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Dr. R.K.Sahu
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Sugarcane Pathology

No. CA/PLP/……468
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To,
Dr. R. Viswanathan
Head, Division of Crop Protection &
Principal Investigator
Plant Pathology (AICRP on Sugarcane)
Sugarcane Breeding Institute (ICAR)
Coimbtore-641007 (TN)

Reference: 1. Letter F.No.17-33/2013-PCS dated May 8, 2013 from Dr. O.K.Sinha IISR, Lucknow

Sub: Annual Report of AICRP on Sugarcane (Plant Pathology) for the year 2012-13

Sir

In response to above reference on subject concerned I am enclosing herewith the Annual Report of AICRP on Sugarcane (Plant Pathology) for the year 2012-13 for further necessary action at your end.

Yours sincerely,

(R.K.Sahu)

Cc: Dr. O.K.Sinha, Project Coordinator (Sugarcane) IISR, Post Dilkusha, Rai Bareilly Road Lucknow-226002

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Annual Report
(2012-2013)

AICRP ON SUGARCANE PATHOLOGY

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Annual Report-2012-2013
AICRP ON SUGARCANE PATHOLOGY

During 2012 crop season, 33 genotypes and five checks, obtained from Sugarcane breeder, Pantnagar were screened and evaluated for red-rot and smut diseases under natural as well as artificial inoculation condition. These genotypes were planted in one replication in two rows of 6 mt. for red-rot and in two replications with 3.0 mts row for smut evaluation. However, row to row distance of 75 cm was maintained for both the experiments. Planting was done on 02-04-2012 in D-6 block of N.E. Borlogue Crop Research Centre, Pantnagar. All recommended agronomical practices were followed to raise and maintain a good crop stand.

Inoculation:

Artificial inoculations for both the diseases were carried out as per technical programme for **PP-17**. For red rot, two pathotypes of *Colletotrichum falcatu*m, **Cf-08** and **Cf-09** were obtained from IISR Lucknow. Pure cultures were grown on oatmeal agar medium and incubated at 28 ± 1^0C. Freshly sporulated 7 days old cultures were taken from petridishes and the spore mass was washed with 100 ml sterilized distilled water and collected in flasks. Conidial suspension at a spore concentration of one million spores (approximately) per ml was prepared and used for artificial inoculations. Artificial inoculations by **cotton swab method** were carried out on 22nd and 23 rd August, 2012, and by **plug method** from 26th to 27th August, 2012. First row was inoculated with Cf-08 and second with Cf-09 pathotype. Both rows were divided into two equal halves; the first half was inoculated by cotton swab method whereas the second half by plug method.

Artificial inoculations for smut were done by steeping three bud setts for 30 minutes in a spore suspension of over 90% viability and a spore load of one million spores per ml just before planting. Smut infected whips, for the purpose, were collected from the field and air dried by keeping under shade and stored in desiccators having anhydrous calcium chloride in the base of desiccators.

Results: PP17

A. Red rot

In plug method, observations on disease severity were recorded following 0-9 rating scale after 60 days of inoculations. Ten randomly selected plants of a plot were split open longitudinally along the point of inoculation and rated individually for both pathotypes by observing condition of top, lesion width, presence of white spots and nodal transgression. In cotton swab method, presence / absence of lesions under neath the cotton swab was considered for assigning the disease reactions.

Data on disease reaction are being presented in **Table 1**. In plug method, 13 genotypes were found resistant, 11 moderately resistant, 5 moderately susceptible 2 susceptible and 1 highly susceptible with Cf-08 pathotype, whereas, 14 resistant, 10 moderately resistant, 5 moderately susceptible and 3 susceptible genotypes with Cf-09 pathotype. In cotton swab method identical reactions for both the pathotypes were recorded with 23 resistant, 4 moderately resistant, 1 moderately susceptible and 4 susceptible.

Table 1: Performance of sugarcane genotypes against Red-rot (2012-13)

Genotypes	Plug		Cotton Swab	
	Cf-08	Cf-09	Cf-08	Cf-09
IVT (Early)				
CoH-09262	R	R	R	R
Co-09020	MR	MR	R	R
CoPb-09212	R	R	R	R
CoPb-09181	HS	S	S	S
CoH-09261	S	S	S	S
CoLk-09202	R	R	R	R
CoH-09263	MR	MR	R	R
CoS-09246	R	R	R	R
IVT (ML)				
Co-09022	R	R	R	R
CoLk-09204	MS	MS	R	R
CoPb-09214	MS	MS	S	S
CoH-09264	No germination			
Co-09021	R	R	R	R
CoS-09232	R	R	R	R
CoS-09240	R	R	R	R
CoS-09231	MS	MS	S	S
AVT (Early) II				
CO-07023	MR	MR	MR	MR
Co-07025	MR	MR	MR	MR
CoH-07261	MS	MS	MR	MR
CoLk-07201	MR	MR	R	R
AVT (ML) I				
CoH-08262	R	R	R	R
CoH-08263	MR	R	R	R

CoH-08264	R	R	R	R
CoPb-08217	MS	MS	MR	MR
CoS-08234	MR	MR	R	R
AVT (ML) II				
Co-07028	MR	MR	R	R
CoH-07264	MR	MR	R	R
CoLk-07202	R	R	R	R
CoLk-07203	S	S	MS	MS
CoPb-07212	MR	MR	R	R
CoPb-07213	MR	MR	R	R
CoS-07232	R	R	R	R
CoS-07234	R	R	R	R
Checks				
CoJ-64	MS	MS	MR	MR
CoPant-84211	MS	MS	MR	MR
CoS-767	MS	MS	MR	MR
CoS-8436	MS	MS	MR	MR
Co-1148	MS	MS	MR	MR

