

# SUGARCANE PATHOLOGY

## PART-I

### Completed Experiment:

#### **Title of Expt.: Management of rust of Sugarcane**

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**Objective:** To find out effective chemical for management of sugarcane rust.

#### **Experimental Details**

**Design:** R.B.D. **Replications:** Four  
**Plot size:** 6.0 x 6.0 m (5 Rows of 6 m) **Fertilizer dose:** 250:115:115 Kg N, P<sub>2</sub>O<sub>5</sub> & K<sub>2</sub>O/ ha  
**Season:** *Suru* 2012-13, 2013-14 and 2014-15  
**Variety:** Co VSI 9805

#### **Treatment details:**

<b>Treat. No.</b>	<b>Fungicide a.i.</b>	<b>Spray conc. (%)</b>
T <sub>1</sub>	Chlorothalonil 75 WP	0.25
T <sub>2</sub>	Propineb 70 WP	0.20
T <sub>3</sub>	Triadimefon 25 WP	0.10
T <sub>4</sub>	Mancozeb 75 WP	0.30
T <sub>5</sub>	Water sprayed control	

#### **Spray Schedule: 1<sup>st</sup> Year: (2012-13)**

\*1) 28/08/2012  
2) 12/09/2012  
3) 27/09/2012

#### **2<sup>nd</sup> Year: (2013-14)**

22/08/2013  
03/09/2013  
19/09/2014

#### **3<sup>rd</sup> year: (2014-15)**

14/08/2014  
30/08/2014  
15/09/2014

\*Immediately after disease appearance

**Results:** The pooled results on intensity of rust disease, cane yield and quality parameters as influenced by different fungicidal treatments are presented in Table 1. The results on germination percentage at 45 DAP were not significant. The germination in different treatments ranged from 60.33 to 65.50 %. All the fungicides had a significant influence on the rust intensity, cane yield and CCS yield. Among different fungicides, Mancozeb 75 WP @ 0.3% recorded significantly least rust intensity (13.75 %) and highest per cent disease control (80.8 %). As regards cane yield, Mancozeb 75 WP @ 0.3% recorded significantly highest cane yield (97.22 t/ha). Moreover in

respect of quality parameters, Mancozeb 75 WP @ 0.3% recorded highest CCS% (14.35%), CCS yield (13.95 t/ha) and sucrose content (20.01%), however, it was par with rest of the fungicidal treatments in respect of CCS % and sucrose content. As regards CCS yield, Mancozeb 75 WP @ 0.3% (13.95 t/ha) was par with Chlorothalonil 75 WP @ 0.25% (12.94 t/ha).

**Cost : Benefit analysis:**

The economics of management of sugarcane rust as influenced by different fungicide treatments is depicted in Table 2. The cost-benefit analysis of different fungicidal treatments showed that Mancozeb 75 WP treatment recorded highest C:B ratio (1.02) and ICBR (54.90).

**Recommendation:**

Three sprays of Mancozeb 75 WP @ 30 g in 10 litre water at 15 days interval after disease appearance are recommended for effective and economical control of sugarcane rust.

**Table 1. Effect of different fungicides on intensity of rust disease, cane yield and quality parameters (Pooled: 2012-13, 2013-14 and 2014-15)**

Treatments		Conc.	Germ. % at 45 DAP*			Pooled Mean	PDI*			Pooled Mean	PDC
			2012-13	2013-14	2014-15		2012-13	2013-14	2014-15		
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	68.25 (55.78)	52.50 (46.67)	60.00 (50.82)	60.33 (51.09)	10.75 (19.12)	15.50 (23.15)	20.50 (26.90)	15.58 (23.06)	72.7
T <sub>2</sub>	Propineb 70 WP	0.20 %	68.75 (56.07)	61.75 (52.21)	65.63 (54.14)	65.50 (54.14)	11.00 (19.34)	17.25 (24.50)	22.25 (28.11)	16.83 (23.99)	70.5
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	68.50 (55.87)	53.25 (46.85)	61.13 (51.42)	61.00 (51.38)	15.50 (23.16)	22.25 (28.12)	27.25 (31.44)	21.67 (27.57)	62.0
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	66.00 (54.32)	55.25 (48.00)	65.13 (53.79)	62.17 (52.04)	7.75 (16.14)	11.25 (19.47)	13.75 (21.71)	10.92 (19.11)	80.8
T <sub>5</sub>	Water sprayed control	--	68.25 (55.71)	61.50 (51.96)	61.88 (51.88)	64.00 (53.18)	42.50 (40.66)	59.25 (50.32)	69.25 (56.32)	57.00 (49.10)	
	SE±		1.72	2.61	1.83	0.90	0.63	1.00	0.86	1.11	
	CD at 5 %		NS	NS	NS	NS	1.93	3.08	2.65	3.63	
	C.V. %		6.20	10.63	6.99	2.97	5.28	6.88	5.23	6.74	

\* Figures in parentheses are the arc-sines to which the statistical analysis pertains.

