From

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To

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Memo. No. RRS/K/2015/ Dated:

Sub: Annual Report for AICRP on sugarcane Plant pathology 2016-17 of Uchani centre.

Respected Sir,

Please find enclosed herewith a copy of Annual Report for AICRP on sugarcane Plant Pathology 2016-17 of CCS HAU RRS, Uchani centre. It is for your submission and necessary action, please.

With regards

Yours sincerely

(Rakesh Mehra)

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE (ICAR)

ANNUAL REPORT (PLANT PATHOLOGY)

20016-17

CCS HARYANA AGRICULTURAL UNIVERSITY

REGIONAL RESEARCH STATION, UCHANI, KARNAL-132001

PP.14

Identification of pathotypes of red rot pathogen

Objective: To gather information on the major pathotypes of red rot pathogen

Year of Start: 1983-84

Location: RRS, Uchani (Karnal)

Technical programme:

A given set of differentials to be inoculated by plug method with different local isolates of red rot pathogen and observations will be recorded on disease development after sixty days.

Results of the current year:

Pathogenic variability in *Colletotrichum falcatum* was studied at CCS Haryana Agricultural University, Regional Research Station, Uchani (Karnal) on eighteen 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, CoSe 95422, Co 86002, CoV 92102 and Co 860032).All the designated pathotypes viz., CF 01, CF 02, CF 03, CF 07, CF 08 CF 09 and CF 11 along with six new isolates RR XX (Co 89003), RR XXI (CoJ 64), RR XXII (CoJ 85) and RR XXIII (CoS 8436) and RR XXIV (CoS 89003), RR XXVI (CoJ 85) collected from different mill zone area of Haryana were used for pathogenic variability. The inoculations were done during last week of August 2016. Red rot observations were recorded 60 days after inoculation and red rot reactions were categorized into three groups viz. resistant (R), susceptible (S) and intermediate (I) based on the various symptomatic parameters as per the technical programme (Table 1).

Observations recorded indicate that all the pathotypes/isolates exhibited susceptible reaction on Co 997, CoC 671, and Khakai, whereas resistant reaction on SES 594, Baragua, CoSe 95422 and CoV 92102. Observations recorded indicate that clones (Co 7717, Co 1148, Co 975, Co 419 , Co 62399 , Co 86002 and Co 860032) a exhibited a clear cut differential reaction (S/R/I)..

Isolates RR XXI ,RR XXII and RR XXVI (shows susceptible reaction on Co 419 ,Co975 ,Co 9 and 97, Co 1148,Co7717 ,Co 62399, CoC 671,CoJ 64 and Khakai and resistant reaction on CoC 671, CoS 8436 , BO 91, Baragua , SES 59, CoSe 95422, Co 86002, CoV 92102 and Co 860032) were more virulent as CF 08 and showed similarity with CF 08. Isolate RR XX and RR XXIV from CoS 89003 shows pathogenic variation on different host differentials. Isolates RR XXIII shows susceptible reaction on Co 997, Co7717 , CoC 671,CoJ 64, CoS 8436 Khakai and

Co 86002 and resistant reaction on Co 7717, CoS 767 Bo 91, Baragua SES 594 CoSe 95422, CoV 92102 and Co 860032.

Table-1: Pathogenic behavior of isolates of *Colletotrichum falcatum* on a set of differentials (Uchani)

Sr. No	Pathotypes / Isolates	Reaction on host differentials																	
		Source	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	CoSe 95422	Co 86002	CoV92102	Co 860032
1	**CF 01**	**Co 1148**	R	R	S	S	I	S	S	I	R	R	R	R	S	R	R	R	R	R
2	**CF 02**	**CoJ 7717**	I	R	S	R	S	I	S	R	R	R	R	R	S	R	R	R	R	R
3	**CF 03**	**CoJ 64**	R	R	S	R	R	R	S	S	R	R	R	R	S	R	R	I	R	R
4	**CF 07**	**CoJ 64**	I	R	S	S	R	R	S	S	R	R	R	R	S	R	R	I	R	I
5	**CF 08**	**CoJ 64**	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
6	**CF 09**	**CoS 767**	R	R	S	S	R	R	S	S	S	R	R	R	S	R	R	R	R	R
7	**CF-11**	**CoJ 64**	S	I	S	I	I	I	I	S	S	R	R	I	S	R	R	S	R	R
8	**RR XX**	**Co 89003**	S	R	S	S	S	S	S	S	R	R	I	R	S	R	R	S	R	S
9.	**RR XXI**	**CoJ 64**	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
10.	**RR XXII**	**CoJ 85**	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
11.	**RR XXIII**	**CoS 8436**	S	S	S	R	S	S	S	S	R	S	R	R	S	R	R	S	R	R
12.	**RR XXIV**	**Co 89003**	R	I	S	S	S	R	S	S	R	R	R	R	S	R	S	S	R	R
13.	**RR XXVI**	**CoJ 85**	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	I	R	R

PP 17:

Evaluation of zonal varieties for resistance to red rot, smut and wilt

Objective: To gather information on relative resistance to red rot of the entries in pre-zonal/zonal varietal trials of the respective zones

Year of Start: 1986-87

Location: RRS, Uchani (Karnal)

Technical programme:

Early and mid-late genotypes/varieties to be evaluated against red rot by the plug and nodal cotton swab method of inoculations.

