

**Department of Plant Pathology: College of Agriculture  
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**Dr. R.K. Sahu**  
Professor & P.I.  
Sugarcane Pathology

No. CA/PLP/RK/...1438...  
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To,  
Dr. R. Viswanathan  
Head, Division of Crop Protection &  
Principal Investigator  
Pathology (AICRP on Sugarcane)  
Sugarcane Breeding Institute (ICAR)  
Coimbtore-641007 (TN)

**Sub:** Annual Report of AICRP on Sugarcane (Pathology) for the year 2016-17

Sir,  
Please find enclosed herewith Annual Report of AICRP on Sugarcane  
(Pathology) for the year 2016-17 for further necessary action at your end.

Yours sincerely,

**(R.K. Sahu)**

Cc: Dr. S.K. Shukla, Project Coordinator (Sugarcane) IISR, Post Dilkusha, Rai  
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# Annual Report (2016-2017)

## AICRP ON SUGARCANE PATHOLOGY



**Department of Plant Pathology: College of Agriculture  
G.B.Pant University of Agriculture & Technology  
Pantnagar-263145, Uttarakhand**

# **Annual Report-2016-2017**

## **AICRP ON SUGARCANE PATHOLOGY**

### **Pantnagar**

During 2016 crop season, 46 genotypes including checks were screened and evaluated for red rot and smut under natural as well as artificial inoculation condition. Performance of all the genotypes was also assessed against yellow leaf disease (YLD) under natural conditions. These genotypes were planted in one replication with two rows of 3 mt. each for red-rot and smut evaluation. However, row to row distance of 75 cm was maintained for both the experiments. Planting was done on 18-03-2016 in B-3 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*, **CF08** and **CF09** 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 **nodal cotton swab method** were carried out on 21<sup>st</sup> August, 2016, and by **plug method** on 22-23 August, 2016. First row was inoculated with CF08 and second with CF09 pathotype. Two canes in each of 20 clumps were inoculated. Inoculations were done in the middle of 3<sup>rd</sup> 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 (teliospores) 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 reaction were recorded following 0-9 rating scale after 60 days of inoculations. Fifteen randomly selected stalks 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, spindle infection, presence of mid rib lesions, presence of acervuli at nodes specially on leaf scars, root primordia and growth ring, 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 nodal cotton swab method, all the genotypes showed resistant reactions for both pathotypes except Co 12027 and CoS 13232 which had susceptible reaction for both the pathotypes. In plug method, 14 genotypes were found resistant, 22 moderately resistant and 4 moderately susceptible and one susceptible. Identical reactions were recorded for both the pathotypes.

**Table 1: Performance of sugarcane genotypes against red rot (2016-17)**

S. No.	Genotypes	Plug		Nodal Cotton Swab	
		CF08	CF09	CF08	CF09
	<b>IVT (Early)</b>				
1.	Co13034	MR	MR	R	R
2.	CoPant 13221	MS	MS	R	R
3.	CoLk 13202	S	S	R	R
4.	CoPant 13222	MR	MR	R	R
5.	CoPb 13181	MS	MS	R	R
6.	CoLk 13201	R	R	R	R
7.	CoS 13231	R	R	R	R
8.	Co 13033	R	R	R	R
9.	CoLk 13203	R	R	R	R
	<b>AVT(Early) I</b>				
1.	Co 12026	R	R	R	R
2.	Co 12027	S	S	S	S
3.	CoPant 12221	MS	MS	R	R

