NC STATE UNIVERSITY

October 2017

Wolfpack's Waggle

October 2017 Newsletter

NC State Apiculture Program

Dedicated to the dissemination of information and understanding of honey bee biology and management

Issue 4, October 2017

More inside

What have we been up to?

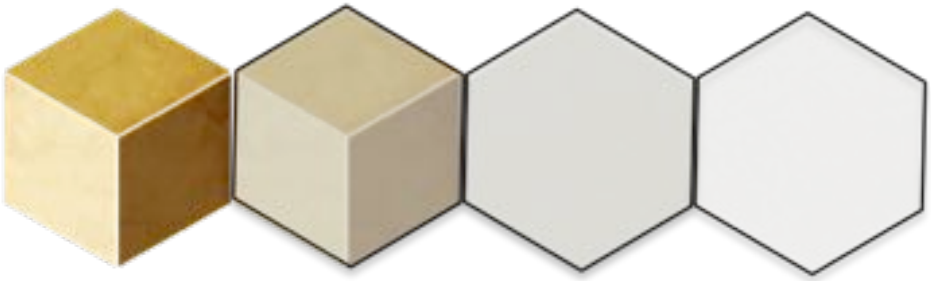
The fall semester so far has been a whirlwind of activity. Our weekly lab meetings have been filled with everyone presenting the exciting findings from their respective summer field projects, which has been very stimulating and bodes well for some of the future papers that will be coming out of the lab in the coming years. Some of the main efforts these last few months has been to submit several grant proposals, including some that were entirely conceived and written in a collaborative effort by the grad students in the program. We also, for the first time, have started to sell jars of our Wolfpack Honey at the NC State farmer's market on the Brickyard of main campus every Wednesday. Our lab group has grown substantially in size these last few months as well, with the addition of several new excellent undergraduate researchers and especially the addition of our new office manager, Sharon Munger, who we very much look forward to working with in various elements of our program particularly the Queen & Disease Clinic.

MBP collaboration with David Bridgers

Our latest beekeeper research collaboration, written by Columbus and New Hanover county member and Master Beekeeper David Bridgers, has tested two relatively new mite-control products in North Carolina for the first time. The results are interesting…

More on Page 3

Beekeeper Education & Engagement System



New developments in the BEES network

Course enrollment predictably lower with increased overhead costs

The BEES network has officially moved has moved to DELTA as of January 1, 2016, and is now including a 43% overhead on each person for each course. Perhaps predictably, this has resulted in a significant decrease in enrollment for the first half of the year: we're down 41.2% from the same period last year. We hope this trend does not continue and that enrollment will rebound later this year.

Beginner level

BEES 1.01: Basic honey bee biology and life history (1.66 hours)

BEES 1.02: Introduction to beekeeping and hive management (1.95 hours)

BEES 1.03: Importance of bees and beekeeping to society (1.71 hours)

Sign up today @:

http://go.ncsu.edu/BEES

Advanced level

BEES 2.01.02: Honey bee anatomy

BEES 2.01.05: Queens and mating

BEES 2.01.07: Foraging biology

BEES 2.02.03: Pathogens, parasites, pests, and problems

BEES 2.02.04: Varroa mite IPM

BEES 2.02.05: Queen rearing and bee breeding

BEES 2.03.01: Africanized bees

BEES 2.03.07: History of beekeeping

Lab spotlight: Esmaeil Amiri

Dr. Esmaeil Amiri has been a member of our lab since Jan. 2016 as a postdoctoral researcher. He is housed at UNC-Greensboro rather than NC State because his position is part of a close and long-time collaboration with Dr. Olav Rueppell on the effects of oxidative stress, aging, and hormesis.

A native Iranian, Esmaeil received his PhD in Denmark, where his work was the first to demonstrate that Deformed Wing Virus is a sexually transmitted disease from drones to queens. His work here has focused on how multiple stressors can manifest in problems at the individual and colony levels.

Esmaeil was just recently awarded a coveted NRC Fellowship to continue his work for the next 3 years, so we look forward to him being part of our research community going forward!

David Bridgers and assistants sampling bees for varroa

Comparing biopesticides for varroa mite control: a MBP research project (written by David Bridgers)

Our latest collaboration with a Master Beekeeper exemplifies one of the final requirements for what it means to become a Master Craftsman: hard work, dedication, and commitment to mastering beekeeping

Varroa mites are insidious parasites of honey bee colonies that are the primary concern for beekeepers in keeping their bees healthy. There have been some new “softer” biopesticides that are available as alternatives to synthetic acaricides, but to date there has been no published data on their efficacy for mite control in North Carolina during the late summer.

I started with an apiary that consisted of 62 colonies of 2- and 3-story nucs. Prior to the beginning of the project, one colony was removed due to excessive mite load compared to the other colonies in the project.