**Table 1. Effect of different fungicides on intensity of rust disease, cane yield and quality parameters  
(Pooled: 2012-13, 2013-14 and 2014-15) contd....**

Treatments		Conc.	Cane yield (t/ha)			Pooled Mean	% increase in yield over control	CCS %			Pooled Mean
			2012-13	2013-14	2014-15			2012-13	2013-14	2014-15	
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	89.98	97.92	88.79	92.23	11.09	14.06	14.23	12.22	14.01
T <sub>2</sub>	Propineb 70 WP	0.20 %	87.64	95.97	86.30	89.97	8.37	13.95	14.23	11.85	13.96
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	86.70	95.83	86.08	89.54	7.85	13.92	14.20	11.79	13.94
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	93.52	100.56	97.59	97.22	17.10	14.63	14.38	13.70	14.35
T <sub>5</sub>	Water sprayed control	--	82.39	85.76	80.89	83.02		12.90	14.08	10.34	13.26
	SE±		1.79	3.02	4.28	1.07		0.32	0.13	0.24	0.32
	CD at 5 %		5.51	9.29	13.20	3.49		0.99	NS	0.74	1.04
	C.V. %		4.06	6.34	9.74	2.05		4.62	1.82	3.53	4.14

**Table 1. Effect of different fungicides on intensity of rust disease, cane yield and quality parameters  
(Pooled: 2012-13, 2013-14 and 2014-15) contd....**

Treatments		Conc.	CCS yield (t/ha)			Pooled Mean	Brix			Pooled Mean
			2012-13	2013-14	2014-15		2012-13	2013-14	2014-15	
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	12.66	13.94	12.22	12.94	23.30	21.00	20.54	21.61
T <sub>2</sub>	Propineb 70 WP	0.20 %	12.24	13.65	11.85	12.58	21.86	20.88	20.34	21.02
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	12.07	13.60	11.79	12.49	22.46	20.25	19.09	20.60
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	13.69	14.46	13.70	13.95	23.01	20.50	19.22	20.91
T <sub>5</sub>	Water sprayed control	--	10.63	12.08	10.34	11.02	21.54	20.63	19.79	20.65
	SE±		0.46	0.41	0.66	0.32	0.39	0.26	0.30	0.31
	CD at 5 %		1.42	1.28	2.03	1.04	1.20	NS	0.91	NS
	C.V. %		7.54	6.13	10.97	4.54	3.47	2.53	3.00	2.54

**Table 1. Effect of different fungicides on intensity of rust disease, cane yield and quality parameters  
(Pooled: 2012-13, 2013-14 and 2014-15) contd....**

Treatments		Conc.	Purity %			Pooled Mean	Sucrose %			Pooled Mean
			2012-13	2013-14	2014-15		2012-13	2013-14	2014-15	
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	86.81	94.89	96.05	92.58	20.53	19.93	19.56	20.00
T <sub>2</sub>	Propineb 70 WP	0.20 %	87.87	95.28	97.09	93.41	20.05	19.89	19.16	19.70
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	85.87	97.24	98.37	93.82	20.34	19.68	18.36	19.46
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	91.32	97.19	97.67	95.39	20.95	19.92	19.16	20.01
T <sub>5</sub>	Water sprayed control	--	86.57	95.43	97.12	93.04	18.75	19.68	17.94	18.79
	SE±		1.46	1.16	0.44	0.72	0.39	0.13	0.27	0.25
	CD at 5 %		NS	NS	1.35	NS	1.21	NS	0.84	0.83
	C.V. %		3.33	2.42	0.90	1.34	3.89	1.32	2.91	2.25

**Table 2. Economics of management of sugarcane rust as influenced by different fungicide treatments  
(Pooled: 2012-13, 2013-14 and 2014-15)**

