

ALL INDIA CO-ORDINATED RESEARCH PROJECT

ON

SUGARCANE

(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)

(ANNUAL REPORT PLANT PATHOLOGY)

(2012-13)

CENTRE: PUSA (BIHAR)



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

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

Dr. M. Alam
Director



No-----/SRI, Pusa

Date -----

To

Dr. O.K. Sinha
Project Co-Ordinator (Sugarcane)
A.I.C.R.P. on Sugarcane Research
P.O. Dilkhusha
Lucknow-226002 (U.P)

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa 2012-2013.

Sir,

I am enclosing herewith one copy of Annual Report (2012-2013) of Plant Pathology experiment for your needful. I have already sent two copies of this report to the Head, Division of Crop Protection, S.B.I, Coimbatore. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(M. Alam)

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

Dr. M. Alam
Director



No. -----/SRI, Pusa

Date -----

To

Dr. R. Viswanathan
Head
Division of Crop Protection & Principal Investigator
Plant Pathology (AICRP on Sugarcane)

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa 2012-2013.

Sir,

I am enclosing herewith two copies of annual report (2012-2013) of Plant Pathology experiment for your needful. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(M. Alam)

1. Project No. : PP 14
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Identification of pathotypes of red rot pathogen
4. Objective of experiment : To gather information on the major pathotypes of red rot from different areas/zones.
5. Year of start : 1983-84 (Continuing project)
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

14 Sugarcane differentials were inoculated with two pathotypes CF 07 and CF 08 and eight isolates collected from different parts of Bihar. Twenty five canes of each differential were inoculated in the 2nd week of August, 2012 and disease progress was assessed after 60 days of inoculation.

The data (Appendix I) indicate that differentials BO 91, Baragua and SES-594 showed resistant reaction. While, Co 1148, Co 997, CoJ 64, CoC 671 and Khakai produced susceptible reaction against all the test isolates. Differentials Co 419, CoS 767, Co 7717, CoS 8436, Co 62399 and Co 975 showed differential reaction against all the test isolates.

It is clear from the data that pathotype CF 07 and isolates RR₂, RR₃, RR₄, and RR₇ showed similar pathological reaction on differential varieties. These isolates alongwith CF 07 produced resistant reaction on differentials Co 419, CoS 767, Co 7717 and Co 975 and intermediate reaction on CoS 8436 and Co 62399. Similarly Pathotype CF 08 and isolates RR₁, RR₅, RR₆ and RR₈ exhibited similar reaction on differential varieties. These isolates and pathotype CF 08 produced intermediate reaction on Co 419, CoS 767, Co 7717 and Co 975 and susceptible reaction on CoS 8436 and Co 62399.

(Detailed in Appendix-I)

APPENDIX- I

P.P.-14 Identification of major Pathotypes of red rot Pathogen 2012-13

Sl. No	Isolates	Sources	Reaction on host differentials													
			Co 1148	Co 419	CoS 767	Co 997	CoJ 64	BO 91	CoC 671	Kha-kai	Co 7717	CoS 8436	Co 62399	Bar-agua	SES 594	Co 975
1.	CF 07	Co 1148	S	R	R	S	S	R	S	S	R	I	I	R	R	R
2.	CF 08	Co 7717	S	I	I	S	S	R	S	S	I	S	S	R	R	I
3.	RR ₁	BO 145	S	I	I	S	S	R	S	S	I	S	S	R	R	I
4.	RR ₂	BO 138	S	R	R	S	S	R	S	S	R	I	I	R	R	R
5.	RR ₃	CoLK 8102	S	R	R	S	S	R	S	S	R	I	I	R	R	R
6.	RR ₄	CoSe 95422	S	R	R	S	S	R	S	S	R	I	I	R	R	R
7.	RR ₅	BO 128	S	I	I	S	S	R	S	S	I	S	S	R	R	I
8.	RR ₆	CoBln 7501	S	I	I	S	S	R	S	S	I	S	S	R	R	I
9.	RR ₇	CoS 8436	S	R	R	S	S	R	S	S	R	I	I	R	R	R
10.	RR ₈	CoJ 7430	S	I	I	S	S	R	S	S	I	S	S	R	R	I

