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**Studies on the Melon Aphid, *Aphis gossypii*
Glover, as a Main Vector of Papaya
Ringspot Virus on Squash Plants in Kafr
El-Sheikh Governorate**

By

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ABSTRACT

Squash, *Cucurbita pepo*, L., is one of the most popular vegetable crops in Egypt. Aphids, *Aphis gossypii* Glov. attack the plants causing severe damage due to sucking plant sap as well as virus transmission such as Papaya ringspot virus-W (PRSV-W). Therefore, field experiment was conducted at Kafr El-Sheikh Governorate to evaluate the efficacy of three insecticides: pymetrozine (50 % WG), flonicamid (50 % WG) and imidacloprid (20 % SC) as well as KZ oil (95 % EC) against aphids, the spread of PRSV and marketable yield of squash. Every tested compound as well as control was replicated three times in a complete randomised block design. The obtained results indicated that imidacloprid significantly was the most effective compound against the aphid population, while KZ oil was the least effective one but, vice versa was observed in reducing the spread of PRSV. The marketable yield of squash was negatively correlated with incidence of PRS virus and aphid population. Also, the incidence of virus was correlated positively with the aphid population.

The laboratory experiments were further conducted to evaluate effect of the tested compounds on acquisition and inoculation of virus and effect of virus-infected squash plants on the biology of *A. gossypii* in addition to effect of three aphidophagous predators: larvae of *Chrysoperla carnea* (Stephens), *Adalia bipunctata* (L.) and *Syrphus* sp., on the spread of PRSV in squash plants by *A. gossypii*. Statistical analysis of data revealed that flonciamid and pymetrozine significantly reduced acquisition and inoculation of virus compared to control and the reduction was comparable to KZ oil application. Higher fecundity, shorter development of nymphs and longer longevity of adults were occurred when aphids fed on virus-infected plants compared with those fed on non-infected plants. Additionally, all life table parameters were significantly higher for aphids fed on infected plants than non-infected ones. The effects of three predators ;*Chrysoperla carnea* (Stephens), *Adalia bipunctata* (Linnaeus), and *Syrphus* sp. on the dispersal of the aphid vector *A. gossypii* and PRSV transmission rate revealed that initially (after 1 day), *C. carnea* and *A. bipunctata*, statistically increased aphid colonization on nearby plants than *Syrphus* sp., thus the transmission rate of virus was greater in the presence of *C. carnea* , *A. bipunctata* than *Syrphus* sp. In contrast, after 7 days, the virus transmission increased somewhat, but without significant difference between the treatments.

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