All India Coordinated Research Project on Sugarcane

(Indian Council of Agricultural Research)

TECHNICAL REPORT

PLANT PATHOLOGY

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Compiled by

Dr. R. Viswanathan

Head, Crop Protection
Sugarcane Breeding Institute
Principal Investigator
AICRP(S)- Plant Pathology

With the Assistance of

Dr. V. Jayakumar
Dr. R. Selvakumar

ICAR-SUGARCANE BREEDING INSTITUTE
Coimbatore- 641 007

PP 14: IDENTIFICATION OF PATHOTYPES IN RED ROT PATHOGEN

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

Location : **i) North Western Zone**
Lucknow, Shahjahanpur, Kapurthala, Uchani and Karnal (SBI)
ii) North Central Zone
Pusa, Seorahi
iii) East Coast Zone
Anakapalle and Cuddalore
iv) Peninsular Zone
Navsari, Coimbatore, Thiruvalla

Year of Start: 1983-84 (continuing project)

New isolates showing pathogenic variability from the previously reported pathotypes at different centers will be confirmed at the following centres, Lucknow and Uchani (North West Zone), Anakapalle (East Coast zone) and SBI, Coimbatore (Peninsular zone). The participating centres will deposit such working isolates at the above mentioned centres latest by June 15 of each year. The zonal centers will also maintain the type cultures.

Sugarcane differentials (14 + 5): Co 419, Co 975, Co 997, Co 1148, Co 7717, Co 62399, CoC 671, CoJ 64, CoS 767, CoS 8436, BO 91, Baragua (*S. officinarum*), Kakhai (*S. sinense*) and SES 594 (*S. spontaneum*). Five new differentials – Co 7805, Co 86002, Co 86032, CoS 95422 and CoV 92102.

No. of isolates: Virulent isolates collected from red rot affected canes of commercially cultivated varieties in the zone.

Method of inoculation: Plug method of inoculation is to be used (Details vide PP 17). Inoculations with each isolate to be done on all the differentials with freshly prepared spore suspension. All inoculations to be completed in 2 days by last week of August.

Observation: One observation at 60^{th} day after inoculation

Evaluation: The canes are to be split open longitudinally. Inoculated canes free from borer infestation and other damages are taken for evaluation. Based on parameters *viz.* nodal transgression, lesion width, white spots, top yellowing/drying, rind infection and sporulation over the rind, the host reaction is categorized into three groups *viz.*, Resistant (R), Susceptible (S) and Intermediate (X) as follows:

R: Lesion width laterally restricted nodal transgression up to 2 nodes, white spots, rind infection, sporulation over the rind and yellowing/drying of tops absent.

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 yellowing/drying of tops absent or present.

X: 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 yellowing/drying of tops absent.

RESULTS OF THE PREVIOUS YEAR

LUCKNOW

Twenty new isolates *i.e.* six isolates from CoLk 8102, five from CoLk 94184, three from CoS 92423, two from Co 0238,two from CoJ 85 and one each from CoS 91269 and CoS 8436 were tested on 14 designated differentials. The virulence pattern of the isolates more or less matched with the existing pathotypes of this zone and there is no emergence of any new virulent pathotype in this zone.

SHAHJAHANPUR

Five red rot isolates *viz*; R 1102, R 1201, R 1302, R 1303 and R 1304 were tested for their pathogenic variability along with designated pathotypes on the prescribed sugarcane differentials. Three isolates *viz*., R 1201, R 1302 and R 1303 exhibited reactions similar to CF08, rest two new isolates R 1102 and R 1304 displayed variable pathogenic reactions. On the basis of pathogenic behaviour of the above two isolates, it is clear that there is emergence of 2 new pathotypes i.e. R 1102 (CoS 8436) and R 1304 (CoS 07250) along with the existence of CF08 and CF09 pathotypes in Uttar Pradesh.

KAPURTHALA

Fourteen differentials were inoculated with 7 pathotypes and 5 isolates collected from Punjab state i.e., RI-295 and RI-298, RI-299, RI-300 and RI-301. The results revealed that isolates RI-299 and RI-301 are found as virulent as pathotype CF08 from CoJ 84 whereas isolate RI-295 and RI-300 are also found quite similar to CF08 except for their differential reaction on one or two differentials. RI-298 from CoJ 88 Phagwara mill area still needs further confirmation.

UCHANI

All the designated pathotypes along with five new isolates RR-XV(CoJ 85), RR-XVI (CoJ 85), RR-XVII (CoS 8436) and RR-XVIII (CoJ 64) and RR- XVIII(Co 89003)collected from different mill zone areas of Haryana were used for pathogenic variability. Observations recorded indicate that isolates RR- XV, RR- XVI, RR- XVII and RR- XVIII showed similarity with CF08.

KARNAL

Seven pathotypes along with 17 isolates collected from CoJ 64, BO 138, CoSe 95422, CoBln 05221, CoS 8436 and Co 89003 were inoculated on 19 sugarcane differentials. The overall disease reaction indicated that there was a clear pathogenic variation on the host differentials. None of the pathotype resembled another isolate in pathogenic behaviour. Among the seven designated pathotypes, CF08 was most virulent followed by CF03, CF07, CF11, CF02, CF01 and CF09.

NORTH CENTRAL ZONE

PUSA

Fourteen sugarcane differentials were inoculated with two pathotypes and 11 isolates collected from different parts of Bihar. It is clear from the data that pathotype CF07 and isolates RR_3, RR_4, RR_5, RR_6, RR_9 and RR_{10} produced resistant reaction on the differentials Co 419, CoS 767, Co 7717 and Co 975 and intermediate reaction on CoS 8436 and Co 62399. CF07 and isolates RR_3, RR_4, RR_5 and RR_6, RR_9 and RR_{10} produced similar pathologenic reaction on the differentials. Similarly, pathotype CF08 and isolates RR_1, RR_2, RR_7, RR_8 and RR_{11} produced intermediate reaction on Co 419, CoS 767, Co 7717 and Co 975 and susceptible reaction on CoS 8436 and Co 62399.

SEORAHI

The designated 4 pathotypes along with 3 isolates, isolate-1, isolate-2 and isolate-3 were inoculated on 16 differentials. The reaction of isolate-1 was founded similar to CF07

and CF08. Isolate-3 was found similar to reaction with CF09 and isolate-2 were found similar to reaction with CF11 on all the differentials, whereas isolate-2 recorded susceptible reaction over 7 differentials, isolate-1 recorded susceptible reaction over 4 differentials and isolate-3 recorded susceptible reaction on 7 differentials. Therefore, isolate-2 and isolate-3 proved to be more virulent than isolate-1.

EAST COAST ZONE

ANAKAPALLE

Nine isolates of red rot fungus collected from Co 419, Co C 671, Co 997, 85 A 261 (CoA 89085), 91 V 83, 86 V 96, Co 62175 and Co 6304 and 81 V 48 were tested on 19 differential varieties. The results revealed that the isolate from 81 V 48 is similar to CF04, the isolates from 91 V 83, 86 V 96, Co 62175 and Co 6304 are similar to CF06. The results of the present study indicate no clear information on pathogenic variation.

CUDDALORE

Sugarcane differential hosts were inoculated with isolates from the varieties *viz*., CoC 24, CoSi 7, CoSi 8 and CoA 92081 along with the reference pathotypes CF04, CF05, CF06 and CF10. The reaction indicated that all the isolates behaved similar to CF06 and CF04 pathotypes. The *C. falcatum* isolates from CoA 92081 and CoC 24 showed differences in reaction with regard to the differential CoS 767 which showed intermediate in reaction while all the other isolates including the reference pathotype registered resistant reaction. These isolates behaved as more virulent than the designated pathotypes and the study also clearly indicated that the designated pathotypes exhibit limited variation.

PENINSULAR ZONE

NAVSARI

Three isolates collected from CoC 671 (CF06), Co 86032(CF86032) and Co 86002 (CF86002) were inoculated on 19 differentials. Results revealed that Co 62399 and CoJ 64 showed intermediate reaction for CF06 but resistant reaction for CF86032 and CF86002 and also differentials Co 7805 and CoSe 95422 showedintermediate reaction on CF06 and CF86002 but resistant reaction toCF86032. Only Co 419 showed intermediate reaction on CF86032 and CF86002 and Co 975 showed intermediate reaction for CF06.

COIMBATORE

Two new isolates CFPI1110 and CFPI1401 along with 5 old isolates and 1 standard pathotype CF671 were inoculated on 19 sugarcane differentials. The disease development on differential hosts indicated that among the 7 isolates, 2 new and 2 old isolates *viz*., CF92012 and CF94012 behaved more or less similar to standard pathotype and 3 old isolates *viz*., CF0323, CFv09356 and CF91017exhibited different reaction from standard pathotype. Among 8 isolates CFv09356 exhibited more virulence followed by CF0323 and CF91017. The study clearly indicated occurrence of new pathotype CF12 in CoV 09356, Co 91017 and Co 94012.

THIRUVALLA

Three new isolates along with 5 old and 1 designate pathotype CF06 were inoculated on 19 sugarcane differentials. Among them CF94012 exhibited more virulence and CFv09356 showed almost similar reaction to this isolate. The new isolate and CF0323 exhibited similar reactions and CFPI1401 showed least virulence. The results suggests emergence of new pathotype CF12.

RESULTS OF THE CURRENT YEAR

LUCKNOW

Nineteen new isolates *i.e.* three isolates from CoS 8436, three isolates from CoS 92423, three isolates from unknown variety, five isolates from Co 0238, two isolates from CoLk 8102, and three isolates from CoSe 95422 were evaluated on 14 differentials by plug method of inoculation. Except Co 0238 isolates, the virulence pattern of other isolates more or less matched with the existing pathotypes of this zone. It was observed that Co 0238 isolates giving intermediate reaction to BO 91; susceptible reaction to Co 62399, CoS 767, Khakai, Co 419 and CoJ 64 and resistance to SES 594, Baragua, Co 997, Co 975 and CoC 671. The resulsts indicate the existence of gained virulence for BO 91 and loss of virulence for Co 997 and CoC 671 (Table 1).

SHAHJAHANPUR

Four *C. falcatum* isolates namely R 1102 (CoS 8436), R 1304 (CoS 07250), R 1501 (CoJ 88) and R 1502 (UP 9530) were tested for variability along with existing pathotypes *viz*., CF01, CF02, CF03, CF07, CF08, CF09 and CF11 on 19 host differentials. The observations of disease behaviour revealed that two isolates R 1501 (CoJ 88) and R 1502 (UP 9530) exhibited reactions parallel to CF09 and CF08 pathotypes, respectively. Other two isolates R 1102 (CoS 8436) and R 1304 (CoS 07250) were found to be new emerging pathotypes on the basis of their reaction on 19host differentials(Table 2).

KAPURTHALA

Nineteen differentials were inoculated with 7 designated pathotypes and 6 isolates *viz*., RI-298 (CoJ 88), RI-302 (Co 89003), RI-303 (CoJ 64), RI-304 (CoJ 85), RI-305 (CoJ 83) and RI-306 (CoPb 91) collected from Punjab state. The data revealed that all the pathotypes and tested isolates were avirulent on CoS 767, CoS 8436, BO 91, SES 594, Baragua, CoV 92102 and CoSe 95422 except pathotypes CF09 and CF11. Pathotype CF09 caused S reaction on CoS 767, whereas CF11 showed I on differentials CoS 767, BO 91 and Baragua. Among the pathotypes, CF08 from CoJ 84 was found most virulent than others by showing S reaction on 10 diffentials. In recent yearsthe isolate RI-304 from CoJ 85 was found most virulent than other isolates and pathotypes because it showed S reaction on 11 differentials. New isolates RI 303 and RI 305 were found as virulent as pathotype CF08(Table 3).

UCHANI

Pathogenic variability was studied on 18 differentials with all the designated pathotypes *viz*., CF01, CF02, CF03, CF07, CF08, CF09 and CF11 along with six new isolates RR XX (Co 89003), RR XXI (CoJ 64), RR XXII (CoJ 85) and RR XXIII (CoS 8436) and RR XXIV(CoS 89003), RR XXVI (CoJ 85) collected from different mill zone area of Haryana. The observations indicated that all the pathotypes/isolates exhibited S reaction on Co 997, CoC 671 and Khakai, whereas R reaction on SES 594, Baragua, CoSe 95422 and CoV 92102. The observations also indicated thatthe clones Co 7717, Co 1148, Co 975, Co 419, Co 62399, Co 86002 and Co 86032 exhibited a clear cut differential reaction. The isolates RR XXI,RR XXII and RR XXVI were more virulent as CF08 and showed similarity with CF08. Isolate RR XX and RR XXIV showed pathogenic variation on host differentials (Table 4).

KARNAL

Seven pathotypes along with 13isolates collected from CoJ 64 (6), CoS 8436 (3), BO 138 (1), CoSe 95422 (1), CoBln 05221(1) and Co 89903 (1) were inoculated independently on a set of 19sugarcane differentials by plug method of inoculation. The overall disease reaction indicated that there was a clear pathogenic variation on the host differentials. None of the

pathotype /isolate resembled another pathotype /isolate in pathogenic behaviour. The differential CoS 8436 succumbed only to isolate Cf8436 (Karnal) for the fourth consecutive years whereas, differential Baragua showed intermediate reaction to CfSe95422 and Cf89003 isolates. A new isolate Cf89003 collected from variety Co 89003 exhibited more virulence with intermediate to susceptible reactions on 14 host differentials, suggests the possible emergence of new pathotype in the subtropics(Table 5).

NORTH CENTRAL ZONE

PUSA

Seventeensugarcane differentials were inoculated with two pathotypes CF07 and CF08 and eight isolates collected from different cane growing areas of Bihar. The resulst indicated that differentials BO 91, Baragua and SES-594 showed R reaction while, Co 1148, Co 997, CoJ 64, CoC 671 and Khakai showedS reaction against allthe test isolates. The differentials Co 419, CoS 767, Co 7717, CoS 8436, Co 62399, Co975, CoV 92102, Co 86032 and CoSe 95422 showed differential reaction against all the test isolates.It is clear from the data that pathotype CF07 and isolates RR_1, RR_3, RR_4, RR_5 and RR_7 produced R reaction on differentials the Co 419, CoS 767, Co 7717, Co 975, CoV 92102 and Co 86032 and I reaction on CoSe 8436 and Co 62399. The pathotype CF07 and the isolates RR_1, RR_3, RR_4, RR_5 and RR_7 showed similar pathological reaction on differentials. Similarly, pathotype CF08 and isolates RR_2, RR_6 and RR_8 produced I reaction on Co 419, CoS 767, Co 7717, Co 975, CoV 92102, Co 86032 and CoSe 95422 and S reaction on CoS 8436 and Co 92399(Table 6).

SEORAHI

Seven pathotypes *viz*. CF01, CF02, CF03, CF07, CF08, CF09 and CF11 along with 2 isolates, isolate-1 (CoLk 8102) and isolate-2 (CoSe 92423) were inoculated on 18 differentials. The reaction of isolate-1 resembled with CF07 and isolate-2 resembled with CF08(Table 7).

EAST COAST ZONE

ANAKAPALLE

Testing of eight isolates obtained from Co 419, CoC 671, Co 997, CoA 89085, Co 62175, 81 V 48, CoOr 12346 and CoA 09321 on 19 host differentials revealed no variation/deviation in reaction. This indicates that all the tested eight isolates have not exhibited any apparent variability(Table 8).

CUDDALORE

Nineteen sugarcane differentials were inoculated with *C. falcatum* isolated from CoC 23, CoC 24, Co 91017, CoA 92081 and designated pathotype CF06. Among the differentials BO 91showed I reactionforthe isolate collected from CoC 24 while all other isolates registered R reaction. Similarly in Co 1148, the isolate from CoC 24 showed S reaction, while it was R to CF06. With regard to reaction in CoS 767, the isolate from CoC 24 showed I reaction which indicated itsvariation from thedesignated pathotype(Table 9).

PENINSULAR ZONE

NAVSARI

At Navsari, three isolates collected from CoC 671 (CF06), Co 86032(Cf86032) and Co 86002 (Cf86002) were inoculated on 19 differentials. The results revealed that CoJ 64, CoS 8436, BO 91, Baragua and SES 594 showed R reaction for all the isolates.Entries Co 7717 and Khakai and CoV 92102 exhibited I reaction to all the isolates. While entries Co 1148 and Co 62399 showed R reaction on Cf 86032 but I reaction on CF06 and Cf 86002 and also entries CoS 767 and CoSe 95422 showedR reaction on CF06 and Cf 86002 but I reaction on Cf86032. Only one entry Co 7805 showedR reaction for Cf86002 and I reaction on CF06 and Cf86032. Entries Co 975 and Co 86032 showed I reaction for Cf86002 and S

reaction for CF06 and Cf 86032. Entries Co 975 showed I reaction for Cf86032 and Co 86002 showed I reaction for CF06(Table 10).

COIMBATORE

Two new isolates (Cfv09356-Keerangudi and CfPI1110-Nathakadu) along with five old isolates (Cf0323-Pettavaithalai, Cf92012-Kanjanur, Cf91017-Nellikuppam, CfPI1110-Kothangudi and CfPI1401- Kadaganur)and 2 standard isolates (CF06 and CF12) were inoculated by plug method on 19 sugarcane differentials. The red rot development on differential hosts indicated that all the isolates except CF12 exhibited more or less similar reactions of the designated pathotype CF06 and among the tested isolates, CF12 exhibited more virulence followed by CfPI1401- Kadaganur and CfV09356-Keerangudi (Table 11).

THIRUVALLA

Eight isolates *viz*., Cf92012 (Kanjanur), CfPI1110 (Nathakadu), CfPI1401 (Kadanganur), Cfv09356, CfPI1110 (Kothangudi), Cf0323 (Pettavaithalai), Cf91017 (Nellikuppam), CoTl 88322 (New isolate -Madhuri) along with 2 designated pathotypes CF06 and CF12 were inoculated by plug method. The disease development on different differentials indicated that, the isolates Cf92012 (Kanjanur), CfPI 1110 (Mathakadi) and CfPI1110 (Kothangudi) exhibited a variable reaction from the standard isolate CF06 with respect to Co7805, CoS 767 and Co 7717, respectively. These isolates were found to be more virulent than the standard isolate CF06, during the current year. Other isolates *viz*., CfPI1401, Cfv09356, Cf0323, Cf91017 and CoTl 88322 (New isolate) exhibited more or less similar reaction to standard isolates(Table 12).

PP17: EVALUATION OF ZONAL VARIETIES FOR RED ROT, SMUT AND WILT

PP 17A: EVALUATION OF ZONAL VARIETIES FOR RED ROT

Objective: To gather information on the relative resistance to red rot in entries of Pre-zonal varietal trial/zonal trials of the respective zones

Locations:

North West Zone : Lucknow, Kapurthala, Uchani, Shahjahanpur, Karnal, Pantnagar
North Central Zone : Pusa, Motipur, Seorahi and Bethuadahari
East Coast Zone : Anakapalle and Cuddalore
Peninsular zone : Thiruvalla, Navsari, Coimbatore

Year of start : 1986-87 (Continuing project)

Varieties: All the centres will test all the entries of early and midlate groups under IVT and AVT of the respective zones. Entries of Inter zonal varietal trial (IZVT) are also to be tested, if listed. The seed material for this programme is to be obtained from the respective breeders of the centres. One 6 metre row of at least 20 clumps for inoculation with each pathotype by plug/nodal method. Any red rot susceptible variety of the same maturity group may be used as standard (check).

Inoculum: (Pathotypes to be used):

North West Zone : CF08 &CF09 (To be inoculated separately)
North Central Zone: CF07 &CF08 (To be inoculated separately)
East Coast Zone : CF04 &CF06 (To be inoculated separately)
Other Zones : Two widely occurring isolates on commercial varieties in the area.

(Note: If pathotypes are not available, CF07, CF08 and CF09 may be obtained from IISR, Lucknow and CF04 &CF06 from RARS, Anakapalle)

Freshly sporulating 7 day old culture in Petri dishes will be taken. The spore mass will be washed with 100 ml of sterile water and collected in a flask. Conidial suspension at a spore concentration of one million spores per ml will be prepared for inoculation. Fresh inoculum should always be used for inoculation.

Methods of inoculation:

1. Plug Method: Two canes in each of the 20 clumps to be inoculated. Inoculation is to be done in the middle of the 3rd exposed internode from bottom and two drops of the spore suspension are to be placed with a large syringe in each cane and sealed with plastic clay (plasticine) or modeling clay.

2. Cotton Swab Nodal Method: (All the centres) Two canes in each of 20 clumps will be inoculated by removing leaf sheath (lower most green leaf sheath) and immediately placing cotton swab (dipped in freshly prepared inoculum suspension) around the cane covering nodal region. The cotton swab should be held in place by wrapping parafilm® over the swab.

Evaluation

Cotton Swab Nodal method: One observation at the end of 60 days after inoculation. Observe for spindle infection i.e. presence of mid rib lesions with or without conidia, presence of acervuli at nodes specially on leaf scar, root primordial and growth ring. Record the intensity of the acervuli at node. Scrap the node and see if lesions are developing into

stalks. Wherever lesions are progressive towards susceptibility the entries are rated as susceptible. If the lesions are dark and restricted to rind tissues, the clones are rated as resistant. Atleast 15 stalks are to be evaluated to assess disease reaction.

Plug method: The canes to be split open longitudinally sixty days after inoculation along the point of inoculation. Inoculated canes free from borer infestation and other damages are taken for evaluation. This is graded on the international scale of 0-9 as follows:

Variety/ genotype ---------- Method of inoculation ----------

No. of canes evaluated	Condition of tops*	Lesion width**	White spot (WS)***	Nodal transgression (NT)****	Total score	Remarks
1.						
2 to						
15						

*1. Condition of top: Green (G) – 0, Yellow (Y)/Dry (D)-1

**2. Lesion width above inoculated internode is assigned the score of 1, 2 or 3

***3.White spot assigned score of 1 or 2 according to whether it is restricted or progressive

****4.N.T. No. of nodes crossed above the inoculated internode and given the score as:

1 if one node is crossed

2 if two nodes are crossed

3. if three nodes are crossed (maximum) or more

Average Score = Total Score/No. of canes evaluated

Disease reaction: 0-9 Scale

0.0 to 2.0 -R

2.1 to 4.0 -MR

4.1 to 6.0 -MS

6.1 to 8.0 -S

8.0 to 9.0 -HS

Note: Average score is taken into account for assigning the disease reaction.

The varieties which show susceptibility by plug method, but have not shown nodal susceptibility are to be retested by nodal method. If these are not susceptible by the nodal method, they may be considered for release.

RESULTS OF THE PREVIOUS YEAR

NORTH WEST ZONE

LUCKNOW

Forty three entries were screened and the results showed that in IVT (Early), all the entries were MR by plug method and R by nodal method against the pathotype CF08. Whereas all the entries except CoLk 12202 and CoPant 12221 were MR by plug method and R by nodal method against the pathotype CF09. In AVT (Early)-I Plant, 3 entries were MR CoLk 11203 was MR against CF09 by plug method. All the entries except CoH 11262 were R against CF08 and MR against CF09 by nodal method. In AVT (Early)-II Plant, all the three entries were MR by plug method and all the entries except Co 10035 were R by nodal method. Genotype Co 10035 was R against CF08 and MR against CF09 by the same method. In IVT (Mid late), out of 15 entries tested, all the entries except CoS 12232 were MR against pathotype CF08 and 5 entries were MR by plug method. All the entries except CoH 12263, CoPb 12181 and CoS 12232 R, whereas CoH 12263 and CoPb 12181 were MR and CoS 12232 was MS against CF08 by nodal method. Five entries were R; three entries

were MR against CF09 by nodal method. In AVT (Mid late)-I Plant, 4 entries were MR by plug method and R by nodal method against both the pathotypes. CoLk 11206 was MR and R against CF08 by plug method and nodal method whereas MR against CF09 by plug and nodal method. InAVT (Mid late)-II Plant, all the 5 entries were MR by plug method whereas R by nodal method against both pathotypes.

SHAHJAHANPUR

Four AVT Early (I Plant), 6 AVT Early (II Plant), 5 AVT Mid late (I Plant), 8 AVT Mid late (II Plant), 12 IVT Early and 17 IVT Mid late entries were evaluated against red rot by plug and nodal cotton swab method using pathotypes CF08 and CF09. Among them 16 and 17 were graded as R/MR to CF08 and CF09, respectively by plug method and 29 and 30 were graded as R/MR to CF08 and CF09, respectively by nodal method.

KAPURTHALA

Forty-three entries were tested against red rot pathotypes CF08 and CF09 by plug and cotton swab methods. In AVT (Early) Plant I, two entries namely CoH 11262 and CoLk 11202 were behaved as MR/ R by plug and cotton swab methods against both the pathotypes. In AVT (Early) Plant II, only one entry Co 10035 behaved as MR/ R by both the methods. In AVT (Mid late) Plant I, five entries behaved as MR/R by plug and cotton swab methods. In AVT (Mid late) Plant II, four entries were found MR/R by plug and cotton swab method. In IVT (Early), five entries were found MR/R to both the pathotypes. In IVT (Mid late), 11entries 2 behaved as MR/R by both the method.

UCHANI

In AVT (early) Plant-I entries CoH 10262, CoLk 11202 and CoLk 11203 and Co 0238 showed R/MR reaction by plug and R by nodal methods against both pathotypes. In AVT (early) Plant-II all the entries were found R/MR by plug and R by nodal methods against CF08 and CF09. In AVT (mid late) Plant-1 6 entries showed R/MR reaction by plug method and R by nodal method. CoPb 11214 behaved MR against CF08 and MS against CF09 by plug method and R by nodal methods against both CF08 and CF09. In AVT (ML) Plant-II three entries showed R/MR reaction by plug and R by nodal methods against CF08 and CF09. In IVT (early) entries CoH 12261 and CoPant 12221showed MR reaction against CF08 and R by CF09 by plug method and R to both CF08 and CF09 pathotypes. In IVT (ML) 11 entries showed R/MR reaction by plug and R reaction by nodal method. The entries CoLk 12205, CoPb 12181 and CoPb 12182 behaved MS against CF08 and MR against CF09 by plug method and R reaction by nodal methods against both pathotypes. However, CoPant 12226 showed MS reaction respectively by plug method but R reaction by nodal method against both pathotypes.

KARNAL

A total of 43 zonal varieties along with six standard varieties were evaluated against red rot by plug and cotton swab methods using CF08 and CF09 pathotypes. Among the ten IVT (E) clones, CoLk 12201 found to be S with isolate CF08 and CF09 by both the methods, while CoLk 12204 rated S to CF08 and CF09 isolates by plug method only. Two AVT (E)-I Plant entries *viz*., CoH 11262 and CoLk 11201 as well as one AVT (E) II plant entry CoH 10261 exhibited S reaction with CF08 isolate by both the inoculation methods. Two IVT (E) clones (Co 12027 and CoH 12261), one IVT (ML) clone CoPant 12226 and one AVT (ML) clone CoPb 10182 showed MS reaction with CF08 and CF09 pathotypes by plug method, all the other varieties were either R/MR in both the methods.

PANTNAGAR

In nodal method, 5 entries showed S reaction whereas remaining had R reactions for both pathotypes. In plug method, 17 entries were found R, 12 MR and 9 MS, 3 S and one HS. Identical reactions were recorded for both the pathotypes.

NORTH CENTRAL ZONE

PUSA

Sixteen entries including one check were tested artificially using CF07 and CF08 isolates. In case of plug method, entry CoSe 95422 showed S reaction against both the pathotypes whereas, entries CoP 12439 and CoSe 12452 were graded as MS against CF07 while CoSe 92423, CoP 12438, CoP 12436 and CoLk 12209 were graded as MS against CF08. The standard CoSe 92423 showed S reaction against CF07, the remaining entries showed R/MR reaction against both the pathotypes. In case of cotton swab method, entries CoSe 92423 and CoSe 95422 showed S reaction against both the isolates, the rest of the entries showed R reaction against both isolates.

MOTIPUR

In IVT (Early), all the entries except CoLk 12207 were MR by plug method and R by nodal method to CF07 and CF08. In AVT (Early)-I Plant, all the entries except CoP 11436 ware MR by plug method and R by nodal method whereas CoP 11436 was MS by plug method and MR by nodal method against CF07. CoP 11436 was S, CoP 11437 was MR; CoP 11438 was MS and CoSe 11451 was S by plug method against CF08. Whereas CoP 11436, CoP 11438 and CoSe 11451 were MS and CoP 11437 was R against CF08 by nodal method. In IVT (Mid late), all the entries except CoLk 09204 were MR by plug method and R by nadal method against both the pathotypes. CoLk 09204 was found MS by plug method and MR bu nodal method to CF07, whereas MR by both the method of inoculation to CF08. In AVT (Mid late)-I Plant, all 4 entries were MR by plug method and R by nodal method to both the test pathotypes. In AVT (Mid late)-II Plant, all 3entries were MR by plug method and R by nodal method against both the test pathotypes.

SEORAHI

The disease reaction of the two pathotypes CF07 and CF08 on 25 varieties under AVT (Early and midlate), IVT (Early and Midlate) resembled by plug and nodal methods. By plug method out of 25 entries which were evaluated, 15 entries were found MR, 5 MS, 3 were rated S and 2 were rated as HS to red rot. By nodal method out of 25 entries, 15 were rated as R, 5 MR, 3 MS and 2 were S to red rot.

NORTH EAST ZONE

BURALIKSON

The resulst revealed that no entry showed R reaction to the red rot. But the entry CoLk 12207 and CoSe 11453 showed R reaction to both the pathotypes in nodal method but MR to CF08 in plug method. CoP 9301 showed S to both the isolates in nodal method but MS to CF07 in plug method. Other entries showed MR reaction to both the pathotypes.

EAST COAST ZONE

ANAKAPALLE

Twenty four entriesincluding susceptible standards were tested by cotton swab and plug methods of inoculation. In the cotton swab method4 entries (CoA 11323, CoA 13324 and Co 13327) showed S and the remaining 16 reacted as R to CF04, CF05 and CF06. In plug method,5showed R while 5 (CoA 11326, CoA 13328, CoA 13321, CoA 13322 and CoV 13356) showed MR reaction to CF04, CF06 and CF05.

CUDDALORE

Among the entries CoA 13321 showed R reaction to both CF04 and CF06 pathotypes. Two entries *viz*., CoA 12322 and CoA 13325 showed R reaction to CF04 pathotype and MR reaction to CF06. Seven entries *viz*., CoA 13322, CoC 13337, CoV 12356, CoA 11321, CoC 11336, CoC 13339 and CoOr 13346 recorded MR reaction to both the pathotypes.

PENINSULAR ZONE
NAVSARI

Out of 53 entries evaluated by plug method, none of the entries exhibited R reaction. Twenty five entries in IVT-E,IVT-ML,AVT–E I plant**,** AVT-E II Plant, AVT-ML I Plant showed MR reaction against red rot.Out of 53 entries evaluated by nodal method, 51 entries exhibited R reaction. Only one entry Co 10017 (AVT-ML I Plant) and one check CoC 671 (IVT-E) exhibited S reaction.

THIRUVALLA

In IVT (Early) out of 15, the eight entries showed MR reaction, five entries showed MS reaction, one variety *viz* Co 85004 showed S reaction. Out of the 15 entries tested in the IVT (Early) trial with nine entries showed MR reaction, five entries showed MS reaction. All the entries except CoC 671 showed R reaction to cotton swab method of inoculation. In the IVT (midlate) trial with CF06, eight entries showed MR reaction, seven entries showed MS reaction. Out of the 17 entries tested in the IVT (midlate) trial with CF12, one entry*viz.,* Co 12014 showed R reaction, eight entries showed MR. All the entries showed R reaction to cotton swab method.

Out of the 11 entries tested in the AVT (Early I Plant) with CF06, six entries showed MR reaction, three entries exhibited MS reaction. For CF12, seven entries showed MR reaction. All the entries except CoC 671 showed R reaction to cotton swab method of inoculation. Out of the six entries tested in the AVT (Early II Plant) with CF06, one variety *viz*., Co 09004 showed R reaction,similarly the entry showed R reaction to CF12, one entry CoN 09072 showed MR reaction to plug method of inoculation. All the entries except CoC 671 showed R reaction to cotton swab method of inoculation. Out of the 13 entries tested in the AVT (midlate I Plant) with CF06, eight entries exhibited MR reaction, four entriesshowed MS reaction. When these entries were tested against CF12, 10entriesexhibited MR reaction by plug method of inoculation.

COIMBATORE

About 27 IVT entries along with the susceptible checks CoC 671 and Co 94012 were inoculated with the pathotype CF06 of red rot pathogen by the plug and nodal methods of inoculation. Evaluation of the inoculated clones revealed that 13 entries were R /MR in the plug method whereas in the nodal method, 20 of them behaved as R.

RESULTS OF THE CURRENT YEAR
NORTH WEST ZONE
LUCKNOW

In IVT (Early), five entries*viz*., CoLk 13201, CoLk 13202, CoLk 13203, CoPant 13221 and CoPb 13181 were MR by plug and nodal method against both the pathotypes.In AVT (Early)–I Plant, two entries*viz.,* Co 12027 and CoLk 12203 were MR by plug and nodal method against both the pathotypes. In AVT (Early)-II Plant, two genotypes *viz.,* CoLk 11201, CoLk 11202 and CoLk 11203 were MR by both the methods against both the pathotypes. In IVT (Mid late), out of thirteen entries tested, seven *viz*., Co 13035, CoH 13262, CoH 13263, CoLk 13204, CoLk 13205, CoPant 13224 and CoS 13232 were MR whereas CoPb 13182 was R by plug and nodal method against both the pathotypes. The entry CoH 13261 was R against the pathotype Cf 08 and MR against Cf 09 by both the method. In AVT (Mid late)-I Plant, 3 entries*viz*., Co 12029, CoLk 12205 and CoS 12232 were MR against both the pathotypes.InAVT (Mid late)-II Plant, 2 entries*viz*., CoLk 11206 and CoS 11232 were MR whereas, CoH 11263 was R by plug and nodal method against both the pathotypes (Table 13).

SHAHJAHANPUR

In AVT (E) I Plant two entries *viz*., Co 12027, CoLk 12203 and in AVT (E) II Plant two entries *viz*., CoLk 11201, CoLk 11202 showed R/MR reaction against CF08 and CF09 pathotypes. In AVT (ML) I Plant four entries *viz*., Co 12029, CoLk 12205, CoPant 12226, CoS 12232 and in AVT (ML) II plant five entries viz., Co 11027, CoH 11263, CoLk 11206, CoLk 11214, CoS 11232 showed R/MR reaction against both the pathotypes. In IVT (E) five entries *viz*., Co 13033, Co 13034, CoLk 13202, CoPant 13221, CoS 13231 and in IVT (ML) eight entries viz., Co 13035, Co 13036, CoH 13262, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182, CoS 13232 showed R/MR reaction against both the pathotypes (Table 14).

