. Location: ZARS, Mandya b. Situation: Irrigated

Forty six genotypes, comprising eight each under IVT Early and IVT Midlate, seven under AVT-E I-Plant, eight under AVT Midlate I –Plant, seven under AVT Early II Plant and eight under AVT Midlate II- plant with their respective group standards were evaluated against early shoot borer, top shoot borer and internode borer at Mandya .

Reaction of sugarcane genotypes against major insect pests of sugarcane at Mandya

Sl.No	Genotypes	Incidence of Borers (%)						
		ESB	Infestation Grade	TSB	Infestation Grade	INB	Infestation Index	Infestation grade
IVT Early 1st plant								
1	Co 08006	15.84	MS	6.25	LS	10	0.53	LS
2	Co 08001	22.4	MS	12.66	MS	14.25	0.11	LS
3	CoN 08071	20.3	MS	18.24	MS	11.25	0.2	LS
4	PI 08131	36.6	HS	15.21	MS	12.75	0.32	LS
5	CoVSI 08121	12.92	LS	10.33	MS	12.05	0.45	LS
6	Co 94008	18.98	MS	4.21	LS	16.25	0.25	LS
7	Co 85004	18.5	MS	5.15	LS	19.25	0.4	LS
8	CoC 671	14.57	LS	3.33	LS	14	0.1	LS
IVT Mid-late								
1	Co 08007	14.75	LS	22.75	HS	4.66	0.38	LS
2	Co 08020	20.56	MS	12.88	MS	2.94	0.53	LS
3	CoVSI 08122	6.84	LS	4.53	LS	7.58	0.69	LS
4	CoVSI 08123	15.51	MS	11.12	MS	6.42	0.38	LS
5	CoVC 08062	7.16	LS	5.33	LS	3.96	0.44	LS
6	CoVC 08064	7.46	LS	5.95	LS	9.25	0.61	LS
7	Co 99004	12.05	LS	13.85	MS	8.33	0.51	LS
8	Co 86032	9.33	LS	16.66	MS	9.5	0.47	LS

AVT Early 1st plant								
1	Co 07012	6.29	LS	4.25	LS	3.33	0.21	LS
2	Co 07015	4.05	LS	3.15	LS	16.66	1.24	LS
3	CoN 07071	6.29	LS	5.33	LS	13.33	0.68	LS
4	PI 07131	5.61	LS	21.15	HS	6.66	0.48	LS
5	Co 85004	4.26	LS	2.24	LS	6.33	0.4	LS
6	Co 94008	8.29	LS	5.6	LS	13.33	1.28	LS
7	CoC 671	6.82	LS	3.5	LS	10	1.04	LS
AVT Midlate I plant								
1	Co 07006	14.15	LS	5.37	LS	16.66	1.22	LS
2	Co 07007	15.5	MS	10.25	MS	6.45	0.39	LS
3	Co 07008	16.25	MS	5.51	LS	13.33	0.97	LS
4	Co 07009	31.33	HS	14.82	MS	13.33	0.99	LS
5	Co 07010	38.19	HS	18.24	MS	16.66	1.48	LS
6	CoSnk 07103	12.24	LS	5.67	LS	10	0.48	LS
7	Co 86032	10.25	LS	5.24	LS	6.66	0.62	LS
8	Co 99004	12.5	LS	7.53	LS	16.66	1.41	LS
AVT Early II plant								
1	Co 06001	7.24	LS	2.25	LS	12.05	0.47	LS
2	Co 06002	8.33	LS	2.33	LS	14	0.3	LS
3	Co 06022	13.69	LS	6.25	LS	13.5	0.33	LS
4	PI 06132	14.34	LS	3.25	LS	10.25	0.51	LS
5	Co 85004	7.51	LS	3.15	LS	14.25	0.38	LS
6	Co 94008	11.14	LS	5.33	LS	12.2	0.45	LS
7	CoC 671	9.66	LS	2.25	LS	11	0.44	LS
AVT Midlate II plant								
1	Co 06012	8.66	LS	3.25	LS	9.25	0.67	LS
2	Co 06020	14	LS	10.85	MS	13.75	0.79	LS
3	Co 06027	6.29	LS	3.33	LS	8.2	0.3	LS
4	CoM 06082	14.25	LS	17.27	MS	6.25	0.61	LS
5	CoM 06084	7.5	LS	3.66	LS	10	0.48	LS
6	CoSnk 03632	42.27	HS	7.37	LS	6.5	0.38	LS
7	Co 99004	8.24	LS	4.5	LS	10.5	0.47	LS
8	Co 86032	9.42	LS	3.75	LS	11.33	0.53	LS

Inference:

Among the genotypes screened under different categories, the following genotypes shown tolerance reaction against different borer pests.

