Oxalic Acid Derivatives for *Varroa* Control

Project No.: **07-POLL4-LeBlanc**

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Interpretive Summary:

Oxalic acid (OA) is widely used for controlling *Varroa* mites. However, OA can be used only when there is no brood in the colony since it is highly toxic to eggs and larvae. The objective of this research is to identify surrogate compounds to oxalic acid that will be as effective in killing *Varroa*, but less toxic to brood. Such compounds have been isolated and testing is underway for miticidal activity and effects on brood survival.

Objectives:

1) Synthesize OA derivatives (carboxylic ester and carboxylic amide)
2) Study the toxicity of the compounds to *Varroa* mites using scintillation vial assays
3) Study the effects on honey bee colonies of the compounds and determine LD-50 for bees and mites

Materials and Methods:

The carboxylic acid ester and amide derivatives are not commercially available and were synthesized. The compounds are being tested for miticidal activity in vials containing *Varroa* mites. Compounds that cause high mite mortality will be tested in colonies for efficacy in reducing *Varroa* populations and for effects on brood survival. Miticidal activity will be tested by counting dead mites that have dropped onto sticky boards placed on the bottom of colonies. The effects of the compounds on brood survival will be determined by measuring brood areas before and after treatments with the OA derivatives.

Results and Discussion:

The derivatives of OA have been successfully synthesized in sufficient amounts for testing. The work will continue so that the derivatives will be tested as potential miticides and to determine the effects on honey bee brood.

Recent Publications:

none