

Efficacy of chemical fungicides and bio-agents against major cotton fungal foliar diseases *in vitro*

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Received : February, 2011; Revised : March, 2011; Accepted : April, 2011

SUMMARY

An investigation studies on major fungal foliar diseases of cotton was carried out *in vitro* in the Department of Plant Pathology, MPKV, Rahuri since isolation of leaf spot pathogens, pathogenicity to efficacy of chemical fungicides and bioagent in *in-vitro*. The isolated pathogens associated with fungal foliar diseases were *Alternaria macrospora*, *Myrothecium roridum* and *Helminthosporium spiciferum*. The pathogenicity of isolated pathogens was proved on susceptible cotton var. LRA-5166. These pathogens produced symptoms within 8-13 days. The pathogenicity test proved the pathogenic nature of isolated pathogens. Efficacy of six fungicides and two bioagents was tested in *in-vitro*. Mancozeb (0.3%), propiconazole (0.1%), propineb (0.3%) were found more effective against *Alternaria* leaf blight, propiconazole (0.1%) and copper oxychloride (0.25%) against *Myrothecium* leaf spot and mancozeb (0.3%) and propiconazole (0.1%) were more effective against *Helminthosporium* leaf spot in full and ½ concentration. *Aspergillus niger* was found more effective than *Trichoderma viride* in *in-vitro*.

Dighule, S.B., Perane, R.R., Amle, K.S. and More, P.E. (2011). Efficacy of chemical fungicides and bio-agents against major cotton fungal foliar diseases *in vitro*. *Internat. J. Plant Sci.*, 6 (2): 247-250.

Key words : Chemical fungicides, Bio-agents, Cotton, Fungal diseases

Cotton is the most important commercial crop which plays a vital role in the national economy. The area under Maharashtra state during 2007-08 was 31.91 lakh ha with the production of 60.00 l bales and productivity of 320 kg lint / ha (Anonymous, 2008). Cotton plant subjects to infection by various fungi, bacteria and viruses which leads to reduction in gross yield and deterioration in quality causing depreciation of market value. Amongst the diseases *Alternaria* leaf blight, *Myrothecium* leaf spot and *Helminthosporium* leaf spot poses an alarming situation in Maharashtra but very less information is available on these aspects. Hence, systemic studies on isolation, pathogenicity of isolated organisms and testing the efficacy of chemical / bioagents in *in vitro* condition was carried out.

MATERIALS AND METHODS

Fresh specimen of cotton leaf spot were collected from the experimental field of All India Coordinated Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth,

Rahuri. Six chemical fungicides namely chlorothalonil, carbendazim, copper oxychloride, mancozeb, propineb and propiconazole and two bioagents *Trichoderma viride* and *Aspergillus niger* in powder form were evaluated against the pathogens.

The common laboratory medium potato dextrose agar was used for the isolation of fungus associated with leaf blight and leaf spot of cotton. Potato dextrose broth (PDB) was used for growing pathogens to study pathogenicity. The well developed fungal growth free from any contamination was transferred to agar slants by hyphal tip method to obtain pure culture. Thirty sterilized earthen pots were filled with sterilized soil. Three seeds of susceptible var. LRA-5166 were sown in each pot in glasshouse under controlled conditions. Forty five days old plants were used to test the pathogenicity. The control plants were sprayed with sterilized water only. Koch's postulates were proved and three isolates were identified as *Alternaria macrospora*, *Myrothecium roridum* and *Helminthosporium spiciferum*.

Poisoned food technique was followed to evaluate the fungicide against pathogens responsible for leaf spots of cotton in *in vitro*. Observations on growth of colony diameter were recorded on 8th day after inoculation. Radial growth was measured and results were expressed as per cent inhibition of mycelial growth over control by using the following formula (Padule and Shinde, 1989).

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