

Wolfpack's Waggle

July 2015 Newsletter

NC State Apiculture Program

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

Issue 3, July 2015

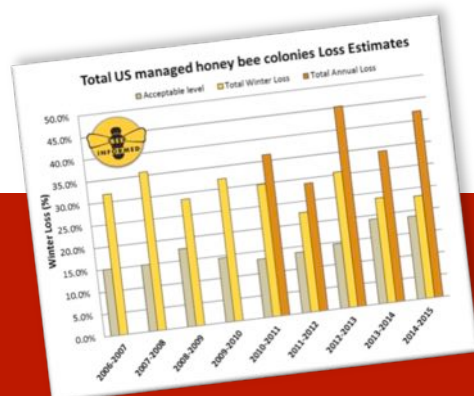


More inside

- Page 2 BEES network update
Lab spotlight: Margie Gurganus
- Page 3 Latest survey results from the Bee Informed Partnership
- Page 4 Donate to the NC State Apiculture Program
- Page 5 Random notes
- Page 6 Teacher's Corner
Tarp's back page

What have we been up to?

This summer is as busy as it has ever been, and with the most colonies (~200) that we've ever had. James' project on the collective decision-making process during queen rearing has been going well, and he will stay busy this fall and winter analyzing his many samples in the genetics lab. Mike's projects using *in vitro* rearing continue to excel, although we've once again had some set backs with the instrumental insemination component of the breeding program. Margarita has been busy sampling native bees from all over the Triangle and making tremendous progress on her projects, and Hongmei continues to keep multiple balls in the air with the migratory stress project and others. It's also been a busy time with travel, with David going to several beekeeper meetings, Hongmei going to Germany to learn microinjections, and Mike presently in Seattle for a bioinformatics workshop. We're also fortunate to have two guest researchers in the lab, Igor de Mattos Medici from Brazil (see profile in April) and Danica Fine from the University of Pennsylvania. Danica has been doing her own undergraduate independent study on micronutrients in artificial diet and has been working hard since May.

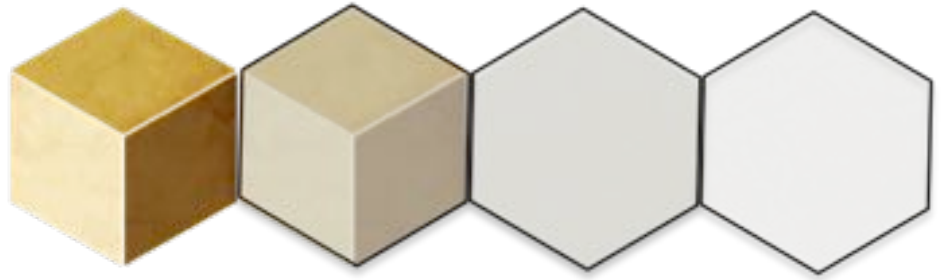


Most recent BIP survey results

This national extension project continues to provide important insights. Beekeepers lost 23.1% of their colonies last winter but 42.1% over the entire year.

More on Page 3

Beekeeper Education & Engagement System



New developments in the BEES network

Looking for partners for an Advanced BEES bee school

Now that the **BEES** network has moved to DELTA (the distance education division in the University), we are exploring novel ways of utilizing the online courses and materials. While there are many entry-level bee schools across the state, **we would like to develop some advanced courses** using the **BEES** network. If you or your club might be interested, please contact us!

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: Margie Gurganus

Margie joined our lab in late 2012 to spearhead our work with the Bee Informed Partnership. Her background with a PhD in Genetics at NC State made her ideally suited to process all of the virus samples as part of that extension initiative.

Margie is a woman of many talents, having also received her JD from Duke Law and being a hobbyist beekeeper. Thus she has provide great perspective and professionalism to the lab.

Regrettably, Margie is moving on within the next month, and we wish her



nothing but the best. We will miss her dedication and commitment to the BIP and all other projects in the lab, and it just won't be the same without you!

Latest colony-loss survey from the Bee Informed Partnership

The most recent poll results suggest that colony losses are not improving. But dig into the details to see some important and revealing patterns.

