

Wolfpack's Waggle

NC State Apiculture Program Newsletter

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

Issue 3 | Jul 2021

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What have we been up to?

This summer has flown by so far, with a lot of moving parts and projects. Jennifer has been doing a lot of field work this season, although unlike last year she has been able to get some help from time to time from Sharon. Erin has also been mostly out in the field rather than the genetics lab, since she is spearheading a large longitudinal project on how virus loads change over the course of the season. Brad, as usual, has been busy analyzing and writing, as well as conducting some additional experiments on drones. Ali continues to publish at a furious pace, and Esmaeil was recently offered a position with the USDA-ARS starting next year. We also hosted three BeeMORE undergraduate students this summer, all of whom worked very hard and produced excellent research results. We hope to continue our momentum into the fall semester and capitalize on another successful season.



Check out our 'Intermediate' BEES Academy

While on hiatus during COVID, we're reviving our extremely popular 'Intermediate' BEES Academy this fall. Designed for beekeepers at all levels who need a "booster shot" to their introductory bee school, this 2-day intensive training is a perfect opportunity to take your beekeeping to the next level.





HONEY BEE QUEEN AND DISEASE CLINIC | BETTER DATA
BETTER BEES

Quality Assurance

Morphometric Analyses: multiple measures of queen or drone, body and reproductive tract (rearing quality)

Semen Quality: total sperm count, and sperm viability in queens (mating success), or drones (mating potential)

Quality Report: a "grade" report of a queen or drone's reproductive quality for your quick interpretation



Strong Research Foundations

Established as a natural extension service leveraging basic and field honey bee research at NC State, the clinic has worked to improve colony health for over 10 years.

Troubleshooting

Mitotyping for Africanization: genetic analyses of maternal ancestry as African or European using population genetic techniques and markers

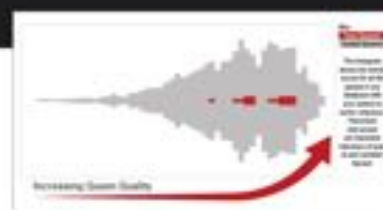
Pathogen Screening: identification of presence and relative levels of ABPV, BQCV, DWV(A&B), IAPV, LSV, Trypanosomes, and both Nosema species. Additional and custom pathogen targets available upon request.

Genotyping Analyses: full assessment of paternity for up to 48 workers and an estimate of queen mating frequency

Custom Collaboration

This highly-tailored collaboration involves custom experimental design, analyses, and interpretation. This unique partnership between science and industry has been utilized to:

- Test the impact of various agrochemicals
- Assess the effects of banking on queen quality measures
- Evaluate novel management practices' improvements in queen mating quality
- Observe the effects of shipping on queen health and sperm quality



Queen and Disease Clinic Pricing

Five Sample Minimum • Bulk Pricing Available

ANALYSIS	PRICING (per sample)	SAMPLES TESTED		
		QUEENS	DRONES	QUEEN+DRONES
Reproductive Quality	\$24.00	✓	✓	
Standard Pathogen Screen	\$55.00	✓	✓	✓
Apiary Pathogen Screen	*\$220.00	UP TO 10 COLONIES/OPERATOR		
Mitotyping (Africanization)	\$35.00	✓	✓	✓
Genotyping (Mating Number)	\$20.00			✓

Custom Disease Screening

Additional and custom pathogen targets available upon request.

Your Bees • Your Data

Any results or interpretations from our work is held in the strictest confidentiality and anonymity

Lab Spotlight: 2021 BeeMORE students

We were lucky enough to resume our annual BeeMORE project, which is a USDA-funded experience for undergraduate research. This year we had **Keana Du** (University of Miami), **Isiah Castro** (University of Colorado), and **Sophia Peña** (Wellesley College). All join our lab for 9 weeks this summer working on various projects involving bees and microbes (the intent of the BeeMORE grant). They were part of a cohort of 11 this year, with the others working in various other labs in the Department of Applied Ecology and other programs. Each ended their summer with excellent poster presentations at the NC State Undergraduate Research Symposium, and we really enjoyed having them in our lab even though it was all too short.



