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"Development on the margin"

Seed Priming with Fungal Endophytes: A New Strategy to Minimize Leafminer Damage in Leguminous Crops

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Abstract

The occurrence of invasive *Liromyza* sp. in farms across sub-Saharan Africa has continued to devastate vegetable production as well as threaten food security income and livelihoods. Seed treatment with pesticides and or beneficial microbes has become an important aspect of modern IPM systems to provide seedlings with broad protection against pests and diseases. However, prior to utilisation of any biopesticide in pest management, its efficacy and environmental behaviours must be assessed. The present study evaluated the effects of fungal endophyte seed priming on seedling emergence, host plant preference, fitness and performance of two leaf miner species, *Liriomyza sativae* and *L. trifolii*. Overall, there was no effect of endophyte seed priming on seed germination, with endophyte and untreated seeds having a germination rate of 66.7–100 % and 80.0–93.3 %, respectively. Irrespective of leafminer species, the number of eggs laid on ten-day old common bean seedling was not affected by endophyte seed treatment, 48 h after plant infestation. However, seed priming with *Trichoderma asperellum* strain M2RT4 and *Beauveria bassiana* strains S4SU1 and G1LU3 significantly suppressed larval hatching, development and pupation. Consequently, the number of larvae quadrupled in the endophyte free treated plants while those of pupae and adults doubled for the untreated seedlings. As a result, bean seedlings primed with *T. asperellum* or *B. bassiana* were less damaged when compared to the untreated controls. The results of this study suggests that seed priming with mutualistic endophytic fungi can be a useful tool for expanding IPM strategies for effective management of leaf miner damage in leguminous crops.

Keywords: Fungal endophytes, IPM, leafminers, legumes, seed priming

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