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Can Successive Generations of Banana Plants Be Protected from Nematode Attack by A Single Inoculation with Beneficial Endophytic Fungi?

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Abstract

Increasing interest in biocontrol of crop pests for environmental and human health reasons have opened the door to a great variety of potential biocontrol agents from a range of environments. Among these, beneficial bacterial and fungal endophytes, i.e. microorganisms that colonize plant tissue without causing disease symptoms and help protect the plant against diseases or pests, are of special interest. This is in part due to the fact that they can be isolated, re-introduced and re-isolated from the very tissues where pests and diseases are known to attack. In the case of roots and nematodes, this is especially interesting, because an introduction of such beneficial organisms into root tissues prior to planting would avoid the need for soil applications of biocontrol agents in great quantities, as endophytes are already "on site" and ready to protect the crop. Beneficial endophytic fungi have been identified for the management of the burrowing nematode, *Radopholus similis*, in banana. These fungi were isolated from healthy roots of bananas grown in areas where natural nematode suppression was either suspected or proven. Once isolated, fungi were screened for nematode suppression in greenhouse trials and later in field experiments. These experiments proved that the endophytes chosen are effective in protecting banana plants not only at the greenhouse level, but also under field conditions. However, as banana is a perennial crop, with re-plantings occurring only at lengthy intervals, the question of how to protect second and subsequent generations remains. Evidence of a transfer of nematode suppression provided by individual fungal endophytes from one banana generation to the next has been found. This data provides incentives to pursue a long-term nematode-bio-control approach in banana using beneficial endophytic fungi.

Keywords: Biocontrol, *Musa* (AAA), nematode management, suppression, transfer

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