Results of the current year:

Forty two entries of zonal varietal trials along with five standard checks were evaluated for resistance to red rot by plug and nodal cotton swab methods of inoculations at CCS Haryana Agricultural University, Regional Research Station, Uchani (Karnal). Entries of AVT (early and mid late) and IVT (early and mid late) were inoculated with CF 08 and CF 09 pathotypes separately. Inoculations were carried out during last week of August 2016. Observations on disease development were recorded after 60 days of inoculations and varieties were categorized on 0-9 scale.

AVT (early) Plant-1:

Four genotypes (Co 12026, Co 12027, CoLk 12203 and CoPant 12221) along with two standards CoJ 64 and Co 0238 were evaluated against CF 08 and CF 09 by plug and nodal cotton swab method of inoculations (Table 2). Four entries viz., Co 12026, CoLk 12203 and CoPant 12221and Co 0238 showed moderately resistant reaction by plug and resistant by nodal cotton swab methods against CF 08 and CF 09 pathotypes . However, Co 12027 exhibited moderately susceptible reaction by plug and resistant by nodal cotton swab methods against CF 08 and CF 09 pathotypes. Among two standards CoJ 64 behaved highly susceptible/susceptible by both plug and nodal cotton swab methods of inoculation with CF 08 and CF 09.

AVT (early) Plant-1I:

Four genotypes (CoH 11262, Co LK 11201, Co LK 11202 and Co LK 11203) along with two standards CoJ 64 and Co 0238 were evaluated against CF 08 and CF 09 by plug and nodal cotton swab method of inoculations (Table 3). Genotypes viz., CoH 11262 and Co LK 11202 were found moderately resistant against CF 08 and resistant against CF 09 by plug and

resistant by nodal cotton swab methods against CF 08 and CF 09 pathotypes. Entries Co LK 11203 and Co LK 11201 showed moderately susceptible reaction against CF 08 and moderately resistant against CF 09 by plug method but resistant reaction by nodal cotton swab methods against CF 08 and CF 09 pathotypes. Among two standards CoJ 64 behaved highly susceptible/susceptible and by both plug and nodal cotton swab methods but Co 0238 showed moderately resistant reaction by plug and resistant reaction by nodal cotton swab methods of inoculations against CF 08 and CF 09 races.

AVT (mid late) Plant-1:

Six entries (Co 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211 and CoS 12232) along with three checks *viz.*, CoS 767, CoS 8436 and Co Pant 97222 were evaluated against CF 08 and CF 09 by plug and nodal cotton swab methods of inoculation. Entries viz., Co 12029, CoH 12263 and CoS 8436 showed resistant/moderately resistant reaction by plug method and resistant reaction by nodal cotton swab methods of inoculations to both CF 08 and CF 09 pathotypes (Table-4). Entries CoLk 12205, CoPant 12226 and CoPb 12211 were found moderately susceptible to CF 08 and moderately resistant to CF 09 by plug method and resistant reaction by nodal cotton swab methods against both CF 08 and CF 09 pathotypes. CoS 12232 exhibited moderately susceptible reaction by plug method and resistant reaction by nodal cotton swab methods of inoculations against CF 08 and CF 09 pathotypes. Check CoS 767 shows moderately susceptible/susceptible reaction by plug method and susceptible reaction by nodal cotton swab method. However, CoPant 97222 showed moderately susceptible/ susceptible reaction by plug method and susceptible reaction by nodal cotton swab method.

AVT (mid late) Plant-1I:

Six entries *viz.,* Co 11027, CoH 11263, CoLK 11204, ColK 11206, CoPb 11214 and CoS 11232 along with three checks CoS 767, CoS 8436 and CoPant 97222 were evaluated against pathotypes CF 08 and CF 09 by plug and nodal cotton swab methods of inoculations. Five entries viz., Co 11027,CoH 11263, CoLK 11204, CoPb 11214 and CoS 11232 showed resistant/ moderately resistant reaction by plug and resistant reaction by nodal cotton swab methods against CF 08 and CF 09. CoLK 11206 showed moderately resistant reaction against CF 08 but moderately susceptible 1 to CF 09 by plug and resistant reaction by nodal cotton swab methods against CF 08 and CF 09 (Table 5). Check CoS 8436 behaved as moderately resistant/resistant with CF 08 and CF 09 pathotypes. However, CoS 767 and Co

Pant 97222 showed moderately susceptible/susceptible reaction by plug method and susceptible reaction by nodal cotton swab method.

