

Use of a Commercial Biofungicide Against Wilt of Pigeonpea (*Cajanus cajan* (L.) Millsp.)

Himani Bhatnagar

Department of Botany, Banaras Hindu University, Varanasi 221 005, U.P.

Present Address : Legumes Pathology, Crop Protection Division, ICRISAT Asia Center, Patancheru 502 324, A. P.

Pigeonpea (*Cajanus cajan* (L.) Millsp.) - a major pulse crop of India and other tropical countries, suffers from a significant loss in the yield due to wilt disease, caused by *Fusarium udum*. Several attempts have been made to control this disease using cultural and host-plant resistant methods. Fungicides, have not been found to give adequate protection against *Fusarium* wilts, so far (Lemanceau and Alabouvette, 1993). Also, the recently growing concern of environmental protection, uneconomical use of chemical fungicides, pathogen-resistance and non-target killing of beneficial microorganisms, have emphasized the greater use of biocides in controlling the plant diseases.

Trichoderma spp. have been widely used as biocontrol agent against different plant diseases (Papavizas, 1985) but their use in control of pigeonpea wilt is relatively less reported. The present study reports assessment of a commercial formulation of *Trichoderma harzianum* (commercially named as *Trichoderma* MTR-35, manufactured by Makhteshim Chemical Works Limited, Israel) against the wilt disease of pigeonpea in a pot experiment. The commercial biofungicide *Trichoderma* MTR-35 was an insoluble greenish powder with a slight typical odour with bulk density 2.0 g ml^{-1} and pH 5.5-6.0. It comprised the propagules of *harzianum* as active ingredient. Recommended dose of the biofungicide was 10 to 20 g powder per 1000 g of soil (i.e. 1-2% w/w).

500 g of sterilized soil was mixed with 5% (w/w) sand- maize meal inoculum of *F. udum*. Biofungicide powder was added to the soil at concentrations 0.5, 1.0, 2.0 and 2.5% (w/w) by mixing uniformly. Control set was maintained by inoculating the soil with sand-inoculum of the pathogen alone. Surface sterilized seeds of 'Bahar' variety of pigeonpea were sown at the rate of 10 seeds per pot (12 cm diam). The experiment was maintained near field conditions. Wilt incidence was observed periodically and final observation was recorded after one month of inoculation.

Wilt was significantly (P) controlled with commercial biofungicide (Fig. 1). A negative and significant correlation ($r = -0.96$, p) was found between doses of biofungicide and per cent wilt incidence. Addition of the biofungicide to the soil at 1.0% (w/w) concentration resulted in 44% wilt incidence. A further increase in biofungicide concentration (2.0 and 2.5% (w/w) resulted in almost complete suppression (disease incidence %) of the disease. Disease incidence was 100% in control set and decreased with increasing concentration of biofungicide.

The present study demonstrates that suitable formulation of biocontrol agent (*Trichoderma* MTR-35) can effectively control pigeonpea wilt. Therefore its use in pigeonpea wilt disease management either alone or in combination with other components like host-plant resistance or cultural practices may pro-

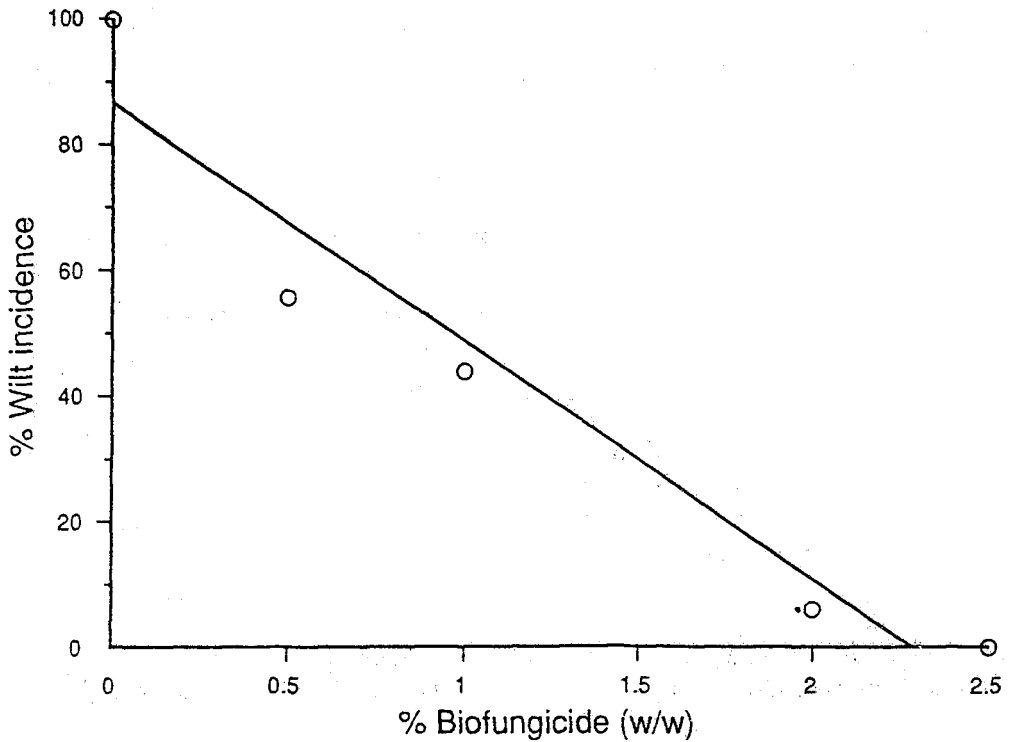


Fig. 1. Effect of commercial biofungicide *Trichoderma* MTR-35 on wilt incidence of pigeonpea

vide alternative and sustainable ways of disease control.

References

Lemanceau, P. and Alabouvette, C. 1993. Suppression of *Fusarium* wilts by fluorescent *Pseudomans*: Mechanism

and applications. *Biocontrol Science and Technology* 3 : 219:234.

Papavizas, G.C. 1985. *Trichoderma* and *Gliocladium* : Biology, ecology and the potential for biocontrol. *Annual Review of Phytopathology*, 23:23-54.

Received : 29-03-1995

Revised : 08-07-1995