ANNUAL REPORT FOR THE YEAR 2012-13
All India Coordinated Research Project on Sugarcane

DIVISION OF PLANT PATHOLOGY

REGIONAL AGRICULTURAL RESEARCH STATION, ANAKAPALLE

ACHARYA N G RANGA AGRICULTURAL UNIVERSITY

PLANT PATHOLOGY DISCIPLINE

Regional Agricultural Research Station, Anakapalle experiments conducted under All India Coordinated Research Project on Sugarcane during 2012-2013

S. No	Project No	Project title
1	PP14 & 14(a)	Identification of pathotypes in red rot pathogen and maintenance of isolates of red rot pathogen
2	PP 17 (a)	Evaluation of zonal varieties for resistance to red rot
3	PP 17 (b)	Evaluation of zonal varieties for resistance to smut.
4	PP 17 (c)	Evaluation of zonal varieties for resistance to wilt.
5	PP 22	Survey of sugarcane diseases occurring in the area on important sugarcane varieties
6	PP 23	Assessment of elite and ISH genotypes for resistance to red rot.
7	PP 30	Assessment of field resistance in sugarcane to red rot
8	PP 31	Screening, epidemiology and management of top rot in sugarcane.

ANNUAL REPORT FOR THE YEAR 2012-13
All India Coordinated Research Project on Sugarcane

Plant Pathology

I. **Project No.** : PP 14

II. **Project title** : Identification of pathotypes / races in red rot pathogen

III. **Serial number of the year of experimentation**: 30

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

This experiment is conducted with an objective to gather information on the major pathotypes of red rot pathogen from different areas / Zones. The study conducted from 1983-84 to 2011-12 indicated the existence of four distinct pathotypes in red rot fungus viz., Cf 04 (CO 419) Cf 05 (Co 997), Cf 06 (Co C 671) and Cf 10 (85 A 261) in coastal Andhra Pradesh.

VI. **Technical programme of work on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report:**

a. **Isolates of red rot fungus used for inoculations:**

S.No.	Variety from which isolate was collected	Year of collection	Place of collection
1	Co 419	1989	Anakapalle (Rejuvenated in July, 2012)
2	Co C 671	2011	SBI , Coimbatore (Rejuvenated in July, 2012)
3	Co 997	2011	SBI , Coimbatore (Rejuvenated in July, 2012)
4	85 A 261 (CoA 89085)	1997	Nellore (Rejuvenated in July, 2012)
5	S-16	2011	Podalakuru (Nellore Dt)
6	Co 62175	2012	Santakaviti (Srikakulam Dt)
7	CoA 09321	2012	Elaswaram (west Godavari Dt.)
8	Co 7219	2012	Chuchukonda (Visakhapatnam Dt.)

b. **Date of Planting** : March 2012

c. **Varieties (16)** : **Baragua (*Saacharum officinarum)*, Khakai (*S.sinense*) Co 419, Co 997, Co C 671, Co 975, Co 1148, Co 7717, B091, Co 62399, Co S 767, Co J 64, Co S 8436 and SES 594**

d. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

e. **Irrigations** : Seven irrigations were given during the crop growth period.

f. **Plant Protection** : --
g. **Date of inoculation** : 18.09.2012

h. **Plot size** : 2.5 m x 0.8 m x 18 rows = 36 sq.m / variety
i. **Design** : Single series
j. **Replications** : Non – replicated

k. **Method of inoculation** : Plug method

l. **Name and designation of the participating Scientist :**

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

m. **Results recorded during the previous year:**

The experiment conducted during 2011-12 with eight red rot isolates indicated the existence of four distinct pathotypes of red rot fungus viz., Cf 419 (Cf 04), Cf 671 (Cf 06), Cf 997 (Cf 05) and Cf 261 (Cf 10) in coastal Andhra Pradesh.

n. **Results obtained during this year**

Observations for the extent of disease spread in each variety – isolate combination was recorded at 60 days after inoculation. For assessing the virulence of each isolate, about 30 standing canes was sampled in each variety. The canes were examined for external symptoms of the disease like yellowing or drying of tops. Later, the canes were split opened longitudinally and scored for internal characters of the disease like lesion width, white spots and extent of nodal transgression. Based on the disease (host reaction), the varieties were classified into three groups viz., Resistant (R), Susceptible (S) and intermediate (I) as follows.

R: Lesion width laterally restricted, nodal transgression up to two nodes, white spots, rind infection, sporulation over the rind and yellowing and drying of tops absent.
S: Lesion width laterally spreading, nodal transgression more than two nodes, white spots progressive or restricted; in case of progressive white spots, rind infection, sporulation over the rind and yellowing or drying of tops absent or present.

I: Lesion width laterally restricted or spreading: nodal transgression more than two nodes, white spots present of absent (restricted type), rind infection, sporulation over the rind and yellowing or drying of tops absent.

The data (Table-1) revealed that the isolates collected from Co 419 (Anakapalle), Co C 671 (Vuyyuru), Co 997 (Anakapalle) and 85 A 261(CoA 89085) (Nellore) are distinctly different in their virulence pattern on the differential varieties and hence are considered as distinct pathotypes viz., Cf 04, Cf 06, Cf 05 and Cf 10 respectively. Variety – isolate interaction revealed that the isolates from Co 7219 is similar to Cf 419 (Cf 04), the isolates from S-16 and Co 62175 are similar to Cf 671 (Cf 06) and CoA 09321 is similar to Co 997 (Cf 05).

The results of the present study clearly indicate the existence of four distinct pathotypes in red rot fungus viz., Cf 04, Cf 06, Cf 05 and Cf 10.

VIII. **Technical summary of the individual report:**

Eight isolates of red rot fungus collected from Co 419, Co C 671, Co 997, 85 A 261 (CoA 89085), Co 7219, S- 16, Co 62175 and CoA 09321 were tested on a set of 16 differential varieties during 2011-12. Variety – isolate interaction revealed that the isolates from Co 7219 IS similar to Cf 419 (Cf 04), the isolate from Co 7219 is similar to Cf 419 (Cf 04), the isolates from S-16 and Co 62175 are similar to Cf 671 (Cf 06) and CoA 09321 is similar to Co 997 (Cf 05). Thus, the present study confirmed the existence of four red rot pathotypes in Andhra Pradesh.

The virulence pattern of four isolates (CO 419, Co C 671, Co 997 and 85 A 261) on differentials indicated the existence of five distinct pathotypes viz., Cf 419 (Cf 04), Cf 671 (Cf –06), Cf 997 (Cf 05) and Cf 261 (Cf 10) in coastal Andhra Pradesh.

IX. **Salient findings:**

The present study clearly indicated the existence of four distinct pathotypes of red rot fungus viz., Cf 04, Cf 06, Cf 05 and Cf 10 in Coastal Andhra Pradesh.

Table 1: Reaction of sugarcane varieties to different isolates of red rot fungus by plug method 60 days after inoculation.