IVT (early):

Nine genotypes (Co 13033 , Co 13034 ,CoLK 13201, CoLk 13202, CoLk 13203, CoPant 13221,CoPant 13222 , CoPb13181 and CoS13231)) along with two standards CoJ 64 and Co 0238 were evaluated against CF 08 and CF 09 by plug and nodal cotton swab method of inoculations (Table 6). Entries viz., Co 13033, Co 13034, CoLk 13202, CoPant 13221 and CoS13231 showed moderately resistant reaction by plug and resistant reaction by nodal cotton swab methods of inoculations to both CF 08 and CF 09 pathotypes. Entries namely, CoLK 13201, CoLk 13203, CoPant 13222 and CoPb13181 were found moderately susceptible /susceptible by plug method and resistant by nodal cotton swab methods against CF 08 and CF 09 except CoPant 13222 which also shows susceptible reaction by nodal cotton swab against both CF 08 and CF 09 races.

IVT (mid late):

Thirteen entries (Co 13035, Co 13036, CoH 13261, CoH 13062, CoH 13063, CoLK 13204 CoLK 13205, CoLk11320, CoPant 13223, CoPant 13224, CoPb 13182,CoPb 13183, CoS 13232 and CoS 13233) along with three checks *viz.,* CoS 767, CoS 8436 and Co Pant 97222 were evaluated against CF 08 and CF 09 by plug and nodal cotton swab methods of inoculation. Entries viz., Co 13035, Co 13036, CoH 13261, CoH 13062, CoH 13063, CoLK 13204 ,CoPant 13223, CoPant 13224, CoPb 13182 and CoS 8436 showed resistant/moderately resistant reaction by plug and resistant reaction by nodal cotton swab methods of inoculations to both CF 08 and CF 09 pathotypes (Table-7). Entries namely CoLK 13205, CoS 13232 and CoPant 13223 behaved moderately susceptible /susceptible against CF 08 and CF 09 by plug method and resistant reaction by nodal cotton swab methods. However, CoPb 13183 showed susceptible/ moderately susceptible reaction by plug method and susceptible reaction by nodal cotton swab method against both CF 08 and CF 09 pathotypes. Checks CoS 767 and Co Pant 97222 were moderately susceptible/susceptible by plug and susceptible by nodal cotton swab methods of inoculation against CF 08 and CF 09

Table-2: Reaction of genotypes of Advance Varietal Trial - Early I Plant against red rot

Sr. No.	Genotype/Variety	Plug method		Nodal cotton swab method	
		CF 08	CF 09	CF 08	CF 09
1.	Co 12026	MR	MR	R	R
2.	Co 12027	MS	MS	R	R
3	CoLk 12203	MR	MR	R	R
4	CoPant 12221	MR	MR	R	R
5	CoJ 64	HS	S	S	S
6	Co 0238	MR	MR	R	R

Table-3: Reaction of genotypes of Advanced Varietal Trial (Early) – II Plant against red rot

Sr. No.	Genotypes	Plug method		Nodal cotton swab method	
		CF 08	CF 09	CF 08	CF 09
1	CoH 11262	MR	MR	R	R
2	Co LK 11201	MS	MR	R	R
3	Co LK 11202	MR	MR	R	R
4	Co LK 11203	MS	MR	R	R
5	CoJ 64	HS	S	S	S
6	Co 0238	MR	MR	R	R

Table-4: Reaction of genotypes of Advanced Varietal Trial – Mid late I Plant against red rot

Sr. No.	Genotypes	Plug method		Nodal cotton swab method	
		CF 08	CF 09	CF 08	CF 09
1	Co 12029	MR	MR	R	R
2.	CoH 12263	MR	R	R	R
3.	CoLK 12205	MS	MR	R	R
4.	CoPant 12226	MS	MR	R	R
5.	CoPb 12211	MS	MR	R	R
6.	CoS 12232	MS	MS	R	R
7.	Co S 767	MS	S	R	R
8.	CoS 8436	MR	MR	R	R
9.	CoPant 97222	S	MS	S	S

Table-5: Reaction of genotypes of Advanced Varietal Trial (Midlate) – II Plant against red rot

