

**Sugarcane Research Institute,  
Rajendra Agricultural University, Bihar,  
Pusa (Samastipur)-848125**

***Dr. S.S. Pandey***  
*Director*



No. ----- / SRI, Pusa

Date -----

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To

Dr. O. K. Sinha  
Project Co-ordinator (Sugarcane)  
AICRP on Sugarcane  
Indian Institute of Sugarcane Research  
P.O. Dilkhusha  
Lucknow-226002 (U.P)

**Sub: Annual Report of Entomology, SRI, Pusa 2013-14.**

Sir,

I am submitting herewith one copy of Annual Report 2013-14 of Entomology for your kind needful. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(S.S. Pandey)

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**ALL INDIA CO-ORDINATED RESEARCH PROJECT**

**ON SUGARCANE**

**(INDIAN COUNCIL OF AGRICULTURE RESEARCH)**

**TECHNICAL REPORT**

**ENTOMOLOGY**

**(2013-14)**

**CENTRE: PUSA (BIHAR)**



**SUGARCANE RESEARCH INSTITUTE  
RAJENDRA AGRICULTURAL UNIVERSITY  
BIHAR, PUSA (SAMASTIPUR)-848125**

**Annual Report of All India Co-ordinated Research Project on Entomology  
Department of Entomology, Sugarcane Research Institute  
Rajendra Agricultural University, Bihar, Pusa-848125  
(2013-14)**

**Project No. E. 4.1**

- (i) Project Title : Evaluation of zonal varieties/genotypes for their reaction against major insect pests of sugarcane.
- (ii) Objective : To grade entries in the zonal varietal trials for their behavior towards damage by key pests in the areas.
- (iii) Period under report : 2013-14
- (iv) Year of Start : 1985-86
- (v) Location : Sugarcane Research Institute, Pusa, Bihar
- (vi) Technical Programme : 2013-14
- (vii) Replication : 03
- (viii) Plot Size : 06 Meter long.
- (ix) Row to row : 90 cm (Spacing)

**Technical Summary**

Twenty three (23) varieties/genotypes comprising of 6 AVT (Early) 1<sup>st</sup> plant, 5 AVT (Mid-late) , 6 AVT (Mid-late) 2<sup>nd</sup> plant and 6 IVT (Mid-late) including standard check were evaluated against Root borer, Shoot borer, Top borer and Stalk borer at SRI, Pusa (Table 1a-d).

The cumulative incidence of early shoot borer was recorded as lowest (2.04 %) in variety BO 91 AVT Mid-late and highest (14.28%) in variety CoP 08436AVT Early 1<sup>st</sup> plant. The genotype tested under different maturity groups are graded under less susceptible reaction against early shoot borer. While, incidence of Root borer was found lowest (1.05%) in variety BO 154 AVT Midlate and Maximum (8.73%) in variety CoSe 10452 IVT Midlate and also graded as less susceptible reaction. The incidence of Top borer was recorded as low to moderate which varied 8.00% in variety BO 130AVT Early 1<sup>st</sup> plant and 17.33% in variety CoSe 08452 AVT Midlate 2<sup>nd</sup> plant. All the genotype evaluated under different maturity groups exhibited less to moderately susceptible reaction against Top borer. The Stalk borer infestation index was varied from zero to 0.05 per cent and showed less susceptible reaction for all tested genotype.

**Table 1a. E. 4.1. Evaluation of Zonal variety/genotype of reaction against borer pest of sugarcane.**

S.N.	Varieties/ genotypes	Early shoot borer (% incidence)						Top borer (% incidence)			Internode			Stalk borer			Root borer % incidence
		30 DAP	60 DAP	90 DAP	120 DAP	Cumm.	No. of bored plant S/ha	III Brood	IV Brood	At harvest	% incidence	% intensity	Infestation on index	% incidence	% intensity	Infestation on index	
								5 <sup>th</sup> month	7 <sup>th</sup> month								
<b>AVT Early first plant</b>																	
1	Cose- 09452	4.53	5.45	1.02	0.85	4.91	1111	7.14	12.12	13.33	-	-	-	1.33	0.15	0.01	3.03
2	B0-153	0.0	3.94	6.14	2.20	8.90	2407	7.01	9.48	10.66	-	-	-	0.00	0.00	0.00	2.43
3	Cop- 08436	0.0	3.65	9.63	3.96	14.28	2777	8.43	10.58	10.66	-	-	-	5.33	0.36	0.01	5.55
4	Up-09453	4.12	0.0	7.64	4.06	11.29	3889	10.75	12.34	13.33	-	-	-	6.66	0.41	0.02	6.89
5	Bo-130	2.57	3.70	4.23	1.41	7.33	2037	5.08	6.55	8.00	-	-	-	0.00	0.00	0.00	2.85
6	Cose- 95422	0.0	4.16	6.30	2.25	9.09	2407	9.00	10.71	12.0	-	-	-	2.66	0.15	0.03	6.57