Sl. No	Pathotype/ Isolate	Source	Reaction of host differentials													
			Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	BO 91	Baragua	Kakhai	SES 594
1.	CF 04	Co 419	S	S	S	S	S	R	S	R	R	R	R	R	S	R
2.	CF 05	Co 997	R	S	S	S	R	R	S	I	R	R	R	R	S	R
3.	CF 06	CoC 671	S	S	S	S	I	S	S	R	R	R	R	R	I	R
4.	CF 10	CoA 89085	S	S	S	I	S	S	S	I	R	R	R	R	R	R
5.	New isolate-1	S-16	S	S	S	S	I	S	S	S	R	R	R	R	R	R
6	New isolate-2	Co 62175	S	S	S	S	I	S	S	S	R	R	R	R	R	R
7	New isolate-3	CoA 09321	I	S	S	S	R	R	S	I	R	R	R	R	S	R
8	New isolate-4	Co 7219	S	S	S	S	S	I	S	R	R	R	R	R	S	R

R: Resistant I: Intermediate S: Susceptible

I **Project No.** : PP 17 (a)

II **Project title** : Evaluation of Zonal varieties for resistance to red rot

III. **Serial number of the year of experimentation**: 26

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

This experiment is conducted every year to obtain information on relative resistance of varieties included in Zonal varietal trial. During 2012-13, twenty four entries / genotypes tested for their reaction to two pathotypes (Cf 04, Cf 06 and Cf 05) of red rot fungus individually and as a mixture by by nodal and plug method of inoculation.

During 2010-11 out of 24 varieties / genotypes tested by plug method of inoculation four entries (Co A 7321, Co C 07336, Co C 07337 and Co 086249) showed resistance while 4 entries Co Or 08346, Co A 06321, Co 06030 and Co V 92102 showed moderately resistant reaction to Cf 04, Cf 06 and mixture of both. Out of 24 entries tested, four entries reacted as resistant, 4 as moderately resistant and 16 as highly susceptible to Cf 04 and Cf 06.

Out of 26 varieties / genotypes tested during 2011-12 by nodal method only four entries (Co A 08321(Co A 08322), CoC 6030 and Co c01061) manifested top drying indicating their nodal susceptibility. In the plug method out of 25 entries, five entries (CoA 07321 (2000A56), CoC07336, CoC07337, Co086249 and CoV 92102) showed resistance while 3 entries CoA 06321 (2001A63), Co Or 08346 and Co 06030 showed moderately resistant reaction to Cf 04, Cf 05 and Cf 06.

VI **Technical programme on which the report is based:**
The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report**

a. **Date of planting** : March 2012

b. **Varieties (24)** : Co A 08323(2003A255), CoA 09321(2004A 55), CoC08336, CoV 09356(2003 V 46), CoA 92081 (87 A 298), Co C 01061, Co 6907, CoA 10321 (2004 A 104), Co Or 10346,Co 7219, Co 86249, Co 6031, CoC 08339, COV92102(83 V 15) CoA 11321 (2005 A 128), CoA 11322 (2004 A 107), CoA 11323(2000 A 240), CoA 11324 (2004 A 128), CoA 11325 (2005 A 108), CoA 11326 ((2005 A 122),Co 87043, Co 87044, Co Si 96071 and COC 10336

c. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

d. **Irrigations** : Seven irrigations were given during the crop growth period.

e. **Plant protection** : --

f. **Date of inoculations** :

1. **Nodal cotton swab method** : September 2012
2. **Plug method** : September 2012

g. **Plot size** : 10 m x 0.8 x 2 rows = 16 sq.m / variety`

h. **Design** : Single series

i. **Replications** : Non – replicated

j. **Dates of harvesting** : November, 2012

1. **Nodal cotton swab method** : November 2012
2. **Plug method** : November 2012

k. **Name and designation of the participating scientist:**

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

l. **Results recorded during the previous year:**

Out of 26 varieties / genotypes tested during 2011-12 by nodal method only four entries (Co A 08321(Co A 08322), CoC 6030 and Co c01061) manifested top drying indicating their nodal susceptibility. In the plug method out of 25 entries, five entries (CoA 07321 (2000A56), CoC07336, CoC07337, Co086249 and CoV 92102) showed resistance while 3 entries CoA 06321 (2001A63), Co Or 08346 and Co 06030 showed moderately resistant reaction to Cf 04, Cf 05 and Cf 06.

m. **Results obtained during this year:**

1.**Cotton swab method:**

Observations for the incidence of nodal infection and internal spread in each variety / genotype was recorded at 60 days after inoculation and the results are presented in Table –2.

It is evident from the results (Table-2) that out of 24 entries tested, only four entries (Co V 09356, Co c01061, Co 86249 and CoA 11322) manifested top drying indicating its susceptibility and the remaining 20 entries reacted as resistant to Cf 04, Cf 05 and Cf 06.

2. Plug method:

Observations on external and internal symptoms were recorded at 60 days after inoculation. Thirty inoculated canes were sampled in each entry for assessing the host reaction. Canes were observed for external symptoms like yellowing or drying of tops. Later, the canes were split opened longitudinally and recorded for internal characteristics of the disease like lesion width, white spots and extent of nodal transgression. Based on the average score of above four characters, reaction of the varieties / genotypes were graded on 0-9 scale and the data are presented in Table – 3.

Results presented in table – 3 revealed that out of 24 varieties / genotypes tested by plug method of inoculation six entries (COC 08336, COA 92081, COA 10321, CO Or 10346, CO 87043 and COC 10336) showed resistance while 4 entries COV 92102, COA 11323, COA 11326 and COSi 96071 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05. Out of 25 entries tested, 5 entries reacted as resistant, 3 as moderately resistant and 16 as highly susceptible to Cf 04, Cf 05 and Cf 06.

VIII Technical programme of the year next to the reporting year:

This experiment is being continued during 2013-14.

IX. Technical summary of the individual report:

Twenty four varieties / genotypes were tested for their reaction to two pathotypes (Cf 04, Cf 05 and Cf 06) of red rot fungus individually by cotton swab and plug method of inoculation. In the cotton swab method, out of 24 entries tested, only four entries (Co V 09356, Co c01061, Co 86249 and CoA 11322) manifested top drying indicating its susceptibility and the remaining 20 entries reacted as resistant**.** out of 24 varieties / genotypes tested by plug method of inoculation six entries (COC 08336, COA 92081, COA 10321, CO Or 10346, CO 87043 and COC 10336) showed resistance while 4 entries COV 92102, COA 11323, COA 11326 and COSi 96071 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05. Out of 25 entries tested, 5 entries reacted as resistant, 3 as moderately resistant and 16 as highly susceptible to Cf 04, Cf 05 and Cf 06.

X. Salient findings:

Out of 24 entries tested, only four entries (Co V 09356, Co c01061, Co 86249 and CoA 11322) manifested top drying indicating its susceptibility and the remaining 20 entries reacted as resistant**.** out of 24 varieties / genotypes tested by plug method of inoculation six entries (COC 08336, COA 92081, COA 10321, CO Or 10346, CO 87043 and COC 10336) showed resistance while 4 entries COV 92102, COA 11323, COA 11326 and COSi 96071 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05. Out of 25 entries tested, 5 entries reacted as resistant, 3 as moderately resistant and 16 as highly susceptible to Cf 04, Cf 05 and Cf 06.

