

ICAR- Sugarcane Breeding Institute, Regional Centre, Karnal
AICRP on Sugarcane Pathology
Annual Report (2014-15)

PP 14: Identification of pathotypes in red rot pathogen

Objective: To gather information on the major pathotypes of red rot from the north western zone

Location: SBI-RC, Karnal

Year of Start: 1983-84 (Continuing project)

Results

Seven established *C. falcatum* pathotypes along with sixteen isolates collected from CoJ 64 (7), BO 138 (1), CoSe 95422 (1), CoBIn 05221(1) and CoS 8436 (6) were inoculated independently on a set of fourteen sugarcane differentials by plug method of inoculation. The overall disease reaction indicated that there was a clear pathogenic variation on the host differentials. None of the pathotype /isolate resembled another pathotype /isolate in pathogenic behavior. Among the seven designated pathotypes, Cf11 was most virulent followed by Cf 08, Cf 03, Cf 07, Cf 09, Cf 02 and Cf 01, respectively (Table 1). Differential CoC 671 exhibited intermediate to susceptible reaction to all the test isolates whereas, differential CoS 8436 succumbed only to isolate CfCoS (Karnal) for the third consecutive years. Of the CoJ 64 isolates, CfCoJ I exhibited more virulence, suggests the possible emergence of new pathotype in the subtropics. A resistant differential Baragua showed intermediate reaction to Cf03 and Cf08; and SES 594 expressed complete resistance to all the isolates.

Multiplication and supply of sugarcane differentials seed:

The seed of four new sugarcane differentials viz., Co 86002, Co 86032, CoV 92102 and CoSe 95422 was multiplied and supplied to Lucknow, Uchani, Ludhiana and Pusa (Bihar) centres.

PP 17 A: Evaluation of Zonal varieties for red rot

Objective: To gather information on the relative resistance to red rot of the entries in zonal varietal trial.

Location: SBI-RC, Karnal

Year of Start: 1986-87 (Continuing project)

Results

In ZVT trial, 38 entries were evaluated for red rot resistance along with five standards by plug and cotton swab methods of inoculation. One IVT (E) Clone CoH 11261 had shown susceptibility to isolate Cf08 by plug and cotton swab methods, while clone CoLk 11201 rated susceptible by plug method only (Table 2). Among the AVT (E)-I Plant entries, CoH 10261 exhibited susceptible reaction with isolate Cf08 by both the methods. Two AVT (E)-II plant clones viz. CoH 09262 and CoPb 09181 were found to be moderately susceptible to susceptible

with Cf08 inocula by plug and nodal methods. Of the Mid late entries, CoH 11264 (IVT- ML) and CoPb 10182 (AVT ML- I Plant) showed MS reaction with Cf08 by plug and susceptible by cotton swab methods. All the other entries were resistant or moderately resistant to red rot by both the methods.

PP 22: Survey of Sugarcane diseases naturally occurring in the area on important varieties

Objective: To gather information on the diseases naturally occurring in the north western zone on important sugarcane varieties

Location: SBI-RC, Karnal

Year of Start: 1989-90 (Continuing project)

Results

Red rot incidence was recorded up to 10% in variety CoS 8436 and traces in variety Co 89003 under Karnal area. Trace incidence of red rot was also found in farmers fields of varieties CoS 97264, CoSe 92423 and CoS 8436 in the reserve area of Khumbi and Gularia Chini Mills (UP). Trace incidence of other diseases i.e. bacterial top rot in variety CoH 88, smut in varieties Co 0238, CoS 8436, CoH 119, CoJ 85; and Pokkah boeng in varieties Co 0238, CoS 8436, CoJ 85, CoH 119 and Co 89003 was also noticed under Karnal and Shahabad Co-operative sugar mills. Severe expression of wilt (up to 25%) was recorded in most of the fields of variety CoS 97264 under Kumbhi Chini Mills (UP). Trace incidence of YLD was observed in some of the entries viz, CoS 8436, CoH 09262, CoPant 10221, CoPb 09204, CoS 09232 and Baragua in the research trials at the centre.