KAPURTHALA

Forty-two genotypes were screened with red rot pathotypes CF08 and CF09 separately by plug and cotton swab methods. In AVT (Early) Plant I, three entries namely Co 12026, Co 12027 and CoPant 12221 behaved as MR/ R by plug and cotton swab methods against both the pathotypes. In AVT (Early) Plant II, only one genotype CoLk 11202 behaved as MR/ R by both the methods. In AVT (Mid late) Plant I, four entries *viz*., Co 12029, CoH 12263, CoPant 12226 and CoPb 12211 behaved as MR/R by plug and cotton swab methods. In AVT (Mid late) Plant II, all the genotypes were found MR/R by both the methods. In IVT (Early), four genotypes namely, Co 13033, CoLk 13202, CoPant 13221 and CoS 13231 were found MR/R to both the pathotypes andin IVT (Mid late), five genotypes *viz*., Co 13036, CoH 13262, CoPant 13223, CoPant 13224 and CoPb 13182 behaved as MR/R by plug and cotton swab method (Table 15).

UCHANI

In AVT (early) Plant-I four entries *viz*., Co 12026, CoLk 12203 and CoPant 12221and Co 0238 showed MR reaction by plug and R by cotton swab methods against CF08 and CF09 pathotypes, whereas Co 12027 exhibited MS reaction by plug and R by cotton swab methods against both the pathotypes. In AVT (E) Plant-II the genotypes *viz*., CoH 11262 and CoLk 11202 were found MR by plug and R by cotton swab methods against both the pathotypes. In AVT (ML) Plant-I the entries Co 12029, CoH 12263 and CoS 8436 showed R/MR reaction by plug method and R reaction by cotton swab methods to both the isolates,in AVT (ML) Plant-II five entries *viz*., Co 11027,CoH 11263, CoLk 11204, CoPb 11214 and CoS 11232 showed R/ MR reaction by plug and R reaction by cotton swab methods against CF08 and CF09. In IVT (E)the entries Co 13033, Co 13034, CoLk 13202, CoPant 13221 and CoS13231 showed MR reaction by plug and R reaction by cotton swab methods to both the pathotypes,in IVT (ML) theentries Co 13035, Co 13036, CoH 13261, CoH 13062, CoH 13063, CoLK 13204,CoPant 13223, CoPant 13224, CoPb 13182and CoS 8436 showed R/MR reaction by plug and R reaction by cotton swab methods of inoculations (Table 16)

KARNAL

Forty two entries were evaluated for red rot resistance against CF08 and CF09 pathotypes. Three entries *viz*., CoPant 13222 IVT(E), CoPb 13183 IVT (ML) and CoH 11262 AVT- E (II plant) exhibited susceptible reaction by plug and cotton swab methods, while two entries namely CoLk 13203 (IVT-E) and CoPb 12111 (AVT- ML-I Plant) showed susceptibility to CF08 and CF09 isolates by plug method only. Six entries were rated as MS and remaining were R /MR with both the inocula and methods (Table 17).

PANTNAGAR

In cotton swabmethod, all the genotypes showed R reactions for both pathotypes except Co 12027and CoS 13232 which showed S reaction for both the pathotypes. In plug method, 14 genotypes were found R, 22 MR, 4 MS and 1 S. Identical reactions were recorded for both the pathotypes (Table 18).

NORTH CENTRAL ZONE

PUSA

In case of plug method, the entriesCoP 11437, CoP 11438, CoP 11451, CoLk 09204, BO 155, BO 130, CoP 13437, CoP 13438, CoSe 13451, CoSe 13452, CoSe 13453 and CoSe 13454 showed MR reaction against both the isolates whereas, entries BO 91, CoP 9301 and CoP 13439 showed R reaction against CF08 and MR against CF07 while, genotype CoP 13436 was observed R against CF07 and MR against CF08, while CoSe 92423 and CoSe 95422 showed S reaction against both the pathotypes. In case of cotton swab method, check varietiesCoSe 92423 and CoSe 95422 showed S reaction against both the pathotypes,and e rest of the genotypes showed R reaction against both the pathotypes (Table 19).

MOTIPUR

In IVT (Early), all the entries except CoP 13437 were MR by plug and nodal methods against both the pathotypes. In AVT (Early)-I Plant, all the entries except CoSe 12451 were MR by both methods against both the pathotypes. In AVT (Early)-II Plant, all the entries were MR against both the pathotypes.In IVT (Mid late), 2 entries*viz*., CoP 13439 and CoSe 13454 were MR by both methods.In AVT (Mid late)-I Plant, all the entries except CoP 12438 were MR and in AVT (Mid late)-II Plant, all the entries except CoSe 11455 were MR by plug and nodal methods against both the pathotypes (Table 20).

SEORAHI

In pug method, 23 genotypes were evaluated for red rot resistance and among them 13 were rated as MR to both pathotype, 3 were rated as MR to CF08 and MS to CF07, 1 was MR to CF07 and MS to CF08, 3 genotypes were rated as MS to both pathotype, 2 genotypes were MS to CF08 and S to CF07, while 1 genotype was rated as S to both pathotypes. In cotton swab method, 22 entries were rated as R to both pathotypes, while 1was rated as R to CF07 and S to CF08 (Table 21).

NORTH EAST ZONE

BURALIKSON

A total of 24 entries including one check were evaluated against red rot using CF 07 and CF 08 pathotypes. Two IVT (Early) clones, CoP 13436, CoP 13437 and one (1) IVT (Midlate) clone CoP 13438 were rated as MR to both the pathotypes.In AVT (Early)-I Plant, CoLk 12207 was found to be R in plug method to CF07 and MR to CF08. Other entries were MR in plug method and R in cotton swab method to both the pathotypes.In AVT (Early)–II plant all four entries *viz*., CoP 11436, CoP 11437, CoP 11438, CoSe 11451 were rated as MR to both the pathotypes in plug method and R in cotton swab method. In AVT (Midlate)-I plant among the four (4) entries CoLk 12209 was rated as R to CF07 and MR to CF08 pathotype in plug method and R in cotton swab method.In AVT (Midlate)–II plant all the four entries viz., BO 155, CoSe 11453, CoSe 11454, CoSe 11455 were found to be MR in plug method and R cotton swab method to both the pathotypes (Table 22).

EAST COAST ZONE

ANAKAPALLE

Thirty two entries were tested for red rot resistance with three pathotypes (CF04, CF05 and CF06). In plug method,five entries *viz*., CoA 11321, CoA 13325, CoA 12321, CoA 12322and CoA 92081 showed R reaction, while 5 entries *viz*., CoA 13321, CoA 13322,CoA 11326, CoA 13328 and CoV 13356 showed MR reaction to allthe pathotypes.In cotton swab

method, out of 32 entries 9 entries *viz*., Co 419, CoC 671,Co 997, Co 6907, Co 13032, CoA 14322, CoA 14324, CoV 14356, and PI 14376 showed S reaction to all the three pathotypes (Table 23).

CUDDALORE

Among the 33entriesscreened, 21 clones *viz.,*Co 13023, Co 13024, Co 13025, Co 13027, Co 13028, Co 13029, Co 13030, Co 13031,CoA 11326, CoA 12322, CoA 13322, CoA 14321, CoA 14323, CoC 14336, CoC 13336, CoC 13337, CoC 13339,CoC 14337, PI 14377, CoV 12356, and CoOr 13346 registered MR reaction by plug method for both CF06 and CF04 pathotypes. In cotton swab method, 27entries*viz*., Co 07013, Co 13023, Co 13024, Co 13025, Co 13027, Co 13028, Co 13029, Co 13030, Co 13031, CoA 11326, CoA 12321, CoA 12322, CoA 12324, CoA 13322, CoA 13323, CoA 14321, CoA 14323, CoC 13336, CoC 13339, CoC 14336,CoC 13337,CoC 14337, PI 14377, CoV 13356CoOr 12346, CoV 12356, and CoOr 13346 were found to be R for both pathotypes (Table 24).

PENINSULAR ZONE

NAVSARI

Out of 58 entries evaluated by plug method, none of the entries exhibited R reaction, whereas 41 entries showed MR reaction,10entries exhibited MS reaction,rest of the entries displayed S to HS reaction by plug method.In cotton swab method, 56 entries exhibited R reaction, one entry *viz*, CoM 11081 (AVT-E I Plant) was found MS and one entry Co 10017 (AVT-ML II Plant) was found S (Table 25).

THIRUVALLA

In IVT (Early) out of 11 entries 3*viz*., Co 13002, CoSnk 13101 and MS 13081 showed R reaction and6 showed MR to plug method of inoculation and in cotton swab method all the entries showed R reaction. With CF12 in plug method, one entry *viz*., Co13003 showed R and eight entries showed MR reaction. In cotton swab method all the entries except CoSnk 13102 showed R reaction. In the IVT (midlate) trial with plug method and isolate CFO6, 3 entries showed R and 15 entries showed MR reaction. In cotton swab method except Co 13006 and CoSnk 13103 all other entries showed R reaction. In IVT (midlate) trial with CF12, 10 entries showed R reaction, 9 entries showed MR reaction by plug method and in cotton swab method all entries except Co 13016 showed R reaction.In AVT (Early I Plant) with CFO6, 5 entries showed MR by plug method and in cotton swab method all entries showed R reaction. With isolate CF12, three entries showed MR reaction by plug method andall entries except CoM 11084 and CoC 671 showed R reaction. In AVT (Early II Plant) with CFO6, three entries showed R reaction, 7 entries exhibited MR reaction in plug method and in cotton swab method all entries except CoC 671 showed R reaction. With CF12 pathotype 9 entries showed MR in plug method while all the entries except Co10026 and CoC 671 showed R reaction in cotton swab method.In the AVT midlate I Plant with CFO6, one entry showed R reaction, 6 exhibited MR reaction in plug method and all entries exhibited R reaction in cotton swab method. With CF12, six entries exhibited MR reaction in plug method and all entries exhibited R reaction in cotton swab method.In the AVT midlate II Plant with CFO6, two entries showed R reaction, ten entries exhibited MR reaction in plug method and all entries exhibited R reaction in cotton swab method. With CF12, two entries showed R reaction, 6entries exhibited MR reaction in plug method andall entries except Co 10017 exhibited R reaction in cotton swab method (Table 26).

COIMBATORE

Thirty three entries were evaluated for red rot resistance by plug and nodal methods against CF06 and CF12 pathotypes. About 22 IVT entries were identified as R to CF06 as against four for CF12 in plug method to red rot. In nodal method, 30 and 15 were R to both

the pathotypes, respectively (Table 27).

SUMMARY

The entries showing R or MR to red rot by various methods of evaluation are listed below

NORTH WEST ZONE

LUCKNOW- plugand nodal cotton swab

IVT (Early)	:	CoLk 13201, CoLk 13202, CoLk 13203, CoPant 13221, CoPb 13181
IVT (Midlate)	:	Co 13035, CoH 13261, CoH 13262, CoH 13263, CoLk 13204, CoLk 13205, CoPant 13224, CoPb 13182, CoS 13232
AVT (Early)-I	:	Co 12027, CoLk 12203
AVT (Early)-II	:	CoLk 11201, CoLk 11202, CoLk 11203
AVT (Midlate)-I	:	Co 12029, CoLk 12205, CoS 12232
AVT (Midlate)-II	:	CoH 11263, CoLk 11206, CoS 11232

SHAHJAHANPUR–Plug&Nodal cotton swabmethod

AVT (Early) Plant I	:	Co 12027, CoLk 12203
AVT (Early) Plant II	:	CoLk 11201, CoLk 11202
AVT (Midlate) Plant I	:	Co 12029, CoPant 12226, CoS 12232
AVT (Midlate) Plant II	:	Co 11027, CoH 11263, CoLk 11206, CoLk 11214, CoS 11232
IVT (E)	:	Co 13033, Co 13034, CoLK 13202, CoPant 13221, CoS13231
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13262, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182, CoS 13232

KAPURTHALA – Plug method& Nodal cotton swab

AVT (Early) Plant I	:	Co 12026, Co 12027, CoPant 12221
AVT (Early) Plant II	:	CoLk 11202
AVT (Midlate) Plant I	:	Co 12029, CoH 12263, CoPant 12226, CoPb 12211
AVT (Midlate) Plant II	:	Co11027, CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214, CoS 11232
IVT (Early)	:	Co 13033, CoLk 13202, CoPant 13221, CoS 13231
IVT (Midlate)	:	Co 13036, CoH 13262, CoPant 13223, CoPant 13224, CoPb 13182

UCHANI – Plug&Nodal cotton swabmethod

AVT (E) Plant I	:	Co 12026, CoLk 12203, CoPant 12221
AVT (E) Plant II	:	CoH 11262, Co LK 11202
AVT (Midlate) Plant I	:	Co 12029, CoH 12263
AVT(Midlate) Plant II	:	Co 11027, CoH 11263, CoLk 11204, CoPb 11214, CoS 11232
IVT (Early)	:	Co 13033, Co 13034, CoLk 13202, CoPant 13221, CoS13231
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13261, CoH 13262, CoH 13263, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182

KARNAL – Plug& nodal cotton swabmethod

IVT (Early)	:	Co 13033, Co 13034, CoLk 13202, CoPant 13221, CoS 13231
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13262, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182
AVT (E) Plant I	:	Co 12026, Co 12027, CoLk 12203
AVT (E) Plant II	:	CoLk 11202
AVT (Midlate) Plant I	:	Co 12029, CoPant 12226, CoS 12232
AVT (Midlate) Plant II	:	Co 11027, CoH 11263, CoLk 11204, CoPb 11214, CoS 11232

PANT NAGAR- Plug& nodal cotton swab method

IVT (Early)	:	Co 13033, Co 13034, CoLk 13201, CoLk 13203, CoPant 13222, CoS 13231
IVT (Midlate)	:	CoS 13231, CoS 13236, CoH 13261, CoH 13262, CoH 13263, CoLk

13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183, CoS 13233

AVT (E) Plant I : Co 12026, CoLk 12203

AVT (E) Plant II : CoH 11262, CoLk 11201, CoLk 11202, CoLk 11203

AVT (Midlate) Plant I : CoH 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211, CoS 12232

AVT (Midlate) Plant II : CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214, CoS 11232

NORTH CENTRAL ZONE

PUSA- Plug& Cotton swab method

: CoLk 09204, CoP 11437, CoP 11438, CoP 11451, CoP 13436, CoP 13437, CoP 13438, CoP 13439, CoSe 13451, CoSe 13452, CoSe 13453, CoSe 13454, BO 130, BO 155

MOTIPUR - Plug and cotton swabmethod

IVT (Early) : CoP 13436, CoSe 13451, CoSe 13452

IVT (Mid late) : CoP 13439, CoSe 13454

AVT (Early) I Plant : CoLk 12207, CoP 12436

AVT (Early) II Plant : CoP 11436, CoP 11437, CoP 11438, CoSe 11451

AVT (Mid late)- I Plant : CoLk 09204, CoLk 12209, CoSe 12453

AVT (Mid late)-II Plant : BO 155, CoSe 11453, CoSe 11454

SEORAHI – Plug and nodal cotton swab method

IVT (Early) : CoSe 13452

IVT (Mid late) : CoP 13439, CoSe 13453

AVT (Early) I Plant : CoP 12436, CoSe 12451

AVT (Early) II Plant : CoP 11437, CoSe 11451

AVT (Mid late)- I Plant : CoLk 09204, CoP 12438, CoSe 12453

AVT (Mid late)-II Plant : CoSe 11453, CoSe 11454, CoSe 11455

NORTH EAST ZONE

BURALIKSON – Plug & nodal cotton swab method

IVT (Early) : CoP 13436, CoP 13437

IVT (Midlate) : CoP 13438

AVT (Early)- I Plant : CoLk 12207, CoP 12436, CoSe 12451

AVT (Early)- II Plant : CoP 11436, CoP 11437, CoP 11438, CoSe 11451

AVT (Midlate)- I Plant : CoLk 09204, CoLk 12209, CoP 12438, CoSe 12453

AVT (Midlate)- II Plant : BO 155, CoSe 11453, CoSe 11454, CoSe 11455

EAST COAST ZONE

ANAKAPALLE

IVT Early : Co 13023, Co 13024, CoA 12321, CoA 12322, CoA 14321

IVT Midlate : Co 13025, Co 13027, Co 13028, Co 13029, Co 13030, Co 13031, CoA 14323, CoC 14337, PI 14377

CUDDALORE- Plug and nodal method

IVT (Early) : Co 13023, Co 13024, CoA 14321, CoC 14336

IVT (Midlate) : Co 13025, Co 13027, Co 13028, Co 13029, Co 13030, Co 13031, Co 13032, CoA 14323, CoC 14 337, PI 14377

AVT- Early (I Plant) : CoA 13322, CoC 13336, CoC 13337

AVT- Early (II Plant) : CoA 12322, CoV 12356

AVT-Mid late (I Plant) : CoA 11326, CoC 13339, CoOr 13346

PENINSULAR ZONE

NAVSARI – Plug method

IVT (Early) : Co 13002, Co 13003, Co 13004, CoN 13071, CoN 13072, MS 13081

IVT (Midlate) : Co 13006, Co 13011, Co 13013, Co 13014, Co 13016, Co 13018, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk 13103, CoSnk 13106, PI 13131, PI 13132

AVT (Early) Plant I : Co 11001, Co 11004, CoM 11082, CoM 11084

AVT (Early) Plant II : Co 10005, Co 10006, Co 10026, Co 10027, CoT 10367

AVT (Midlate) Plant I : Co 11005, Co 11007, Co 11019, CoM 11085

AVT (Midlate) Plant II : Co 09009, Co 10015, Co 10031, CoM 10083, CoT 10368, CoT 10369, CoVc 10061, PI 10131

THIRUVALLA – Plug & nodal method

IVT (Early) : Co13002, Co13003, Co13004, CoN 13072, CoSnk13101, CoSnk13102, MS 13081, Co 85004, Co 94008

IVT (Midlate) : Co 13005, Co 13008, Co 13009, Co 13011, Co 13013, Co 13014, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk13104, CoSnk13105, CoSnk13106, CoT 13366, PI 13132

AVT (Early) Plant I : Co 11004, Co 85004, Co 94008

AVT (Early) Plant II : Co 10004, Co 10005, Co 10006, Co 10024, Co 10027, CoT 10366, CoT 10367

AVT (Midlate) Plant I : Co 11005, Co 11007, Co 11012, CoM 11086

AVT (Midlate) Plant II : Co 09009, Co 10015, Co 10033, CoT 10368, CoVC10061, PI 10131

COIMBATORE – Plug and nodal method

: CoM 13082, CoSnk 13105, MS 13081

PP 17B: EVALUATION OF ZONAL VARIETIES FOR SMUT

Objective: To gather information on the relative resistance of the entries to smut inoculation in zonal trials of the respective zones

Locations:

North West Zone : Lucknow, Kapurthala, Shahjahanapur, Pantnagar
North Central Zone : Pusa, Seorahi
East Coast Zone : Anakapalle, Cuddalore
Peninsular Zone :Coimbatore, Powarkheda, Thiruvalla, Padegaon, Navsari, Kolhapur, Sankeshwar and Pune

Year of Start: 1994-95 (continuous project)

Varieties: All the entries of early and midlate group under IVT and AVT of the respective zones. The seed material is to be obtained from the respective breeders of the centre.

Inoculum: *Sporisorium scitamineum* (Syn. *Ustilago scitaminea*) teliospores freshly collected from smut susceptible sugarcane varieties will serve as source of inoculum.

Storage: Freshly collected whips are air dried by keeping under shade and teliospores are collected in butter paper bags and are stored in desiccators under anhydrous calcium chloride. Spore viability is to be ensured before inoculation.

Three budded setts of the test clones/entries to be pre-soaked in smut teliospore suspension (spore load @ 10^6 spores ml^{-1}) for a period of 30 min along with the respective checks/standards for R and S categories and planted in 6m/20' rows. Field observations to be made from the time of whip emergence (around 45 days) at fortnightly intervals and the number of smut infected clumps to be recorded. Evaluation is based on the percentage of clumps infected (No. of affected clumps/total clumps 100). It is required to maintain at least 15 to 20 clumps in each genotype before arriving at the percentage infection.

The following grading was followed for calculating the disease reaction.

0 % : Resistant (R)
>0 to 10 % : Moderately Resistant (MR)
>10 to 20 % : Moderately Susceptible (MS)
>20 to 30 per cent : Susceptible (S)
Above 30% : Highly susceptible (HS)

RESULTS OF THE PREVIOUS YEAR

NORTH WEST ZONE

LUCKNOW

Out of forty three entries tested, eleven *viz.,* CoH 11262, CoLk 11203, CoS 10231, Co 11027, CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214, Co 10036, CoH 10262 and CoPant 10221 were S to smut.

SHAHJAHANPUR

Out of 41 entries 27*viz*., CoLk 11201, CoLk 11202, CoLk 11203, CoH 11262, Co 10035, CoS 10231, CoH 10261, Co 11027, CoH 11263, CoLk 11204, CoLk 11206, CoS 11232, Co 10036, CoH 10262, CoPant 10221, CoPb 10181, CoPB 10182, Co 12026, Co 12027, CoH 12261, CoLk 12201, CoLk 12202, CoLk 12203, CoLk 12204, CoPant 12221, CoPant 12222, CoS 12231 were identified as R/MR.

KAPURTHALA

Out of 43 entries, 20 namely CoH 11262, Co 10035, CoH 10261, CoH 11263, CoPb 11214, Co 10036, CoH 10262, CoPant 10221, CoPb 10181, Co 12026, CoLk 12201, CoPant 12221, CoPant 12222, Co 12028, CoH 12263, CoPant 12223, CoPant 12225, CoPant 12226, CoPb 12181, CoPb 12211 were rated as MR, 22 were rated as MS, one entry CoH 12261 was rated as S.

PANTNAGAR

Out of 42 entries 13 entries were rated as R, 10 were MR, 11 were MS, 7 were S and one was HS.

NORTH CENTRAL ZONE

PUSA

Sixteen entries including one check were tested and the data showed that thirteen entries CoP 12436, CoP 12437, CoP 12439, CoLk 12208, CoSe 12453, CoLk 12207, CoLk 12209, CoSe 12451, CoSe 12452, BO 91, CoP 9301, BO 130 and CoLk 09204 remained free from smut thus, were graded as R, while two entries CoSe 92423 and CoP 12438 were graded as MR.

SEORAHI

Out of 25 varieties which were evaluated for smut resistance, 17 were rated as R, 2 were MR, 2 were MS, one was S and 3 were HS.

EAST COAST ZONE

ANAKAPALLE

Out of 24 entries tested, six showed R reaction (CoA 13324, CoA 13325, CoA 13326, CoA 13328 and CoV 13356), while five entries (Co 997, Co 7706, CoA 13327, CoA 13321and CoA 13322) were rated as MR. The remaining entries showed MS, S to HS reaction.

CUDDALORE

Among the 25 entries screened for resistance to smut 10 entries *viz*., CoA 12322, CoA 12324, CoA 13325, CoA 13327, CoC 13337, CoC 13338, CoV 13356, , CoC 13339, CoOr 13346 and CoV 12357 showed R reaction and four entries viz., CoC 10336, CoC 11336, CoOr 12346 and CoV 12356 showed MR reaction.

PENINSULAR ZONE

PADEGAON

Out of 60 entries, 10entries i.e. Co 12001, Co 12003, Co 12007, CoM 12081, CoM 12082, CoM 12083, CoN 12071, CoN 12072, CoT 12366 and CoT 12367 from IVT Early, 7 entries*viz.,* Co 10004, Co 10005, Co 10006, Co 10024, Co 10026, CoT 10366 and CoT 10367 from AVT–Early (I Plant), 2 entries*viz.,* Co 09004 and Co 09007 from AVT–Early (II Plant), 9 entries *viz.,* Co 12014, Co 12016, Co 12017, Co 12019, Co 12021, CoM 12084, CoM 12085, CoM 12086 and CoN 12073 from IVT-Midlate and 4 entries *viz.,* Co 09009, CoM 10083, CoT 10368 and CoT 10369 from AVT-ML I Plant showed R reaction to smut.

SANKESHWAR

In IVT (Early) out 12 entries 5 namely Co 12001, Co 12003, Co 12008, Co 12024 and CoN 10072 were rated as R. Of the remaining 7 entries, 2 were rated as MR, 4 were rated as MS, one entry Co 12006 was rated as S. In AVT (Plant I) out of 8 entries Co10004, Co10005, Co 10026 and Co 10027 found to be R, where as Co10024 found to be MR and the remaining 3 entries namely Co10006, CoT10366 and CoT 10367 were MS. In AVT Early (Plant II) 3 entries were tested and among them Co 09004 and Co 09007 were rated as R and CoN 09072 was rated as MR. In IVT (Mid late) six entries Co12009, Co 12016, Co 12017, Co12019, CoM 12084, CoM 12085 and CoT 12368 were R, Co12014, Co 12021 and CoN 12073 were MR, Co12012 was MS and remaining 3 entries CoM 12086, CoN 12074 and VSI

12121 were found to be S. In AVT mid late (Plant I) the entries Co 99004, Co 10015, Co 10033, CoM 10083, CoT 10368, CoT 10369, PI 10132 and PI 10132 was graded as R. While each entry Co10031 was graded as MS and Co 10017 graded as HS.

POWERKHEDA

Among AVT – II (early), two entries (Co 09007 &CoN 09072) were found to be MR whereas in the AVT – I (Early) one entries namely CoT 10366 and five entries i.e. Co 10004, Co 10024, Co 10026, Co 10027 andCoT 10367 were found to be R and MR to smut disease of sugarcane, respectively. Among AVT – I (mid late), three entries namely CoT 10368, CoT 10369 and CoVc 10061 were found to be R whereas five entries i.e. Co 09009, Co 10031, CoM 10083, PI 10131 and PI 10132 exhibited MR reaction to smut disease. In IVT (early), seven entries namely Co 11004, Co 11016, Co 11017, Co 11018, CoM 11081, CoT 11366 and PI 11131 were found to be R while remaining entries showed MR to S reaction. Among IVT (Mid late), six entries namely Co 11005, Co 11007, Co 11012, Co 11020, Co 11021 and Co 11023 were found to be R and remaining entries exhibited MR to MS.

KOLHAPUR

In IVT out of 12 entries showed R reaction to smut, entries Co12006 and Co12008 showed MR and MS reaction to smut, respectively. In AVT Early (I plant), out of eight entries only one entry i.e Co10027 showed MR to smut and remaining all showed R reaction. In AVT- Early (II Plant) Co 09004 and Co09007 showed R reaction and remaining one CoN 09072 was found to be MR to smut. In IVT Midlate out of 15, 9 entries*viz*, Co12014, Co12016, Co 12017,Co12019, Co12021, CoM 12084, CoM 12085, CoM 12086 and CoN 12073 found R to smut whereas remaining five sugarcane entry Co12012, Co12024, CoN 12074, CoT 12368, VSI 12121 were MR. In AVT Midlate (I plant) out of 11 entries 4 *viz*, Co 09009, CoM 10083, CoT 10368 and CoT 10369 were R to smut whereas Co 10031,Co 10033, CoVc 10061 and PI 10132 entries found MR. Two entries Co 10017 and PI 10131 shown MS reaction and remaining one entry Co 10015 found S to smut.

PUNE

Out of 32 entries including 2 standard checks 15 entries*viz.,* Co11017, Co11018, CoN11071, CoN11072, CoT11366, CoN09072, Co11021, Co11022, Co11023, Co11024, CoM11085, CoM11086, Co11087, CoN11073, and CoN11074 were found R, 10 were found MS, 5 were found S and remaining 2 were found HS.

NAVSARI

Out of 55 entries evaluated for smut, 31 entries exhibited R, 7 entries showed MR, 5 entries exhibited MS reaction and rest of the entries showed S to HS.

COIMBATORE

Out of 27 IVT entries tested along with two susceptible checks Co 96007 and Co 97009 and resistant check Co 6806, 4 entries viz., Co 12003, Co 12017, Co 12021 and Co 12083 were MR, 6 were MS, 2 were S and 15 were HS to smut.

RESULTS OF THE CURRENT YEAR

NORTH WEST ZONE

LUCKNOW

Out of forty two entries tested, eighteen *viz.,* Co 13034, CoLk 13203, CoS 13231, Co 12026, Co 12203, CoPant 12221, CoLk 11202, Co 13035, CoPb 13182, CoS 13232, CoPb 13183, Co 12029, CoH 12263, CoLk 12205, CoPb 12211, Co 11027, CoH 11263 and CoLk 11204 were S and remaining 24 were tolerant to smut.

SHAHJAHANPUR

Among the screened entries 32 *viz*., Co 12027, Co 12029, CoLk 12203, CoPant 12221, CoLk 11201, CoLk 11202, CoH 12263, CoPant 12226, CoS 12232, CoH 11263,

CoLk 11204, CoLk 11206, CoLk 11214, CoS 11232, Co 13034, CoLk 13201, CoLK 13202, CoLk 13203, CoPb 13181, CoS13231, Co 13035, Co 13036, CoH 13261, CoH 13262, CoH 13263, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183, CoS 13232 and CoS 13233 were rated as R/MR.

KAPURTHALA

Out of 42 entries five namely, CoH 13262,CoLk 13201, CoPant 13221, CoPant 13223 andCoS 13231 were rated as R and 14 entries*viz*., Co 12026, Co 13033,CoH 11262, CoH 11263, CoH 12263, CoH 13261, CoLk 13203, CoPant 12226, CoPant 13224,CoPb 12211, CoPb 11214, CoPb 13181, CoPb 13183 and CoS 13232 were rated as MR.

PANTNAGAR

Out of 41 genotypes 23 genotypes were found R, 3 were MR andremaining entries showed various degrees of susceptibility with 10 MS and 5 S reaction.

NORTH CENTRAL ZONE

PUSA

Eighteen sugarcane genotypes including one check were tested for smut resistance. It is observed that seven entries viz., CoP 11438, CoP 11451, CoLK 09204, BO 155, BO 91, CoP 9301 and CoP 13439 remained free from smut disease and graded as R. Whereas, ten entries viz., CoP 11437, BO 130, CoSe 92423, CoP 13436, CoP 13437, CoSe 13451, CoSe 13452, CoP 13438, CoSe 13453 and CoSe 13454 were graded as MR against smut disease.

MOTIPUR

Out of twenty three entries tested, five *viz.,* CoP 13436, CoP 13439, CoSe 13452, CoSe 13454 and CoLk 12207 were S and remaining 16 were tolerant to smut.

SEORAHI

Of 23 entries, 18 were rated as R and 1wasrated as MS, while 4 were rated as HS against smut.

EAST COAST ZONE

ANAKAPALLE

Out of 32 entries evaluated against smut nine entries *viz*.,Co 13023,Co 13024, CoC 14336, Co 13025, Co 13028, Co 13030, Co 13031, Co 13032 and CoA 14323 exhibited MR reaction.

CUDDALORE

Among the thirty three clones screened, four clones *viz.,* Co 13032, CoC 14337, CoV 13356 and CoA 12324 recorded Rand twenty clones *viz.,* Co 07013, Co 13023, Co 13024, CoA 14321, CoC 14336, CoV 14356, Co 13025, Co 13028, Co 13029, Co 13030, Co 13031, PI 14376, PI 14377, CoC 13337, CoA 12322, CoOr 12346, CoV 12356, CoA 11326, CoC 13339 and CoOr 13346 were MR, six clones were MS, two clones were S and one was HS to smut disease.

PENINSULAR ZONE

PADEGAON

Out of 58 clones, 2 *viz.,* CoN 13071 and MS 13081 from IVT Early, 3clones*viz.,* CoM 11081, CoM 11082,and CoM 11084 from AVT–Early (I Plant), 5 entries*viz.,* Co 10004, Co 10024, Co 10026, CoT 10366 and CoT 10366 from AVT–Early (II Plant), 14 entries *viz.,* Co 13008, Co 13014, Co 13016, Co 13018, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk 13104, CoSnk 13105, CoSnk 13106, CoT 13366, PI 13131 and PI 13132 from IVT-Midlate, 2entries *viz.,* Co 11007 and CoM 11086 from IVT-Midlate (I Plant) and 3entries *viz.,* CoM 10083, CoT 10368 and CoT 10369 from AVT-Midlate (II Plant) showed R reaction to smut disease.

SANKESHWAR

In IVT (E)among eight entries 4 *viz*., Co 13003, CoN 13072, CoSnk 13101and CoSnk 13102 were graded as R. In IVT (ML) 14 entries namely Co 13008, Co 13009, Co 13011, Co 13014, Co 13016, CoM 13082, Co 13073, CoN 13074, CoSnk 13014, CoSnk 13015, CoSnk 13016, CoT 13366, PI 13131, PI 131312 were rated as R. In AVT Early (PC I) all 8 entries recorded R reaction, whereas in AVT Midlate (PC I) out of 6 entries, 4 viz., Co 11005, Co 11007, Co 11012 and Co 11019 showed R reaction. In AVT Early (PC II) out of 8 entries tested, four *viz*., Co10004, Co 10024, Co 10026 and CoT 10366 were R to smut. In AVT Midlate (PC II) out of 11 entries tested, Co 10015, Co 10017, Co 10031, Co 10033, CoM 10083, CoVc 10061 and PI 10131 were rated as R.

POWERKHEDA

Among AVT– II (early) entries three *viz*.,Co 10027, CoT 10366, CoT 10367 and in AVT – I (early) two viz.,Co 11004 and CoM 11081 were found to be R and five entries i.e. Co 11001, Co 10004, Co 10024, Co 10026, and CoM 11084showed MR reaction.In the mid late group, three entries viz., CoT 10368, CoT 10369 andCoVv 10061 in AVT – II and two entries, i.e.,Co 11005 and Co 11007 in AVT – I were found to be R where as seven entries i.e. Co 11012, Co 10031, CoM 10083, PI 10131, PI 10132, CoM 11085 and CoM 11086 exhibited MR reaction. In IVT (early), six entries namely Co 12001, Co 12006, CoM 12083, CoN 12072, CoT 12366 and CoT 12367 were found to be R while remaining entries showed MR to S reaction. Among IVT (Mid late), five entries namely Co 12014, Co 12016, Co 12019, Co 12021 and CoN 12073 were found to be R and remaining genotypes exhibited MR to MS reaction to smut disease.

