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PLANT PATHOLOGY

(All India Coordinated Research Project on Sugarcane)

Division of Crop Protection

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Contents

PP 14: Identification of pathotypes in red rot pathogen

This year 12 new isolates *i.e.* one each from BO 91 (IR 48) and CoS 91269 (IR 57) and ten isolates from CoLk 8102 (IR-49, IR 50, IR 51, IR 52, IR 53, IR 54, IR 55, IR 56, IR 58 and IR 59) were collected and evaluated for their virulence pattern on designated differentials except Co 997 viz., Co 419, Co 975, Co 1148, Co 7717, Co 62399, CoC 671, CoJ 64, CoS 767, CoS 8436, BO 91, Khakai (*S. sinense*), Baragua (*S. officinarum*) and SES-594 (*S. spontaneum*) using plug method of inoculation. The result indicated that the virulence pattern of the isolates more or less matched with the designated pathotype Cf 02. Hence, there is no emergence of any new virulent pathotype in this zone.

Table-1: Reaction of pathotypes on a set of differentials

S. No.	Pathotype	Source	Co 419	Co 975	Co 997	Co 1148	Co 62399	Co 7717	CoC 671	CoJ 64	CoS 767	BO 91	Baragua	Khakai	SES 594	CoS 8436
1	Cf 01	Co 1148	R	S	S	S	S	R	S	S	R	R	R	S	R	-
2	Cf 02	Co 7717	I	R	S	R	I	S	S	I	R	R	R	R	R	-
3.	Cf 03	CoJ 64	R	R	S	R	R	R	R	S	R	R	R	R	R	-
4.	Cf 04	Co 419	S	S	S	S	R	S	S	S	R	R	R	S	R	-
5.	Cf 05	Co 997	R	S	S	S	R	R	S	S	R	R	R	S	R	-
6.	Cf 06	CoC 671	R	S	S	S	R	R	S	S	R	R	S	S	R	-
7.	Cf 07	CoJ 64	I	R	S	S	R	R	I	S	R	R	R	S	R	-
8.	Cf 08	CoJ 64	I	S	S	S	S	S	S	S	I	R	R	S	R	-
9.	Cf 09	CoS 767	I	R	I	S	R	R	I	S	S	R	R	S	R	-
10.	Cf 10	85A261	S	S	S	I	S	S	S	S	R	R	R	R	R	I
11.	Cf 11	CoJ 64	S	I	S	I	I	S	I	S	I	I	I	I	R	I

-: Not evaluated on CoS 8436

Table-1a: Reaction of red rot isolates on a set of differentials

S. No.	Isolates	Source	Co 419	Co 975	Co 997	Co 1148	Co 62399	Co 7717	CoC 671	CoJ 64	CoS 767	BO 91	CoS 8436	CoLk 8102	Baragua	Khakai	SES 594
1	IR-48	BO 91	R	R	-	R	I	I	S	R	R	R	R	S	R	R	R
2	IR-49	CoLk 8102	R	R	-	R	R	R	S	R	R	R	R	S	R	R	R
3.	IR-50	CoLk 8102	R	R	-	R	I	-	S	R	R	R	R	S	R	R	R
4.	IR-51	CoLk 8102	R	R	-	R	I	R	S	R	R	R	R	S	R	R	R
5.	IR-52	CoLk 8102	R	R	-	R	R	I	S	R	R	R	R	S	R	R	R
6.	IR-53	CoLk 8102	R	R	-	R	R	I	S	R	R	R	R	S	I	R	R
7.	IR-54	CoLk 8102	S	R	-	R	S	S	S	R	R	R	R	S	R	R	R
8.	IR-55	CoLk 8102	S	R	-	R	S	S	S	R	R	R	R	S	R	R	R
9.	IR-56	CoLk 8102	I	R	-	R	S	S	S	R	R	R	R	S	R	R	R
10.	IR-57	CoS 91269	I	R	-	R	S	S	S	R	R	R	R	S	R	R	R
11.	IR-58	CoLk 8102	S	R	-	R	R	R	S	R	R	R	R	S	R	R	R
12.	IR-59	CoLk 8102	S	R	-	R	R	R	S	R	R	R	R	S	R	R	R

-: Not evaluated

PP17: Evaluation of Zonal Varieties for red rot, smut and wilt

(A) North West Zone, Lucknow

In North West Zone, at IISR Farm Lucknow, 33 genotypes viz., 3 entries of Initial Varietal Trial (Early) viz., Co 10035, CoH 10261 and CoS 10231; 5 entries of Advanced Varietal Trial (Early)-I Plant viz., CoH 09262, CoH 09263, CoLk 09202, CoPb 09181 and CoS 09246; 3 entries of Initial Varietal Trial (Early)-II Plant viz., CoPb 08211, CoPb 08212 and CoS 08233; 10 entries of Initial Varietal Trial (Mid late) viz., Co 10036, Co 10037, Co 10039, CoH 10262, CoH 10263, CoPant 10221, CoPb 10181, CoPb 10182, CoPb 10183 and CoPb 10211; 5 entries of Advanced Varietal Trial (Mid late)-I Plant viz., Co 09022, CoH 09264, CoLk 09204, CoPb 09214 and CoS 09232 and 6 entries of Advanced Varietal Trial (Mid late)-II Plant viz., CoH 08262, CoH 08263, CoH 08264, CoPb 08217, CoS 08234 and CoS 08235 were screened against red rot, smut and natural incidence of wilt. Natural incidence of Grassy shoot disease (GSD) and yellow leaf disease (YLD) was also recorded (Table-3).