2021 'Intermediate' BEES Academy

It is with great delight that we are continuing our 'Intermediate' BEES Academy in 2021 set for Oct 2-3 in Monroe, NC. Please forward to anyone who you think may be interested in this beekeeper training opportunity.



Are you a beekeeper with a number of years of experience who wants to increase your understanding of bees and improve your practices? Do you feel like you might need a “booster shot” to update what you learned in your beginner bee school? Wish there was an opportunity to reinforce your experience to maximize your beekeeping success?

If you answered yes to any of these questions, set aside two full days and immerse yourself in theoretical and practical aspects of beekeeping at our latest BEES Academy. During live and pre-taped videos from the Beekeeper Education & Engagement System (BEES), Dr. David Tarpy, other members of the NC State Apiculture Program, and CES instructors will help you build upon your current knowledge of beekeeping by exploring topics including:

- Honey bee anatomy
- Division of labor & bee behavior
- Queens, drones, and mating
- Diseases, parasites, and disorders
- Varroa Integrated Pest Management
- Advanced management techniques
- Africanized honey bees
- Effects of pesticides
- Honey and other hive products

Each presentation is roughly 30-60 minutes and will be followed by a short Q&A discussion period. On the second day, you will have the opportunity to practice and observe important areas associated with bee management, such as: Hive products, How to read a pesticide label, Diseases under the microscope, Monitoring for varroa mites, Nutrition and supplemental feeding, Identification of native bees, and others.

Our next BEES Academy will be held Saturday October 2nd through Sunday October 3rd at the Union County Agriculture Center in Monroe, NC. Space is limited, so be sure to register early!

Further information and links to online registration through the NC State REPORTER system can be found at:

<https://www.ncsuapiculture.net/bees-academy-home>



2019 BEES Academy
Chatham County Extension Center
September, 2019



BEES Academy (Continued)

NC STATE UNIVERSITY APICULTURE PROGRAM + YOUR LOCAL NC EXTENSION OFFICE

• B • E • E • S •
BEES
ACADEMY

SATURDAY, OCTOBER 2 & SUNDAY OCTOBER 3RD, 2021 AT THE UNION COUNTY AGRICULTURE CENTER
 3230 PRESSON RD. MONROE, NC 28112

The Perfect Prep Opportunity for the Journeyman Beekeepers Exam!

half day of hands-on experience

- Honey bee anatomy
- Division of labor & bee behavior
- Queens, drones, and mating
- Diseases, parasites, and disorders
- Varroa Integrated Pest Management
- Advanced management techniques
- Effects of pesticides
- Honey and other hive products

To learn more and register click here

Union County Beekeepers, NC COOPERATIVE EXTENSION, NC STATE EXTENSION

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 Brad Metz - NC State Research Associate
 Alison McAfee - NCERC Postdoctoral Fellow (UNC)

Undergraduate Researchers
 Keana Du, Isiah Castro, Sophia Peña

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.

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.

Gift-In-Kind

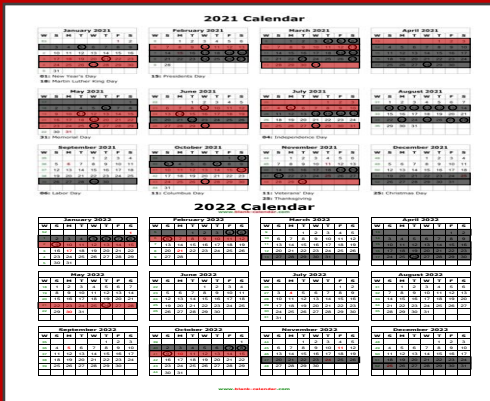
The Apiculture program is always seeking creative solutions to its material needs. If you have surplus equipment or other non-monetary assets to give (e.g., gently used honey extractors, microscopes, even vehicles), please consider donating them to the program. You will receive credit for the monetary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

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 go to our website for more information: www.ncsuapiculture.net

go.ncsu.edu/apiculture





Speaking requests

While our lab group is smaller than it has been in years past, with students graduating and fewer postdocs at the present time, we still have opened up our online speakers request form for the 2022 calendar year. With well over 40 presentations given in 2021, be sure to book us early!



Congratulations Hannah!

