

Wolfpack's Waggle



July 2017 Newsletter

NC State Apiculture Program

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

Issue 3, July 2017

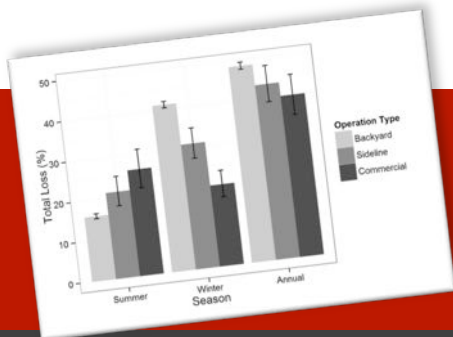


More inside

- Page 2 BEES network update
Lab spotlight: Tatianaidea Medina Nieto
- Page 3 103 years of the NC State Apiculture Program
- Page 4 Donate to the NC State Apiculture Program
- Page 5 Random notes
- Page 6 Teacher's Corner
Tarpy's back page

What have we been up to?

Summers are always a busy time of year, and this year is no different. James and Joe are busy with their first research seasons, both on the biology of queens; James is investigating how queens might learn to live together (or not), and Joe is testing the short- and long-term effects of pesticide exposure during queen rearing. Hannah and her team (including Claire, Erin, and Nathan) have again been busily sampling the native bee communities all across the state. We have also been hosting a MS student from East Carolina University, Starling Krentz, who has been seeing if there might be a way to "vaccinate" queens so that their offspring are less prone to a given pathogen. Jen has been juggling all of these efforts, especially the queen rearing, and keeping the bees happy. Esmail and Dan are busy with their projects at UNCG and UPenn, respectively, and Brad continues to expand the queen clinic in new directions. Perhaps the biggest news is that Hongmei is very soon to start her new position at Central State University in OH, so all the best and thanks!



103 years of the NC State Apiculture Program

At the recent NCSBA conference, we presented a comprehensive history of our program dating back to 1914 and the many changes in people, approaches, and problems facing the apiculture industry.

More on Page 3



New developments in the BEES network

Course enrollment remains steady but fewer students overall

The **BEES** network has officially 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)

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

Sign up today @:

<http://go.ncsu.edu/BEES>

Lab spotlight: Tatianaide Medina Nieto

As mentioned in recent *Wolfpack Waggle* issues, we are conducting a new initiative for the next 3 years known as BeeMORE. Funded by the USDA, the project is aimed at attracting top-notch undergraduate researchers from all across the country to NCSU to study the interface between

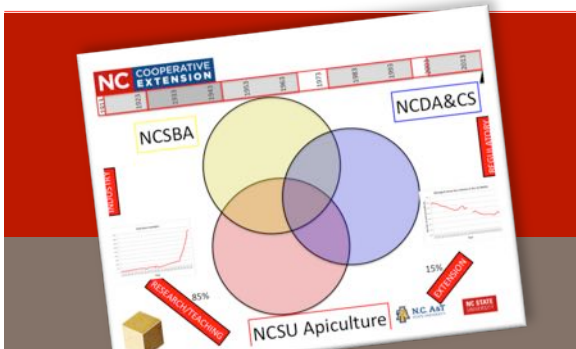
bees and microbes.

Tatianaide Medina Nieto is the first BeeMORE student to participate in our program this summer. She hails from Wake Forest University where she has been working with Dr. Susan Fahrback on bee neurobiology. Her project



here has been investigating when queen bees get infected with virus.

Tatianaide is poised to enter an MD-PhD program when she graduates, so we anticipate great things for her going forward!



The NC beekeeping community is comprised of the collaborative interactions among the NCSBA, the NCDA, and our Apiculture Program.

The history of the Apiculture Program at NC State University has a somewhat hazy beginning, in large part because there was a lot of overlap (and therefore confusion) between state agencies back then (specifically the Agriculture Department, now the NCDA&CS, and the A&M College, now NCSU). In 1913, a USDA scientist named **George H. Rea** came to NC to investigate the potential need for a presence in beekeeping extension. After only one year it became clear that there was indeed a high demand, and **C. L. Sams** was hired in 1914 by the state and moved full-time to A&M College in 1925 where he remained until his death in 1945. Also in 1925, **Frank Meacham** was hired at the University to teach beekeeping and serve as the extension specialist in beekeeping. Other faculty were also involved in apiculture at the time, including **Z. P. Metcalf** and **J. E. Eckert**. After WWII, another extension apiculturist took over the

program, **W. A. Stephen**. Known as Steve by all of the beekeepers in the state, he helped to modernize beekeeping in post-war NC until his departure to Ohio State in the mid-1960s. There was a brief hiatus in the program during his absence.