Tr. No.	Treatments	Conc. (%)	Cane yield (t/ha)	Gross returns (Rs/ha)	Additional returns (Rs/ha)	Cost of cultivation (Rs/ha)	Net returns (Rs/ha)	C:B ratio	ICBR
T <sub>1</sub>	Chlorothalonil 75 WP	0.25	92.23	207518	20723	109332	98185	0.90	14.34
T <sub>2</sub>	Propineb 70 WP	0.20	89.97	202433	15638	108521	93911	0.87	24.67
T <sub>3</sub>	Tridemefon 25 WP	0.10	89.54	201465	14670	109637	91828	0.84	8.38
T <sub>4</sub>	Mancozeb75 WP	0.30	97.22	218745	31950	108469	110276	1.02	54.90
T <sub>5</sub>	Water sprayed control	--	83.02	186795		107887	78908	0.73	

**Market rates:** 1) Sugarcane- Rs. 2250/t      2) Chlorothalonil - Rs. 1156/kg      3) Propineb- Rs.634/kg      4) Tridemefon- Rs.3500/lit.  
5) Mancozeb - Rs.388/kg      6) Tebuconazole - Rs. 744/lit.      7) Hexaconazole-Rs.680/lit.      8) Propiconazole - Rs. 1500/lit

## **PART-II: On-going Experiments**

### **Expt. No. 1. Evaluation of zonal varieties / genotypes for resistance to smut (PP-17B)**

**Objective:** To gather information on the relative resistance of the entries in zonal varietal trial to smut disease.

#### **Experimental Details**

- |   |  |
|---|--|
| 1. <b>Plot size:</b> 6 M x 1 Rows   | 5. <b>Date of planting:</b> 08/01/2014 |
| 2. <b>Fertilizer dose:</b> 250:115:115 Kg N, P <sub>2</sub> O <sub>5</sub> & K <sub>2</sub> O/ ha |  |
| 3. <b>No. of genotypes:</b> 30+ 13 Ch. = 43   | 6. <b>Date of harvest:</b> Jan-2015    |
| 4. <b>Season:</b> <i>Suru</i>   | 7. <b>Replications:</b> 2              |

#### **Smut Reaction Assessment key**

<b>Smut Reaction</b>	<b>Incidence (%)</b>
1. Resistant (R):	0.00
2. Moderately Resistant (MR):	0.01 to 10.00
3. Moderately Susceptible (MS):	10.01 to 20.00
4. Susceptible (S):	20.01 to 30.0
5. Highly Susceptible (HS):	More than 30.00

**Results:** The results are presented in Table 3.

- 1) IVT-(Early):** Out of 13 genotypes included in IVT (Early), **1 genotype** i.e. CoM 11081 showed **resistant** reaction to smut. **One** genotype i.e. Co 11001 showed **moderately resistant** reaction. **Two** genotypes *viz.*, Co 11016 and Co 11018 showed **moderately susceptible** reaction to smut disease, whereas **04** genotypes *viz.*, Co 11004, Co 11084, CoT 11366 and PI 11131 showed **susceptible** whereas **5** genotypes *viz.*, Co 11017, CoM 11082, CoM 11083, CoN 11071 and CoN 11072 showed **highly susceptible** reaction to smut.
- 2) AVT–Early (I Plant):** Out of 03 genotypes, **2** genotypes *viz.*, Co 09004 and Co 09007 showed **resistant** reaction whereas CoN 09072 showed **moderately susceptible** reaction to smut disease.
- 3) IVT–Midlate:** Out of 14 genotypes tested, **11** genotypes *viz.*, Co 11005, Co 11012, Co 11021, Co 11022, Co 11023, Co 11024, CoM 11085, CoM 11086, CoM 11087, CoN 11073 and CoN 11074 showed **resistant** reaction to smut. **Two** genotypes i.e. Co 11019 and Co 11020 showed **moderately susceptible** reaction where as one genotype i.e. Co 11007 showed **susceptible** reaction to smut.

Thus, out of 43 zonal varieties/genotypes, one genotype i.e. CoM 11081 from IVT Early, 02 genotypes *viz.*, Co 09004 and Co 09007 from AVT–Early (I Plant) and 11 genotypes *viz.*, Co 11005, Co 11012, Co 11021, Co 11022, Co 11023, Co 11024, CoM 11085, CoM 11086, CoM 11087, CoN 11073 and CoN 11074 from IVT-Midlate showed resistant reaction to smut disease.

