
RESEARCH PAPER

Effect of carbofuran insecticide on VAM colonization and phosphorus uptake in chilli plants of Gwalior

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Vegetables form an important source of essential components of balanced human diet. The indiscriminate use of pesticides in fruits and vegetables is of great concern for health and environment safety. The objective of the present study, is to investigate the effect of carbofuran on VAM colonization and phosphorus uptake in *Capsicum annuum* Linn. plants. Addition of recommended dose of carbofuran decreased root colonization and higher dose of carbofuran effected the root colonization adversely. Various doses of carbofuran effected VAM colonization, which indirectly affected phosphorus uptake in chilli plants.

Key words : Carbofuran insecticide, Phosphorus uptake, VAM, Colonization

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INTRODUCTION

Bell pepper (*Capsicum annuum* L.) commonly known as chilli belongs to family Solanaceae. It is one of the most important spice cum vegetable grown in India with great export potential. Chilli is a native of new world subtropics, and is grown in over 1.4 million hectare producing about 18.8 million tones of fresh and dry fruits in India. The crop occupies an area of 0.9 million hectare, with an annual production of 0.9 million tones dry chilli in India (Ukkund *et al.*, 2007).

Vesicular arbuscular mycorrhizal (VAM) fungi are important rhizospheric microorganisms and are widespread in most of the vegetables. They are mutualistic symbionts between soil borne fungi and the roots of higher plants. Phosphorus (P) is one of the major essential macronutrients for biological growth and development. VAM benefit the host plant primarily by increasing the capability of the root system to absorb and translocate phosphorus through an extensive network of external hyphae (Menendez *et al.*, 1999). VAM fungi utilize insoluble forms of phosphorus as tricalcium phosphate, root phosphate, super phosphate rather than available forms of phosphate (Sieverding, 1991).

Pesticides are chemicals used in agriculture for the control of pests, weeds and plant disease. The use of a wide range of

chemicals to destroy pests and weed is an important aspect of agriculture practice in both developed and developing countries. The aim of pesticides application is to reduce the population of pathogens, but it can also affect the availability of compatible host species necessary for growth of particular mycorrhizal species (Jonas *et al.*, 2004).

Carbofuran is a carbamate insecticide which is effective by their systemic action in crop. The sap feeding pests like thrips, mites, aphids, etc., cause severe damage to chillies and the application of carbofuran to crops as granules is reported to be effective. Furthermore, the application of pesticides will affect the antagonistic interaction between VAM and plant pathogenic organisms and their subsequent beneficial effect on plant development and growth. Malathion, carbofuran, DDT, aldicarb, endosulfan and cypermethrin have been reported to negatively affect the colonization of plant roots when applied at high doses (Venkateswarlu *et al.*, 2004, Veeraswamy *et al.*, 2003).

RESEARCH METHODOLOGY

Field design:

The experiment was conducted at charak garden of Jiwaji University, Gwalior. *Capsicum annuum* Linn. variety sadabahar was grown in field plots (1m x 1m) in triplicates. The design