Red rot:

(i) Initial Varietal Trial (Early)

Two genotypes viz., Co 10035 and CoS 10231 were moderately resistant (MR) to both the pathotypes, while CoH 10261 was moderately susceptible (MS) to Cf 08 and moderately resistant (MR) to Cf 09.

(ii) Advanced Varietal Trial (Early)-I Plant

Out of 5 genotypes tested, 4 genotypes viz., CoH 09263, CoLk 09202, CoPb 09181 and CoS 09246 were moderately resistant (MR), while CoH 09262 was moderately susceptible (MS) to susceptible (S) to both the pathotypes.

(iii) Initial Varietal Trial (Early)-II Plant

Out of 3 genotypes tested, two genotypes viz., CoPb 08211, CoPb 08212 exhibited moderately resistant (MR) reaction against both the pathotypes, while CoS 08233 showed moderately resistant (MR) reaction against Cf 08 and highly susceptible (HS) reaction against Cf 09.

(iv) Initial Varietal Trial (Mid late)

Out of 10 genotypes tested, six genotypes viz., Co 10036, Co 10037, CoH 10262, CoPant 10221, CoPb 10181, and CoPb 10211 exhibited resistant (R) to moderately resistant (MR), while 4 genotypes viz., Co 10039, CoH 10263, CoPb 10182 and CoPb 10183 were susceptible (S) to highly susceptible (HS) to both the pathotypes.

(v) Advanced Varietal Trial (Mid late)-I Plant

Out of 5 genotypes of Advanced Varietal Trial (Mid late)-I Plant tested, all the genotypes exhibited resistant (R) to moderately resistant (MR) reaction to both the pathotypes except CoPb 09214 which exhibited moderately susceptible (MS) reaction to Cf 08 and moderately resistant (MR) reaction to Cf 09.

(vi) Advanced Varietal Trial (Mid late)-II Plant

Out of 6 genotypes viz., tested, 5 genotypes viz., CoH 08262, CoH 08263, CoH 08264, CoS 08234 and CoS 08235 exhibited resistant (R) to moderately resistant (MR), while CoPb 08217 showed moderately susceptible (MS) reaction to both the pathotypes.

Smut:

Sixteen genotypes *viz.,* Co 09022, Co 10035, Co 10037, CoH 09262, CoH 09263, CoH 10262, CoPant 10221, CoPb 08217, CoPb 09181, CoPb 09214, CoPb 10181, CoPb 10182, CoPb 10211, CoS 08234, CoS 09246 and CoS 10231 were susceptible and remaining 17 were found tolerant to smut.

Wilt:

Natural incidence of wilt was noticed in 11 genotypes *viz.,* Co 10036, Co 10037, Co 10039, CoH 08263, CoH 09263, CoH 10261, CoH 10263, CoPb 08211, CoPb 09181, CoPb 10181 and CoS 10231.

Grassy shoot and yellow leaf disease:

Natural incidence of grassy shoot disease (GSD) was observed in Co 10035, CoH 08262, CoH 09264, CoLk 09202, CoPb 08212, CoPb 10182 and LG 05002 and yellow leaf disease (YLD) in genotypes Co 10035, Co 10036, CoH 08263, CoLk 09202, CoPant 10221, CoS 08234, CoS 09232 and CoS 10231.

Table-3: Reaction of sugarcane genotypes against red rot, smut and wilt at IISR, Lucknow