KOLHAPUR

Out of 58 entries, 4 *viz*., Co 13002, Co 13004, CoN 13071 and MS 13081 from IVT Early, 4 *viz*., Co 11004, CoM 11081, CoM 11082 and CoM 11084 from AVT Early (I Plant), 6 *viz*., Co 10004, Co 10005, Co 10024, Co 10026, CoT 10366 and CoT 10367 from AVT Early (II Plant), 15 *viz*., Co 13008, Co 13009, Co 13014, Co 13016, Co 13018, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk 13104, CoSnk 13105, CoSnk 13106, CoT 13366, PI 13131 and PI 13132 from IVT Midlate, 3 *viz*., Co 11007, Co 11012 and CoM 11086 from AVT Midlate (I Plant), 3 *viz*., CoM 10083, CoT 10368 and CoT 10369 from AVT Midlate (II Plant) shown R reaction to smut disease.

PUNE

Out of 51 entries screened, 34 *viz.,* Co12001, Co12003, CoM12081, CoM12082, CoM12083, CoT12366, CoN12072, CoT12367, Co10004, Co10006, Co10024, Co10026, Co10027, CoT10367, Co09004, Co09007,Co12012, Co12016, Co12017, Co 12019, Co 12021, CoM12084, CoM12085, CoN12073, CoT12368, VSI12121, Co09009,Co10015, Co10031, CoM10083, CoT10368, CoT10369, PI10131 and PI10132 were found R, 2 were found MR, 7 were found MS, 5 were found S and remaining 3 were HS.

NAVSARI

Out of 58 entries evaluated, thirty entries *viz*., Co 13002, Co 13004, CoN 13071, CoSnk 13102 and MS 13081 (IVT-E),Co 13006, Co 13008, Co 13009, Co 13011, Co 13014, Co 13016, Co 13018, CoM 13082, CoN 13073, CoN 13074, CoSnk 13105 and CoT 13366 (IVT-ML),Co 11001 and CoM 11084 (AVT–E I plant)**,** Co 10005, Co 10006 and CoT 10366 (AVT-E II Plant), Co 11005, Co 11019, CoM 11085 and CoM 11086 (AVT–ML I plant)**,** CoT 10369,CoVc10061 and PI 10132 (AVT–ML II plant) exhibited R reaction. Eight entries *viz*., Co 13003 and CoN 13072 (IVT-E), CoSnk 13104 (IVT-ML), Co 10004 and CoT 10367 (AVT-E II Plant), Co 09009, CoM 10083 and PI 10131 (AVT ML II Plant) showed MR reaction.

COIMBATORE

Totally 28 IVT entries were evaluated for smut resistance, among them 10 entries were identified as R/MR, eight behaved as MS and the rest were S/HS to the disease.

SUMMARY

Entries showing R and MR against smut are as follows

NORTH WEST ZONE

KAPURTHALA

AVT (Early) Plant I	:	Co 12026
AVT (Early) Plant II	:	CoH 11262
AVT (Midlate) Plant I	:	CoH 12263, CoPant 12226, CoPb 12211
AVT (Midlate) Plant II	:	CoH 11263, CoPb 11214
IVT (Early)	:	Co 13033, CoLk 13201, CoLk 13203, CoPant 13221, CoPb 13181, CoS 13231
IVT (Midlate)	:	CoH 13261, CoH 13262, CoPant 13223, CoPant 13224, CoPb 13183, CoS 13232

PANT NAGAR

AVT (Early) Plant I	:	Co 12026, Co 12027, CoLk 12203, CoPant 12221
AVT (Early) Plant II	:	CoH 11262, CoLk 11201, CoLk 11202
AVT (Midlate) Plant I	:	CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211, CoS 12232
AVT (Midlate) Plant II	:	CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214, CoS 11232
IVT (Early)	:	CoLk 13203, CoPb 13181
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13261, CoH 13263, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183,

SHAJAHANPUR

AVT (Early) Plant I	:	Co 12026, Co 12027, CoLk 12203, CoPant 12221
AVT (Early) Plant II	:	CoLk 11201, CoLk 11202, CoLk 11203
AVT (Midlate) Plant I	:	Co 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211, CoS 12232
AVT (Midlate) Plant II	:	Co 11027, CoH 11263, CoLk 11204, CoLk 11214, CoS 11232
IVT (Early)	:	Co 13034, CoLk 13201, CoLk 13202, CoLk 13203, CoPb 13181, CoS13231
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13261, CoH 13262, CoH 13263, CoLk 13204, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183, CoS 13232, CoS 13233

NORTH CENTRAL ZONE

PUSA

	:	CoLk 09204, CoP 11437, CoP 11438, CoP 11451, CoP 11456, CoP 13437, CoP 13438, CoP 13439, CoSe 13451, CoSe 13452, CoSe 13453, CoSe 13454, BO 155, BO 130

SEORAHI

IVT (Early)	:	CoP 13437, CoSe 13452
IVT (Mid late)	:	CoP 13438, CoSe 13453
AVT (Early) I Plant	:	CoP 12436, CoSe 12451
AVT (Early) II Plant	:	CoP 11436, CoP 11437, CoP 11438
AVT (Mid late)- I Plant	:	CoLk 09204, CoLk 12209, CoP 12438
AVT (Mid late)-II Plant	:	BO 155, CoSe 11453, CoSe 11454, CoSe 11455

EAST COAST ZONE

ANAKAPALLE

IVT Early	:	Co 07013, Co 13023, Co 13024, CoA 14321, CoC 14336
IVT Midlate	:	Co 13025, Co 13028, Co 13030, Co 13031, Co 13032, CoA 14323, PI 14377

CUDDALORE

IVT (Early)	:	Co 07013, Co 13023, Co 13024, CoA 14321, CoC 14336, CoV 14356
IVT (Mid late)	:	Co 13025, Co 13028, Co 13029, Co 13030, Co 13031, Co 13032, CoC 14337, PI 14376, PI 14377
AVT (Early) I Plant	:	CoC 13337
AVT- Early (II Plant)	:	CoA 12322, CoOr 12346, CoV 12356
AVT- Midlate I Plant	:	

PENINSULAR ZONE

PADEGAON

IVT (Early)	:	Co 13002, Co 13003, Co 13004, CoN 13071, MS 13081
AVT(Early) Plant I	:	Co 11004, CoM 11081, CoM 11082, CoM 11084
AVT(Early) Plant II	:	Co 10004, Co 10005, Co 10024, Co 10026, CoT 10366, CoT 10367
IVT (Midlate)	:	Co 13008, Co 13009, Co 13014, Co 13016, Co 13018, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk 13103, CoSnk 13104, CoSnk 13105, CoSnk 13106, CoT 13366, PI 13131, PI 13132
AVT(Midlate) Plant I	:	Co 11007, Co 11012, CoM 11085, CoM 11086
AVT– Midlate II Plant	:	CoM 11086, CoT 10368, CoT 10369

KOLHAPUR

IVT (Early)	:	Co 13002, Co 13003, Co 13004, CoN 13071, CoSnk 13102, MS 13081
IVT (Midlate)	:	Co 13008, Co 13009, Co 13014, Co 13016, Co 13018, Co 13020, CoM 13082, CoN 13073, CoN 13074, CoSnk 13103, CoSnk 13104, CoSnk 13105, CoSnk 13106, CoT 13366, PI 13131, PI 13132
AVT (Early) Plant I	:	Co 11004, CoM 11081, CoM 11082, CoM 11084
AVT (Early) Plant II	:	Co 10004, Co 10005, Co 10024, Co 10026, CoT 10366, CoT 10367
AVT (Midlate) Plant I	:	Co 11007, Co 11012, CoM 11085, CoM 11086
AVT– Midlate II Plant	:	Co 10031, CoM 10083, CoT 10368, CoT 10369

SANKESWHAR

IVT (Early)	:	Co 13003, CoN 13072, CoSnk 13101, CoSnk 13102
IVT (Midlate)	:	Co 13008, Co 13009, Co 13011, Co 13014, Co 13016, CoM 13082, CoN 13073, CoN 13074, CoSnk 13104, CoSnk 13105, CoSnk 13106, CoT 13366, PI 13131
AVT (Early) Plant I	:	Co 11001, Co 11004, CoM 11081, CoM 11082, CoM 11084
AVT (Early) Plant II	:	Co 10004, Co 10024, Co 10026, CoT 10366
AVT (Midlate) Plant I	:	Co 11005, Co 11007, Co 11012, Co 11019
AVT (Midlate) Plant II	:	Co 10015, Co 10017, Co 10031, Co 10033, CoM 10083, CoVc 10061, PI 10131

PUNE

IVT (Early)	:	Co 12001, Co 12003, CoM 12081, CoM 12082, CoM 12083, CoT 12366, CoN 12072, CoT 12367
IVT (Early) II Plant	:	Co 09004, Co 09007
IVT (Midlate)	:	Co 12012, Co 12016, Co 12017, Co 12019, Co 12021, CoM 12084, CoM 12085, CoN 12073, CoT 12368, VSI 12121
AVT (Early)	:	Co 10004, Co 10006, Co 10024, Co 10026, Co 10027, CoT 10367
AVT Midlate I Plant	:	Co 09009, Co 10015, Co 10031, CoM10083, CoT 10368, CoT 10369,

PI 10131, PI 10132, MS 10033

POWARKHEDA

AVT(Early) Plant I	:	Co 10004, Co 10024, Co 10026, Co 10027, CoT 10366, CoT 10367, Co 11001, Co 11004, CoM 11081, CoM 11084
AVT (Midlate) Plant I	:	Co 10031, CoM 10083, CoT 10368, CoT 10369, CoVc 10061, PI 10131, PI 10132, Co 11005, Co 11007, Co 11012, CoM 11085, CoM 11086
IVT (Early)	:	Co 12001, Co 12006, CoM 12081, CoM 12083, CoN 12071, CoN 12072, CoT 12366, CoT 12367
IVT (Mid late)	:	Co 12009, Co 12012, Co 12014, Co 12016, Co 12017, Co 12019, Co 12021, Co 12024, CoN 12073, CoT 12368, VSI 12121

NAVSARI

IVT(Early)	:	Co 13002, Co 13003, Co 13004, CoN 13071, CoN 13072, CoSnk 13102, MS 13081
IVT (Midlate)	:	Co 13006, Co 13006, Co 13009, Co 13011, Co 13014,Co 13016, Co 13018, CoM 13082, CoN 13073, CoN 13074, CoSnk 13104, CoSnk 13105, CoT 13366
AVT(Early) Plant I	:	Co 11001, CoM 11084
AVT(Early) Plant II	:	Co 10004, Co 10005, Co 10006, CoT 10366, CoT 10367
AVT (Midlate) Plant I	:	Co 11005, Co 11019, CoM 11085, CoM 11086
AVT (Midlate) Plant II	:	Co 09009, CoM 10083, CoT 10368, CoT 10369, CoVc 10061, PI 10131, PI 13132

COIMBATORE

	:	Co 13004, Co 13018, Co 13020, CoM 13082, CoN 13071, CoN 13073, CoSnk 13104, CoSnk 13106, MS 13081, PI 13131

PP 17C: EVALUATION OF ZONAL VARIETIES FOR WILT

Location : Kapurthala, Lucknow, Pusa, Navsari, Anakapalle
Year of Start : 2000-2001
Varieties : Entries of AVT of the respective zones for the year
Plot size and Planting: Two rows of 5 m length planted under wilt sick soils
Standards : Any wilt susceptible and resistant variety of the zone.
Observations: 1. Germination count at 45 days of planting
2. Appearance of wilt symptoms on the standing canes (on clumps)
3. At the end of 10 months, 10 clumps are to be uprooted with roots. All canes from the clumps will be split open longitudinally and the wilt severity index scored on a 0--4 scale.

Evaluation : 0-4 Scale of wilt severity index

Grade	Symptoms
0	Healthy canes and roots with no external or internal 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 the internal tissuesextend 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 tissues throughout the entire length of the cane except the top. Severe pith and cavity formation. Sparse fungal growth observed in the pith cavities.
4	Complete yellowing and drying 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 discoloration and dislodge easily from the stalks. Roots mildly discoloured and slightly necrotic.

The mean wilt severity index is worked out based on the number of canes sampled.

Mean wilt severity index = Sum of wilt indices of individual stalks/Number of stalks sampled

Note: Varieties were screened for wilt resistance in wilt sick plot.

RESULTS OF THE PREVIOUS YEAR

LUCKNOW

Natural incidence of wilt was observed in 17 entries*viz.,* Co 12026, Co 11027, Co 12028, CoH 12261, CoH 10262, CoH 12262, CoH 12263, CoPant 10221, CoPant 12221,

CoPant 12223, CoPant 12225, CoPant 12226, CoPb 10181, CoPb 12212, CoS 10231, CoS 12231 and CoS 12232.

KAPURTHALA

Out of 43 entries 33 behaved as R, 7 entries namely Co 10035, CoLk 11203, CoH 11263, CoS 11232, CoLk 12206, CoPant 12226, CoPb 12182 as MR, 3 entries viz., CoH 11262, CoLk 12203, CoLk 12204 as MS and 2 standards viz., Co 7717 and Co 89003 were rated as HS.

PUSA

Out of 16entries evaluated, three CoLk 12207, CoLk 12208 and CoLk 12209 were graded as R, while 10, BO 91, BO 130, CoP 12437, CoP 12438, CoP 12436, CoP 12439, CoP 9301, CoSe 12453, CoSe 12451 and CoLk 09204 were graded as MR,while 2 (CoSe 92423 and CoSe 12452) showed MS reaction and check (CoSe 95422) showed S to wilt (Table 19).

ANAKAPALLE

Out of 24 entries tested, two entries CoA 13325 and CoA 13321 showed R reaction while the entries CoA 12321, CoA 11323, CoA 13328, CoA 13324 and CoA 13322 reacted as MR, the remaining showed S to HS reaction.

NAVSARI

Fourteen entries *viz*., Co 10005, Co 10006, Co 10024, Co 10026, Co 10027, CoT 10366 and CoT 10367 (AVT-E I Plant), Co 09004, Co 09007, CoN 09072 (AVT-E II Plant), Co 10015, Co 10031, CoT 10368 and PI 10132 (AVT-ML I Plant) showedMR reaction.One entry viz., PI 10131 (AVT-ML I Plant) exhibited MS reaction to wilt, remaining entries showed S reaction to wilt. Two zonal checks viz., Co 94008 (AVT-E I Plant) and Co 99004 (AVT-E II Plant)showed MS reaction, while two checks Co 85004 (AVT-E I Plant) and Co 86032 (AVT-E II plant) exhibited MS reaction, one check CoC 671 (AVT-E I plant) displayed S reaction to wilt.

RESULTS OF THE CURRENT YEAR

LUCKNOW

Incidence of wilt was observed in 5 genotypes *viz.,* CoPant 13222 CoS 13231 CoH 11262 Co 13036 CoPant 12226 and no incidence of wilt disease was observed in other entries.

KAPURTHALA

Out of 42 entries 27 behaved as R, 11 namely Co 13034, Co 13036, CoH 11263, CoLk 11201, CoLk 11203, CoLk 13201, CoLk 13203, CoPant 12226, CoS 11263, CoS 11232, and CoPant 13224 behaved as MR and four *viz*., CoLk 12203, CoH 11262, Co 13033 and CoH 13263 behaved as MS.

PUSA

Out of 18genotypes, nine entries BO 155, BO 130, CoP 13436, CoP 13437, CoP 13438, CoSe 13451, CoSe 13452, CoSe 13453 and CoSe 13454 were graded as R, whereas, seven entries *viz*., CoP 11437, CoP 11438, CoP 11451, CoLk 09204, BO 91, CoP 9301 and CoP 13439 were graded as MR.

MOTIPUR

Natural incidence of wilt was observed in 4 genotypes *viz.,* CoSe 13452, CoP 13438, CoSe 13453 and CoP 12438, the remaining entries showed no disease.

ANAKAPALLE

Out of 32 entries tested, 3 entries *viz*., Co 13031, CoA 14323 (2009 A 252), and CoC 14337 exhibited R reaction and the remaining entries showedMR, MS and HS reaction.

NAVSARI

Out of 34 entries none showed R reaction, whereas21 entries *viz*., Co 13006, Co 13009 and CoN 13073 (IVT-ML), Co 11001, Co 11004,CoM 11082 and CoM 11084 (AVT-E I Plant),Co 10005, Co 10006, Co 10027, CoT 10366 and CoT 10367 (AVT-E II Plant), Co 11005, Co 11007, Co 11012, CoM 11085 and CoM 11086 (AVT-ML I Plant), Co 10015, Co 10031, CoT 10368 and PI 10132 (AVT-ML II Plant) showedMR reaction.Eightentries exhibited MS reaction and remaining entries showed S reaction to wilt.

SUMMARY

Entries showing Resistance against wilt are as follows

NORTH WEST ZONE

KAPURTHALA

AVT (Early) Plant I	:	Co 12026, Co 12027, CoPant 12221
AVT (Early) Plant II	:	CoLk 11201, CoLk 11202, CoLk 11203
AVT (Midlate) Plant I	:	Co 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211, CoS 12232
AVT (Midlate) Plant II	:	Co11027, CoH 11263, CoLk 11204, CoLk 11206, CoPb 11214
IVT (Early)	:	Co 13034, CoLk 13201, CoLk 13202, CoLk 13203, CoPant 13221, CoPant 13222, CoPb 13181, CoS 13231
IVT (Midlate)	:	Co 13035, Co 13036, CoH 13261, CoH 13262, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182, CoPb 13183, CoS 13232, CoS 13233

NORTH CENTRAL ZONE

PUSA

	:	CoLk 09204, CoP 11437, CoP 11438, CoP 11451, CoP 13436, CoP 13437, CoP 13438, CoP 13439, CoSe 13451, CoSe 13452, CoSe 13453, CoSe 13454, BO 130, BO 155

EAST COAST ZONE

ANAKAPALLE

IVT Early	:	Co 13023, Co 13024, CoA 12321, CoA 14321, CoA 14322,
IVT Midlate	:	Co 13031, CoA 14323, CoC 14337, PI 14377

PENINSULAR ZONE

NAVSARI

IVT Early	:	-
IVT Midlate	:	Co 13006, Co 13009, CoN 13073
AVT- (Early) Plant I	:	Co 11001, Co 11004, CoM 11082, CoM 11084
AVT (Early) Plant II	:	Co 10005, Co 10006, Co 10027, CoT 10367
AVT- (Midlate) Plant I	:	Co 11005, Co 11007, Co 11012, CoM 11085, CoM 11086
AVT- (Midlate) Plant II	:	Co 09009, Co 10015, Co 10031, CoT 10368, PI 10132

PP 17D: YELLOW LEAF DISEASE

YLD symptoms of mid rib yellowing are expressed during 6-8 months crop stage. If disease severity increases, the yellowing spreads to laminar region and later there will be drying of affected mid rib and adjoining laminar tissue from leaf tip downwards along the mid rib. Another important symptom would be bunching of leaves in the crown. Highly susceptible variety will exhibit severe foliage drying during maturity stage. In place of yellow discoloration, purple or pinkish purple discoloration may also be seen on the mid rib and lamina. Canes of the affected plant do not dry. To assess YLD severity, the following disease severity grades are to be given during maturity stages of the crop (3 observations by 8^{th}, 10^{th} and 12^{th} months). Each time, minimum of 25 canes (free from other biotic stresses) are to be scored.

YLD severity grades:

(The colour photographs of YLD symptoms displaying severity grades are available in the soft copy of the technical programme).

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

Mean of the severity grades to be computed and the following YLD severity scale is to be used to assign disease reaction of the variety.

YLD severity scale:

Disease grade Score	Description 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 OF THE PREVIOUS YEAR

LUCKNOW

Yellow leaf disease incidence was observed in Co 11027, CoS 11232 and CoPb 10181.

SHAHJAHANPUR

A total of 23 entries were screened and out of these, 19 were found R/MR and rest were MS/S to YLD.

KAPURTHALA

No disease symptoms were observed.

UCHANI

In AVT (E) Plant-1 two entries CoH 10262 and CoLk were R to YLD. Two entries viz., CoLk 11202 and CoLk 11203 showed MR reaction. In AVT (E) Plant II entry CoH 10261 exhibited R reaction and entries *viz.,* CoS 10035 and CoS 10231 were found MS against YLD. In AVT (ML) Plant-1 entry CoH 11263 showed R reaction and CoS 8436 showed MR reaction against YLD. In AVT (ML) –II two entries CoH 11262 and CoPb 10182 showed R reaction. Three entries were found MS for YLD. In IVT (E) three were found R and two entries CoLk 12203 and CoLk 12204 showed MR reaction, however, five entries were found MS against YLD. In IVT (ML) two entries CoLk 12205 and CoPb12211 showed R reaction and three entries namely were MR against YLD. Seven entries were MS and two varieties (CoPb 12212 and CoS 12232) showed S reaction.

PANTNAGAR

Out of 42 entries, 22 were found R, 14 MR, 5 MS and 1 S.

PUSA

Mild yellowing of midrib was seen in four varieties i.e. CoSe 95422, CoS 8436, Co 0238 and CoJ 64.

ANAKAPALLE

Out of 51 entries two viz., CoA 12321 and CoA 12322 showed R reaction, while the entries Co 7219, CoA 13326, CoA 13321 and CoA 13323 recorded MR reaction and remaining are S.

NAVSARI

Out of 52 varieties, 37 entries showed R reaction, nine entries viz., Co 12003 and CoT 12367 (IVT-E), Co 12009, Co 12012, Co 12014, Co 12019, Co 12024, CoM 12085 and CoT 12368 (IVT-ML) were found MR and 1 entry viz., Co 10368 (AVT-ML I Plant) displayed MS reaction. Out four checks one viz, Co 94008 (IVT-E) gave R reaction, while 2 checks viz., CoC 671 (IVT-E) and Co 99004 (IVT-ML) were found MR and Co 86032 (IVT-ML) was observed as S.

COIMBATORE

In IVT (E) out of 12 entries and three standards, 9 entries exhibited R reaction and the standard CoC 671 had shown MS reaction. In IVT (ML) 9 entries exhibited R reaction and 5 entries had shown MR reaction. In AVT (E) Plant I out of 11 entries, 7 entries viz. Co 94008, Co 10005, Co 10006, Co 10026, Co 10024, Co 10027, CoT 10367, and had shown R and 2 (CoT 10366, Co 10004) entries had shown MR reaction. In AVT (E) Plant II all the 3 entries (Co 09004, Co 09007, CoN 09072) exhibited MS reaction and the standards, Co 94008 and Co 85004 had shown MR reaction. In AVT (mid late) four entries had shown R and 6 entries exhibited MR and 2 entries Co 10031, CoT 10368, had shown MS reaction to YLD.

POWARKHEDA

In the early group, seven entries i.e. Co 09004, Co 10005, Co 10006, Co 10024, Co 10027, CoT 10366 and CoT 10367 exhibited R reaction whereas remaining were found to be MR to MS. In the mid late group, nine entries exhibited R reaction whereas remaining two entries were MR.

RESULTS OF THE CURRENT YEAR

LUCKNOW

YLD incidence was observed in eight genotypes *viz*., CoLk 13201, CoPb 13181, Co 12027, CoH 13263, CoPb 13182, CoH 12263, CoS 12232 and CoPb 11214.

KAPURTHALA

No disease symptoms were observed during the year 2016-17.

UCHANI

In AVT (E) Plant-1, out of 4 entries only Co 12026 showed YLD resistance and entries viz., Co 12027, CoLk 12203 and CoPant 12221 were MS. In AVT (E) Plant II trial, CoLk 11202 was YLD resistant. The entries CoH 11262 and CoLk 11201 were MS and CoLk 11203 was found to be S. Entries CoH 12263, CoLk 12205 in AVT (ML) Plant-1, showed MR and three entries namely, Co 12029, CoS 8436 and CoPb 12211 were MS. The entries viz., CoPant 12226and CoS 12232 CoS 767 and Co Pant 97222 were S to YLD. Out of six entries in AVT (ML) –II, CoH 11263 and CoPb 11214 showed resistant reaction and CoLk 11204 and CoS 8436 were MS. The entries Co 11027 and CoLk 11232 were YLD susceptible and three entries CoLk 11206, Co Pant 97222 andCoS 767 wereHS.Out of nine entries in IVT (E), four entries viz., CoLk 13201, CoLk 13202, CoLk 13203 and CoPant 13221were MR and Co 13033, Co 13034, Co Pant 13222 and CoPb 13181 wereMR to YLD. Of the 15 evaluated under IVT (ML), only CoS 13233showed resistance and four entries viz., CoH 13261, CoH 13262, CoH 13263 andCoS 13232 showed MR reaction against YLD. Eight entries Co 13035, Co 13036, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPb 13182 and CoPb 13183exhibited MS to YLD.

SHAHJAHANPUR

Forty two genotypes were evaluated for YLD resistance in six trials. In AVT (Early I plant), all 4 Co 12026, Co 12027, CoLk 12203 and CoPant 12221 were found to be R. Two genotypesCoLk 11201 and CoLk 11202 were found to be R and CoLk 11203 was MR in AVT (E, II plant). In AVT (M, I plant), all 6 genotypesCo 12029, CoH 12263, CoLk 12205, CoPant 12226, CoPb 12211 and CoS 12232 were rated as R. In AVT (M, II plant), the genotypes CoH 11263, CoLk 11204, CoS 11232 and CoS 767 were R and Co 11027 and CoLk 11214 were MR. Two genotypes CoPant 13222 and CoS 13231 were found to be R and the genotypes CoLk 13201, CoLk 13202, CoPant 13221 and CoPb 13181 were rated as MR in IVT (E). There were 8 genotypes viz., CoH 13263, CoLk 13204, CoLk 13205, CoPant 13223, CoPant 13224, CoPant 97222, CoS 767 and CoS 8436 found as R and 4 genotypes such as CoPb 13182, CoPb 13183, CoS 13232 and CoS 13233 were MR in IVT (M).

PANTNAGAR

Under natural condition, YLD was assessed on 41 genotypes. Out of these, 25 were recorded as R, 9 as MR, 6 asMS and only one was recorded as S**.**

PUSA

YLD was not observed in any experimental plots.

ANAKAPALLE

Out of 64 genotypes, three entries namely 2006 A 64, Co 13029 and Co 7602showed resistance against YLD under natural conditions, while five genotypes viz., Co 7219, CoA 12322, CoA 14323, CoC 13336 and PI 15376 showed MR reaction and remaining genotypes were S under natural conditions.

SEORAHI

Of 23 genotypes screened, 17 genotypes were YLD resistant, 2 were MR and 4 genotypes were MS to YLD. In IVT (E) trial, CoP 13436,CoSe 13451 and CoSe 13452 were found as resistant, whileCoP 13437 was MR to YLD. Among IVT (ML) genotypes, CoP 13438, CoSe 13453 and CoSe 13454 were resistant to YLD, while CoP 13439 was MS to YLD. The entries CoP 12436 and CoSe 12451 were found as resistant, while CoLk 12207 was s MS to YLD in AVT (E) I Plant trial. In AVT (E) II Plant trial, genotypes *viz*.CoP 11437, CoP 11438 and CoSe 11451 were found as resistant, while CoP 11436 was found to be MS to YLD. Among Advanced Varietal Trial (ML) l Plant genotypes, CoLk 09204 and CoLk 12209 were YLD resistant and CoP 12438 was MR to YLD while CoSe 12453 was MS

to YLD. In AVT (ML) II Plant trial, all four genotypes viz., BO 155, CoSe 11453, CoSe 11454 and CoSe 11455 were found to be YLD resistant.

NAVSARI

Of 58 zonal varieties/ entries from IVT (E), IVT (ML), AVT (E I & II Plant) , AVT (ML I & II Plant) , along with 5 checks (CoC 671, Co 94008 , Co 85004, Co 86032 and Co 99004) were evaluated for YLD resistance. 52 entries showed resistant reaction. Five entries viz., MS 13081 (IVT-E), Co 13005, CoT 13366, PI 13131 and PI 13132 (IVT-ML) were found as MR. Only one entry viz., Co 10368 (AVT-ML II Plant) was recorded as MS.Out of five checks, CoC 671 and Co 94008 (IVT-E) were found resistant and only Co 99004 (IVT-ML) was found MR to YLD. The check Co 85004 (IVT-E) exhibited MS reaction and Co 86032 (IVT-ML) was observed as YLD susceptible.

COIMBATORE

During the season, about 28 IVT entries and 31 AVT entries were monitored for the YLD severity based on the 0-5 scale. Among the IVT and AVT entries, 10 each were apparently free from the disease symptoms and had shown R reaction. The disease severity in rest of the entries were in the category of MS to MR. Three IVT mid late entries viz., Co 13016, CoT 13366 and PI 13131 and one AVT (ML II plant) entry Co 10031 were found to be susceptible to YLD. Similarly, the ratoon fields of AVT (E I plant) and AVT (ML I plant) were monitored throughout the season where two entries such as, Co 10006 and Co 10027 in AVT (E I plant) ratoon were found apparently free from the disease symptoms. In AVT (ML I plant) ratoon, the entry Co 10031 had shown YLD score more than 3 with severe stunting symptoms and none of the entries in that were found to be free from the disease.

POWARKHEDA

A total of 30 AVT genotypes were observed for their resistance to YLD. In the early group, 10 genotypes i.e.,Co 10006, Co 10024, Co 10026, Co 10027, CoT 10366, CoT 10367, Co 11001, CoM 11081, CoM 11082 and CoM 11084 were found to be R whereas others exhibited MR to MS reaction. Among the mid late group, 13 genotypes viz.,Co 09009, Co 10015, Co 10017, Co 10033, Co 11005, Co 11007, Co 11012, Co 11019, CoM 10083, CoM 11085, CoM 11086,CoT 10368, CoVC 10061exhibited YLD resistance whereas remaining four entries were found to be MR.

SANKESHWAR

In IVT (E), seven entries viz., Co 13003, CoN 13004, CoN 13071, CoN 13072, CoSnk 13101, CoSnk 13102 and MS 13081 showed R reaction and Co 13002 exhibited MR reaction. In IVT (ML), out of 20 entries, 19 entries showed R reaction and only PI 131312 recorded MR reaction. In AVT- E (PC I), all entries viz., Co 11001, Co 11004, CoM 11081, CoM 11082 and CoM 11084 were R. In AVT– ML (PC I), all six entries viz., Co 11005, Co 11007, Co 11012, Co 11019, CoM 11085 and CoM 11086 were R.

In AVT – E (PC II), out of 8 entries, 7 entries viz., Co 10004, Co 10005, Co 10006, Co 10026, Co 10027, Co 13086 and CoT 10367 showed R reaction, only Co 10024 displayed MR reaction. In AVT–ML (PC II), all entries viz., Co 09009, Co 10015 , Co 10017, Co 10031, Co 10033 , CoM 10083, CoT 10368, CoT 10369, CoVC 10061, PI 10131 and PI 10132 were found to be R.

PP 22: SURVEY OF SUGARCANE DISEASES NATURALLY OCCURRING IN THE AREA ON IMPORTANT VARIETIES

Objectives: To gather information on the diseases naturally occurring in the area on varieties to compile all India status report yearly.
Location: Lucknow, Kapurthala, Uchani, Shahjahanpur, Pantnagar, Karnal (SBI), Pusa, Modipuram, Seorahi, Buralikson, Anakapalle, Cuddalore, Coimbatore, Sankeshwar, Powarkheda, Tiruvalla, Padegaon, Kolhapur, Navsari and Pune.
Year of Start: 1989-1990
Observations: Periodic observations in June, September and December in all locations to gather information on the %incidence of diseases on all varieties of the area (General survey).

RESULTS OF THE PREVIOUS YEAR

LUCKNOW

In the disease survey, incidence of red rot was noticed in CoLk 8102, CoS 8436, CoS 91269 and CoJ 85. In general, incidence of red rot was low (2-5%). However, in some fields of CoLk 8102 and CoS 8436, the incidence was to tune of 20 per cent. Incidence of smut was observed in CoSe 92423 and Co 0238. Incidence of GSD was noticed in most of the field surveyed (1-2%). In some locations, higher incidence of GSD was noticed in CoS 91269 (5-10 %). The incidence of the minor diseases like pokkah boeng (PB) is increasing substantially and it is mostly affecting the early sugarcane variety Co 0238. In some fields PB incidence was noticed more than 30 per cent. Stray incidence of leaf scald was also observed in Co 0238. In Bihar, red rot was recorded in varieties namely BO 130 and CoSe 95422 to the tune of 2-4%. Whereas PB was observed in the variety Co 0238 and YLD was noticed in the varieties CoLk 94184 and Co 0238.

KAPURTHALA

Red rot was observed with an incidence from traces to 5.0 %on varieties CoS 8436, CoJ 64, CoJ 85 and Co 89003. Wilt incidence of 7-8 %was observed on Co 89003 and CoS 8436 in Amloh, Batala, Dhuri, and Gurdaspur mills area. Varieties Co 89003 and Co 0238 were found infected with smut in traces. Pokkah boeng disease was observed on variety Co 0238 (1-2%). Red stripe/top rot disease was observed (in traces) on CoJ 85. GSD was observed with an incidence of 1-2% on Co 0238.

UCHANI

Red rot was observed on plant and ratoon crop of CoS 8436, CoJ 85, CoPant 84212 and Co 89003 varieties during both pre and post monsoon seasons ranging from 2 to 30 per cent. Top rot was observed on varieties viz., CoJ 85, CoH 152, CoH 119, CoPant 84212 and Co 0238 ranging from 2 to 25 per cent. Wilt was noticed in varieties namely Co 89003, CoH 119, Co 7717, CoS 767, CoS 8436 and Co 05011 ranging from 5 to 50 per cent. The incidence of wilt in association with red rot and was also observed. The incidence of wilt in association with red rot and root borer was also observed. Smut incidence ranging from 2-25 %was observed on varieties CoH 150, Co 0238, Co 89003, CoH167 and CoH 99. GSD was observed in traces to 15 %on varieties Co 0238 and other varieties. Pokkah boeng (traces to 40%) appeared on Co 0238 and other varieties. YLD was noticed in traces on varieties viz., Co 0238, CoS 8436, CoH 119, CoH 152, CoS 767, Co 89003, CoH 119, CoH 160, Co 05011. Incidence of mosaic in traces was observed in CoH 119, CoS 96267 and CoS 8436 varieties.

