To Choose or Not to Choose?: Investigating the Trophic Effects of Thiamethoxam on Euplectrus comstockii when Parasitizing Trichoplusia ni, Year Two

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In 2001, second generation neonicotinoids were introduced into the insecticide market. Thiamethoxam is the most used of these. It has a unique chemical structure that makes it highly water soluble. Limited information is available on the trophic effects of thiamethoxam on non-target arthropods. Because it's safe for mammals and so closely related to the natural insecticide nicotine, it has been suggested for widespread use in integrated pest management. This second-year research investigated the trophic effects of thiamethoxam on a pest insect – cabbage looper (Trichoplusia ni) and its biological control agent – parasitic wasp (Euplectrus comstockii).The purpose of this study was two-fold: first, to determine the toxicity of the thiamethoxam on the T.ni when fed through a continuous diet beginning at the neonate stage; and secondly, to determine if thiamethoxam would impact the parasitization of the T.ni by the E. comstockii. Toxicity testing was conducted using the following treatments: 10ppm, 100ppm, 1,000ppm, and 10,000ppm. There were two control groups: a negative control (water) and positive control (30% acetone). The neonate loopers were kept on the diet for seven days to determine toxicity based on mortality and effect on development. After 7 days, 30 surviving loopers from each treatment group were separated for the parasitization part of this study. A single parasitic wasp was placed in with each looper. After 24 hours, each looper was checked for the number of wasp eggs laid on its body. The following conclusions were drawn: The pest insect did not show susceptibility to the thiamethoxam, when given in a continuous diet. However, the neonicotinoid, at the concentration of 10,000 ppm, had a negative effect on parasitizing and ovipositing by the parasitic wasp.

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