

**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)  
A.I.C.R.P. (Sugarcane)  
P.O. Dilkhusa  
Lucknow-226002 (U.P)

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa,2015-16.

Sir,

I am enclosing herewith one copy of Annual Report (2015-16) of Plant Pathology experiments Sugarcane Research Institute, Pusa, for your needful. I have already sent two copies of this report to the Head, Division of Crop Protection& Principal Investigator, S.B.I, Coimbatore. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(S. S. Pandey)

**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. R. Viswanathan  
Head  
Division of Crop Protection & Principal Investigator  
Plant Pathology, AICRP (Sugarcane)  
SBI, Coimbatore-641007 (T. N.)

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa, 2015-16.

Sir,

I am enclosing herewith two copies of annual report (2015-16) of Plant Pathology experiments Sugarcane Research Institute, Pusa, for your needful. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(S. S. Pandey)

E-mail: [dssripusa12@gmail.com](mailto:dssripusa12@gmail.com).

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 : (2015-16)
7. Technical summary :

14 Sugarcane differentials were inoculated with two pathotypes CF 07 and CF 08 and eleven isolates collected from different parts of Bihar. Among eleven collected isolates two isolates i.e. CoS 98231 and CoS 91269 are newly collected isolates than previous year. Twenty five canes of each differential were inoculated in the 2<sup>nd</sup> week of August, 2015 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 RR<sub>3</sub>, RR<sub>4</sub>, RR<sub>5</sub>, RR<sub>6</sub>, RR<sub>9</sub> and RR<sub>10</sub> produced resistant reaction on differentials Co 419, CoS 767, Co 7717 and Co 975 and intermediate reaction on CoS 8436 and Co 62399. CF 07 and isolates RR<sub>3</sub>, RR<sub>4</sub>, RR<sub>5</sub> and RR<sub>6</sub>, RR<sub>9</sub> and RR<sub>10</sub> produced similar Pathological reaction on differential. Similarly, Pathotype CF 08 and isolates RR<sub>1</sub>, RR<sub>2</sub>, RR<sub>7</sub>, RR<sub>8</sub> and RR<sub>11</sub> produced intermediate reaction on Co 419, CoS 767, Co 7717 and Co 975 and susceptible reaction on CoS 8436 and Co 62399. Hence, CF 08 and isolates RR<sub>1</sub>, RR<sub>2</sub>, RR<sub>7</sub>, RR<sub>8</sub> and RR<sub>11</sub> are exhibiting the similar pathological reaction on differentials.

(Detailed in Appendix-I)

**APPENDIX- I**  
**P.P.-14 Identification of major Pathotypes of red rot Pathogen 2015-2016**

Sl. No	Isolates	Sources	Reaction on host differentials													
			Co 1148	Co 419	CoS 767	Co 997	CoJ 64	BO 91	CoC 671	Khakai	Co 7717	CoS 8436	Co 62399	Baragua	SES 594	Co 975
1.	CF 07	CoJ 64	S	R	R	S	S	R	S	S	R	I	I	R	R	R
2.	CF 08	CoJ 64	S	I	I	S	S	R	S	S	I	S	S	R	R	I
3.	RR <sub>1</sub>	BO 145	S	I	I	S	S	R	S	S	I	S	S	R	R	I
4.	RR <sub>2</sub>	CoS 98231	S	I	I	S	S	R	S	S	I	S	S	R	R	I
5.	RR <sub>3</sub>	BO 138	S	R	R	S	S	R	S	S	R	I	I	R	R	R
6.	RR <sub>4</sub>	CoLk 8102	S	R	R	S	S	R	S	S	R	I	I	R	R	R
7.	RR <sub>5</sub>	CoS 91269	S	R	R	S	S	R	S	S	R	I	I	R	R	R
8.	RR <sub>6</sub>	CoS 8436	S	R	R	S	S	R	S	S	R	I	I	R	R	R
9.	RR <sub>7</sub>	CoLk 94184	S	I	I	S	S	R	S	S	I	S	S	R	R	I
10.	RR <sub>8</sub>	BO 141	S	I	I	S	S	R	S	S	I	S	S	R	R	I
11.	RR <sub>9</sub>	Co 1148	S	R	R	S	S	R	S	S	R	I	I	R	R	R
12.	RR <sub>10</sub>	CoSe 95422	S	R	R	S	S	R	S	S	R	I	I	R	R	R
13.	RR <sub>11</sub>	BO 128	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 : (2015-16)
7. Technical summary :

Sixteen genotypes including one check of different maturity groups were tested artificially by using CF 07 and CF 08 isolates of red rot pathogen adopting plug and cotton swab methods of inoculations. The inoculation was done in the 2<sup>nd</sup> week of August 2015. In case of plug method, genotype CoSe 95422 showed susceptible reaction against both the isolates whereas, genotypes CoP 12439 and CoSe 12452 were graded as moderately susceptible reaction against CF 07 while CoSe 92423, CoP 12438, CoP 12436 and CoLk 12209 were graded as moderately susceptible against CF 08. Single genotype CoSe 92423 showed susceptible reaction against CF 07. The remaining genotypes showed resistant to moderately resistant reaction against both the test isolates.

