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Combined inoculation of arbuscular mycorrhizal fungi and Azotobacter beneficial to *Proralea corylifolia* L.

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The effect of *Glomus macrocarpum*, *Glomus fasciculatum* and *Azotobactor Proralea corylifolia* L. was studied in sterilized soil. Compared to un-inoculated plants, chlorophyll content, height, weight, number and area of leaves of plant and weight were maximum in plants inoculated with *G. macrocarpum*, *G. fasciculatum* and *Azotobactor* or with *G. macrocarpum* and *G. fasciculatum* or with only *G. macrocarpum*, or *G. fasciculatum*. The levels of root colonization was higher in all AM inoculated plants. There was significant increases in (3.96%) and P (0.21%) in the plant treated with a combination of *Glomus macrocarpum*, *Glomus fasciculatum* and *Azotobactor*. The results clearly indicated that compared to individual inoculation, AM fungal species with *Azotobactor* used in combinations were more beneficial for much improved growth of onion.

Key word : *G. mosseae*, *G. fasciculatum*, *Proralea corylifolia*, Per cent colonization.

INTRODUCTION

Soil provides the matrix for the biological processes involved in nutrient cycling. Among the biological processes involved in the rhizoplane, the unique role of symbiotic bacteria and the AM fungi which ensure fixation and mobilization and availability to nitrogen and phosphorus to plants have been well recognized (Marchner, 1995). It is well-established fact that the AM always prefer certain host exhibiting maximum symbiotic response and increased the growth and yield of crop mainly through improved uptake of nutrients (Allen, 1991). Scanty information is available in wide variation among and within different species on AM fungi in their ability to promote plant growth (Read,1996). This led to the concept of host preference 'by AM fungi (Mosse, 1973). Hence it is always better to select an efficient AM fungus for a particular host-soil-climate combination to harness the maximum benefits. This study was aimed to find the response of *Proralea corylifolia* to inoculation of *Glomus macrocarpum*, *G. fasciculatum* and *Azotobacter* in unsterile soil either singly or in combinations.

MATERIALS AND METHODS

The investigation was carried out in sterilized soil of polyhouse during 2006 - 2007 using aromatic plant seedlings of *P. corylifolia*. The soil used for experiment contained organic carbon 0.86%; pH, 6.8; available, N 0.74%; P_2O_5, 2.8 kg/ha, Electrical conductivity (EC) was 0.17 ohm^{-1} and native AM spore population averaging 87 spores / 50 g soil. Seedlings, used in the experiment were grown on sterile soil and 30 seedlings were transplanted in earthen pots of 25 x 15 cm diameter. Soil-root-cultures of *Glomus macrocarpum* and *G. fasciculatum* were cultivated on maize roots using mixture of soil : sand : FYM (1:1:1). The cultures containing clamydospores (96-112 spores/50 g soil) and root segments of maize colonized by particular AM fungus were used as mycorrhizal inoculum. Application of AM inoculum was 129 g soil / plant when single species was used and 5g soil/plant when two species used in combination in soil with seedling roots. Azotobacter as per treatment was 10g/plants. The experiment was arranged in a completely randomized design with five replications. Observation such as chlorophyll content, plant height, number of leaves, size of stem, and fresh weight of bulb were recorded 30 and 60 days after planting. The fresh weight of plant and leaves was taken immediately after harvest. The dry weight was determined after drying the plant at 80^0 C for 48 hrs. The root samples of each treatment were hcollected, processed and stained in 0.05% cotton blue in lactophenol (Philips and Hayman, 1970). Per cent root colonization was calculated using the method of Giovanetti and Mosse (1980). The nitrogen and phosphorus from shoot and bulb of onion were determined following the method of Jackson (1973). Estimation of chlorophyll was carried out following the procedure of Arnon (1949).

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