

Testing Antioxidants and Amino Acids for Use as Nutritional Supplements and *Varroa* Mite Control in Honey Bee Colonies

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PROJECT SUMMARY

Objectives:

- Determine if honey bees are either tolerant of or repelled by various food supplements containing antioxidants and amino acids in specific concentrations.
- Determine the ability of these supplements compounds to kill *Varroa* mites.

Background:

The recent decline in honey bee populations associated with colony collapse disorder has prompted some researchers to focus on bee health. One emphasis has been on bee nutrition and its potential role in preventing disease by boosting immune responses.

This now-completed multiyear project explored the use of compounds containing antioxidants and amino acids as a food supplement that would bolster the bees' ability to combat stress, poor diet, and susceptibility to disease.

The project methodology consisted of conducting both feeding trials for the bees and *Varroa* miticide trials (vial assays) for the mites.

Discussion:

The feeding trials involved giving free-flying bees a choice of a control solution (syrup only) or a supplemented syrup solution. The supplements, tested at concentrations of 1%, 2%, and 5%, were nine compounds commonly found in nectar, honey, propolis, pollen, and royal jelly.

The research team found that most of the bees were attracted first to the syrup solution and only then went to the supplemented solution. Overall, there was no statistical difference between visits to the two choices.

However, in the 2% test, one compound, gallic acid did attract the bees, but also killed them. Similarly, in the 5% test, gallic acid and L-cysteine, proved fatal to the bees—and aspartic acid was the least visited (and the bees lived).

The miticide trials involved exposing the mites to 12 compounds. The results were that there was some low-level miticidal activity across all 12, but only two of them—benzophenone and ferulic acid—killed more than 40% of the mites.

The researchers recommended further study of the test and other compounds for both nutritional support and mite control, and also for ascertaining how best to deliver such treatments in the colony environment (e.g., contact or systemic by feeding bees).

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For More Details, Visit

- Poster location 46, Pollination Pavilion, Session 3; or on the web (after January 2011) at AlmondBoard.com/AICposters
- 2009-10 Annual Report CD (09-POLL3-Sammataro); or on the web (after January 2011) at AlmondBoard.com/ResearchReports