**Table 3. Incidence of smut on sugarcane genotypes from AICRP trials under artificially inoculated conditions**

S.N.	Genotype	Smut %	Reaction	S. N.	Genotype	Smut %	Reaction
<b>IVT – Early ( 13 )</b>							
1	Co 11001	3.39	MR	23	Co 11022	0.00	<b>R</b>
2	Co 11004	27.27	S	24	Co 11023	0.00	<b>R</b>
3	Co 11016	14.81	MS	25	Co 11024	0.00	<b>R</b>
4	Co 11017	40.00	HS	26	CoM 11085	0.00	<b>R</b>
5	Co 11018	10.87	MS	27	CoM 11086	0.00	<b>R</b>
6	CoM 11081	0.00	<b>R</b>	28	CoM 11087	0.00	<b>R</b>
7	CoM 11082	55.56	HS	29	CoN 11073	0.00	<b>R</b>
8	CoM 11083	57.45	HS	30	CoN 11074	0.00	<b>R</b>
9	CoM 11084	28.33	S	<b>Checks</b>			
10	CoN 11071	48.33	HS	31	Co 85004	13.04	MS
11	CoN 11072	52.00	HS	32	Co 94008	0.00	R
12	CoT 11366	22.22	S	33	CoC 671	0.00	R
13	PI 11131	27.66	S	34	Co 86032	0.00	R
<b>AVT – Early I Plant ( 03 )</b>				35	Co 99004	50.00	HS
14	Co 09004	0.00	<b>R</b>	36	CoM 265	0.00	<b>R</b>
15	Co 09007	0.00	<b>R</b>	37	Co 740	29.31	S
16	CoN 09072	17.78	MS	38	Co 7219	10.34	MS
<b>IVT– Midlate (14)</b>				39	Co 7527	15.87	MS
17	Co 11005	0.00	<b>R</b>	40	VSI 434	27.78	S
18	Co 11007	27.27	S	41	CoVSI 3102	0.00	R
19	Co 11012	0.00	<b>R</b>	42	CoM 9057	0.00	R
20	Co 11019	16.28	MS	43	MS 10001	0.00	R
21	Co 11020	12.50	MS				
22	Co 11021	0.00	<b>R</b>				
21	CoN 10073	33.33	HS				

## Expt. No. 2. Evaluation of zonal varieties / genotypes for resistance to YLD (PP-17D)

**Objective:** To gather information on the relative resistance of the entries in zonal varietal trial to YLD disease.

### Experimental Details

1. **Plot size:** 6 M x 1 Rows
2. **Fertilizer dose:** 250:115:115 Kg N, P<sub>2</sub>O<sub>5</sub> & K<sub>2</sub>O/ ha
3. **No. of genotypes:** 30+ 13 Ch. = 43
4. **Season:** *Suru*
5. **Date of planting:** 08/01/2014
6. **Date of harvest:** Jan-2015
7. **Replications:** 2

### YLD severity grades:

Disease grade	Description
0	No symptom of the disease
1	Mild yellowing of midrib in one or two leaves, no sign of typical bunching of leaves caused by YLD
2	Prominent yellowing of midrib on all the leaves in the crown. No bunching of leaves
3	Progress of midrib yellowing to laminar region in the whorl, yellowing on the upper leaf surface, and bunching of leaves
4	Drying of laminar region from leaf tip downwards along the midrib, typical bunching of leaves as a tuft
5	Stunted growth of the cane combined with drying of symptomatic leaves

### YLD severity scale:

Score	Disease reaction
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

**Results:** The results are presented in Table 4. Out of 43 genotypes, from AICRP trials under naturally conditions, **38** genotypes showed **resistant** reaction to YLD disease while **04** genotypes exhibited **moderately resistant** and **one** genotype recorded **moderately susceptible**, reaction to YLD disease under natural conditions in the field

