

**Evaluation of Endophytic *Fusarium oxysporum* Isolates for Control of Lesion  
Nematodes *Pratylenchus goodeyi* in Tissue Culture Banana Plants**

**Catherine Wanjiku Machungo**

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## ABSTRACT

*Pratylenchus goodeyi* is one of key pests of bananas in Kenya. Although management of this pest has mainly relied on use of clean planting material produced through tissue culture, re-infestation of plants in the field remains a critical concern. Fungal endophytes may be used to provide protection and extend plant life. In this study, the effect of selected *Fusarium oxysporum* endophytic isolates on *P.goodeyi* damage, population and growth of tissue culture bananas and the effect of different endophyte inoculation methods on root colonization of tissue culture banana plants were evaluated. Tissue culture banana variety Giant Cavendish and Grand naine were inoculated with fungal endophytes by sprinkling the roots with the solid substrate containing the fungal inoculum during planting. The plants were inoculated with 1200 *P.goodeyi* in mixed developmental stages and nematode damage and population evaluated sixteen weeks later. Plant response to endophyte treatment was assessed from plant height, girth, number of functional leaves, length and width of the youngest leaf, fresh and root and shoot dry weights for the entire duration of the experiments. Two post flask weaning techniques, plants potted before inoculation and plants placed in nutrient solution before endophyte inoculation and three inoculum delivery methods namely use of solid substrate, dipping plants in fungal inoculum and drenching plants with the fungal inoculum were evaluated. *F.oxysporum* endophytic isolates significantly suppressed nematode damage and population densities in inoculated plants compared to uninoculated controls ( $P<0.001$ ). Reduction in nematode damage and population in inoculated plants over the controls ranged between 28.9% to 66.4% and 46.1% and 65.2% respectively. Improved growth was observed for plants inoculated with endophytes when compared to the control treatment for most growth parameters, though the differences were not significant ( $P>0.05$ ). Up to 14.4% increase in plant height, 12.9% increase in girth, 38.6%

increase in shoot weight and a 36% increase in root weight was observed for endophyte inoculated plants when compared to the control treatment. Percentage root colonization did not differ significantly between plants potted before inoculation and plants put in nutrient solution prior to inoculation ( $P>0.05$ ). Percentage root colonization for the two techniques ranged between 47.6% to 54.7% for the three endophytic isolates. There were no significant variations in percentage root colonization between the three inoculation methods ( $P>0.05$ ), however the use of solid substrate gave relatively higher rates of colonization. The results demonstrate the potential of fungal endophytes for the biological control of banana nematode *P.goodeyi*, potential to enhance plant growth and ability to colonize tissue culture banana plants.