SHAHJAHANPUR

Red rot was reported with 2% incidence on variety Co 1148. The incidence of smut up to 2 percent was noticed on varieties Co 05011, UP 05125 and UP 9530 at Shahjahanpur and 0.1 to 2 percent on several varieties at various part of western Uttar Pradesh. Maximum incidence up to 5 - 25 percent of wilt was observed on variety Co 0238 at Bareilly and 2 to 15 percent were reported on Co 05011 from Shahjahanpur, Hardoi and Faizabad. Fifteen percent incidence was also observed on Co 0238 and Co 118 at Faizabad and Shahjahanpur, respectively. GSD was reported in almost all the popular sugarcane cultivars and its incidence varied from 1 to 5 percent from central and western part of UP. YLD was reported up to 1–30 percent on several popular cultivars. The maximum incidence of 20–25 percent of pokkah boeng disease was reported from Nazibabad and Khatauli on most of popular cultivars. The meager incidence (1-4%) of pokkah boeng was reported from Shahjahanpur, Gajipur and various locations of western UP on several cultivars. The incidence of rust was occurred on variety CoS 767 with 2 percent at western region of UP. Sugarcane mosaic disease was occurred with 10 to 20 percent on CoPant 97222 at SRI, Shahjahanpur. The minor incidence of stinking rot and leaf binding were also observed at Shahjahanpur and Faizabad.

PANTNAGAR

One acre of severe red rot on CoS 767 was found in Doiwala and severe incidence was seen in CoS 8436 in Gadarpur. Low incidence of smut was observed in CoPant 05224 in Khatima, CoS 767 and Co 0238 was found infected with wilt in Liberhedi, CoS 88230, CoS 767 in Doiwala. GSD was noticed in Co 0238 in Liberhedi, CoS 8436 in Iqbalpur, CoS 95255, CoPant 92423, CoS 96268, CoS 88230 in Laksar, CoPant 03220, Co 0238, CoH 160 in Doiwala, CoPant 03220, Co 0238, CoS 8436 in Sitarganj. Mild incidence of banded sclortial disease was noticed in CoPant 99214. YLD noticed in scanty, seen in some pockets, pokkah boeng incidence was mild to severe in most of the varieties except CoPant 3220, however, most severe in Co 0238 at all places.

KARNAL

Red rot incidence up to 20% on ratoon of CoS 8436 in Karnal and Gohana sugar mills, whereas traces on Co 89003 in village Rindal (Karnal) and Shamli (UP)was recorded. Traces to 1% smut was found in Ratoon crop of varieties Co 0238 and Co 89003 under Karnal and also in one IVT (E) zonal variety CoLk 12203 at the Centre. Pokkah boeng disease was noticed up to 2% in varieties viz. Co 0238, Co 89003, CoH 119, CoH 160, CoS 8436 and CoJ 85. Trace incidence of top rot was noticed in varieties CoJ 88 and CoJ 85. Wilt was seen in few clumps of variety Co 05011 under farm trials at Shahabad Cooperative sugar mills, whereas, severe wilt incidence was recorded in variety Co 89003 at many fields of Karnal and Shamli (UP). Further, trace incidence of YLD was noticed in the varieties CoS 10231, Co 0238, Co 10035, CoH 10261, CoPb 11211 and CoS 8436 and mosaic in clones viz., , K07 291, K08 429, Co 8347, Co 62198, Co 0331, SA04-472, BM 555, CoS 8436, CoS 10231,and CoH 09262 under trials at the Centre.

PUSA

Eleven sugarcane varieties were found affected with red rot, wilt, smut, grassy shoot, pokkah boeng and YLD. Smut was observed on varieties BO 141, BO 136 and BO 154 and it varied from trace to 5%. GSD was observed on the varieties Co 0238 and CoJ 64. Varieties Co 0233, Co 0118 and CoLk 94184 were found affected with wilt. Red rot alongwith wilt, GSD and Pokkah boeng were observed on varieties CoS 8436. Wilt in combination with red rot was observed in variety CoSe 95422. The variety Co 0238 was

found affected with wilt and pokkah boeng diseases, while, YLD was noticed in traces in four varieties i.e. Co 0238, CoJ 64, CoSe 95422 and CoS 8436.

SEORAHI

During the course of survey, cultivar CoSe 92423, CoSe 98231, Co 0238 and UP 05125 were found affected with smut (1-5%), particularly in ratoon crops in the Kushinagar, Deoria, Basti and Maharajganj districts. The incidence of GSD (1 - 6%) was also recorded in the Kushinagar and Basti districts on cultivars, Co 0238 and CoS 08279. The pokkah boeng disease (1–5%) was also recorded on Co 0238 and CoS 08279 in the Kushinagar, Bast and Balarampur districts.

BURALIKSON

No major or minor disease was found in Dhemaji and Sonitpur areas except leaf spots caused by *Leptosphaeria sacchari*. The extent of the diseases was less than 5%. But no major diseases were encountered on other varieties like Co 997 and 740.

ANAKAPALLE

During 2015-16 Red rot, smut, yellow leaf disease, grassy shoot, top rot, ring spot, rust and wilt diseases were recorded on sugarcane. Red rot 10-40 % incidence was observed on Co 62175, 81 A 99, 93 V 297 and 81 V 48 in Visakhapatnam and East Godavari districts. Smut disease incidence was noticed in all most all sugarcane growing areas of Andhra Pradesh ranging from 10-35 % mostly on ratoon crop of Co A 92081,CoV 09356 (2003V46), 91 V 83 . Wilt incidence also was observed 10-30 % in Coastal areas of Andhra Pradesh on Co 8368, 87 A 380, Co7219, 91 V 83, CoA 92081, Co 62175 and 81 A99. During 2015- 16 the incidence of YLD is 10- 70 %. Rust, ring spot and GSD are predominant diseases recorded during the period 2015-16 on sugarcane. 10 -20 % rust and ring spot incidence was observed.

CUDDALORE

Incidence of red rot was recorded in varieties *viz.,* CoC 24, CoSi 7, CoA 92081, CoSi 8, and CoV 09356 and disease severity ranged between 2 to 62%. Smut incidence was observed in the varieties *viz.,* CoSi 8 and Co 86032 and the incidence ranged between 2 and 8%. Wilt disease incidence was recorded in Co 86032 (3%). YLD was noticed in Co 86032, CoC 24, CoV 94102 and CoV 92102 disease incidence ranged from 5 to 10 %.

COIMBATORE

Surveys revealed endemic or sporadic occurrence of red rot in Cauvery delta in Tamil Nadu. Red rot was found in CoV 09356, Co 0323, PI 1110 and Co 86032 in different districts. The cultivar Co 86032 exhibited red rot only in one field in Cauvery delta. Severe smut was noticed on CoA 92081, Co 97009, PI 96-843 and CoC 22 in different districts. Moderate levels of smut were observed in the clone 2007-291. Severe YLD along with degeneration was observed in Co 86032 in different districts especially Tiruppur, Erode and Sivaganga. Wilt was observed in CoC 22, TNAU Si8 and CoSi 6. Pokkah boeng was also observed in many varieties other than Co 86032.

SANKESHWAR

Pokkah boeng was observed only in few pockets and its first appearance was prominently observed during May month, brown spot the most common and predominant foliar disease observed even from 2 months age to harvest, rust was observed during August to September months. Smut is seen commonly in most of the varieties, but the disease is not in such a stage to cause any severe yield reduction. YLD is observed in some varieties in severe form.

POWARKHEDA

Red rot was recorded on CoS 88230 near Kareli sugarcane factory and the incidence was 2.0-3.0 percent. Smut was observed from all the locations. Mainly, the disease was

recorded on Co 86032, Co 99004, Co 7219, Co 94012, Co 8014, CoJ 64, Co 0238, CoC 671 and Co 62175. The highest incidence was noticed on CoJ 64 up to 11.0 per cent. The fields of Co 94012 and CoJ 64 were found to be affected and incidence was recorded up to 25 per cent. GSD was observed from Hoshangabad, Kareli and Bankhedi sugarcane growing area. Mainly, GSD was recorded on Co 86032 and CoJ 64 with the incidenceof up to 5 per cent. YLD was observed in very low or in traces to 10 %on CoVSI 434.

THIRUVALLA

Pokkah boeng disease was observed in most of the varieties cultivated. Mosaic was seen commonly in most of the crop varieties, but the disease was not in such a stage to cause any severe yield reduction. Grassy shoot was uncommon but noticed in some varieties obtained from Mandya for red rot resistance screening.

PADEGAON

Surveys were conducted in Kolhapur, Satara Sangli, Pune, Solapur and Ahmednager districts of Maharashtra. Smut was observed on Co 7527 ratoon crop up to 10% at Ajara, Dist. Kolhapur. YLD was observed in Kasbe bavada, Radhanagri, Gadhinglaj from Kolhapur district on Co 86032. GSD was recorded in Bhuinj, Bavadhan, Kikali from Wai tehsil, Satara districts in the cultivar CoM 265 (ratoon). Pokka boeng was noticed on CoVSI 9805, Co 92005 in Satara and Kolhapur district. The incidence of rust was noticed all districts from western part of Maharashtra up to 20- 40%. Brown spot was a major problem observed predominantly in Sangli and Kolhapur districts because of frequent rains and high humidity during rainy season. The incidence of ring spot disease was noticed up to 5-15% on Co 92005.

KOLHAPUR

The incidence of seed borne disease *viz.,* GSD is increased due to use of unhealthy seed material. It is noticed that the smut is not much observed in the zone except Co 7527 (Maximum 5%). The non recommended sugarcane entry CoM 0261 is highly susceptible to smut and it was observed. Among the foliar diseases, rust and ring spot fungal diseases are predominant in the region because of favorable weather condition. The intensity of these diseases was noticed in the range of 25-60 % (rust) and 5-22 % (ring spot). The Pokkah boeng disease was almost noticed on all sugarcane varieties after receiving Pre-monsoon shower in May. The brown spot has been noticed every year on CoM 0265 sugarcane variety with high intensity upto 60%. The sugarcane variety Co 86032 is becoming susceptible to YLD. The intensity of YLD is more on Co 86032 after attaining the age of 8 to 12 months.

NAVSARI

The survey indicated that wilt, red rot and whip smut were the major diseases in region. Area affected under wilt, red rot and whip smut was 2.41, 1.94 and 4.93 per cent, respectively. The incidence of smut was recorded on varieties like CoSi 95071, Co 86002, Co 97009 and Co 99004. Maximum incidence of smut was recorded in the varieties CoSi 95071, Co 86002 and Co 97009 and it was to the tune of 15.40 %. The wilt incidence noticed in CoC 671, Co 86032, Co 86002 and CoSi 95071 varieties and was maximum to the tune of 4.45 %. The red rot was recorded in the varieties of CoC 671, Co 86032, Co 86002, and Co 97009 and it was to the tune of 3.70 %. Highest wilt and red rot incidence was noticed in the variety CoC 671 and minimum in Co 86032.In addition to these diseases, the incidence of PB disease was observed in Co 99004. Grassy shoot, YLD was found in traces. GSD was observed in Co 86032 and CoM 0265 and YLD was noticed in Co 86032 and Co 99004.

PUNE

The brown rust is very common and majority of sugarcane varieties commercially grown in the state *viz.,* Co 86032, CoM 0265, CoC 671, CoVSI 9805, VSI 434 and Co 92005 are observed susceptible to this disease. During the survey, a unknown insect was observed

feeding on spores of *Puccinia melanocephala*on leaves of sugarcane variety CoM 0265, CoC 671, Co 86032, CoVSI 9805 and CoC 671.

RESULTS OF THE CURRENT YEAR

NORTH WEST ZONE

LUCKNOW

Incidence of red rot was noticed in Co 0238, CoS 8436, CoS 92423, CoLk 08102, CoS 91269 and CoSe 95422. Localized incidence (3-8 %) of red rot was also noticed in Co 0238 at several locations of Uttar Pradesh. However, in some fields of CoLk 8102, CoSe 95422 and CoS 8436, there was 25% incidence. Incidence of smut was also observed in CoSe 92423 and Co 0238. Incidence of GSD was noticed in most of the field surveyed (1-3 %) to (10-20 %) in CoS 91269. The incidence of pokkah boeng is increasing substantially and the incidence of leaf scald was also noticed in Co 0238.

KARNAL

Survey was carried out under the reserved area of 20 sugar mills of the zone comprising Haryana (14), Uttar Pradesh (3), Bihar (2), Uttrakhand (1). Severe red rot incidence (> 40%) was recorded in Co 89003; upto 20% in CoPant 84212 and trace to 1% on variety Co 89003 under Panipat, Karnal, Asandh (Haryana) and Shamli (UP) area. Similarly up to 10% incidence was recorded in two fields of mix varieties at Laksar (UK). Severe incidence (01- 20%) was noted in ratoon of variety Co 89003 at Panipat followed by CoH 150 (1- 8%, Shahabad) and CoH 152 (trace – 3.0%, Palwal). Incidence in other varieties viz. Co 0238, CoH 156, CoH 160 and CoH 119 ranged from trace to 1.0%. None of the field of variety CoH 150 was free from smut in Shahabad. Further, trace incidence observed in the variety Co 0238 at Sobitgarh (UP). GSD was recorded up to 5% in Co 89003 (ratoon) at Sonipat, 1- 3.0% in CoH 150 (Shahabad) and trace to 2.0% in other varieties i.e. Co 0238, CoS8436, CoJ 88, CoH 160, CoH 152 and CoH 119 in Haryana. Trace to 3.0% incidence was also observed on Co 0238, Co 98014 and CoS 8436 at Mawana. Pokkah boeng incidence was ranging from trace to 3% in varieties viz. CoH 150, CoH 119, CoS 8436, Co 0238, Co 89003, CoJ 85 and CoJ 88 in Haryana, whereas in UP, disease was prevailing in the varieties Co 0238, Co 98014 and CoS 8436. However, in one field of variety Co 0238 in village Jaisinghpur, Mawana (UP) incidence of 10-12% was observed. Further, very severe incidence of top rot (40%) was recorded in CoJ 85 at Meham, 5% in CoH 150 (Shahabad), 1.0- 2.0 % in CoS 8436 (Karnal & Rohtak), up to 2.0% in CoJ 85 (Rohtak) and trace in varieties CoH 119 and CoH 152 at Palwal and Kaithal (Haryana). Disease was recorded by 2.0 – 3.0 % in CoJ 88 under Deoband, Laksar and Sobitgarh areas. Mild to severe incidence of wilt (up to 30.0%) was seen in variety Co 89003 at many fields of Haryana and UP.

UCHANI

Red rot was observed on plant and ratoon crop of CoS 8436, CoJ 85 and Co 89003 varieties in sugar mill zone areas of Karnal, Bhadsu, Shahabad, Panipat, Asandh, Yamunanagar Kaithal and Rohtak during both pre and post monsoon seasons ranging from 2 to 25 per cent. Wilt was noticed in varieties namely Co 89003, Co 05011, CoS 8436, CoH 119 , Co 767 and Co 1148 in Panipat, Sonipat, Yamunanagar, Rohtak, Asandh, Jind , Panipat and Karnal sugar mill zone areas ranging from 5 to 25 per cent. The incidence of wilt in association with red rot was also observed in Panipat and Karnal sugar mill zone areas particularly in Co 89003. The incidence of wilt in association with red rot and root borer was also observed in Karnal, Panipat and Rohtak sugar mill zone areas. Smut incidence in the range of 2- 15% was observed on the varieties Co 0238, Co 89003, CoH 99, CoH 160, Co 0118, CoH 119 and Co 05011 in Shahabad, Karnal, Bhadsu, Rohtak, Jind and Kaithal sugar mill zone areas. Top rot was observed on the varieties viz., CoJ 85, Co 0238, CoH 152

and CoH 119 in Shahabad, Karnal, Kaithal, Yamunanagar and Rohtak sugar mill zone areas ranging from 2 to 60 per cent. GSD was observed in traces to15% in Karnal, Shahabad, Yamunanagar, Jind, Rohtak and Asand areas of Haryana on the varieties which include Co89003, CoJ 85 , Co 0238, CoS 8436, CoH 119, CoH 160 and CoH152. Pokkah boeng (traces to 35%) appeared on varieties viz., Co89003, CoJ 85, Co 0238, CoS 8436, CoH 119, CoH 160, CoH 152 and Co 05011 in Yamunanagar , Karnal, Jind, ,Panipat, Sonipat, Rohtak, Shahabad,Gohana, Kaithal, Panipat and Asand sugar mill zone area. YLD was noticed intraces to 5 % on the varieties Co 0238, CoS 8436, CoH 119, CoH 152, Co 89003, CoH 119, CoH 160 and Co 05011 in Yamunanagar, Karnal, Asand, Jind , Rohtak, Shahabad and Panipat sugar mill zone areas. Incidence of mosaic in traces was observed in CoH 119 and CoS 8436 in Shahabad, Karnal, Panipat and Asand.

PANTNAGAR

During the survey, red rot was not recorded on any of the varieties in the field. Smut was observed in traces in few cultivars during October to January. Wilt was observed on CoS 767 in Liberhedi, and on CoS 88230, CoS 767 in Doiwala. Foliar disease (ring spots and eye spots) were observed in scanty level to mild in almost all the varieties. Most severe on CoPant 99214, CoS 88230, Co 0118, CoS 767, CoS 96268, CoPant 92423 in Khanpur, Laksar and Iqbalpur area. YLD was seen as a minor disease in some pockets in CoPant 84212, CoPant 03220, CoPant 05224 mild incidence in CoPant 90223 and CoS 767. PB was present at low level in some varieties, more in Co 0238 at most of the places.

SHAHJAHANPUR

Red rot was observed on the variety Co 0238 with incidence of 5-15%, 1-2%, 2-10%,40% from Nigohi, Rosa, Hargaon and Gola, respectively. The varieties CoJ 85 and CoJ 88 were affected with 10 to 20% from Mankapur and Nigohi, respectively. An unknown variety was also infected with 60-90% at Rosa (Shahjahanpur) area. Variety Co 1148 was also affected with 1.0% stray from Ramala. Incidence of smut up to 3% was noticed on varieties Co 0238, Co 1158, CoS 98231, CoS 767, CoSe 92423 and CoLk 94184 at Hardoi, Gajraula, Palia and Shahjahanpur. It was also found on CoJ 88 with high incidence at Deoband (Saharanpur). Wilt was reported on the varieties Co 05011, Co 0238, CoS 08279, CoS 08272, CoS 08276 and CoS 08452 from SRI Shahjahanpur, its incidence varied from stray to 5%. This disease also observed on Co 05011 with the incidence of trace to 25% in Gola Research farm, Shamli and Mawana. GSD was reported in almost all the popular sugarcane cultivars and its incidence varied from 2 to 25% in Shahjahanpur and Bareilly. Pokkah boeng disease was reported in Co 0238 with incidence of 15-30% from SRI Shahjahanpur and Hardoi. It was also reported up to incidence of 5% from Shahjahanpur, Sitapur, Gajraula, Palia and Gola. The popular cultivars viz; Co 0238, Co 0118, Co 05011, CoS 08279, CoS 08272, CoS 8436, CoSe 01434 and UP 05125 were affected by YLD in various sugar mill areas. Sugarcane mosaic, stinking rot, pine apple diseases were also noticed at various places in traces.

KAPURTHALA

The disease survey on sugarcane crop was conducted three times during May-June, September and November. Red rot was observed from traces to 6.0 %on Co 89003, CoJ 64 and CoJ 85 and CoPb 91 in Ajnala, Amloh, Bhogpur, Bhudewal, Nawashahr and Phagwara sugar mills areas. Wilt incidence of 6-7% was observed on Co 89003 and CoS 8436 in Dhuri, Nawanshahr, Amloh, Budhewal and Fazilka mills area. The varieties Co 0238 and Co 89003 were found infected with smut from traces to 5.0% in Kiriafgana, Batala, Mukerian, Dasuya Nakodar and Phagwara and Ajnala mills area. Pokkah boeng disease was observed on variety Co 0238 (traces to 2%) in Mukerian, Dasuya, Gurdaspur, Kiriafgana, Batala, Ajnala and Bhogpur sugarmills area. Red stripe/top rot disease was observed traces on CoJ 85 in

Bhogpur, Budhewal Dhuri, Amloh and Morinda sugar mills area. GSD was observed with an incidence of 1-2% on Co 0238 in Butter Sevian, Kiriafgana, Mukerian, Dasuya and Gurdaspur Dasuya and Gurdaspur sugarmills area.

NORTH CENTRAL ZONE

PUSA

During survey, incidence of wilt was noticed in varieties CoLk 94184, CoSe 98231, Co 0118 and Co 0233. Smut was observed in BO 141 and BO 136. Variety Co 05011 was found affected with Pokkah Boeng and mosaic diseases. The varieties CoSe 92423, CoS 8436 and CoSe 95422 were found affected with red rot. Red rot and GSD was observed in variety Co 0235. While YLD was noticed in ratoon crop of varieties CoSe 95422 and CoSe 8436 in two clumps only in the farmer field during 2nd week of August, 2016.

SEORAHI

The survey was conducted in various mill zones area of different co-operative and private sugarmills of eastern Uttar Pradesh. Red rotwas reported with 15 and 20% incidence oncultivarsCoSe 92423 and UP 9530 in Ramkola sugar millat the farmer fields. The wilt was observed on varieties CoS 08279 (2%) and Co 0238 (10%) incidence in Seorahi and variety Co 98014 was observed to have 15 –20% incidence in the Ramkola sugar mill atfarmer's field.Traces to 1% incidence of smut was reportedin the plant and ratoon crops of CoSe 11453, UP 05125, CoSe 01434, CoS 08279, CoSe 92423, Co 0238, CoS 8432,Co 0118, Co 05011and CoP 9301 and incidence range from 2 to 8 %from Seorahi, Ramola, Dhara, Khada, Manakapur, Balarampur, Babhanan, Uttaraulla sugar mill zone areas in eastern UP. GSD was noticed in the varieties namely Co 05011, Co 0118, Co 0238, Co 98014, CoS 88230, CoS 91269, CoS 97261, CoS 13231, CoS 08272, CoS 08279, CoSe 92423, CoSe 01424, UP 5125 and CoJ 88 were from Babhanan, Balarampur, Chhatiyawn, Manakapur, Uttaraulla, Ramkola, Seorahi and Sultanpur sugar mill zone areas in the farmers field and its incidence varied from 2 to 6%.The pokkah boeng was also recorded on cultivars CoS 08279, CoS 08272, UP 9530, UP 05125, CoSe 96436, CoSe 92423, CoSe 01434, CoS 06279, CoS 91269 Co 05011, Co 98014, Co 0118 and Co 0238 atBabhanan, Mankapur, Ramkola, Seorahi, Khada and Balarampur sugar mill areas and the incidence varied from 1 to 10% .YLD was also recorded on Co 05011 and UP 05125 from Seorahi sugar mill at the farmer's field up to 15% and 10% mosaic incidence was recorded in the variety CoPant 97222. Further YLD, mosaic and stinking rot were noticed in traces on the varietiesCo 0118, CoS 08272and CoS 08279 at the GSSBRI farm.

MOTIPUR

In Bihar**,** CoP 9301, Co 0238, CoSe 95422, Co 0118, CoLk 94184, Co 0239, BO 130 were the varieties found in cultivation. Red rot was recorded in varieties CoSe 95422, Co 0238 and BO 130 to the tune of 3-7 %. Whereas Pokkah Boeng was observed in the variety Co 0238 (5-20 %) and Yellow leaf disease (YLD) was noticed in the varieties *viz*., CoLk 94184, Co 0118, BO 130 and Co 0238.

NORTH EAST ZONE

BURALIKSON

Sugarcane genotypes were found to be affected with red rot, wilt, YLD, pokkahboeng and leaf spot in Golaghat District of Assam. Red rot, wilt and YLD were observed in Co 740, Co 997, CoBln 09104. Red rot incidence varied from trace to 8.82%. Wilt was observed in ratoon crop of Khanikor upto 18.51%. Trace to 5.66% YLD incidence was noticed in Co 997. Foliar disease, ring spot was recorded in CoBln 09103, BO 130 and CoSe 12453 upto 24%. Pokkahboeng was also observed in CoSe 11454, CoLk 09204, CoP 13436, BO 130 in tillering stage. But these genotypes regained from disease condition except

the genotype CoSe 11451where top rot phase was observed. Banded sclerotial disease was also observed in BO 155 in traces.

EAST COAST ZONE

ANAKAPALLE

Red rot of 10-40 % was observed on Co 62175, 81 A 99, 93 V 297, S-12 and 81 V 48 in Visakhapatnam, Chittor and Srikakulam districts. Smut incidence was noticed in almost all sugarcane growing areas of Andhra Pradesh ranging from 10-45 % mostly on ratoon crop of CoA 92081, CoV 09356 (2003V46), 91 V 83 and 97 R 83. Wilt incidence also was observed 10-30 % in Coastal areas of Andhra Pradesh on Co 86032, 87 A 380, Co 7219, 91 V 83, Co A 92081, Co 62175 and 81 A 99. YLD is increasing year after year in all sugarcane growing areas of Andhra Pradesh in all the varieties and recorded 10-70%. Top rot, rust, ring spot and GSD are predominant diseases recorded during the period 2016-17 on sugarcane. Rust and ring spot diseases were observed in some areas even after 2-3 months after planting. Though leaf scald disease once appeared in traces, is again seen emerging on a economically significant note especially during 2016 and 2017. This is attributed to the fact of growing NBV1 that has been showing increased susceptibility over years.

CUDDALORE

The survey conducted in Cuddalore, Villupuram, Kanchipuram and Thiruvannamalai Districts of Tamil Nadu and Puducherry state indicated that 2 to 54 % incidence of red rot onCoC 24, CoC 23 and Co 91017. Smut was recorded in variety CoC 22 and CoSi 6 with 2 and 8 % severity. Wilt was observed in Co 86032 (2 to 12 %) and YLD was noticed on Co 86032 (5 to 15 %) and CoV 09356 (5 to 10 %).

NAYAGARH

Incidence of red rot was recorded 5-30% in the varieties *viz*. Co 86032, Co 6907, CoOr 03151 andCo 86249. Ring spot and GSD were predominant diseases in sugarcane and their incidence in the rang of 10-40%. Pokkah boeng was observed during rainy days in the range of 5-10% but plants recovered after the season. Mosaic was prevalent in the areas and incidence varied from 5% to 40%.

PENINSULAR ZONE

COIMBATORE

Detailed surveys for smut, wilt and YLD were conducted in Karnataka and Tamil Nadu. Occurrence of red rot in Co 86027 and TNAU Si8 was found in Namakkal and Tiruvannamalai Dt, respectively. Trace incidence of red rot was found in a ratoon crop of Co 06022 in Nagapattinam Dt. Sudden outbreak of smut in Co 86032 was found in Villupuram and Tiruvannamalai districts. Continuation of the old varieties such as Co 97009 and PI-96-843 with severe smut was found to be the reason for the sudden outbreak of the disease. Further severe wilt outbreak was found in both the states. The varieties Co 62175, Co 86032 and Co 0323 were affected in the Karnataka state and in many varieties in Tamil Nadu. Severe rust occurrence of brown rust was found in Co 0323 in Karnataka. Degeneration in the cultivars Co 86032, CoA 92081 and CoV 94101 was found due to YLD and mosaic. Occurrence of GSD was found in many districts where healthy seed nursery programme is not followed. Degeneration due to YLD was addressed through YLD-free nurseries. Disease-free crops raised from such nurseries recorded ~250 tonnes/ha in the variety in Erode and Namakkal Districts in Tamil Nadu.

PADEGAON

The survey of sugarcane diseases was undertaken in Kolhapur, Satara, Sangli, Ahmednagar, and Solapur districts of Western Maharashtra. The incidence of diseases like smut, GSD, pokkah boeng, rust, YLD, brown spot, pineapple and ring spot was observed in different areas. Smut incidence was noticed up to 8% on Co 7219 at Kasbe-Digraj in Sangli

district. The incidence of YLD was noticed in villages from Kolhapur district on Co 86032, CoC 671. GSD was noticed in Pune, Ahmednager and Satara districts on the sugarcane varieties viz., CoM 265 and Co 86032 (ratoon). Pokkah boeng was noticed on CoVSI 9805 and CoC 671 in Solapur district. The incidence of rust up to 25-30% was noticed in Kolhapur district on CoM 0265, Co 92005 and Co 86032. Moreover, 5-10% rust incidence was noticed on CoM 0265 from Satara district. Brown spot was a major problem observed up to 5-20% predominantly in Satara, Sangli and Pune districts because of frequent rains and high humidity. The incidence of ring spot disease was noticed up to 5% in Kolhapur district on CoM 0265,Co 86032 and Co 92005, whereas trace incidence of pineapple disease was noticed on Co 86032 and CoM 0265.

THIRUVALLA

Ring spot, sheath blight, rust, mosaic and pokkah boeng were recorded but none of the diseases were in a severe stage to cause any drastic yield decline. Sheath blight due to *Rhizoctonia solani* was observed in the entire experimental field in the station during May – June. Ring spot was the most common and predominant foliar disease observed even from two months age up to harvest. Rust disease was observed during August – September months. But the disease subsided with the onset of North East monsoon showers. Mosaic was seen commonly in most of the crop varieties, but the disease was not in such a stage to cause any severe yield reduction and grassy shoot was not observed commonly.

NAVSARI

Surveys were undertaken in 10 sugarcane growing sugar factories area of South Gujarat region. Wilt, red rot and whip smut were the major diseases in South Gujarat region. Area affected under wilt, red rot and whip smut was 2.02, 1.63 and 4.92% respectively. The incidence of smut was recorded on varieties like CoSi 95071, Co 86002, Co 97009 and Co 99004. Maximum incidence of smut was recorded on CoSi 95071, Co 86002 and Co 97009 and it was to the tune of 9.70 % in Bardoli Sugar factory area. The wilt incidence noticed in CoC 671, Co 86032, Co 86002, CoM 0265 and CoSi 95071 varieties and was maximum to the tune of 6.54 % in Gandevi Sugar factory. The red rot was recorded on CoC 671, Co 86032, Co 86002, Co 0323, CoVSI 03102, CoVSI 0434 and Co 97009 and it was to the tune of 1-2 % in all Sugar factory areas. Highest wilt and red rot incidence was noticed in variety CoC 671 and minimum in Co 86032. In addition to these diseases, the incidence of pokkah boeng disease was observed in Co 99004 in Bardoli, Gandevi, Chalthan and Kamrej Sugar factory areas. Grassy shoot, YLD were found in traces at Chalthan, Mahuva, Narmada, Bardoli sugar factory areas and also Navsari surrounding area. Grassy shoot was observed on Co 86032, CoC 671 and CoM 0265 and YLD was noticed on Co 86032 and Co 99004.

POWARKHEDA

Survey of different sugarcane growing areas were undertaken to record the incidence of major diseases like red rot, wilt, smut, GSD, YLD and pokkah boeng. Red rot was recorded on CoLk 8001/Unknown at Narsingpur with incidence of up to 20%. Only 2-3 plots were infected with red rot. Smut was found to be major diseases and observed from all the locations i.e. Hoshangabad, Bankhedi, Kareli, Gadarwara and Narsingpur sugarcane growing area. Mainly, the disease was recorded on Co 7219, Co 86032, Co 99004,Co 06027, Co 94012, Co 8014, CoM 0265, CoJ 64, Co 0238 and CoS 88230. The highest incidence was noticed on Co J 64 up to 12%. Wilt was observed from Kareli, Gadarwara and Narsingpur sugarcane growing areas on Co 94012 with incidence of up to 40%. GSD was observed on Co 86032 and Co J 64 from Kareli sugarcane growing area with the incidence of up to 7%. YLD from Hoshanngabad and Kareli locations on Co JN 86572, Co 09007, Co 85004 Co 99004, Co 86032, CoVSI 434 and CoS 88230 with the incidence of up to 15%. Pokkah boeng was observed in traces.

PUNE

The GSD incidence in Maharashtra was up to 15% on CoC 671, Co 86032, CoM0265, Co 419, CoVSI9805 and Co 92005. Smut incidence was up to 5% in Khandesh and Vidarbha region on Co 86032 and Co 419. Pineapple disease was observed in ill-drained soils up to 5% affecting germination. Due to drought and low humidity for last 2 crop seasons, the incidence of the pokkah boeng was low to 10% throughout Maharashtra. The rust disease up to 15% was observed starting September after the monsoon period and present throughout the year. The eye spot incidence was noted in Southern Maharashtra on CoC671, Co92005 and Co86032 up to 7 %. The mosaic was minor and observed in traces. The incidence of brown spot was noted on CoM0265 up to 5%. The incidence of YLD is increasing on CoC 671, CoM0265, Co 86032, Co 419, VSI434 throughout Maharashtra.

SANKESHWAR

Smut, rust, brown spot and grassy shoot were the major diseases in region. Maximum incidence of smut was observed on Co 86032 and Co 8011, CoC 671 and Co 91010 and it was to the tune of 11.4%. 10-17% rust incidence was observed in some areas after 2-3 months of planting. Brown spot was a major problem observed predominantly in Dharwad and Belgaum districts because of frequent rains and high humidity during rainy season. The pokkah boeng disease was noticed on all sugarcane varieties after receiving pre monsoon shower in May. YLD was observed in some varieties in severe form.

KOLHAPUR

The survey of sugarcane diseases was carried out before onset of south-west monsoon and after over monsoon in the region. The incidence GSD is increased due to use of unhealthy seed material. Smut was not much observed in the zone except on Co 7527 upto 2% in Kagal tehsil. Among the foliar diseases, rust and ring spot fungal diseases are predominant in the region. The intensity was noticed in the range of 5-25 % (rust) and 2-10% (ring Spot). The pokkah boeng was noticed on all sugarcane varieties in the range of 2-5%. The brown spot caused by *Cercospora longipes* is noticed every year on CoM 0265 sugarcane variety with intensity in the range of 15-20%. The intensity of YLD is more in 8 to 12 months crop on the variety Co 86032.

AKOLA

Surveys in Wardha, Yavatmal and Telhara areas indicated that Pokkah Boeng (up to 5% incidence), YLD (upto 2%), mosaic (traces – 1%) were found in low intensity on Co 265 (Ratoon), Co 86032 and Local variety Paturda. In Nagpur and Bhandara regions, Pokkah boeng was recorded upto 6% on variety Co 03102 and NR 9805. The other varieties Co 86032, CoM0265, Co 03102, Co 92005 and NR-9805 were also affected by Pokkah boeng. YLD and mosaic diseases were also observed on all these varieties. In Wardha regions, Pokkah Boeng, YLD and mosaic were observed on Co 86032, CoVSI 8005, CoM0265and the incidence was very low upto 5% only.

