

Occurrence of Arbuscular Mycorrhizal Fungi and *Fusarium* in TC Banana Rhizosphere Inoculated with Microbiological Products in Different Soils in Kenya

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ABSTRACT

The impact of microbiological commercial products (PHC Biopak, Rhizatech and ECO-T) on the occurrence of mycorrhizae and *Fusarium* in the rhizosphere of tissue culture banana (Gros Mitchel cv.) was assessed. Tissue cultured banana plantlets were inoculated with PHC Biopak (*Bacillus*), Rhizatech (mycorrhiza) and ECO-T (*T. harzianum*) under greenhouse conditions using a completely randomized design in a Vertisol, Rhodic Ferralsol and Humic Nitisol sampled from the major banana growing regions in Kenya. Potted plants were later established under field conditions in the three agro ecological zones. Roots and soils sampled at end of potting and at flowering were assessed for AM fungi colonization and *Fusarium* populations. The effect of product inoculation on AM fungi colonization varied and only significant ($p < 0.05$) in Rhodic Ferralsol with Rhizatech increasing intensity of colonization by 31.9% and PHC Biopak increasing the frequency of colonization by 38.6% compared to the non-inoculated control (12.9%). *F. oxysporum*, fsp. *cubense*, *F. proliferatum* and *F. incarnatum* were recovered from the experimental soils. *Foc* was the most abundant in the three soils (prior to inoculation) accounting for 60.6% of all *Fusarium* colony forming units. After inoculation, at the end of potting stage and at flowering, *F. proliferatum* was mostly isolated from the three zones accounting for 35.2% of the total fungal population. *Foc* was isolated from Humic Nitisol and Vertisol accounting for 11.5% of the total fungal population. PHC Biopak, ECO-T and Rhizatech suppressed *Foc* colony forming units per gram of soil by 47, 68 and 55%, respectively in the Humic Nitisol. ECO-T reduced *Fusarium* colony forming units per gram of soil by 6% in Rhodic Ferralsol and PHC Biopak by 50% in Vertisol compared to the non-inoculated soils. There is potential in use of commercial microbiological products to suppress *Foc* and the efficacy of the products depends on soil physico-chemical properties.

Key words: Tissue culture banana, *Trichoderma*, *Bacillus*, mycorrhiza, *Fusarium*