Table 2: Reaction of varieties / genotypes to three pathotypes of red rot fungus in Cotton swab method at 60 days after inoculation (2012-2013)

S.No	Clone	Pathotypes of red rot fungus					
		Cf 04		Cf 06		Cf 05	
		Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction
1	Co A 08323(2003A255)	0.0	R	0.0	R	0.0	R
2	CoA 09321(2004A 55)	0.0	R	0.0	R	0.0	R
3	CoC08336	0.0	R	0.0	R	0.0	R
4	**CoV 09356(2003 V 46)**	0.0	R	0.0	R	0.0	R
5	CoA 92081 (87 A 298)	0.0	R	0.0	R	0.0	R
6	**Co C 01061**	**8.7**	**HS**	**8.8**	**HS**	**9.0**	**HS**
7	Co 6907	4.4	MS	5.6	MS	5.2	MS
8	CoA 10321 (2004 A 104)	0.0	R	0.0	R	0.0	R
9	Co Or 10346	0.0	R	0.0	R	0.0	R
10	Co 7219	4.8	MS	5.0	MS	5.6	MS
11	**Co 86249**	**8.1**	**HS**	**8.4**	**HS**	**8.3**	**HS**
12	Co 6031	0.0	R	0.0	R	0.0	R
13	CoC 08339	0.0	R	0.0	R	0.0	R
14	COV92102(83 V 15)	0.0	R	0.0	R	0.0	R
15	CoA 11321 (2005 A 128)	0.0	R	0.0	R	0.0	R
16	**CoA 11322 (2004 A 107)**	**8.2**	**HS**	**8.8**	**HS**	**9.0**	**HS**
17	CoA 11323(2000 A 240)	0.0	R	0.0	R	0.0	R
18	CoA 11324 (2004 A 128)	0.0	R	0.0	R	0.0	R
19	CoA 11325 (2005 A 108)	0.0	R	0.0	R	0.0	R
20	CoA 11326 ((2005 A 122)	0.0	R	0.0	R	0.0	R
21	Co 87043	0.0	R	0.0	R	0.0	R
22	Co 87044	0.0	R	0.0	R	0.0	R
23	Co Si 96071	0.0	R	0.0	R	0.0	R
24	COC 10336	0.0	R	0.0	R	0.0	R

R: Resistant MR : Moderately Resistant MS : Moderately Susceptible
S: Susceptible HS: Highly susceptible

Table 3: Reaction of varieties / genotypes to the three pathotypes of red rot fungus by plug method at 60 days after inoculation (2012-2013)

S.No	Clone	Pathotypes of red rot fungus					
		Cf 04		Cf 06		Cf 05	
		Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction
1	Co A 08323(2003A255)	8.6	HS	8.9	HS	9.1	HS
2	CoA 09321(2004A 55)	8.3	HS	8.5	HS	9.0	HS
3	**CoC08336**	**1.4**	**R**	**1.3**	**R**	**1.7**	**R**
4	CoV 09356(2003 V 46)	6.9	MS	7.0	MS	7.2	MS
5	**CoA 92081 (87 A 298)**	**1.2**	**R**	**1.6**	**R**	**1.4**	**R**
6	Co C 01061	8.9	HS	9.0	HS	8.6	HS
7	Co 6907	9.2	HS	8.9	HS	8.3	HS
8	**CoA 10321 (2004 A 104)**	**1.4**	**R**	**1.6**	**R**	**1.3**	**R**
9	**Co Or 10346**	**1.2**	**R**	**1.8**	**R**	**1.7**	**R**
10	Co 7219	8.3	HS	8.5	HS	8.1	HS
11	Co 86249	8.9	HS	8.5	HS	H.6	HS
12	Co 6031	9.2	HS	9.0	HS	8.7	HS
13	CoC 08339	8.6	HS	8.3	HS	8.9	HS
14	COV92102(83 V 15)	1.8	R	3.6	MR	3.0	MR
15	CoA 11321 (2005 A 128)	8.6	HS	8.9	HS	9.1	HS
16	CoA 11322 (2004 A 107)	9.1	HS	9.0	HS	8.8	HS
17	CoA 11323(2000 A 240)	**3.8**	**MR**	**3.2**	**MR**	**3.1**	**MR**
18	CoA 11324 (2004 A 128)	8.6	HS	8.4	HS	8.2	HS
19	CoA 11325 (2005 A 108)	8.9	HS	8.8	HS	9.1	HS
20	CoA 11326 ((2005 A 122)	3.6	MR	6.8	MS	7.2	MS
21	**Co 87043**	**1.2**	**R**	**1.5**	**R**	**1.6**	**R**
22	Co 87044	8.4	HS	8.6	HS	8.9	HS
23	Co Si 96071	3.7	MR	7.2	MS	7.8	MS
24	COC 10336	1.6	R	1.4	R	1.8	R

R: Resistant MR : Moderately Resistant MS : Moderately Susceptible
S: Susceptible HS: Highly susceptible

I **Project No.** : PP 17 (b)

II **Project title** : Evaluation of Zonal varieties for resistance to smut

III. **Serial number of the year of experimentation**: 19

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

This experiment is conducted every year to select genotypes resistant to smut which are included is Zonal varietal trial.

During 2010-11 Out of 24 entries tested, four entries (Co A 08323, Co C 08337, Co C08339 and Co V 92102) showed resistant reaction while one entriy (Co A 08321) reacted as moderately resistant, five entries (Co C0 7336, PI 06376, PI 06377, Co Or 08346 and Co C 07337) reacted as moderately susceptible under artificial inoculated condition.

During 2011-12 Out of 24 entries tested, four entries (Co A 08323, Co C 08337, Co C08339 and Co V 92102) showed resistant reaction while one entriy (Co A 08321) reacted as moderately resistant, five entries (Co C0 7336, PI 06376, PI 06377, Co Or 08346 and Co C 07337) reacted as moderately susceptible under artificial inoculated condition.

VI **Technical programme on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report**

a. **Date of planting** : March 2012

b. **Varieties (24)** : Co A 08323(2003A255), CoA 09321(2004A 55), CoC08336, CoV 09356(2003 V 46), CoA 92081 (87 A 298), Co C 01061, Co 6907, CoA 10321 (2004 A 104), Co Or 10346,Co 7219, Co 86249, Co 6031, CoC 08339, COV92102(83 V 15) CoA 11321 (2005 A 128), CoA 11322 (2004 A 107), CoA 11323(2000 A 240), CoA 11324 (2004 A 128), CoA 11325 (2005 A 108), CoA 11326 ((2005 A 122),Co 87043, Co 87044, Co Si 96071 and COC 10336

c. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

d. **Irrigations** : Seven irrigations were given during the crop growth period.

e. **Plant protection** : --

f. **Plot size** : 5 m x 0.8 x 2 rows = 8 sq.m / variety`

g. **Design** : Single series

h. **Date of harvest** : February, 2013

i. **Inoculum** : Teliospores collected from commercially cultivated susceptible varieties around Anakapalle were used as source of inoculum.

j. **Storage**

Freshly collected smut whips were shade dired and teliospores collected by sraping and sieving. The smut spore powder so collected was packed in butter paper covers which were stored in a desiccator using calcium chloride as desiccant. Spore viability was tested before inoculation.

k. **Method of inoculation**:

l. **Name and designation of the participating scientist:**

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

m. **Results recorded during the previous year:**

During 2011-12 Out of 24 entries tested, four entries (Co A 08323, Co C 08337, Co C08339 and Co V 92102) showed resistant reaction while one entriy (Co A 08321) reacted as moderately resistant, five entries (Co C0 7336, PI 06376, PI 06377, Co Or 08346 and Co C 07337) reacted as moderately susceptible under artificial inoculated condition.

n. **Results obtained during this year:**

Smut incidence was recorded at fortnightly intervals from the appearance of first smut whip. At each observation, affected clumps were rogued out to avoid secondary infection. Based on the percent smut incidence, the entries were grouped into different categories and the data are furnished in Table-4.

