

P.56 - The impact of agricultural practices on arbuscular mycorrhizal fungi

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Symbiotic associations between arbuscular mycorrhizal fungi (AMF) and plant roots are widespread in natural environments and provide a range of benefits to the host plant. These include improved nutrition, enhanced resistance to soil-borne pests, diseases, and drought, as well as tolerance to heavy metals. Lastly, AMF improve soil structure. As obligately mutualistic symbionts these fungi also colonize the roots of many agricultural crops. It is often claimed that agricultural practices (use of fertilisers and biocides, tillage, dominance of monocultures and the growing of non-mycorrhizal crops) are detrimental to AMF. As a result, agroecosystems are impoverished in AMF and may not provide the fully expected range of benefits to the crops. Some agricultural farming systems (also known as biological and ecological agriculture) may have a less negative impact on AMF because they exclude the use of water-soluble fertilisers and most biocides and generally have diverse rotations and reduced soil tillage. In the frame of a long-standing project, we examined whether and how AMF communities are influenced by farm management practices in different agroecosystems. We investigated rice (biological versus conventional farming), maize (tillage and N fertilisation) fields as well as vineyards in Italy, and many subtropical crops (various tillage practices) in Mexico. The results consistently demonstrate that agriculture treatments strongly affect the diversity of AMF communities and that land management may be crucial to increase the benefits and the biodiversity of AMF in farming systems.