In 1974, the state beekeepers successfully lobbied the state legislature to revive the program, and in 1975 **J. T. Ambrose** was hired to run the NC State Apiculture Program and launched it into the modern era. Dr. Ambrose's influence on the state's beekeeping community—and on the NC State Beekeepers Association in particular—cannot be understated. In 1982, he started what is now the largest and oldest continually run Master Beekeeper Program in the nation. As Executive

The NC State Apiculture Program: an Historical Perspective

With the 100 year anniversary of the NC State Beekeepers Association, their annual convention was a great opportunity to reflect on the history of our program. Turns out we've been around for even longer.

Secretary of the NCSBA, he wrote their newsletter, annual booklet, and calendar, as well as conducting their two state-wide conferences each year. Dr. Ambrose stepped down as Extension Apiculturist in 2000, and his last PhD student



The “Long and short of beekeeping in NC circa 1935.” Frank B. Meacham (left), C. L. Sams (center), and Z. P. Metcalf (right) were all involved heavily in the NC State Apiculture Program prior to World War II.

NC State Apiculture Program history (Continued)

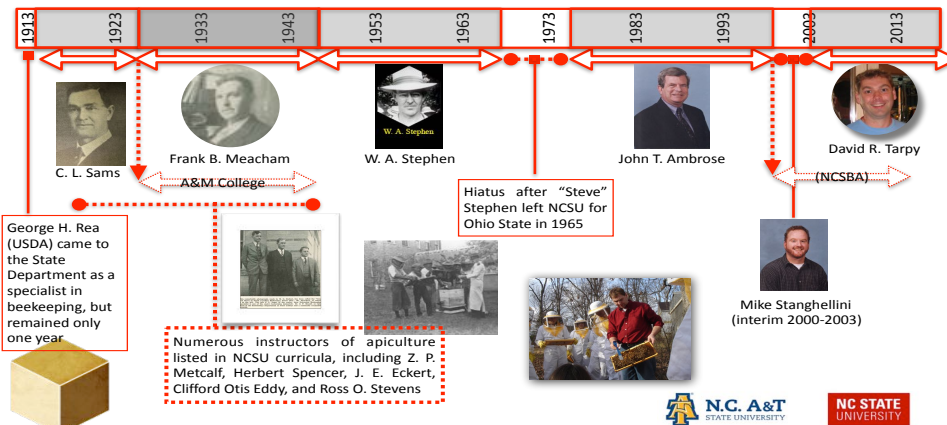
Michael Stanghellini, served in an interim capacity for three years before taking his own position at Rutgers University in New Jersey.

In 2003, Dr. Ambrose's successor was hired and continues to this day. During

the last 14 years, there has not only been unprecedented growth in beekeeping within the state, the size and scope of the entire program has transitioned to a majority-research program, although our commitment to extension continues.



103 years of the NC State Apiculture Program



There have been several NC State Extension Apiculturists over the last century, and each has changed with the times and addressed critical issues dealing with beekeeping during their tenure.

NC State Apiculture Program

David Tarry, Professor and Extension Apiculturist
919-515-1660
david_tarry@ncsu.edu

Jennifer Keller, Apiculture Technician
919-513-7703
jjkeller@ncsu.edu

Erin McDermott, Genetics Technician
919-513-6732
eemcderm@ncsu.edu

Hongmei Li-Byarlay, NRC Postdoctoral Fellow
Esmaeil Amiri, Postdoctoral researcher (UNCG)
Dan Charbonneau, Postdoctoral researcher (UPenn)
Brad Metz, Postdoctoral researcher and Queen & Disease Clinic coordinator

Graduate Researchers

James Withrow, PhD Student
Joe Milone, PhD Student
Hannah Levenson, MS Student
Lauren Rusert, MS Student

Undergraduate Researchers

Claire Collins (media intern), Sarah Hassan, Tatianaide Medina Nieto, Nathan Lasala, Alexandria Fava, Will Fowler

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!

NC State Queen & Disease Clinic

APICULTURE PROGRAM

<http://entomology.ces.ncsu.edu/apiculture/queen-disease-clinic/>

Queen & Disease Clinic busier than ever

Ever since **Brad Metz** has joined the program, we've never been busier with processing samples in the clinic. In addition to processing and analyzing the reproductive quality of queens, Brad is also in the middle of developing an analogous process for doing the same for drones. As such, we hope to offer a parallel service for the reproductive quality of honey bee males next season.

Random notes

Recent publications

Amiri, E., M. K. Strand, O. Rueppell, and D. R. Tarpay. (2017b).

