

## **PROCEEDINGS OF AICCIP ANNUAL GROUP MEETING: 2011-12**

### **PLANT PATHOLOGY PANEL: TECHNICAL PROGRAMME FOR 2011-12**

The Plant Pathology Panel meeting was held from 6<sup>th</sup> to 8<sup>th</sup> April, 2011 in the Chaudhury Charan Singh Haryana Agricultural University, Haryana under the Chairmanship of Dr.S.K.Gandhi, Professor and Head, Dept. of Plant Pathology, CCSHAU, HISAR and Convened by Dr. Dilip Monga, Principal Investigator, (Plant Pathology) and Head, CICR, Regional Station, Sirsa. B. Sree Lakshmi and Dr. J. Beniwal acted as rapporteurs. The following scientists from different AICCIP Centres attended the meeting and presented the result of 2010-11 trials. The technical programme for the year 2011-12 was finalized.

1. Dr. P.S. Sekhon, PAU, Ludhiana
2. Dr.R.P.Gaur, Sri Ganga Nagar
3. Dr.N.K.Yadav, CRS,SIRSA
4. Dr. Jagadish Beniwal, HAU, Hisar
5. Dr. P.K. Dhoke, CRS, MAU, Nanded
6. Dr. P.V. Patil, MCRS, NAU, Surat
7. Dr. H.J. Kapadia, JAU, Junagadh
8. Dr. O.V. Ingole, PDKV, Akola
9. Dr.R.R. Perane, MPKV, Rahuri
10. Dr. Niranjan Chinara, Bhawanipatnam, OUAT
11. Dr. S.N. Chattannavar, ARS, UAS, Dharwad
12. Dr. B. Sree Lakshmi, RARS, ANGRAU, LAM, Guntur
13. Dr. S.Nakkeeran, TNAU, Coimbatore
14. Dr.M.Gunasekaran, Senior Scientist,CICR,Coimbatore
15. Dr.Suria Chanrda Selvan, CRS,TNAU,Srivilliputtur
16. Dr. S.A. Astaputre, UAS, Dharwad
17. Dr.N.N.Sharma, Rallis India Ltd., Banglaore
18. Dr. P. Mareeswari, ARS, Aruppukottai, TNAU
19. Mr.Devendra Kadian, Monsanto
20. Dr.Daljeet Singh, PAU,RS,Faridkot

## Technical Programme:2011-12

### Path.1: Epidemiological studies on cotton diseases-(cont.....)

#### 1(a): Observations on the occurrence of the diseases (in farmer's field and research farms) - (At all centers except Pune and CICR Sirsa)

All Information regarding major / minor / new (e.g. Tobacco streak virus disease, *Helminthosporium* Leaf spot, *Phoma* leaf spot etc) disease have to be reported. The participating centers were informed to record the data in per cent disease index in 10 locations in farmer field and research farm during the season as per the earlier finalized AICCIP standardized protocols.

#### 1(b): Disease progress in relation to weather factors (All centers except Pune)

The experiment will continue as per the earlier procedure suggested during 2007-08. The regression equations developed for *Alternaria* by Rahuri center will be validated by other centers (TNAU, CBE., Nanded, Junagrah, Dharwad, and Faridkot) for validation. Similarly the equations developed for CLCuD and other diseases will be validated by other centres where the diseases are prevalent. Each center will focus on most important disease on a susceptible variety/hybrid or Bt hybrid for correlation.

#### 1(c): Studies on the variability of *Myrothecium* leaf spot (Khandwa) and *Alternaria* leaf spot (other centres). 1. *Myrothecium* leaf spot. 2. *Alternaria* leaf spot

Samples of *Myrothecium* leaf spots will be sent to Dr. Shastry for variability studies by Punjab, Haryana, Gujrat and Maharashtra Pathologists.

*Alternaria* isolates from minimum of ten locations covering wider area should be collected for confirmation of species (Hisar, Sriganaganagar, Faridkot, Akola and Dharwad).

#### 1(d) Survey, monitoring, diagnosis, role of vectors, alternate hosts to TSV (Lam in collaboration with NBPGR, Regional Station, Hyderabad and CICR, Nagpur and TNAU, Coimbatore).

Development of virus disease rating scale and disease loss assessment may be made with the most susceptible genotype and host vector relationship may be ascertained.

**Path.2: Screening of AICCIP entries for disease reaction- cont.....****Path.2: (a) Screening of breeding lines for disease reaction (all centers)**

North Zone centers : Both National and Zonal entries\*

Central and South zones centres : - do -

\*Only national entries at CICR,RS,Sirsa

The artificial screening will be carried out for different diseases at following centers

Disease	Centre
CLCuD	Ludhiana- All entries
Bacterial blight	Lam
Myrothecium	Khandwa
Alternaria	Rahuri
Grey Mildew	Dharwad
Root rot	Sirsa

For CLCuD screening, Hisar and Sriganaganagar centres will also develop screening nurseries.

In case of field screening, all centres will use local susceptible checks for diseases to ensure proper screening. Sprinklers may be provided for proper disease development to ensure effective screening.

