Project No. E.4.1. Evaluation of zonal varieties/genotypes for their reaction against major insect pests of sugarcane.

Objective: To grade the entries in the zonal varietal trials for their behavior towards damage by key pests in the area.

Location: SBI-RC, Karnal

Year of Start: 2008 (Continuing project)

Results

Ratoon of eighteen sugarcane genotypes along with three standard varieties were evaluated against major insect pests namely; black bug (BB), early shoot borer (ESB), top borer (TB) stalk borer (SB) and root borer (RB) (Table-1). Black bug incidence ranged from 13.6 to 33.4 per cent. Two genotypes; CoLk 09204 and CoS 08234 had BB incidence <15.0 per cent hence graded as Least susceptible (LS). ESB incidence ranged from 2.9 to 16.8 per cent. Seventeen genotypes showed LS reaction (<15.0%) except CoS 08233 which was graded as MS to ESB (15.1 – 30.0%). Top borer incidence varied from 0.0 to 4.7 per cent which was below ETL (<10.0%) hence no conclusion could be drawn. Root borer incidence ranged from 13.0 to 26.1per cent. Two genotypes; CoS 08233 and CoS 09246 shown LS reaction (<15.0%) and sixteen genotypes were moderately susceptible to root borer (15.1 – 30.0%). The infestation index of stalk borer ranged from 0.0 to 3.0. Seventeen genotypes had infestation index < 2.0 hence rated as least susceptible to stalk borer while one genotype Co 09022 was moderately susceptible to stalk borer (infestation index 2.1 to 5.0).

Plant crop

Evaluated eighteen sugarcane genotypes comprising of eight AVT I and ten AVT II along with two standard varieties for their reaction against major insect pests viz., early shoot borer (ESB), top borer (TB), stalk borer (SB) and root borer (RB) (Table-2). The incidence of ESB ranged from 4.6 to 14.2 per cent and 1.7 to 7.5 per cent in AVT I and AVT II, respectively. The incidence of ESB was below ETL (<15.0%) hence, no conclusion could be drawn. In case of top borer, the incidence ranged from 0.0 to 3.1 and 0.5 to 11.0 per cent in AVT I and II respectively. Fifteen genotypes shown least susceptible reaction (<10.0%) to top borer except CoLk 09202 which was MS (10.1 - 20.0%). Stalk borer infestation index varied from 0.7 to 1.6 and 0.9 to 4.4 in AVT I and AVT II, respectively. Thirteen genotypes; were least susceptible to stalk borer (Infestation index<2.0). Five genotypes; CoH 10261, CoLk 09202, Co 09022, CoH 09264 and CoPb 09214 shown MS reaction to stalk borer (Infestation index 2.1-5.0). Root borer incidence varied from 18.6 to 78.3 and 22.8 - 72.6 per cent in AVT I and AVT II respectively. None of the genotypes showed least susceptible reaction (<15.0 per cent). Four genotypes; Co10035, Co10036, Co 09022 and CoPb 09214 were moderately susceptible to root borer (15.1 to 30.0%).

Project No. E.28. Survey and surveillance of sugarcane insect- pests.

Objective: To identify the key insect- pests in the area.

Location: SBI-RC, Karnal

Year of Start: 2008 (Continuing project)