The hives were numbered 1 through 62, each painted with a different color (black, red, green and blue) alternating every hive to minimize drifting. The apiary was divided into 4 groups of 15 colonies each. Pint jars were purchased numbered and marked with colors corresponding with the colonies. One group was a control group that received no treatment, the second group received one (1) treatment of oxalic acid, the third group received HopGuard II treatment, and the last group received three (3) treatments of Oxalic Acid once a week for three weeks. The Oxalic Acid and HopGuard II treatments were mixed and administered according to the manufacture instructions outlined on the label.

At beginning of the experiment, we installed a sticky board in each colony. Two days later, we collected sticky boards and samples of bees by bumping a frame of brood with emerging bees in the plastic tub. Next, we took 1 cup of bees from the tub and placed them in the pint jars. Alcohol was poured in each jar of bees and sealed. Alcohol was used to euthanize the bees and mites.

We then moved inside where we could continue with the alcohol wash and begin to count the mites on the sticky boards and in the alcohol. About 4 weeks later, at the conclusion of the experiment, the same people assembled and again collected samples of bees. We followed the same procedure with the bees and alcohol as we had done before. We did the final alcohol wash and counted mites in the alcohol and on the sticky boards again to get the final count.

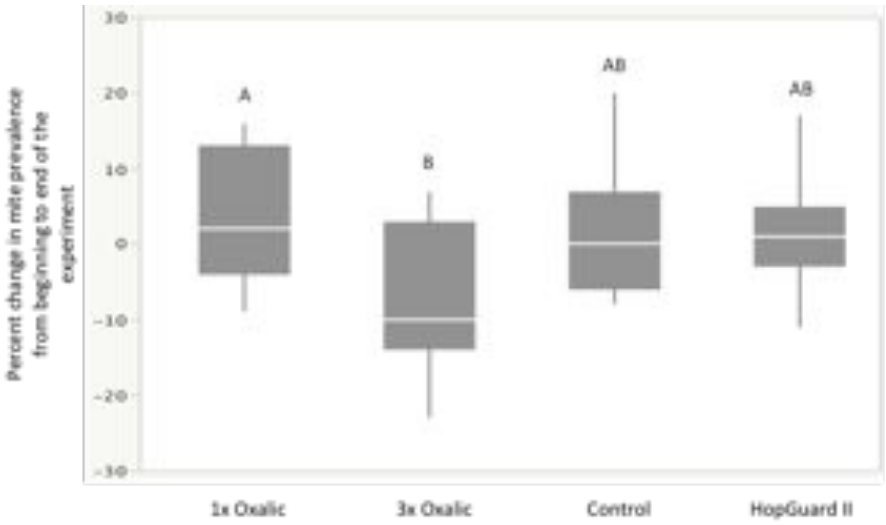
Mr. Bridgers applied Oxalic Acid according to the label following the ‘trickle’ or ‘drizzle’ method.

The tallies were compiled on a spread sheet and forwarded to Dr. Tarpy for a final analysis. We found that there were no significant differences in the mite levels among the treatment groups at the beginning of the experiment. At the

MBP research (Continued)

end of the experiment, the 3X Oxalic Acid treatment group had significantly fewer mites compared to the other treatment groups. Treating only once with Oxalic Acid or HopGuard II were not significantly different from doing nothing to control mites, and all of those groups had an average increase in mite prevalence over the 4 week experimental period.

I need to thank **Brushy Mountain Bee Farm** for supplying the sticky boards and Oxalic Acid, and I thank **Mann Lake, Ltd.** for supplying the HopGuard II. Those who assisted with collecting the samples of bees and conducting the mite counts include my wife **Kay Bridgers**, NCDA&CS Apiary Inspector **Adolphus Leonard**, and local beekeepers **Tom Rhyne** and **Rick Williams**.



NC State Apiculture Program

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Hannan Levenson, MS Student (Entomology)
Lauren Rusert, MS Student (Entomology)

Undergraduate Researchers
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Support the NC State Apiculture Program!

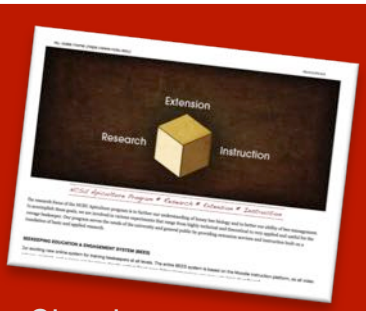
The Apiculture Science fund-raising efforts operate under the auspices of the North Carolina Agricultural Foundation, Inc. a 501(c)3 organization. You will receive an official receipt for your donation.

Make a gift toward emerging needs – Consider supporting the program with a gift that would go toward the current area of greatest importance. Flexible funding enables the Apiculture Program to address critical needs as they emerge, often enhancing the program beyond what would be possible through restricted grant funding. Funding of any amount, from $10 to $10,000, will be extremely helpful.

Make a gift-in-kind – The Apiculture program is always seeking creative solutions to its material needs. If you have surplus equipment or other non-monetary assets to give (e.g., gently used honey extractors, microscopes, even vehicles), please consider donating them to the program. You will receive credit for the monetary value of the gift and the gratitude of our faculty and students.

