

**ANNUAL REPORT OF THE EXPERIMENTS CONDUCTED UNDER AICRP ON SUGARCANE PATHOLOGY AT  
GENDA SINGH SUGARCANE BREEDING AND RESEARCH INSTITUTE, SEORAH, KUSHINAGAR, U.P.  
DURING 2013-2014**

**PP- 14** Identification of pathotypes of red rot pathogen.

**Objective:** To gather information on the major pathotypes of red rot from different areas/zones.

**Location:** North Central Zone, G.S.S.B.R.I., Seorahi, Kushinagar, U.P.

**Year of start:** 1989-90(Continuing project)

**Differentials/Varieties/genotypes:**

1-Co 419	2- Co 975	3- Co 997	4-Co 1148
5- Co 7717	6- Co 62399	7-CoC 671	8-CoJ 64
9-CoS 767	10-CoS 8436	11-BO 91	12-Baragua (S. officinarum)
13-Khakai (S. sinence)	14-SES 594 (S. spontanium)		

**No. of isolates:** Virulant isolates collected from red rot affected canes of commercially cultivated varieties in zones.

**Date of inoculation:** 25/26-08-2013

**Method of inoculation:**

Plug method of inoculation is to be used (details vide pp 17). Inoculation with one isolate to be done on all the differentials with same spore suspension . All inoculations to be completed in 2 days by last week of August. 30 canes of each of 14 differentials were inoculated with each of the above cited isolates of red rot fungus individually. Observations to the extent of disease development were recorded after 60 days of inoculations. The canes were split open longitudinally 60 days after inoculation along the point of inoculation. Inoculated canes free from borer infestation and other changes are taken for evaluation. Based on the parameters, viz; Nodal transgression, lesion width, white spots, condition of top green/ yellow/dry, rind infestation and sporulation over the rind, the host reaction is categorized into three groups, viz;(R) Resistant,(S)Susceptible,(I) Intermediate as follows:

**Resistant(R):** Lesion width laterally restricted, nodal transgression up to 2 nodes; white spots; rind infection, sporulation over the rind and yellow/dry of top absent.

**Susceptible (S):** Lesion width laterally spreading, Nodal transgression more than 2 nodes; white spots progressive or restricted; in case of progressive white spots, rind infection, sporulation over the rind and yellow/dry of top absent or present.

**Intermediate(I):** Lesion width laterally restricted or spreading, nodal transgression more than 2 nodes; white spots absent or present( restricted type); rind infection, sporulation over the rind and yellow/drying of tops absent.

### **RESULT**

The final data recorded 60 days after inoculation are presented in table 1. At Seorahi, 2 pathotypes, viz; CF07 and CF 08 alongwith two isolates ,isolate-1 (isolated from CoSe 95422 and isolate-2 (isolated from CoLk 8102) were inoculated on 14 differentials, viz; Co 419,Co 975, Co 997, Co 1148, Co 7717, Co 62399, Coc 671, CoJ 64, CoS 767, CoS 8436, BO 91, Baragua, Khakai and SES 594 were tested by plug method of inoculation with 7 days old culture of red rot pathogen. The reaction of isolate-1 resembled with the reaction of CF 07 and the reaction of isolate-2 resembled with CF 08 on all the 14 differentials. However no new pathotypes identified.

**PP 17(a):** Evaluation of I.V.T./A.V.T./Zonal varieties for resistance to red rot.

**Objective :** To gather information on the relative resistance to red rot of the enteries in zonal varietal trials of the respective zones.

