

## Effect of bavistin and endocel foliar sprays on VAM colonization and growth of four blackgram cultivars

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### ABSTRACT

The effect of one pesticide and one insecticide namely bavistin and endocel, respectively as foliar sprays on four cultivars of blackgram viz., LBG 20, LBG 402, LBG 17 and T 9 with respect to VAM colonization, nodulation, shoot dry matter, 100 grain weight, Phosphorus and nitrogen contents was studied in an field experiment. The bavistin and endocel sprays negatively affected all the parameters studied when compared to that of control ones. However, the bavistin spray resulted in comparatively greater reduction in all the parameters than that of endocel spray. The extent of reduction varied from cultivar to cultivar both in bavistin and endocel treatments.

**Key words :** Blackgram cultivars, Bavistin, Endocel, VAM infection

### INTRODUCTION

Symbiotic microorganisms have an enormous advantage over free-living microorganisms in soil because of their protective niche in plant roots. This makes mycorrhizal fungi much better placed than phosphate-solubilizing fungi and bacteria for bringing about phosphorus (P) uptake by plant roots. The role of VAM fungi in 'P' cycling in natural ecosystems is vital. In crop production, mycorrhizal inoculation of plants which can utilize mycorrhizal association for nutrient uptake, may well be a practical alternative to large applications of fertilizer. The VAM fungi are also implicated in the uptake of other nutrient elements like zinc (Gilmore, 1971) and sulphur (Gray and Gerdemann, 1973). Besides the direct nutritional advantages, the mycorrhizae have also been accredited with other benefits like increasing the resistance to disease, drought and salinity (Levy and Kriken, 1980).

Legumes play a key role in many agricultural systems as sources of high protein grain and herbage as well as for maintaining and improving soil fertility. Leguminous grain crops (pulses) provide nearly one quarter of the world's dietary protein requirements at present, mostly in tropics and sub-tropics. In legumes, the VAM infection enhances nodulation (Asai, 1944; Carling *et al.*, 1978). The legumes require high 'P' content for better nodulation, nitrogen fixation and optimum growth (Mosse, 1977). Blackgram, *Vigna mungo* (L.) Hepper, is believed to be a native of India and considered to be as one of the most highly prized pulses in India. It is extensively cultivated in almost all states of the country and often as a mixed crop. Blackgram provides an excellent forage and the grain is consumed in various forms.

Changing agricultural practices have resulted in increased application of pesticides and fungicides for the

control of diseases. The benefits of fungicides, increased crop growth via destruction of pathogens, may be diluted by harmful effects on beneficial microbes like mycorrhizal fungi (Trappe *et al.*, 1984). Several systemic and non-systemic fungicides were tested against a variety of VA mycorrhizal fungi for their effect on the degree of infection and sporulation. Menge (1982) found that benzimidazole fungicides like bavistin are toxic to VAM fungi. In spite of common practice of spraying agricultural chemicals on crops, the reports on the effect of fungicides or insecticides on VAM fungi when applied as foliar sprays are few. In the present investigation, an attempt was made to find out the effect of bavistin and endocel foliar sprays on four selected blackgram cultivars with respect to VAM colonization, growth parameters and grain weight.

### MATERIALS AND METHODS

A field plot of size 15 m x 7 m was prepared in Botanical garden of Acharya Nagarjuna University. Each main plot was sub-divided into nine blocks of 5 m x 2 m size with three blocks in each row. In each block, the four blackgram cultivars viz., LBG 20, LBG 402, LBG 17 and T9, each in four rows, were raised in random distribution. Bavistin at a concentration of 1g/lit and Endocel at a concentration of 2 ml/lit or water (control) were sprayed on foliage, selecting three blocks for each treatment and control in a random manner, one week after the 30<sup>th</sup> and 45<sup>th</sup> days.

The plants of treatments as well as control were carefully uprooted at 45 days and 60 days, washed gently under tap water and cut into one cm pieces. These cut root bits were stained following the method of Phillips and Hayman (1970). The stained root bits were observed for the per cent VAM infection by the method of Giovanetti and Mosse (1980) and also number of vesicles/