Proceedings of the One day meeting on

EVALUATION FOR COTTON LEAF CURL VIRUS DISEASE (CLCuD)

At Central Institute for Cotton Research, Nagpur

5th August, 2014

The meeting on 'Evaluation for cotton leaf curl virus disease (CLCuD)' was chaired by Dr C. D. Mayee, ex-Chairman ASRB and was attended by 10 scientists from public sector institutions and 14 representatives from the Private sector. In his welcome address Dr K.R. Kranthi, Director, CICR emphasized the increasing concerns of the CLCuD in North zone. The leaf curl virus has been on the rise with the near mono-culture (only hirsutum hybrids) in cultivation and decline in the cultivation of the immune *G. arboreum* species. The CLCuD can be severely debilitating resulting in complete yield loss either with the highly virulent Burewala strain or a combination of any of the six species of the begomo- viruses. The new highly virulent species of recombinant virus called the 'Burewala species' which originated in Pakistan during 2001-02 has now spread all across North zone. He also presented a brief history of the Disease and its effect on commercial cultivation of cotton and Indian economy.

In the introductory remarks, Dr C.D. Mayee, Former Chairman, ASRB, New Delhi explained the detailed epidemiology of CLCuD. He also explained the urgent need to fine-tune the grading of the disease and to map the progression of the disease. Dr Mayee also explained the circumstances under which the paid trisl for CLCuD was formulated for North zone. During the current cropping season 2014-15, field trials have been laid out with 100 Bt Cotton hybrids and 50 pre-release hybrids at five centres of North zone- (Faridkot, Abohar, Hisar, Sirsa and Sriganganagar) with two treatments- Normal date of sowing and late sowing.

Dr. Rishi Kumar, Senior Scientist, CICR (RS), Sirsa presented the status report of CLCuD in North zone. He explained the AICRP trial methodologies conducted and results obtained. Over the years, monitoring and grading of the disease was refined. The management of disease is possible through development of resistant varieties/hybrids, control of its vector whitefly (*Bemisia tabaci* Gennadius) and management of alternate hosts including clean cultivation through weed management. Among these, development of resistant varieties /hybrids is the most effective and reliable method for which germplasm and new sources need to be properly screened on a regular basis to identify resistant material to be used for varietal/hybrid development. We need to have fool proof cotton leaf curl virus disease screening methodologies for this purpose. At present, screening under field conditions is carried out at disease hot spots or by using screening nursery and infector rows of susceptible varieties. Under artificial conditions, screening is carried out through artificial inoculation using viruliferous whiteflies either by free choice method under polyhouse/net house conditions or through release of counted viruliferous white flies on test plants under plastic jars in polyhouse/screen house for fixed interval. The grafting technique however is seldom being used in India. It has been observed over the years that the various techniques require further standardization/ refinement. For instance the disease development is influenced by several weather, plant and vector factors like temperature, relative humidity, light, plant age, culture and sex of whiteflies etc. These factors affecting disease development need to be understood properly in order to make refinement of techniques.

With this background information the issues were open for discussion.

After detailed deliberations, the following points emerged-

1. The trial should have two dates of sowing for screening of CLCuD disease. One normal date and another late sown.
2. Minimum of two susceptible infectors should be included in the trial, two rows after every 4 hybrids. (Ex: HS-6 and RS921)
3. The observations should be taken at 15 days interval from 45 days after sowing ie., 60, 75, 90, 105 and 120 days
4. The top 1/3 portion of the plant should be monitored for CLCuD incidence.
5. The 0-6 grading can be considered for rating, wherein grade '0' is immune and garde '6' is severest disease symptom.
6. PDI ((per cent disease index) shall be calculated by using the following formula: PDI = (Average grading in test entry / Average grading in the infector entry) x 100
7. Lines showing PDI of 0-30 (± 5) can be considered for cultivation in the state; 30-40 PDI (the hybrids will be retained for second paid evaluation for one more year) and hybrids showing > 40 PDI in any one trial shall be rejected. Once the hybrids are identified, they may be recommended for 3 years of cultivation in the state.
8. From next year susceptible checks should be included amongst the coded treatments along with infestor rows.

The other issue discussed was on the request from two companies ie., M/s J K Seeds and M/s Krishidhan seeds pvt ltd., for evaluating their hybrids at their farm as they had not submitted the seeds timely for CLCuD evaluation.

Under AICRP trials the seeds are coded and the experimental design has one infector row between every two check entries. After thorough discussion, it emerged that the hybrids of M/s J K Seeds and M/s Krishidhan seeds pvt ltd., were not coded and also infectors are not included as per the scientific conditions prescribed in the common trial format. Thus it was surmised that such conditions were not fulfilled in any of the proposed trials being conducted separately by the two companies, therefore it would be inappropriate to include their trial data along with the coded entries.

