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EFFECTS OF ARBUSCULAR MYCORRHIZAL FUNGI ON CARBON DIOXIDE (CO_2) AND WATER (H_2O) EMISSIONS IN TURFGRASS SOIL UNDER DIFFERENT SALINITY IRRIGATION LEVELS

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Abstract

Host plants inoculated with arbuscular mycorrhizal (AM) fungi are widely believed to tolerate stressful situations such as heat, salinity, drought, metals, and extreme temperatures. However, increased nutrient and/or water uptake by AM symbiosis may affect soil biochemical properties and emissions of the greenhouse gas carbon dioxide (CO_2). Therefore, an experiment was designed to investigate the effect of AM fungi on CO_2 and water (H_2O) emissions in lawns. Three different AM fungi species were used in this experiment (*Funneliformis mosseae*, *Claroideoglomus etunicatum* and *Rhizophagus irregularis*). Turfgrass plants were grown in pots in mycorrhizal and non-mycorrhizal soils for ten weeks, and the plants were subjected to irrigation cycles with salted water at 0.6, 4.5, 6.0, and 7.5 dS m^{-1} ratios. The effects of AM fungi and saline irrigation at different rates on CO_2 and H_2O emissions and their effects on plant morphological growth and AM fungi parameters were also evaluated. At the end of the experiment, it was seen that irrigations with different salt ratios affected AM fungi, which was negative as the salt ratio increased. Nevertheless, a symbiosis was established between the plant and the AM fungi. CO_2 and H_2O emissions and soil temperature decreased with mycorrhiza treatments and increased irrigation water salinity. In addition, it was determined that AM fungi increased plant growth under salt stress. Among the AM fungi species, especially *C. Etunicatum* was more successful.

Key words: arbuscular mycorrhizal fungi, greenhouse gas, salinity, symbiosis, turfgrass

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