PP 23: ASSESSMENT OF ELITE AND ISH GENOTYPES FOR RESISTANCE TO RED ROT

Objective: To gather information on *Saccharum* sp. and elite genotypes for resistance to red rot, so that the resistant genotypes could be used in breeding programme as possible donor for resistance.
Locations: Kapurthala, Uchani, Karnal, Shahjahanpur, Lucknow, Pusa, Seorahi, Anakapalle, Cuddalore, and Navsari
Plot Size: One, six metre row of at least 10 clumps
No. of isolates: As indicated in PP 17 experiment
Method of inoculation: Plug method only
Inoculum: As per details given under PP 17 (Pathotypes to be inoculated individually only)
Method of evaluation: As per details in PP 17

BRIEF FINDINGS OF PREVIOUS YEAR

KAPURTHALA

Of the 33 genotypes, none behaved as R, 17 were found MR against CF08 and 22 against CF09. Genotypes ISH 108, ISH 191 and ISH 269 were found MS to CF08 whereas MR to CF09. Genotypes ISH 137 and ISH 282 were S to CF08 but MR and HS to CF09, respectively. Six genotypes were HS to both the pathotypes whereas ISH 012, ISH 148, ISH 267 and ISH 287 were HS to CF08 and MR to CF09. Genotype ISH 193 behaved HS against CF08 and S against CF09.

UCHANI

Nine clones were evaluated and among them IA 31-32, F1108, IA 30-17, and IA 31-35 were found R/MR whereas, genotypes B 44-167, IA 30-14, Q-65, Q-45 and 57 NG 131 showed S reaction against red rot pathotype CF08.

PUSA

Twenty seven elite and ISH genotypes were planted on 12th March, 2016 for assessment of red rot resistance.

NAVSARI

Twenty elite and ISH genotypes were evaluated and among them one genotype SES 594 gave R reaction. Thirteen genotypes were observed with MR reaction. Only one genotype viz., ISH 175 showed MS reaction. Two genotypes viz., ISH 69 and ISH 9 displayed S reaction. Three genotypes viz., ISH 41, ISH 176 and ISH 43 exhibited HS reaction.

FINDINGS OF CURRENT YEAR

NORTH WEST ZONE

KAPURTHALA

Of the 32 genotypes, none of the entries behaved as resistant, 14 genotypes were found MR against CF08 and 18 against CF09. Five genotypes ISH-108, ISH 191, ISH-224, ISH-269, and ISH-313 were found MS to CF08 whereas MR to CF09. Genotypes ISH 137 was found S to CF08 and MS to CF09. Five genotypes were HS to both the pathotypes by plug method of inoculation whereas ISH-012, ISH-148, ISH-267 and ISH-287 were HS to CF08 and MR/MS to CF09 (Table 33).

KARNAL

Twenty three ISH genotypes were inoculated with CF08 and CF09 isolates by plug method of inoculation for red rot resistance. Eleven genotypes exhibited S/HS,

seven MS and five R/MR reaction to CF08 isolate. Similarly with CF09 isolate, 13 genotypes showed S/HS, two MS and eight R/MR reactions (Table 34).

UCHANI

Nine ISH clones viz., IA 30-14, IA 30-17, IA 31-32, IA 31-35, B 44-167, F1108, Q-65, Q-45 and 57 NG 131 were evaluated for resistance to red rot by plug method using pathotype CF08 . The clones namely F1108, IA 30-17, and IA 31-35 were found R/MR whereas, genotype B 44-167, IA 30-14, IA 31-32, Q-65, Q-45 and 57 NG 131 showed MS/S reaction against red rot pathotype CF08.

SHAHJAHANPUR

ISH genotypes were collected from SBI Coimbatore and multiplied during 2016-17.

LUCKNOW

Trial not conducted

NORTH CENTRAL ZONE

PUSA

Out of 27 clones, 06 clones (AS 04-1687, AS 04-1689, BM – 1003143, BM 1009163, SA 98-13 and SA – 409) failed to germinate. Due to poor germination, the inoculation was not carried out in rest of clones. After multiplication of seed materials, 27 clones were planted during 2017planting season and inoculation will be done during August, 2017.

SEORAHI

Trial not conducted

PENINSULAR ZONE

CUDDALORE

Among the 27 elite and ISH clones screened for resistance to red rot against CF04 and CF06 by plug method of inoculation, two clones *viz*., SA 04-454 and Gu 07-2276 recorded resistant reaction. Thirteen clones *viz.,* BM 1005149, BM 1010168, PG 9869137, SA 98-13, SA 04-390, SA 04-496, SA 04-409, AS 04-1689, AS 04-2097, MA 5/37, MA 5/99, MA 5/22 and GU 07-3849 were MR to both the pathotypes (Table 35).

NAVSARI

Out of 26 elite and ISH genotypes evaluated for red rot resistance, only one genotype SES 594 gave resistant reaction. Fourteen genotypes, viz., ISH 111, ISH 58, ISH 100, ISH 287, ISH 12, ISH 50, ISH 147, ISH 267, ISH 118, ISH 117, ISH 114, ISH 115, AS 04-1687 and GU 07-2276 were observed with MR reaction. Five genotypes *viz*., ISH 175, ISH 229, AS 04-2097, MA 5/5 and MA 5/51showed MS reaction. Two genotypes viz., ISH 69 and MA 5/99 displayed S reaction. Four genotypes viz., ISH 41, ISH 176, ISH 9 and ISH 43 exhibited HS reaction by plug method (Table 36).

COIMBATORE

Twenty seven ISH clones were evaluated for red rot by plug and nodal methods for CF06 and CF12 pathotypes. About 14 clones were identified as resistant to CF06 as against eight for CF12 in plug method. In nodal method 18 and 19 were resistant to the two pathotypes, respectively (Table 37).

ANAKAPALLE

Trial not conducted

PP 28: B. METHODOLOGY FOR SCREENING SUGARCANE GENOTYPES FOR RESISTANCE TO BROWN RUST (*Puccinia melanocephala*)

Objective: To standardize methodology for inoculation of uredospores of brown rust and rating of resistance

Year of Start: 2013-14

Locations: Pune, Padegaon, Kolhapur, Sankeshwar and Anakapalle

1. **Inoculation methodology:**

(i) Clip inoculation in leaf whorl

As soon as brown rust appears in field, select rust affected leaves, cut leaf bits (clips) measuring 8-10 cm. Select ten rust-free plants of the same susceptible variety in a different location. In three shoots of each plant (clump), insert 2-3 clips in the leaf whorl of each shoot.

(ii) Leaf whorl inoculation

As soon as brown rust appears in field, collect rust affected leaves. Make a suspension of uredospores in sterilized distilled water (10^4-10^5 spores/ml). Pour 1 ml freshly prepared uredospores suspension in each leaf whorl. Inoculate in 10 clumps (three shoots per clump) of same susceptible variety.

In the aforementioned two methods, plants to be inoculated may be marked by cutting one-third of the tips of the uppermost leaves so that they can easily be identified during recording observations.

Observations: After 4 weeks, record symptoms on leaves by counting – (i) average number of rust pustules per square inch, and (ii) number of leaves bearing rust pustules.

ii. Rating of resistance:To be taken up after standardization of inoculation method

RESULTS OF THE PREVIOUS YEAR

PUNE

Observations indicate that, out of 2 methods, number of rust pustules were higher (24.20/sq.inch^2) under leaf whorl method. In clip inoculation, the average numbers of rust pustules per square inch were 13.20. Therefore, leaf whorl inoculation method is far superior over clip inoculation method.

PADEGAON

It is evident from the results that in the leaf whorl inoculation method, higher average no. of rust pustules (38.34 per sq. inch) and higher no. of leaves bearing rust pustules (9.4) was recorded as compared to the clip inoculation method (26.08 per sq. inch and 9.2 respectively).

KOLHAPUR

It was observed that average number of rust pustules found in the leaf whorl inoculation (49.17 /inch^2) than the clip inoculation method (32.54/inch^2). Among the two inoculation methods leaf whorl inoculation method is found effective.

SANKESHWAR

Out of 2 methods, number of rust pustules (53.8/inch^2) on inoculated were higher under leaf whorl method. In clip inoculation, the average numbers of rust pustules per sq. inch were 21.3. Therefore leaf whorl inoculation method is far superior over clip inoculation method.

ANAKAPALLE

Trial not conducted

RESULTS OF THE CURRENT YEAR

PUNE

While comparing clip inoculation in leaf whorl and leaf whorl inoculation methods, number of rust pustules per square inch leaf was more in leaf whorl method (23.20/inch^2). In clip inoculation, the average number of rust pustules per square inch was 13.00. Therefore, leaf whorl inoculation method is found superior over clip inoculation method (Table 38).

KOLHAPUR

In clip inoculation method brown rust development was slower than in leaf whorl method. More number of rust pustules was found in the leaf whorl inoculation (40.05/inch^2) than the clip inoculation method (30.75/inch^2) (Table 39). In addition sugarcane genotypes were screened to identify the resistance and the nresults are given below.

1) IVT (E): Among the tested 8 sugarcane genotypes, 3 genotypes *viz*., Co 13002, CoSnk 13101 and MS 13081 were found free from rust, whereas remaining five showed rust severity in the range of 10-20% under natural condition.

2) AVT (EI) plant: Out of 5 sugarcane genotypes, Co 11004, CoM 11082 and CoM 11084 were found free from rust whereas, remaining genotypes showed the rust intensity in the range of 25-30 % under natural condition.

3) AVT (E II) plant): Among the 8 genotypes, 4 genotypes *viz*., Co 10005, Co 10006, Co 10027 and CoT 10367 were found free from rust while remaining genotypes shown rust disease intensity in the range of 10-20% under natural condition.

4) IVT (ML): Among the tested20 sugarcane genotypes, 6 genotypes *viz*., Co 13008, Co 13011, Co 13016, CoM 13082, CoSnk 13103 and CoSnk 13106 were found rust free and remaining 14 genotypes showed rust intensity in the range of 5-20% under natural condition.

5) AVT (ML I) plant: Of the six sugarcane genotypes, Co 11007, Co 11019 and CoM 11085 were free from rust and remaining sugarcane genotypes recorded rust severity in the range of 20-40%.

6) AVT (ML II) plant: Out of 11 genotypes, 4 genotypes *viz*., Co 10015, Co 10031, Co 10033 and CoM 10083 were found free from rust whereas, remaining genotypes recorded rust severity in the range of 10-25%.

7) Check varieties: Among the check varieties only Co 86032 and Co 740 were found free from rust and other varieties showed rust severity in the range of 5-35%.

SANKESHWAR

Observations indicated that, out of 2 methods, number of rust pustules (36.54 /inch^2) on inoculated were higher under leaf whorl method. In clip inoculation, the average number of rust pustules per square inch was 24.31. Therefore leaf whorl inoculation method was found superior over clip inoculation (Table 40).

PADEGAON

The leaf whorl inoculation method recorded higher number of rust pustules (31.91 per sq. inch) and more number of leaves were showing rust pustules (5.6). In clip inoculation method the number of rust pustules were lower (25.85) per sq. inch and less number of leaves were showing rust pustules (5.4). This indicates that the leaf whorl inoculation method is better for screening than the clip inoculation method. A third method i.e. spray inoculation with urediniospores suspension (10^4-10^5 spores/ml) was experimented which recorded the higher number of rust pustules (33.42) per sq. inch than these methods (Table 41).

ANAKAPALLE

Trial not conducted

PP 31: SCREENING, EPIDEMIOLOGY AND MANAGEMENT OF POKKAH BOENG IN SUGARCANE

Objectives: To study the development of pokkah boeng disease in relation to weather parameters and its management in sugarcane crop

Location: Uchani, Shahjahanpur, Seorahi, Kolhapur, Akola, Anakapalle

Year of Start: 2011-2012

Observations to be recorded: Screening the desirable varieties for the incidence of pokkah boeng, correlation of climatic factors in relation to disease development and management of pokkah boeng under field conditions if the disease reaches acute phases.

(i) Screening:

Symptoms to be observed:

Mild -Green plants with pokkah boeng (curling/twisting of spindle leaves, twisting of leaves, whitish/chlorotic streaks on the leaves) at varying intensities.

Moderate -Yellowing of 3rd/4th leaf followed by complete yellowing of foliage and expression of top rot symptom

Severe -Yellowing of leaves + Discoloration (Light colored) of silk +wilting symptom in opened stalks

Observe for the presence of above symptoms and grade it as given below

Varieties	%infected Plants				Disease reaction
	Mild	Moderate	Severe	Total incidence	
VI					
V2					
V3					

* No restriction on number of varieties to be studied

Disease Reaction:

0-5% - Resistant; >5-10% - Moderately Susceptible; 10-20% - Susceptible;
20% - Highly Susceptible

(ii) Epidemiology

Record temperature, relative humidity and rainfall from May to September and establish correlation with disease incidence

(iii) Management – (To be taken up during second year of the Project)

Varieties: Two susceptible varieties

Treatments:

T-1 Sett treatment – Overnight soaking with Carbendazim – 0.1% a.i.
T-2 Foliar spray – Carbendazim – 0.05% a.i. (3 sprays at 15 days interval from May 15th)
T-3 – Sett treatment (T1) +Foliar spray with carbendazim (T2)
T-4 Control

Replications: 4

Observations: Record disease incidence of pokkah boeng displaying symptoms of top rot or wilt or both and present the date in a tabular form.

RESULTS OF PREVIOUS YEAR

KAPURTHALA

Out of 43 entries, 15 showed MS and remaining were found R. Two check varieties Co 0238 and CoS 85 behaved as HS and MS. The minimum and maximum temperature of 34.5 and 25.0°C, RH 49.8 to 73.1 % and rainfall 19.0 mm were noted from May-September. The disease incidence was initiated during 1st fortnight of June and gradually increased till August-September. Maximum incidence was observed during the month of October. Rainfall and high humidity play an important role in incidence.

UCHANI

Pokkah boeng Incidence on important varieties viz., CoS 8436 (16%), Co 0238 (24%), CoH 133 (19%) and CoH 119 (8%) was observed during July-August 2015. Twenty six varieties of sugarcane were screened under natural conditions. Varieties namely CoH 92, CoH 160, CoH 164, CoH 167, CoH 150, CoH 99 and were found R to pokkah boeng disease. Varieties CoH 56, CoH 151, CoH 119, Co 0118, Co 1148, CoH 56, CoH 128, Co 7717, Co 0237, CoJ 64, Co 05011, CoJ 85, S -11 252 and S-11 202 were found MS to pokkah boeng disease.Varieties namely CoH 110, CoH 152, CoS 8436, and CoH 133 were found S, Co 0238 variety showed HS reaction.

SHAHJAHANPUR

A total of 23 varieties were screened, out of these, 17 showed the behavior as R, rest of them were graded as MS and S. No symptoms of top rot and wilting of stalk have been observed in the planted setts. The incidence of pokkah boeng disease was high after rain fall along with high humidity and low temperature conditions.

PUSA

Ten varieties were screened under natural condition; out of them only three varieties namely CoSe 95422, CoP 124 and CoP 141 were noticed with mild infection in the month of last week of July and gradually increased till the end of August. The disease was maximum in 1st week of August. Maximum rainfall and high humidity favour the development of pokkah boeng disease. After rainfall, the reduction in disease was seen from the last week of August. Initial symptoms showed curling and twisting of spindle leaves and chlorotic leaves. No symptoms of top rot and wilt were observed.

KOLHAPUR

In IVT Early among the screened 12 sugarcane genotypes, 8 genotypes *viz;* Co 12001, Co 12006, Co 12007, Co 12008, CoM 12081, CoM 12083, CoN 12071 and CoT 12366 found R to pokkah boeng whereas Co 12003, CoM 12082, CoN 12072 and CoT 12367 were MS. In AVT Early (I Plant) out of eight sugarcane genotypes Co 10004, Co 10024, Co 10027 were found R whereas, remaining all were MS. In AVT Early II plant Co 09004 found S and remaining two genotypes were resistant to pokkah boeng. In IVT ML out of 15 sugarcane genotypes werefound R to PB and remaining were MS. In AVT ML I plant among the screened genotypes Co 09009, Co 10033, CoM 10083, CoT 10368, PI 10131 and PI 10132 showed whereas, Co 10015, Co 10017, Co 10031 and CoT 10369 were MS, only one sugarcane genotype CoVC 10061 was found to be S.

AKOLA

All sugarcane varieties showed R reaction against PB except Co 99004 which showed MR reaction.

PUNE

Out of 12 genotypes varieties/ genotypes, 6 viz., Co 85004, CoM 0265, CoVSI 03102, Co 86032, CoVSI 0309 and Co 94012 were observed free from the disease, while remaining 6 varieties/ genotypes *viz.,* CoVS I9805, CoC 671, VSI 434, CoVSI 0405, CoVSI

2000-01 and Co 419 were found susceptible. The fungicides viz., Carbendazim and mancozeb are found effective to control pokkah boeng disease effectively when these two fungicides are sprayed thrice after 15th May onwards. However, mancozeb found more effective than the carbendazim.

SANKESHWAR

Pokkah boeng was prominently observed with its first appearance during May month. The result revealed that sett treatment + foliar spray carbendazim 0.05% showed highest germination and also low disease incidence of top rot disease (94.5 and 6.7 respectively) compared to the other treatments.

ANAKAPALLE

Out of 24 varieties / genotypes screened only the variety Co C 671 showed highly susceptible reaction, while Co 419 and Co 997 exhibited susceptible reaction to top rot and remaining entries were resistant.

RESULTS OF CURRENT YEAR

I. SCREENING FOR POKKAH BOENG RESISTANCE

NORTH WEST ZONE

KAPURTHALA

Forty-two entries along with two check varieties viz., Co 0238 and CoJ 85 were screened for pokkah boeng under natural conditions. Out of 42 entries, nine genotypes showed MS reaction, six were S and remaining entries were found to be R. Check varieties Co 0238 and CoJ 85 behaved as HS and MS to the disease respectively (Table 42).

UCHANI

Sixty nine varieties of sugarcane were screened against pokkah boeng under natural conditions. Twenty nine varieties were found resistant to pokkah boeng. Thirty one varieties showed MS reaction to pokkah boeng. Eight varieties (CoH 110, CoH 133, CoH 152, CoJ 85, CoLk 13204, CoPb 11214, CoPant 13222 and CoS 8436exhibited S reaction. Co 0238 variety showed HS reaction against pokkah boeng (Table 43).

SHAHJAHANPUR

A total of 13 varieties were planted for pokkah boeng screening and its incidence was correlated with climatic conditions. Variety Co 0238 was used as susceptible check for PB. Of 13, ten varieties displayed the behavior of resistant. Rest three varieties were rated as MS (Table 44).

KOLHAPUR

While screening for pokkah boeng in IVT (E) trial, 8 sugarcane genotypes were screened. Of them, 4 genotypes *viz*., Co 13003, Co 13004, CoSnk 13101 and CoSnk 13102 were found R whereas Co 13002, CoN 13071, CoN 13072 and MS 13081 were found MS. In AVT Early (I Plant) trial, all the five sugarcane genotypes *viz*.,Co 11001, Co 11004, CoM 11081, CoM 11082 and CoM 11084 were found R.Out of 8 genotypes under AVT Early (II plant), only 3 genotypes *viz*., Co 10004, Co 10024 and Co 10027 showed Rand Co 10005, Co 10026, CoT 10366 and CoT 10367 showed MS reaction while, remaining genotypes showed S. Under IVT ML, out of 20 genotypes, 10 genotypes *viz*., Co 13005, Co 13006, Co 13011, Co 13013, Co 13018, CoM 13082, CoSnk 13103, CoSnk 13105, PI 13131 and PI 13132 found R to pokkah boeng and only Co 13014 showed S reaction. The remaining 9 genotypes showed MR reaction.

In AVT ML (I plant) trial, all the six sugarcane genotypes *viz*.,Co 11005, Co 11007, Co 11012, Co 11019, CoM 11085 and CoM 11086 were found R to pokkah boeng. Out of 11 genotypes under AVT ML (II plant), 8 genotypes *viz*., Co 09009, Co 10015, Co 10031, Co 10033, CoM 10083, CoT 10368, CoT 10369, CoVC 10061 shown resistant reaction to

pokkah boeng disease under natural condition. Remaining 3 genotypes exhibitedMS reaction.Among the sugarcane check varieties, Co 85004, Co 86032 and Co 740 were found R to pokkah boeng, whereas, CoC 671, Co 7527 and Co 99004 were found MS (Table 45).

NORTH CENTRAL ZONE

PUSA

Of 11 genotypes screened under natural condition, four genotypesshowed MR reaction whereas seven genotypes were susceptible to PB. The disease appeared in the 2nd week of June and gradually increased till 1st week of August. Initial symptoms showed whitish, curling, twisting and bending of the leaves from the top portion. Yellowing of foliage and reading of spindles with small holes were also noticed at later stage. High humidity and rainfall favours the disease development (Table 46).

SEORAHI

A total of 30 genotypes/varieties were screened for PB under natural condition.Out of 30 genotypes, 18 were PB resistant and 5 were MS whereas remaining were S (Table 47).

EAST COAST ZONE

ANAKAPALLE

Out of 32 varieties / genotypes screened against top rot under natural conditions only CoC 671 showed HS reaction while four entries (Co 13030, Co 419, Co 7219 and Co 997) exhibited S reaction to top rot and remaining entries were R (Table 48).

PENINSULAR ZONE

PUNE

Out of the 14 genotypes, CoVSI03102 and Co 85004 were free from the disease, while remaining 12 genotypes *viz.,* Co 419, Co 86032, Co 94012,CoC 671, CoVSI9805, VSI434, CoVSI0405, CoVSI0309, CoM0265, CoVSI2000-01, MS 10001 and VSI08005 were found susceptible (Table 49).

AKOLA

The incidence of pokkah boeng was in range of 1.40 to 9.48 %. CoM11082 showed highest (9.48%) PB incidence in AVT (E I) Plant trial. In AVT (EII) Plant trial, the incidence was ranging from 0.60 to 6.19 %. Co 10006 showed highest (6.19 %) disease incidence. In IVT ML Plant, the incidence of PB was maximum in Co99004 (4.88 %). In AVT ML I Plant, Co11012 showed highest (4.67 %) disease incidence. In AVT ML II Plant, The incidence of PB was ranging from 0.00 to 3.72 % .CoT 10368 showed highest (3.72 %) disease incidence (Table 50).

II. EPIDEMIOLOGY

In Kapurthala, the disease incidence appeared during 1st fortnight of June and gradually increased till August-September. Rainfall and high humidity play an important role in PB incidence.

In Shahjahanpur, the incidence of PB appeared after rain fall along with high humidity when low temperature prevails in nature. The symptoms of PB were severely affected at 32.8^{0}C (Maximum), 26.0^{0}C (Minimum), relative humidity up to 86.0 %and 462 mm rainfall in the month of July, 2016 followed by August month.

In Uchani centre, PB incidence was noticed in first week of June 2016. PB incidence started increasing during rainfall with high humidity conditions.

In Pusa, the minimum and maximum temperature of 23.0 to 35.2^{0}C, 53.1 to 93.0% relative humidity and 34.6 to 319.2 mm rainfall were observed during May to October, 2016.

In Seorahi, the severity of PB was correlated with weather parameters under natural conditions. The temperature (25-31^o C), relative humidity (67- 91.33%)) and rainfall (255 - 390 mm) were recorded during the year. The disease was maximum in first week of July and

gradually increased till the last week of August. After rainfall the reduction in disease was seen from the second week of July. Initial symptoms showed curling and twisting of spindle leaves and chlorotic leaves. No symptoms of top rot and wilt have been observed in the planted fields.

In Anakapalle, the disease incidence was initiated during the first fortnight of June and gradually increased till November and then the disease was slowed down. Highest disease was observed during the month of October. The disease incidence was positively correlated with the number of rainy days, low temperature and high RH.

III. POKKAH BOENG MANAGEMENT

KAPURTHALA

The efficacy of Carbendazim fungicide for the management of pokkah boeng was tested on Co 0238 and CoJ 85 under field conditions. The results revealed that fungicide treatment viz., carbendazim significantly controlled the disease as compared to control. Sett treatment and foliar spray at 15 days interval from May 15th (T_3) was found most effective to control the PB and highest germination and low disease incidence (12.75 % in Co 0238 and 10 % in CoJ 85) was recorded as compared to other treatments (Table 51).

PUSA

Sett treatment with Carbendazim 0.1% and three foliar spraying with Carbendazim @ 0.05% at 15 days interval showed the maximum (46.8) percent germination and also low disease incidence (5.3) of Pokkah boeng (Table 52).

ANAKAPALLE

For management of top rot, the sett treatment combined with foliar spraying of Carbendazim @0.05% showed the highest percent germination and also low disease incidence of toprot (83.4 and 4.1 respectively) compared to the other treatments (Table 53).

SANKESHWAR

The experiments on management revealed that sett treatment (Overnight soaking with carbendazim- 0.1%) + foliar spray carbendazim @ 0.05% showed the highest %germination (88.32) and also low disease incidence (6.38),respectively) compared to other treatments(Table 54).

PUNE

For management of PB, the fungicides *viz*., carbendazim and mancozeb were tested along with control in 5 treatments. Both the fungicides were found effective to control PB effectively when they were sprayed thrice at an interval of 15 days after 15th May. However, mancozeb @ 0.3 % was found more effective than the carbendazim and the disease control was up to 74.81 % (Table 55).

PP 32: MANAGEMENT OF BROWN SPOT DISEASEOF SUGARCANE

Objective: To find out effective method of brown spot management through chemicals.
Locations: Pune, Padegaon, Kolhapur and Sankeshwar
Year of Start: 2015-16
Treatment:
I. Variety : Brown spot susceptible variety CoM 0265 (or local susceptible variety)
II. Fungicides

T.1	- Propiconazole	-	0.1 %
T.2	- Hexaconazole	-	0.1 %
T.3	- Triadimefon	-	0.1 %
T.4	- Mancozeb	-	0.3 %
T.5	- Carbendazim	-	0.1 %
T.6	- Control (Untreated)	-	-

III. Time of application of fungicides: To be applied just after appearance of brown spot lesions followed by two sprays at 15 days interval.
Plot size : 6 x 7 sq. m
Design : RBD
Replications : Three
Observations:

1. Germination %
2. Disease incidence% (No. of clumps showing disease / total no. of clumps x 100)
3. Disease severity (% leaf area covered with brown spot lesions based on observations of 10 leaves per clump; total no. of clumps to be observed at least 10)
4. Cane yield per plot and per hectare
5. Brix, Pol %, Purity and CCS %
6. Cost-benefit ratio

RESULTS OF THE PREVIOUS YEAR
PUNE

The incidence of the disease was not observed during the year and hence the treatments were not imposed. During 2015-16 planting season this trial has been conducted in the operational area of the Sarsenapati Santaji Ghorpade Sugars Ltd, Kagal, Kolhapur Dt where the disease is being observed every year.

PADEGAON

In the chemical management of brown spot of sugarcane experimental trial is vitiated due least incidence of brown spot in the experimental plots.

KOLHAPUR

The experiment is vitiated due to non feasibility of spraying of various fungicides (as per treatment) during rainy season. Only one spray of each fungicide was taken at the time of disease appearance. Almost all the fungicides controlled the disease because the intensity of diseases was less and weather condition was not congenial for multiplication of pathogen.

SANKESHWAR

Five fungicides viz., propiconazole, hexaconozole, tridemefon, mancozeb and carbendazim were tested for the management of disease. Propiconazole (0.1%) was found

superior compared to other fungicides for the control of the disease besides improving cane yield.

RESULTS OF THE CURRENT YEAR

PADEGAON

The results on intensity of brown spot disease, growth and quality parameters as influenced by different treatments were recorded.The results on germination percentage at 45 DAP were not significant. The germination in different treatments ranged from 57.3 to 66.0%. All the fungicides had a significant influence on the brown spot intensity, cane yield and CCS yield. Among the treatments, Propiconazole 0.1% recorded the lowest disease intensity of 10.0% followed by Mancozeb 0.3 % which recorded the disease intensity of 13.0% and the %disease control of 79.8 (Table 56).

KOLHAPUR

Due to flood condition during rainy season the trail was not completed.

SANKESHWAR

Due to least incidence of brown spot in experimental plot, the trail was not completed.

PUNE

The incidence of the disease was not observed throughout crop period and hence the treatments were not imposed so far.

PP 33: MANAGEMENT OF YELLOW LEAF DISEASE THROUGH MERISTEM CULTURE

RESULTS OF THE CURRENT YEAR

ANAKAPALLE

Thetissue culture seedlings derived from CoA14321, CoA92081 and CoV08356 were transplanted in field at rate of 9135, 2460 and 6500 plantlets respectively. It was confirmed that YLD incidence (%) was not seen in breeder seed. However, YLD in range of 0-10% was observed foundation seedof all the three cultivars.

COIMBATORE

Detailed field experiments were conducted to assess impact of YLD on cane growth and yield by comparing the crops planted with virus-infected and virus-free planting materials of the popular variety Co 86032. It was found that the disease has significantly affected germination, plant growth/yield parameters such as number of stalks, cane diameter, cane length, number of internodes, cane weight, juice yield etc in the popular variety Co 86032. It was found that due to virus infection, cane and juice yield are reduced by ~20 and 10 per cent, respectively in the variety in the plant crop.

Table 1. Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Lucknow

Sl. No.	Pathotype	Source	Reaction on host differentials													
			Co 419	Co 975	Co 997	Co 1148	Co 62399	Co 7717	CoC 671	CoJ 64	CoS 767	BO 91	CoS 8436	Baragua	Khakai	SES 594
1.	CF01	Co 1148	R	S	S	S	S	R	S	S	R	R	-	R	S	R
2.	CF02	Co 7717	I	R	S	R	I	S	S	I	R	R	-	R	R	R
3.	CF03	CoJ 64	R	R	S	R	R	R	R	S	R	R	-	R	R	R
4.	CF04	Co 419	S	S	S	S	R	S	S	S	R	R	-	R	S	R
5.	CF05	Co 997	R	S	S	S	R	R	S	S	R	R	-	R	S	R
6.	CF06	CoC 671	R	S	S	S	R	R	S	S	R	R	-	S	S	R
7.	CF07	CoJ 64	I	R	S	S	R	R	I	S	R	R	-	R	S	R
8.	CF08	CoJ 64	I	S	S	S	S	S	S	S	I	R	-	R	S	R
9.	CF09	CoS 767	I	R	I	S	R	R	I	S	S	R	-	R	S	R
10.	CF10	85A261	S	S	S	I	S	S	S	S	R	R	I	R	R	R
11.	CF11	CoJ 64	S	I	S	I	I	S	I	S	I	I	I	I	I	R
12	IR-121	CoS 8436	S	R	R	R	I	I	S	S	R	R	S	R	S	R
13	IR-122	CoS 8436	S	R	R	R	R	R	S	S	R	R	S	R	S	R
14	IR-123	CoS 8436	S	R	R	R	I	R	S	S	R	R	S	R	S	R
15	IR-124	CoS 92423	S	R	R	R	I	I	S	S	R	R	S	R	S	R
16	IR-125	CoS 92423	S	R	R	R	S	S	S	S	R	R	S	R	S	R
17	IR-126	CoS 92423	S	R	R	R	S	S	S	S	R	R	R	R	S	R
18	IR-127	Unknown variety	S	R	R	R	R	S	R	S	S	R	R	R	S	R
19	IR-128	Unknown variety	S	R	I	R	S	S	S	S	I	R	R	R	S	R
20	IR-129	Unknown variety	S	R	R	R	R	R	S	S	I	R	S	R	S	R
21	IR-130	Co 0238	S	R	R	R	S	R	S	S	S	I	R	R	S	R
22	IR-131	Co 0238	S	R	R	I	S	I	R	S	S	I	R	R	S	R

23	IR-132	Co 0238	S	R	R	I	S	I	R	S	S	I	R	R	S	R
24	IR-133	CoLk 8102	S	R	R	R	S	S	S	S	R	R	S	R	S	R
25	IR-134	CoLk 8102	S	R	R	R	S	S	S	S	R	R	R	R	S	R
26	IR-135	Co 0238	S	R	R	R	S	R	R	S	S	I	R	R	S	R
27	IR-136	Co 0238	S	R	R	R	S	R	R	S	S	I	R	R	S	R
28	IR-137	CoSe 95422	S	R	R	R	R	S	S	S	R	R	R	R	S	R
29	IR-138	CoSe 95422	S	R	R	R	R	S	S	S	R	R	I	R	S	R
30	IR-139	CoSe 95422	S	R	R	R	R	R	S	S	R	R	S	R	S	R

Table 2.Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Shahjahanpur

Sl. No.	Pathotype	Source	Reaction on host differentials																			
			Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	B0 91	Co 86002	Co 86032	Co 7805	CoV 92102	CoSe 95422	Baragua	Khakai	SES 594	Tallied with pathotype
1	CF01	Co 1148	R	S	S	S	R	S	S	S	R	R	R	S	S	S	S	R	R	S	R	-
2	CF02	Co 7717	X	R	S	R	S	X	S	X	R	R	R	S	S	S	S	S	R	S	R	-
3	CF03	CoJ 64	R	R	S	R	R	R	X	S	R	R	R	X	X	S	X	X	R	S	R	-
4	CF07	CoJ 64	X	R	S	S	R	R	X	S	R	R	R	S	S	S	S	R	R	S	R	-
5	CF08	CoJ 64	X	S	S	S	S	S	S	S	X	R	R	S	S	S	S	S	R	S	R	-
6	CF09	CoS 767	X	X	S	S	R	R	X	S	S	R	R	S	S	S	X	S	R	S	R	-
7	CF11	CoJ 64	S	X	S	X	X	X	X	S	X	R	X	S	S	S	S	R	X	X	R	-
8	R 1102	CoS 8436	S	S	S	X	R	S	S	S	R	S	R	S	S	S	S	S	R	S	R	New
9	R 1304	CoS 07250	S	R	S	S	R	S	S	S	S	S	S	S	S	S	S	S	S	S	R	New
10	R 1501	CoJ 88	X	S	S	S	S	S	S	S	X	R	R	S	S	S	S	S	R	S	R	CF08
11	R 1502	UP 9530	X	X	S	S	R	R	X	S	S	R	R	S	S	S	X	S	R	S	R	CF09

Table 3.Pathogenic behavior of *C. falcatum* pathotypes on host differentials–Kapurthala