Planted: 33

Germinated: 32

B. Smut

Incidence of smut was recorded by counting infected clumps per row at fortnightly intervals starting from 45 days after planting. Results are given in Table 2. Due to inadequate quantity of seed material three genotypes viz. CoH-09261, CoH-09264 and CoS-09240 could not be planted for smut evaluation. Out of 30 genotypes only CoLk-09202 was found resistant whereas, 3 were found moderately resistant. Remaining 26 genotypes showed various degrees of susceptibility. Among them 6 moderately susceptible, 3 susceptible and 17 genotypes were found highly susceptible. Maximum disease incidence (84.2%) was recorded in Co-07025 followed by CoS-09246 (66.6%) and CoPb-07213 (65.0%).

Table 2: Performance of sugarcane genotypes against Smut (2012-13)

Genotypes	Smut (%)	Reaction
IVT (Early)		
Co -09020	25.0	S
CoH-09261	-	-
CoH-09262	14.2	MS
CoH-09263	26.6	S
CoLk-09202	00.0	R
CoPb-09181	12.5	MS
CoPb-09212	21.4	S
CoS -09246	66.6	HS
IVT (ML)		

Co-09021	05.0	MR
Co-09022	33.3	HS
CoH-09264	-	-
CoLk-09204	11.7	MS
CoPb-09214	72.7	HS
CoS-09231	05.8	MR
CoS-09232	46.1	HS
CoS-09240	-	-
AVT (Early)II		
Co-7023	18.7	MS
CoH-7261	05.8	MR
CoLk-7201	33.3	HS
Co-7025	84.2	HS
AVT (ML) I		
CoH-08262	50.4	HS
CoH-08263	45.0	HS
CoH-08264	56.2	HS
CoPb-08217	50.0	HS
CoS-08234	36.3	HS
AVT (ML) II		
Co-07028	50.0	HS
CoH-07264	38.4	HS
CoLk-07202	50.0	HS
CoLk-07203	20.0	MS
CoPb-07212	11.1	MS
CoPb-07213	65.0	HS
CoS-07232	47.0	HS
CoS-07234	45.0	HS
Checks		
CoJ-64	20.0	MS
CoPant-84211	16.6	MS
CoS-767	42.8	HS
CoS-8436	26.6	S
Co-1148	33.3	HS

(-) could not be planted due to inadequate seed quantity

R= Resistant (0%)

MR= Moderately Resistant > 0-10%

MS= Moderately Susceptible> 10-20%

S= Susceptible > 20-30%

HS= Highly Susceptible above 30%

PP 22: Survey of naturally occurring sugarcane diseases

Sl.No.	Disease	Name of area surveyed	Disease incidence	Varieties affected	Crop stage when observed
1.	Redrot	Sitarganj, Kiccha, Gadarpur, Kashipur Sugar Mill, area, Distt. U.S.Nagar Areas of sugar mill Laksar Distt. Haridwar	in traces	CoPant-97222, CoS-8436, CoS-8432, CoPant-99214, CoS-767, CoPant-99259 Co-1148	August onwards
2.	Smut	do	Observed at some places	do	May-July Octo.-January
3.	Wilt	do	scanty	do	September onwards
4.	RSD	do	scanty	do	August onwards
5.	GSD&Albino	do	Scanty to mild	do	August onwards
6.	Foliar disease (ring spots and eye spots)	do	Scanty to mild	do	August onwards
7.	Banded Sclortial Disease	do	Mild	do	During rainy season
8.	YLD	do	Scanty, seen in some pockets	do	November onwards
9.	Pokha boeng	do	Low to Mild	Most of the varieties and genotypes planted for evaluation and screening	August onwards

Note: survey on incidence of different diseases is based on feed back received from Millers, Cane department officials, farmers, and our own visits.

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

As per technical programme 12 genotypes were selected for this trial. The trial was planted in single replication with two rows of 3.0 mts length. One Kg. of partially broken sorghum grain and sand mixture (1:3 ratio) mixed with 100 ml of distilled water. The thoroughly mixed medium was sterilized at 15 lb pressure for 2 hours and after two days the medium was inoculated with pathogen Cf-08) and kept for 15 days in incubation. The inoculum was applied in furrows and on the setts just before planting. Disease development in each row was recorded by death of settlings, yellowing and drying of leaves, mid-rib lesions in the whorl and production of dead hearts. Presence of *Colletotrichum falcatu*m was confirmed by isolating the pathogen from the affected plant.

S.No.	Variety/Genotype	Resistance Level	Symptoms observed	*C. falcatum* recovered Yes/No	Any other information
1.	Co S-767	S	SY, SM, LY	Yes	
2.	Co-1148	S	SY, SD, SM	Yes	
3.	CoPant-84211	S	SY, SD, LD	Yes	
4.	CoPb-08213	S	SY, SD, LD, CD	Yes	
5.	CoH-08261	S	SY, SM, LY	Yes	
6.	CoH-08263	S	SY, SM, LY	Yes	
7.	CoPb-08214	S	SY, SD, SM	Yes	
8.	CoS-08436	S	SY, SD, LD	Yes	
9.	CoJ-64	S	SY, SD, LD	Yes	
10.	CoH-07264	MR	No symptoms	No	
11.	Co-17023	MR	No symptoms	No	
12.	CoLk-07203	MR	No symptoms	No	

* Evaluation based on SY (65), SM (90), CR (150), LY (160), CD (180)