**Table 4. Disease severity of YLD on sugarcane genotypes from AICRP trials under naturally conditions**

S. N.	Genotype	Score	Reaction	S. N.	Genotype	Score	Reaction
<b>IVT – Early ( 13 )</b>							
1	Co 11001	0.00	<b>R</b>	23	Co 11022	0.00	<b>R</b>
2	Co 11004	0.00	<b>R</b>	24	Co 11023	0.5	<b>R</b>
3	Co 11016	2.2	MS	25	Co 11024	0.00	<b>R</b>
4	Co 11017	0.7	<b>R</b>	26	CoM 11085	0.00	<b>R</b>
5	Co 11018	0.6	<b>R</b>	27	CoM 11086	0.00	<b>R</b>
6	CoM 11081	0.00	<b>R</b>	28	CoM 11087	0.00	<b>R</b>
7	CoM 11082	0.00	<b>R</b>	29	CoN 11073	0.00	<b>R</b>
8	CoM 11083	0.00	<b>R</b>	30	CoN 11074	0.00	<b>R</b>
9	CoM 11084	0.00	<b>R</b>	<b>Checks</b>			
10	CoN 11071	1.5	MR	31	Co 85004	0.00	<b>R</b>
11	CoN 11072	1.0	<b>R</b>	32	Co 94008	0.5	<b>R</b>
12	CoT 11366	1.6	MR	33	CoC 671	0.00	<b>R</b>
13	PI 11131	0.00	<b>R</b>	34	Co 86032	0.4	<b>R</b>
<b>AVT – Early I Plant ( 03 )</b>				35	Co 99004	0.00	<b>R</b>
14	Co 09004	0.00	<b>R</b>	36	CoM 265	0.00	<b>R</b>
15	Co 09007	0.8	<b>R</b>	37	Co 740	0.00	<b>R</b>
16	CoN 09072	1.1	MR	38	Co 7219	0.00	<b>R</b>
<b>IVT– Midlate (14)</b>				39	Co 7527	0.00	<b>R</b>
17	Co 11005	0.00	<b>R</b>	40	VSI 434	0.00	<b>R</b>
18	Co 11007	0.00	<b>R</b>	41	CoVSI 3102	0.00	<b>R</b>
19	Co 11012	0.00	<b>R</b>	42	CoM 9057	0.00	<b>R</b>
20	Co 11019	0.7	<b>R</b>	43	MS 10001	0.00	<b>R</b>
21	Co 11020	0.00	<b>R</b>				
22	Co 11021	1.4	MR				
21	CoN 10073	0.00	<b>R</b>				

**Expt. No. 3. Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties (PP-22)**

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

**Results:** The results have been presented in Table 5.

The survey of sugarcane diseases was undertaken in Nasik, Dhule, Jalgaon, Aurangabad and Ahmednagar districts w.e.f 10-14 August 2014. Moreover, Kolhapur, Satara and Sangli districts of Western Maharashtra were surveyed during 26-28 August 2014. During survey, the incidence of different diseases like smut, grassy shoot, pokka boeng, rust, YLD, brown spot and ring spot was noticed in different area. The abstract of area surveyed and diseases naturally occurring on different varieties is given in Table 5.

Smut incidence was noticed upto 40% on CoM 261 at Vakare, Tal. Karveer, Dist. Kolhapur where farmers are growing the variety although it is not recommended. The incidence of yellow leaf disease (YLD) was noticed in Donawade, Kumbi-Kasari villages from Karveer tahsil of Kolhapur district on CoM 86032. The grassy shoot disease (GSD) was noticed in Chopda and Yaval tahsil of Jalgaon districts on the sugarcane variety Siddhagiri-1243 and CoM 265 (ratoon). Pokka boeng was noticed on Co 98071, CoVSI 3102 and CoVSI 9805 in Jalgaon and Kolhapur district. The incidence of rust disease was noticed upto 25% in Faizpur-Nhavi area from Yaval tahsil of Jalgaon district on the sugarcane variety Siddhagiri-1243. Moreover, 10-15% rust incidence was noticed on Co 92005 and CoM 265 from Karveer tahsil of Kolhapur district and Kannad tahsil of Aurangabad district. Brown spot was a major problem observed predominantly in Satara, Sangli and Kolhapur districts because of frequent rains and high humidity during rainy season. The incidence of ring spot disease was noticed upto 30% in Karveer, Gargoti and Aajra tahsil of Kolhapur district on the sugarcane variety Co 92005, whereas trace incidence was noticed on Co 86032 and Co 7527.

**Table 5: Survey of naturally occurring sugarcane diseases in Western and North Maharashtra region during August 2014**

Sl. No.	Disease	Name of area surveyed	% Disease incidence (clump basis)	Varieties affected	Crop stage when observed
1	Smut	Vakare Tal. Karveer Dist. Kolhapur	40%	CoM 261	10 months
2	YLD	Donawade, Kumbi-Kasari Tal. Karveer Dist. Kolhapur	5%	CoM 86032	11 months
3	GSD	Kolwad, Satod, Wardi Tal. Chopda Dist. Jalgaon	10%	Siddhagiri-1234 (Ratoon)	10 months
		Nhavi Tal. Yaval Dist. Jalgaon	5%	CoM 265 (Ratoon)	10 months

contd...