Sr. No.	Genotypes /Variety	Plug method		Nodal cotton swab method	
		CF 08	CF 09	CF 08	CF 09
1	Co 11027	MR	MR	R	R
2.	CoH 11263	R	R	R	R
3.	CoLK 11204	MR	MR	R	R
4.	ColK 11206	MR	MS	R	R
5.	CoPb 11214	MR	MR	R	R
6.	CoS 11232	MR	MR	R	R
7.	Co S 767	MS	S	S	S
8.	CoS 8436	MR	MR	R	R
9.	CoPant 97222	S	MS	S	S

Table-6: Reaction of genotypes of Initial Varietal Trial - Early against red rot

Sr. No.	Genotype/Variety	Plug method		Nodal cotton swab method	
		CF 08	CF 09	CF 08	CF 09
1.	Co 13033	MR	MR	R	R
2.	Co 13034	MR	MR	R	R
3	CoLK 13201	MS	MS	R	R
4	CoLk 13202	MR	MR	R	R
5	CoLk 13203	MS	S	R	R
6	CoPant 13221	MR	MR	R	R
7	CoPant 13222	S	MS	S	S
8	CoPb13181	MS	MS	R	R
9	CoS13231	MR	MR	R	R
10	CoJ 64	HS	S	S	S
11	Co 0238	MR	MR	R	R

Table-7: Reaction of genotypes of Initial Varietal Trial – Mid late against red rot

Sr. No.	Genotype/Variety	Plug method		Nodal cotton swab method	
		CF 08	CF 08	CF 08	CF 09
1.	Co 13035	MR	MR	R	R
2.	Co 13036	MR	MR	R	R
3.	CoH 13261	MR	MR	R	R
4.	CoH 13262	MR	MR	R	R
5.	CoH 13263	MR	R	R	R
6	CoLK 13204	MR	MR	R	R
7	CoLk 13205	S	MS	R	R
8	CoPant 13223	MR	MR	R	R
9	CoPant 13224	MR	R	R	R
10	CoPb 13182	MR	MR	R	R
11	CoPb 13183	S	MS	S	S
12	CoS 13232	MS	MS	R	R
13	CoS 13233	MS	MS	R	R
14	Co S 767	MS	S	R	R
15	CoS 8436	MR	MR	R	R
16	CoPant 97222	S	MS	S	S

Score Reaction

0-2 : R (Resistant)
2.1-4 : MR (Moderately Resistant)
4.1-6 : MS (Moderately Susceptible)
6.1-8 : S (Susceptible)
> 8 : HS (Highly Susceptible)

PP.17D:

Evaluation of zonal varieties for resistance to yellow leaf disease (YLD)

Objective: To gather information on relative resistance to YLD of the entries in pre-zonal/zonal varietal trials of the respective zones

Year of Start: 2014- 15

Location: RRS, Uchani (Karnal)

Technical programme:

Early and mid-late varieties to be evaluated against YLD under natural conditions

Results of the current year:

Twenty AVT **(**early& mid late) and twenty two IVT **(**early& mid late) entries of zonal varietal trials along with five standard checks were evaluated for resistance to YLD at CCS Haryana Agricultural University, Regional Research Station, Uchani, Karnal. Observations on disease development were recorded following 0-5 scale.

To assess YLD severity, the disease severity grades were recorded during maturity stages of the crop (3 observations by 8^{th}, 10^{th} and 12^{th}months). Each time, minimum of 25 canes (free from other biotic stresses) were scored.

AVT (early) Plant-1

Four genotypes (Co 12026, Co 12027, CoLk 12203 and CoPant 12221) along with two standards CoJ 64 and Co 0238 were evaluated against YLD (Table 8). One entry Co 12026 showed resistant reaction and three entries viz., Co 12027, CoLk 12203 and CoPant 12221 showed moderately susceptible reaction against YLD. However, two standards CoJ 64 and Co 0238 showed moderately susceptible and susceptible reaction against YLD, respectively.

AVT (early) Plant II

Four varieties (CoH 11262, CoLk 11201, CoLk 11202 and CoLk 11203) along with two standards CoJ 64 and Co 0238 were evaluated against YLD under natural conditions (Table 9). Entry CoLk 11202 exhibited resistant reaction. Two genotypes *viz.,* CoH 11262 and CoLk 11201 were found moderately susceptible and one entry CoLk 11203 susceptible against YLD. However, two standards CoJ 64 and Co 0238 also showed moderately susceptible and susceptible reaction against YLD, respectively.

