

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

Dr. S. S. Pandey
Director



No-----/SRI, Pusa

Date -----

To

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

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa 2014-15.

Sir,

I am enclosing herewith one copy of Annual Report (2014-15) of Plant Pathology experiments 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 -----

To

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

Sub: Annual report of Plant Pathology, Sugarcane Research Institute, Pusa2014-15.

Sir,

I am enclosing herewith two copies of annual report (2014-2015) of Plant Pathology experiments for your needful. Kindly acknowledge the receipt of the same.

Encl: As above.

Yours faithfully

(S. S. Pandey)

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 : (2014-15)
7. Technical summary :

14 Sugarcane differentials were inoculated with two pathotypes CF 07 and CF 08 and tenisolates collected from different parts of Bihar. Twenty five canes of each differential were inoculated in the 3rd week of August, 2014 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 RR₁, RR₃, RR₄, RR₅ and RR₈ produced resistant reaction on differentials Co 419, CoS 767, Co 7717 and Co 975 and intermediate reaction on CoS 8436 and Co 62399. Since pathotype CF 07 and isolates RR₁, RR₃, RR₄, RR₅ and RR₈ produced similar pathological reaction on differentials. Hence, isolates RR₁, RR₃, RR₄, RR₅ and RR₈ are similar to CF 07 in their level of virulence. Similarly Pathotype CF 08 and isolates RR₂, RR₆, RR₇, RR₉ and RR₁₀ produced intermediate reaction on Co 419, CoS 767, Co 7717 and Co 975 and susceptible reaction on CoS 8436 and Co 62399. Hence, isolates RR₂, RR₆, RR₇, RR₉ and RR₁₀ are similar in exhibiting the pathological reaction on differentials.

(Detailed in Appendix-I)

APPENDIX- I
P.P.-14 Identification of major Pathotypes of red rot Pathogen 2014-2015

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	CoS8 436	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 ₁	Co 1148	S	R	R	S	S	R	S	S	R	I	I	R	R	R
4.	RR ₂	BO 145	S	I	I	S	S	R	S	S	I	S	S	R	R	I
5.	RR ₃	BO 138	S	R	R	S	S	R	S	S	R	I	I	R	R	R
6.	RR ₄	CoLK 8102	S	R	R	S	S	R	S	S	R	I	I	R	R	R
7.	RR ₅	CoSe 95422	S	R	R	S	S	R	S	S	R	I	I	R	R	R
8.	RR ₆	BO 128	S	I	I	S	S	R	S	S	I	S	S	R	R	I
9.	RR ₇	CoLK 94184	S	I	I	S	S	R	S	S	I	S	S	R	R	I
10.	RR ₈	CoS 8436	S	R	R	S	S	R	S	S	R	I	I	R	R	R
11.	RR ₉	CoJ 7430	S	I	I	S	S	R	S	S	I	S	S	R	R	I
12.	RR ₁₀	BO 141	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 : (2014-15)
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 inoculation. The inoculation was done in the 3rd week of August 2013. In case of plug method, genotypes CoSe 95422 and CoSe 92423 showed susceptible reaction against both the isolates, whereas, genotypes CoSe11456 was graded as moderately susceptible reaction against CF 07 and CF 08. The remaining genotypes showed resistant to moderately resistant reaction against both the test isolates.

In case of cotton swab method, genotypes CoSe 11455, CoSe 95422 and CoSe 92423 showed susceptible reaction against both the isolates, whereas, genotypes CoSe 11453 and CoSe 11456 was graded as susceptible reaction against CF 07 isolate and resistant reaction against isolate CF 08. 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
year-2014-2015

Sl. No	Genotypes	Plug Method		Cotton swab		Smut	Wilt
		CF 07	CF 08	CF 07	CF 08		
1.	CoP 11436	MR	MR	R	R	R	MR
2.	CoP 11437	R	R	R	R	R	MR
3.	CoP 11438	MR	MR	R	R	R	R
4.	CoSe 11451	MR	R	R	R	R	MR
5.	BO 153	R	R	R	R	R	MR
6.	CoP 11439	MR	MR	R	R	R	MS
7.	CoP 11440	MR	MR	R	R	R	MR
8.	CoSe 11453	MR	MR	S	R	MR	MS
9.	CoSe 11454	MR	MR	R	R	MR	MS
10.	CoSe 11455	MR	MR	S	S	R	MR
11.	CoSe 11456	MS	MS	S	R	MR	MR
12.	BO 130	R	R	R	R	R	MR
13.	BO 91	MR	MR	R	R	R	MR
14.	CoP 9301	R	MR	R	R	R	R
15.	CoSe 92423	S	S	S	S	MR	MS
16.	CoSe 95422 (Check)	S	S	S	S	MR	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 : (2014-15)
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 eleven genotypes (CoP11436, CoP11437, CoP 11438, CoSe 11451, BO 153, CoP 11439, CoP 11440, CoSe 11455, BO 91, CoP 9301 and BO 130) remained free from smut disease and thus, were graded as resistant. While five entries (CoSe 11453, CoSe 11454, CoSe 11456, CoSe 95422 and CoSe 92423) got infection ranging from 1.5 to 6.6 per cent and thus, 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 : (2014-15)
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, two genotypes (CoP 11438 and CoP 9301) free from wilt infection and they were graded as resistant. While nine entries (CoP11436, CoP 11437, CoSe 11451, BO 153, CoP 11440, CoSe 11455, CoSe 11456, BO 91 and BO 130) were graded as moderately resistant. While four entries CoP 11439, CoSe 11453, CoSe 11454 and CoP 92423 showed moderately susceptible reaction 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 : (2014-15)
7. Technical summary :

Yellow leaf disease was not appeared in any experimental plots as well as cane growing areas of Bihar during report of the year.