1. Project No. : PP 17 a
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Evaluation of Zonal varieties for resistance to red rot disease.
4. Objective of experiment : To gather information on the relative resistance to red rot of the entries in Zonal varietal trial of the respective Zones.
5. Year of start : 1986-87 (Continuing project)
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

Twenty five, genotypes including one check of different maturity groups were tested artificially against red rot disease by plug and cotton swab methods of inoculation. The inoculation was done in the 2nd week of August, 2012. By plug method, entries CoP-09436, CoP-09437 and BO 91 were graded as resistant, entries CoP 08436, CoBln 07501, CoSe 08451, CoSe 08453, CoSe 08452, CoP 08437, CoSe 09451, CoSe 09452, UP 09453, CoSe 09454, CoB 07429 and CoP 9301 were graded as moderately resistant. Two entries CoB 07427 and CoBln 07502 showed moderately susceptible reaction while, CoB 07426, CoB 07428, CoB 07430, CoBln 07503, CoSe 95422 and CoSe 92423 were graded as susceptible reaction whereas, two entries, CoBln 08501 and Co 1148 showed highly susceptible to red rot disease.

In cotton swab method of inoculation, entries CoP 08436, CoSe 08452, CoP 08437, CoSe 09452, UP 09453, CoB 07429, CoP 09437 and BO 91 were graded as resistant. Whereas, CoB 07426, CoB 07427, CoB 07428, CoBln 07501, CoSe 08451, CoSe 08453, CoBln 07502, CoBln 07503, CoSe 09451, CoSe 09454, CoP 09436 and CoP 9301 were observed moderately resistant. While, two entries CoB 07430 and CoBln 08501 were found moderately susceptible and three entries CoSe 95422, CoSe 92423 and Co 1148 showed susceptible to red rot disease.

(Detailed in Appendix-II)

1. Project No. : PP 17 b
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Evaluation of zonal varieties for resistance to smut disease
4. Objective of experiment : To gather information on the relative resistance to smut of the entries in zonal varietal trial of the respective zones.
5. Year of start : 1994-95 (Continuing project)
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

Twenty five genotypes including one check of different maturity groups were tested artificially against smut disease. Three budded setts of 25 genotypes were artificially inoculated by soaking them in freshly collected spore suspension of the smut pathogen for 30 minutes. The incidence of smut was recorded as percent of disease the data showed that sixteen genotypes (CoB 07426, CoB 07428, CoP 08436, CoSe 08451, Cose 08453, CoSe 08452, CoBln 07502, CoP 08437, Cose 09451, CoSe 09452, UP 09453, CoSe 09454, CoP 09436, CoB 07429, BO 91 and CoP 9301) remained free from smut disease while seven entries (CoB 07427, CoB 07430, CoBln 07501, CoBln 08501, CoP 09437, CoSe 95422 and CoSe 92423) showed moderately resistant reaction and single genotype i.e CoBln 07503 showed moderately susceptible reaction against smut disease.

(Detailed in Appendix-II)

1. Project No. : PP 17 c
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Evaluation of zonal varieties for resistance to wilt disease.
4. Objective of experiment : To gather information on the relative resistance to wilt of the entries in zonal varietal trial of the respective zones.
5. Year of start : 2000-01 (Continuing project)
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

Twenty five genotypes including one check of different maturity groups were planted in two rows of 5 metre. long in wilt sick plot to test their relative resistance to wilt disease. Data were recorded on 0-4 scale, out of twenty five genotypes evaluated, five genotypes (Cose 08452, CoP 08437, CoSe 09454, BO 91 and CoP 9301) showed resistant reaction while thirteen entries (CoB 07427, CoP 08436, CoBln 07501, CoSe 08451, CoSe 08453, CoBln 07502, CoBln 07503, CoSe 09452, UP 09453, CoSe 09454, CoP 09436, CoB 07429 and CoP 09437) reacted as moderately resistant to wilt disease. Two entries (CoB 07426 and CoB 07427) showed moderately susceptible reaction. The remaining four genotypes showed susceptible to highly susceptible reaction to wilt disease.