AVT (Mid late) Plant-1

Six entries (Co 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211 and CoS 12232) along with three checks *viz.,* CoS 767, CoS 8436 and Co Pant 97222 were evaluated against YLD under natural conditions (Table 10). Entries CoH 12263, CoLk 12205 showed moderately resistant reaction .Three entries namely ,Co 12029, CoS 8436 and CoPb 12211 showed moderately susceptible reaction and two entries CoPant 12226 and CoS 12232 CoS 767 and Co Pant 97222 were susceptible to YLD. However, two standards CoS 767 and Co Pant 97222 showed highly susceptible reaction against YLD, respectively.

AVT (Mid late) –II

Six entries *viz.,* Co 11027, CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214 and CoS 11232 along with three checks CoS 767, CoS 8436 and CoPant 97222 were evaluated against

YLD under natural conditions (Table 11). Two entries CoH 11263 and CoPb 11214 showed resistant reaction. Two entries (CoLk 11204 and CoS 8436) were found moderately susceptible, two entries (Co 11027 and CoLk 11232) susceptible and three entries (CoLk 11206, Co Pant 97222 and CoS 767) showed highly susceptible reaction to YLD.

IVT (early)

Nine genotypes (Co 13033, Co 13034, CoLk 13201, CoLk 13202, CoLk 13203, CoPant 13221, CoPant 13222, CoPb 13181 and CoS 13231) along with two standards CoJ 64 and Co 0238 were evaluated against YLD under natural conditions (Table 12). Four entries viz., CoLk 13201, CoLk 13202, CoLk 13203 and CoPant 13221were found moderately resistant and four varieties namely Co 13033, Co 13034, Co Pant 13222 and CoPb 13181 showed moderately resistant reaction to YLD. Among the two standards CoJ 64 and Co 0238 behaved moderately susceptible and susceptible respectively, against YLD.

IVT (mid late)

Fifteen entries (Co 13035, Co 13036, CoH 13261, CoH 13262, CoH 13263, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183, CoS 13232 and CoS 13233) including three checks *viz.,* CoS 767, CoS 8436 and Co Pant 97222 were evaluated against YLD under natural conditions (Table 13). Entry CoS 13233 showed resistant and four entries (CoH 13261, CoH 13262, CoH 13263 and CoS 13232) showed moderately resistant reaction against YLD. Eight entries (Co 13035, Co 13036, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182 and CoPb 13183) exibited moderately susceptible reaction against YLD. Check CoS 8436 behaved as moderately susceptible however, Co Pant 97222 and CoS 767 showed susceptible reaction against YLD.

Table-8: Reaction of genotypes of Advanced Varietal Trial (Early) – I Plant against YLD

Sr. No.	Genotypes/ Variety	YLD	
		score	reaction
1	Co 12026	1.0	R
2.	Co 12027	3.0	MS
3.	CoLk 12203	3.0	MS
4.	CoPant 12221	3.0	MS
5.	CoJ 64	3.0	MS
6.	Co 0238	3.5	MS

Table-9: Reaction of genotypes of Advanced Varietal Trial (Early) – II Plant against ` YLD

Sr.No.	Genotype/Variety	YLD	
		Score	Reaction
1.	CoH 11262	2.5	MS
2.	Co LK 11201	2.5	MS
3.	Co LK 11202	2.0	MR
5.	Co LK 11203	3.5	S
6.	CoJ 64	3.0	MS
	Co 0238	3..5	S

Table-10: Reaction of genotypes of Advanced Varietal Trial (Midlate) – I Plant against YLD

Sr.No.	Genotype/Variety	YLD	
		Score	Reaction
1.	Co 12029	2,5	MS
2.	CoH 12263	1.5	MR
3.	CoLK 12205	2.0	MR
4.	CoPant 12226	3.5	S
5.	CoPb 12211	2.5	MS
6.	CoS 12232	4.0	S
7.	Co S 767	4.5	HS
8.	CoS 8436	2.5	MS
9.	CoPant 97222	4.5	HS

Table-11: Reaction of genotypes of Advanced Varietal Trial (Midlate) –II Plant against YLD

Sr.No.	Genotypes/ Variety	YLD	
		Score	Reaction
1.	Co 11027	4.0	S
2.	CoH 11263	2.0	MR
3.	CoLK 11204	2.5	MS
4.	ColK 11206	4.5	HS
5.	CoPb 11214	2.0	MR
6.	CoS 11232	3.5	MS
7.	Co S 767	4.5	HS
8.	CoS 8436	2.5	MS
9.	CoPant 97222	4.5	HS

Table-12: Reaction of genotypes o Initial Varietal Trial - Early against YLD

Sr. No.	Genotypes/ Variety	YLD	
		Score	Reaction
1.	Co 13033	3.0	MS
2.	Co 13034	3.0	MS
3	CoLK 13201	2.0	MR
4	CoLk 13202	2.0	MR
5	CoLk 13203	2.0	MR
6	CoPant 13221	2.0	MR
7	CoPant 13222	3.0	MS
8	CoPb13181	3.0	MS
9	CoS13231	2.5	MS
10	CoJ 64	3.0	MS
11	Co 0238	3.5	S