S. No	Pathotypes / Isolates	Source	Reaction on 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	Khakai	SES 594	Co 86002	Co 7805	Co 86032	CoV 92102	CoSe 95422
1	CF01	Co 1148	R	S	S	S	R	S	S	S	R	R	R	R	S	R	R	S	R	R	R
2	CF02	Co 7717	X	R	S	R	S	X	S	X	R	R	R	R	S	R	R	S	R	R	R
3	CF03	CoJ 64	R	R	S	R	R	R	S	S	R	R	R	R	S	R	X	S	R	R	R
4	CF07	CoJ 64	X	R	S	S	R	R	X	S	R	R	R	R	S	R	X	S	S	R	R
5	CF08	CoJ 84	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	S	R	R	R
6	CF09	CoS 767	X	X	S	S	R	R	S	S	S	R	R	R	S	R	R	S	R	R	R
7	CF11	CoJ 64	S	X	S	X	X	X	X	S	X	R	X	X	S	R	S	S	R	R	R
8	RI-298	CoJ 88	X	S	S	S	S	S	S	S	R	R	R	R	S	R	X	S	X	R	R
9	RI-302	Co 89003	X	X	S	S	S	R	S	S	R	R	R	R	S	R	S	S	S	R	R
10	RI-303	CoJ 64	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	S	R	R	R
11	RI-304	CoJ 85	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	S	S	R	R
12	RI-305	CoJ 83	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	S	R	R	R
13	RI-306	CoPb 91	S	S	S	X	S	S	S	S	R	R	R	R	S	R	R	S	R	R	R

Table 4.Pathogenic behavior of *C. falcatum* pathotypes on host differentials– Uchani

S. No	Pathotypes / Isolates	Reaction on host differentials																	
		Source	Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	Bo 91	Baragua	Khakai	SES 594	CoSe 95422	Co 86002	CoV92102	Co 86032
1	CF 01	Co 1148	R	R	S	S	I	S	S	I	R	R	R	R	S	R	R	R	R	R
2	CF 02	CoJ 7717	I	R	S	R	S	I	S	R	R	R	R	R	S	R	R	R	R	R
3	CF 03	CoJ 64	R	R	S	R	R	R	S	S	R	R	R	R	S	R	R	I	R	R
4	CF 07	CoJ 64	I	R	S	S	R	R	S	S	R	R	R	R	S	R	R	I	R	I
5	CF 08	CoJ 64	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
6	CF 09	CoS 767	R	R	S	S	R	R	S	S	S	R	R	R	S	R	R	R	R	R
7	CF-11	CoJ 64	S	I	S	I	I	I	I	S	S	R	R	I	S	R	R	S	R	R
8	RR XX	Co 89003	S	R	S	S	S	S	S	S	R	R	I	R	S	R	R	S	R	S
9	RR XXI	CoJ 64	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
10	RR XXII	CoJ 85	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	R
11	RR XXIII	CoS 8436	S	S	S	R	S	S	S	S	R	S	R	R	S	R	R	S	R	R
12	RR XXIV	Co 89003	R	I	S	S	S	R	S	S	R	R	R	R	S	R	S	S	R	R
13	RR XXVI	CoJ 85	S	S	S	S	S	S	S	S	R	R	R	R	S	R	R	I	R	R

Table 5.Pathogenic behavior of *C. falcatum* pathotypes on host differentials- Karnal

S. No.	Pathotype /isolate	Source	Reaction on host differentials																			
			Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 7805	Co 89003	Co 62399	Co 86002	Co 86032	CoC 671	CoJ 64	CoS 767	CoS 8436	CoV 92102	CoSe 95422	Bo 91	Baragua	Khakai	SES 594
1.	CF01	C0 1148	R	R	S	S	R	S	R	X	R	R	S	R	R	R	R	R	R	R	R	R
2	CF02	Co 7717	R	R	S	R	S	X	R	R	R	R	S	R	R	R	R	R	R	R	R	R
3	CF03	CoJ 64	R	R	R	R	R	R	X	X	R	R	X	X	R	R	R	R	R	R	R	R
4	CF07	CoJ 64	R	R	S	X	R	R	R	R	X	R	S	S	R	R	R	R	R	R	R	R
5	CF08	CoJ 64	S	X	S	R	R	R	R	R	S	R	X	S	X	R	R	R	R	R	R	R
6	CF09	CoS 767	R	R	R	R	X	S	R	X	S	R	X	X	S	R	X	S	R	R	R	R
7	CF11	CoJ 64	S	S	S	X	S	X	X	S	S	S	S	X	R	R	R	R	R	R	X	R
8	cfBO138	BO 138	R	R	R	R	R	R	R	X	X	R	X	R	R	R	X	R	R	R	R	R
9	cfSe 95422	CoSe 95422	R	R	S	R	S	S	X	S	S	S	X	R	R	R	R	X	R	X	R	R
10	cfBLN 05521	CoBln 05521	R	R	S	X	R	X	R	R	R	X	R	R	R	R	R	R	R	R	R	R
11	Cf 89003	Co 89003	S	S	S	S	S	S	S	S	S	S	S	X	X	R	R	R	R	X	R	R
12	cf8436 (K)	CoS 8436	S	X	S	S	S	S	S	S	X	X	S	X	X	S	S	R	X	R	R	R
13	cf8436 (RI)	CoS 8436	X	R	S	R	R	R	R	X	R	X	X	S	R	R	R	R	R	R	R	R
14	cf8436 (UPCSR)	CoS 8436	S	X	S	R	R	X	X	R	S	X	X	S	R	R	R	R	R	R	R	R
15	cfUP 1	CoJ 64	R	R	R	R	R	R	R	R	X	R	X	X	R	R	R	R	R	R	R	R
16	cfUP 2	CoJ 64	R	R	S	R	R	R	R	R	R	R	S	R	R	R	R	R	R	R	R	R
17	cfUP3	CoJ 64	R	R	R	R	R	R	R	X	X	R	R	X	R	R	R	R	R	R	R	R
18	cfCoJ I	CoJ 64	S	X	S	R	R	R	R	X	R	R	S	S	R	R	R	R	R	R	R	R
19	cfCoJ II	CoJ 64	R	R	R	R	R	R	X	R	R	R	R	R	R	R	R	R	R	R	R	R
20	cfCoJ III	CoJ 64	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Table 6.Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Pusa

Sl. No.	Pathotype	Source	Reaction on host differentials																
			Co 419	Co 997	Co 1148	Co 62399	Co 7717	CoC 671	CoJ 64	CoS 767	CoS 8436	BO 91	Baragua	Khakai	SES 594	CoSe 95422	Co 86002	CoV 92102	Co 86032
1.	CF07	CoJ 64	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
2.	CF08	CoJ 64	I	S	S	S	I	S	S	I	S	R	R	S	R	I	-	I	I
3.	RR_1	BO 145	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
4.	RR_2	CoS 98231	I	S	S	S	I	S	S	I	S	R	R	S	R	I	-	I	I
5.	RR_3	CoLk 8102	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
6.	RR_4	CoS 8436	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
7.	RR_5	CoLk 94184	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
8.	RR_6	BO 141	I	S	S	S	I	S	S	I	S	R	R	S	R	I	-	I	I
9.	RR_7	CoSe 95422	R	S	S	I	R	S	S	R	I	R	R	S	R	S	-	R	R
10.	RR_8	BO 128	I	S	S	S	I	S	S	I	S	R	R	S	R	I	-	I	I

Table 7.Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Seorahi

S. No.	Pathotype /isolates	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	Khakai	SES 594	Co 86002	CoV 92102	Co 86032	CoSe 95422
1	CF01	Co 1148	I	I	R	I	I	I	I	R	I	I	I	R	I	R	I	I	S	R
2	CF02	Co 7717	S	I	I	R	I	I	I	I	I	R	I	I	S	R	I	I	S	R
3	CF03	CoJ 64	I	R	I	I	I	I	I	I	I	R	R	I	I	R	I	S	I	R
4	CF 07	CoJ 64	I	S	I	S	I	S	S	S	S	R	S	I	I	R	S	S	S	I
5	CF 08	CoJ 64	S	I	S	I	S	S	I	I	S	I	I	I	S	R	S	S	S	I
6	CF 09	CoS 767	I	S	I	I	S	I	I	I	I	I	I	I	I	R	-	-	-	I
7	CF 11	CoJ 64	I	I	S	I	I	S	S	S	S	I	I	I	S	R	-	-	-	I
8	Isolate-1	CoLk 8102	I	S	I	S	I	I	S	S	S	R	S	I	I	R	-	-	-	I
9	Isolate-2	CoSe 92423	S	I	S	I	S	S	I	I	S	I	I	I	S	R	-	-	-	I

Table 8.Pathogenic behavior of *C. falcatum* pathotypes on host differentials– Anakapalle

Sl. No	Pathotype	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	Co 7805	Co 86002	Co 86032	CoV 92102	CoSe 95422
1.	CF04	Co 419	S	S	S	S	S	R	S	R	R	R	R	R	S	R	S	S	I	S	R
2.	CF05	Co 997	S	S	S	S	I	R	S	I	R	R	R	R	S	R	S	S	I	R	R
3.	CF06	CoC 671	S	S	S	S	S	I	S	R	R	R	R	R	I	R	S	I	R	I	R
4.	CF10	CoA 89085	S	S	S	I	S	I	S	I	R	R	R	R	I	R	I	I	I	I	R
5.	New isolate-1	Co 62175	S	S	S	S	S	R	S	R	R	R	R	R	R	R	S	S	S	S	R
6.	New isolate-2	81 V 48	S	S	S	S	S	S	S	R	R	R	R	R	I	R	I	I	R	S	R
7.	New isolate-3	CoOr 12346	S	S	S	S	S	S	S	R	R	R	R	R	I	R	I	I	R	I	R
8.	New isolate-4	CoA 09321	S	S	S	S	S	S	S	R	R	R	R	R	I	R	I	I	R	I	R

Table 9.Pathogenic behavior of *C. falcatum* pathotypes on host differentials– Cuddalore

Sl No	Pathotype	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	Khakai	SES 594	CoSe 95422	Co 7805	Co 86002	CoV 92102	Co 86032
1	CF06	CoC 671	X	S	S	R	R	X	S	S	R	R	R	R	X	R	R	R	X	R	X
2	Isolate 1	CoC 24	S	X	X	S	X	X	S	S	X	R	X	R	X	R	R	R	X	R	X
3	Isolate 2	CoSi 7	X	X	S	S	X	S	S	X	R	R	R	R	X	R	R	R	X	X	X
4	Isolate 3	CoSi 8	S	S	X	R	R	S	S	X	R	R	R	R	X	R	R	R	R	X	R
5	Isolate 4	CoA 92081	S	S	S	S	R	X	S	X	X	R	R	R	X	R	R	R	S	R	X

Table 10.Pathogenic behavior of *C. falcatum* pathotypes on host differentials–Navsari

Sl. No.	Pathotype	Source	Reaction on 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	Khakai	SES 594	CoV 92102	Co 7805	Co 86002	CoSe 95422	Co 86032
1.	CF06	CoC 671	S	S	S	I	I	I	S	R	R	R	R	R	I	R	I	I	I	R	S
2.	Cf86032	Co 86032	S	I	S	R	I	R	S	R	I	R	R	R	I	R	I	I	S	I	S

4.	Cf86002	Co 86002	S	S	I	I	I	I	S	R	R	R	R	R	I	R	I	R	S	R	I

Table 11.Pathogenic behavior of *C. falcatum* pathotypes on host differentials - Coimbatore

Sl. No	Pathotype	Reaction on host differentials																		
		Co 419	Co 975	Co 997	Co 1148	Co7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	BO 91	Baragua	Khakai	SES594	CoSe 95422	Co 7805	Co 86002	CoV 92102	Co 86032
1	CF06	S	I	S	I	I	I	S	I	I	R	I	R	I	R	R	R	I	I	I
2	CF12	S	I	I	S	S	S	S	S	I	R	I	R	S	R	R	I	I	I	I
3	Cf0323 Pettavaithalai	S	I	I	I	R	I	S	I	I	R	R	R	I	R	R	S	I	I	I
4	Cf92012Kanjanur	S	I	I	R	S	R	S	I	I	R	I	R	I	R	R	I	S	I	I
5	Cf91017 Nellikuppam	S	I	I	I	S	I	S	I	R	R	R	R	I	R	R	I	S	R	I
6	CfPI1110 Kothangudi	S	I	R	R	S	I	S	I	I	R	I	R	I	R	R	R	I	I	I
7	CfPI1401 Kadaganur	S	I	I	I	S	I	S	I	S	R	I	R	I	R	R	S	S	I	I
8	Cfv09356 Keerangudi	S	I	I	I	I	I	S	I	I	R	I	R	I	R	R	I	I	I	S
9	Cf86027 Nathakadu	S	I	I	I	I	S	S	I	R	R	I	R	I	R	R	I	R	I	I

Table 12.Pathogenic behavior of *C. falcatum* pathotypes on host differentials -Thiruvalla

S. No	Pathotype/ Isolate	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	CoSc 95422	CoV92102	Co7805	Co86002	Co86032
1	Cf 92012 (Kanjanur)	R	R	R	I	R	I	S	S	I	R	R	R	R	R	I	R	S	R	R
2	Cf PI 1110 (Mathakadi)	I	I	I	I	I	R	S	I	S	I	I	R	I	R	I	R	I	I	I
3	Cf PI 1401 (Kadanganur)	R	R	I	I	I	I	I	I	I	R	R	R	I	R	I	I	I	R	I
4	Cfv09356	I	I	S	I	I	S	S	S	I	R	I	I	I	I	I	S	I	R	R
5	Cf PI 1110 (Kothangudi)	I	R	S	R	S	I	S	S	I	R	R	I	I	R	I	I	I	R	R
6	Cf 0323 (Pettavaithalai)	R	R	I	I	I	I	I	S	I	R	R	R	I	R	I	I	I	R	R
7	Cf91017 (Nellikuppam)	R	R	I	R	S	I	S	I	I	R	I	R	I	R	I	I	I	R	R
8	CoTl 88322 (New isolate)	I	I	I	I	I	S	S	S	R	R	R	R	I	R	R	I	I	I	I
9	CF06	I	I	S	I	R	I	S	I	R	R	R	R	R	R	R	I	R	I	I
10	CF12	I	I	S	I	I	S	S	I	I	R	I	R	I	R	R	I	I	I	I

Table 13. Evaluation of sugarcane genotypes for red rot, smut, wilt and YLD- Lucknow

Sl. No.	Genotype	Red Rot				Smut	Wilt	YLD
		Plug Method		Nodal Method				
		Cf08	Cf09	Cf08	Cf09			
Initial Varietal Trial (Early)								
1.	Co 13033	Not planted due to non-availability of cane damaged by wilt						
2.	Co 13034	MR	MS	MR	MR	S	-	-
3.	CoLk 13201	MR	MR	MR	MR	-	-	-
4.	CoLk 13202	MR	MR	MR	MR	-	-	S
5.	CoLk 13203	MR	MR	MR	MR	S	-	-
6.	CoPant 13221	MR	MR	MR	MR	-	-	-
7.	CoPant 13222	HS	HS	S	S	-	S	-
8.	CoPb 13181	MR	MR	MR	MR	-	-	S
9.	CoS 13231	R	S	R	MS	S	S	-
Advanced Varietal Trial (Early)-I Plant								
1.	Co 12026	HS	HS	S	S	S	-	-
2.	Co 12027	MR	MR	MR	MR	-	-	S
3.	CoLk 12203	MR	MR	MR	MR	S	-	-
4.	CoPant 12221	MS	MS	MR	MR	S	-	-
Advanced Varietal Trial (Early)-II Plant-								
1.	CoH 11262	HS	HS	S	S	-	S	-
2.	CoLk 11201	MR	MR	MR	MR	-	-	-
3.	CoLk 11202	MR	MR	MR	MR	S	-	-
4.	CoLk 11203	MR	MR	MR	MR	-	-	-
Initial Varietal Trial (Midlate)								
1.	Co 13035	MR	MR	MR	MR	S	-	-
2.	Co 13036	MR	MS	MR	MR	-	S	-
3.	CoH 13261	R	MR	R	MR	-	-	-
4.	CoH 13262	MR	MR	MR	MR	-	-	-
5.	CoH 13263	MR	MR	MR	MR	-	-	S
6.	CoLk 13204	MR	MR	MR	MR	-	-	-
7.	CoLk 13205	MR	MR	MR	MR	-	-	-
8.	CoPant 13223	MS	MS	MR	MR	-	-	-
9.	CoPant 13224	MR	MR	MR	MR	-	-	-
10.	CoPb 13182	R	R	R	R	S	-	S
11.	CoPb 13183	HS	HS	S	S	S	-	-
12.	CoS 13232	MR	MR	MR	MR	S	-	-
13.	CoS 13233	HS	HS	S	S	-	-	-
Advanced Varietal Trial (Mid late)-I Plant								
1.	Co 12029	MR	MR	MR	MR	S	-	-
2.	CoH 12263	MS	MS	MR	MR	S	-	S
3.	CoLk 12205	MR	MR	MR	MR	S	-	-
4.	CoPant 12226	MS	MS	MR	MR	-	S	-
5.	CoPb 12211	MS	S	MR	MS	S	-	-
6	CoS 12232	MR	MR	MR	MR	-	-	S

Advanced Varietal Trial (Mid late)-II Plant								
1.	Co 11027	MR	MS	MR	MR	S	-	-
2.	CoH 11263	R	R	R	R	S	-	-
3.	CoLk 11204	MR	MS	MR	MR	S	-	-
4.	CoLk 11206	MR	MR	MR	MR	-	-	-
5.	CoPb 11214	MR	MS	MR	MS	-	-	S
6.	CoS 11232	MR	MR	MR	MR	-	-	-
Check	CoJ 64	HS	S	S	S	-	-	-
Check	CoS 767	MR	S	MR	MS	-	-	-
Check	Co 1158	-	-	-	-	S	-	-
Check	CoLk 7701	-	-	-	-	S	-	-

Table 14. Evaluation of sugarcane genotypes for red rot& smut resistance-Shahjahanpur

Sl. No.	Genotypes/ Varieties	Reaction against Red rot				Smut	YLD
		Plug method		Nodal Cotton swab			
		CF08	CF09	CF08	CF09		
AVT Early (I Plant)							
1	Co 12026	MS	S	R	R	MS	R
2	Co 12027	MR	MR	R	R	MR	R
3	CoLk 12203	MR	MR	R	R	R	R
4	CoPant 12221	MS	MS	R	R	MR	R
5	CoJ 64	HS	HS	S	R	MR	R
6	Co 0238	MS	MS	R	R	MS	R
AVT Early (II Plant)							
1	CoH 11262	HS	HS	S	S	MS	MS
2	CoLk 11201	MR	MR	R	R	MR	R
3	CoLk 11202	MR	MR	R	R	MR	R
4	CoLk 11203	MS	MS	R	R	MS	MR
5	Co 0238	MS	S	R	R	R	MR
6	CoJ 64	HS	HS	S	S	R	R
AVT Mid late (I Plant)							
1	Co 12029	MR	MR	R	R	R	R
2	CoH 12263	MR	MS	R	R	R	R
3	CoLk 12205	MS	MR	R	R	MS	R
4	CoPant 12226	MR	MR	R	R	MR	R
5	CoPb 12211	S	MS	R	R	MS	R
6	CoS 12232	MR	MR	R	R	R	R
7	CoS 767	MS	HS	R	S	R	R
8	CoS 8436	MS	MS	R	R	MR	R
9	CoPant 97222	S	S	S	S	R	R
AVT Mid late (II Plant)							
1	Co 11027	MR	MR	R	R	MS	MR
2	CoH 11263	MR	MR	R	R	MR	R
3	CoLk 11204	MR	MS	R	R	MR	R
4	CoLk 11206	MR	MR	R	R	MR	MS
5	CoLk 11214	MR	MR	R	R	MR	MR
6	CoS 11232	MR	MR	R	R	R	R
7	CoS 767	MS	HS	R	S	R	R
8	CoS 8436	MS	MR	R	R	R	MR
9	CoPant 97222	S	S	S	S	R	R

	Co 453 (S)	S	S	S	S	-	-
	Co 1158 (S)	-	-	-	-	HS	-
IVT Early							
1	Co 13033	MR	MR	R	R	MS	MS
2	Co 13034	MR	MR	R	R	MR	MS
3	CoLk 13201	S	MS	S	R	MR	MR
4	CoLK 13202	MR	MR	R	R	MR	MR
5	CoLk 13203	MS	S	R	S	R	MS
6	CoPant 13221	MR	MR	R	R	MS	MR
7	CoPant 13222	S	S	S	S	MS	R
8	CoPb 13181	MS	MS	R	R	R	MR
9	CoS13231	MR	MR	R	R	R	R
10	Co 0238	MS	MS	R	R	R	-
11	CoJ 64	S	S	S	S	MR	R
12	Co 453 (S)	S	S	S	S	-	-
13	Co 1158 (S)	-	-	-	-	HS	-
IVT Mid late							
1	Co 13035	MR	MR	R	R	R	R
2	Co 13036	MR	MR	R	R	R	MR
3	CoH 13261	MS	MS	R	R	R	MS
4	CoH 13262	MR	MR	R	R	R	MR
5	CoH 13263	MR	MS	R	R	MR	R
6	CoLk 13204	MR	MR	R	R	MR	R
7	CoLk 13205	HS	S	S	S	MS	R
8	CoPant 13223	MR	MR	R	R	R	R
9	CoPant 13224	MR	MR	R	R	R	R
10	CoPb 13182	MR	MR	R	R	R	MR
11	CoPb 13183	S	S	S	S	MR	MR
12	CoS 13232	MR	MR	R	R	MR	MR
13	CoS 13233	MS	MS	R	R	R	MR
14	CoPant 97222	HS	MS	S	R	R	R
15	CoS 767	MR	MS	R	R	MS	R
16	CoS 8436	MS	MS	R	R	R	R
17	Co 453 (S)	S	S	S	S	-	-
18	Co 1158 (S)	-	-	-	-	HS	-

Table 15. Evaluation of sugarcane genotypes for red rot, smut and wilt resistance-Kapurthala

Sl. No	Genotypes	Red rot						Smut	Wilt
		Plug method				Cotton swab			
		CF08		CF09		CF08	CF09		
		Score	Rating	Score	Rating	Rating	Rating		
AVT (Early) Plant I									
1	Co 12026	3.9	MR	3.4	MR	R	R	MR	R
2	Co 12027	3.7	MR	3.8	MR	R	R	MS	R
3	CoLk 12203	4.9	MS	5.7	MS	R	R	MS	MS
4	CoPant 12221	3.3	MR	3.9	MR	R	R	MS	R
5	CoJ 64	8.9	HS	8.4	HS	S	S	S	-
6	Co 0238	3.8	MR	3.5	MR	R	R	S	-
AVT (Early) Plant II									
1	CoH 11262	7.8	S	8.3	HS	S	S	MR	MS
2	CoLk 11201	4.8	MS	3.7	MR	R	R	MS	MR
3	CoLk 11202	3.6	MR	3.5	MR	R	R	MS	R
4	CoLk 11203	3.7	MR	4.6	MS	R	R	S	MR
5	CoJ 64	8.9	HS	8.4	HS	S	S	S	-
6	Co 0238	3.8	MR	3.5	MR	R	R	S	-
AVT (Mid Late) Plant I									
1	Co 12029	3.5	MR	3.7	MR	R	R	MS	R
2	CoH 12263	3.8	MR	3.6	MR	R	R	MR	R
3	CoLk 12205	4.9	MS	5.4	MS	R	R	S	R
4	CoPant 12226	3.9	MR	3.4	MR	R	R	MR	MR
5	CoPb 12211	3.8	MR	3.9	MR	R	R	MR	R
6	CoS 12232	4.2	MS	4.5	MS	R	R	MS	MR
7	CoS 767	8.0	S	8.1	HS	S	S	S	-
8	CoS 8436	3.7	MR	3.8	MR	R	R	MS	-
9	CoPant 97222	5.8	MS	5.7	MS	S	S	MS	-
AVT (Mid Late) Plant II									
1	Co11027	3.8	MR	3.5	MR	R	R	MS	R
2	CoH 11263	3.2	MR	3.5	MR	R	R	MR	MR
3	CoLk 11204	3.9	MR	3.7	MR	R	R	MS	R
4	CoLk 11206	3.5	MR	3.8	MR	R	R	MS	R
5	CoPb 11214	3.6	MR	3.5	MR	R	R	MR	R
6	CoS 11232	3.8	MR	3.4	MR	R	R	MS	MR
7	CoS 767	8.0	S	8.1	HS	S	S	S	-
8	CoS 8436	3.7	MR	3.8	MR	R	R	MS	-
9	CoPant 97222	5.8	MS	5.7	MS	S	S	MS	-
IVT (Early)									
1	Co 13033	3.5	MR	3.7	MR	R	R	MR	MS
2	Co 13034	5.1	MS	3.8	MR	R	R	MS	MR
3	CoLk 13201	6.2	S	5.9	MS	R	R	R	MR
4	CoLk 13202	3.4	MR	3.4	MR	R	R	MS	R

5	CoLk 13203	3.6	MS	6.2	S	R	R	MR	MR
6	CoPant 13221	3.8	MR	3.6	MR	R	R	R	R
7	CoPant 13222	5.7	MS	6.5	S	S	R	HS	R
8	CoPb 13181	5.3	MS	5.6	MS	R	R	MR	R
9	CoS 13231	3.4	MR	3.6	MR	R	R	R	R
10	CoJ 64	8.9	HS	8.4	HS	S	S	S	-
11	Co 0238	3.8	MR	3.5	MR	R	R	S	-
IVT (Midlate)									
1	Co 13035	8.0	S	4.4	MS	S	R	MS	R
2	Co 13036	3.2	MR	3.6	MR	R	R	MS	MR
3	CoH 13261	4.3	MS	3.5	MR	R	R	MR	R
4	CoH 13262	3.8	MR	3.3	MR	R	R	R	R
5	CoH 13263	5.9	MS	6.2	S	R	R	MS	MS
6	CoLk 13204	5.8	MS	6.0	MS	R	R	S	R
7	CoLk 13205	8.2	HS	7.7	S	R	S	MS	R
8	CoPant 13223	3.5	MR	3.8	MR	R	R	R	R
9	CoPant 13224	3.7	MR	3.5	MR	R	R	MR	MR
10	CoPb 13182	3.4	MR	3.7	MR	R	R	MS	R
11	CoPb 13183	8.5	HS	8.3	HS	S	S	MR	R
12	CoS 13232	4.4	MS	4.8	MS	R	R	MR	R
13	CoS 13233	6.0	MS	5.7	MS	S	R	MS	R
14	CoS 767	8.0	S	8.1	HS	S	S	S	-
15	CoS 8436	3.7	MR	3.8	MR	R	R	MS	-
16	CoPant 97222	5.8	MS	5.7	MS	S	S	MS	-

Table 16. Evaluation of sugarcane genotypes for red rot& YLDresistance- Uchani

Sl. No.	Genotype	Red rot				YLD
		Plug method		Nodal method		
		CF08	CF09	CF08	CF09	
AVT (Early) Plant I						
1.	Co 12026	MR	MR	R	R	R
2.	Co 12027	MS	MS	R	R	MS
3.	CoLk 12203	MR	MR	R	R	MS
4.	CoPant 12221	MR	MR	R	R	MS
5.	CoJ 64	HS	S	S	S	MS
6.	Co 0238	MR	MR	R	R	MS
AVT (Early) Plant II						
1.	CoH 11262	MR	MR	R	R	MS
2.	Co LK 11201	MS	MR	R	R	MS
3.	Co LK 11202	MR	MR	R	R	MR
4.	Co LK 11203	MS	MR	R	R	S
5.	CoJ 64	HS	S	S	S	MS
6.	Co 0238	MR	MR	R	R	S
AVT (Midlate) Plant I						
1.	Co 12029	MR	MR	R	R	MS
2.	CoH 12263	MR	R	R	R	MR
3.	CoLk 12205	MS	MR	R	R	MR
4.	CoPant 12226	MS	MR	R	R	S
5.	CoPb 12211	MS	MR	R	R	MS
6.	CoS 12232	MS	MS	R	R	S
7.	Co S 767	MS	S	R	R	HS
8.	CoS 8436	MR	MR	R	R	MS
9.	CoPant 97222	S	MS	S	S	HS
AVT (Midlate) Plant II						
1.	Co 11027	MR	MR	R	R	S
2.	CoH 11263	R	R	R	R	MR
3.	CoLk 11204	MR	MR	R	R	MS
4.	CoLk 11206	MR	MS	R	R	HS
5.	CoPb 11214	MR	MR	R	R	MR
6.	CoS 11232	MR	MR	R	R	MS
7.	CoS 767	MS	S	S	S	HS
8.	CoS 8436	MR	MR	R	R	MS
9.	CoPant 97222	S	MS	S	S	HS
IVT (Early)						
1.	Co 13033	MR	MR	R	R	MS
2.	Co 13034	MR	MR	R	R	MS
3	CoLk 13201	MS	MS	R	R	MR
4	CoLk 13202	MR	MR	R	R	MR
5	CoLk 13203	MS	S	R	R	MR
6	CoPant 13221	MR	MR	R	R	MR

7	CoPant 13222	S	MS	S	S	MS
8	CoPb13181	MS	MS	R	R	MS
9	CoS13231	MR	MR	R	R	MS
10	CoJ 64	HS	S	S	S	MS
11	Co 0238	MR	MR	R	R	S
IVT (Midlate)						
1.	Co 13035	MR	MR	R	R	MS
2.	Co 13036	MR	MR	R	R	MS
3.	CoH 13261	MR	MR	R	R	MR
4.	CoH 13262	MR	MR	R	R	MR
5.	CoH 13263	MR	R	R	R	MR
6.	CoLk 13204	MR	MR	R	R	MS
7.	CoLk 13205	S	MS	R	R	MS
8.	CoPant 13223	MR	MR	R	R	MS
9.	CoPant 13224	MR	R	R	R	MS
10.	CoPb 13182	MR	MR	R	R	MS
11.	CoPb 13183	S	MS	S	S	MS
12.	CoS 13232	MS	MS	R	R	MR
13.	CoS 13233	MS	MS	R	R	R
14.	CoS 767	MS	S	R	R	S
15.	CoS 8436	MR	MR	R	R	MS
16.	CoPant 97222	S	MS	S	S	S

Table 17. Evaluation of sugarcane genotypes for red rot- Karnal

Sr. No.	Entry	Red Rot Rating				YLD	Other disease
		Plug Method		Cotton Swab			
		CF08	CF09	CF08	CF09		
IVT(E)							
1	Co 13033	MR	MR	R	R	R	
2	Co 13034	MR	MR	R	R	R	
3	CoLk 13201	S	MS	R	R	MR	
4	CoLk 13202	MR	MR	R	R	R	
5	CoLk 13203	MS	S	R	R	R	
6	CoPant 13221	MR	MR	R	R	R	
7	CoPant 13222	S	HS	S	S	MR	
8	CoPb 13181	MS	MS	R	R	R	
9	CoS 13231	MR	MR	R	R	R	
AVT(E-I Plant)							
10	Co 12026	MR	MR	R	R	R	
11	Co 12027	MR	R	R	R	R	
12	CoLk 12203	MR	R	R	R	MR	Smut (T)
13	CoPant 12221	MS	MR	R	R	R	
AVT(E-II Plant)							
14	CoH 11262	HS	HS	S	S	MR	
15	CoLk 11201	MS	MR	R	R	R	
16	CoLk 11202	MR	MR	R	R	MR	
17	CoLk 11203	MS	MS	R	R	MR	
IVT(ML)							
18	Co 13035	MR	MR	R	R	R	
19	Co 13036	MR	MR	R	R	MR	
20	CoH 13261	MS	MS	R	R	MR	
21	CoH 13262	MR	MR	R	R	R	
22	CoH 13263	MR	MS	R	R	MS	
23	CoLk 13204	MR	MR	R	R	R	
24	CoLk 13205	HS	MS	R	R	R	
25	CoPant 13223	MR	MR	R	R	R	
26	CoPant 13224	MR	MR	R	R	R	
27	CoPb 13182	MR	MR	R	R	R	
28	CoPb 13183	S	HS	S	S	R	
29	CoS 13232	MS	MS	R	R	R	
30	CoS 13233	MS	MS	R	R	R	
AVT(ML-I Plant)							
31	Co 12029	R	MR	R	R	MR	
32	CoH 12263	MR	MS	R	R	R	
33	CoLk 12205	MS	MS	R	R	R	
34	CoPant 12226	MR	MR	R	R	R	
35	CoPb 12211	S	S	R	R	R	
36	CoS 12232	MR	R	R	R	MR	

AVT(ML-II Plant)							
37	Co 11027	R	MR	R	R	MR	
38	CoH 11263	R	R	R	R	MR	Wilt(T)
39	CoLk 11204	MR	MR	R	R	R	
40	CoLk 11206	MR	MS	R	R	MS	
41	CoPb 11214	MR	MR	R	R	MR	
42	CoS 11232	R	MR	R	R	R	
Standard(s)							
43	CoS 767	MS	S	R	R	S	
44	CoS 8436	R	MR	R	R	MS	
45	CoPant 97222	MS	MR	R	R	R	
46	CoJ 64	S	MS	S	R	MS	
47	Co 0238	MR	MR	R	R	MR	
48	CoPant 84211	HS	S	R	R	S	

Table 18. Evaluation of sugarcane genotypes for red rot, smut& YLD –Pantnagar

S. No.	Genotypes	Plug		Nodal Cotton Swab		Smut	YLD
		CF08	CF09	CF08	CF09		
IVT (Early)							
1	Co 13033	R	R	R	R	S	R
2	Co13034	MR	MR	R	R	MS	MS
3	CoLk 13201	R	R	R	R	S	R
4	CoLk 13202	S	S	R	R	MS	R
5	CoLk 13203	R	R	R	R	R	MR
6	CoPant 13221	MS	MS	R	R	MS	MR
7	CoPant 13222	MR	MR	R	R	S	R
8	CoPb 13181	MS	MS	R	R	R	MS
9	CoS 13231	R	R	R	R	S	R
AVT(Early) I							
1.	Co 12026	R	R	R	R	R	MS
2.	Co 12027	S	S	S	S	R	MS
3	CoLk 12203	R	R	R	R	R	MR
4	CoPant 12221	MS	MS	R	R	R	R
AVT(Early) II							
1.	CoH 11262	MR	MR	R	R	R	S
2.	CoLk 11201	R	R	R	R	R	R
3.	CoLk 11202	R	R	R	R	MR	R
4.	CoLk 11203	R	R	R	R	S	R
IVT (ML)							
1	Co 13035	MR	MR	R	R	MS	R
2	Co 13036	MR	MR	R	R	MS	MR
3	CoH 13261	MR	MR	R	R	R	MR
4	CoH 13262	MR	MR	R	R	R	MS
5	CoH 13263	MR	MR	R	R	MS	MR
6	CoLk 13204	MR	MR	R	R	MR	R
7	CoLk 13205	MR	MR	R	R	R	R
8	CoPant 13223	MR	MR	R	R	R	R
9	CoPant 13224	MR	MR	R	R	R	R
10	CoPb 13182	MR	MR	R	R	MS	MR
11	CoPb 13183	MR	MR	R	R	R	R
12	CoS 13232	MS	MS	S	S	MS	R
13	CoS 13233	MR	MR	R	R	MS	MS
AVT(ML) I							
1.	CoH 12029	MR	MR	R	R	MS	R
2.	CoH 12263	MR	MR	R	R	R	R
3.	CoLk 12205	MR	MR	R	R	MR	R
4.	CoPant 12226	R	R	R	R	R	MR
5.	CoPb 12211	R	R	R	R	R	R
6.	CoS 12232	MR	MR	R	R	R	R