The data presented in Table –4 indicated that out of 24 varieties / genotypes tested, four entries (Co A 08323, CoC 08339, COV92102 and Co 87043) showed resistant reaction while three entries (CoV 09356, CoA 10321 and Co Or 10346) reacted as moderately resistant, seven entries (CoA 09321, Co 86249, CoA 11321, CoA 11322, CoA 11323, CoA 11325 and CoA 11326) reacted as moderately susceptible. The remaining 10 entries showed susceptible to highly susceptible reaction.

VIII. **Technical programme of the year next to the reporting year:**

This experiment is being continued during 2013-14

IX. **Technical summary of the individual report:**

Twenty four varieties / genotypes were tested for their resistance to smut disease. Smut incidence was recorded at fortnightly intervals from the date of appearance of first smut whip. Based on the percent smut incidence, the entries were grouped into different categories.

out of 24 varieties / genotypes tested, four entries (Co A 08323, CoC 08339, COV92102 and Co 87043) showed resistant reaction while three entries (CoV 09356, CoA 10321 and Co Or 10346) reacted as moderately resistant, seven entries (CoA 09321, Co 86249, CoA 11321, CoA 11322, CoA 11323, CoA 11325 and CoA 11326) reacted as moderately susceptible. The remaining 10 entries showed susceptible to highly susceptible reaction.

X. **Salient findings:**

Out of 24 varieties / genotypes tested, four entries (Co A 08323, CoC 08339, COV92102 and Co 87043) showed resistant reaction while three entries (CoV 09356, CoA 10321 and Co Or 10346) reacted as moderately resistant, seven entries (CoA 09321, Co 86249, CoA 11321, CoA 11322, CoA 11323, CoA 11325 and CoA 11326) reacted as moderately susceptible. The remaining 10 entries showed susceptible to highly susceptible reaction.

Table 4: Reaction of varieties / genotypes to smut (2012- 2013)

S.No	Clone	Percent smut incidence	Reaction
1	Co A 08323(2003A255)	**0.0**	**R**
2	CoA 09321(2004A 55)	15.0	MS
3	CoC08336	72.3	HS
4	CoV 09356(2003 V 46)	7.6	MR
5	CoA 92081 (87 A 298)	39.4	HS
6	Co C 01061	53.7	HS
7	Co 6907	59.4	HS
8	CoA 10321 (2004 A 104)	7.8	MR
9	Co Or 10346	9.09	MR
10	Co 7219	33.3	HS
11	Co 86249	23.5	MS
12	Co 6031	66.3	HS
13	**CoC 08339**	**0.0**	**R**
14	**COV92102(83 V 15)**	**0.0**	**R**
15	CoA 11321 (2005 A 128)	19.0	MS
16	CoA 11322 (2004 A 107)	15.15	MS
17	CoA 11323(2000 A 240)	20.0	MS
18	CoA 11324 (2004 A 128)	25.0	S
19	CoA 11325 (2005 A 108)	20.0	MS
20	CoA 11326 ((2005 A 122)	18.5	MS
21	**Co 87043**	**4.69**	**R**
22	Co 87044	88.5	HS
23	Co Si 96071	36.6	HS
24	COC 10336	28.2	S

R: Resistant MR: Moderately Resistant MS: Moderately susceptible
S: Susceptible HS: Highly susceptible

I **Project No.** : PP 17 (C)

II **Project title** : Evaluation of Zonal varieties for resistance to wilt

III. **Serial number of the year of experimentation**: 02

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

To select genotypes resistant to wilt among the agronomically important selections. This is a new study.

VI **Technical programme on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report**

a. **Date of planting** : March 2012

b. **Varieties (24)** : Co A 08323(2003A255), CoA 09321(2004A 55), CoC08336, CoV 09356(2003 V 46), CoA 92081 (87 A 298), Co C 01061, Co 6907, CoA 10321 (2004 A 104), Co Or 10346,Co 7219, Co 86249, Co 6031, CoC 08339, COV92102(83 V 15) CoA 11321 (2005 A 128), CoA 11322 (2004 A 107), CoA 11323(2000 A 240), CoA 11324 (2004 A 128), CoA 11325 (2005 A 108), CoA 11326 ((2005 A 122),Co 87043, Co 87044, Co Si 96071 and COC 10336

c. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

d. **Irrigations** : Seven irrigations were given during the crop growth period.

e. **Plant protection** : --

f. **Plot size** : 5 m x 0.8 x 2 rows = 8 sq.m / variety`

g. **Design** : Single series

h. **Date of harvest** : February, 2013

i. **Method of inoculation** : Plug method

j. **Inoculum** : Cane growing areas of the state visited during July-August, 2012 and wilt affected cane samples from different varieties will be collected. Isolates obtained from the samples will be maintained on PDA. About 30 standing canes will be inoculated in each variety with each isolate by adopting plug method of inoculation.

k. Data to be collected:

Germination count at 45 days after planting

2. Appearance of wilt symptoms on the standing canes

3. At the end of 10 months 10 clumps are to be uprooted with roots. All the canes from the clumps will be split open longitudinally and the wilt severity index scored on a 0- 4 scale

0.0- 0.9 = Resistant
1.0- 1.9= Moderately Resistant
2.0- 2.9= Moderately susceptible
3.0- 3.9= Susceptible
>4.0 = Highly Susceptible

Grade	**Symptoms**
0	Healthy canes and roots with no external symptoms of wilt
1	No wilting or drying of leaves, no stunting or shrinking of the stalk or rind, slight pith formation with yellow discolouration of the internal tissues in one or two lower internodes only. No cavity formation or fungal growth seen. Apparently normal and healthy roots
2	Mild yellowing of top leaves and drying of lower leaves, mild stunting and shrinking of the stalk and rind. Yellowish discolouration of internal tissues extending to three or four bottom internodes. Slight cavity formation of the pith, no fungal growth seen, slightly discoloured roots.
3	Mild yellowing of top leaves and drying of lower leaves, mild stunting and shrinking of the stalk and rind. Light brown discolouration of the internal tissue throughout the entire length of the cane expect the top. Severe pith and cavity formation. Sparse fungal growth observed in the pith cavities.
4	Complete yellowing and death of the leaves, marked stunting, shrinking and drying of the stalk and rind, dark brown discolouration of the internal tissues extending throughout the entire length of the cane. Large pith cavities with profuse over growth of the associated fungi. Most of the roots necrotic with dark discolouration which dislodge easily from the stalks. Roots mildly discoloured and slightly necrotic.

$$\text{Mean wilt severity index} = \frac{\text{Sum of wilt incidences of individual stalks}}{\text{Number of stalks samples}}$$

l. **Name and designation of the participating scientist:**

Dr. N. Raj Kumar Scientist (Plant Pathology)

m. **Results recorded during the previous year:**

Out of 24 varieties / genotypes tested during 2010-11, eight entries (Co C 08337, Co A 07321, Co 06031, CoC08338, Co C 8339, Co Or 06031, CoC 01061 and Co V 92102) showed resistant reaction while two entries (Co V 07356 and CoA 06321) reacted as moderately resistant. The remaining 14 entries showed susceptible to highly susceptible reaction.