Pest	IVT (Early)	IVT (Midlate)	AVT-Early I PC	AVT (Midlate)	AVT Early II PC	AVT Midlate II PC
ESB	Co 08006 CoVSI 08121	CoVSI 08122 CoVC 08062	Co 07105	CoSnk 07103 Co 07006	Co 06001	Co 06027 CoM 06084 Co 06012
TSB	Co 08006 CoVSI 08121	CoVSI 08122 CoVC 08062	Co 07105	CoSnk 07103 Co 07006	Co 06001	Co 06027 CoM 06084 Co 06012
INB	All the entries showed LS reaction to INB					

Experiment –E.27 Mass multiplication of potential bio-agents of sugarcane insect pest

1. Title of the Experiment: Mass multiplication of potential bio agents of Sugarcane white wooly aphid *Ceratovacuna lanigera*
2. Objectives: To develop effective management of *Ceratovacuna lanigera*
3. Experimental details: Mass multiplication technique for brown lace wing *Micromus igoratus* have been standardized under laboratory condition
4. Results Experiment vitiated because of non availability of white wooly aphid *Ceratovacuna lanigera* the host of *Micromus igoratus*.

Experiment- E.28**1. Title of the Experiment: Survey and Surveillance of Sugarcane insect pests**

2. Objectives: To identify the key insect-pests in the area
3. Experimental details:
 - a. Location: Mandya district
 - b. Situation: Irrigated
 - c. Methodology: Survey was conducted once in a month in different sugar factory areas of Mandya districts and the findings were presented briefly in the table given below

4. Results:

Survey and Surveillance of Sugarcane insect pests in Mandya district

Sl. No.	PEST	LEVEL OF INCIDENCE (%)
1	Early Shoot Borer	9.25-47.50
2	Top Shoot Borer	3.50-23.00
3	Internode Borer	8.25-43.25
4	Pyrilla	<0.25 adult/ nymph/clump
5	Woolly aphid	Incidence restricted to few clumps
6	Mealy bug	25% of the clumps observed over an area of 15 acres at Chikkabagilu (Malvalli Taluk)
7	Root Grub	Two Instances (<1 gunta area affected)

Experiment –E.30

1. Title of the Experiment: Monitoring of insect-pests and Bio-agents in sugarcane agro ecosystem

2. Objectives: To find out the activity of sugarcane pests and their bio-agents

3. Experimental details:

a. Location: ZARS, Mandya

b. Situation: Irrigated

c. Plot Size: 0.5 ac

d. Fertilizer (kg/ha) 25:100:125 NPK

e. Variety: Co 86032

4. Date of planting: 25/01/2011

5. Methodology: Sugarcane was raised in 0.5 acre area. All the recommended practices were followed except, application of insecticides. Observations on the incidence of borers was recorded by examining 100 shoots/canes at 5 places (Four corners and in the middle), Sucking pests were evaluated by examining 20 canes.

6. Results:

Monitoring of insect-pests and Bio-agents in sugarcane agro eco system

Time of Observation	ESB	TSB	INB
30 DAP	2.24	-	-
60 DAP	6.75	-	-
90 DAP	10.50	-	-
120 DAP	3.80	-	-
150 DAP	-	3.75	-
210 DAP	-	12.50	-
At Harvest	-	-	16.50
Cumulative incidence	23.29	16.25	16.50

Experiment – E.32

1. Title of the Experiment: Study Population dynamics of sugarcane borers using pheromone traps

2. Objectives: To study the population dynamics of sugarcane borers (Early Shoot Borer, Top Shoot Borer and Inter Shoot Borer)

3. Experimental details:

- a. Location: ZARS, Mandya
- b. Situation: Irrigated
- c. Plot Size: 1.0 ac
- d. Fertilizer (kg/ha) 25:100:125 NPK
- e. Variety: Co 62175

4. Date of planting: 25/01/2011

5. Methodology: Three pheromone traps for each sugarcane borer pest were installed in the second fortnight of February till the harvest of the crop in one acre area. The pheromone lures were changed once in two months. Observations were made at weekly interval.

6. Results: ESB and TSB moths were active through out the year. Characteristic peak of ESB was recorded on 19th standard week (May 2nd week). Top shoot borer activity was high and it formed peaks in March, April, August and September. Internode borer activity was low through out the year.