Average colony losses over the last 9 years of BIP surveys is ~one-third of all honey bees.

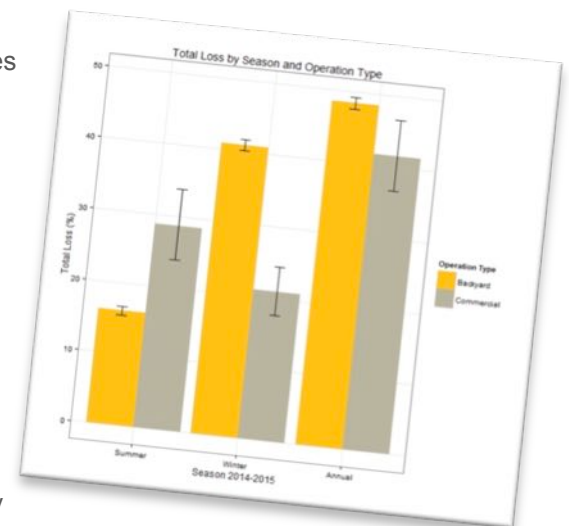
The Bee Informed Partnership (<http://beeinformed.org>), in collaboration with the Apiary Inspectors of America (AIA) and the United States Department of Agriculture (USDA), recently released our preliminary results for the ninth annual national survey of honey bee colony losses. For the 2014/2015 winter season, a preliminary 6,128 beekeepers in the United States provided valid responses. Collectively, these beekeepers managed 398,247 colonies in October 2014, representing about 14.5% of the country's estimated 2.74 million managed honey bee colonies.

About two-thirds of the respondents (67.2%) experienced winter colony loss rates greater than the average self-reported acceptable winter mortality rate of 18.7%. Preliminary results estimate that a total of **23.1% of the colonies managed in the United States were lost over the 2014/2015 winter**. This would represent a decrease in losses of 0.6 percentage points compared to the previous 2013/2014 winter (total loss estimated at 23.7%) and the second year in a row to be notably lower than the 9-year average total

loss of 28.7% (see Figure 1).

Beekeepers do not only lose colonies in the winter but also throughout the summer, sometimes at significant levels. To quantify this claim of non-winter colony mortality we began including summer and annual colony loss since the 2012/2013 report. In 2014, the summer losses surpassed winter losses at 27.4% (total summer loss). This compares to summer losses of 19.8% in 2013 and 25.3% in 2012. Importantly, commercial beekeepers appear to consistently lose greater numbers of colonies over the summer months than over the winter months, whereas the opposite seems true for smaller scale beekeepers (see Figure 2). Responding **beekeepers reported losing 42.1% of the colonies managed over the last year** (total annual loss, between April 2014 and April 2015).

As in previous years losses were not consistent across the country, with annual losses exceeding 60% in several states, while Hawaii reported the lowest total annual losses of ~14% (see Figure 3).



Backyard beekeepers manage 50 or fewer colonies, whereas commercial beekeepers manage 501 or more colonies. Commercial beekeepers lose more colonies during the summer, but hobbyist beekeepers lose more over the winter and more overall.

NC State Apiculture Program



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.



Tarpy lab in the news

Check out this excellent piece on WRAL about our Queen & Disease Clinic! In it, Deniz explains the different tests that we offer to beekeepers and researchers alike.

[LINK](#)

Save the date!

Next webinar:
September 5th, 2013
Hosted by:
Rockingham County
Beekeepers Association
Topic: What beekeepers
should know about
viruses and their effects
on colony health



Latest webinar

Our last Apiculture Webinar was about pesticides and the new labeling requirements that EPA is implementing to help protect pollinators. Thanks to Wayne Buhler, our resident pesticide expert in the Department of Horticulture, and Pat Jones of the NCDA&CS Pesticide Division for their excellent guest presentations.

