*Egyptian Journal of Biological Pest Control, 19(2), 2009, 129-133*

# Effect of Different Fertilization Rates on Control of *Bemisia tabaci* (Genn.) by *Verticillium lecanii* and *Beauveria bassiana* in Potato Crop

**Abdel-Raheem, A. M.; K. H. Sabry and Zakia A. Ragab**
Pests and Plant Protection Department, National Research Centre, Dokki, Giza, Egypt
*(Received: September 28, 2009 and Accepted: October 23, 2009)*

## ABSTRACT

Pathogencity of the two entomopathogenic fungi isolates, *Verticillium lecanii* and *Beauveria bassiana* to the whitefly, *Bemisia tabaci* (Genn.) under laboratory conditions and also effect of different fertilization rates on its control by the two fungi in potato crop at El-Behira Governorate, Egypt for the two successive potato seasons 2006 and 2007 were studied. Three concentrations were used (2.5 x$10^5$, 2.5 x $10^6$ and 2.5 x $10^7$ conidia/ ml.). Under laboratory conditions, results showed that *V. lecanii* and *B. bassiana* had induced death after the 4th day from treatment. The maximum percent of mortality (100 %) occurred after the 7th day post treatment with the third concentration (2.5 x $10^7$ conidia/ ml.) in both isolates. The third concentration was the highly toxic to the adults of *B. tabaci* compared with the other two concentrations. Under field conditions, the third concentration (2.5 x $10^7$) was also the most effective concentration against the whitefly after the third treatment by both *V. lecanii* and *B. bassiana.* Percent of reduction ranged between 55.8 and 100% in all concentrations. *V. lecanii* was slightly more effective than *B. bassiana* against *B. tabaci.* There were no direct or indirect effects of fertilization rates on the percent of infestation by *B. tabaci* and also its control by *V. lecanii* and *B. bassiana* in both seasons. These results confirmed that *V. lecanii* and *B. bassiana* isolates are promising agents for whitefly control in the field.

**Key words:** Entomopathogenic fungi, *Bemisia tabaci*, potato, fertilization rates, control, Egypt.

## INTRODUCTION

The sweet potato whitefly, *Bemisia tabaci* (Genn.) (Homoptera: Aleyrodidae) causes significant damage to potato as direct feeding pest and vector of viruses (Bellows *et al.*, 1994). *B. tabaci* is one of the most severe pests of crops in subtropical and tropical climates (Galina *et. al.*, 1997). The widespread distribution of *B. tabaci* is attributed to their exceptionally wide host range and short generation time. The cause of its populations increase is unknown but it may be due to the extended use of synthetic organic insecticides and subsequent augmented resistance to pesticides, changing climatic conditions and international movement of plant materials in the nursery and horticultural trade (Wang *et al.*, 2007).

The entomopathogenic fungus, *Beauveria bassiana* (Balsamo) Vuillemin has a high activity against whitefly (Al-Deghairi, 2008).

Dietary nitrogen and carbohydrates impact survival, growth and reproduction of insects (White, 1984). Bi *et al.* (2001) found that increasing plant nitrogen also enhanced cotton foliar photosynthetic rates and stomatal conductance, and altered concentrations of glucose, fructose and sucrose in cotton petioles. Petiole glucose levels were significantly correlated with numbers of whitefly adults on leaves during their peak populations. Significant correlations between whitefly numbers and other cotton physiological parameters occurred on only a few sampling dates. Seruwag *et al.* (2003) investigated the influence of NPK fertilizer on the symptoms and spread of cassava mosaic virus disease (CMD) and on population of the whitefly vector (*Bemisia tabaci*) in Uganda using three cassava varieties.

The present work aims to use biocontrol agents to control the pest to avoid conventional insecticides pollution in potato tubers and environment as well as to reduce the costs of control. Besides, this work aims to test, if fertilization rates could affect the control of *B. tabaci* by *V. lecanii* and *B. bassiana.*

## MATERIALS AND METHODS

### Cultures of fungi

Fungi were isolated from different stages of *Cassida vittata* and *Scrobipalpa ocellatella* by collecting these insects from the field and transferred them to the laboratory. After few days, when infected insects, covered with fungal mycelium occurred, the insects' cadavers were placed on a wetted filter paper in a Petri–dish and incubated at 26±1 °C for 7 days. A potato dextrose agar (PDA) media was prepared (1 Kg potato, 100g dextrose, 80g agar, and 4L distilled water). This media was autoclaved at 120°C for 20 min, and poured in Petri- dishes (10cm diameter x 1.5 cm). The new fungal generation was isolated from the insect surface cadavers and cultured on PDA medium. Fungal culture purified weekly until pure cultures were obtained. Then the fungal cultures were incubated at 25±1°C and 92±5% RH.