Sl. No.	Genotype	Red rot Reaction		Smut	Wilt	GSD	YLD
		(Cf 08)	Cf 09				
	Initial Varietal Trial (Early)						
1.	Co 10035	MR	MR	S	-	S	S
2.	CoH 10261	MS	MR	-	S	-	-
3.	CoS 10231	MR	MR	S	S	S	S
	Advanced Varietal Trial (Early)-I Plant						
1.	CoH 09262	S	MS	S	-	-	-
2.	CoH 09263	MR	MR	S	S	-	-
3.	CoLk 09202	MR	MR	-	-	S	S
4.	CoPb 09181	MR	MR	S	S	-	-
5.	CoS 09246	MR	MR	S	-	-	-
	Initial Varietal Trial (Early)-II Plant						
1.	CoPb 08211	MR	MR	-	S	-	-
2.	CoPb 08212	MR	MR	-	-	S	-
3.	CoS 08233	MR	HS	-	-	-	-
	Initial Varietal Trial (Mid late)						
1.	Co 10036	R	MR	-	S	-	-
2.	Co 10037	MR	MR	S	S	-	S
3.	Co 10039	S	S		S	-	-
4.	CoH 10262	R	MR	S	-	-	-
5.	CoH 10263	HS	HS	-	S	-	-
6.	CoPant 10221	MR	R	S	-		S
7.	CoPb 10181	MR	MR	S	S	-	-
8.	CoPb 10182	S	HS	S	-	S	-
9.	CoPb 10183	HS	HS	-	-	-	-
10.	CoPb 10211	MR	MR	S	-	-	-
	Advanced varietal Trial (Mid late)-I Plant						
1.	Co 09022	R	MR	S	-	-	-
2.	CoH 09264	MR	MR	-	-	S	S
3.	CoLk 09204	MR	MR	-	-	-	-
4.	CoPb 09214	MS	MR	S	-	-	-
5.	CoS 09232	MR	MR	-	-	-	S
	Advanced varietal Trial (Mid late)-II Plant						
1.	CoH 08262	MR	MR	-	-	S	
2.	CoH 08263	MR	MR	-	S		S
3.	CoH 08264	MR	MR	-	-	-	-
4.	CoPb 08217	MS	MS	S	-	-	-
5.	CoS 08234	MR	MR	S	-		S
6.	CoS 08235	MR	MR	-	-	-	-
Check	CoJ 64*	HS	S	-	-	-	-
Check	CoS 767*	MR	MS		-	-	-
Check	CoLk 9617**	-	-	S	-	-	-

*: Check for red rot **: Check for smut

(B) North Central Zone, Motipur

In North Central Zone, 3 entries of Initial varietal Trial (Mid Late) viz., CoSe 10451, CoSe 10542 and CoSe 10453; 2 entries of Advance Varietal Trial (Mid late)-I Plant viz., BO 154 and CoP 09437; 3 entries of Initial varietal Trial (Mid Late)-II Plant viz., CoP 08437, CoSe 08451 and CoSe 08452 and none of the entries of Advance varietal Trial (Early)-I Plant were tested against red rot (Cf 07 and Cf 08) pathotypes. Out of eight genotypes, CoP 08437, CoP 9301, CoP 09437, CoSe 08451, CoSe 08452, BO 91, BO 130 and BO 154 were moderately resistant, while two genotypes CoSe 92423 and CoSe 95422 were moderately susceptible to both the pathotypes. CoSe 10451 was highly susceptible to Cf 07 and moderately resistant to Cf 08, while CoSe 10452 and CoSe 10453 were moderately susceptible to highly susceptible to Cf 08 and moderately resistant to Cf 07 (Table-4).

Table-4: Reaction of sugarcane genotypes against red rot at IISR Regional Station, Motipur

. No.	Genotype	Red Rot	
		Cf 07	Cf 08
Initial Varietal Trial (Early)- I Plant			
1.	BO 135	-	-
2.	CoP 08436	-	-
3.	CoSe 09452	-	-
4.	UP 09453	-	-
Initial varietal Trial (Mid Late)			
1.	CoSe 10451	HS	MR
2.	CoSe 10542	MR	HS
3.	CoSe 10453	MR	MS
Advance Varietal Trial (Mid late)-I Plant			
1.	BO 154	MR	MR
2.	CoP 09437	MR	MR
Initial varietal Trial (Mid Late)-II Plant			
1.	CoP 08437	MR	MR
2.	CoSe 08451	MR	MR
3.	CoSe 08452	MR	MR
Check	BO 91	MR	MR
Check	CoSe 92423	MR	MR
Check	CoP 9301	MR	MR
Check	CoJ 64*	S	HS

Nt:- Not tested *: Check for red rot

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

A survey was conducted Pallia Kalan Sugar Mill, Unit of Bajaj Hindustan Ltd.; Lakimpur Kheri Biswan Sugar Mill, Sitapur and Shamli and Unn sugar Mills, Muzaffarnagar (U.P.) were surveyed for the sugarcane diseases naturally occurring on important varieties.

In the command area of Pallia Kalan Sugar Mill, Unit of Bajaj Hindustan Ltd.; Lakimpur Kheri , sugarcane fields in Ateria, Badegaon, Bijoria and Basantapur kalon villages were surveyed. In some of the fields in low lying areas, red rot incidence was noticed up to 40.0% in variety CoSe 92423. Variety CoS 7250, a newly released variety was found highly susceptible to red rot under field condition. Incidence of smut (<1.0%) in CoSe 92423, CoSe 01424, CoSe 01434, CoS 98231 and Co 0238; GSD (5-10%) in CoSe 92423 and Co 0238 was also observed.

In the command area of Biswan Sugar Mill, incidence of red rot (1-2%) was observed in CoLk 8102. Incidence of smut was noticed in CoSe 92423, CoSe 03234 and Co 0236. Minor incidence of grassy shoot disease (GSD) was also observed in Co 0238 and CoPk 09151. In the command area of Shamli Sugar Mill, in some of the fields incidence of GSD (5-10%) was observed in CoS 767. Incidence of smut (2-5%) in CoS 1424 and yellow leaf disease (1-2%) in Co 0238 was also observed. In the command area of Unn Sugar Mill, Incidence of GSD (15-20%) in CoS 767 and yellow leaf disease (1-2%) in Co 0238 was also observed.