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Effect of Non-Pathogenic *Fusarium oxysporum* Strain 162 in *Solanaceae* and Cucurbitaceae Crops Towards *Trialeurodes vaporariorum*

R.D. Menjivar, J. Kranz, Richard A. Sikora

University of Bonn, INRES Institute of Crop Science and Resource Conservation, Dept. of Plant Pathology, Unit. Nematology in Soil Ecosystem, Germany

Abstract

The greenhouse whitefly *Trialeurodes vaporariorum* (GHWF) is one of the most widely distributed insect pests in tropical and subtropical agricultural regions, affecting over 600 different plant species. *T. vaporariorum* (GHWF) has been a problem in greenhouses for many years, because it has the capability to reduce plant productivity and longevity. Besides whiteflies are very important vectors of viruses and are able to cause significant crop damages and yield losses. Induction of systemic resistance by non-pathogenic microorganisms is a well known option in plant protection. For example non-pathogenic strains of fungi of the genus *Fusarium* used to induce systemic resistance are able to control the incidence of *Fusarium* wilt and *Meloidogyne incognita* in tomato. Accordingly the objective of this study was to evaluate the effect of *F. oxysporum* strain 162 (Fo 162) in two different vegetables towards *T. vaporariorum*. Fo 162 was applied at $1 \times 106\,\mathrm{cfu\,g^{-1}}$ of soil twice to the respective treatments. The first fungal inoculation took place during germination time and the second when the seedlings were transplanted. About 1000 GHWF adults were released in each trial. Ten days after the second Fo162 inoculation, the number of GHWF adults on the leaves was counted for the next 12 and 9 consecutive days on tomato (*Lycopersicon esculentum*) cv. Hellfruecht and on squash (*Cucurbita pepo*) cv. Eight Ball, respectively. The study revealed that 38 % (mean number of all consecutive samplings) of the released GHWF adults could be found on the tomato plants treated with Fo162 in comparison to 62 % of all counted GHWF adults detected on the leaves of the non-treated control plants. In squash the percentages were 20 % (plants treated with Fo162) and 80 % (control plants), respectively. This investigation demonstrates an impact of the endophytic fungus Fo162 in tomato and squash on *T. varporariorum* because it reduces the population density of this pest on the leaves of the tested crops. This might be used as a further option in an integrated pest management system to control this serious greenhouse pest. The possible fungal mode of action and its effect on insects regarding resistance mechanisms are discussed.

Keywords: Cucurbitaceae, endophytic fungi, insects, pests management, resistance mechanisms, *Solanaceae*, vegetables, whiteflies

Contact Address: Richard A. Sikora, University of Bonn, Institute of Crop Science and Resource Conservation, Nussallee 9, 53123 Bonn, Germany, e-mail: rsikora@uni-bonn.de