AVT(ML) II							
1	CoH 11263	R	R	R	R	R	R
1.2	CoLk 11204	MR	MR	R	R	R	R
4.3	CoLk 11206	MR	MR	R	R	R	R
2.4	CoPb 11214	MR	MR	R	R	R	R
3.5	CoS 11232	R	R	R	R	R	MR
Checks							
1.	CoJ64	S	S	S	S	R	S
2.	CoPant84211	S	S	S	S	R	MR
3.	CoS767	S	S	S	S	R	MR
4.	CoS8436	S	S	S	S	R	R
5.	Co1148	S	S	S	S	R	R
6.	Co 1158	-	-	-	-	MS	-

Table 19. Evaluation of sugarcane genotypes for red rot, smut and wilt -Pusa

Sl. No	Varieties	Plug				Cotton Swab		Smut	Wilt
		CF07	Score	CF08	Score	CF07	CF08		
1	CoLk 09204	3.0	MR	3.2	MR	R	R	R	MR
2	CoP 11437	2.2	MR	2.4	MR	R	R	MR	MR
3	CoP 11438	2.4	MR	2.2	MR	R	R	R	MR
4	CoP 11451	3.2	MR	3.8	MR	R	R	R	MR
5	CoP 13436	1.2	R	1.4	MR	R	R	MR	R
6	CoP 13437	2.6	MR	2.4	MR	R	R	MR	R
7	CoP 13438	2.8	MR	3.2	MR	R	R	MR	R
8	CoP 13439	3.0	MR	1.2	R	R	R	R	MR
9	CoSe 13451	2.6	MR	2.2	MR	R	R	MR	R
10	CoSe 13452	2.4	MR	2.6	MR	R	R	MR	R
11	CoSe 13453	2.8	MR	2.2	MR	R	R	MR	R
12	CoSe 13454	3.2	MR	2.8	MR	R	R	MR	R
13	BO 155	2.2	MR	2.4	MR	R	R	R	R
14	BO 130	2.8	MR	2.2	MR	R	R	MR	R
15	BO 91	2.2	MR	2.2	R	R	R	R	MR
16	CoP 9301	2.6	MR	2.2	R	R	R	R	MR
17	CoSe 92423	6.4	S	6.2	S	S	S	MR	MS
18	CoSe 95422	6.4	S	6.6	S	S	S	S	S
19	Co 1148	-	-	-	-	-	-	S	-

Table 20. Evaluation of sugarcane genotypes for red rot -Motipur

Sl. No.	Genotype	Plug method		Nodal method		Smut	Wilt	YLD
		Cf07	Cf08	Cf07	Cf08			
Initial Varietal Trial (Early)								
1.	CoP 13436	MR	MR	MR	MR	S	-	-
2.	CoP 13437	MS	MS	MR	MR	-	-	S
3.	CoSe 13451	MR	MR	MR	MR	-	-	-
4.	CoSe 13452	MR	MR	MR	MR	S	S	-
Advanced Varietal Trial (Early)-I Plant								
1.	CoLk 12207	MR	MR	MR	MR	S	-	-
2.	CoP 12436	MR	MR	MR	MR	-	-	-
3.	CoSe 12451	MR	MS	MR	MR	-	-	-
Advanced Varietal Trial (Early)-II Plant								
1.	CoP 11436	MR	MR	MR	MR	-	-	S
2.	CoP 11437	MR	MR	MR	MR	-	-	S
3.	CoP 11438	MR	MR	MR	MR	-	-	-
4.	CoSe 11451	MR	MR	MR	MR	-	-	-
Initial Varietal Trial (Mid late)								
1.	CoP 13438	MR	MS	MR	MS	-	S	-
2.	CoP 13439	MR	MR	MR	MR	S	-	S
3.	CoSe 13453	MS	MR	MR	MR	-	S	-
4.	CoSe 13454	MR	MR	MR	MR	S	-	S
Advanced Varietal Trial (Mid late)-I Plant								
1.	CoLk 09204	MR	MR	MR	MR	-	-	S
2.	CoLk 12209	MR	MR	MR	MR	-	-	-
3.	CoP 12438	MS	MS	MR	MR	-	S	-
4.	CoSe 12453	MR	MR	MR	MR	-	-	-
Advanced Varietal Trial (Mid late)-II Plant								
1.	BO 155	MR	MR	MR	MR	-	-	-
2.	CoSe 11453	MR	MR	MR	MR	-	-	-
3.	CoSe 11454	MR	MR	MR	MR	-	-	-
4.	CoSe 11455	MS	MR	MR	MR	-	-	-
Standard Checks								
1.	BO 91	MS	MS	MR	MR	-	-	-
2.	CoP 9301	MR	MR	MR	MR	-	-	-
3.	CoSe 92423	MS	S	MR	MS	-	-	-
4.	CoSe 95422	MS	S	MR	S	-	-	-
5.	CoJ 64	HS	HS	HS	S	-	-	-

Table 21. Evaluation of sugarcane genotypes for red rot, smut& YLD resistance-Seorahi

S.No.	Genotypes	Disease Reaction				Smut	YLD
		CF07		CF08			
		Plug	Nodal Cotton Swab	Plug	Nodal Cotton Swab		
Initial Varietal Trial (Early)							
1	CoP 13436	S	R	MS	R	HS	R
2	CoP 13437	S	R	S	S	R	MR
3	CoSe 13451	MS	R	MR	R	HS	R
4	CoSe 13452	MR	R	MR	R	R	R
Initial Varietal Trial (Mid-late)							
1	CoP 13438	MS	R	MR	R	R	R
2	CoP 13439	MR	R	MR	R	HS	MS
3	CoSe 13453	MR	R	MR	R	R	R
4	CoSe 13454	S	R	MS	R	HS	R
Advance Varietal Trial (Early) I Plant							
1	CoLk 12207	MS	R	MS	R	MS	MS
2	CoP 12436	MR	R	MR	R	R	R
3	CoSe 12451	MR	R	MR	R	R	R
Advance Varietal Trial (Early) lI Plant							
1	CoP 11436	MS	R	MS	R	R	MS
2	CoP 11437	MR	R	MR	R	R	R
3	CoP 11438	MS	R	MR	R	R	R
4	CoSe 11451	MR	R	MR	R	R	R
Advance Varietal Trial (Mid-late) l Plant							
1	CoLk 09204	MR	R	MR	R	R	R
2	CoLk 12209	MS	R	MS	R	R	R
3	CoP 12438	MR	R	MR	R	R	MR
4	CoSe 12453	MR	R	MR	R	R	MS
Advance Varietal Trial (Mid-late) lI Plant							
1	BO 155	MR	R	MS	R	R	R
2	CoSe 11453	MR	R	MR	R	R	R
3	CoSe 11454	MR	R	MR	R	R	R
4	CoSe 11455	MR	R	MR	R	R	R
Standards							
1	BO 130	MR	R	MR	R	HS	R
2	BO 91	MS	R	MR	R	R	R
3	CoSe 95422	S	R	S	S	R	R
4	CoP 9301	MS	R	MR	R	R	R
5	CoSe 92423	S	R	MS	R	R	MS
6	Co 1158	-	-	-	-	HS	-

Table 22. Evaluation of sugarcane genotypes for red rot resistance- Buralikson

Sl. No.	Entries	CF 07			CF 08		
		Plug method	Reaction	Nodal method	Plug method	Reaction	Nodal Method
IVT- Early							
1.	CoP 13436	2.72	MR	R	2.40	MR	R
2.	CoP 13437	3.00	MR	R	3.20	MR	R
IVT- Midlate							
3.	CoP 13438	2.20	MR	R	2.68	MR	R
AVT (Early)- I Plant							
4.	CoLk 12207	2.00	R	R	2.20	MR	R
5.	CoP 12436	2.83	MR	R	3.30	MR	R
6.	CoSe 12451	3.20	MR	R	3.66	MR	R
AVT (Early)- II Plant							
7.	CoP 11436	2.80	MR	R	2.20	MR	R
8.	CoP 11437	2.33	MR	R	2.05	MR	R
9.	CoP 11438	2.50	MR	R	2.45	MR	R
10.	CoSe 11451	2.50	MR	R	2.60	MR	R
AVT (Midlate)- I Plant							
11.	CoLk 09204	2.40	MR	R	2.90	MR	R
12.	CoLk 12209	1.40	R	R	2.73	MR	R
13.	CoP 12438	2.60	MR	R	2.80	MR	R
14.	CoSe 12453	2.50	MR	R	2.10	MR	R
AVT (Midlate)- II Plant							
15.	BO 155	3.00	MR	R	2.40	MR	R
16.	CoSe 11453	2.83	MR	R	2.20.	MR	R
17.	CoSe 11454	2.60	MR	R	3.45	MR	R
18.	CoSe 11455	2.80	MR	R	3.50	MR	R
Local check							
19.	Akipura	6.20	S	S	5.40	MS	S
Standard Check							
Midlate							
20.	BO91	3.00	MR	R	2.40	MR	R
21.	CoP 09301	2.40	MR	R	2.30	MR	R
22.	CoSe 92423	2.50	MR	R	2.50	MR	R
Early							
23.	BO 130	2.30	MR	R	2.30	MR	R
24.	CoSe 95422	2.10	MR	R	2.60	MR	R

Table 23.Evaluation of genotypes for red rot, smut& wilt resistance- Anakapalle

S. No	Clone	Plug method			Cotton swab method			Smut	Wilt	YLD
		CF04	CF05	CF06	CF04	CF05	CF06			
IVT Early										
1	Co 07013	MS	MS	MS	R	R	R	MR	MS	S
2	Co 13023	MR	MR	MR	R	R	R	MR	MR	S
3	Co 13024	MR	MR	MR	R	R	R	MR	MR	S
4	CoA 12321 (2006 A 64)	R	MR	R	R	R	R	HS	MR	R
5	CoA 12322 (2006A102)	MR	MR	MR	R	R	R	HS	MS	MR
6	CoA 14321 (2009A107)	R	MR	R	R	R	R	MR	MR	S
7	CoA 14322 (2009A235)	S	S	S	S	S	S	S	MR	S
8	CoC 14336	MS	MS	MS	R	R	R	MR	S	S
9	CoV 14356	HS	HS	HS	S	S	S	MS	S	S
IVT Midlate										
12	Co 13025	MR	MR	MR	R	R	R	MR	MS	S
13	Co 13027	MR	MR	MR	R	R	R	S	MS	S
14	Co 13028	R	R	R	R	R	R	MR	MS	S
15	Co 13029	MR	MR	MR	R	R	R	MS	MS	R
16	Co 13030	R	R	R	R	R	R	MR	MS	S
17	Co 13031	MR	MR	MR	R	R	R	MR	R	S
18	Co 13032	HS	HS	HS	S	S	S	MR	S	S
19	CoA 14323 (2009A252)	R	R	R	R	R	R	MR	R	MR
20	CoA 14324 (2009A385)	S	S	S	S	S	S	MS	S	S
21	CoC 14337	MR	MR	MR	R	R	R	S	R	S
22	PI 14376	HS	HS	HS	S	S	S	MS	S	S
23	PI 14377	MR	MR	MR	R	R	R	MR	MR	S
24	CoV 92102	MR	MR	MR	R	R	R	S	MR	S

25	Co 86249	MR	R	R	R	R	R	MS	MR	S
26	Co 419	HS	HS	HS	S	S	S	HS	HS	S
27	CoC 671	HS	HS	HS	S	S	S	MS	HS	HS
28	Co 997	HS	HS	HS	S	S	S	MR	HS	HS
29	85 A 261	HS	HS	HS	S	S	S	HS	S	S
30	Co 6907	HS	HS	HS	S	S	S	HS	HS	MS
31	Co 7219	HS	HS	HS	R	R	R	HS	S	MR
32	Co 7706	HS	HS	HS	R	R	R	MR	MR	HS

Table 24. Evaluation of sugarcane genotypes for red rot,smutand YLD resistance-Cuddalore

S. No.	Clone	Plug method		Nodal Method		Smut	YLD
		CF06	CF04	CF06	CF04		
IVT - Early							
1.	Co 07013	MS	MS	R	R	MR	MR
2.	Co 13023	MR	MR	R	R	MR	MR
3.	Co 13024	MR	MR	R	R	MR	MR
4.	CoA 14321	MR	MR	R	R	MR	MR
5.	CoA 14322	S	S	S	S	HS	MS
6.	CoC 14336	MR	MR	R	R	MR	MR
7.	CoV 14356	S	S	S	S	MR	MR
IVT- Midlate							
1.	Co 13025	MR	MR	R	R	MR	MR
2.	Co 13027	MR	MR	R	R	S	MR
3.	Co 13028	MR	MR	R	R	MR	MR
4.	Co 13029	MR	MR	R	R	MR	R
5.	Co 13030	MR	MR	R	R	MR	MR
6.	Co 13031	MR	MR	R	R	MR	R
7.	Co 13032	S	S	S	S	R	MR
8.	CoA 14323	MR	MR	R	R	MS	MR
9.	CoA 14324	S	S	S	S	MS	MR
10.	CoC 14337	MR	MR	R	R	R	MS
11.	PI 14376	S	S	S	S	MR	MR
12.	PI 14377	MR	MR	R	R	MR	MR
AVT – Early I Plant							
1.	CoA 13322	MR	MR	R	R	MS	MR
2.	CoA 13323	MS	MS	R	R	MS	R
3.	CoC 13336	MR	MR	R	R	MS	MR
4.	CoC 13337	MR	MR	R	R	MR	MR
5.	CoV 13356	MS	MS	R	R	R	MS
AVT – Early II Plant							
1.	CoA 12321	MR	MS	R	R	S	R
2.	CoA 12322	MR	MR	R	R	MR	R
3.	CoA 12323	S	S	S	S	MS	MR
4.	CoOr 12346	MS	MS	R	R	MR	MR
5.	CoV 12356	MR	MR	R	R	MR	MR
AVT- Midlate I Plant							
1.	CoA 11326	MR	MR	R	R	MR	MR

2.	CoA 12324	MS	MS	R	R	R	MR
3.	CoC 13339	MR	MR	R	R	MR	MR
4.	CoOr 13346	MR	MR	R	R	MR	MR
Check							
1.	CoC 671	HS	HS	S	S	HS	-
2.	Co 86249	MR	MR	R	R	S	-

Table 25. Evaluation of sugarcane genotypes for red rot, smut and YLD- Navsari

S. No.	Varieties	Plug method		Cotton swab method	Smut	Wilt	YLD
		Score	Reaction	Reaction			
(I) Initial Varietal Trial (Early)							
1.	Co 13002	2.8	MR	R	R	-	R
2.	Co 13003	3.6	MR	R	MR	-	R
3.	Co 13004	3.2	MR	R	R	-	R
4.	CoN 13071	2.9	MR	R	R	-	R
5.	CoN 13072	3.0	MR	R	MR	-	R
6.	CoSnk 13101	4.6	MS	R	HS	-	R
7.	CoSnk 13102	5.5	MS	R	R	-	R
8.	MS 13081	3.0	MR	R	R	-	MR
Standard							
1.	Co 85004	4.6	MS	R	-	-	-
2.	Co 94008	2.8	MR	R	-	-	-
3.	CoC 671	8.8	HS	S	-	-	-
(II) Initial Varietal Trial (Midlate)							
1.	Co 13005	4.4	MS	R	S	-	MR
2.	Co 13006	2.9	MR	R	R	MR	R
3.	Co 13008	8.6	HS	R	R	-	R
4.	Co 13009	8.7	HS	R	R	MR	R
5.	Co 13011	3.4	MR	R	R	-	R
6.	Co 13013	3.6	MR	R	MS	MS	R
7.	Co 13014	3.0	MR	R	R	-	R
8.	Co 13016	3.4	MR	R	R	-	R
9.	Co 13018	2.9	MR	R	R	-	R
10.	Co 13020	2.6	MR	R	S	-	R

11.	CoM 13082	3.0	MR	R	R	-	R
12.	CoN 13073	3.2	MR	R	R	MR	R
13.	CoN 13074	2.8	MR	R	R	-	R
14.	CoSnk 13103	3.4	MR	R	MS	-	R
15.	CoSnk 13104	5.0	MS	R	MR	-	R
16.	CoSnk 13105	8.2	HS	R	R	-	R
17.	CoSnk 13106	3.2	MR	R	HS	-	R
18.	CoT 13366	5.6	MS	R	R	-	MR
19.	PI 13131	3.4	MR	R	MS	-	MR
20.	PI 13132	2.9	MR	R	HS	-	MR
Standard							
1.	Co 99004	3.4	MR	R		-	
2.	Co 86032	8.2	HS	R		-	
(III) Advanced Varietal Trial- Early I Plant							
1.	Co 11001	3.6	MR	R	R	MR	R
2.	Co 11004	3.2	MR	R	HS	MR	R
3.	CoM 11081	4.8	MS	MS	MS	MS	R
4.	CoM 11082	2.9	MR	R	S	MR	R
5.	CoM 11084	3.4	MR	R	R	MR	R
(IV) Advanced Varietal Trial- Early II Plant							
1.	Co 10004	7.0	S	R	MR	S	R
2.	Co 10005	3.4	MR	R	R	MR	R
3.	Co 10006	3.2	MR	R	R	MR	R
4.	Co 10024	4.8	MS	R	S	MS	R
5.	Co 10026	3.6	MR	R	HS	S	R
6.	Co 10027	3.2	MR	R	MS	MR	R
7.	CoT 10366	6.2	S	R	R	MS	R
8.	CoT 10367	3.4	MR	R	MR	MR	R
(V) Advanced Varietal Trial- Midlate I Plant							
1.	Co 11005	3.2	MR	R	R	MR	R
2.	Co 11007	3.0	MR	R	MS	MR	R
3.	Co 11012	5.2	MS	R	S	MR	R
4.	Co 11019	3.6	MR	R	R	S	R
5.	CoM 11085	3.0	MR	R	R	MR	R

6.	CoM 11086	4.8	MS	R	R	MR	R
(VI) Advanced Varietal Trial- Midlate II Plant							
1.	Co 09009	3.2	MR	R	MR	MR	R
2.	Co 10015	3.6	MR	R	S	MR	R
3.	Co 10017	8.6	HS	S	S	S	R
4.	Co 10031	3.8	MR	R	MS	MR	R
5.	Co 10033	6.9	S	R	HS	MS	R
6.	CoM 10083	3.2	MR	R	MR	S	R
7.	CoT 10368	3.4	MR	R	R	MR	MS
8.	CoT 10369	3.4	MR	R	R	MS	R
9.	CoVc 10061	3.0	MR	R	R	S	R
10.	PI 10131	3.0	MR	R	MR	MS	R
11.	PI 10132	4.8	MS	R	R	MR	R

Table 26. Evaluation of sugarcane genotypes for red rot-Thiruvalla

Sl. No	Genotypes	CF06			CF12		
		Plug		Cotton swab	Plug		Cotton swab
		Score	Reaction	Reaction	Score	Reaction	Reaction
IVT (Early)							
1	Co13002	2	R	R	3	MR	R
2	Co13003	2.3	MR	R	2	R	R
3	Co13004	3.6	MR	R	4	MR	R
4	CoN 13071	4.6	MS	R	2.6	MR	R
5	CoN 13072	3	MR	R	3	MR	R
6	CoSnk13101	2	R	R	2.3	MR	R
7	CoSnk13102	3.3	MR	R	5.6	MS	S
8	MS 13081	2	R	R	3	MR	R
9	Co 85004	2.3	MR	R	2.3	MR	R
10	Co 94008	3.5	MR	R	2.5	MR	R
11.	CoC 671	6.6	S	R	5.3	MS	R
IVT (Midlate)							
1.	Co 13005	2	R	R	2	R	R

2.	Co 13006	7	S	S	3	MR	R
3.	Co 13008	2.3	MR	R	2	R	R
4.	Co13009	3.3	MR	R	2	R	R
5.	Co 13011	2	R	R	2	R	R
6.	Co 13013	2.3	MR	R	2	R	R
7.	Co 13014	2.6	MR	R	3	MR	R
8.	Co 13016	2.3	MR	R	6.3	S	S
9.	Co 13018	3	MR	R	6.6	S	R
10.	Co 13020	2.3	MR	R	2.6	MR	R
11.	CoM 13082	2.3	MR	R	2	R	R
12.	CoN 13073	2.6	MR	R	2	R	R
13.	CoN 13074	3	MR	R	2.6	MR	R
14.	CoSnk13103	4.6	MS	S	2.3	MR	R
15.	CoSnk13104	3.6	MR	R	2	R	R
16.	CoSnk13105	3	MR	R	2.6	MR	R
17	CoSnk13106	3	MR	R	2.6	MR	R
18	CoT 13366	2.3	MR	R	2	R	R
19	PI 13131	6	MS	R	3.3	MR	R
20	PI 13132	2	R	R	2	R	R
21	Co 86032	4.3	MS	R	3	MR	R
22	Co 99004	3.3	MR	R	5	MS	R
AVT Early(I Plant)							
1	Co 11001	4	MR	R	5.6	MS	R
2	Co 11004	4	MR	R	2.3	MR	R
3	CoM 11081	3.6	MR	R	5	MS	R
4	CoM 11082	4.6	MS	R	5.6	MS	R
5	CoM 11084	5.6	MS	R	7.3	S	S
6	Co 85004	3.3	MR	R	3	MR	R
7	Co 94008	2.6	MR	R	3.6	MR	R
8	CoC 671	7.3	S	S	8	S	S
AVT Early II Plant							
1.	Co 10004	3.3	MR	R	3.3	MR	R
2.	Co 10005	4	MR	R	2.5	MR	R

3.	Co 10006	2.6	MR	R	2.3	MR	R
4.	Co 10024	2	R	R	4	MR	R
5.	Co 10026	2.6	MR	R	4.6	MS	S
6.	Co 10027	2.6	MR	R	2.3	MR	R
7.	CoT 10366	2	R	R	3.3	MR	R
8.	CoT 10367	2	R	R	3	MR	R
9.	Co 85004	3.3	MR	R	3	MR	R
10.	Co 94008	2.6	MR	R	3.6	MR	R
11.	CoC 671	7.3	S	S	8	S	S
AVT Midlate (I Plant)							
1.	Co 11005	4	MR	R	3.6	MR	R
2.	Co 11007	3.3	MR	R	2.6	MR	R
3.	Co 11012	3.6	MR	R	4	MR	R
4.	Co 11019	4.3	MS	R	3.6	MR	R
5.	CoM 11085	7.3	S	R	5.6	MS	R
6.	CoM 11086	4	MR	R	4	MR	R
7.	Co 86032	3.6	MR	R	3.3	MR	R
8.	Co 99004	2	R	R	2	R	R
AVT Midlate II Plant							
1.	Co 09009	3.3	MR	R	3.3	MR	R
2.	Co 10015	2.3	MR	R	3	MR	R
3.	Co 10017	3.3	MR	R	4.3	MS	S
4.	Co 10031	2.6	MR	R	4.6	MS	R
5.	Co 10033	2.6	MR	R	3.3	MR	R
6.	CoM 10083	5.3	MS	R	6.3	S	R
7.	CoT 10368	2.3	MR	R	3.3	MR	R
8.	CoT 10369	3.3	MR	R	6	MS	R
9.	CoVC10061	3	MR	R	2	R	R
10.	PI 10131	2	R	R	3.3	MR	R
11.	PI 10132	4	MR	R	7	S	R
12.	Co 86032	3.6	MR	R	3.3	MR	R
13.	Co 99004	2	R	R	2	R	R

Table 27. Evaluation of sugarcane genotypes for red rot, smut and YLD– Coimbatore

S No.	Entry	CF06			CF12			Smut
		Plug method		Nodal method	Plug method		Nodal method	
		Score	Reaction		Score	Reaction		
1	Co 13002	1.6	R	R	4.2	MS	R	MS
2	Co 13003	1.6	R	R	5.0	MS	R	MS
3	Co 13004	1.5	R	R	8.0	S	S	MR
4	Co 13005	2.0	R	R	7.0	S	S	HS
5	Co 13006	4.2	MS	R	6.0	MS	R	MS
6	Co 13008	2.0	MR	R	-	RT	RT	S
7	Co 13009	2.6	MR	R	9.0	HS	S	HS
8	Co 13011	2.5	MR	R	6.8	S	S	MS
9	Co 13013	0.0	R	R	6.1	S	S	HS
10	Co 13014	2.4	MR	R	6.2	S	S	MS
11	Co 13016	3.0	MR	R	9.0	HS	S	S
12	Co 13018	2.0	R	R	5.4	MS	R	MR
13	Co 13020	3.4	MR	R	7.0	S	S	R
14	CoM 13082	3.4	MR	R	3.8	MR	R	R
15	CoN 13071	8.0	S	RT	8.1	HS	RT	MR
16	CoN 13072	8.0	S	R	8.0	S	S	HS
17	CoN 13073	3.4	MR	R	7.0	S	R	MR
18	CoN 13074	2.0	R	R	7.4	S	S	S
19	CoSnk 13101	2.4	MR	R	6.2	S	S	MS
20	CoSnk 13102	4.6	MS	R	5.0	MS	S	S
21	CoSnk 13103	8.0	S	R	5.6	MS	R	MS
22	CoSnk 13104	3.0	MR	R	4.2	MS	R	MR
23	CoSnk 13105	2.6	MR	R	3.6	MR	R	HS
24	CoSnk 13106	5.0	MS	R	5.2	MS	R	R
25	CoT 13366	8.1	HS	S	9.0	HS	S	MS
26	MS 13081	2.0	R	R	2.8	MR	R	R
27	PI 13131	9.0	HS	S	9.0	HS	S	MR
28	PI 13132	1.8	R	R	9.0	HS	S	HS
29	Co 12001	4.4	MS	R	7.0	S	R	-
30	Co 12017	5.0	MS	R	6.0	MS	R	-
31	Co 12021	3.0	MR	R	3.6	MR	S	-
32	Co 12024	5.0	MS	R	4.4	MS	R	-
33	CoN 12071	2.0	R	R	7.0	S	R	-
Standard – red rot								
34	CoC 671	9.0	HS	S	9.0	HS	S	-
35	Co 94012	9.0	HS	S	9.0	HS	S	-
Standard – smut								
	Co 96007						-	HS
	Co 97009						-	HS

Table 28. Evaluation of sugarcane genotypes for smut resistance-Padegaon

S. No.	Genotype	Smut %	Reaction	S.No.	Genotype	Smut %	Reaction
IVT – Early							
1	Co 13002	6.90	MR	36	CoSnk 13104	0.00	R
2	Co 13003	10.00	MR	37	CoSnk 13105	0.00	R
3	Co 13004	0.00	MR	38	CoSnk 13106	0.00	R
4	CoN 13071	0.00	R	39	CoT 13366	0.00	R
5	CoN 13072	17.50	MS	40	PI 13131	0.00	R
6	CoSnk 13101	21.95	S	41	PI 13132	0.00	R
7	CoSnk 13102	10.42	MS	**AVT – Midlate I Plant**			
8	MS 13081	0.00	R	42	Co 11005	20.83	S
AVT – Early I Plant				43	Co 11007	0.00	R
9	Co 11001	32.43	HS	44	Co 11012	3.33	MR
10	Co 11004	4.00	MR	45	Co 11019	38.24	HS
11	CoM 11081	0.00	R	46	CoM 11085	5.56	MR
12	CoM 11082	0.00	R	47	CoM 11086	0.00	R
13	CoM 11084	0.00	R	**AVT – Midlate II Plant**			
AVT – Early II Plant				48	Co 09009	15.91	MS
14	Co 10004	0.00	R	49	Co 10015	36.36	HS
15	Co 10005	11.90	R	50	Co 10017	24.49	S
16	Co 10006	37.04	HS	51	Co 10031	11.43	MS
17	Co 10024	0.00	R	52	Co 10033	26.83	S
18	Co 10026	0.00	R	53	CoM 10083	0.00	R
19	Co 10027	33.33	HS	54	CoT 10368	0.00	R
20	CoT 10366	0.00	R	55	CoT 10369	0.00	R
21	CoT 10367	0.00	R	56	CoVC 10061	31.58	HS
IVT– Midlate				57	PI 10131	18.18	MS
22	Co 13005	30.30	HS	58	PI 10132	20.00	MS
23	Co 13006	37.50	HS	**Checks**			
24	Co 13008	0.00	R	59	Co 85004	18.42	MS
25	Co 13009	2.63	MR	60	Co 94008	0.00	R
26	Co 13011	31.71	HS	61	CoC 671	33.33	HS
27	Co 13013	18.75	MS	62	Co 86032	0.00	R
28	Co 13014	0.00	R	63	Co 99004	20.8	S
29	Co 13016	0.00	R	64	CoM 265	0.00	R
30	Co 13018	0.00	R	65	Co 740	36.17	HS
31	Co 13020	0.00	R	66	Co 7219	33.33	HS
32	CoM 13082	0.00	R	67	Co 7527	35.90	HS
33	CoN 13073	0.00	R	68	MS 10001	0.00	R
34	CoN 13074	0.00	R	69	CoVSI 3102	0.00	R
35	CoSnk 13103	5.88	MR				

Table 29. Evaluation of sugarcane genotypes for smut resistance-Sankeshwar

Sl. No	Entry	Smut Reaction	YLD	Sl. No	Entry	Smut Reaction	YLD
I. IVT (Early)				**AVT - Early (PC I)**			
1	Co 13002	HS	MR	1	Co 11001	R	R
2	Co 13003	R	R	2	Co 11004	R	R
3	CoN 13004	S	R	3	CoM 11081	R	R
4	CoN 13071	S	R	4	CoM 11082	R	R
5	CoN 13072	R	R	5	CoM 11084	R	R
6	CoSnk 13101	R	R	**Checks**			
7	CoSnk 13102	R	R	1	Co 94008	R	HS
8	MS 13081	HS	R	2	CoC 671	MS	R
Checks				3	Co 85004	R	R
9	Co 94008	HS	R	4	Co 8011	MS	R
10	CoC 671	HS	R	5	Co 740	S	R
11	Co 85004	R	R	**AVT Midlate (PC I)**			
12	Co 8011	S	R	1	Co 11005	R	R
13	Co 740	HS	R	2	Co 11007	R	R
IVT (ML)				3	Co 11012	R	R
1	Co 13005	S	R	4	Co 11019	R	R
2	Co 13006	S	R	5	CoM 11085	S	R
3	Co 13008	R	R	6	CoM 11086	HS	R
4	Co 13009	R	R	**Checks**			
5	Co 13011	R	R	7	Co 86032	R	R
6	Co 13013	HS	R	8	Co 99004	HS	R
7	Co 13014	R	R	9	Co 8011	S	R
8	Co 13016	R	R	10	Co 740	HS	R
9	Co 13018	HS	R	**AVT early PC II**			
10	Co 13020	S	R	1	Co 10004	R	R
11	CoM 13082	R	R	2	Co 10005	S	R
12	CoN 13073	R	R	3	Co 10006	HS	R
13	CoN 13074	R	R	4	Co 10024	R	MR
14	CoSnk 13103	S	R	5	Co 10026	R	R
15	CoSnk 13104	R	R	6	Co 10027	HS	R
16	CoSnk 13105	R	R	7	CoT 10366	R	R
17	CoSnk 13106	R	R	8	CoT 10367	HS	R
18	CoT 13366	R	R	**Checks**			
19	PI 13131	R	R	1.	CoC 671	S	MR

20	PI 13132	R	MR	2.	Co 85004	R	R
Checks				3	Co 94008	S	R
1	Co 86032	R	MR	4	Co 8011	HS	R
2	Co 99004	HS	R	5	Co 740	HS	R
3	Co 8011	HS	R	**AVT- ML PC II**			
4	Co 740	S	R	1	Co 09009	HS	R
				2	Co 10015	R	R
				3	Co 10017	R	R
				4	Co 10031	R	R
				5	Co 10033	R	R
				6	CoM 10083	R	R
				7	CoT 10368	S	R
				8	CoT 10369	S	R
				9	CoVc 10061	R	R
				10	PI 10131	R	R
				11	PI 10132	HS	R
				Checks			
				1	Co 86032	R	R
				2	Co 99004	S	R
				3	Co 8011	HS	R
				4	Co 740	HS	R

Table 30. Evaluation of sugarcane genotypes for smut resistance- Powarkheda

Sl. No.	Genotype	Smut	YLD	Sl. No.	Genotype	Smut	YLD
Advance Varietal Trial (Early I)				**Initial Varietal Trial (Early)**			
1	Co 10004	MR	MR	1	Co 12001	R	-
2	Co 10005	MS	MR	2	Co 12003	MS	-
3	Co 10006	MS	R	3	Co 12006	R	-
4	Co 10024	MR	R	4	Co 12007	MS	-
5	Co 10026	MR	R	5	Co 12008	S	-
6	Co 10027	R	R	6	CoM 12081	MR	-
7	CoT 10366	R	R	7	CoM 12082	MS	-
8	CoT 10367	R	R	8	CoM 12083	R	-
9	Co 11001	MR	R	9	CoN 12071	MR	-
10	Co 11004	R	MS	10	CoN 12072	R	-
11	CoM 11081	R	R	11	CoT 12366	R	-
12	CoM 11082	MS	R	12	CoT 12367	R	-
13	CoM 11084	MR	R	13	Co 7219	S	-
14	Co 7219	S	-				
Advance Varietal Trial (mid late)				**Initial Varietal Trial (mid late)**			
1	Co 09009	MS	R	1	Co 12009	MR	-
2	Co 10015	S	R	2	Co 12012	MR	-
3	Co 10017	S	R	3	Co 12014	R	-
4	Co 10031	MR	MR	4	Co 12016	R	-
5	Co 10033	MS	R	5	Co 12017	MR	-
6	CoM 10083	MR	R	6	Co 12019	R	-
7	CoT 10368	R	R	7	Co 12021	R	-
8	CoT 10369	R	MR	8	Co 12024	MR	-
9	CoVc 10061	R	R	9	CoM 12084	MR	-
10	PI 10131	MR	MR	10	CoM 12085	MS	-
11	PI 10132	MR	MR	11	CoM 12086	MS	-
12	Co 11005	R	R	12	CoN 12073	R	-
13	Co 11007	R	R	13	CoN 12074	MS	-
14	Co 11012	MR	R	14	CoT 12368	MR	-
15	Co 11019	MS	R	15	VSI 12121	MR	-
16	CoM 11085	MR	R	16	Co 7219	S	-
17	CoM 11086	MR	R				
18	Co 7219	S	-				

