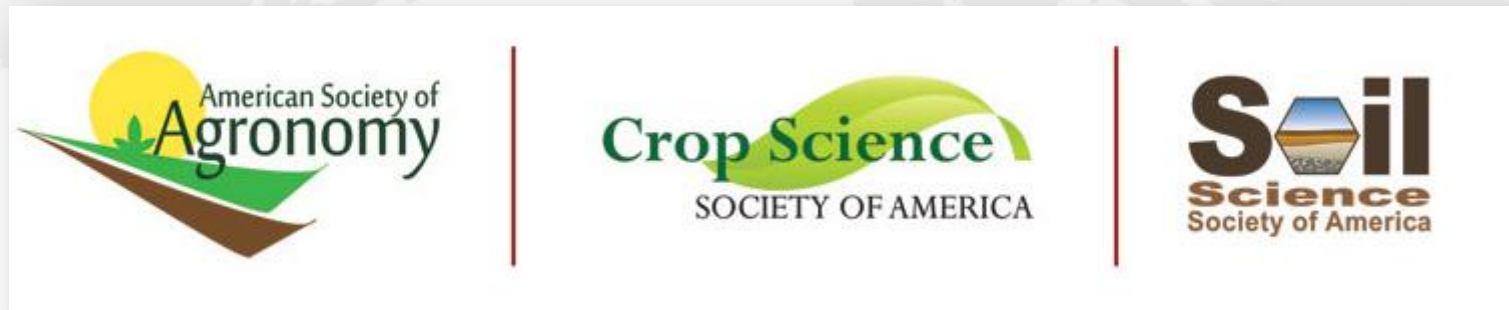


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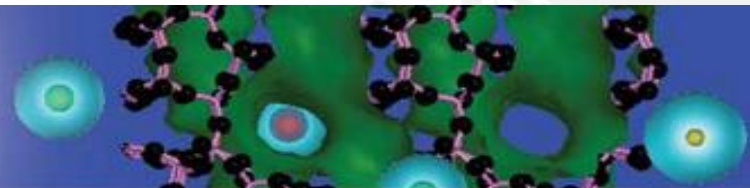


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*Mycorrhizae in Sustainable
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Vesicular-Arbuscular Mycorrhizae and Environmental Stress

David M. Sylvia and Stephen E. Williams

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The soil environment contains many physicochemical properties that are constantly being modified by dynamic biological processes. In particular, soil in the immediate vicinity of plant roots is influenced profoundly by root-derived nutrients and microbial activity. Among the predominant organisms in this region are the vesicular-arbuscular mycorrhizal (VAM) fungi. These fungi are found in nearly all soils where plants grow, including environments that are considered stressful to plant growth. In fact, we expect mycorrhiza to have their greatest impact when plants are exposed to growth-limiting environmental stress.

Abbott and Robson (1991) stated that "the relationship between the level of mycorrhizal colonization and soil chemical and physical properties are markedly variable." Indeed, there are now considerable data demonstrating that VAM fungi have adapted to a wide range of environmental conditions (Stahl & Christensen, 1991). The objective of this chapter is to document the effects of various soil environmental stresses on the occurrence, distribution,

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...Dead pale yellow creamy **mycorrhizae** of beech...

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Horizons and Humus Forms in Beech Forests of the Belgian Ardennes

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Abstract

Forest soil organic horizons are named on the basis of visual observations made directly in the field, thus this is often subjective. To find more objective bases for their classification, humus form horizons in 13 beech stands (*Fagus sylvatica* Ehrh.) were compared. Test sites were located in the Belgian Ardennes (western Europe), which encompasses a wide range of ecological conditions. I used a semi-quantitative micromorphological method for the description of horizons, and a multivariate method for data analysis. These methods helped to discern objective discontinuities among Oi, Oe, and Oa horizons, adding new criteria for their characterization, such as the root system of trees. Within these horizons, transitions between sub-horizons are gradual and thus do not lie on clear-cut criteria. The transition between Oa and A horizons was also gradual. The composition of Oa and A horizons varies according to humus form. The vertical distribution of soil organisms and their vertical movements were considered the origin of discontinuous and continuous processes taking part in the transition from one horizon to another. The observation of horizons under a dissecting microscope may

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