Hannah Levenson has officially graduated and has already started a new postdoctoral position (also at NC State, so she hasn't gone far!). She is busily writing up her thesis chapters and many side projects for publication, so expect to see a flurry of papers from her in the coming year or two. We will sorely miss having her around the lab and working with her, since she's been such a central member of our group.

Random Notes

New Publications

Swami, R., B. Gasner, D. R. Tarpy, M. K. Strand, O. Rueppell, and H. Li-Byarlay. (2021). Assessment of two different extraction methods on nucleic acids for sociogenomics. *Annals of the Entomological Society of America*. <https://doi.org/10.1093/aesa/saab027>

Amiri, E., O. Rueppell, and D. R. Tarpy. (2021). Honey bee viruses. In: *Honey Bee Medicine for the Veterinary Practitioner*, T. Ryan Kane and C. M. Faux (eds.). pp. 253-276.

Presentations

Because of COVID, we aren't holding any face-to-face events. Instead, we've been quick to move everything online through Zoom and other platforms. Importantly, we're holding monthly webinars called **Apiculture Online—Hive Chat with NC State** and posting their recordings on our YouTube channel. Between the live-stream and recordings, we've been averaging ~650 people and over 1,000 in some weeks.

In addition, David has given presentations to the Somerset Beekeepers (UK), Mile Hive Beekeepers Association (CO), Western Apicultural Society, and the Denver Journeyman study group, all remotely of course. We are looking forward to getting back to in-person presentations (see Page 3) for this fall and into 2022.

...and sadly missed

This past spring semester, we had three undergraduate researchers graduate and move on to greener pastures. **Danyelle Reiskind**, **April Sharp**, and **Rachel Laminack** were all with us for multiple semesters, but they are all moving into post-graduate education. Danyelle is vying for veterinary school, whereas both April and Rachel are entering into graduate school at NC State (April in Biology with Becky Irwin and Rachel in Entomology with Max Scott). Best of luck to you all, and we'll miss you.



Teacher's Corner: Courses at NC State

Because of our move to the Department of Applied Ecology (see below), this will be the final time we will be teaching ENT 203 "An Introduction to the Honey Bee and Beekeeping." Don't worry, however, as we will continue to offer the same course just under a different header (AEC 203), which will become part of the new Applied Ecology undergraduate major. For this last semester, it is still unclear if it will be face-to-face or we will have to go online again, but we're ready for any eventuality after last fall semester!



<https://www.ncsuapiculture.net/instruction>

Tarpy's Back Page

It is often said that the only constant thing in life is change...

Universities are comprised of different colleges, and our program has always been part of the College of Agriculture & Life Sciences (CALs). Colleges, then, are structured into any number of different Departments, each with 5-75 different faculty programs. In 2016, CALs underwent a major reorganization, where 16 departments were restructured into 12 through several mergers. Importantly, the Department of Entomology (where our program was housed) was merged with Plant Pathology to create the Department of Entomology & Plant Pathology (DEPP), which now has ~50 faculty.

Apiculture has always been on the fringe of Entomology as a discipline, since most entomologists study insect pests worthy of exterminating. The merger with Plant Pathology made our program even more of a minority of one, since now most of the students and research in the department was geared towards eradicating some sort of pestilence in cropping systems. As such, our students and other program members were having a difficult time assimilating and taking courses, since we are more interested in honey bees and how to keep them healthy in a complex world.

As a result of these and other factors, as of July 1, 2021 **our program has officially moved to the Department of Applied Ecology** from DEPP. As such, we are now housed in a department that has an undergraduate teaching major and other faculty programs in pollinator biology. Despite moving "on paper," pretty much nothing else has changed: we are housed still in the same on-campus lab and office space, I teach the same courses on bees and beekeeping, and (critically) the program has retained the same personnel. The upsides have been notable, including a new temporary field research laboratory since our previous building was condemned last fall, as well as a more appropriate curriculum for any future graduate students studying honey bees and other beneficial insects.

So while the NC State Apiculture Program might have moved departments, we have retained the same responsibilities in research, extension, and teaching. We will continue to offer online courses through our Beekeeper Education & Engagement System (BEES), provide services in our Queen & Disease Clinic, and holding any number of different extension trainings. So rest assured, while things may change, in this case they have pretty much stayed the same.