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 : (2014-15)
7. Technical summary :

To ascertain 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, 2014. In general, in the months of September and December the severity of the diseases was higher as compare to month of June. Sixteen sugarcane varieties were found affected with red rot, wilt, smut, Grassy shoot disease, PokkahBoeng and Spike diseases.

Smut was observed on varieties CoSe 98231, BO 137 and BO 147. Grassy shoot disease was observed on single variety CoJ 64. Varieties CoS 767, CoJ 88, Co 0233, Co 94211, BO 141, Co 0118 and Co 0232 were found affected with wilt disease. Red rot alongwith wilt and PokkahBoeng was observed on varieties CoS 8436 and CoLK 98184. While varieties CoS 8432 and Co 0238 were found affected with PokkahBoeng disease. Variety Co 97222 was found affected with spike disease alone. The severity and location 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 (2014-15)

Sl. No	Varieties	June	September	December	Areas
1.	CoSe 98231	Smut (5 %)	-	-	Sidhwalia
2.	CoJ 64	-	Grassy shoot disease (5%)	Grassy shoot disease (5%)	Sidhwalia
3.	BO 137	Smut (T)	-	-	Narkatiyaganj
4.	CoS 767	-	Wilt (T)	Wilt (5%)	Manjhawalia
5.	CoJ 88	-	Wilt (5%)	Wilt (10%)	Manjhawalia
6.	CoS 8436	-	PokkahBoeng (T), Wilt (T), Red rot (T)	PokkahBoeng (T), Wilt (5%), Red rot (5%)	Manjhawalia
7.	CoLK 94184	-	PokkahBoeng (5%), Red rot (T), Wilt (T)	PokkahBoeng (5%), Red rot (5%), Wilt (T)	Hasanpur, Harinagar
8.	Co 0233	-	Wilt (10 %)	Wilt (20%)	Harinagar
9.	Co 97222	-	Spike (T)	Spike (T)	Sidhwalia
10.	Co 94211	-	Wilt (T)	Wilt (10%)	Manjhawalia
11.	CoS 8432	-	PokkahBoeng (T)	PokkahBoeng(5%)	Harinagar
12.	BO 141	-	Wilt (T)	Wilt (T)	Manjhawalia
13.	Co 0118	-	Wilt (5%)	Wilt (10%)	Hanspur, Narkatiyaganj
14.	Co 0238	-	PokkahBoeng (5%)	PokkahBoeng (10%)	Hanspur, Sidhwalia
15.	Co 0232, Co 0233	-	Wilt (T)	Wilt (5%)	Manjhawalia
16.	BO 147	Smut (10 %)	Wilt (10%)	Wilt (15%)	Sidhwalia, Narkatiyaganj, Manjhawalia

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 : (2014-15)
7. Technical summary :

The experiment could not be conducted due to non receipt of seed materials from Co-ordinated unit.

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 : (2014-15)
7. Technical summary :

Fourteen varieties including two checks were tested for field resistance to red rot with three replications. The disease development was recorded at fortnightly intervals till maturity of the crop.

Among 14 varieties, tested no red rot symptom were observed in varieties BO 139, CoSe 05452, CoSe 05451, Co 0419, Co 05020 and BO 154 under field condition. While in eight varieties CoSe 95422, CoSe 06456, CoB 099161, CoBIn 05502, CoB 07426, CoB 07427, CoB 07428 and CoBIn 05501 red rot symptom were observed having moderately susceptible to susceptible levels of resistant.

(Detail in Appendix-IV)

APPENDIX- IV

P.P 30 Assessment of field resistance of Sugarcane varieties to Red rot2014-15.

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	Poor germination
2.	Cose 95422 (Check)	S	SY (90), SD (120), SM (150), LY (210)	Yes	PB, Red rot, wilt
3.	Cose 05452	R	No Symptoms observed.	No	-
4.	CoSe 06456	S	SY (90), SD (120), CR (150)	Yes	Poor germination
5.	Cose 05451	MR	No Symptoms observed.	No	-
6.	CoB 099161	S	SY (90), SD (120), SM (150), CR (180)	Yes	PokkahBoeng, 25% clumps dried
7.	CoBln 05502	MS	SY (90), SM (120), LY (150), LD (210)	Yes	-
8.	Co 0419	MR	No Symptoms observed.	No	-
9.	Co 05020	R	No Symptoms observed.	No	-
10.	CoB 07426	S	SY (60), SD (90), SM (120), LY (150), LD (210)	Yes	Due to wilt plant dries and died.
11.	CoB 07427	MS	SY (60), SD (60), SM (90), LY (150)	Yes	-
12.	CoB 07428	S	SY (60), SD(90), SM (120), CR (150), LY (180), LD (210)	Yes	Disease appears in 70% clumps.
13.	BO 154 (Check)	MR	No Symptoms observed.	No	-
14.	CoBln-05501 (Check)	S	SY (60), SD (90), SM (150), LY (240)	YES	Logging & Sprouting in 60% canes were observed.