

**Screening selected isolates of endophytic *Fusarium oxysporum* for biological control of  
banana nematodes in tissue culture banana**

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## ABSTRACT

Studies were carried out to investigate the efficacy of selected isolates of endophytic *Fusarium oxysporum*, against banana nematodes under greenhouse and field conditions. Greenhouse experiments involved the use of two isolates *4MOC321* and *1ISR23*, tested against *Pratylenchus goodeyi* in two experiments. Isolate *V5W2* was used as a positive standard. The field experiments involved the assessment of three isolates *V5W2*, *Emb2.4o* and *Eny 7.11o* from bananas in Uganda, against banana nematodes in both on-farm and on-station trials. Dessert banana cv. Giant Cavendish and cv. Grand Nain were used in all experiments. The on-station trial assessed the response of two month old banana plants, inoculated with one of the three *V5W2*, *Emb2.4o* and *Eny 7.11o* isolates and challenged with mixed nematode species (*P. goodeyi* and *Helicotylenchus multicinctus*) one month later. The on-farm trial assessed the performance of two month old banana plants inoculated with each of the three isolates and planted into a field naturally infested with nematodes (*P. goodeyi*, *H. multicinctus* and *Meloidogyne* spp.). All endophyte isolates significantly suppressed nematode populations and damage to bananas in both greenhouse and field studies. Results from the greenhouse experiment demonstrated a significant reduction of *P. goodeyi* population by >50 % and percentage root necrosis was reduced by >30 % by the endophytes. *Fusarium oxysporum* isolates *4MOC321* and *1ISR23* also enhanced plant growth. In the on-station trial, the endophytes suppressed nematode population density by >45 % and reduced percentage root necrosis by >20 %. Nematode damage was also significantly lower in endophyte treated plants compared with control plants in on-farm trial. Isolates *Eny7.11o* and *V5W2* enhanced plant growth as compared to the control treatments. Banana yields were significantly increased following endophyte treatments. Carry-over effect of endophytes to suckers was also evident. Suckers from endophyte inoculated plants had higher percentage root

colonization compared to non-inoculated plants. The study has demonstrated the potential of endophytic *F. oxysporum* to suppress key plant parasitic nematode populations under field conditions and, promote banana plant growth and yield.