**Path.2 (b) Confirmation and maintenance of disease resistant lines**

At all centres, scientists will keep the resistant entries (few bolls of selfed seed) from the initial evaluation trials (National trials) like Br02a or b for *G. hirsutum* Varieties, Br 22 a/b for *G. arborum*, Br 34 b for *G. herbaceum* and Br 14a for *G. barbadense* after screening against important diseases.

A maximum of 2-3 important diseases prevailing in the area will be considered.

A maximum of five entries will be kept from each trial.

Seed cotton yield and quality aspects will also be recorded keeping resistance as first priority.

Those lines will be evaluated again for one more year i.e. tested at hot spot for that particular disease under nursery/ artificial inoculation condition at below mentioned centres to have confirmed final reaction.

S.No.	Disease	Hot spot
1	Cotton leaf curl virus	PAU, Abohar / Ludhiana
2	Bacterial leaf blight	PDKV, Akola
3	Alternaria leaf spot	MPKV, Rahuri
4	Myrothecium leaf spot	Khandwa
5	Grey mildew	Dharwad
6	Root rot	CICR,RS,Sirsa
7	Fusarial wilt	PAU

The process will be continuous one and within 5-6 years each centre will have their collection of resistant entries for use in developing resistant varieties / hybrid by that centre.

### **Path.3: Management of Disease**

#### **Path 3(a): Management of fungal foliar diseases through chemicals**

##### **Experiment: 2. (IInd year)**

Fungicide: Ergon 44.3% (Kresoxim methyl 500g/l) SC against grey mildew and leaf spots (M/s Rallis India Pvt. Ltd) and Phytotoxicity,

Dose : 300, 400 and 500 ml/ha(Bio-efficacy)

Treatments:

T1: Ergon 300ml/ha

T2: Ergon 400ml/ha

T3: Ergon 500ml/ha

T4: Propiconazole 0.1%

T5: Carbendazim 0.1%

T6: COC (0,3%) + Streptocycline ) 0,01%

T7: Untreated control (Water Spray)

Three sprays has to be given at 15 days interval after the initiation of the symptom.

Design: RBD

Plot size : 60 plants / plot

Replications : 3

Variety : Local susceptible Bt hybrid

Volume of water : 500 L/ha

Centres : Faridkot, Hisar, Junagadh, Nanded, Dharwad Guntur and Khandawa

Treatments : 500, 1000 and 2000 ml/ha (Phytotoxicity) – Single spray should be given after the disease appearance (unreplicated).

Observation: Phytotoxicity symptom has to be observed prior to and after 1st, 3rd, 7th, 10th and 15th days of spraying.

##### **Experiment: 3. Testing of Insecticide + Fungicide premixture RIL-074/F1(Acephate 60%+Kresoxim methyl 15% WG) against sucking pests and the diseases (leaf spot, greymildew etc,)**

The experiment will be conducted by Entomologist and the data on diseases will be recorded by the Plant pathologist. The trial will be conducted at following centres: Sriganganagar, Faridkot, Junagarh, Dharwad, Surat, Akola, Khandwa, Raichur, Guntur, and Srivelliputtur. Data on yield will also be reported.

For CLCuV early interventional spray will be included if required at Faridkot and Sriganganagar centres and will collect data on white fly incidence also.

### 3(b) Management of Grey mildew and Rust through SAR inducing chemicals.

1. Seed treatment with *P. fluorescens* Pf-1 (TNAU) @ 10 g/kg seed plus foliar spray @ 0.4% on 60 and 90 DAS.
2. Seed treatment with *P. fluorescens* Pf-1 (CICR) @ 10 g/kg seed plus foliar spray @ 0.4% on 60 and 90 DAS.
3. Spraying of propiconazole at 0.1% (for rust)/ Carbendazim 50 WP @ 0.1% (for grey mildew only) on 60 and 90 DAS
4. Foliar application of COC (0.3%)+ Streptocycline (0.01%) at 60 and 90 DAS
5. SAR inducing chemical, at 100 ppm (Salicylic acid) on 60 and 90 DAS.
6. SAR inducing chemical, at 100 ppm ( iso nicotinic acid) on 60 and 90 DAS.
7. Untreated control (Water Spray)

Based on the need an additional spray may be taken after 120 DAS.

Design : RBD

Plot size : 60 Plants / plot

Replications : 3

Variety : Local susceptible cultivar. Dharwad centre will supply seed to CICR, Nagpur.

The Centres : CICR, Nagpur, Dharwad, Abhojar, Lam, TNAU, Coimbatore.

Pf-1(TNAU) and Pf-1(CICR) NAGPUR will be supplied to the other centres by the respective host institutes.

Population dynamics of Pseudomonads in the rhizosphere of the treated and untreated plants has to analyzed at flowering phase. Depending on the facilities available with different centres the phylloplane microflora will be assayed.

