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Research Article

Phytophthora foot root (*Phytophthora capsici* Leonian.) of black pepper management through fungi toxicant and consortium in western Ghats of Karnataka

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ABSTRACT

Phytophthora foot rot (*Phytophthora capsici* Leonian) of black pepper could be managed effectively by application to vines with potassium phosphonate (@ 0.3 per cent) as spraying (@ 2 l^{-vine}) and drenching (3 $^{l\text{-}vine}$) and bioagent *Trichoderma harzianum* 50 g with one kg of neem cake as soil application during first week of June and third week August to the root zone. The protected vines exhibited minimum leaf yellowing, least defoliation, minimum death of vines and highest yield (green berry yield and projected yield). However, bioagents application i.e., Consortium of bacteria @ 10^8 cfu/g (for growth, nematode and Phytophthora suppression – IISR-6 and IISR 859) as spraying (@ 2 l^{-vine}) and drenching (@ 3 l^{-vine}) and *Trichoderma harzianum* (MTCC 5179) 50 g with one kg of neem cake as soil application around the root zone of the vine twice (June and August) also significantly reduced the disease with respect to less leaf infection, less yellowing, less defoliation and less death of vines.

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INTRODUCTION

Black pepper (*Piper nigrum* L.) high valued spice and widely used in Ayurvedic preparations has been under cultivation traditionally in arecanut and coconut mixed cropping systems since long time in Western Ghats of Karnataka. India exported more than half of the pepper produced here, that is 25,250 tonnes valued at Rs. 414.00 crores in 2008-09. Indian pepper fetches a premium price in major international markets because of its preference and intrinsic quality (Thomas, 2010).

In Karnataka, black pepper is cultivated in Coorg, Uttara Kannada, Dakshina Kannada, Shimoga, Chikmagalore and Hassan districts. Among the diseases of the crop, Phytophthora foot rot caused by *Phytophthora capsici* Leonian is a major and serious malady, causing huge economic loss and is the major constraints in its cultivation in Uttara Kannada Dist. of Karnataka under arecanut cropping system.

During monsoon and post monsoon, the crop was severely infected with the pathogen (*P. capsici*) at Sirsi, Uttara Kannada, Karnataka. This soil borne pathogen causes infection to leaves, stem, collar, root inflorescence, berries and results on mortality of the vines ranging from 34-65 per cent and resulting in huge monitory losses more than 46 per cent to farmers. Hence, an attempt was made to investigate the efficacy of potassium phosphonate and *Trichoderma harzianum* (MTCC-5179) and consortium of bacteria for control of the disease.

MATERIALS AND METHODS

A field experiment was carried out by applying fungicides, bioagents and plant product like neem cake at Horticulture Research Station (University of Horticultural Sciences, Bagalkot, Karnataka) Sirsi taluka of Uttara Kannada district of Karnataka in central Western Ghats of India during 2008-09.