**Table 1b. E. 4.1. Evaluation of Zonal variety/genotype of reaction against borer pest of sugarcane.**

S.N.	Varieties/ genotypes	Early shoot borer (% incidence)						Top borer (% incidence)			Internode			Stalk borer			Root borer % incidence
		30 DAP	60 DAP	90 DAP	120 DAP	Cumm.	No. of bored plant S/ha	III Brood	IV Brood	At harvest	% incidence	% intensity	Infestation on index	% incidence	% intensity	Infestation on index	
								5 <sup>th</sup> month	7 <sup>th</sup> month								
<b>AVT Mid-late</b>																	
1	BO 154	3.74	4.54	5.51	3.78	12.75	3519	5.31	8.52	10.66	-	-	-	0.00	0.00	0.00	1.05
2	CoP 09437	0.0	1.78	1.61	0.67	3.28	926	9.67	10.93	14.66	-			4.00	0.20	0.01	1.35
3	CoP 9301	0.0	1.72	2.85	1.19	4.59	741	5.71	8.0	9.33				0.000	0.00	0.00	4.93
4	BO 91	0.0	1.67	0.0	1.03	2.04	370	6.81	7.29	8.00				0.00	0.00	0.00	3.87
5	CoSe 92423	2.35	4.65	5.81	2.91	10.56	2407	9.30	10.98	14.66				5.33	0.30	0.01	2.36

**Table 1c. E. 4.1. Evaluation of Zonal variety/genotype of reaction against borer pest of sugarcane.**

S.N.	Varieties/ genotypes	Early shoot borer (% incidence)						Top borer (% incidence)			Internode			Stalk borer			Root borer % incidence
		30 DAP	60 DAP	90 DAP	120 DAP	Cumm.	No. of bored plant S/ha	III Brood	IV Brood	At harvest	% incidence	% intensity	Infestation on index	% incidence	% intensity	Infestation on index	
								5 <sup>th</sup> month	7 <sup>th</sup> month								
<b>AVT Mid-late 2<sup>nd</sup> plant</b>																	
1	CoP 08437	0.0	1.53	5.26	2.27	7.52	1296	1052	11.90	14.66	-	-	-	0.00	0.00	0.00	2.67
2	CoSe 08451	0.0	3.22	1.81	1.51	4.41	556	8.91	11.94	16.00	-	-	-	0.00	0.00	0.00	3.43
3	CoSe 08452	2.91	3.84	10.20	2.10	8.91	2037	8.86	12.69	17.33	-	-	-	9.33	0.60	0.05	5.81
4	BO 91	0.0	2.89	1.23	1.03	3.03	741	6.49	8.97	13.33	-	-	-	1.33	0.15	0.01	4.36
5	CoP 9301	0.0	1.81	5.19	2.35	7.77	1296	5.94	7.47	10.66	-	-	-	0.00	0.00	0.00	6.23
6	CoSe 92433	4.87	2.35	2.75	0.82	6.25	1481	6.42	8.84	12.00	-	-	-	0.00	0.00	0.00	7.18

