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SUGARCANE-PLANT PATHOLOGY



ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE



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Annual Report of AICRP on Sugarcane Plant Pathology
For 2014- 2015

PP.17 (b): Evaluation of zonal varieties/genotypes for their resistance against smut disease

Objectives: To evaluate the entries of zonal varieties, AVT-I (E), AVT –II (E), AVT-I (ML) and AVT-II (ML) for their resistance to smut.

Plot size: Three meter long row planted with 10, three-bud setts with 2 replications.

Location: Zonal Agriculture Research Station, Powarkheda

Entries: All available entries (early and mid-late)

Inoculum: Freshly collected *Ustilago scitiminea* teliospores.

Inoculation: The method of inoculation consists of steeping of setts for 30 minutes in a spore suspension of over 90 % viability and with a spore load of one million spores per ml.

Observation: Incidence of smut was recorded as below:

0.0% : Resistant (R)

More than 0.0 to 10% : Moderately Resistant (MR)

More than 10 to 20% : Moderately Susceptible (MS)

More than 20 to 30% : Susceptible (S)

More than 30 % : Highly Susceptible (HS)

Standards: Variety Co.7219 was used as check

Date of Planting: 23/02/2014

Year of Reporting: 2014 - 2015

Result: A total of twenty nine genotypes, AVT-I early (three) and IVT early & Midlate (twenty six) along with one check namely Co 7219 were evaluated for their reaction to smut disease. The per cent incidence of smut on different genotypes was recorded and presented in table 1, 2 and 3. Among AVT, one entry namely Co 09007 was found to be resistant and others two showed moderate resistance. Among IVT, seven entries i.e. Co 10004, Co 10006, Co 10024, Co 10026, Co 10027, CoM 10081 and CoT 10366 in early group and eight entries i.e. CoM 10083, CoM 10084, CoN 10073, CoT 10368, CoT 10369, CoVC 10061, PI 10131 and PI 10132 in midlate group were found to be resistant whereas remaining showed moderate resistance to highly susceptible reaction. Smut incidence ranged between 3.2 to 33.5 per cent in different genotypes whereas standard check (Co.7219) exhibited 21.6 per cent.

PP 17 D: Evaluation of zonal varieties/genotypes for their resistance against Yellow leaf disease (YLD).

Objectives: To evaluate AVT and IVT entries for their resistance to Yellow leaf disease.

Location: Zonal Agriculture Research Station, Powarkheda

Entries: All available entries (early and mid-late).

Inoculation: Naturally occurring

Methodology: To assess YLD severity, 0-5 disease severity grades are to be given during maturity stages of the crop (3 observations by 8th, 10th and 12th months). Each time, minimum of 25 canes (free from other biotic stresses) are to be scored. Mean of the severity grades to be computed and the following YLD severity scale is to be used to assign disease reaction of the variety.

Observation: YLD severity scale

<u>Score</u>	<u>Disease reaction</u>
0.0-1.0	Resistant
>1.0-2.0	Moderately resistant
>2.0-3.0	Moderately susceptible
>3.0-4.0	Susceptible
>4.0-5.0	Highly susceptible

Year of Reporting: 2014 - 2015

Result: Thirty genotypes (AVT (3) and IVT (27)) were observed for their resistance to yellow leaf disease (YLD). Disease severity were recorded and presented in table 4, 5 and 6. Among AVT, disease was appeared in CoN- 09072 with moderately resistant reaction while two entries were found to be resistant. Among IVT, disease was appeared in Co 11001, Co 11004, Co 11018, CoN 11072, CoT 11366, Co 11021 and Co 11022 with resistant to moderately resistant reaction whereas other entries showed resistant reaction.

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

Objectives: To gather information on the diseases naturally occurring in the area on the Sugarcane varieties for compiling an all India disease status report yearly.

Location: Zonal Agriculture Research Station, Powarkheda.

