



पादप रोग विज्ञान विभाग, कृषि महाविद्यालय
गोविन्द बल्लभ पन्त कृषि एवं प्रौद्योगिक विष्वविद्यालय
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Dr. R.K. Sahu
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Sugarcane Pathology

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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)

Sub: Annual Report of AICRP on Sugarcane (Plant Pathology) for the year 2014-15

Sir,
Please find enclosed herewith the Annual Report of AICRP on Sugarcane
(Pathology) for the year 2014-15 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
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Annual Report (2014-2015)

AICRP ON SUGARCANE PATHOLOGY



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Annual Report-2014-2015

AICRP ON SUGARCANE PATHOLOGY

Pantnagar

During 2014 crop season, 33 genotypes and five checks for red-rot and 8 genotypes and 5 checks for smut were screened and evaluated 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 04-04-2014 in D-6 block of N.E. Borlough 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 falcatum*, **Cf-08** and **Cf-09** were obtained from IISR Lucknow. Pure cultures were grown on oatmeal agar medium and incubated at $28 \pm 1^{\circ}\text{C}$. 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 19th August, 2014, and by **plug method** on 20-21 August, 2014. First row was inoculated with Cf-08 and second with Cf-09 pathotype. Two canes in each of 20 clumps were inoculated. Inoculations were done in the middle of 3rd exposed internode from the bottom and two drops of the spore suspension was injected with a syringe in each cane and sealed with plastic clay whereas in cotton swab method two canes each in 20 clumps were inoculated by placing the cotton swab, dipped in freshly prepared inoculum around the cane covering the nodal region after removing the lower most green leaf sheath.

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 underneath the cotton swab was considered for assigning the disease reactions. Disease reactions have been indicated as R for resistant and S for susceptible genotypes.

Data on disease reaction are being presented in **Table 1**. In cotton swab method, all genotypes had resistant reactions for both pathotypes. In plug method, 12 genotypes were found resistant, 20 moderately resistant and 1 moderately susceptible. No genotype was found to be susceptible or highly susceptible. Identical reactions for both the pathotypes.

Table 1: Performance of sugarcane genotypes against Red-rot (2014-15)

S. No.	Genotypes	Plug		Cotton Swab	
		Cf-08	Cf-09	Cf-08	Cf-09
	IVT (Early)				
1.	CoLk 11202	MR	MR	R	R
2.	CoLk 11203	MR	MR	R	R
3.	CoLk 11201	MR	MR	R	R
4.	CoH 11261	MS	MS	R	R
5.	CoPb 11211	MR	MR	R	R
6.	CoH 11262	R	R	R	R
	AVT(Early) I				
1.	Co10035	MR	MR	R	R
2.	CoH10261	R	R	R	R
3.	CoS10231	MR	MR	R	R
	AVT(Early) II				
1.	CoH09262	MR	MR	R	R
2.	CoH09263	MR	MR	R	R
3.	CoLk09202	MR	MR	R	R
4.	CoPb09181	MR	MR	R	R

5.	CoS09246	MR	MR	R	R
	IVT (ML)				
1.	CoLk 11205	MR	MR	R	R
2.	CoS 11232	MR	MR	R	R
3.	CoLk 11206	MR	MR	R	R
4.	CoLk 11204	MR	MR	R	R
5.	CoPb 11182	R	R	R	R
6.	CoPb 11213	MR	MR	R	R
7.	CoPb 11181	R	R	R	R
8.	CoPb 11214	R	R	R	R
9.	CoH 11263	R	R	R	R
	AVT(ML) I				
1.	Co10036	MR	MR	R	R
2.	CoPant10221	R	R	R	R
3.	CoH10262	R	R	R	R
4.	CoPb10181	R	R	R	R
5.	CoPb10182	R	R	R	R
	AVT(ML) II				
1.	Co09022	R	R	R	R
2.	CoH09264	MR	MR	R	R
3.	CoLk09204	MR	MR	R	R
4.	CoS09232	MR	MR	R	R
5.	CoPb09214	R	R	R	R
	Checks				
1.	CoJ-64	MS	MS	S	S
2.	CoPant-84211	S	S	S	S
3.	CoS-767	MS	MS	S	S
4.	CoS-8436	MS	MS	S	S
5.	Co-1148	HS	HS	S	S

0.0-2.0 R
2.1-4.0 MR
4.1-6.0 MS
6.1-8.0 S
Above 8.0 HS

PP17 (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. Out of 8 genotypes only CoH-10261 was found resistant. Remaining 7 genotypes

showed various degrees of susceptibility with 1 moderately susceptible, 2 susceptible and 4 highly susceptible. Maximum disease incidence (36.3%) was recorded in CoPb10182 followed by CoPant10221 (35.7%) and CoPb-10181 (35.7%).

