ABSTRACT

Studies on vesicular-arbuscular mycorrhizas in Barbados

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Three of the four genera of the Endogonaceae that form vesicular-arbuscular mycorrhizas (VAM) are represented in Barbadian soils. *Glomus* spp. and *Sclerocystis* spp. were common in sand dunes, forest soils and cultivated soil under onions. Three unidentified sporocarp forming *Glomus* species were found in sand dunes and forest soils. *Gigaspora* spp. were found only in the natural (undisturbed) ecosystems, particularly in sand dunes, where *G. Margarita* was very common. *Acaulospora* spp. were not found.

Infection levels in field onions (inland wide) ranged from 40% to 69% and plants were infected with fine hyphae, coarse hyphae or both. Available phosphorus ( Olsen P) varied greatly even between neighbouring fields and increased levels of P decreased VAM infection levels. The best conditions for growth of onions (adjudged by yields) corresponded with the best conditions for the development of the VAM fungi. In many fields, plants showed symptoms of 'onion blast' disease. Of those plants affected by onion blast, those that had the worst symptoms also had the highest VAM infection.

Pigeonpea (*Cajanus cajan*) showed a dramatic response to VAM in an experiment using natural 'infective' soil and soil treated by a new 'freeze-thaw' technique. In this treatment, soil is deep frozen and
held at -20°C and then warmed to +28°C; the cycle is repeated. The soil is rendered free from viable VAM fungi and more complex organisms, while bacteria such as Rhizobium are unaffected.

Daylis (1973) hypothesised that sedges (Cyperaceae) have become non-mycotrophic through having evolved a highly efficient graminoid root system. But sedges in Barbados were found to be regularly mycotropic when the soil was not oxygen deficient due to waterlogging. The graminoid characteristics of roots were not altered by infection nor waterlogging. The Daylis' hypothesis as it applies to sedges is therefore rejected.