MAKE A DONATION

Make an estate gift – If you are interested in planning an estate gift to benefit Apiculture, please let us know! We can provide you with the tools you and your attorney will need to ensure that your wishes are fulfilled. Please click the link above for more information.



Check out our new website!

In conjunction with our department merger, we decided to update and move our program's website, which is now located at http://ncsuapiculture.net. With a cleaner look and streamlined content, we hope this new look will be easier to navigate and enable us to include regular blog posts. Be sure to update your bookmarks!

Virtual Reality beekeeping

We recently held two demonstration workshops for external and internal stakeholders, showcasing our ongoing initiative in creating a virtual reality platform in "hands-on" beekeeping education in collaboration with our colleagues (Dr. Derek Ham) in the College of Design.

Random notes

Recent publications

Kulhanek, K., N. Steinhauer, K. Rennich, D. M. Caron, R. R. Sagili, J. Pettis, J. D. Ellis, M. E. Wilson, J. T. Wilkes, D. R. Tarpy, R. Rose, K. Lee, J. Rangel, and D. vanEngelsdorp. (2017). A national survey of managed honey bee 2015-2016 annual colony losses in the USA. *Journal of Apicultural Research*, **56**: 328-340.

Recent outreach presentations

Jennifer Keller spoke to the 5 Counties Beekeepers last month and had a fantastic time. David also gave a webinar presentation to the Montgomery County Beekeepers in Pennsylvania, which was very well received and almost felt as if he was there in person!

We also had another successful year at BugFest in downtown Raleigh in September. Every year, Jennifer organizes the members of the lab and ENT 203 students to volunteer at our booth that promotes honey bees and apiculture science. This year we had some nice displays on the other "non-honey bee" insects in the state, information about our research and extension programs, and the ever-popular frame of newly emerged "callow" bees (that can't fly or sting) so that children of all ages can hold them in their hands.

Welcome aboard!

We have had a fairly substantial turnover in the lab this semester, where we have been joined by **Elizabeth de Jongh**, **Carson Noel**, **Kimberly Rogers**, and **Olivia Loyack**. With the exception of Olivia (who will be assisting Hannah on her project on native bee community ecology), all have joined **Alexandria Fava** on assisting the many projects in the lab in processing samples from the summer. In doing so, they are helping to extract DNA and conduct PCR analyses on honey bees to determine mating numbers of queens.

We are also very lucky to be joined by **Sharon Munger**, who just very recently joined the lab as Office Manager and the Project Manager of our USDA-FSCAP grant. She comes to us with an wealth of expertise and background, and we very much look forward to having her as part of our team!

…and sadly missed.

Will Fowler was in our lab only for a short period of time (in between graduating from Cary Academy and starting his freshman year at the University of Washington), but his impact remains. We hope we will be able to continue our collaboration on creating a new in-field "pregnancy test" for DWV and other viruses as his undergraduate career continues.

Teacher's corner:
Courses at NC State

This semester, our ENT 203 course, "An introduction to the honey bee and beekeeping", has regained traction and quickly exceeded the maximum enrollment of 180 students. Both Hannah and Lauren are doing a great job TAing the course for the first time, and James and Joe is assisting for their third and second year, respectively. Regrettably, we will not be offering ENT 401 next semester because of changes to our newly merged department and policies about distance education courses, but we still hold out hope to revive the course someday.

http://go.ncsu.edu/honeybees

Tarpy's back page

Autumn, and particularly October, is synonymous with the state fair here in North Carolina. When I first started my position in September 2003, I was on the job for only 2 weeks before I was informed that my position was the traditional judge of honey and hive products. Never having judged a honey show before at that point, I was fairly intimidated to say the least! Also, being so new, we didn't have anyone else in the lab at that point (including Jennifer, who wasn't hired until the following February), so I was practically flying solo. Many, many thanks that first year to the NCDA crew and others to help shepherd me along.

Fast-forward to last year, we had made it a lab tradition to all help out with judging the exhibit entries (except for the extracted honey categories—that is left to out-of-state judges, not only because of the high volume of entries but also because it is perhaps the most politically charged). Last year we had most everyone in the lab help out, and we always paired up (one who was experienced with one who was just learning) and judged everything from the photography, to wax figurines, to comb and creamed honey.

Nonetheless, the NCDA&CS State Fair organizers have decided that they only want accredited and experienced judges at the state fair. Their argument was that while I personally was qualified (by simply being the Extension Apiculturist), our other lab members were not because they had no experience, which is clearly not true since I had no experience either when I first started. This decision is a real pity, as over the years we've provided the only experience for numerous lab members in honey judging, including 4 current Extension Apiculturists around the nation, several of whom are now judging the honey competitions in their respective state fairs. They would have never been afforded the opportunity to learn this craft without our policy of team-building and collective judging, so it is a shame that the NCDA no longer wishes to take advantage of our lab's volunteerism. If Departments of Agriculture across the US wish to have trained and experienced honey judges in the future, then they should provide such opportunities to the next generation of students who wish to enter the field.

Sincerely, David

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