AICRP Report on Sugarcane Pathology

Location: Coimbatore

PP14: Identification of pathotypes/races in red rot pathogen

Experimental details/methodology:

A set of five new isolates along with four old isolates and one reference pathotype (CF06 - Cf671) were independently inoculated on 14 sugarcane differentials in August 2013 and the canes were evaluated for disease development during October 2013 and disease intensity was rated. The red rot development on differential hosts indicated that among five new isolates four behaved more or less similar to the reference pathotype, while one isolate Cf09356 showed more virulence followed by CfSi6 Tanjoreand Cf0323 Guruvareddyur. The isolate Cf09356- Elanganur behaved difsbi1ferently by producing intermediate (I) reaction on BO91 and Baragua, R reaction on CoS 8436 and SES 595 and S reaction on all other tested sugarcane differentials.

PP17 a: Evaluation of Pre –Zonal/IET varieties and genotypes for resistance in red rot (*Colletotrichum falcatum* Went)

a. Red rot

Thirty nine IVT entries were evaluated for red rot resistance by plug and nodal methods of pathogen inoculation against Cf671 pathotype. Among them, 21 were found to be resistant, seven moderately resistant and six were moderately susceptible in plug method of testing. In nodal method of testing 33 were found to be resistant.

b. Smut

About 17 IVT clones comprising of eight early types and nine mid-late types were evaluated for smut resistance along with their respective standards. Among the early types: one was resistant, three were moderately resistant and four were highlysusceptible. Among the mid-late clones, one was resistant, one was moderately resistant, one was moderately susceptible, three were susceptible and three were highlysusceptible.

PP22. Survey of sugarcane diseases occurring naturally in the area on important sugarcane varieties.

During this season surveys were conducted in the parts of Tamil Nadu, Karnataka, Andhra Pradesh and Maharashtra for red rot, smut, wilt and YLD assessed disease status and collected new isolates. Surveys revealed endemic or sporadic occurrence of red rot in Cauvery delta in Tamil Nadu. However, smut was found to be severe in CoA 92081 in Tamil Nadu and Co 62175, CoVc 03165 and an unknown variety in Cauvery basin in Karnataka. Widespread occurrence of YLD was observed in major varieties under cultivation in all these states. Detailed field studies conducted at TheniDt revealed that the crop raised from tissue culture derived nurseries maintained a good field stand. Root borer and wilt complex was found in sugarcane cv TNAU Si 8 (Si 2000-02) in parts of Thanjavur Dt in Tamil Nadu.

PP 30. Assessment of field resistance in sugarcane to red rot

Field tolerance to red rot in 21 genotypes which were susceptible to red rot by plug method was assessed against grain inoculum in the field. The entries comprised seven

clones of PZVT 2007 series, three 2009 series, two 2010 series, 11 high sucrose types and Co 11015. Susceptible checks CoC 671 and Co 94012 and resistant check Co 86032 were also included in the trial. The following clones 2007-13, -41, -287, 2009-314, 2010-211, M-1, -17, -26, -32, -75, GH-5, -205, and RMS-28 remained free from red rot infection and indicate possession of field tolerance. The variety Co 86032 exhibited tolerance to the red rot as in the previous years.

Table 1 Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Coimbatore

Sl. No.	Isolates	Source	Reaction of host differentials													
			Co 419	**Co 975**	**Co 997**	**Co 1148**	**Co 62399**	**Co 7717**	**CoC 671**	**CoJ 64**	**CoS 767**	**CoS 8436**	**BO 91**	**Baragua**	**Khakai**	**SES 594**
1	CF06	CoC 671	S	I	S	I	S	I	S	S	I	R	R	R	I	R
2	Cf91017	Co 91017	S	S	S	R	S	S	S	I	I	R	R	R	I	R
3	CfSi6 (Tanjore)	CoSi 6	S	S	S	S	S	S	S	S	I	R	R	R	I	R
4	CfSi6 (Kanchi)	CoSi 6	R	R	S	I	I	R	S	R	R	R	R	R	R	R
5	Cf94012 (O)	Co 94012	I	I	S	S	S	S	S	I	R	R	R	R	I	R
6	Cf94012 (G)	Co 94012	R	R	S	R	I	S	S	I	R	R	R	R	R	R
7	CfSi6 (Karai)	CoSi 6	I	I	S	R	I	R	S	I	R	R	R	R	I	R
8	CfSi97021	Co 97021	S	I	S	S	S	I	S	I	I	R	R	R	R	R
9	Cf0323	Co 0323	I	I	S	S	S	I	S	S	I	R	R	R	S	R
10	Cf09356	CoV 09356	S	S	S	S	S	S	S	S	S	R	I	I	S	R

Table 2 Evaluation of IVT entries for red rot and smut resistance

Sl. No.	Entry	Red rot		Smut
		Plug method	Nodal Method	
1	Co 10004	MR	R	S
2	Co 10005	MS	R	HS
3	Co 10006	R	R	HS
4	Co 10015	R	R	HS
5	Co 10017	MR	R	HS
6	Co 10024	MS	R	HS
7	Co 10026	R	R	HS
8	Co 10027	R	R	HS
9	Co 10031	MS	R	HS
10	Co 10033	MR	R	HS
11	CoVc 10061	R	R	HS
12	CoN 10071	S	S	HS
13	CoN 10072	R	R	HS
14	CoN 10073	MR	R	MS
15	CoM 10081	HS	S	HS
16	CoM 10082	HS	S	HS
17	CoM 10083	MS	R	HS
18	CoM 10084	S	S	HS
19	CoVSI 10121	S	S	HS
20	CoVSI 10122	R	R	HS
21	PI 10131	R	R	HS
22	PI 10132	MR	R	HS
23	CoT 10366	MS	R	MS
24	CoT 10367	R	R	HS
25	CoT 10368	R	R	MS
26	CoT 10369	R	R	HS
Backlogs				
1	Co 09002	R	R	-
2	Co 09003	R	R	-
3	Co 09004	R	R	-
4	Co 09005	R	R	-
5	Co 09006	R	R	-
6	Co 09007	MR	R	-
7	Co 09010	R	R	-
8	Co 09012	MR	R	-
9	Co 09013	MS	S	-
10	Co 09014	R	R	-
11	Co 0240	R	R	-
12	CoN 09071	R	R	-
13	CoN 09072	R	R	-
Standards				
1	CoC 671	HS	S	-
5	Co 96007	-	-	HS

Table 3. Identification of field tolerant clones in sugarcane to red rot

S. No.	Clone	Disease reaction in field testing	Reaction to grain inoculum
1	Co 11015	S	X
2	2007-13	S	X
3	2007-41	S	X
4	2007-164	S	Y
5	2007-197	S	Y
6	2007-286	S	Y
7	2007-287	S	X
8	2007-332	S	Y
9	2009-207	S	Y
10	2009-314	S	X
11	2009-513	S	Y
12	2010-191	S	Y
13	2010-211	S	X
14	GH-5	S	X
15	GH-16	S	Y
16	GH-205	S	X
17	M-1	S	X
18	M-17	S	X
19	M-26	S	Y
20	M-32	S	X
21	M-75	S	X
22	M-171	S	Y
23	M-238	S	Y
24	RMS 28	S	X
Standards			
1	CoC 671	HS	Y
2	Co 86032	MS	X
3	Co 94012	HS	Y

X: Free from disease; Y: clear expression of the disease