Table-13: Reaction of genotypes of Initial Varietal Trial – Midlate against YLD

Sr. No.	Genotype/Variety	YLD	
		Score	Reaction
1.	Co 13035	3.0	MS
2.	Co 13036	3.0	MS
3.	CoH 13261	2.0	MR
4.	CoH 13062	2.0	MR
5.	CoH 13063	2.0	MR
6.	CoLK 13204	3.0	MS
7.	CoLk113205	3.0	MS
8.	CoPant 13223	3.0	MS
9.	CoPant 13224	3.0	MS
10.	CoPb 13182	3.5	MS
11.	CoPb 13183	3.5	MS
12.	CoS 13232	2.0	MR
13.	CoS 13233	0.0	R
14.	Co S 767	4.0	S
15.	CoS 8436	3.0	MS
16.	CoPant 97222	4.0	S

PP-22:

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

Objective: To gather information on diseases naturally occurring in the mill area on important sugarcane varieties

Year of Start: 1989-90

Location: Different mill zone areas of Haryana.

Results of current year:

Survey was conducted in various mill zones areas of different co- operative and pvt sugar mills of Haryana state during pre and post monsoon seasons for sugarcane diseases on important sugarcane varieties during 2016-17 (Table 14).

Red rot:

Red rot was observed on plant and ratoon crop of CoS 8436, CoJ 85 and Co 89003 varieties in sugar mill zone areas of Karnal, Bhadsu, Shahabad, Panipat, Asandh, Yamunanagar Kaithal and Rohtak during both pre and post monsoon seasons ranging from 2 to 25 per cent.

Top rot:

Top rot was observed on varieties viz., CoJ 85, Co 0238, CoH 152 and CoH 119 in Shahabad, Karnal, Kaithal, Yamunanagar and Rohtak sugar mill zone areas ranging from 2 to 60 per cent.

Wilt:

Wilt was noticed in varieties namely Co 89003, Co 05011 , CoS 8436, CoH 119 , Co 767 and Co 1148 in Panipat, Sonipat, Yamunanagar, Rohtak, Asandh, Jind , Panipat and Karnal sugar mill zone areas ranging from 5 to 25 per cent. The incidence of wilt in association with red rot was also observed in Panipat and Karnal sugar mill zone areas particularly in Co 89003. The incidence of wilt in association with red rot and root borer was also observed in Karnal, Panipat and Rohtak sugar mill zone areas.

Smut:

Smut incidence ranging from 2- 15 per cent was observed on varieties Co 0238, Co 89003 , CoH 99 CoH 160, Co 0118, CoH 119 and Co 05011 in Shahabad, Karnal, Bhadsu, Rohtak, Jind and Kaithal sugar mill zone areas.

Grassy shoot disease:

GSD was observed in traces to15 per cent in Karnal, Shahabad, Yamunanagar, Jind, Rohtak and Asand areas of Haryana on varieties which include Co89003, CoJ 85 , Co 0238, CoS 8436, CoH 119, CoH 160 and CoH152.

Pokkah boeng:

Pokkah boeng (traces to 35%) appeared on varieties viz., Co89003, CoJ 85, Co 0238, CoS 8436, CoH 119, CoH 160, CoH 152 and Co 05011 in Yamunanagar , Karnal, Jind, ,Panipat, Sonipat, Rohtak, Shahabad,Gohana, Kaithal, Panipat and Asand sugar mill zone area.

YLD:

Yellow leaf disease was noticed in Traces-5 % on varieties viz., Co 0238, CoS 8436, CoH 119, CoH 152, Co 89003, CoH 119, CoH 160 and Co 05011 in Yamunanagar , Karnal , Asand, Jind , Rohtak, Shahabad and Panipat sugar mill zone areas.

Mosiac:

Incidence of mosaic in traces was observed in CoH 119 and CoS 8436 varieties in sugar mill zone areas of Shahabad, Karnal, Panipat and Asand.