Out of 26 varieties / genotypes tested during 2011-12 five entries (Co A 07321, Co C 08338, Co 06030, Co 06031, CoC08338 and Co 086246) showed resistant reaction while two entries (Co 08339 and CoA 06321) reacted as moderately resistant. The remaining 19 entries showed susceptible to highly susceptible reaction.

n. **Results obtained during this year:**

Observations on external and internal symptoms were recorded at 90 days after inoculation. Thirty inoculated canes were sampled in each entry for assessing the host reaction. Canes were observed for external symptoms like yellowing and death of the leaves, marked stunting, shrinking and drying of the stalk and rind, dark brown discolouration of the internal tissues extending throughout the entire length of the cane. Large pith cavities with profuse over growth of the associated fungi. Most of the roots necrotic with dark discolouration which dislodge easily from the stalks. Roots mildly discoloured and slightly necrotic, reaction of the varieties / genotypes were graded on 0-4 scale.

The data presented in Table –5 indicated that out of 24 varieties / genotypes tested, five entries (**CoA 92081 and CoV 92102**) showed resistant reaction while five entries (**CoC 08339, CoA 11321, CoA 11323, Co 87043 and Co 87044**) reacted as moderately resistant. The remaining 19 entries showed susceptible to highly susceptible reaction.

VIII. **Technical programme of the year next to the reporting year:**

This experiment is being continued during 2013-14

IX. **Technical summary of the individual report:**

24 varieties / genotypes tested, five entries (**CoA 92081 and CoV 92102**) showed resistant reaction while five entries (**CoC 08339, CoA 11321, CoA 11323, Co 87043 and Co 87044)** reacted as moderately resistant. The remaining 19 entries showed susceptible to highly susceptible reaction

X. **Salient findings:**

Out of 24 varieties / genotypes tested, five entries (**CoA 92081 and CoV 92102**) showed resistant reaction while five entries (**CoC 08339, CoA 11321, CoA 11323, Co 87043 and Co 87044)** reacted as moderately resistant. The remaining 19 entries showed susceptible to highly susceptible reaction.

Table 5: Reaction of varieties / genotypes to wilt (2012- 2013)

S.No	Clone	Germination count At 45 DAP	Mean wilt severity index	Reaction
1	Co A 08323(2003A255)	47	2.1	MS
2	CoA 09321(2004A 55)	45	2.3	MS
3	CoC08336	43	3.3	MS
4	CoV 09356(2003 V 46)	47	3.8	HS
5	**CoA 92081 (87 A 298)**	**45**	**0.5**	**R**
6	Co C 01061	48	4.0	HS
7	Co 6907	47	2.45	MS
8	CoA 10321 (2004 A 104)	50	2.22	MS
9	Co Or 10346	50	3.45	S
10	Co 7219	48	3.74	S
11	Co 86249	45	2.58	MS
12	Co 6031	43	2.34	MS
13	CoC 08339	47	1.40	MR
14	**COV92102(83 V 15)**	**43**	**0.45**	**R**
15	CoA 11321 (2005 A 128)	48	1.41	MR
16	CoA 11322 (2004 A 107)	42	2.33	MS
17	CoA 11323(2000 A 240)	45	1.0	MR
18	CoA 11324 (2004 A 128)	44	3.18	S
19	CoA 11325 (2005 A 108)	48	2.72	MS
20	CoA 11326 ((2005 A 122)	49	2.0	MS
21	Co 87043	47	1.63	MR
22	Co 87044	45	1.23	MR
23	Co Si 96071	43	2.33	MS
24	COC 10336	47	3.58	S

R: Resistant MR: Moderately Resistant MS: Moderately susceptible
S: Susceptible HS: Highly susceptible

I **Project No.** : PP 22

II **Project title** : Survey of sugarcane diseases occurring in the area on important sugarcane varieties.

III. **Serial number of the year of experimentation**: 24

IV. **Location** : A general survey was conduced in the state of Andhra Pradesh.

V. **Objectives:**

To gather information on diseases naturally occurring on sugarcane to compile a status report on all India basis.

VI **Technical programme on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Dicipline wise technical report**

a) Name and designation of the participating scientist:

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

b) Results obtained during previous year :

Red rot, smut, top rot, ring spot, rust and wilt diseases were recorded on sugarcane during 2007-08.

During 2008-09 and 2009- 10 Red rot, smut, yellow leaf disease, grassy shoot, top rot, ring spot, rust and wilt diseases were recorded on sugarcane.

c) Results obtained during this year :

A general survey was conducted to study and record the natural occurrence of diseases on important sugarcane varieties in Andhra Pradesh and the results are presented in Table – 6.

It is evident from the results presented in Table – 6 that red rot, 10-40 % incidence was observed on Co62175, 81A 99, 93 V 297 and 81 V 48 in V isakhapatnam, Chittor and Srikakulam districts . Compared to 2011-12 the cultivation of Co 62175 was reduced due to severe incidence of red rot during 2011-12. But this year also noticed the red rot incidence where the farmers who were growing ratoon crop of Co 62175.

Smut disease incidence was noticed in all most all sugarcane growing areas of Andhra Pradesh ranging from 10-60 % mostly on ratoon crop of Co A 92081,CoV 09356 (2003V46), 91 V 83 and 97 R 83.

Wilt incidence also was observed 10-40 % in Coastal and Telangana areas of Andhra Pradesh on Co 8368, 87 A 380, Co7219, 91 V 83, CoA 92081, Co 62175 and 81 A99.

Yellow leaf disease is increasing year after year in all sugarcane growing areas of Andhra Pradesh in all the varieties.

Top rop rust, ring spot and GSD are predominant diseases recorded during the period 2012-13 on sugarcane. Rust and ring spot diseases are observed in some areas even after 2-3 months after planting and also increasing their incidence year after year.

VIII. **Technical programme of the next year to the reporting year:**

The experiment is being continued during 2013-14.

Table: 6 -Natural Occurrence of sugarcane diseases in Andhra Pradesh during 2012-2013

Disease	Name of area surveyed	% disease incidence (Clump basis)	Varieties affected	Crop stage when observed	Any other information
Red rot	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	20-30	81A 99 81 V 48	Grand growth stage	Ratoon crop
	Santakaviti, Honjaram, Medamarthi, Labham, Lankam, guttavelli, Kollivalasa, Sankili (Srikakulam Dt)	10-30	Co 62175	Grand growth stage	Ratoon crop and water logging conditions
	Chodavaram, Narsipatnam, Tandava, Etikoppaka (Visakhapatnam Dt)	10-25	81A 99 81 V 48	Grand growth stage	Water logging conditions
	Punganur, Palamaner, Nagulapalem of Chittor dt	30-40	93 V 297	Grand growth stage	Ratoon crop and water logging conditions
Smut	Bobbili, Salur, Gajapatinagaram (Vijayanagaram Dt)	50-60	CoA 92081	Grand growth stage	More during April to June And ratoon crop
	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	30-40	Co6907 Co A 92081	Tillering to cane formation	
	Cheepurupalli, Ranastalam, Rajam, Terlam , Nemalam (Vijayanagaram Dt)	20-50	CoA 92081 CoA 99082 (93 A145)	Tillering to cane formation	
	Bodhan, Rudrur Karimnagar, Nizamabad	30-40	CoA 92081 97 R 401	Tillering to cane formation	
	Samalkot, Elaswaram, yerravarm, Chelluru (East Godavari dt)	20-30	Co A 92081,CoV 09356 (2003V46),91 V 83	Tillering	
	Chodavaram, Narsipatnam, Tandava, Etikoppaka (Visakhapatnam Dt)	10-25	Co6907 Co A 92081	Grand growth stage	
Wilt	Bobbili, Salur, Gajapatinagaram (Vijayanagaram Dt)	10-20	Co 8368 87 A 380 Co7219	Grand growth stage	Ratoon crop
	Samalkot, Elaswaram, yerravarm, Chelluru (East Godavari dt)	10-15	91 V 83	Grand growth stage	Ratoon crop