**Table 1d. E. 4.1. Evaluation of Zonal variety/genotype of reaction against borer pest of sugarcane.**

S.N.	Varieties/ genotypes	Early shoot borer (% incidence)						Top borer (% incidence)			Internode			Stalk borer			Root borer % incidence
		30 DAP	60 DAP	90 DAP	120 DAP	Cumm.	No. of bored plant S/ha	III Brood	IV Brood	At harvest	% incidence	% intensity	Infestation on index	% incidence	% intensity	Infestation on index	
								5 <sup>th</sup> month	7 <sup>th</sup> month								
<b>IVT Mid-late</b>																	
1	Cose 10451	0.000	4.83	6.52	2.91	10.71	22223	7.60	7.47	8.000	-	-	-	0.00	0.00	0.00	5.22
2	coSe 10452	0.00	2.22	5.63	1.12	6.38	1111	8.45	10.12	16.00	-	-	-	2.66	0.15	0.01	8.73
3	CoSe 10453	2.11	1.92	5.00	9.39	7.90	25.93	7.14	8.66	10.66	-	-	-	0.00	0.00	0.00	4.64
4	BO 91	2.53	23.8	4.34	2.45	7.55	2408	6.52	9.27	12.00	-	-	-	4.00	0.36	0.01	7.37
5	CoP 9301	0.0	1.42	3.44	1.03	4.95	926	5.61	7.95	9.33	-	-	-	0.00	0.00	0.00	6.56
6	CoSe 92423	0.00	2.43	4.54	2.47	7.81	1852	9.09	10.07	14.66				5.33	0.46	0.02	7.88



## Project No. E-28

- (i) Project Title : Survey and surveillance of sugarcane insect pests.
- (ii) Objective : To identify key insect pests of sugarcane in the area.
- (iii) Period under report : 2013-14 :
- (iv) Year of Start : 2003-04
- (v) Location : Sugarcane Research Institute, Pusa, Bihar
- (vi) Technical Programme : 2013-14

### Technical summary

Survey on the insect pest of sugarcane under the reserved area of Harinagar, Narkitayaganj, Riga and Hasanpur sugar factory were conducted during cropping season 2013-14. The percent incidence of early shoot borer (13 to 18%), Root borer (2 to 12%), Top borer (4 to 12%), Stalk borer (below 5%), Pyrilla (10 to 40) per leaf and Black bug (5 to 18%) were observed as the key pests of Sugar Factory reserved area of sugarcane .The incidence of other pest like Plassey borer, Mealy bug, Termite, Grass hopper, Scale insect, White fly etc. were also recorded in traces. Beside sugar Mills reserved area, a roving survey was also conducted at sugarcane field in and around Pusa at monthly interval. The percent incidence of early Shoot borer, Root borer, Top borer were varied from 2.6 to 9.56, 1.47 to 7.86 and 4.3 to 11.6, respectively. While pyrilla was observed 5-10 per leaf. The severe incidence of mites was observed in varieties BO 153, Co 957, CoS 767. For the 1<sup>st</sup> time Derbid plant hopper was observed at Pusa Farm, Sugarcane Research Institute, Pusa and its incidence was observed 10-15 per leaf.

**Table 4 Survey and Surveillance of sugarcane insect pests at SRI, Pusa**

Sl. No.	Variety	Location	Name of pest	% incidence		Average	Remarks
				Min .	Max.		
1.	Cos 767 BO 147 CoSe 92423 Copant 03220	Harinagar	Early shoot borer	8	22		
			Top borer	3	12		
			Stalk borer	2	5		
			Pyrilla per leaf	25	40		
			Black bug	5	18		
2.	Bo-147 Cos- 0238,98231 Co-0118,98014	Narkatiyaganj	ESB	5	8		
			ToP	6	13		
			Stalk	2	4		
			Pyrilla per leaf	20	60		
3.	Co 0235	Hasanpur	ESB	5	7		
			Top	4	9		
			Top	1	3		
4.	BO 153 Co 957 Co 7717 Co 1148 CoS 767 Co 419,BO 141,BO 154,BO 139	Pusa Farm	ESB	2.6	9.56		
			Root	1.47	7.86		
			Top	4.3	11.6		
			Pyrilla per leaf	5	10		
			Black bug	10	15		
			Mite	20	25		
			Derbid plant hopper per leaf	10	15		
5.	BO 91,BO 141,CoSe 92423	Riga	Top	8	16		
			Black bug	5	9		
			Mealy bug	10	15		
			Scale insect	Trace	Trace		
			Pyrilla	Trace	Trace		

## Project No. E-30

1. Project Title : Monitoring of insect pests and bio-agents in sugarcane agro-ecosystem.
2. Objective : To grade entries in the zonal varietal trials for their behavior towards damage by key pests in the area.
3. Project No. : **E-30**
4. Period under report : 2013-14
5. Year of Start : 2007-08
6. Location : Sugarcane Research Institute, Pusa, Bihar
7. Plot size : 0.2 hectare
8. Duration : Long term
9. Variety : BO 141
10. Metrological data : Yes (Monthly average)

### Technical Summary:-

Sugarcane variety BO 141 was planted in 0.2 hectare area. The population of Root borer, Shoot borer, Top borer, Stalk borer, Plassey borer, Pyrilla, Scale insect, Mealy bug and their natural enemies were recorded during cropping season 2013-14 at Pusa Farm of Sugarcane Research Institute were recorded at monthly interval. The data on monitoring of insect pest and its bio-agent revealed that the mean per cent incidence of Root borer, Shoot borer, Top borer and Stalk borer were varied from 1.4 to 5.8%, 1.9% to 7.2%, traces to 11.6% and traces to 6.6%, respectively. Whereas, the incidence of sugarcane Pyrilla was recorded which varied from traces to 2.7/leaf.

