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RESEARCH PAPER

Management of sclerotium root rot in lentil and fusarium wilt in chickpea using *Trichoderma* isolates

LAXMI RAWAT, Y. SINGH* AND J. KUMAR
Department of Plant Pathology, College of Agriculture, G.B. Pant University of Agriculture and Technology, Pantnagar, U.S. NAGAR (UTTARAKHAND) INDIA (Email : drysingh69@gmail.com)

Abstract : *Trichoderma* spp. have been extensively used as a biological agent for the management of a large number of soil borne, seed-borne and foliar plant pathogens by employing various mechanisms. In the present study, ten *Trichoderma* isolates were screened for their antagonistic potential against two major soil borne plant pathogens *viz*., *Sclerotium rolfsii* and *Fusarium oxysporum* causing root rot and wilt in lentil and chickpea, respectively. Under laboratory conditions, high antagonistic activity against both the test pathogens by all the *Trichoderma* isolates was observed. Under field conditions, Th-14 followed by Th-1 showed maximum plant growth promotion and biocontrol potential against *Sclerotium rolfsii* and *Fusarium oxysporum* f.sp. *ciceri* in lentil and chickpea, respectively.

Key Words : Lentil, Chickpea, *Trichoderma* spp., Wilt, Root rot, *Fusarium, Sclerotium*

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INTRODUCTION

Agriculture has been, and will continue to be the lifeline of the Indian economy. It sustains livelihood of about two-third of population, and is the backbone of agro industries. However, sustainability of agricultural growth has emerged as central issue confronting the nation. This issue is becoming even more important as the pressure on land and other natural resources has increased manifold with increase in population and per capita consumption of food grains. Several other biotic and abiotic stresses also contribute to crop losses every year. Among biotic stresses, diseases, pests, weeds, etc. contribute to several crop losses.

To prevent these crop losses, farmers resort to indiscriminate and mostly irrelevant crop protection measures which, over the time, have led to serious situations of resurgence in pest populations, increased crop losses and importantly, environment including ground water and food stuff pollution. Use of bioagents having biocontrol and plant growth promotion (PGP) activities have been considered as more natural and environmentally acceptable alternative to minimize the use of synthetic chemicals and their hazardous effects, and to provide protection to the plants against resident pathogen populations. Fungi are by far the most extensively researched group of biological control agents. Weindling (1932) over 75 years ago, demonstrated the antagonistic nature of fungal species from the genus, *Trichoderma*. The genus *Trichoderma* is the most common saprophytic fungi in the rhizosphere and widely distributed in all types of soil and other diverse habitats (Hajieghrari *et al*., 2008).

Trichoderma spp. are known to exhibit mycoparasitism, antibiosis, enzyme secretion, competition and induction of systemic resistance in plants as a means to inhibit the growth and multiplication of its target fungi (Benitez *et al*., 2004). *Trichoderma* spp. produce numerous biologically active compounds, including cell wall degrading enzymes, antifungal metabolites (Susanne and Markus, 2007), volatile (Michrina *et al*., 1995) and non-volatile compounds (Benitez *et al*., 2004) that impede colonization of pathogens in the rhizosphere of the plant, which help in reducing/ inactivating the pathogens population in the soil environment.

* Author for correspondence.