**Table 5 contd...**

<b>Sl. No.</b>	<b>Disease</b>	<b>Name of area surveyed</b>	<b>% Disease incidence (clump basis)</b>	<b>Varieties affected</b>	<b>Crop stage when observed</b>
4	Pokkah boeng	Kolwad, Satod, Tal. Chopda Dist. Jalgaon	25%	Co 98071	10 months
		Vardi Tal. Chopda Dist. Jalgaon	15%	Co VSI 3102	11 months
		Radhanagri Dist. Kolhapur	20%	Co VSI 3102	11 months
5	Rust	Donwade Tal. Karveer Dist. Kolhapur	15%	Co 92005	10 months
		Telvadi Tal. Kannad Dist. Aurangabad	10%	CoM 265 (Ratoon)	10 months
		Faizpur-Nhavi Tal. Yaval Dist. Jalgaon	25%	Siddhagiri- 1234	11 months
6	Brown Spot	Amjai-Varvade, Solankur, Aavali Tal. Radhanagri; Aamse, Mharul, Donawade Tal. Karveer Dist. Kolhapur	40%	CoM 265	12 months
		Aamse, Maharul Tal. Gadhinglaj Dist. Kolhapur	30%	CoM 265	10 months
		Karad Tal. Karad Dist. Satara	20%	CoM 265	11 months
		Kovad Tal. Chandgarh Dist. Kolhapur	10%	Co 86032	10 months
7	Ring Spot	Donawade, Tal. Karveer Dist. Kolhapur	25%	Co 92005	12 months
			Traces	Co 86032	10 months
		Kovad Tal. Chandgarh Dist. Kolhapur	5%	Co 7527	10 months

#### Expt. No. 4 Management of rust of Sugarcane (PP-28A)

**Objective:** To find out effective chemical for management of sugarcane rust.

#### Experimental Details

**Design:** R.B.D.

**Replications:** Four

**Plot size:** 6.0 x 6.0 m (5 Rows of 6 m) **Fertilizer dose:** 250:115:115 Kg N, P<sub>2</sub>O<sub>5</sub> & K<sub>2</sub>O/ ha

**Season:** *Suru* 2014-15

**Date of Planting:** 28/01/2014

**Variety:** Co VSI 9805

**Date of Harvesting:** 25/01/2015

#### Treatment details:

Treat. No.	Fungicide a.i.	Spray conc. (%)
T <sub>1</sub>	Chlorothalonil 75 WP	0.25
T <sub>2</sub>	Propineb 70 WP	0.20
T <sub>3</sub>	Triadimefon 25 WP	0.10
T <sub>4</sub>	Mancozeb 75 WP	0.30
T <sub>5</sub>	Water sprayed control	

**Spray Schedule:** 1) 14/08/2014 (Immediately after disease appearance)  
2) 30/08/2014  
3) 15/09/2014

**Results:** The results on intensity of rust disease, cane yield and quality parameters as influenced by different treatments are presented in Table 6. The results on germination percentage at 45 DAP were not significant. The germination in different treatments ranged from 60.00 to 65.63 %. All the fungicides had a significant influence on the rust intensity, cane yield and CCS yield. Mancozeb 75 WP @ 0.3 % recorded significantly least rust intensity (13.75 %) and the highest per cent disease control (80.1 %). As regards cane yield, Mancozeb 75 WP @ 0.3 % recorded highest cane yield (97.59 t/ha), however, it was at par with rest of the fungicidal treatments. Moreover in respect of quality parameters, Mancozeb 75 WP @ 0.3 % recorded highest CCS % (14.04 %) and CCS yield (13.70 t/ha), however, it was at par with rest of the fungicidal treatments.

#### Cost : Benefit analysis:

The economics of management of sugarcane rust as influenced by different fungicide treatments is depicted in Table 7. The cost-benefit analysis of different fungicidal treatments showed that Mancozeb 75 WP @ 0.3 % treatment recorded highest C:B ratio (1.02).