(Detail in Appendix-II)

(Appendix II)

Evaluation of Zonal varieties/genotypes against red rot, wilt and smut diseases (2012-13).

Sl.No	Varieties	Disease Reaction			
		Red rot		Wilt	Smut
		Plug	Cotton swab		
1.	CoB-07426	S	MR	MS	R
2.	CoB-07427	MS	MR	MR	MR
3.	CoB-07428	S	MR	MS	R
4.	CoP-08436	MR	R	MR	R
5.	CoB-07430	S	MS	HS (100 % loss)	MR
6.	CoBln-07501	MR	MR	MR	MR
7.	CoSe-08451	MR	MR	MR	R
8.	CoSe-08453	MR	MR	MR	R
9.	CoSe-08452	MR	R	R	R
10.	CoBln -07502	MS	MR	MR	R
11.	CoBln -07503	S	MR	MR	MS
12.	CoBln -08501	HS	MS	HS	MR
13.	CoP-08437	MR	R	R	R
14.	CoSe-09451	MR	MR	R	R
15.	CoSe-09452	MR	R	MR	R
16.	UP-09453	MR	R	MR	R
17.	CoSe-09454	MR	MR	MR	R
18.	CoP-09436	R	MR	MR	R
19.	CoB-07429	MR	R	MR	R
20.	CoP-09437	R	R	MR	MR
21.	BO-91	R	R	R	R
22.	CoSe-95422	S	S	S	MR
23.	CoSe 92423	S	S	S	MR
24.	CoP 9301	MR	MR	R	R
25.	Co-1148(Check)	HS	S	HS	-
26.	Co-1158 (Check)	-	-	-	HS

1. Project No. : PP 22
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Survey of sugarcane diseases naturally occurring in Bihar on important sugarcane varieties.
4. Objective of experiment : To gather information on the diseases naturally occurring in Bihar on varieties to compile all India disease status report yearly.
5. Year of start : 1988-89 (Continuing project)
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

An extensive surveys for sugarcane diseases were carried out in the months of April, June, September and December, 2012, in different cane growing areas of Bihar. Fourteen sugarcane varieties were found affected with red rot, wilt, Smut, Sett rot, Pokkah Boeng and Spike diseases.

Red rot in combination with wilt was observed on varieties CoS 91269, CoS 8436 and BO 145. Variety Co 0118 was found affected with wilt disease. Varieties BO 137 & BO 147 were found affected with smut, Pokkah Boeng and wilt diseases.

While variety CoLk 9418 was found affected with Pokkah Boeng. Varieties CoS 8432 and CoSe 98231 were affected with Smut disease. Variety Co 0238 was affected with Smut and Pokkah Boeng diseases in traces. Variety CoJ 64 was affected with spike disease. Pokkah Boengs and Wilt diseases were observed on variety Co 0235. While BO 141 was affected with sett rot and Pokkah Boeng diseases.