Reduced queen quality and honey bee diseases: interactions between two major threats to colony health. *Insects*, **8**: 48.

Alburaki, M., S. J. Steckel, M. T. William, J. A. Skinner, D. R. Tarpay, W. G. Meikle, J. Adamczyk, and S. D. Stewart. (2017b). Agricultural landscape and pesticide effects on honeybee biological traits. *Journal of Economic Entomology*. doi: 10.1093/jee/tox111

Guiffre, C., S. Lupkin, and D. R. Tarpay. (2017). Automated assay and differential model of the Western honey bee (*Apis mellifera*) autogrooming using digital image processing. *Computers and Electronics in Agriculture*, **135**: 338-344.

Lopez-Urbe, M. M., R. H. Appler, S. D. Frank, and D. R. Tarpay. (2017). Linking genetic diversity and immunocompetence in feral and managed honey bee colonies (*Apis mellifera*). *Conservation Genetics*, **18**: 659–666.

Strange, J. P., D. A. Delaney, D. R. Tarpay, and R. R. James. (2017). Novel microsatellite loci reveal high genetic diversity yet low population structure for alfalfa leafcutting bees in North America. *Conservation Genetics*, **18**: 679–687.

Welcome aboard!

In addition to Tatianaide Medina Nieto (page 2), **Nathan LaSala**, **Alexandria Fava**, and **Will Fowler** have all joined the program. Nathan will return to UNC-Asheville at the

end of summer, and Will has enrolled in the University of Washington. Hongmei also had another two high school interns help her research projects this summer, **Vennela Avula** and **Sachi Shinde**, both of whom are going to UNC this fall.

...and sadly missed.

Viki Blanchard ended her “junior year abroad” from the University of Exeter and has now returned after a terrific and productive two semesters. We miss you already!

Recent outreach presentations

Joe Milone and **Erin McDermott** spoke to the Lee county beekeepers on May 10th and the Person county beekeepers on June 15th. Both talks addressed Joe's research on the pesticide exposome of bee colonies the queen and disease clinic and viral prevalence.

Hannah Levenson presented at TRC North Raleigh on June 19th on 'Honey bee Basics,' as well as at TRC Morrisville on July 10th and 17th. She has also been presenting to kid's camps (about 30 kids ages 7-13), bringing beekeeping equipment, an observation frame, and also playing a game—'A Bee or Not A Bee'—where they have a bunch of pictures and they have to sort them into a bees and non-bees.

Hannah has also volunteered to work with other NCSU researchers running a native bee table at the 'Festival for the Eno River' on July 1st. The theme for this year was the bumble bee! They brought a bunch of outreach goodies and a bumble bee hive for them to show the public.

Teacher's corner: Courses at NC State

This upcoming fall semester, our ENT 203 course, "An introduction to the honey bee and beekeeping", has regained traction and quickly hit the maximum enrollment of 180 students. It will be TA'd by Hannah Levenson and Lauren Rusert for the first time, and Joe Milone and James Withrow will assist for the third straight year. This summer we have updated much of the content to make it more timely and relevant, and we look forward to what will surely be another successful and fun semester!

<http://go.ncsu.edu/honeybees>



Tarpy's back page

During the recent summer convention of the NCSBA, I attended one of my favorite presentations every year—the summaries and synopses of the NCDA&CS Apiary Inspectors. The envy of all other state inspection programs, these hard-working men and women are the true boots on the ground when it comes to keeping tabs on the health of the state honey bee population.

While the territories of the different inspectors range widely from the mountains to the coast, there were three persistent themes that pretty much each of them shared about what they're seeing in 2017. First, the priority in management has been and continues to be the varroa mite, particularly since these parasites help vector viral pathogens that really challenge the health of our bees. Second, there seems to be an increasing prevalence of European foulbrood (EFB). Usually an opportunistic disease brought on by other stressors, these instances seem unusually persistent and prevalent compared to years past. It is unclear if it is a different strain of EFB or just unusual stresses of this beekeeping season, but they warned beekeepers to be extra vigilant for this brood disease. Third, particularly this time of year, an emphasis was placed on Best Management Practices (BMPs). Many of the problems that befall bees, with a little knowledge and experience, can be preventable or at least mitigated. Reducing stress from lack of nutrition during the summer dearth, reducing mite loads, leaving sufficient honey, providing a good water source, and giving adequate but not surplus space in the hive can all make the bees' lives a lot easier.

The issues raised by the NCDA&CS inspectors reminded me just how complicated yet simple beekeeping can be, as in the old adage "the more things change, the more they stay the same." We should be on the lookout for potential new problems, but we should always remember to keep our eye on the things we know to be most problematic.

Sincerely, David