4.	CoLk 12203	R	R	R	R
	<b>AVT(Early) II</b>				
1.	CoLk 11203	R	R	R	R
2.	CoLk 11201	R	R	R	R
3.	CoLk 11202	R	R	R	R
4.	Co 11262	MR	MR	R	R
	<b>IVT (ML)</b>				
1.	CoS 13233	MR	MR	R	R
2.	CoPb 13182	MR	MR	R	R
3.	CoLk 13204	MR	MR	R	R
4.	CoH 13263	MR	MR	R	R
5.	CoS 13232	MS	MS	S	S
6.	CoPant 13224	MR	MR	R	R
7.	CoH 13261	MR	MR	R	R
8.	Co 13036	MR	MR	R	R
9.	CoPant 13223	MR	MR	R	R
10.	CoPb 13183	MR	MR	R	R
11.	CoLk 13205	MR	MR	R	R
12.	CoH 13262	MR	MR	R	R
13.	Co 13035	MR	MR	R	R
	<b>AVT(ML) I</b>				
1.	CoH 12029	MR	MR	R	R
2.	CoH 12263	MR	MR	R	R
3.	CoPant 12226	R	R	R	R
4.	CoPb 12211	R	R	R	R
5.	CoLk 12205	MR	MR	R	R
6.	CoS 12232	MR	MR	R	R
	<b>AVT(ML) II</b>				
1.	CoLk 11204	MR	MR	R	R
2.	CoPb 11214	MR	MR	R	R
3.	CoS 11232	R	R	R	R
4.	CoLK 11206	MR	MR	R	R
5.	CoH 11263	R	R	R	R
	<b>Checks</b>				
1.	CoJ64	S	S	S	S
2.	CoPant84211	S	S	S	S
3.	CoS767	S	S	S	S
4.	CoS8436	S	S	S	S
5.	Co1148	S	S	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 41 genotypes 23 genotypes were found resistant, 3 moderately resistant. Remaining genotypes showed various degrees of susceptibility with 10 moderately susceptible and 5 susceptible. Maximum disease incidence (28.5%) was recorded in CoLk 13201 followed by Co 13033 (27.7%) and CoS 13231 (26.0%).

**Table 2: Performance of sugarcane genotypes against Smut (2016-17)**

S. No.	Genotypes	Reaction	Infected clumps %
	<b>IVT (Early)</b>		
1.	Co13034	MS	16.6
2.	CoPant 13221	MS	16.6
3.	CoLk 13202	MS	12.5
4.	CoPant 13222	S	23.5
5.	CoPb 13181	R	0.0
6.	CoLk 13201	S	28.5
7.	CoS 13231	S	26.0
8.	Co 13033	S	27.7
9.	CoLk 13203	R	0.0
	<b>AVT(Early) I</b>		
1.	Co 12026	R	0.0
2.	Co 12027	R	0.0
3.	CoPant 12221	R	0.0
4.	CoLk 12203	R	0.0
	<b>AVT(Early) II</b>		
1.	CoLk 11203	S	20.6
2.	CoLk 11201	R	0.0
3.	CoLk 11202	MR	5.0
4.	CoH 11262	R	0.0
	<b>IVT (ML)</b>		
1.	CoS 13233	MS	11.7
2.	CoPb 13182	MS	16.0
3.	CoLk 13204	MR	8.0
4.	CoH 13263	MS	16.6
5.	CoS 13232	MS	12.5
6.	CoPant 13224	R	0.0
7.	CoH 13261	R	0.0
8.	Co 13036	MS	12.5
9.	CoPant 13223	R	0.0
10.	CoPb 13183	R	0.0
11.	CoLk 13205	R	0.0
12.	CoH 13262	R	0.0

13.	Co 13035	<b>MS</b>	13.3
	<b>AVT(ML) I</b>		
1.	CoH 12029	<b>MS</b>	11.7
2.	CoH 12263	<b>R</b>	0.0
3.	CoPant 12226	<b>R</b>	0.0
4.	CoPb 12211	<b>R</b>	0.0
5.	CoLk 12205	<b>MR</b>	7.0
6.	CoS 12232	<b>R</b>	0.0
	<b>AVT (ML) II</b>		
1.	CoLk 11204	<b>R</b>	0.0
2.	CoPb 11214	<b>R</b>	0.0
3.	CoS 11232	<b>R</b>	0.0
4.	CoLK 11206	<b>R</b>	0.0
5.	CoH 11263	<b>R</b>	0.0
	<b>Checks</b>	<b>R</b>	0.0
1.	CoJ 64	<b>R</b>	0.0
2.	CoPant 84211	<b>R</b>	0.0
3.	CoS 767	<b>R</b>	0.0
4.	CoS 8436	<b>R</b>	0.0
5.	Co 1148	<b>R</b>	0.0
6.	Co 1158	<b>MS</b>	16.6

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 3**. Out of 41 genotypes, 25 were found resistant, 9 moderately resistant 6 moderately susceptible and 1 susceptible.