	Karimnagar, Nizamabad	30-40	93 V 297	Tillering stage	Ratoon crop
	Chodavaram, Narsipatnam, Tandava, Etikoppaka (Visakhapatnam Dt)	30-40	CoA 92081 81 A99	Grand growth stage	Ratoon crop
	NCS Sugar factory, Bobbili	20-25	Co 6907, 81 A99 Co 62175, Co 7601	Grand growth stage	Ratoon crop
YLD	Bobbili, Salur, Gajapatinagaram (Vijayanagaram Dt)	10-30	CoA 92081,Co 86032, Co 8368, CoV 09356 (2003V46)	Grand growth stage	Drought situation followed by heavy rains Ratoon crop and water logging conditions
	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	15-25	Co6907 Co A 92081	Grand growth stage	
	Cheepurupalli, Ranastalam, Rajam, Terlam , Nemalam (Vijayanagaram Dt)	30-50	CoA 92081 Co 86032, Co 8368	Grand growth stage	
	Karimnagar, Nizamabad	30-35	93 V 297 Co A 92081 83R 23	Grand growth stage	
	Samalkot, Elaswaram, yerravarm, Chelluru (East Godavari dt)	30-60	Co A 92081, CoV 09356(2003V46) 91 V 83, CoV 92102	Grand growth stage	
	Etikoppaka (Visakhapatnam Dt)	10-15	Co A 92081, Co6907	Grand growth stage	
	Punganur, Palamaner, Nagulapalem of Chittor dt	20-50	93 V 297, CoA 92081, CoV 09356(2003V46) Co 7201, 86 V 96 (CoV 94101), 2002V 46.	Grand growth stage	
GSD	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	50-60	C0 7219 CoA 92081	Tillering	More severe in ratoons
	Samalkot, Elaswaram, yerravarm, Chelluru (East Godavari dt)	10-20	Co A 92081, CoV 09356 (2003V46)CoV 92102	Ratoons	Tillering

Rust	Bobbili, Salur, Gajapatinagaram (Vijayanagaram Dt)	10-15	CoA 92081	Grand growth stage	Increased after heavy Neelam cyclonic rains durineg November
	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	50-60	Co6907, C0 7219 CoA 92081	Tillering to cane formation	
	Cheepurupalli, Ranastalam, Rajam, Terlam , Nemalam (Vijayanagaram Dt)	30-50	CoA 92081 CoA 99082 (93 A145) Co86032,**CoA 06321** (2001A63) CoV 09356(2003V46)	Grand growth stage	
Ring Spot	Bobbili, Salur, Gajapatinagaram (Vijayanagaram Dt)	40-50	CoA 92081	Grand growth stage	Increased after heavy Neelam cyclonic rains durineg Nov.
	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	30-40	Co6907, C0 7219 CoA 92081	Grand growth stage	
	Cheepurupalli, Ranastalam, Rajam, Terlam , Nemalam (Vijayanagaram Dt)	40-60	CoA 92081 CoA 99082 (93 A145) Co86032 CoA 06321 (2001A63)	Grand growth stage	
Top rot	Samalkot, Elaswaram, yerravarm, Chelluru (East Godavari dt)	20-30	CoV 09356 (2003V46) 91 V 83	Tillering to cane formation	Increased after heavy Neelam cyclonic rains durineg November
	Nagulapalli, Achutapuram, Kothuru, Munagapaka (Visakhapatnam Dt)	20-30	Co6907 CoA 99082 (93 A145) Co 7219	Tillering to cane formation	

I **Project No.** : PP 23

II **Project title** : Assessment of elite and ISH genotypes for resistance to red rot.

III. **Serial number of the year of experimentation**: 01

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

This experiment is conducted every year to obtain information on relative resistance of varieties included in Zonal varietal trial. During 2011-12, seventeen ISH entries / genotypes tested for their reaction to two pathotypes (Cf 04, Cf 06 and Cf 05 of red rot fungus individually by plug method of inoculation.

VI **Technical programme on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report**

a. **Date of planting** : March 2012

b. **Varieties (17)** : ISH 257, ISH 263, ISH 267, ISH 293, ISH 287, ISH 296, ISH 282, ISH 280, ISH 271, ISH 291, ISH 276, ISH 308, ISH 338, ISH 274, ISH 312, ISH 301, ISH 285

c. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

d. **Irrigations** : Seven irrigations were given during the crop growth period.

e. **Plant protection** : --

f. **Date of inoculations** : September, 2012

1. **Plug method** : September, 2012

g. **Plot size** : 10 m x 0.8 x 2 rows = 16 sq.m / variety`

h. **Design** : Single series

i. **Replications** : Non – replicated

j. **Dates of harvesting** :

1. **Plug method** : November 2012

k. **Name and designation of the participating scientist:**

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

l. **Results recorded during the previous year:**

Out of 17 varieties / genotypes tested by plug method of inoculation during 2011-12 six entries (ISH-263, ISH- 267, ISH- 276, ISH- 291 and ISH- 312) showed resistance while 3 entries ISH- 280, ISH 271 and ISH 308 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05 and remaining are highly susceptible.

m. **Results obtained during this year:**

1. Plug method:

Observations on external and internal symptoms were recorded at 60 days after inoculation. Thirty inoculated canes were sampled in each entry for assessing the host reaction. Canes were observed for external symptoms like yellowing or drying of tops. Later, the canes were split opened longitudinally and recorded for internal characteristics of the disease like lesion width, white spots and extent of nodal transgression. Based on the average score of above four characters, reaction of the varieties / genotypes were graded on 0-9 scale and the data are presented in Table – 7.

Results presented in table – 7 revealed that out of 17 varieties / genotypes tested by plug method of inoculation five entries (ISH-26, ISH- 276, ISH-282, ISH- 291 and ISH- 312) showed resistance while 4 entries ISH- 280, ISH 271, ISH- 338 and ISH 308 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05 and remaining are highly susceptible.

VIII Technical programme of the year next to the reporting year:

This experiment is being continued during 2012-13.

IX Technical summary of the individual report:

Seventeen varieties / genotypes were tested for their reaction to two pathotypes (Cf 04, Cf 05 and Cf 06) of red rot fungus individually and as a mixture by nodal and plug method of inoculation.

Out of 17 varieties / genotypes tested by plug method of inoculation five entries (ISH-26, ISH- 276, ISH-282, ISH- 291 and ISH- 312) showed resistance while 4 entries ISH- 280, ISH 271, ISH- 338 and ISH 308 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05 and remaining are highly susceptible.

X. Salient findings:

Out of 17 varieties / genotypes tested by plug method of inoculation five entries (ISH-26, ISH- 276, ISH-282, ISH- 291 and ISH- 312) showed resistance while 4 entries ISH- 280, ISH 271, ISH- 338 and ISH 308 showed moderately resistant reaction to Cf 04, Cf 06 and Cf 05 and remaining are highly susceptible.