Table 14: Survey of sugarcane disease naturally occurring in the Haryana State on important sugarcane varieties

Name of disease	Location	Disease incidence	Varieties affected	Crop stage when observed
Red rot	Karnal, Bhadsu ,Shahabad, Panipat, Asandh, Yamunanagar Kaithal and Rohtak	2-25 %	CoS 8436, CoJ 85 and Co 89003	3-9months
Top rot	Shahabad, Karnal, Kaithal Yamunanagar and Rohtak	2-60 %	CoJ 85, Co 0238, CoH 152 and CoH 119	4-7 months
Wilt	Panipat, Sonipat, Yamunanagar ,Rohtak, Asandh, Jind ,Panipat and Karnal	5 to 25%	Co 89003, CoS 8436, CoH 119 and Co 05011 , Co 767, Co 1148 and CoS 8436	6-8 months
Smut	Shahabad, Karnal, Jind Bhadsu, Rohtak and Kaithal	2 -15%	Co 0238, Co 89003 , CoH 99 CoH 160, Co 0118 and Co 05011	4-6 months
Grassy shoot disease (GSD)	Karnal,Shahabad,YamunanagarJ ind, Rohtak and Assand	Traces-5 %	Co89003, CoJ 85 , Co 0238, CoS 8436,CoH 119,CoH 160 and CoH 152	5-6 months

Pokkah boeng	Yamunanagar ,Karnal ,Jind , Panipat, Kaithal Kaithal.Sonipat,Rohtak,Shahabad,Gohana and Assand	Traces to 35 %	Co 0238, CoS 8436, Co 89003, CoH 119 ,CoJ 85, Co 05011 and CoH160	4-9 months
YLD	Asand ,Yamunanagar ,Karnal Jind, Rohtak,Shahabad and Panipat	Traces-5 %	Co 0238,CoS 8436, CoJ 85,CoH 152, Co 89003 ,CoH 119, CoH 160 and Co 05011	7-10 months
Mosiac	Shahabad , Karnal, Panipat and Assand	Traces	CoH 119 and CoS 8436	6-9 months

PP-23:

Assessment of elite and ISH genotypes for resistance to red rot

Objective: To gather information on *Saccharum* sp. and elite genotypes for resistance to red rot, so that the resistant genotypes could be used in breeding programme as possible donor for resistance

Location: RRS, Uchani (Karnal)

Results of current year:

Nine ISH clones viz., IA 30-14, IA 30-17, IA 31-32, IA 31-35, B 44-167, F1108, Q-65, Q-45 and 57 NG 131 were evaluated for resistance to red rot by plug method using pathotype CF 08 . Inoculations were carried out during last week of August, 2016. Observations on disease development were recorded after 60 days of inoculations and clones were categorized on 0-9 scale.

The clones namely F1108, IA 30-17, and IA 31-35 were found resistant/moderately resistant whereas, genotypes B 44-167, IA 30-14, IA 31-32, Q-65, Q-45 and 57 NG 131 showed moderately susceptible/ susceptible reaction against red rot pathotype CF 08.

PP 31:

Epidemiology, varietal screening and management of pokkah boeng

Objective: To study epidemiology and management of pokkah boeng disease

Year of start: 2011-12

Location: Karnal

Result of current year:

Pokkah boeng incidence was noticed in first week of June 2016. Initial symptoms showed whitish and chloratic yellow leaves. Malformed or twisted top symptoms develop during rainy season period. Yellowing of foliage, wilting and reddening of spindles also noticed at later stage. The average maximum temperature 33.9°C (31.5-38.9°C) and minimum 25.7°C (23.6-27.7°C), average relative humidity morning 85.9 (67.3-93.3) per cent and evening 65.8 (37.0-80.6) per cent and with total rainfall 94.7 mm (av. 5.0 mm) were recorded from June-September (22- 39 met. week). Pokkah boeng incidence starts increasing during rainfall with high humidity conditions. Incidence on important varieties viz., CoS 0238 (26.0 %), CoH 133 (21.0%) CoS 8436 (19.0 %), CoJ 85 (14.0 %) and CoH 119 (9.0 %) was observed during June- September, 2016.

Sixty nine varieties of sugarcane were screened against pokkah boeng disease under natural conditions. Twenty nine varieties viz., CoH 92, CoH 160, CoH 164, CoH 167, CoH 150, CoH 99 , CoS 767,Co 12026, Co 12027, CoLk 12203, CoH 11262, CoLK 11201, CoLK 11203 ,Co 12029 ,CoH 12263 ,CoLK 12205 ,CoPant 12226 ,CoPb 12211, Co 11027, CoH 11263,CoLK 11204 ,Co 13033,CoLk 13203, CoPant 13231, Co 13035, CoH 13062, CoH 13063, CoLk 13205 and CoPb 13183 were found resistant to pokkah boeng . Thirty one varieties namely, CoH 56, CoH 151, CoH 119, Co 0118, CoH 128, Co 1148, Co 7717, Co 0237, CoJ 64, Co 05011 , S -11 252 , S-11 202, S-11 73, CoPant 12221, CoLK 11202 ,CoS 12232, CoLK 11206,CoS 11232 ,CoLK 13201, CoLk 13202, CoPant 13221, CoPb 13182 , Co 13036 , Co 13034, CoPb13181, CoH 13261 , CoPant 13223 ,CoPant 13224, CoPb13182 ,CoS 13232 and CoS 13233 showed moderately susceptible reaction to pokkah boeng . Eight varieties (CoH 110, CoH 152, CoH 133, CoJ 85, CoS 8436, CoPb 11214, CoPant 13222 and CoLK 13204 exhibited susceptible reaction to pokkah boeng. Co 0238 variety showed highly susceptible reaction against pokkah boeng.