Random notes

New publications

Lee, K. V., N. Steinhauer, K. Rennich, M. E. Wilson, D. R. Tarpy, D. M. Caron, R. Rose, K. S. Delaplane, K. Baylis, E. J. Lengerich, J. Pettis, J. A. Skinner, J. T. Wilkes, D. vanEngelsdorp for the Bee Informed Partnership. (2015). A national survey of managed honey bee 2013-2014 annual colony losses in the USA: results from the Bee Informed Partnership. *Apidologie*, **46**: 292–305.

Tarpy, D. R., H. R. Mattila, and I. L. G. Newton. (2015). Characterization of the honey bee microbiome throughout the queen rearing process. *Applied Environmental Microbiology*, **81**: 3182–3191.

Seeley, T. D., D. R. Tarpy, S. R. Griffin, A. Carcione, and D. A. Delaney. (2015). A survivor population of wild colonies of European honeybees in the northeastern United States: investigating its genetic structure. Published online in *Apidologie*. DOI: 10.1007/s13592-015-0355-0

Welcome aboard!

We have several new people in the lab. We were joined by a new PhD student, **Dash Donnelly**, who is a graduate student in Becky Irwin's lab (a newly recruited pollinator ecologist extraordinaire lured away from Dartmouth) in the Department of Applied Ecology. His interests are more aligned

with the Entomology graduate program, however, particularly given his background—his family runs one of the largest beekeeping operations in the country out of the Dakotas!

We were also joined by several new undergraduate researchers this summer, including **Charlie Gray, Andrea Fitzgerald, and Abby Cooper**. Charlie is working with Hongmei on her CRISPR project, and Andrea (who is from UNC) and Abby (a high school intern) are working with Margarita on the effects of urbanization on native bee physiology.

...and sadly missed

We bid adieu to **Ravi Dixit** and **Gabriella Quinlin**, who were undergraduate researchers who graduated this past semester. Gabriella is going to Michigan State University in Rufus Issac's lab, one of the premiere native pollinator groups in the country, for a summer internship. Also departing are **Donna Albrigth** and our first-ever media intern **Hannah Thigpen**. Best of luck to you all!

Pollinator protection stewardship update

For the last year or so, a committee has been discussing the many changes that the EPA is implementing for pesticide regulation. Spearheaded by Debbie Hambrick at the NC Farm Bureau, we have been discussing these important issues to see how they will eventually be implemented within the state of North Carolina.

Teacher's corner: Courses at NC State

Our upcoming offering of ENT 203 "An Introduction to the Honey Bee and Beekeeping" is resurging. Our enrollment did not hit capacity last year after several years of competing offerings from other sections, but now it is on the rebound and back to full enrollment. We also had a great semester this past spring with our ENT 401 "Honey Bee Biology and Management" course (pictured left), which had record enrollment. Unfortunately, given the diminished number of faculty in the department and changing priorities in our curriculum, it is very possible that this was the last offering of the course. We should definitely this fall.

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



Tarpy's back page

On May 19th, the White House released their proposed 'National Strategy To Promote The Health Of Honey Bees And Other Pollinators.' This is a really, really big deal, as it includes three major initiatives:

- 1 Reduce honey bee colony losses to economically sustainable levels;
- 2 Increase monarch butterfly numbers to protect the annual migration; and
- 3 Restore or enhance millions of acres of land for pollinators through combined public and private action.

The second initiative is critically important but would not directly affect our program, while the other two very much have the potential to do so. The first is directly informed by the annual BIP surveys (see page 3), and consistently one of the top reasons for colony loss is prematurely failing queens (a major research focus of the lab). We have also been engaged in the last few years on pollinator habitat to improve honey and native bee forage (and therefore nutrition). The President has proposed an additional \$34M to be spent on these important objectives, bringing the total federal budget to \$82.5M for bee research and extension endeavors. For a \$20B agricultural economy that relies heavily on bees for pollination, this is well worth the investment.

Now while we've all learned, the hard way, the distinction between proposed and appropriated funds, but we hope congress will agree that pollinators are worth supporting financially. In doing so, we aim to take advantage of this opportunity and further our ongoing work on pollinator habitats, disease ecology, and improving queen quality.

Sincerely, David