

## Publication

## Arbuscular Mycorrhizal Fungi and Rhizobium to Control Plant Fungal Diseases

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Soil microorganisms can be used to decrease the input of fertilizers, pesticides and other chemicals. Among soil microorganisms, arbuscular mycorrhizal (AM) fungi and Rhizobium spp. can promote plant growth and control plant fungal diseases. However these microorganisms are not yet used in commercial biocontrol products. Integration of arbuscular mycorrhizal fungus with Rhizobium sp. thus appears to be a promising approach for sustainable agriculture. Arbuscular mycorrhizal fungi and root-nodule bacterium Rhizobium are two root symbionts. Arbuscular mycorrhizal fungi increases soil nutrients and water absorption, while root-nodule bacteria fix atmospheric nitrogen and produce antibiotics and phytoalexins. These microbes modify the quality and abundance of rhizosphere microflora and alter overall microbial activity of the rhizosphere. They induce changes in the host root exudation pattern. A procedure for successful development of these microorganisms is required by selection and screening of efficient isolates. Knowledge of culture systems that are adapted to their establishment and multiplication is needed. Arbuscular mycorrhizal fungi provide specific niches for bacteria. Arbuscular mycorrhizal bacteria improve nutrient acquisition in plants. Arbuscular mycorrhizal bacteria may contribute to ability of arbuscular mycorrhizal fungi to inhibit pathogens, acquire mineral nutrients and modify plant root growth. Combined use of these microorganisms is more beneficial than their use alone. These symbionts also interact with other beneficial microorganisms synergistically and can be exploited for sustainable agriculture.

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