**Location :** North Central Zone, Seorahi.

**Year of commencement :** 1989-90 (Continuing project).

Varieties :

**1-Advanced Varietal Trial (Early) I Plant:**

**Enteries (4):** BO 153, CoP 08436, CoSe 09452 and UP 09453

**2-Initial Varietal Trial (Mid-late)**

**Enteries (3) :** CoSe 10451, CoSe 10452 and CoSe 10453

**3-Advanced Varietal Trial (Mid-late) I Plant:**

**Enteries (2):** BO 154 and CoP 09437

**4- Advanced Varietal Trial (Mid-late) II Plant:**

**Enteries (3) :** CoP 08437, CoSe 08451 and CoSe 08452

## RESULTS

At G.S.S.B.R.I; all the varieties including checks of different trials were evaluated by Plug, Nodal and Cotton swab methods of inoculation using pathotypes; viz, CF 07 and CF 08 separately and mixed inoculums of CF 07 and CF 08 pathotypes for Advanced varietal trial (Early) I Plant, Initial varietal trial (Mid-late), Advanced varietal trial (Mid-late) I Plant and Advanced Varietal trial (Mid-late) II Plant. The inoculation was done in 2<sup>nd</sup> week of July by Nodal /Cotton swab method and in the last week of August by Plug method.

### Plug method

**Advanced Varietal Trial (Early) I Plant:** 4 varieties were evaluated against red rot, none behaved as resistant, 4 varieties, viz; BO 153, CoP 08436, CoSe 09452 and UP 09453 were rated as moderately resistant to red rot disease.

**Initial Varietal Trial (Mid-late) :** 3 varieties were evaluated against red rot, none behaved as resistant, 3 varieties, viz; CoSe 10451, CoSe 10452 and CoSe 10453 were rated as moderately resistant to red rot disease.

**Advanced Varietal Trial (Mid-late) I Pant:** 2 varieties were evaluated against red rot, none behaved as resistant, CoP 09437 was rated as moderatly resistant and BO 154was susceptible to red rot disease.

**Advanced Varietal Trial (Mid-late) II Pant:** 3 varieties were evaluated against red rot, none behaved as resistant, 3 varieties, viz., CoP 08437, CoSe 08451 and CoSe 08452 were rated as moderately resistant to red rot disease.

## SUMMARY

By Plug method ( Table -2 ), out of 12 varieties evaluated, none behave as resistant, 11 varieties were rated as moderately resistant and only BO 154 was susceptible to red rot.

## NODAL METHOD

**Advanced Varietal Trial (Early) I Plant:** 4 varieties were evaluated against red rot, 4 varieties, viz; BO 153, CoP 08436, CoSe 09452 and UP 09453 were rated as resistant to red rot disease.

**Initial Varietal Trial (Mid-late) :** 3 varieties were evaluated against red rot, 3 varieties, viz; CoSe 10451, CoSe 10452 and CoSe 10453 were rated as resistant to red rot disease.

**Advanced Varietal Trial (Mid-late) I Pant:** 2 varieties were evaluated against red rot, CoP 09437 was rated as resistant and BO 154 was rated as moderately susceptible to red rot disease.

**Advanced Varietal Trial (Mid-late) II Pant:** 3 varieties were evaluated against red rot, 3 varieties, viz., CoP 08437, CoSe 08451 and CoSe 08452 were rated as resistant to red rot disease.

## SUMMARY

By nodal method (table 2), out of 12 varieties evaluated, 11 varieties were rated as resistant, and one was rated as moderately susceptible to red rot disease.

## COTTON SWAB METHOD

Results recorded by cotton swab method were the same as the results recorded by Nodal method of inoculation.

**P 17 (b)** : Evaluation of pre-zonal/zonal varieties/genotypes for resistance to smut.

**Objective** :To gather information on the relative resistance to smut of the enteries in prezonal/zonal trials of the respective zones.

**Location** :North Central zone, Seorahi, Kushinagar, U.P.

**Year of commencement** : 1997-98

**Variety** : As per PP 17

**Method** : The method of inoculation consists of steeping of sets (three budded) for 30 minutes in a spore suspensions of over 90 per cent viability with a spore load of one million spore per milliliter. The data is presented in Table 3 .

**Date of Planting** : 02-03-2013

**Date of inoculation** : 02-03-2013

## RESULTS

**Initial Varietal Trial (Early)**: Out of 04 varieties, evaluated against smut, 02 varieties, viz,BO 153 and UP 09453 were rated as resistant, 2 varieties, viz, CoP 08436 and CoSe 09452 were rated as moderatly susceptible to smut disease.

