

# Paul C. And Edna H. Warner Endowment Fund for Sustainable Agriculture

## Report Form

**Summary:** (Describe your project, its objectives and results in one or two sentences)

This project examined the effectiveness of a non-chemical Varroa mite control method for honey bee colonies called drone brood removal. We also explored the use of the waste drone brood as a food from which beekeepers could derive additional income.

**What was done?** (One paragraph describing the goals, experiments and how they were performed)

The goals of this project were to examine the effectiveness of a mite control method called drone brood removal and the link between drone brood removal and entomophagy. Drone brood removal has been demonstrated to provide the only effective non-chemical Varroa mite control, but its uptake is limited because of high labor demands. Volunteer beekeepers utilizing drone brood removal were interviewed to provide Varroa mite counts for the colonies they manage, and their mite control strategy (drone brood removal, oxalic acid, or no treatment) were recorded. Mite levels were recorded twice, once in the spring and once in the fall. To examine the link between drone brood removal and entomophagy, beekeepers were interviewed regarding their opinions of drone brood removal and whether they would be willing to work with others to sell drone larvae.

**What were the results?** (One paragraph on the outcome of the experiments, what was learned from them)

Mite levels significantly increased in the fall (Repeated Measures ANOVA,  $p:0.005$ ,  $F:8.601$ ,  $df: 2$ ,  $N:51$ ), however, there was no significant difference between mite treatments. This indicates that drone brood removal, as implemented by participating beekeepers, was not effective at reducing Varroa mite levels. However, 85% of beekeepers were open to selling drone larvae, which indicates that beekeepers would be willing to work to create an edible insect product from drone larvae generated through the drone brood removal procedure.

**How have the results contributed or will they contribute to sustainable agriculture?** (One paragraph on how will farmers uses this research information and what difference will it make on their farms.)

Drone brood removal is the only non-chemical intervention available to beekeepers for the control of Varroa mites, but can be less effective than other approaches and requires a significant investment in labor. Additional income derived from sale of the waste drone brood produced through this procedure should provide an incentive for small- to medium-

scale beekeepers to include this sustainable approach to Varroa management into their Varroa management plans.