Table 31. Evaluation of sugarcane genotypes for smut resistance- Kolhapur

S. No	Genotypes	Smut incidence (%)	Reaction	YLD
IVT Early				
1	Co 13002	4.53	R	R
2	Co 13003	7.45	MR	R
3	Co 13004	0.00	R	MR
4	CoN 13071	0.00	R	MR
5	CoN 13072	12.85	MS	MR
6	CoSnk 13101	16.73	MS	R
7	CoSnk 13102	8.62	MR	R
8	MS 13081	0.00	R	MR
AVT Early I Plant				
1	Co 11001	25.05	S	R
2	Co 11004	0.00	R	S
3	CoM 11081	0.00	R	R
4	CoM 11082	0.00	R	MR
5	CoM 11084	0.00	R	R
3. Advanced Varietal Trial- Early II Plant				
1	Co 10004	0.00	R	S
2	Co 10005	0.00	R	R
3	Co 10006	28.13	S	MS
4	Co 10024	0.00	R	S
5	Co 10026	0.00	R	MR
6	Co 10027	26.45	S	MR
7	CoT 10366	0.00	R	MR
8	CoT 10367	0.00	R	MR
IVT Midlate				
1	Co 13005	24.65	S	MR
2	Co 13006	29.13	S	R
3	Co 13008	0.00	R	MS
4	Co 13009	0.00	R	R
5	Co 13011	26.70	S	R
6	Co 13013	12.47	MS	R
7	Co 13014	0.00	R	R
8	Co 13016	0.00	R	MR
9	Co 13018	0.00	R	R
10	Co 13020	0.00	R	R
11	CoM 13082	0.00	R	R
12	CoN 13073	0.00	R	MR
13	CoN 13074	0.00	R	MR
14	CoSnk 13103	1.93	MR	MR
15	CoSnk 13104	0.00	R	MS
16	CoSnk 13105	0.00	R	R
17	CoSnk 13106	0.00	R	R

18	CoT 13366	0.00	R	MS
19	PI 13131	0.00	R	MS
20	PI 13132	0.00	R	S
AVT Midlate I Plant				
1	Co 11005	16.53	MS	R
2	Co 11007	0.00	R	R
3	Co 11012	0.00	R	R
4	Co 11019	27.86	S	R
5	CoM 11085	2.13	MR	MR
6	CoM 11086	0.00	R	R
AVT Midlate II Plant				
1	Co 09009	11.15	MS	MS
2	Co 10015	29.01	S	R
3	Co 10017	20.95	S	R
4	Co 10031	7.58	MR	MR
5	Co 10033	20.73	S	R
6	CoM 10083	0.00	R	R
7	CoT 10368	0.00	R	MR
8	CoT 10369	0.00	R	S
9	CoVC 10061	23.15	S	MR
10	PI 10131	12.63	MS	S
11	PI 10132	15.33	MS	MR
Checks				
1	CoC 671	12.47	MS	S
2	Co 94008	0.00	R	MS
3	Co 85004	26.65	S	R
4	Co 86032	0.00	R	MR
5	Co 99004	16.21	MR	S
6	Co 740	28.48	S	R
7	Co 7527	26.32	S	MS
8	CoM 0265	0.00	R	MR

Table 32. Evaluation of sugarcane genotypes for smut resistance- Pune

Sl. No.	Genotype	Smut (%)	Reaction
IVT Early			
1	Co 12001	0.0	R
2	Co 12003	0.0	R
3	CoM 12081	0.0	R
4	CoM 12082	0.0	R
5	CoM 12083	0.0	R
6	CoT 12366	0.0	R
7	CoN 12072	0.0	R
8	CoT 12367	0.0	R
9	Co 12007	25.00	S
10	Co 12008	25.00	S
11	Co 12006	40.00	HS
12	CoN 12071	33.33	HS
AVT Early			
1	Co 10004	0.0	R
2	Co 10006	0.0	R
3	Co 10024	0.0	R
4	Co 10026	0.0	R
5	Co 10027	0.0	R
6	CoT 10367	0.0	R
7	Co 10005	14.28	MS
8	CoT 10366	18.18	MS
IVT Early II Plant			
1	Co 09004	0.0	R
2	Co 09007	0.0	R
3	CoN 09072	18.18	MS
IVT Midlate			
1	Co 12012	0.0	R
2	Co 12016	0.0	R
3	Co 12017	0.0	R
4	Co 12019	0.0	R
5	Co 12021	0.0	R
6	CoM 12084	0.0	R
7	CoM 12085	0.0	R
8	CoN 12073	0.0	R
9	CoT 12368	0.0	R
10	VSI 12121	0.0	R
11	Co 12014	14.28	MS
12	CoM 12086	15.47	MS
13	CoN 12074	11.11	MS
14	Co 12024	25.00	S
15	Co 12009	75.00	HS

AVT Midlate I Plant			
1	Co 09009	0.0	R
2	Co 10015	0.0	R
3	Co 10031	0.0	R
4	CoM10083	0.0	R
5	CoT 10368	0.0	R
6	CoT 10369	0.0	R
7	PI 10131	0.0	R
8	PI 10132	0.0	R
9	MS 10033	10.00	MR
10	CoVc 10061	11.11	MS
11	Co 10017	25.00	S
Standard check			
1	Co 740	20.00	MS
2	Co 7219	25.00	S

Table 33. Assessment of elite and ISH genotypes for resistance to red rot – Kapurthala

Sl. No.	Genotype	CF08		CF09		Sl. No.	Genotype	CF08		CF09	
		Score	Reaction	Score	Reaction			Score	Reaction	Score	Reaction
1.	ISH 001	3.6	MR	3.4	MR	17	ISH 191	8.5	HS	8.1	HS
2.	ISH 007	3.8	MR	3.9	MR	18	ISH 193	3.4	MR	3.7	MR
3.	ISH 012	8.4	HS	4.3	MS	19	ISH 203	3.6	MR	3.5	MR
4.	ISH 105	3.9	MR	8.2	HS	20	ISH 211	4.7	MS	3.7	MR
5	ISH 108	5.2	MS	3.8	MR	21	ISH 224	3.8	MR	3.7	MR
6	ISH 113	3.6	MR	3.7	MR	22	ISH 260	3.5	MR	3.6	MR
7	ISH 114	8.5	HS	8.4	HS	23	ISH 264	8.2	HS	8.5	HS
8	ISH 117	4.2	MS	6.7	S	24	ISH 265	8.4	HS	4.2	MS
9	ISH 118	3.4	MR	3.7	MR	25	ISH 267	4.3	MS	3.8	MR
10	ISH 135	6.2	S	4.1	MS	26	ISH 269	8.5	HS	8.7	HS
11	ISH 137	3.6	MR	3.7	MR	27	ISH 273	3.9	MR	3.4	MR
12	ISH 144	8.3	HS	6.5	S	28	ISH 281	3.3	MR	3.8	MR
13	ISH 148	3.9	MR	6.1	S	29	ISH 286	8.5	HS	3.9	MR
14	ISH 159	3.6	MR	3.7	MR	30	ISH 287	8.3	HS	8.4	HS
15	ISH 185	8.2	HS	8.6	HS	31	ISH 308	5.2	MS	8.2	HS
16	ISH 187	4.9	MS	3.9	MR	32	ISH 309	4.5	MS	3.5	MR

Table 34.Assessment of elite and ISH genotypes for resistance to red rot- Karnal

Sl. no.	Genotype	Red rot reaction		Sl. no.	Genotype	Red rot reaction	
		CF08	CF09			CF08	CF09
1	AS 04-245	S	S	13	MA 5/5	S	S
2	AS 04- 635	S	S	14	MA 5/22	MS	MR
3	AS 04- 1687	MR	MR	15	MA 5/51	MS	S
4	AS 04- 1689	MR	MR	16	PG 9869137	S	MS
5	AS 04- 2097	HS	HS	17	SA 98-13	MR	MR
6	BM 1003143	S	S	18	SA 04- 390	MS	MR
7	BM 1005149	MS	HS	19	SA 04-409	MS	S
8	BM 1010168	MS	MR	20	SA 04-454	MR	MR
9	CYM 07-986	S	MS	21	SA 04-458	S	HS
10	GU 07-2276	R	MR	22	SA 04-472	S	S
11	GU 07-3774	HS	HS	23	SA 04-496	MS	S
12	GU 07-3849	S	S				

Table 35. Assessment of elite and ISH genotypes for resistance to red rot -Cuddalore

Sl. No.	Genotype	CF06		CF04	
		Score	Reaction	Score	Reaction
1.	BM 1003143	5.8	MS	4.8	MS
2.	BM 1005149	3.8	MR	3.2	MR
3.	BM 1009163	9.0	HS	8.6	HS
4.	BM 1010168	2.8	MR	3.4	MR
5	BM 1022173	6.4	S	7.2	S
6	PG 9869137	3.6	MR	4.0	MR
7	SA 98-13	3.2	MR	3.4	MR
8	SA 04-454	1.8	R	2.0	R
9	SA 04-472	4.9	MS	5.6	MS
10	SA 04-458	8.3	HS	8.6	HS
11	SA 04-390	3.7	MR	3.8	MR
12	SA 04-496	2.9	MR	3.4	MR
13	SA 04-409	3.8	MR	3.1	MR
14	AS 04-1689	3.6	MR	3.9	MR
15	AS 04-245	5.4	MS	4.9	MS
16	AS 04-2097	3.4	MR	3.8	MR
17	AS 04-635	4.3	MS	4.8	MS
18	AS 04-1687	5.8	MS	4.8	MS
19	MA 5/51	8.8	HS	9.0	HS
20	MA 5/5	7.4	S	6.8	S
21	MA 5/37	2.9	MR	2.6	MR
22	MA 5/99	3.4	MR	3.0	MR
23	MA 5/22	2.9	MR	3.6	MR
24	Gu 07-3849	3.8	MR	3.2	MR
25	Gu 07-3774	9.0	HS	9.0	HS
26	Gu 07-2276	1.8	R	1.6	R
27	CYM 07-986	5.6	MS	5.4	MS
28	CoC 671 (Std)	9.0	HS	9.0	HS

Table 36. Assessment of elite and ISH genotypes for resistance to red rot –Navsari

Sl. No.	Genotype	Local Isolate		Sl. No.	Genotype	Local Isolate	
		Score	Reaction			Score	Reaction
1.	ISH 111	3.2	MR	14	ISH 118	3.6	MR
2.	ISH 175	5.8	MS	15	ISH 9	8.2	HS
3.	ISH 58	3.4	MR	16	ISH 43	8.8	HS
4.	ISH 100	3.8	MR	17	ISH 117	3.6	MR
5	ISH 287	2.8	MR	18	ISH 114	3.5	MR
6	ISH 12	3.0	MR	19	SES 594	1.0	R
7	ISH 50	3.6	MR	20	ISH 115	3.4	MR
8	ISH 41	8.6	HS	21	AS 04-2097	4.8	MS
9	ISH 147	3.3	MR	22	MA 5/5	5.2	MS
10	ISH 69	7.0	S	23	MA 5/99	7.2	S
11	ISH 267	3.4	MR	24	MA 5/51	5.6	MS
12	ISH 229	4.4	MS	25	AS 04-1687	3.0	MR
13	ISH 176	8.4	HS	26	GU 07-2276	2.9	MR

Table 37. Assessment of elite and ISH genotypes for resistance to red rot – Coimbatore

S. No	Entries	CF06			CF12		
		Plug method	Nodal method	Plug method	Nodal method	Plug method	Nodal method
1	AS 04-245	9.0	HS	S	9.0	HS	S
2	AS 04-635	1.4	R	R	6.0	MS	R
3	AS 04-1687	2.6	MR	R	5.0	MS	R
4	AS 04-1689	3.2	MR	R	2.6	MR	R
5	AS 04-2097	4.0	MR	R	4.4	MS	R
6	BM 1003143	6.2	S	S	9.0	HS	S
7	BM 1005149	4.2	MS	S	8.0	S	S
8	BM 1009163	5.6	S	S	8.0	S	S
9	BM 1010168	1.0	R	R	3.0	MR	R
10	BM 1022173	5.2	MS	R	5.0	MS	R
11	CYM 07-986	5.2	MS	R	5.0	MS	R
12	GU 07-2276	1.0	R	R	2.8	MR	R
13	GU 07-3774	9.0	HS	S	9.0	HS	S
14	GU 07-3849	2.4	MR	R	6.0	MS	R
15	MA 5/5	6.6	S	S	8.0	S	S
16	MA 5/22	1.0	R	R	8.0	S	S
17	MA 5/37	2.1	MR	R	3.0	MR	R
18	MA 5/51	9.0	HS	RT	9.0	HS	R
19	MA 5/99	1.0	R	R	2.2	MR	R
20	PG 9869137	4.1	MS	R	9.0	HS	S
21	SA 98-13	2.6	MR	R	2.0	R	R
22	SA 04-390	3.2	MR	R	5.0	MS	R
23	SA 04-409	3.0	MR	R	3.0	MR	R
24	SA 04-454	3.8	MR	R	4.0	MR	R
25	SA 04-458	9.0	HS	S	6.0	S	S
26	SA 04-472	6.1	S	R	8.0	S	R
27	SA 04-496	6.2	S	R	8.0	S	R
	CoC 671 (Std)	9.0	HS	S	9.0	HS	S
	Co 94012 (Std)	9.0	HS	S	9.0	HS	S

Table 38. Assessing screening methods for resistance to brown rust- Pune

Clip inoculation method		Leaf whorl method	
Shoot Number	**Av. No. of rust pustules per sq.inch**	**Shoot Number**	**Av. No. of rust pustules per sq.inch**
1	15	1	25
2	17	2	23
3	12	3	27
4	16	4	30
5	16	5	23
7	14	7	28
8	13	8	22
9	15	9	25
10	12	10	29
Total	130	Total	232
Average	13.00	Average	23.20

Table 39. Assessing screening methods for resistance to brown rust - Kohlapur

Sl. No.	**Inoculation methodology**	**Average no. of rust pustules/inch^2**	**No. of leaves bearing rust pustules**
1.	Clip inoculation in leaf whorl	30.75	8.36
2.	Leaf whorl inoculation	40.05	9.18

Table 40. Assessing screening methods for resistance to brown rust - Sankeshwar

Sr. No	**Inoculation methodology**	**Average no. of rust pustules/inch^2**	**No. of leaves bearing rust pustules**
1.	Clip inoculation in leaf whorl	24.31	9.9
2.	Leaf whorl inoculation	36.54	9.4

Table 41. Assessing screening methods for resistance to brown rust - Padegaon

Sr. No.	**Inoculation methodology**	**Average no. of rust pustules/inch^2**	**No. of leaves bearing rust pustules**
1.	Clip inoculation in leaf whorl	25.85	5.4
2.	Leaf whorl inoculation	31.91	5.6
3.	Spray Inoculation	33.42	5.9

Table 42. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Kapurthala

S. No.	Genotypes	% incidence	Disease reaction	S. No.	Genotypes	% incidence	Disease reaction
1	Co 11027	0.0	R	31	CoPant 13221	9.0	MS
2	Co 12026	1.0	R	24	CoLk 13201	12.0	MS
3	Co 12027	0.0	R	25	CoLk 13202	3.0	R
4	Co 12029	4.0	R	26	CoLk 13203	0.0	R
5	Co 13033	4.0	R	27	CoLk 13204	14.0	S
6	Co 13034	7.0	MS	28	CoLk 13205	0.0	R
7	Co 13035	3.0	R	29	CoPant 12221	11.0	S
8	Co 13036	0.0	R	30	CoPant 12226	0.0	R
9	CoH 11262	4.0	R	32	CoPant 13222	11.0	S
10	CoH 11263	2.0	R	33	CoPant 13223	2.0	R
11	CoH 12263	2.0	R	34	CoPant 13224	6.0	MS
12	CoH 13261	17.0	S	35	CoPb 11214	16.0	S
13	CoH 13262	4.0	R	36	CoPb 12211	1.0	R
14	CoH 13263	4.0	R	37	CoPb 13181	6.0	MS
15	CoLk 11201	0.0	R	39	CoPb 13183	3.0	R
16	CoLk 11202	12.0	S	40	CoS 11232	9.0	MS
17	CoLk 11203	0.0	R	41	CoS 12232	13.0	S
18	CoLk 11204	0.0	R	42	CoS 13231	2.0	R
19	CoLk 11206	7.0	MS	43	CoS 13232	8.0	MS
20	CoLk 12203	0.0	R	44	CoS 13233	10.0	MS
21	Co 0238 (check)	23.0	HS	23	CoLk 12205	3.0	R
22	CoJ 85 (Check)	17.0	S	38	CoPb 13182	0.0	R

Table 43. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Uchani

S.No.	Genotype	% incidence	Disease reaction	S.No.	Genotype	% incidence	Disease reaction
1	Co 0118	10	MS	36	CoLk 11202	9	MS
2	Co 0237	10	MS	37	CoLk 11203	1 .0	R
3	Co 05011	8	MS	38	CoLk 11204	2	R
4	Co 11027	1	R	39	CoLk 11206	9	MS
5	Co 1148	10	MS	40	CoLk 12203	0	R
6	Co 12026	0	R	41	CoLk 12205	2	R
7	Co 12027	2	R	42	CoLk 13201	6	MS
8	Co 12029	3	R	43	CoLk 13202	7	MS
9	Co 13033	2	R	44	CoLk 13203	2	R
10	Co 13034	6	MS	45	CoLk 13204	12	S
11	Co 13035	0	R	46	CoLk 13205	0	R
12	Co 13036	7	MS	47	CoPant 12221	8	MS
13	Co 7717	9	MS	48	CoPant 12226	0	R
14	CoH 110	16	S	49	CoPant 13221	7	MS
15	CoH 11262	2	R	50	CoPant 13222	14	S
16	CoH 11263	0	R	51	CoPant 13223	6	MS
17	CoH 119	9	MS	52	CoPant 13224	7	MS
18	CoH 12263	4	R	53	CoPb 11214	12	S
19	CoH 128	7	MS	54	CoPb 12211	2	R
20	CoH 13062	2	R	55	CoPb 13182	6	MS
21	CoH 13063	0	R	56	CoPb 13183	2	R
22	CoH 13261	7	MS	57	CoPb13181	8	MS
23	CoH 133	21	S	58	CoS 11232	6	MS
24	CoH 150	0	R	59	CoS 12232	10	MS
25	CoH 151	7	MS	60	CoS 13231	2	R
26	CoH 152	18	S	61	CoS 13232	9	MS
27	CoH 156	8	MS	62	CoS 13233	7	MS
28	CoH 160	2	R	63	CoS 767	0	R
29	CoH 164	5	R	64	CoS 8436	19	S
30	CoH 167	4	R	65	S 11 252	9	MS
31	CoH 56	9	MS	66	S-11 202	8	MS
32	CoH 92	2	R	67	S-11 733	9	MS
33	CoH 99	0	R	68	Co 0238	26	HS
34	CoJ 64	8	MS	69	CoJ 85	14	MS
35	CoLk 11201	1	R				

Table 44. Reaction of sugarcane clones for resistance to *Pokkah boeng* - Shahjahanpur

Sl. No.	Varieties	Percent infected plants				Disease reaction
		Mild	Moderate	Severe	Incidence	
1	CoLk 09202	0	0	0	0	R
2	CoPant 97222	0	0	0	0	R
3	CoS 11244	3	3	0	6	MS
4	CoS 12231	3	0	0	3	R
5	CoS 14231	4	0	0	4	R
6	CoS 14233	1	0	0	1	R
7	CoSe 09455	2	0	0	2	R
8	CoSe 11456	4	0	0	4	R
9	CoSe 12451	6	1	0	7	MS
10	CoSe 12453	1	0	0	1	R
11	CoSe 13451	6	0	0	6	MS
12	CoSe 13452	1	0	0	1	R
13	CoSe 13453	2	0	0	2	R
14	Co 0238 (Std)	11	2	0	15	S

Table 45. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Kolhapur

S. No.	Genotype	% infected plants				Disease Reaction
		Mild	Moderate	Severe	Total Incidence	
IVT (E)						
1	Co 12001	3	--	--	3	R
2	Co 12003	--	7	-	7	MS
3	Co 12006	2	--	--	2	R
4	Co 12007	--	--	--	0	R
5	Co 12008	4	--	--	4	R
6	CoM 12081	2	--	--	2	R
7	CoM 12082	--	6	--	6	MS
8	CoM 12083	--	--	--	0	R
9	CoN 12071	4	--	--	4	R
10	CoN 12072	--	9	--	9	MS
11	CoT 12366	--	--	--	0	R
12	CoT 12367	--	8	--	8	MS
AVT (E-I)						
1	Co 10004	--	--	--	0.0	R
2	Co 10005	3	6	---	9.00	MS
3	Co 10006	5	5	--	10.00	MS
4	Co 10024	-	-	-	0.0	R
5	Co 10026	3	4	--	7.0	MS
6	Co 10027	--	--	--	0.0	R
7	CoT 10366	2	6	--	8.0	MS
8	CoT 10367	8	--	--	8.0	MS
AVT (EII)						
1	Co 09004	--	10	--	10	MS
2	Co 09007	--	--	--	0.0	R
3	CoN 09072	--	--	--	0.0	R
IVT (ML)						
1	Co 12009	2	4	--	6.0	MS
2	Co 12012	--	--	--	0.0	R
3	Co 12014	2	5	--	7.0	MS
4	Co 12016	2	7	--	9.0	MS
5	Co 12017	--	--	--	0.0	R
6	Co 12019	--	--	--	0.0	R
7	Co 12021	--	4	--	4	R
8	Co 12024	2	--	--	2.0	R
9	CoM 12084	5	4	--	9.0	MS
10	CoM 12085	-	-	-	0.0	R
11	CoM 12086	-	-	-	0.0	R
12	CoN 12073	3	5	-	8.0	MS
13	CoN 12074	3	--	--	3.0	R
14	CoT 12368	4	3	--	7.0	MS

S. No.	Genotype	% infected plants				Disease Reaction
		Mild	Moderate	Severe	Total Incidence	
15	VSI 12121	5	5	--	10.00	MS
AVT (ML I)						
1	Co 09009	--	--	---	0.0	R
2	Co 10015	5	2	--	7	MS
3	Co 10017	3	7	--	10	MS
4	Co 10031	1	5	--	6	MS
5	Co 10033	--	--	--	0.0	R
6	CoM 10083	3	--	--	3.0	R
7	CoT 10368	5	--	--	5	R
8	CoT 10369	--	10	--	10	MS
9	CoVc 10061	--	15	--	15	S
10	PI 10131	--	--	--	--	R
11	PI 10132	--	--	--	--	R
Checks						
1	CoC 671	2	6	--	8.0	MS
2	Co 94008	--	11	--	11.0	S
3	Co 85004	3	--	--	3.0	R
4	Co 86032	2	--	--	2.0	R
5	Co 99004	--	13	--	13.0	MS
6	Co 740	--	--	--	0.0	R
7	Co 7527	3	5	--	8	MS

Table 46. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Pusa

Sl. No.	Varieties	Percent infected plants			Total incidence	Disease reaction
		Mild	Moderate	Severe		
1.	CoX 12092	13	07	05	25	S
2.	CoX 12191	16	03	02	21	S
3.	CoX 12264	13	05	02	20	S
4.	CoX 12278	02	-	-	02	R
5.	CoX 12348	13	06	02	21	S
6.	CoX 12070	15	03	02	20	S
7.	CoX 12137	03	-	-	03	R
8.	CoX 12144	15	06	02	23	S
9.	CoX 12489	04	-	-	04	R
10.	CoX 12494	02	-	-	02	R
11.	CoSe 95422 (Check)	13	05	02	20	S

Table 47. Reaction of sugarcane clones for resistance to Pokkah boeng - Seorahi

S.No.	Varieties	Percent infected plants				Disease reaction
		Mild	Moderate	Severe	Total incidence	
1	CoLk 13201	8	4	-	12	S
2	CoLk 14201	2	-	-	2	R
3	CoS 08279	10	7	-	17	S
4	CoS 09232	-	-	-	-	R
5	CoS 09455	2	1	-	3	R
6	CoS 10239	5	3	-	8	MS
7	CoS 11244	5	3	-	8	MS
8	CoS 13231	9	6	-	15	S
9	CoS 8436	7	6	-	13	S
10	CoSe 15451	3	-	-	3	R
11	CoSe 11451	-	1	-	1	R
12	CoSe 11455	-	-	-	-	R
13	CoSe 11456	2	1	-	3	R
14	CoSe 12231	3	4	-	7	MS
15	CoSe 12451	-	-	-	-	R
16	CoSe 12452	-	2	-	2	R
17	CoSe 13451	-	-	-	-	R
18	CoSe 13452	2	1	-	3	R
19	CoSe 13453	1	3	-	4	R
20	CoSe 14231	9	5	-	14	S
21	CoSe 14232	2	-	-	2	R
22	CoSe 14233	2	-	-	2	R
23	CoSe 14451	3	-	-	3	R
24	CoSe 14452	1	-	-	1	R
25	CoSe 14453	7	6	-	13	S
26	CoSe 14454	6	2	-	8	MS
27	CoSe 14455	2	-	-	2	R
28	CoSe 14456	-	-	-	-	R
29	CoSe 95422	4	3	-	7	MS
30	Co 0238	8	8	-	16	S

Table 48. Reaction of sugarcane clones for resistance to top rot - Anakkapalle

S.No.	Variety	%infected plants				Reaction
		Mild	Moderate	Severe	Total incidence	
IVT (E)						
1	Co 07013	6	2	0	8	MR
2	Co 13023	8	3	0	11	MS
3	Co 13024	3	1	0	4	R
4	Co A 14322 (2009 A 235)	7	2	0	9	MR
5	Co A 14321 (2009 A 107)	4	0	0	4	R
6	CoA 12321 (2006 A 64)	0	0	0	0	R
7	CoA 12322 (2006 A 102)	0	0	0	0	R
8	CoC 14336	6	1	0	7	MR
9	CoV 14356	9	2	1	12	MS
10	CoC 01060 (C)	5	1	0	6	MR
11	CoA 92081 (C)	0	0	0	0	R
IVT (ML)						
12	85 A 261	0	0	0	0	R
13	Co 13025	4	1	0	5	R
14	Co 13027	7	2	0	9	MR
15	Co 13028	4	1	0	5	R
16	Co 13029	9	2	1	12	MS
17	Co 13030	12	3	1	6	S
18	Co 13031	7	2	0	9	MR
19	Co 13032	5	1	0	6	MR
20	Co 419	12	3	1	16	S
21	Co 6907	4	2	0	6	R
22	Co 7219	12	4	0	16	S
23	Co 7706		1	0	5	R
24	Co 997	11	3	2	16	S
25	CoA 14323 (2009 A 252)	8	2	0	10	MR
26	CoA 14324 (2009 A 385)	7	1	0	8	MR
27	CoC 14337	9	3	0	12	MS
28	CoC 671	21	6	1	28	HS
29	PI 14376	12	4	1	17	S
30	PI 14377	7	2	0	9	MR
31	CoV 92102 (C)	8	3	0	11	MS
32	Co 86249 (C)	6	1	0	7	MR

Table 49. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Pune

S. No.	Variety	Disease incidence	S. No.	Variety	Disease incidence
1	Co 419	33.33 %	8	CoVSI 03102	0.0
2	Co 86032	12.50 %	9	CoVSI 0405	28.57%
3	Co85004	0.0	10	CoVSI 2000-01	16.16%
4	Co94012	16.66 %	11	CoVSI 9805	33.33%
5	CoC 671	10.00 %	12	MS 10001	16.66%
6	CoM 0265	33.33%	13	VSI 08005	25.00%
7	CoVSI 0309	30%	14	VSI 434	35.71%

Table 50. Reaction of sugarcane clones for resistance to *Pokkah boeng*- Akola

S. No.	Genotypes	% PB incidence	Reaction	S. No.	Genotypes	% PB incidence	Reaction
	IVT (E) Plant			7	CoT10366	6.14	MS
1	Co 13002	4.12	R	8	CoT10367	1.16	R
2	Co 13003	4.9	R	9	Co 85004 (C)	0.6	R
3	Co 13004	1.08	R	10	Co 94008 (C)	3	R
4	Co 85004	3.49	R	11	CoC 671 (C)	4.67	R
5	Co 94008	3.52	R		**IVT (ML) Plant**		
6	CoC 671	3.04	R	1	Co 13005	2.75	R
7	CoN13071	4.03	R	2	Co 13006	2.85	R
8	CoN13072	3.23	R	3	Co 13008	1.35	R
9	CoSnk13101	5.11	MS	4	Co 13009	3.36	R
10	CoSnk13102	6.28	MS	5	Co 13011	3.13	R
11	MS13081	4.17	R	6	Co 13013	2.86	R
	AVT (EI) Plant			7	Co 13014	2.46	R
1	Co 11001	1.4	R	8	Co 13016	4.6	R
2	Co 11004	4.47	R	9	Co 13018	3.34	R
3	Co 85004	1.64	R	10	Co 13020	4.17	R
	Co 94008	2.74	R	11	Co 86032	2.04	R
5	CoC 671	2.6	R	12	Co 99004	4.88	R
6	CoM11081	2.29	R	13	CoM13082	2.88	R
7	CoM11082	9.48	MS	14	CoN13073	0	R
8	CoM11084	2.05	R	15	CoN13074	0	R
	AVT (EII) Plant			16	CoSnk13103	3.49	R

S. No.	Genotypes	% PB incidence	Reaction	S. No.	Genotypes	% PB incidence	Reaction
1	Co 10004	5.38	MS	17	CoSnk13104	3.11	R
2	Co 10005	3.77	R	18	CoSnk13105	3.51	R
3	Co 10006	6.19	MS	19	CoSnk13106	2.72	R
4	Co 10024	2.81	R	20	CoT13366	4.37	R
5	Co 10026	3.29	R	21	PI13131	3.76	R
6	Co 10027	3.2	R	22	PI13132	4.4	R

Table 51. Management of *Pokkah boeng/*top rot disease in sugarcane- Kapurthala

Treatments		Co 238		CoJ 85	
		Germination	% Disease Incidence	Germination	% Disease Incidence
T_1	Sett treatment-Overnight soaking with Carbendazim (0.1% a.i.)	50.0	15.25	49.8	14.5
T_2	Foliar spray-Carbendazim (0.05% a.i.-3 sprays at 15 days interval from May 15th)	45.6	22	46.7	19.25
T_3	Sett treatment (T_1) + Foliar spray with Carbendazim (T_2)	50.8	12.75	51.0	10
T_4	Control	45.0	29.5	46.0	28.75
	CD at 5%	2.16	3.31	4.69	2.83
	C.V.	2.83	4.27	14.74	9.77

Table 52. Management of *Pokkah boeng/*top rot disease in sugarcane- PUSA

Treatment		Germination (%)	Disease incidence (%)
T_1	Sett treatment (Overnight soaking with carbendazim 0.1%)	40.4	12.3
T_2	Foliar spraying (Carbendazim 0.05%, 3 sprays at 15 days interval from 30th June)	34.2	10.7
T_3	T_1+T_2	46.8	5.3
T_4	Control	22.2	32.7
SEM±		1.48	0.89
CD at 5%		4.73	2.84
CV%		7.17	10.0

Table 53. Management of *Pokkah boeng/* top rot disease in sugarcane- Anakapalle

Sl.No.	Treatments	Germination (%)	Disease incidence
T_1	Sett treatment- Overnight soaking with carbendazim- 0.1% a.i	75.6	15.2
T_2	Foliar spray- Carbendazim -0.05% a.i (3 sprays at 15 days interval from May 15th)	70.3	11.4
T_3	Sett treatment (T1) + Foliar spray- Carbendazim -0.05% (T2)	83.4	4.1
T_4	Control	61.3	21.8
	SE+	1.34	0.58
	CD at 5 %	NS	1.41
	C.V. %	5.21	4.82

Table 54. Management of *Pokkah boeng/* top rot disease in sugarcane- Sankeshwar

Sl.No.	Treatment	Germination (%)	Disease incidence
1	Sett treatment- Overnight soaking with Carbendazim- 0.1%	77.34	8.38
2	Foliar spray- Carbendazim -0.05% (3 sprays at 15 days interval from May 15th)	81.74	12.86
3	Sett treatment (T1) + Foliar spray- Carbendazim -0.05% (T2)	88.32	6.38
4	Control	68.68	29.94
	SE+	0.52	0.45
	CD at 5 %	1.31	1.39

Table 55. Management of *Pokkah boeng/* top rot disease in sugarcane- Pune

S. No.	Treatments	Germination (%)	Total height (cm)	Mill able height (cm)	Cane yield (t/ha)	CCS (t/ha)	Disease Control (%)
1	Sett treatment - Overnight soaking with Carbendazim 0.1% a.i.	58.75	220	198.5	125.15	18.42	64.25
2	Foliar spray – Carbendazim – 0.05% a.i. (3 sprays at 15 days interval from May15.)	59.5	222.5	201.5	133.98	20.16	62.63
3	Sett treatment (T1) + Foliar spray with carbendazim (T2)	61	235	211.75	134.44	20.13	66.2
4	Foliar spray- Mancozeb – 0.3% a.i. (3 sprays at 15 days interval from May15th)	62	235.5	213	135.42	19.52	74.81
5	T5: Control	57	219.25	195	124	18.14	0
	S.E. $\pm$	3.39	8.9	9.09	1.32	0.86	1.83
	CD at 5%	10.47	27.44	28.2	4.08	1.87	5.66

Table 56. Effect of different fungicides on intensity of brown spot – Padegaon

S. No.	Treatments	Conc.	Germ. % at 45 DAP	PDI	PDC	NMC /ha (1000)	Cane yield (t/ha)	CCS %	CCS yield (t/ha)
T_1	Propiconazole	0.10%	64.33	10.00	84.46	89.68	103.8	14.14	14.67
T_2	Hexaconazole	0.10%	57.33	25.00	61.14	83.087	86.6	13.91	12.06
T_3	Tridemefon	0.10%	63.67	42.33	34.20	79.04	81.2	13.76	11.17
T_4	Mancozeb	0.30%	66.00	13.00	79.79	86.277	98.0	14.57	14.26
T_5	Carbendazim	0.10%	64.33	25.67	60.10	81.32	85.6	13.90	11.90
T6	Chlorothalonil	0.25%	65.33	48.33	24.87	79.387	81.6	13.77	11.23
T7	Water sprayed control	--	59.33	64.33		75.03	80.2	13.72	11.00