Field efficiency and selectivity effects of selected insecticides on cotton aphid, Aphis gossypii Glover (Homoptera: Aphididea) and its predators

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Abstract:

Cotton aphid, Aphis gossypii Glover (Homoptera: Aphididae) is a key pest of cotton plants in Egypt. A two-year field study was conducted at Faculty of Agriculture, Assiut University, Egypt, during 2013 and 2014 growing seasons to determined the efficiency of acetamiprid, imidacloprid, thiamethoxam, dinotefuran, pirimicarb and malathion on cotton aphid and selectivity effects of these insecticides on Coccinella undecimpunctata L. and Chrysoperla carnea (Stephens). The results indicated that thiamethoxam, dinotefuran, acetamiprid and imidacloprid proved to be the most effective insecticides in reducing cotton aphid population up to 21 days after treatment throughout both seasons and caused an average reduction percentage ranged from 73.58 to 96.42%, whereas pirimicarb and malathion showed the lowest reduction with an average ranged 38.08 to 66.68% at different exposure dates during 2013 and 2014 seasons. In addition, the selectivity effects of acetamiprid, imidacloprid, pirimicarb and malathion reduced the population of C. undecimpunctata with an average ranged from 78.05 to 96.43% and were classified as harmful. Thiamethoxam reduced the population with an average ranged from 68.72 to 69.20% and was classified as moderately harmful. Dinotefuran showed a slightly harmful effect to C. undecimpunctata with an average reduction 44.3 and 41.81% during 2013 and 2014 seasons. On the other hand, acetamiprid and dinotefuran caused a significant reduction in the population of C. carnea with an average ranged from 28.28 to 56.52% and were classified as harmless. Thiamethoxam and imidacloprid reduced the population with an average ranged from 55.53 and 64.39% and were classified as moderately harmful. By contrast, malathion and pirimicarb showed the highest reduction in the population with an average ranged from 67.15 to 96.57% and were classified as harmful during both seasons. These results suggested that, the selection of a suitable insecticide in an IPM program to control the cotton aphid not only depends on its efficiency against the aphid but also its toxicity to natural enemies (predators and parasitoids) and its persistence.

Keywords:

Aphididae, cotton, insect predators, pesticides, selectivity

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