**Initial Varietal Trial (Mid-late) I Pant**: Out of 03 varieties evaluated against smut, 02 varieties viz., CoSe 10452 and CoSe 10453 were rated as moderately resistant while CoSe 10451 was rated as moderately susceptible to smut disease.

**Advanced Varietal Trial (Mid-late) I Pant**: Out of 02 varieties evaluated against smut, 01 variety CoP 09437 was rated as resistant while BO 154 was rated as highly susceptible to smut disease.

**Advanced Varietal Trial (Mid-late) II Pant**: Out of 3 varieties evaluated against smut, 1 variety, viz; CoP 08437 was rated as resistant whereas 2 varieties, viz, CoSe 08451 and CoSe 08452 were rated as moderately susceptible to smut disease.

## SUMMARY

Out of 12 varieties evaluated against smut, 04 varieties were rated as resistant, 02 varieties were rated as moderately resistant, 05 varieties were rated as moderately susceptible and only variety was rated as highly susceptible to smut disease (Table-2).

**PP 22 : Survey of sugarcane diseases naturally occurring in the area on varieties for compiling an All India Disease status report yearly.**

**Location :** North Central Zone, Seorahi, Kushinagar, U.P.

**Year of commencement :** 1989-90

**Observation :**

Periodic observation in June, September and December in all locations, to gather information on the incidence of diseases in all the varieties of the area (General survey).

**Disease situation during the current year:**

Red rot, smut, wilt, RSD, SYLD, GSD, Foliar Diseases and other disease problems were observed in the eastern U.P. during the crop season 2013-14. Natural disease incidence of major and minor diseases of sugarcane are presented in Table 3. Incidence of red rot disease (5-10 per cent) was recorded in CoLk 8102, CoSe 95422 and CoS 07250 in sugar factories area of Kushinagar, Gorakhpur, Deoria and Khalilabad districts. 5-10 per cent smut, especially more in ratoons were observed in all the factory areas in the varieties, viz; CoSe 01424, CoSe 92423, CoSe 96436, CoSe 98231, CoS 767, CoS 88230, CoS 95255, UP 9530 and BO 91. Wilt incidence (1-2 per cent) was observed in CoSe 92423 and UP 9530 in sugar factory area of Kushinagar, Maharajganj and Basti districts. 1-2 per cent GSD was observed on the varieties, viz; CoSe 92423, CoSe 98231, CoS 95255, CoS 8436, UP 9530 and UP 0097. Pokkahboeng was observed in stroy in CoSe 92423. In the crop season 2012-2013, the foliar diseases of sugarcane was observed in stray.



**Table 3:** Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties.

Incidence of sugarcane diseases in Eastern U.P. during 2013-2014

Sl. No	Disease	Name of area surveyed	%Disease incidence(c lump basis)	Varieties affected	Crop stage when observed	Any other information
1.	Red rot	Kushinagar, Mahrajganj, Deoria, Gorakhpur and Khalilabad	5-10	CoLk 8102 and CoSe 95422 and CoS 07250	Growth & maturity stage	
2.	Smut	Kushinagar, Mahrajganj and Basti	5-10	CoSe 01424, CoSe 92423, CoSe 96436, CoS 767, CoS 88230, CoSe 98231, CoS 95255, UP 9530 and BO 91	Tillering & Maturity stage	
3.	Wilt	Kushinagar, Mahrajganj and Basti	1-2	CoSe 92423 and UP 9530	Maturity stage	
4.	G.S.D.	Kushinagar, Mahrajganj and Basti	1-2	CoSe 92423, CoS 98231, CoS 95255, CoS 8436, UP 9530 and UP 0097	Growth stage	
5.	Pokkah boeng	Kushinagar .	Stray	CoSe 92423	Tillering stage	
6.	Foliar diseases (1) <u>Alternaria</u> leaf spot (2) <u>Curvularia</u> leaf spot	Kushinagar	Stray	CoSe 01424, CoSe 92423, CoSe 96436, CoS 98231, CoS 88230 and CoS 95255	Growth stage	