



On the use of biocontrol agents against plant-parasitic nematodes

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Abstract : Plant-parasitic nematodes (PPN) undoubtedly represent a serious threat to the world economy. Growing dissatisfaction with chemical nematicides due to environmental issues obstructing the use of traditional chemicals has created re-directions in the type and choice of applicable nematicides. The role of different beneficial microorganisms ranks high as environmentally friendly biological alternatives to synthetic nematicides. However, in order to maximize the benefit from these biocontrol agents against PPN, a few issues and/or shortcomings in experimentations and applications against PPN have been reviewed herein. It should be highlighted that an evaluation of biocontrol agent efficacy, based on egg mass index (EI) is better than that based on nematode-gall index (GI) because the former index measure nematode fecundity. Moreover, EI does not measure nematode reproduction adequately because it does not quantify the eggs produced. Nematode eggs may be a better parameter of sedentary nematode reproduction than GI, EI or other developmental stages. Possible weak links in a nematode's life-cycle that can be targeted for biocontrol by fungal or bacterial antagonists are illustrated herein in more details. Many researchers study the effects of biocontrol agents on their targets of PPN exclusively but the efficacy of these agents on crop yields and/or plant growth parameters as the crux of the matter should also be considered. Moreover, such an efficacy is mainly based on PPN parameters but measuring accumulations and/or activities of pathogenesis-related proteins and other relevant compounds could be used as fast and accurate biochemical markers or components of systemic resistance in plants against PPN infection and reproduction.

Key words: Plant-parasitic nematodes, biocontrol, induced resistance, markers, mode of action.

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