**Table 3: Performance of sugarcane genotypes against YLD (2016-17)**

S.No.	Genotypes	YLD
	<b>IVT (Early)</b>	
1.	Co13034	MS
2.	CoPant 13221	MR
3.	CoLk 13202	R
4.	CoPant 13222	R
5.	CoPb 13181	MS
6.	CoLk 13201	R
7.	CoS 13231	R
8.	Co 13033	R
9.	CoLk 13203	MR

	<b>AVT(Early) I</b>	
1.	Co 12026	MS
2.	Co 12027	MS
3.	CoPant 12221	R
4.	CoLk 12203	MR
	<b>AVT(Early) II</b>	
1.	CoLk 11203	R
2.	CoLk 11201	R
3.	CoLk 11202	R
4.	Co 11262	S
	<b>IVT (ML)</b>	
1.	CoS 13233	MS
2.	CoPb 13182	MR
3.	CoLk 13204	R
4.	CoH 13263	MR
5.	CoS 13232	R
6.	CoPant 13224	R
7.	CoH 13261	MR
8.	Co 13036	MR
9.	CoPant 13223	R
10.	CoPb 13183	R
11.	CoLk 13205	R
12.	CoH 13262	MS
13.	Co 13035	R
	<b>AVT(ML) I</b>	
1.	CoH 12029	R
2.	CoH 12263	R
3.	CoPant 12226	MR
4.	CoPb 12211	R
5.	CoLk 12205	R
6.	CoS 12232	R
	<b>AVT(ML) II</b>	
1.	CoLk 11204	R
2.	CoPb 11214	R
3.	CoS 11232	MR
4.	CoLk 11206	R
5.	CoH 11263	R
	<b>Checks</b>	
1.	CoJ 64	S
2.	CoPant 84211	MR
3.	CoS 767	MR
4.	CoS 8436	R
5.	Co 1148	R

#### 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 (Mill zone)	Disease incidence	Varieties surveyed	Crop stage when observed
1.	Redrot	Sitarganj, Kiccha, Gadarpur, Bajpur Distt. U.S.Nagar Laksar, Liberhedi, Iqbalpur Distt. Haridwar Doiwala Distt.Dehradun	Not observed	CoPant 5224, CoPant 3220, Co 0238, CoPant 97222, CoS88230, , CoH 160, CoPant 99214, Co 89003, CoJ 85, UP 9530, CoSe 5125, Co 118, CoPant 84211, CoPant84212 CoPant 90223	July onwards
2.	Smut	do	Low incidence observed in some cultivars	do	Octo.-January
3.	Wilt	do	CoS 767 and was found infected in Liberhedi, CoS 88230, CoS 767 in Doiwala	do	September onwards
4.	GSD	do	CoPant 3220, CoS 8436 in Sitarganj , CoS 8436 in Iqbalpur, CoS 95255, CoS 96268, CoS 88230 in Laksar, CoPant 3220, CoH 160 in Doiwala,	do	August onwards
5.	Foliar disease (ring spots, and eye spots)	do	Scanty to mild in almost all the varieties. Most severe on CoPant 99214, CoS 88230, Co 118, CoS 767, CoS 96268, CoPant 92423 in Khanpur, Laksar and Iqbalpur area	do	August onwards
7.	YLD	do	Scanty, seen in some pockets in CoPant 84212, CoPant 3220, CoPant 5224 mild incidence in CoPant 90223 and CoS 767	do	November onwards
8.	Pokkah boeng	do	Scanty to mild in some varieties more in Co0238 at most of the places	do	

**Note:** Survey on incidence of different diseases is based on our visits, feedback received from farmers, cane department and mill officials.