Population dynamics of Sugarcane borers through Pheromone Traps 2011

Standard week No.	Temperature		Relative humidity(%)		RF (mm)	Sugarcane borers		
	Max °C	Min °C	RH-I hour	RH-II hour		ESB (moths/Trap)	TSB (moths/Trap)	INB (Moths/Trap)
7	30.4	18.4	91	47	4.6	4.45	8.25	1.00
8	30.8	18.7	91	46	0	3.00	9.50	0.00
9	30.7	17.2	90	45	0	1.00	1.25	1.00
10	30.7	21.2	91	47	0	11.00	14.50	3.00
11	30.9	20.5	91	47	4.6	8.00	9.50	4.25
12	31.4	20.6	91	48	6.4	12.25	8.25	2.25
13	31.4	20.8	90	47	2.8	13.75	8.00	1.00
14	33.1	20.8	91	36	0	16.50	5.25	0.50
15	33.6	21.1	92	41	23.8	9.25	9.25	0.00
16	33.0	22.7	91	38	20.8	2.50	6.25	0.25
17	33.9	22.3	91	37	153.8	0.50	2.25	0.00
18	32.9	22.0	91	38	5.8	6.25	1.00	0.50
19	33.7	22.0	91	33	0	39.50	0.50	1.50
20	30.7	22.0	91	37	4.2	10.25	0.50	0.50
21	31.7	22.0	91	47	14.4	1.50	1.00	0.00
22	34.4	21.2	91	39	26.6	1.00	0.00	0.00
23	32.7	22.6	91	40	6	0.25	0.25	0.00
24	31.9	22.3	91	49	1.8	0.50	2.25	0.00
25	29.6	21.4	91	47	11	12.75	5.50	0.25
26	32.0	21.6	91	43	2.6	0.50	1.25	0.50
27	30.8	19.0	91	45	1	0.00	0.25	0.50
28	30.0	16.6	91	45	0	0.25	0.25	0.00
29	30.4	14.9	90	45	5.4	0.50	0.50	0.00
30	30.3	17.14	91	36	30.2	0.75	3.25	0.25
31	30.0	17.1	90	43	7	3.25	6.00	0.50
32	30.3	20.5	91	54	23.8	12.50	18.00	3.25
33	30.3	20.2	91	52	9.4	2.25	25.00	1.00
34	29.3	20.7	91	54	63.6	5.25	10.25	1.00
35	29.6	20.7	91	51	4.2	6.00	15.00	0.50
36	29.9	20.0	91	56	8.2	4.00	6.00	0.25
37	28.6	20.2	91	59	1.4	4.25	10.50	0.25
38	28.9	19.7	91	57	6.2	3.00	12.25	0.00
39	32.0	20.7	91	42	3.8	0.50	0.50	0.00
40	32.6	21.0	91	42	66.4	0.50	5.00	0.25
41	31.7	21.0	91	45	34	0.50	5.25	0.00
42	30.3	19.8	91	53	26	1.00	6.25	1.00
43	30.0	19.2	91	53	48	1.50	3.00	0.75
44	29.9	20.4	91	56	29.4	1.50	2.50	0.75
45	31.0	20.6	91	48	53.8	1.50	3.00	0.50
46	30.4	21.2	91	48	4.6	4.00	7.25	1.00
47	31.4	20.5	91	48	6.4	1.75	1.00	0.50
48	31.3	20.8	91	48	2.8	1.00	1.25	0.00
49	30.3	20.6	91	50	0	2.25	3.25	0.50
50	31.0	20.2	91	53	0	5.50	7.00	1.00
51	30.4	17.4	91	43	0	7.25	6.50	0.50
52	30.3	16.8	91	45	1.6	5.25	1.00	3.25

Correlation study of weather parameters with pheromone trap catches of Sugarcane borers :

Sugarcane borers	Temperature °C		Relative humidity (%)		Rainfall (mm)
	Maximum	Minimum	RH- I hour	RH- II Hour	
ESB	0.24	0.30	0.12	-0.22	-0.15
TSB	-0.27	0.19	0.21	0.47	0.02
INB	-0.11	0.11	0.06	0.18	-0.09

Early shoot borer established positive correlation with maximum temperature and negative correlation with rainfall and relative humidity at 14.30hr. Top shoot borer catches established negative correlation with maximum temperature and positive correlation with relative humidity at 14.30hr. Internode borer catches established negative correlation with both maximum temperature and rainfall.

Sl. No	Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Rainy days	SSH (hrs)	Insect pests
		Maximum	Minimum	07.30 hrs	14.30 hrs				
1	April 2011	36.0	23.1	91	38	176.2	8	7.9	ESB,TSB
2	May 2011	33.7	21.8	90	40	51.0	6	7.8	ESB
3	June 2011	31.5	22.0	91	44	21.4	3	4.1	Aphid
4	July 2011	29.2	16.9	90	53	41.8	5	7.7	Aphid
5	Aug 2011	29.9	20.5	91	54	101.8	9	4.1	Wooly Aphid
6	Sept 2011	30.1	20.3	91	52	30.4	5	5.6	Pyrilla
7	Oct 2011	30.7	20.1	91	51	193.0	15	5.9	TSB, Pyrilla
8	Nov 2011	32.1	20.5	93	49	121.6	8	8.2	INB
9	Dec 2011	30.2	18.8	91	49	2.8	0	6.3	INB
10	Jan2012	29.7	20.6	91	53	0	0	6.9	ESB
11	Feb2012	32.6	21.1	91	49	0	0	8.4	ESB,INB
12	March2012	31.5	21.3	90	49	0	0	9.1	ESB,TSB
					Total	740	59		

ESB- Early shoot borer ,TSB- Top shoot borer, INB- Inter node borer