Table 7. Reaction of ISH sugarcane entries to Cf 04, Cf 06 and Cf 05 under Plug method at 60 days after Inoculation (2012-13)

S.No	Varieties	Pathotype of red rot fungus					
		Cf 04		Cf 06		Cf 05	
		Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction	Score on 0-9 scale	Reaction
1	ISH 257	8.6	H.S	8.7	H.S	8.4	HS
2	ISH 263	4.6	MS	5.4	MS	4.5	MS
3	**ISH 267**	**1.5**	**R**	**1.4**	**R**	**1.8**	**R**
4	ISH 271	2.7	MR	3.4	MR	3.2	MR
5	ISH 274	5.2	MS	5.8	MS	4.8	MS
6	**ISH 276**	**1.8**	**R**	**1.6**	**R**	**1.9**	**R**
7	ISH 280	3.2	MR	2.8	MR	3.7	MR
8	**ISH 282**	**1.4**	**R**	**1.7**	**R**	**1.6**	**R**
9	ISH 285	9.0	HS	8.7	HS	9.0	HS
10	ISH 287	9.0	HS	8.7	HS	9.0	HS
11	**ISH 291**	**1.7**	**R**	**1.3**	**R**	**1.6**	**R**
12	ISH 293	5.2	MS	5.6	MS	5.4	MS
13	ISH 296	9.0	HS	8.7	HS	9.0	HS
14	ISH 301	8.4	HS	8.2	HS	8.7	HS
15	ISH 308	3.4	MR	3.8	MR	3.0	MR
16	**ISH 312**	**1.8**	**R**	**1.6**	**R**	**1.2**	**R**
17	ISH 338	3.3	MR	3.8	MR	3.6	MR

R: Resistant MR : Moderately Resistant MS : Moderately Susceptible
S: Susceptible HS: Highly susceptible

I. Project No. **PP-30**

II. Project Title Assessment of field resistance in sugarcane to red rot.

III. Serial number of the year of experimentation: 01

IV. Location Regional Agricultural Research Station, Anakapalle.

V. Technical programme on which the report is based:

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VI. Discipline wise technical report

a.	**Date of planting**	:	March 2012
b.	**Varieties (24)**	:	Co A 08323(2003A255), CoA 09321(2004A 55), CoC08336, CoV 09356(2003 V 46), CoA 92081 (87 A 298), Co C 01061, Co 6907, CoA 10321 (2004 A 104), Co Or 10346,Co 7219, Co 86249, Co 6031, CoC 08339, COV92102(83 V 15) CoA 11321 (2005 A 128), CoA 11322 (2004 A 107), CoA 11323(2000 A 240), CoA 11324 (2004 A 128), CoA 11325 (2005 A 108), CoA 11326 ((2005 A 122),Co 87043, Co 87044, Co Si 96071, COC 10336, Co 671, C0 419 and C0997.
c.	**Fertilizer application**	:	112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.
d.	**Irrigations**	:	Seven irrigations were given during the crop growth period.
e.	**Plant protection**	:	--
f.	**Date of inoculations**	:	
1.	**Nodal cotton swab method**	:	September 2012
2.	**Plug method**	:	September 2012
g.	**Plot size**	:	10 m x 0.8 x 2 rows = 16 sq.m / variety`
h.	**Design**	:	Single series
i.	**Replications**	:	Non – replicated
j.	**Dates of harvesting**	:	November, 2012
1.	**Nodal cotton swab method**	:	November 2012
2.	**Plug method**	:	November 2012

k. **Name and designation of the participating scientist:**

Dr. N. Raja Kumar Scientist (Plant Pathology)

l. **Results recorded during the previous year:**

New study

m. **Results obtained during this year:**

VIII Technical programme of the year next to the reporting year:

This experiment is being continued during 2012-13.

IX. Technical summary of the individual report:

Twenty seven varieties / genotypes were screened for field resistance to red rot by grain method of inoculation fourteen entries (CoA 09321, Co C 01061, Co 6907, Co 7219, Co 86249, Co 6031, CoA 11321, CoA 11322, CoA 11324, CoA 11325 and Co 87044) included susceptible checks CoC 671, Co 419 and Co 997 exhibited varying symptoms like Yellowing of leaves in settling (SY) and Drying of leaves in settling (SD). Remaining 13 entries showed resistance and not exhibited any kind of symptoms.

X. Salient findings:

Out of 27 varieties / genotypes tested by rot by grain method of inoculation fourteen entries (CoA 09321, Co C 01061, Co 6907, Co 7219, Co 86249, Co 6031, CoA 11321, CoA 11322, CoA 11324, CoA 11325 and Co 87044) included susceptible checks CoC 671, Co 419 and Co 997 exhibited varying symptoms like Yellowing of leaves in settling (SY) and Drying of leaves in settling (SD). Remaining 13 entries showed resistance and not exhibited any kind of symptoms.

Table 8 : Assessment of field resistance in sugarcane to red rot (2012- 2013)

S.No	Clone	Reaction to red rot	Symptoms observed	*C. falcatum* recovered (Yes/No)
1	Co A 08323(2003A255)	R	--	No
2	CoA 09321(2004A 55)	S	SY,SD	Yes
3	CoC08336	R	--	**No**
4	CoV 09356(2003 V 46)	R	--	**No**
5	CoA 92081 (87 A 298)	R	--	**No**
6	Co C 01061	S	SY,SD	Yes
7	Co 6907	S	SM	Yes
8	CoA 10321 (2004 A 104)	R	--	**No**
9	Co Or 10346	R	--	**No**
10	Co 7219	S	SY,SD	Yes
11	Co 86249	S	SY,SD	Yes
12	Co 6031	S	SY,SD	Yes
13	CoC 08339	R	--	**No**
14	COV92102(83 V 15)	R	--	**No**
15	CoA 11321 (2005 A 128)	S	SY,SD,CD	Yes
16	CoA 11322 (2004 A 107)	S	SY,SD	Yes
17	CoA 11323(2000 A 240)	R	--	**No**
18	CoA 11324 (2004 A 128)	S	SY,CD	Yes
19	CoA 11325 (2005 A 108)	S	SY,SD	Yes
20	CoA 11326 ((2005 A 122)	R	--	**No**
21	Co 87043	R	--	**No**
22	Co 87044	S	SY	**Yes**
23	Co Si 96071	R	--	**No**
24	COC 10336	R	--	**No**
25	CoC 671	S	SY,SD,CD	**Yes**
26	Co 419	S	SY,SD,CD	**Yes**
27	Co 997	S	SY,SD,CD	**Yes**

Yellowing of leaves in settling (SY); Drying of leaves in settling (SD); Settling mortality (SM); Rotting in intermodal tissue of cane (CR); Yellowing of spindle leaves (LY); Drying of spindle leaves (LD); Whole clump drying (CD).

I **Project No.** : PP 31

II **Project title** : Screening, epidemiology and management of top rot in sugarcane.

III. **Serial number of the year of experimentation**: 02

IV. **Location** : Regional Agricultural Research Station, Anakapalle

V. **Objectives, results of past years and future line of work:**

This experiment is conducted every year to obtain information on relative resistance of varieties included in Zonal varietal trial. During 2011-12, 51 entries / genotypes were tested for their reaction to top rot disease under natural conditions.

VI **Technical programme on which the report is based:**

The technical programme of work for the year 2012-13 was discussed and finalized during 29th group meet of AICRP on sugarcane held at Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in October, 2011.

