

IMPACT OF MYCORRHIZAL INOCULATION ON THE GROWTH AND SURVIVAL OF COFFEE SEEDLINGS

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Mycorrhizal inoculation in coffee nurseries could be a novel strategy to improve nursery performance by enhancing nutrient uptake, promoting root development, protecting against root pathogens, and increasing resilience to drought and salinity. This study evaluated the effects of four treatments on coffee seedlings: T1 (control) used the recommended potting mixture (topsoil, sand, cow dung, and coir dust in a 1:1:1:1 ratio), T2, T3, and T4 incorporated 25 g, 50 g, and 75 g of mycorrhizal inoculum into the mixture, respectively. Treatments were arranged in a complete randomized design, with three replicates each with 30 seedlings maintained under shade house conditions. Growth parameters; plant height, collar diameter, fresh and dry biomass and root-to-shoot length ratio, N, P, and K levels in soil and plant tissues, and survival rate were recorded three months after establishment. Data were analyzed using analysis of variance (ANOVA) in R software and means were separated using the LSD test. A significantly higher ($p < 0.05$) collar diameter and height increment were observed in T4, than in the control. Coffee seedlings with mycorrhizal inoculation exhibited a higher shoot-to-root length ratio than the control. T2 and T3 showed a significantly ($p < 0.05$) higher fresh root biomass while higher shoot biomass was in the control. However, survival rates did not differ significantly among the treatments at three months of establishment. Soil P did not differ among treatments, yet N and K were significantly different in the T1 and T2 treatments, respectively. Coffee seedlings in T3 had significantly high P content. In conclusion, mycorrhizal inoculation greatly enhanced the growth and root development of coffee seedlings. Further research on the long-term effects and optimal dosage of mycorrhizal inoculation, is suggested to explore its potential use in commercial coffee nurseries.

Keywords: Biomass, Growth parameters, Mycorrhizal inoculum, Nursery performance