

**Book review:**

**Impact of Arbuscular Mycorrhizas on Sustainable  
Agriculture and Natural Ecosystems**

*Edited by S. Gianinazzi and H. Schuepp*

This book is the product of the 1993 meeting of a European network on arbuscular mycorrhizas. It gives an excellent, comprehensive coverage of the state of knowledge (at the time of the meeting) on arbuscular mycorrhizal symbioses. The degree to which the book fulfils the promise contained in the title, however, is disappointing. Only two of the 17 chapters have substantial discussion of the role of arbuscular mycorrhizas in either agricultural or natural systems.

The first four chapters are devoted to characterization of the fungal partner, including taxonomy, diversity and methodologies for characterization. Chapters 5 through 8 are devoted to plant-fungus interactions including physiological characteristics of the host plant that influence the development and functioning of the mycorrhiza, the infection process, interactions at the cellular level and the influence of colonization on root architecture.

Chapters 9 and 10 offer the main contribution of the book to the subject indicated by the title. The first of these chapters is related to the sustainability of plant-soil systems in general, while the second is related more specifically to agricultural systems. The role of arbuscular mycorrhizas in nutrient cycling and the importance of the extraradical mycelium are emphasized in chapter 9. The authors of chapter 10 urge us to look beyond the effect of arbuscular mycorrhizas on plant growth by considering the extra benefits that "result from the inseparable, complex processes that unite all components of the agrosystem." The extra benefits discussed include soil structure and aggregation, and interactions with other soil biota including fauna.

The next five chapters are devoted to more specific aspects of the symbiosis such as hyphal phosphorus transport, approaches to the study of the extraradical mycelium, water relations, uptake of heavy metals and biocontrol of pathogens.

The penultimate chapter discusses the potential to manage the interaction between arbuscular mycorrhizal fungi and other soil microorganisms including *Rhizobium*, *Frankia*, diazotrophic bacteria, PGPR and phosphate-solubilizing microorganisms. The final chapter discusses the opportunities for using arbuscular mycorrhizas in the fast growing industry of micropropagation of plants.

The strength of this book is in the comprehensive coverage presented, the thoroughness of coverage of each topic, and the extensive list of references included. The book would be a very useful reference for anyone interested in arbuscular mycorrhizal symbioses in general, not just for those interested in their impact on ecosystems.

All chapters of the book are well written, although more careful editing would have avoided numerous typographical errors.

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