### Path 3 (c): Developing IDM modules for the management of cotton diseases (New Experiment)

#### Treatment details:

1. Bt Hybrid 1 + Module 1
2. Bt Hybrid 1 + Module 2
3. Bt Hybrid 1 + Module 3
4. Bt Hybrid 2 + Module 1
5. Bt Hybrid 2 + Module 2
6. Bt Hybrid 2 + Module 3
7. Farmers Practice

Bt cotton hybrids will be selected based on tolerance to one or the other disease.

Modules may be prepared depending upon the severity of the diseases occurring in different zones.

Design: RBD

Replications: 3

Plot size: 50sq.m

Centres: Guntur, Rahuri and TNAU, Coimbatore

Module 1	Module 2	Module 3
Seed Treatment	Seed Treatment	Seed Treatment
Soil Application – Pseudomonas fluorescens or Bacillus subtilis	-	Soil Application – Trichoderma viride or T.Harzianum
Foliar spray with Pseudomonas fluorescens or Bacillus subtilis at 1% concentration on 60,90,120 DAS	Foliar spray with Propiconazole (0.1%) for Alternaria leaf spot or Carbendazim (0.1% for grey mildew) COC 0.3%+ Streptocycline 0.01% for bacterial blight at 60,90,120 DAS.**	Foliar spray at 60 DAS Ergon @ 1 ml/ ltr , 90 & 120 DAS Taquat @1.5 ml/ltr , COC + Streptocycline if needed.
** - Need based application may be given based on the disease severity observed in the respective places.		

- The interventions within a module can be modified based on location needs.

#### Path 4: Crop Loss Estimation

#### 4 (c) Bacterial blight (to be carried out at Dharwad, Lam, Surat and Akola).

##### Fungicide: Copper oxy chloride 0.3% + Streptocycline 100 ppm

The following will be the treatments.

1. COC (0.3%) + Streptocycline 100 ppm spray at 35 DAS
2. COC (0.3%) + Streptocycline 100 ppm spray at 35 and 50 DAS
3. COC (0.3%) + Streptocycline 100 ppm spray at 35,50 and 65 DAS
4. COC (0.3%) + Streptocycline 100 ppm spray at 35, 50, 65 and 80 DAS
5. COC (0.3%) + Streptocycline 100 ppm spray at 35,50,65,80 and 95 DAS
6. COC (0.3%) + Streptocycline 100 ppm spray at 50,65,80 and 95 DAS
7. COC (0.3%) + Streptocycline 100 ppm spray at ,65,80 and 95 D
8. COC (0.3%) + Streptocycline 100 ppm spray at 80 and 95 DAS
9. COC (0.3%) + Streptocycline 100 ppm spray at 95 DAS
10. Water spray

Design: RBD with Three replications

Plot size: 60 plants / treatment

Variety: Susceptible Variety/Hybrid or Bt Hybrid

#### Path.4 (e) Crop loss estimation due to CLCuD and distribution pattern of CLCuD in north zone-2<sup>nd</sup> year

##### Experiment 1: To work out relationship between Disease index and yield reduction due to cotton leaf curl virus disease

Location: Hisar (Sirsa -Voluntary Centre), Faridkot, Ganganagar, Abohar

Variety /hybrid : Local Popular Bt Hybrids

Treatment details and observations:

1 Research farms on 4 local popular hybrid will be sown in half and acre area and 10 sets each (50 plants/set) of diseased and healthy plants will be tagged and data on Disease Index, yield loss and quality parameters will be recorded and analyzed.

### **Experiment 2: Study on distribution pattern of cotton leaf curl virus disease on local popular Bt hybrid at farmer's field.**

Observations of CLCuD occurrence (DI) on two villages in each block (district wise) will be recorded during the cropping season for four popular hybrids. The locations will be evenly spread over the entire state. At each location, 4 set of observations (25 plants each totaling 100 plants) will be recorded in a field

Location: Hisar, (Sirsa – Voluntary Centre), Faridkot and Sriganaganagar

#### **4.(f) Rust (Dharwad and Lam)**

(Procedure similar to BLB)

Variety: Local susceptible cultivar (H x B)

Fungicide: Propiconazole @ 0.1%

#### **Path. 7 Fusarium wilt of cotton (Pune Centre) - cont.....**

The Pune Center will screen all Desi cotton genotypes (*G arboreum* and *G herbaceum*) in combined Fusarial cultures at sick plot. The seeds (25 gm of each entry) of all desi cotton trials may be sent to Pune centre from CICR Regional station, Coimbatore while distributing seeds, for screening Fusarium wilt (Action: Project Coordinator).

For confirmation and verification of resistance, the resistant materials has to be sent to the Plant Pathologist, PAU, Ludhiana.

1. A separate discussion was held by North zone Plant Pathologists where it was decided to modify the present cotton leaf curl virus disease rating scale from 0-4 to 0-6 and also taking yield reduction by disease in to consideration. The details will be circulated separately.
2. As advised by ADG (CC) a program for integrated management of cotton leaf curl virus disease will be developed involving different centres of north zone with multidisciplinary approach for separate funding.

Finally, Dr. Monga concluded the session with vote of thanks.