The following committees were constituted during the meeting

Committee to formulate protocols for evaluation of CLCuD

Dr C.D. Mayee, Former Chairman, ASRB, New Delhi. Chairman,

Members

Dr Sandhya Kranthi, Head, Division of Crop Protection, CICR, Nagpur
Dr Beniwal, Professor (Plant Pathology), CCSHAU, Hisar
Dr Joginder Singh, Rasi Seeds
Dr Sameer Wadyalkar, Ankur Seeds
Dr Dilip Monga, Head CICR (RS) Sirsa. Member Secretary

Monitoring team

Dr K.R. Kranthi, Director, CICR, Nagpur, Chairman

Members

Dr Dilip Monga, Head CICR (RS), Sirsa,
Shri A. P. Singh, Additional Commissioner (Crops), DAC, GOI
Dr S. Siwach, Director of Research, CCSHAU, Hisar
Dr Pankaj Rathore, Director, PAU, Faridkot
Dr P.L. Nehra, Professor and Principal Investigator (Agronomy)
Director, DOCD, Mumbai
Dr Satya Prakash, Shriram Bioseed Genetics
Dr P. J. Kulkarni, Mahyco
Dr Hari Prasada Rao, Nuziveedu Seeds
Dr Pawan Kumar Kansal, Kohinoor seed Fields India Pvt Ltd.
Dr Rishi Kumar, Senior Scientist (Entomology), CICR (RS), Sirsa, Member Secretary

Participants List

S.No.	Name of Participant	Designation	Company/Institution	State
1.	Dr.C.D.Mayee	Ex-Chairman ASRB	ICAR	New Delhi
2.	Dr.K.R.Kranthi	Director	CICR, Nagpur	Maharashtra
3.	Dr Sandhya Kranthi	Head, Crop Prot.	CICR, Nagpur	Maharashtra
4.	Dr M.V. Venugopalan	Head, PME cell	CICR, Nagpur	Maharashtra
5.	Dr.V.Chinababu Naik	Scientist	CICR, Nagpur	Maharashtra
6.	Dr.A.H.Prakash	PC & Head	CICR RS, Coimbatore	Tamil Nadu
7.	Dr Rishi Kumar	Sr. Scientist	CICR RS, Sirsa	Haryana
8.	Dr S.S. Sewach	Director of Research	CCSHAU	Harayana
9.	Dr Pankaj Ratore	Director	PAU, Faridkot	Punjab
10	Dr.Pradeepkumar	Asst.Prof.	ARS, Sriganganagar	Rajasthan
11	Dr.Rupesh kumar Arora	Asst. Plant Pathologist	ARS, Bathinda	Punjab
12	Dr.Joginder Singh	Consultant	Rasi Seeds Pvt. Ltd., Jalna	Maharashtra
13	Dr Pawankumar Kansul	M.D.	M/s Kohinoor Seed Pvt. Ltd.	Delhi
14	Dr R.S.Rathi	General Manager.	Bayer Crop Science Ltd.	Gujarat
15	Dr.Ramesh Raut	Director	Krishidhan Seeds Pvt. Ltd. Pune	Maharashtra
16	Dr.N. Jagan Mohan Rao	Vice President	Ganga Kaveri Seeds Pvt. Ltd.	Andhra Pradesh
17	Dr.V.N.Kulkarni	VP (R&D)	JK Agri.Genetics	Hyderabad
18	Dr.V.S.Dagonkar	Lead Breeder Cotton	Bayer Bioscience Pvt. Ltd.	Hyderabad
19	Dr.B.Rosaiah	Crop Consultant	Nuziveedu Seeds,	Andhra Pradesh
20	Dr.S.S.Mane	Sr.Cotton Breeder	Nuziveedu Seeds,Aurangabad	Maharashtra
21	Vaibhav Kashikar	Executive Director	Ankur Seed Pvt. Ltd., Nagpur	Maharashtra
22	Dr.Samir Wadyalkar	Trial Coordinator	Ankur Seed Pvt. Ltd.,	Maharashtra
23	Mr.V.S .Kiran	Sr.Breeder	Ganga Kaveri Seeds Pvt. Ltd.	Andhra Pradesh
24	Raut V. K .	Research Scientist	Mahyco Seed, Jalna	Maharashtra
25	Dr.R.M.Singh	Head Breeder, Cotton	Bioseed Research, India	Andhra Pradesh