Results

The mean incidence per cent of early shoot borer was traces (T) to 20.0, T to 27.0, T to 60.0, T to 17.0, T to 21.0 T to 11.0 per cent in commercial cane varieties; Co 89003, CoS 8436, CoH 119, Co 0118,Co 0238 and Co 05011, respectively (Table-3). The incidence of top borer in varieties; Co 89003, CoS 8436, CoH 119, Co 0118,Co 0238 and Co 05011 was ranged from T to 9.0, T to 9.1, T to 16.5, T to11.3, T to 17.4 and T to 07.0 per cent, respectively. Stalk borer infestation index was 5.6, 2.6, 2.3, 1.6, 1.8 and 1.9 in varieties; Co 89003, CoS 8436, CoH 119, Co 0118, Co 0238 and Co 05011, respectively. The sugarcane varieties; Co 0118, Co 0238 and Co 05011 shown LS reaction to stalk borer (infestation index <2.0) while CoH 119 and CoS 8436 shown MS reaction (infestation index 2.1 to 5.0). The variety Co 89003 was highly susceptible to stalk borer had infestation index >5.0. The mean incidence of root borer was 63.3, 51.5, 42.5, 46.0, 45.0 and 61.0 per cent in varieties; Co 89003, CoS 8436, CoH 119, Co 0118, Co 0238 and Co 05011, respectively. Incidence of internode borer, as new insect in the area was 3.6 per cent in variety, Co 05011. Ratoon crops of all the varieties were severely infested with black bugs. The black bug population ranged from 7.0 to 86.0 bugs/ tillers. Incidence of pyrilla was recorded from traces to 96.0 nymphs and adults/ leaf. Mealy bug and white flies incidence was in traces. The ratoon crops were damaged by army worm in traces. The incidence of pink borer in ratoon sprouts was ranged from traces to 17.0 per cent.

Internode borer identified as new pests of sugarcane. Root borer and pink borer were minor pests now they gained the status of major pest. Early shoot borer, top borer, stalk borer, black bug, pyrilla and white grub were identified as key pests and Gurdaspur borer, army worm, mealy bugs, white fly and thrips as occasional pest of sugarcane in North Western Zone.

Project No. E.30 Monitoring of insect pests and bio agent's in sugarcane agro-ecosystem.

Objective: To monitor the key insect-pests and natural enemies in the area.

Location: SBI-RC, Karnal

Year of Start: 2008 (Continuing project)

Results

Monitored major insect pests and their bio-agents in sugarcane variety Co 0238. The incidence of early shoot borer (ESB), top borer (TB) and Stalk borer (SB) was recorded 11.3, 12.9 and 60.3 per cent, respectively (Table-4). The population of sucking insect, Pyrilla was (71.0 individual/ leaf). The parasitization of pyrilla by *Epiricania melanoleuca* was 78.0%. The pyrilla eggs were parasitized (28.3%) by *Tetrastichus pyrillae.* The parasitization of top borer larvae by *Isotima javensis* and *Stenobracon deesae was* 2.7 and 4.*8.*per cent, respectively. The parasitization of stalk borer larvae by *Cotesia flavipes was* recorded 4.3 per cent. The prevalence of effective parasitoides of major insect pests of sugarcane was identified viz.; *Isotima javensis and Stenobracon deesae, Cotesia flavipes*, *Tetrastichus pyrillae* and *Epiricania melanoleuca* parasitizing to top borer larvae, stalk borer larvae, pyrilla eggs and pyrilla nymphs and adults, respectively.

Table1. Reaction of sugarcane genotypes against major insect pests in ratoon

Sl. No.	Variety/Genotypes	Incidence (%)				Stalk borer	
		Black bug	Early shoot borer	Top borer	Root borer	Intensity (%)	Infestation Index
1	CoS 09232	22.1	6.5	0.00	20.7	3.0	0.2
2	CoPb 09214	33.4	3.6	0.00	15.7	6.7	0.4
3	CoLk 09204	13.6	6.1	0.00	19.2	0.0	0.0
4	CoH 09264	18.8	4.9	0.00	22.2	3.0	0.1
5	Co 09022	33.3	4.6	0.00	21.5	13.9	3.0
6	CoJ 64	39.3	6.5	0.00	23.5	2.2	0.2
7	CoPb 08211	21.1	10.0	0.76	18.2	15.7	1.4
8	CoPb 08212	31.3	3.1	0.00	26.1	10.0	0.6
9	CoS 08233	21.6	16.8	0.00	14.2	19.6	1.3
10	CoS 09246	26.3	2.9	0.00	13.0	19.9	0.9
11	CoH 09262	25.8	5.8	0.00	19.0	14.9	1.0
12	Co 0238	21.5	5.1	2.60	17.8	0.0	0.0
13	CoPb 09181	27.6	5.5	0.00	17.8	31.0	1.9
14	CoLk 09202	22.2	4.9	0.00	16.3	0.0	0.0
15	CoH 09262	27.8	6.6	0.00	25.4	14.3	0.5
16	Co 08235	28.0	3.6	0.00	20.5	14.1	0.9
17	CoS 08234	14.7	9.8	1.59	17.4	14.4	1.3
18	CoS 8436	30.3	9.6	4.7	25.0	0.0	0.0
19	CoH 08264	20.7	6.6	0.00	15.6	0.0	0.0
20	CoH 08263	19.4	4.4	0.44	15.4	13.7	1.0
21	CoPb 08217	19.2	4.2	0.00	17.4	2.0	0.7