(Details in Appendix III)

APPENDIX- III

P.P. 22 Survey of Sugarcane diseases naturally occurring on Sugarcane Varieties (2012-13)

Sl.No	Varieties	June	September	December	Areas
1.	CoLK 94184	-	Pokkah Boeng (5%)	-	Hasanpur
2.	CoS 8432	Smut (5%)	-	-	Manjhawalia
3.	BO 137	Smut (T)	Pokkah Boeng (T)	Wilt (T)	Basurari farm
4.	CoSe 98231	Smut (5%)	-	-	Sidhwalia
5.	BO 147	Smut (10%)	Pokkah Boeng (5%) + Wilt (10%)	Wilt (15%)	Sidhwalia, Narkatiyaganj, Harinagar, Manjhawalia
6.	Co 0238	Smut (5%)	Pokkah Boeng (10%)	Pokkah Boeng (10%)	Manjhawalia, Sidhwalia
7.	CoJ 64	-	Spike (T)	Spike (T)	Sidhwalia
8.	Co 0118	-	Wilt (5%)	Wilt (10%)	Manjhawalia
9.	CoS 91269	-	Wilt (5%) + Red rot (T)	Wilt (10%) + Red rot (T)	Manjhawalia
10.	CoS 8436	-	Wilt (T), Red rot (T)	Wilt (5%) + Red rot (T)	Riga, Pusa
11.	Co 0235	-	Wilt (10%) + Pokkah Boeng (T)	Wilt (20%)	Gopalganj, Sidhwalia, Manjhawalia
12.	BO 145	-	Wilt (T) + Red rot (T)	Wilt (T) + Red rot (T)	Pusa
13.	BO 141	Sett rot	Pokkah Boeng (T)	Pokkah Boeng (T)	Gopalganj, Harinagar

1. Project No. : PP 30
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Assessment of field resistance in sugarcane to red rot.
4. Objective of experiment : Identification of sugarcane varieties exhibiting field resistance to red rot.
5. Year of start : 2010-11
6. Technical programme on which report based during : (2012-13)
7. Technical summary :

Fourteen varieties including resistant check (BO 139 and BO 154) were tested for field tolerance to red rot with three replications. The disease development was recorded at fortnightly intervals till maturity of the crop.

Among 14 varieties, tested five varieties (BO 139, CoSe 05452, Co 0419, Co 05020 and BO 154) including two resistant and three moderately resistant varieties were found free from red rot infection. While nine varieties (CoSe 95422, CoSe 06456, CoSe 05451, CoB 099161, CoBIn 05502, CoB 07426, CoB 07427, CoB 07428 and CoBIn 05501) were showed the red rot disease symptom.

(Detail in Appendix-IV)

APPENDIX- IV

P.P 30 Assessment of field resistance of Sugarcane varieties to Red rot, 2012-13.

Sl. No	Varieties	Resistance Level (MR/S)	Symptoms observed followed by number of days after Planting	C. falcatum (Yes/No)	Any others informations.
1.	BO 139 (Check)	MR	No Symptoms observed	No	-
2.	Cose 95422 (Check)	S	SY (60), SM (90), CR (120), LY (150), LD (210), CD (270)	Yes	Red rot in combination with wilt appeared, 30 % clumps were dried
3.	Cose 05452	R	No Symptoms observed	No	-
4.	CoSe 06456	S	SD (90), SM (120)	Yes	-
5.	Cose 05451	MR	SY (60), SD (90)	Yes	-
6.	CoB 099161	S	SY (45), SM (60), CR (150), LY (210)	Yes	Pokkah Boeng observed
7.	CoBln 05502	MS	SY (60), SM (90)	Yes	Pokkah Boeng observed
8.	Co 0419	MR	No Symptoms observed	No	-
9.	Co 05020	R	No Symptoms observed	No	Less germination
10.	CoB 07426	S	SY (45), SD (60), SM (90)	Yes	Wilt
11.	CoB 07427	MS	SY (60), SD (80), SM (90), CR (210), LD (240)	Yes	-
12.	CoB 07428	S	SY (45), SD(90), SM (120), CR (210), LY (240), LD (260)	Yes	wilt (Trace)
13.	BO 154 (Check)	MR	No Symptoms observed	No	-
14.	CoBln - 05501 (Check)	S	SY (45), SD (60), SM (90), CR (210), LY (240), LD (290)	Yes	Redning of leaves, wilt (Traces)

