

Induction of Mycorrhizal Associations in *Piper nigrum* L.

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Black pepper (*Piper nigrum* L.) is used as a spice and the demand for organic spices is increasing. In organic farming, arbuscular mycorrhizal (AM) fungi are used as biofertilizers. Hence, the feasibility of inducing micorrhizal associations in pepper was investigated. Four inoculum levels of native *Glomus* sp. were tested in pot experiments to find out the effective spore density for inoculation. Inoculum levels were prepared by incorporating different numbers of viable (brown colored) spores per 800g pot: 400 spores(T1), 800(T2), 1200(T3) and 1600(T4). Completely randomized design was used with five replicates. Destructive sampling was done at 12th, 20th and 28th weeks post inoculation. The measurements taken were: plant height, shoot dry weight, root dry weight, number of leaves, and stem diameter at the collar region. Fungal colonization was observed in cleared roots under the microscope. Final AM spore density of soil was quantified. Data were statistically analyzed. **All** four treatments were successful in infecting pepper roots. The brown spore density was significantly different at 20th and 28th week of post inoculation. The mean number of spores was high in T2, 42.4 at 20th week and 41.2 at 28th week post inoculation. The brown spore densities of T2 and T3 increased with time while T1 and T4 showed a decrease. The shoot and root dry weights were significantly different ($p < 0.05$) at the first and second destructive sampling. The mean plant height was the highest in T2 at 12th, 20th and 28th weeks recording the heights being 36.42 cm, 60.76 cm and 95.9 cm, respectively. Shoot dry weight was high in T2: 2.45 g, 3.27 g and 5.72 g at 12th, 20th and 28th weeks, respectively. Root dry weight was high in T4, 0.22 g at 12th, T2 and T4 0.27 g at 20th and T1 0.57 g at 28th weeks. Accordingly the pot which incorporated 800 spores was found to be the most effective. Hence, the spore density influences for better colonization and simultaneous improvement in growth parameters.

Keywords: *Glomus* sp., Spore, Density, Pepper