Table- 2. Reaction of sugarcane genotypes against major insect pests in plant crop

Sl. No.	Variety/Genotypes	Incidence (%)			Stalk Borer	
		Shoot borer	Top Borer	Root borer	Intensity (%)	Infestation Index
AVT Ist Plant						
1	Co 10035	14.2	1.9	18.6	12.6	1.6
2	Co 0238	6.0	13.9	62.3	23.4	4.4
3	CoH 10261	6.5	1.9	71.6	8.7	2.3
4	CoS 10231	5.3	0.6	44.8	10.5	1.4
5	Co 10036	7.0	2.1	24.9	17.0	1.3
6	CoH 10262	4.6	3.1	70.3	11.3	0.7
7	Co Plant 10221	7.5	0	68.3	14.3	1.4
8	Co Pb 10181	5.8	0.5	78.3	15.6	1.4
9	Co Pb 10182	10.4	1.6	66.2	16.9	1.2
10	CoS 8436	6.8	0.9	56.9	11.6	1.5
AVT II Plant						
1	CoH 09262	3.2	2.3	62.3	17.4	0.9
2	CoH 09263	3.5	1.6	67.6	7.0	1.1
3	Co Lk 09202	1.7	11.0	70.3	8.9	3.5
4	Co Pb 09181	7.5	1.8	68.6	15.8	1.5
5	CoS 09246	4.4	0.5	70.6	12.2	0.9
6	Co 09022	6.2	1.4	22.8	13.4	4.4
7	CoH 09264	2.4	3.9	64.2	9.0	3.7
8	Co Lk 09204	6.3	2.5	72.6	12.1	3.4
9	Co Pb 09214	6.3	5.9	28.6	23.0	1.0
10	CoS 09232	3.6	0.7	67.6	8.7	1.5

Table- 3: Incidence of major insect pests in sugarcane.

Sl. No.	Variety	Incidence (%)			Population		Stalk borer
		Shoot borer	Top borer	Root borer	Black bug/ tiller	Pyrilla/ leaf	Infestation Index
1	Co 89003	T to 20.0	T to 9.0	63.3	T to 86.0	T to 86.0	5.6
2	CoS 8436	T to 27.0	T to 9.1	51.5	T to 39.0	T to 96.0	2.6
3	CoH119	T to 60.0	T to 16.5	42.5	T to 22.0	T to 79.0	2.3
4	Co 0118	T to 17.0	T to 11.3	46.0	T to 44.0	T to 89.0	1.6
5	Co 0238	T to 21.0	T to 17.4	45.0	T to 59.0	T to 73.0	1.8
6	Co 05011	T to 11.0	T to 07.0	61.0	T to 41.0	T to 53.0	1.9

T= Traces

Table - 4 Incidence of major insect- pests and their bio-agents in sugarcane ecosystem

S.No.	Insect-pests	Infestation / Population	Bio- agents	Parasitisation (%)
1	Early shoot borer	11.3 **%**	**-**	**-**
2	Top borer	12.9%	*Isotima javensis*	2.7 (Larvae)
			Stenobracon deesae	4.8(Larvae)
3	Stalk borer	60.3%	*Cotesia flavipes*	4.3(Larvae)
4	Pyrilla	(71.0 individual/ leaf).	*Epiricania melanoleuca*	78.0 (Nymph and adults)
			Tetrastichus pyrillae.	28.3 (eggs)
5	White flies	07.0 puparia/cm$^{2)}$	*Encarcia* Sp.	Traces