Table 2: Performance of sugarcane genotypes against Smut (2014-15)

S. No.	Genotypes	Reaction	Infected clumps %
	AVT (Early)I		
1.	Co10035	MS	16.6
2.	CoH10261	R	0.0
3.	CoS10231	S	22.2
	AVT (ML) I		
1.	Co10036	HS	33.3
2.	CoPant10221	HS	35.7
3.	CoH10262	S	27.2
4.	CoPb10181	HS	35.7
5.	CoPb10182	HS	36.3
	Checks		
1.	CoJ-64	MS	14.3
2.	CoPant-84211	MR	7.7
3.	CoS-767	MS	15.4
4.	CoS-8436	HS	62.5
5.	Co-1148	HS	41.6

***IVT (Early)-** CoLk11202, CoLk11203, CoLk11201, CoH11261, CoPb 11211, CoH11262

***AVT (Early) II-** CoH09262, CoH09263, CoLk09202, CoPb09181, CoS09246

***IVT (ML)-** CoLk11205, CoS11232, CoLk11206, CoLk11204, CoPb11182, CoPb 11213, CoPb11181, CoPb11214, CoH11263

***AVT (ML) II-** Co09022, CoH09264, CoLk09204, CoS09232, CoPb09214

*** could not be planted as the seed material was not made available**

R= Resistant (0%)

MR= Moderately Resistant > 0-10%

MS= Moderately Susceptible > 10-20%

S= Susceptible > 20-30%

HS= Highly Susceptible above 30%

PP 17(D): YLD

Performance of YLD was assessed under natural conditions. Disease reactions are being presented in **Table 1**. Out of 33 genotypes, 26 were found resistant, 5 moderately resistant and 3 susceptible.

Table 3: Performance of sugarcane genotypes against YLD (2014-15)

S.No.	Genotypes	YLD
	IVT (Early)	
1.	CoLk 11202	S
2.	CoLk 11203	S
3.	CoLk 11201	MR
4.	CoH 11261	R
5.	CoPb 11211	R
6.	CoH 11262	R
	AVT (Early)I	
1.	Co10035	R
2.	CoH10261	R
3.	CoS10231	R
	AVT(Early) II	
1.	CoH09262	R
2.	CoH09263	R
3.	CoLk09202	R
4.	CoPb09181	R
5.	CoS09246	R
	IVT (ML)	
1.	CoLk 11205	R
2.	CoS 11232	R
3.	CoLk 11206	S
4.	CoLk 11204	MR
5.	CoPb 11182	MR
6.	CoPb 11213	R
7.	CoPb 11181	S
8.	CoPb 11214	R
9.	CoH 11263	R
	AVT (ML) I	
1.	Co10036	R
2.	CoPant10221	R
3.	CoH10262	R
4.	CoPb10181	R
5.	CoPb10182	R
	AVT(ML) II	
1.	Co09022	R
2.	CoH09264	R
3.	CoLk09204	R
4.	CoS09232	R
5.	CoPb09214	R
	Checks	
1.	CoJ-64	MR
2.	CoPant-84211	MR
3.	CoS-767	MR
4.	CoS-8436	MR
5.	Co-1148	MR

YLD severity scale

- 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

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, Bajpur Distt. U.S.Nagar Laksar, Liberhedi, Iqbalpur Distt. Haridwar	Seen in some pockets in traces severe incidence in CoS8436 at Kashipur centre	CoPant97222, CoS8436, CoS767, CoS88230, ,	August onwards
2.	Smut	do	Observed at some places	CoPant97222, CoPant90223, CoS767 CoS88230, CoS8436,	May-July Octo.-January
3.	Wilt	do	scanty	CoS8436, Co0238, CoPant3220, CoPant99214	September onwards
4.	GSD&Albino	do	Scanty to mild	Co88230, CoPant3220 CoS97264, CoS767, Co0238, CoPant5224, CoJ85, CoPant97222	August onwards
5.	Foliar disease (ring spots, leaf streak and eye spots)	do	Scanty to mild	CoS88230, CoPant3220 CoPant99214, CoS767, Co0238 CoPant5224	June onwards
6.	Banded Sclortial Disease	do	Mild	CoPant3220, CoS767, CoS8436, CoPant99214, CoJ85	During rainy season
7.	YLD	do	Scanty, seen in some pockets	CoS767, CoS8436 Co0238	November onwards
8.	Pokkah boeng	do	Low to Mild	CoS88230, CoPant3220 CoPant99214, CoS767, Co0238, CoS8436, Co0118, CoJ85, CoS97264	Most severe in Haridwar on CoS-88230 and CoS-8436
9.	Mosaic	do	Low to Mild	CoS88230, CoS8436	Observed at some places in Haridwar

Severe bird damage was noticed in CoPant 99214 and CoPant 97222 at Kashipur and Pantnagar

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