In case of cotton swab method, genotypes CoSe 92423 and CoSe 95422 showed susceptible reaction against both the isolates. The rest of the genotypes showed resistant reaction against both the test isolates.

(Detailed in Appendix-II)

**APPENDIX-II****Screening of zonal/pre zonal varieties against red rot, smut and wilt diseases (2015-16)**

Sl. No.	Varieties	Plug		Cotton swab		Smut	Wilt
		CF 07	CF 08	CF 07	CF 08		
1.	BO-91	MR	MR	R	R	R	MR
2.	CoSe-92423	S	MS	S	S	MR	MS
3.	BO-130	MR	MR	R	R	R	MR
4.	CoP-12437	MR	MR	R	R	R	MR
5.	CoP-12438	MR	MS	R	R	MR	MR
6.	CoP-12436	MR	MS	R	R	R	MR
7.	CoP-12439	MS	MR	R	R	R	MR
8.	CoP-9301	MR	R	R	R	R	MR
9.	CoLk-12208	MR	MR	R	R	R	R
10.	CoSe-12453	MR	MR	R	R	R	MR
11.	CoLk-12207	MR	MR	R	R	R	R
12.	CoLk-12209	MR	MS	R	R	R	R
13.	CoSe-12452	MS	MR	R	R	R	MS
14.	CoSe-12451	MR	MR	R	R	R	MR
15.	CoLk-09204	MR	MR	R	R	R	MR
16.	CoSe 95422 (check)	S	S	S	S	-	S
17.	Co-1158 (check)	-	-	-	-	HS	-

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 : (2015-16)
7. Technical summary :

Sixteen genotypes including one check of different maturity groups were tested artificially against smut disease. Three budded sets of 16 genotypes were artificially inoculated by soaking the sets 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 thirteen genotypes (CoP 12436, CoP 12437, CoP 12439, CoLk 12208, CoSe 12453, CoLk 12207, CoLk 12209, CoSe 12451, CoSe 12452, BO 91, CoP 9301, BO 130 and CoLk 09204) remained free from smut disease and thus, were graded as resistant. While two genotypes (CoSe 92423 and CoP 12438) got infection ranging from 1.0 to 3.0 per cent and they were graded as moderately resistant 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 : (2015-16)
7. Technical summary :

Sixteen genotypes including one check of different maturity groups were planted in two rows of 5 meter long in wilt sick plot to test their relative resistance to wilt disease. Data were recorded on 0-4 scale. Out of sixteen genotypes evaluated, three genotypes (CoLk 12207, CoLk 12208 and CoLk 12209) free from wilt infection and they were graded as resistant. While ten genotypes (BO 91, BO 130, CoP 12437, CoP 12438, CoP 12436, CoP 12439, CoP 9301, CoSe 12453, CoSe 12451 and CoLk 09204) were graded as moderately resistant. While two genotypes (CoSe 92423 and CoSe 12452) showed moderately susceptible reaction and single genotype i.e. Check (CoSe 95422) showed susceptible to wilt disease.

(Detail in Appendix-II)



1. Project No. : PP 17 d
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Yellow leaf disease of sugarcane (YLD).
4. Objective of experiment : -
5. Year of start : 2014-2015 (Continuing project)
6. Technical programme on which report based during : (2015-16)
7. Technical summary :

Yellow leaf disease were observed in some pockets of Bihar in few clumps during last week of November onward. Mild yellowing of midrib was seen in four varieties i.e. CoSe 95422, CoS 8436, Co 0238 and CoJ 64.

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 : (2015-16)
7. Technical summary :

To know the disease position and varietal susceptibilities of sugarcane, an extensive survey was carried out in different cane growing areas of Bihar in the months of June, September and December, 2015. Eleven sugarcane varieties were found affected with red rot, wilt, smut, Grassy shoot disease, Pokkah boeng and YLD diseases.

Smut was observed on varieties BO 141, BO 136 and BO 154 and it varied from trace to 5%. Grassy shoot disease was observed on varieties Co 0235 & CoJ 64. Varieties Co 0233, Co 0118 and CoLk 94184 were found affected with wilt disease. Red rot alongwith wilt, GSD and Pokkah boeng were observed on varieties CoS 8436 and Co 0235. While varieties Co 0238 was found affected with wilt and PokkahBoeng diseases. While, YLD was noticed in traces during last week of November onwards in four varieties i.e. Co 0238, CoJ 64, CoSe 95422 and CoS 8436. While, wilt in combination with red rot was observed in variety CoSe 95422. The severity and locations of the diseases are depicted in appendix-III.

