Iranian Journal of Horticultural Science and Technology 18 (3): 315 - 328 (2017)

Effect of Arbuscular Mycorrhizal Fungi on Seasonal Changes of Some Growth and Physiological Parameters of Apple Clonal Rootstocks in a Calcareous Soil

A. Gharaghani*, A. Hosseini and M. Zarei[1]

An experiment carried out to study the effects of arbuscular mycorrhizal fungi on growth and physiological parameters ofthreecommercialapple clonalrootstocks during growing season in greenhouse. This investigation was conducted with two factors, rootstock (M_9, M_7 and, MM_{106}) and species of arbuscular mycorrhizal fungi (*Glomus versiforme*, *Rhizophagus intraradices*, *Claroideoglomus etunicatum* and, control) in a completely randomized design. Growth (including plant height and diameter and shoot fresh weight) and physiological (including total chlorophyll, photosynthesis, and transpiration) parameters as well as root colonization were measured in 11, 15 and 19 weeks after transplanting. Results showed that mycorrhizal treatments and rootstoks had significant effects on all measured parameters comparing to the control. It was also shown that the fungus *Glomus versiforme* performed better than other fungi having the highest records for almost all of the measured parameters. Among the rootstocks, MM_{106} performed the highest shoot fresh weight (as well as plant height in the first and second measurements) but the final height of M_7 was more than MM_{106}. The highest and the lowest plant diameter were observed in MM_{106} and M_7, respectively. The highest chlorophyll content, transpiration and photosynthesis rate was measured in M_9 but the highest root colonization was recorded in M_7. It seems that choosing proper rootstocks and treating them with suitable arbuscular mycorhizal fungi could reduce adverse conditions of calcareous soils for apple trees.

Keywords: Arbuscular mycorhizal fungus, Apple, Clonal rootstocks, Growth, Photosynthesis.

1. Assistant Professor, former M.Sc. Student, Department of Horticultural Science and Assosiate Professor, Department of Soil Science, College of Agriculture, Shiraz University, Shiraz, Iran, respectively.
*Corresponding author, Email: (agharghani@shirazu.ac.ir).