

BIODIVERSITY AND SIGNIFICANCE ROLE OF MYCORRHIZAL FUNGI FOR GLOBAL CROP PRODUCTIVITY AND ECOSYSTEM SUSTAINABILITY IN ORGANIC FARMING SYSTEMS

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A b s t r a c t

A sustainable farming system is biologically-based when its productive and supportive components, plant and soil, are in balance. This balance depends on the ability of soil and plant to support, in concert, a healthy and diverse native microbiota at the plant-soil interface, the rhizosphere. The rising claim for more environmental friendly and healthy agriculture is a strong incentive to find alternative strategies to replace the use of mineral fertilizer and pesticide. *Arbuscular mycorrhizal* fungi (AMF), a main component of soil microbiota, represent a promising tool as providers of key ecological services. Mycorrhizal fungi are widespread in agricultural systems and are especially relevant for organic agriculture because they can act as natural fertilisers, enhancing plant yield. Here we explore the various roles that mycorrhizal fungi play in sustainable farming systems with special emphasis on their contribution to crop productivity and ecosystem functioning. We review the literature and provide a number of mechanisms and processes by which mycorrhizal fungi can contribute to crop productivity and ecosystem sustainability. In the process they enhance plant growth and health, the proliferation of soil organisms, and the formation of soil structure without recourse to an application of chemicals. These fungi are therefore a key to biologically-based, sustainable farming. Our results highlight the significance of mycorrhizal fungi for sustainable farming systems and point to the need to develop farming systems in which the positive effect of these beneficial soil fungi is optimally being utilized.

KEY WORDS: Arbuscular mycorrhizal fungi, biodiversity, Sustainable agriculture



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