Table 15: Reaction of sugarcane clones for resistance to Pokkha boeng

Sr.No	Genotype	Total incidence (%)	Disease reaction
1	CoH 110	16.0	S
2	CoH 152	18.0	S
3	CoH 156	8.0	MS
4	CoH 151	7.0	MS

5	CoH 119	9.0	MS
6	Co 0118	10.0	MS
7	CoH 133	21.0	S
8	CoH 128	7.0	MS
9	CoH 92	2.0	R
10	CoH 160	2.0	R
11	CoH 56	9.0	MS
12	Co 1148	10.0	MS
13	CoS 8436	19.0	S
14	Co 7717	9.0	MS
15	Co 0238	26.0	HS
16	Co 0237	10.0	MS
17	CoJ 85	14.0	MS
18	CoH 167	4.0	R
19	CoH 164	5.0	R
20	CoS 767	0.0	R
21	CoJ 64	8.0	MS
22	CoH 150	0.0	R
23	CoH 99	0.0	R
24	Co 05011	8.0	MS
25	S 11 252	9.0	MS
26	S-11 202	8.0	MS
27	S-11 733	9.0	MS
28	Co 12026	0.0	R
29	Co 12027	2.0	R
30	CoLk 12203	0.0	R
31	CoPant 12221	8.0	MS
32	CoH 11262	2.0	R
33	Co LK 11201	1.0	R
34	Co LK 11202	9.0	MS
35	Co LK 11203	1 .0	R
36	Co 12029	3.0	R
37	CoH 12263	4.0	R
38	CoLK 12205	2.0	R
39	CoPant 12226	0.0	R
40	CoPb 12211	2.0	R
41	CoS 12232	10.0	MS
42	Co 11027	1.0	R

43	CoH 11263	0.0	R
44	CoLK 11204	2.0	R
45	ColK 11206	9.0	MS
46	CoPb 11214	12.0	S
47	CoS 11232	6.0	MS
48	Co 13033	2.0	R
49	Co 13034	6.0	MS
50	CoLK 13201	6.0	MS
51	CoLk 13202	7.0	MS
52	CoLk 13203	2.0	R
53	CoPant 13221	7.0	MS
54	CoPant 13222	14.0	S
55	CoPb13181	8.0	MS
56	CoS 13231	2.0	R
57	Co 13035	0.0	R
58	Co 13036	7.0	MS
59	CoH 13261	7.0	MS
60	CoH 13062	2.0	R
61	CoH 13063	0.0	R
62	CoLK 13204	12.0	S
63	CoLk 13205	0.0	R
64	CoPant 13223	6.0	MS
65	CoPant 13224	7.0	MS
66	CoPb 13182	6.0	MS
67	CoPb 13183	2.0	R
68	CoS 13232	9.0	MS
69	CoS 13233	7.0	MS

For management of pokkah boeng , experiment was conducted by following three treatments viz., T_1 Sett treatment (overnight soaking with carbendazim 0.1%), T_2 Foliar spray with carbendazim 0.05% - 3 sprays at 15 days interval and T_3 (T_1 + T_2) and control with four replications on varieties Co 238 and CoS 8436. Overnight cane soaking with carbendazim 0.1% and foliar sprays with carbendazim was found best in controlling the pokkah boeng which gave lowest disease incidence of 6.4 per cent and 4.5 per cent in Co 0238 and CoS 8436, respectively and also increase germination.

Table 16: Management of Pokkah boeng disease in sugarcane

Sr No.	Treatment	Per cent Germination		Per cent disease incidence	
		C0 0238	**CoS8436**	**C0 0238**	**CoS 8436**
1.	T_1 Sett treatment (overnight soaking with carbendazim 0.1%	45.5	46.2	14.6	11,2
2.	T_2 Foliar spray with carbendazim 0.05% - 3 sprays at 15 days interval	39 .2	38.3	11.3	9.4
3.	T_3 (T_1 + T_2) T_1 Sett treatment+ T_2 Foliar spray with carbendazim 0.05%	46.0	45.6	6.4	4.5
4.	Control	38.0	38.9	27.0	18.0
CD at 5%		2.7	2.4	3.4	2.9