**Table 6. Effect of different fungicides on intensity of rust disease, cane yield and quality parameters (2014-15)**

Treatments		Conc.	Germ. % at 45 DAP*	PDI*	PDC	Cane yield (t/ha)	CCS %	CCS yield (t/ha)	Brix	Purity %	Sucrose %
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	60.00 (50.82)	20.50 (26.90)	70.4	88.79	13.76	12.22	20.54	96.05	19.56
T <sub>2</sub>	Propineb 70 WP	0.20 %	65.63 (54.14)	22.25 (28.11)	67.9	86.30	13.71	11.85	20.34	97.09	19.16
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	61.13 (51.42)	27.25 (31.44)	60.7	86.08	13.69	11.79	19.09	98.37	18.36
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	65.13 (53.79)	13.75 (21.71)	80.1	97.59	14.04	13.70	19.22	97.67	19.16
T <sub>5</sub>	Water sprayed control	--	61.88 (51.88)	69.25 (56.32)	--	80.89	12.80	10.34	19.79	97.12	17.94
	SE±		1.83	0.86		4.28	0.24	0.66	0.30	0.44	0.27
	CD at 5 %		NS	2.65		13.20	0.74	2.03	0.91	1.35	0.84
	C.V. %		6.99	5.23		9.74	3.53	10.97	3.00	0.90	2.91

\* Figures in parentheses are the arc-sines to which the statistical analysis pertains.

**Table 7. Economics of management of sugarcane rust as influenced by different fungicide treatments**

<b>Tr. No.</b>	<b>Treatments</b>	<b>Conc.</b>	<b>Cane yield (t/ha)</b>	<b>Gross returns (Rs/ha)</b>	<b>Cost of cultivation (Rs/ha)</b>	<b>Net returns (Rs/ha)</b>	<b>C:B ratio</b>
T <sub>1</sub>	Chlorothalonil 75 WP	0.25 %	88.79	199778	109332	90445	0.83
T <sub>2</sub>	Propineb 70 WP	0.20 %	86.30	194175	108521	85654	0.79
T <sub>3</sub>	Tridemefon 25 WP	0.10 %	86.08	193680	109637	84043	0.77
T <sub>4</sub>	Mancozeb 75 WP	0.30 %	97.59	219578	108469	111108	1.02
T <sub>8</sub>	Water sprayed control	--	80.89	182003	107887	74115	0.69

**Expt. No. 5. Methodology for screening sugarcane genotypes for resistance to brown rust (*Puccinia melanocephala*) (PP-28B)**

**Objective:** To standardize methodology for inoculation of urediniospores of sugarcane brown rust and rating of resistance.

**Year of Start:** *Suru* 2014-15

**Date of Planting:** 07/01/2014

**Date of first disease appearance:** 11/08/2014

**Date of Inoculation:** 14/08/2014

**Inoculation Methodology:**

**1) Clip Inoculation in Leaf Whorl:**

As soon as brown rust appeared in the field, rust affected leaves were selected and leaf bits (clips) measuring 8-10 cm were prepared. Ten rust free plants of same susceptible variety were selected in different location. In 3 shoots of each plant (clump), 2-3 clips were inserted in the leaf whorl of each shoot.

**2) Leaf Whorl Inoculation:**

As soon as brown rust appeared in the field, rust affected leaves were selected. Suspension of urediniospores ( $10^4$ - $10^5$  spores/ml) was prepared in sterilized distilled water and 1 ml freshly prepared suspension was poured in each leaf whorl. A total of 10 clumps were inoculated @ 3 shoots per clump.

**Observations:** After 4 weeks, following observations were recorded.  
i) Average no. of rust pustules per square inch and  
ii) No. of leaves bearing rust pustules

**Results:** The results are presented in Table 8. Clip inoculation in leaf whorl with rusted leaf clips and inoculation of rust urediniospores suspension in leaf whorl were suggested as per ICAR programme. It is evident from the results that in the leaf whorl inoculation method, higher average no. of rust pustules (21.86 per sq. inch) and higher no. of leaves bearing rust pustules (11.6) was recorded as compared to the clip inoculation method (19.76 per sq. inch and 10.6 respectively). This indicates that the leaf whorl inoculation method is better for screening than the clip inoculation method.

**Table 8. Evaluation of inoculation methods for screening sugarcane genotypes against brown rust**

Sr. No.	Inoculation Methodology	Average no. of rust pustules/inch <sup>2</sup>	No. of leaves bearing rust pustules
1.	Clip Inoculation in Leaf Whorl	19.76	10.6
2.	Leaf Whorl Inoculation	21.86	11.6