VII. **Discipline wise technical report**

a. **Date of planting** : March 2012

b. **Varieties** : 52

c. **Fertilizer application** : 112, 100 and 120 kg N, P_2O_5 and K_2O / ha respectively. Entire P_2O_5 and K_2O were applied as basal dose. N fertilizer (Urea) was applied two equal splits at 45 and 90 days after planting.

d. **Irrigations** : Seven irrigations were given during the crop growth period.

e. **Plant protection** : --

g. **Plot size** : 10 m x 0.8 x 2 rows = 16 sq.m / variety`

h. **Design** : Single series

i. **Replications** : Non – replicated

j. **Dates of harvesting** : February, 2012

k. **Name and designation of the participating scientist:**

1. Dr. N. Raj Kumar Scientist (Plant Pathology)
2. Dr.K. PrasadaRao, Principal Scientist (Sugarcane)

l. **Results recorded during the previous year:**

During 2011-12 Fifty one varieties / genotypes were screened against top rot disease under natural conditions Out of 51 varieties / genotypes five varieties (Co C 671, Co A 99082, Co 7706, CoA 09321, CoA 92081,and 2008 A 380) showed Highly Susceptible, while six entries Co 419, Co C 1061, Co C 8339, CoV 92102, Co 7805 and Co A 08321 susceptible reaction to top rot disease and remaining are Resistant.

m. **Results obtained during this year:**

Results presented in table – 9 revealed that out of 52 varieties / genotypes were screened against top rot disease under natural conditions nineentries/varieties (Co 419, Co C 671, Co 7706, CoA 92081 (87 A 298**),** CoA 99082 (93 A145), 2008A 171, 2008A 124, 2008A 380 and CoV 92102) showed Highly Susceptible, while five entries 2008A234, 2009A302, 2009A288, CoA 11322 and CoA 11326) susceptible reaction to top rot disease and remaining are Resistant.

VIII. Technical programme of the year next to the reporting year:

This experiment is being continued during 2013-14.

IX. Technical summary of the individual report:

Fifty two varieties / genotypes were screened against top rot disease under natural conditions Out of 52 varieties / genotypes were screened against top rot disease under natural conditions nineentries/varieties (Co 419, Co C 671, Co 7706, CoA 92081 (87 A 298**),** CoA 99082 (93 A145), 2008A 171, 2008A 124, 2008A 380 and CoV 92102) showed Highly Susceptible, while five entries 2008A234, 2009A302, 2009A288, CoA 11322 and CoA 11326) susceptible reaction to top rot disease and remaining are Resistant.

X. Salient findings:

Out of 52 varieties / genotypes were screened against top rot disease under natural conditions nineentries/varieties (Co 419, Co C 671, Co 7706, CoA 92081 (87 A 298**),** CoA 99082 (93 A145), 2008A 171, 2008A 124, 2008A 380 and CoV 92102) showed Highly Susceptible, while five entries 2008A234, 2009A302, 2009A288, CoA 11322 and CoA 11326) susceptible reaction to top rot disease and remaining are Resistant.

Table: 9 – Reaction of Sugarcane clones for resistance to top rot (20012-2013)

S. No	Varieties	Per cent infected plants				Disease reaction
		Mild	Moderate	Severe	Total incidence	
1.	CO 419	13	6	3	22	HS
2.	CO C 671	22	12	7	43	HS
3.	CO 997	2	1	0	3	R
4.	CO 7706	18	10	5	33	HS
5.	CO6304	0	0	0	0	R
6.	87 A 298	12	8	6	26	HS
7.	81 A99	0	0	0	0	R
8.	84 A 125	0	0	0	0	R
9.	93 A145	18	12	7	37	HS
10.	CO A7219	0	0	0	0	R
11.	CO 6907	0	0	0	0	R
12.	85 A 261	0	0	0	0	R
13.	2004 A 55	0	0	0	0	R
14	CO Si96071	0	0	0	0	R
15.	CO 87043	0	0	0	0	R
16.	2008 A 104	0	0	0	0	R
17.	2008 A 105	0	0	0	0	R
18.	2008A 15	0	0	0	0	R
19.	2008 A 13	0	0	0	0	R
20.	2008 A 120	0	0	0	0	R
21.	2008 A 160	0	0	0	0	R
22.	2008A 171	12	11	5	27	HS
23.	2008A 124	15	12	7	34	HS
24.	2008A234	9	6	3	18	S
25	2008A187	0	0	0	0	R
26	2008A458	0	0	0	0	R
27	2008A466	0	0	0	0	R
28	2008A 380	23	12	5	40	HS
29	2008A387	0	0	0	0	R
30	2008A419	0	0	0	0	R
31	2009A190	0	0	0	0	R

32	2009A377	0	0	0	0	R
33	2009A302	7	3	2	12	S
34	CO87044	0	0	0	0	R
35	2009A104	0	0	0	0	R
36	2009A107	3	2	0	5	R
37	CoOr10346	0	0	0	0	R
38	Co86249	0	0	0	0	R
39	2009A271	0	0	0	0	R
40	CoC10336	0	0	0	0	R
41	2009A235	0	0	0	0	R
42	2009A288	7	3	1	11	S
43	CoV92102	12	9	5	26	HS
44	2009A123	0	0	0	0	R
45	2009A385	0	0	0	0	R
46	2009A399	0	0	0	0	R
47	CoA11323	3	2	3	8	MS
48	CoA11321	0	0	0	0	R
49	CoA11326	7	3	2	12	S
50	CoA11324	0	0	0	0	R
51	CoA11325	0	0	0	0	R
52	CoA 11322	7	3	3	13	S

R: Resistant , MR: Moderately Resistant, MS: Moderately Susceptible, S: Susceptible, HS: Highly Susceptible

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Table: 10. Monthly mean weather data during the crop season 2012-13

Month & Year	No. of Rainy Days	Rain (mm)	Temparature c		R.H%		Wind velocity (kmph)	B.S.S.H	Evaporation (m.m)
			Max	Min	F.N	A.N			
Jan, 2012	0	0.0	929.1	430.6	2986	1619	45.23	222.1	105.4
Feb, 2012	0	0.00	952.80	401.40	2724.00	1314.00	53.40	219.00	136.90
Mar, 2012	0	0.0	1077.7	616.1	2902.0	1715.0	79.1	227.2	167.6
April, 2012	1	5.4	1088.9	659.6	2537.0	1555.0	26.4	218.3	188.1
May, 2012	6	40.4	1149.2	756.5	2618.0	1701.0	26.5	200.2	185.2
June, 2012	8	44.4	1089.7	738.7	2300.0	1691.0	28.7	114.9	160.0
July, 2012	16	168.6	983.6	689.7	2776.0	2228.0	18.304	108.0	93.6
Aug, 2012	19	183.6	975.4	679.2	2849.0	2178.0	21.17	100.5	85.3
Sept, 2012	18	251.8	956.3	650.5	2753.0	2187.0	19.16	110.9	72.1
Oct, 2012	10	141.4	986.9	623.4	2808.0	2022.0	24.94	172.5	87.8
Nov, 2012	6	298.8	891.5	521.9	2778.0	1932.0	36.7	173.3	79.2
Dec, 2012	0	0.0	947.2	445.8	2829.0	1544.0	40.3	227.2	107.1
Jan, 2013	1	19.8	931.6	462.8	2960	1730	36.1	186.3	97.2
Febr, 2013	1	5.00	888.60	421.00	2555.00	1226.00	48.30	191.70	113.30
Mar, 2013	1	5.0	1084.3	541.1	2737.0	1291.0	58.5	251.0	170.8

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