(Details in Appendix III)



## APPENDIX- III

## P.P. 22 Survey of Sugarcane diseases naturally occurring on Sugarcane Varieties (2015-16)

Sl. No	Varieties	June	September	December	Areas
1.	Co 0238	-	Wilt (T), Pokkah boeng (T)	Wilt (T)	Manjhaulia, Sidhwalia
2.	CoS 8436	-	Red rot (5%), Wilt (T), Pokkah boeng (T)	Red rot (10%), Wilt (10%), Grassy Shoot Diseases (T)	Nautan, Mainatanh Narkatiaganj
3.	Co 0235	-	Wilt (T), Red rot (T), Pokkah boeng (T), Grassy Shoot Disease (T)	Wilt (5%), Red rot (T), Grassy Shoot Disease (T)	Shivhar, Manjhaulia
4.	Co 0233	-	Wilt (2%)	Wilt (5%)	Dudhai (Manjhaulia)
5.	CoLk 94184	-	Wilt (T)	Wilt (T)	Sidhwalia
6.	BO 141	Smut (T)	-	-	Riga
7.	BO 136	Smut (T)	-	-	Gopalganj (Hatua Farm)
8.	BO 154	Smut (T)	-	-	Pusa, Kalanpur
9.	CoJ 64	-	Grassy Shoot Disease (5%)	Grassy Shoot Disease (5%)	Sidhwalia, Shivhar
10.	Co 0118	-	Wilt (2%)	Wilt (5%)	Narkatiaganj, Hasanpur, Sidhwalia
11.	Co 0238, CoJ 64, CoSe 95422 and CoS 8436	-	-	YLD (T)	Pusa, Harinagar, Gopalganj, Manjhaulia
12.	CoSe 95422	-	Wilt (2-5%)	Wilt (10%), Red rot (5%)	Pusa

1. Project No. : PP 23
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Assessment of elite and ISH genotypes for resistance to red rot.
4. Objective of experiment : To gather information for resistance to red rot so that resistant genotypes could be used in breeding programme as donor of resistance.
5. Year of start : 1996-97 (continuing project)
6. Technical programme on which report based during : (2015-16)
7. Technical summary :

Twenty seven elite and ISH genotypes for resistance to red rot were received on 12<sup>th</sup> March, 2016 from SBI, Comibatore. Received seed materials were planted on 12<sup>th</sup> March, 2016 for assessment of elite and ISH genotypes.

1. Project No. : PP 31
2. Location : Sugarcane Research Institute, Pusa, Samastipur (Bihar)
3. Title of experiment : Screening, epidemiology and management of Pokkah Boeng in sugarcane.
4. Objective of experiment : To study the development of Pokkah boeng disease in relation to the weather parameters and its management in sugarcane crop.
5. Year of start : 2015-2016 (continuing project)
6. Technical programme on which report based during : (2015-16)
7. Technical summary :

Ten varieties were screened under natural condition, out of ten only three varieties namely CoSe 95422, CoP 124 and CoP 141 were noticed with mild infection in the month of last week of July and gradually increased till the end of August. The disease was maximum in the month of 1<sup>st</sup> week of August. Maximum rainfall and high humidity favour the development of Pokkah boeng disease. After rainfall the reduction in disease was seen from last week of August. Initial symptoms showed curling and twisting of spindle leaves and chlorotic leaves. No symptoms of top rotting and wilting have been observed. Temperature, Relative humidity and Rainfall were observed during May, 2015 to December, 2015 are given below:

Months	Temperature		Relative humidity		Rainfall
	Maximum (°C)	Minimum (°C)	Morning	Evening	
May	35.6	23.6	82.0	47.0	43.8
June	36.7	25.6	84.5	51.4	55.4
July	33.8	25.0	88.1	70.4	149.6
August	30.9	24.2	90.9	68.1	256.8
September	33.7	23.9	89.0	64.0	155.00
October	32.1	20.2	89.0	50.0	4.2
November	29.3	14.6	89.0	50.0	-
December	23.3	8.6	86.0	53.0	-

Sl. No.	Varieties	Percent infected plants				Disease reaction
		Mild	Moderate	Severe	Total incidence	
1	CoP 122	-	-	-	-	R
2.	CoP 123	-	-	-	-	R
3.	CoP 124	03	-	-	03	R
4.	CoP 131	-	-	-	-	R
5.	CoP 132	-	-	-	-	R
6.	CoP 133	-	-	-	-	R
7.	CoP 134	-	-	-	-	R
8.	CoP 141	02	-	-	02	R
9.	CoP 142	-	-	-	-	R
10.	CoSe 95422	03	-	-	03	R