Table1. Pathogenic behaviour of *C. falcatum* pathotypes on host differentials – SBIRC, Karnal

Sr. No	Pathotype / isolate	Source	Reaction on host differentials													
			Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	Bo 91	Baragua	Khakai	SES 594
1.	CF01	Co 1148	R	R	R	S	R	R	S	R	R	R	R	R	R	R
2	CF02	Co 7717	S	X	R	R	S	R	X	R	R	R	R	R	R	R
3	CF03	CoJ 64	X	X	R	R	X	S	S	S	R	R	R	X	X	R
4	CF07	CoJ 64	X	R	R	X	X	S	S	S	R	R	R	R	R	R
5	CF08	CoJ 64	S	X	R	R	S	S	S	X	x	R	S	X	X	R
6	CF09	CoS 767	R	X	R	R	R	X	S	S	S	R	R	R	R	R
7	CF11	CoJ 64	S	S	S	S	S	S	S	X	S	R	R	R	S	R
8	cfBO138	BO 138	R	R	S	R	R	R	S	R	R	R	R	R	R	R
9	cfSe 95422	CoSe 95422	S	R	R	R	X	S	S	R	R	R	R	R	X	R
10	cfBLN 05521	CoBlN 05521	R	X	R	R	R	R	S	X	R	R	R	R	X	R
11	cf8436 (K)	CoS 8436	R	X	S	R	X	S	S	R	R	S	X	R	X	R
12	cf8436 (R)	CoS 8436	R	X	X	R	X	R	S	R	R	R	R	R	R	R
13	cf8436 (O)	CoS 8436	R	R	R	R	R	R	S	R	R	R	R	R	R	R
14	cf8436 (P)	CoS 8436	X	R	R	R	R	S	S	R	R	R	R	R	R	R
15	cfUP 1	CoJ 64	R	R	R	R	R	X	X	R	R	R	R	R	R	R
16	cfUP 2	CoJ 64	R	R	R	R	R	R	S	X	R	R	R	R	R	R
17	cfUP3	CoJ 64	R	R	X	X	R	R	X	X	R	R	R	R	R	R
18	cfCoJ I	CoJ 64	X	R	X	X	X	S	S	X	R	R	R	R	X	R
19	cfCoJ II	CoJ 64	R	R	R	R	R	R	X	S	R	R	R	R	R	R
20	cfCoJ III	CoJ 64	R	R	R	R	R	S	S	X	R	R	R	R	X	R
21	cfCoJ IV	CoJ 64	X	R	R	R	X	R	S	R	R	R	R	R	R	R
22	cf8436 (RI)	CoS 8436	S	S	S	X	X	X	S	R	R	R	R	R	S	R
23	cf8436 (UPCSR)	CoS 8436	S	X	S	R	S	R	S	X	R	R	X	R	S	R

R- Resistant; X- Intermediate; S- Susceptible

Table 2 Evaluation of zonal varieties for red rot resistance - SBIRC, Karnal

Row No.	Entry	Red Rot Rating			
		Plug Method		Cotton Swab Method	
		CF 08	CF 09	CF 08	CF 09
1	IVT-Early CoH 11261	HS	MS	S	R
2	CoH 11262	MS	MR	R	R
3	Co LK 11201	S	R	R	R
4	Co LK 11202	MR	R	R	R
5	Co LK 11203	MR	R	R	R
6	CoPb 11211	MR	MR	R	R
7	CoPB 11212	R	R	R	R
8	AVT-Early (I Plant) Co 10035	R	R	R	R
9	CoH 10261	S	MR	S	R
10	CoS 10231	R	R	R	R
11	CoJ 64 (Standard)	MS	S	S	R
12	CoPant 84211 (Standard)	HS	S	S	S
13	AVT –Early (II Plant) CoH 09262	MS	R	S	R
14	CoH 09263	R	R	R	R
15	CoLk 09202	R	MR	R	R
16	CoPb 09181	S	MS	S	R
17	CoS 09246	R	R	R	R
18	CoS 767 (Standard)	MS	S	S	R
19	CoS 8436 (Standard)	R	MR	R	R
20	CoPant 97222 (Standard)	R	MR	R	R
21	IVT-ML Co 11026	MR	MR	R	R
22	Co 11027	R	R	R	R
23	CoH 11263	R	R	R	R
24	CoH 11264	MS	R	S	R
25	CoLk 11204	MR	MR	R	R
26	CoLk 11205	R	R	R	R
27	CoLk 11206	R	R	R	R
28	CoPb 11181	R + WILT	R	R	R
29	CoPb 11182	MS	MS	R	R
30	CoPb 11213	R	R	R	R
31	CoPb 11214	R	R	R	R
32	CoS 11231	MS	MS	R	R
33	CoS 11232	R	R	R	R
34	AVT –ML (I Plant) Co 10036	R	R	R	R
35	CoH 10262	R	R	R	R
36	CoPant 10221	R	R	R	R
37	CoPb 10181	R	R	R	R
38	CoPb 10182	MS	MS	S	R

39	AVT ML (II Plant) Co 09022	R	R	R	R
40	CoH 09264	MR	R	R	R
41	CoK09204	R	R	R	R
42	CoPb 09214	MR	R	R	R
43	CoS 09232	R	R	R	R

R- Resistant; MR-Moderately Resistant; MS- Moderately Susceptible; S- Susceptible; HS- Highly Susceptible