The bio-agents of Root and Early shoot borer were not appeared during cropping season 2013-14. While, parasitization of bio-agents such as, *Apanteles flavipes*, *Rhanconus scirpophagae* and *Stenobracon deesae* were recorded against top borer. The data presented in table 3a revealed that population of *S. deesae* varied from 2.56 to 10.34% during May to November. Where its peaks (10.34%) noticed in September. Population of *Apanteles flavipes* was ranged between 2.7 to 8.69% during May to November with its highest population (8.69%) was recorded in month of September. The activity of *R. scirpophagae* was recorded from August to September with its peak (4.34%) in month of September. The parasitization of *T. pyrillae* and *E. melanoleuca* was recorded from May to November and these highest parasitization were recorded 18.51% and 33%, respectively in month of October. In case of Stalk borer, the parasitization of *Apanteles flavipes* was also recorded but found in traces.

**Table : 3a. E.30 Monitoring of insect pest and natural enemies of Sugarcane (0.2 ha area)**

Period of observation	% incidence top borer	% Parasitism (Top borer)			% incidence of shoot borer	% incidence of root borer	% Parssitism of (root and shoot borer) if any
		<i>A. Flavipes</i>	<i>R. scripophagae</i>	<i>S. deesae</i>			
January	-	-	-	-	-	-	Not appeared.
February	-	-	-	-	-	-	
March	Trace	-	-	-	2.1	1.4	
April	4.3	-	-	-	3.5	2.3	
May	7.3	2.70	-	2.56	7.2	5.8	
June	11.6	2.85	-	4.87	4.6	3.3	
July	9.8	5.8	2.94	6.45	1.9	1.5	
August	6.8	6.06	3.03	7.30	-	-	
September	5.4	8.69	4.34	10.34	-	-	
October	Trace	7.40	3.70	8.47	-	-	
November	Trace	3.57	3.22	4.22	-	-	
December	Trace	-	-	-	-	-	

**Table : 3b. E.30 Monitoring of insect pest and natural enemies of Sugarcane (0.2 ha area)**

Period of observation	Pyrilla/leaf	% Parasitism (Pyrilla)		% incidence of stalk borer	% parasitism (stalk borer)
		<i>T. pyrrillae</i>	<i>E. melanoleuca</i>		A. Flavipes
January	-	-	-	-	-
February	-	-	-	-	-
March	-	-	-	-	-
April	Trace	-	-	-	-
May	1.3	-	-	-	-
June	1.7	-	-	-	-
July	Trace	-	-	Traces	-
August	0.90	Trace	Trace	2.66	-
September	2.3	12.0	10.52	6.66	Trace
October	2.7	33.0	18.51	4.56	Trace
November	0.6	13.0	13.04	1.33	-
December	Trace	-	-	Traces	-

**Table 5- Meteorological data during crop season 2013-14**

Month	Temperature		Relative humidity (%)		Rainfall (mm)	No. of raining days
	Max.	Min.	7 hrs.	14 hrs.		
January, 2013	19.2	7.3	92	65	12.2	01
February, 2013	24.8	11.5	93	60	30.6	03
March, 2013	30.8	16.0	88	50	0.0	00
April, 2013	35.3	20.6	78	43	13.2	01
May, 2013	35.4	24.5	82	58	100.1	05
June, 2013	33.5	26.4	88	71	235.8	09
July, 2013	33.5	26.8	89	69	45.4	07
August, 2013	32.8	26.0	89	68	127.7	10
September, 2013	34.0	25.8	88	63	111.1	03
October, 2013	30.2	22.5	91	67	285.0	06
November, 2013	27.8	14.0	90	46	0.0	00
December, 2013	23.5	10.5	91	55	0.0	00
January, 2014	19.4	9.5	90	68	9.5	02
February, 2014	22.3	10.7	90	60	22.4	03