Year of Reporting: 2014-2015

Observations:

Survey of different sugarcane growing areas were undertaken to record the incidence of major diseases like smut, red rot, wilt, GSD, YLDS and Pokkah boeng. Diseases recorded along with area, variety and per cent incidence are given in Table 7.

- 1. Smut:** The smut was found to be major sugarcane disease as it observed from all locations and almost all varieties. Mainly smut was noticed on Co J 64, Co 86032 and Co 7219 from Hoshangabad, Amla/Betul, Bankhedi, Kareli and Tendukheda sugarcane growing area. The incidence was up to 11.0 per cent.
- 2. Wilt:** The wilt incidence was observed from Bankhedi, Kareli and Tendukheda sugarcane growing area. Mainly the fields of Co J 64 were found to be affected and incidence was recorded up to 20.0 per cent.
- 3. Grassy Shoot Disease:** The GSD was observed from Hoshangabad, Kareli and Bankhedi sugarcane growing area on different varieties. The incidence was up to 6.0 per cent.
- 4. Yellow Leaf Disease Syndrome:** The YLD was observed in very low or in traces at different locations. However, the incidence was recorded up to 10.0 per cent on Co 99004 at Hoshangabad.
- 5. Pokkah Boeng:** The disease was observed from Hoshangabad, Bankhedi, Kareli and Tendukheda sugarcane growing area. The incidence was ranged between 1.0-13.0 per cent and mainly recorded on Co 99004, Co C 671 and Co 86032.

Table 1. Reaction of different sugarcane early/mid late Advance Varietal Trial genotype against smut disease

S.N.	Group	Genotype/ Variety	Per cent Incidence	Grade
1	AVT- (E) I	Co 09004	3.2	MR
2	AVT- (E) I	Co 09007	0.0	R
3	AVT (E) I	CoN 09072	4.0	MR
4	Check	Co 7219	21.6	S

Table 2. Reaction of different sugarcane Initial Varietal Trial (early) genotype against smut disease

S.N.	Group	Genotype/ Variety	Per cent Incidence	Grade
1	IVT (E)	Co 10004	0.0	R
2	IVT (E)	Co 10005	3.5	MR
3	IVT (E)	Co 10006	0.0	R
4	IVT (E)	Co 10024	0.0	R
5	IVT (E)	Co 10026	0.0	R
6	IVT (E)	Co 10027	0.0	R
7	IVT (E)	CoM 10081	0.0	R
8	IVT (E)	CoM 10082	12.8	MS
9	IVT (E)	CoN 10071	8.5	MR
10	IVT (E)	CoN 10072	7.2	MR
11	IVT (E)	CoT 10366	0.0	R
12	IVT (E)	CoT 10367	4.3	MR
13	Check	Co 7219	21.6	S

Table 3. Reaction of different sugarcane Initial Varietal Trial (midlate) genotype against smut disease

S.N.	Group	Genotype/ Variety	Per cent Incidence	Grade
1	IVT (M)	Co 10015	9.6	MR
2	IVT (M)	Co 10017	14.5	MS
3	IVT (M)	Co 10031	5.2	MR
4	IVT (M)	Co 10033	10.8	MS
5	IVT (M)	CoM 10083	0.0	R
6	IVT (M)	CoM 10084	0.0	R
7	IVT (M)	CoN 10073	0.0	R
8	IVT (M)	CoT 10368	0.0	R
9	IVT (M)	CoT 10369	0.0	R
10	IVT (M)	CoVC 10061	0.0	R
11	IVT (M)	CoVSI 10121	33.5	HS
12	IVT (M)	CoVSI 10122	20.8	S
13	IVT (M)	PI 10131	0.0	R
14	IVT (M)	PI 10132	0.0	R
15	Check	Co 7219	21.6	S

Table 4. Reaction of different sugarcane early/mid late Advance Varietal Trial genotype against yellow leaf diseases (YLD)

