Gefördert durch das 7te Rahmenprogramm der EU, als ein Teilprojekt von INBIOSOIL - innovative biological products for soil pest control - http://inbiosoil.uni-goettingen.de.

40-9 - Kombinierte Substratbehandlungen mit Neem und Insektenpathogenen (Nematoden, Pilze) zur Integrierten Kontrolle von *Frankliniella occidentalis* (Pergande)

Combination of Soil-Applied Azadirachtin with Entomopathogens for an Integrated Management of Western Flower Thrips, Frankliniella occidentalis (Pergande)

Jacinter Otieneo, Hans-Michael Poehling

Leibniz-Universität Hannover, Institut für Gartenbauliche Produktionssysteme, Abteilungen Phytomedizin und Biosystemtechnik, Herrenhäuserstraße 2, 30419 Hannover, Deutschland, stukenberg@ipp.uni-hannover.de

This study aims to develop an integrated system for control of Western Flower thrips (WFT) *Frankliniella occidentalis*. We tested biocontrol agents such as soil applications of Entomopathogenic Nematodes *Steinernema carpocapsae* Nemastar® (E-Nema GmbH), isolates of *Metarhizium anisopliae* (IPP 2539 & ICIPE-69) and *Beauveria bassiana* (Naturalis® (BioGard, Italy) and two Neem formulations, Neem Azal-T (1% Azadirachtin A) and Neem pellets (7 % Azadirachtin) (Trifolio-M GmbH) alone and in combinations. All possible single and combined treatments were analysed for inducing acute mortality and we checked surviving individuals for retarded development of mycosis as possible cause of secondary mortality.

The bioassay results of the single treatments indicated between 40% to 60% control with NeemAzal-T solution proving to be the best. However all the cadavers with EPF treatments showed development of mycosis. Therefore the total mortality attributed to the Entomopathogenic fungi amounted > 80%. Combinations of treatments with Steinernema, NeemAzal-T and Metarhizium (ICIPE) further improved fast control effects and resulted in total mortalities between 95-97% when late mortality by mycosis was considered too. Out of 7 treatment combinations between *S. carpocapsae*, *M. anisopliae* ICIPE-69 and both Neem Azal-T and Neem pellets, two gave synergistic response, four additive and one antagonistic response.

Three levels of dose response combination of these treatments were further tested, Metarhizium (ICIPE) at concentrations of 1× 10, 1× 10 and1× 10 conidia/L, *Steinernema carpocapsae* at 100 IJ/cm^{2,} 400 IJ/cm^2 and 800 IJ/cm^2 and finally Neem Azal-T at 0.25%, 0.5% and 1%. The results indicated between 62-65% mortality of lower dosages while the highest doses recorded 70% mortality for *Steinernema carpocapsae*, 65-68% for NeemAzal-T and 72% for Metarhizium (ICIPE). The combined use of Neem Azal-T with the entomopathogens may be the most promising to increase the efficacy and reliability of biocontrolling WFT.