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CHAPTER 6

GENERAL DISCUSSION AND CONCLUSIONS

Consistent AMF colonization of *S. sudanense* trap plants by banana plantation soils from Uganda suggests that AMF are active biological components of this habitat. MIP assessment of the Ugandan banana farm soils showed that soils containing banana genotype *Musa* AAA had a higher mycorrhizal activity than soils containing banana genotype *Musa* ABB. This suggests that specific banana cultivars (*Musa* AAA) may support a more vigorous AMF population in the banana farm soils. Banana cultivars have been shown to differ in their receptivity to AMF infection (Declerk *et al.*, 1995). Therefore incorporation of the mycorrhizal technology in order to improve the sustainability of banana production in Uganda should look into selecting banana cultivars that are highly receptive to AMF.

The fact that *S. sudanense* plants became mycorrhizal from these soils implies that banana plants growing in these farm soils could also become mycorrhizal. Bananas are known to form facultative symbiosis with AMF in the field (Rizzardi, 1990). However, mycorrhization of these plants in the farm soils would be unplanned and uncontrolled. This would result in association with unknown indigenous AMF of unknown beneficial properties and quantity. Therefore screening for AMF effective at addressing specific problems faced by Ugandan

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banana farmers should be a consideration for future research. One of the major factors contributing to declining banana production in Uganda is plant parasitic nematodes. Studies (Umesh *et al.*, 1988; Jaizme-Vega *et al.*, 1997; Pinochet and Fernandez, 1997) have shown that AMF may be effective at increasing plant resistance to nematodes. Aluminum toxicity, which is a common problem in Ugandan soils, has also been shown to be potentially alleviated by AMF (Rufyikiri *et al.*, 2000).

Successful inoculation of micropropagated banana plants with *G. mosseae* (Nicolson & Gerdemann) Gerdemann & Trappe isolated from Uganda has indicated the potential for using indigenous AMF species in inoculation programs. Selection of high-performance AMF species among isolated indigenous species should be a consideration for future research. Isolation of AMF species from soil is not difficult however it is time consuming. I was able to isolate only two AMF species in the time I had.

The majority of the farms in Uganda are of low-input agricultural practice. Suckers are used as planting material. Without having to incorporate a whole new technology of outplanting practice, perhaps investigations could be made into successfully mycorrhizing suckers to augment the habitat mycorrhiza. From my experience, it is not difficult to infect young plant material with AMF. However it is difficult to predict mycorrhizal species dominance and commensurate mycorrhizal plant benefit.

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An efficient system can be developed to successfully mycorrhize highly receptive banana cultivars with a dominant and effective indigenous AMF such that outplanting provides a competitively dominant plant/symbiont combination for a specific habitat. Plant/symbiont couples of known effectivity for plant disease control, nutrient absorption, toxicity alleviation and stress conferance would be a realistic choice to provide the low-input farmers with sustainable and successful banana cropping systems. It is possible that the incorporation of the mycorrhizal technology can contribute to the improvement of sustainable and successful banana production by the low-input agricultural sector in Uganda.