S.N.	Group	Genotype/ Variety	Score	Disease reaction
1	AVT- (E) I	Co 09004	0.0	R
2	AVT- (E) I	Co 09007	0.0	R
3	AVT (E) I	CoN 09072	1.2	MR

Table 5. Reaction of different sugarcane Initial Varietal Trial (early) genotype against yellow leaf diseases (YLD)

S.N.	Group	Genotype/ Variety	Score	Disease reaction
1	IVT (E)	Co 11001	0.9	R
2	IVT (E)	Co 11004	1.7	MR
3	IVT (E)	Co 11016	0.0	R
4	IVT (E)	Co 11017	0.0	R
5	IVT (E)	Co 11018	0.7	R
6	IVT (E)	CoM 11081	0.0	R
7	IVT (E)	CoM 11082	0.0	R
8	IVT (E)	CoM 11083	0.0	R
9	IVT (E)	CoM 11084	0.0	R
10	IVT (E)	CoN 11071	0.0	R
11	IVT (E)	CoN 11072	0.6	R
12	IVT (E)	CoT 11366	0.2	R
13	IVT (E)	PI 11131	0.0	R

Table 6. Reaction of different sugarcane Initial Varietal Trial (Midlate) genotype against yellow leaf diseases (YLD)

S.N.	Group	Genotype/ Variety	Score	Disease reaction
1	IVT (M)	Co 11005	0.0	R
2	IVT (M)	Co 11007	0.0	R
3	IVT (M)	Co 11012	0.0	R
4	IVT (M)	Co 11019	0.0	R
5	IVT (M)	Co 11020	0.0	R
6	IVT (M)	Co 11021	0.8	R
7	IVT (M)	Co 11022	0.6	R
8	IVT (M)	Co 11023	0.0	R
9	IVT (M)	Co 11024	0.0	R
10	IVT (M)	CoM 11085	0.0	R
11	IVT (M)	CoM 11086	0.0	R
12	IVT (M)	CoM 11087	0.0	R
13	IVT (M)	CoN 11073	0.0	R
14	IVT (M)	CoN 11074	0.0	R

Table 7. Incidence of naturally occurring diseases on sugarcane

S.N.	Disease	Name of area	Per cent Disease Incidence	Varieties/location	Stage of Crop(month)	Any other information
1	Smut	Hoshangabad	2-7 3-8 1-3 9-11	Co 99004 Co 86032 Co C 671 Co 7219	5-6 & 8-9 month	
		Bankhedi	2-3 2-3 6-10 4-6	Co M 265 Co 86032 Co J 64 Co 0238		
		Kareli	5-11 1-3	Co J 64 Co M 265		
		Tendukheda	3-5 8-10 3-4	Co 86032 Co J 64 Co 0238		
		Amla/Betul	4-7 3-6 1-2	Co 86032 Co 62175 Co C 671		
2	Wilt	Tendukheda	0-10	Co J 64	8-9 month	
		Bankhedi	0-20	Co J 64		
3	GSD	Hoshangabad	1-3 2-5 1-2	Co 86032 Co 7219 Co C 671	7-8 month	
		Bankhedi	1-4 2-3 4-5	Co 86032 Co C 671 Co J 64		
		Kareli	1-3 5-6	Co 86032 Co J 64		
4	YLDS	Hoshangabad	0-10 traces	Co 99004 Co 86032	7-8 month	
		Kareli	traces 2-3	Co 86032 Co J 64		
		Bankhedi	traces 1-3	Co C 671 Co J 64		
5	Pokkah Boeng	Hoshangabad	5-13 3-8, 3-6 2-5 1-3	Co 99004 Co C 671 Co 86032 Co 85004 Co JN 86-141	7-8 month	
		Tendukheda	2-4	Co 86032		
		Bankhedi	2-5 3-6	Co 0238 Co 86032		
		Kareli	4-6 2-5	Co 86032 Co M 265		