

The Northeast Beekeeper Winter 2011

Greetings from Dyce Lab. I want to update you on activities at the lab for this year as well as on a number of other items of interest to beekeepers including information on Master Beekeeper Workshops, legislative items, research at the lab, an update on CCD, new mite treatments, and more.

Teaching



Student in Practical Beekeeping display their frames

This past fall was a teaching fall. I had 69 students in ENTOM2600 – Biology of the Honey Bee - and 24 in ENTOM2640 – Practical Beekeeping. One of the lab exercises involves the construction of a frame, along with wiring and embedding foundation. Those are my lab students to the left, proudly displaying their accomplishments. We also went on several field trips to see how beekeepers remove honey from hives, how commercial operations extract honey and how a successful beekeeper takes advantage of the NYS Farmer's Markets. Students also made candles and extracted

honey at the lab in time to take presents home to their parents for their Thanksgiving break. Not a bad return for all that tuition. Thanks (again) to Jon Ryan and Alan Tremblay who hosted field trips to their operations and provided students a real window into the world of commercial beekeeping.



Pei-Chun holds a swarm before getting stung

Lab Activities

One of my graduate students, Pei-Chun Wu, to the left, will be working on a study this summer to determine the effects of *Nosema ceranae* on several aspects of honey bee foraging behavior and length of life. She will examine the foraging behavior of individual workers that are experimentally infected with different doses of nosema spores and compare those results to a group of uninfected control workers. The goal is to determine

the effect of the parasite on the age when workers begin to forage, the overall foraging intensity in terms of trips per day and duration of trips, the decision whether or not to collect pollen, and length of foraging life.

My other graduate student, Rick Ciccirelli, is working on identifying the mechanisms by which colonies regulate the production and maintenance of drones. The results of his study will directly impact those interested in doing selective breeding and controlled mating using the drone saturation technique.

I will be working with two commercial migratory beekeepers on a project to evaluate the effects of supplementary feeding (pollen substitute and sugar syrup) on colony health and pollinator efficiency while on site for pollination in cranberries in MA (see picture to right). This will be an interesting experiment as bees do not usually do well while on site for cranberry pollination, often coming out of the field in seriously weakened condition.



Colonies in cranberry pollination in MA

There are a couple of reasons for this. The nutritional environment in cranberry bogs and the surrounding environment is likely inadequate for sustaining colony health. Additionally, bees may be exposed to a number of pesticides while on location. Beekeepers are resorting to the use of supplemental feeding to keep their bees strong during these periods of stress; however, there are no data on the effectiveness of this technique, nor are there any data on how feeding pollen substitute and/or sugar syrup affects pollination efficiency.

Meetings and Events

- The ESHPA summer picnic for 2011 will be held on Saturday July 23, at the Canandaigua VA Medical Center in Canandaigua, New York. Bring a dish to pass, beverage of your choice, and a lawn chair. Go to: <http://www.eshpa.org> (Hold down CTRL key while left clicking with mouse)
- The Eastern Apicultural Society will host its annual summer conference and short course July 25-29, 2011 in Warwick, RI. Go to: <http://www.easternapiculture.org/>
- Betterbee will host field days in Greenwich, NY: dates are not set, but you can check at <http://www.betterbee.com/>

Master Beekeeper Workshops

I am hosting several Master Beekeeper Workshops this year. There are still a few slots available. With so many new beekeepers, proper training is essential, especially for the management of varroa mites and American foulbrood. I am offering a new workshop on the laboratory diagnosis of nosema and AFB in the fall.

- **Apprentice Level Spring Workshops**

- May 7-8th, 2011: Ithaca
- May 14-15th, 2011: Ithaca
- May 21-22th, 2011: Betterbee

The Spring Course is a comprehensive two-day workshop designed to build basic beekeeping skills. The Spring Course focuses on starting with bees, beekeeping equipment and construction, spring and summer management goals, identification and management of bee pests, and basic bee biology. Students learn about the life-cycle of the colony, the activities of the queen, workers and drones, and a little about sex determination and the development of the bee from an egg to an adult.



New beekeepers install packages at Dyce Lab

Participants receive a manual to complement the lectures. Field activities include one or more of the following, depending on weather and availability of resources: build a frame, wire it, install and embed foundation; install packages, inspect colonies

- **Apprentice Level Fall Workshops**

- September 10, 2011: Betterbee
- September 24, 2011: Ithaca

The Fall Course is a one-day workshop that focuses on removing the crop from the hive, preparation for the fall flow, extracting and processing honey, bottling and labeling, identification and management of honey bee pests, and preparing the colony for winter. It also covers the chemistry of honey and wax and the proper way to handle both. Participants receive a manual to complement the lecture. Field activities include uncapping combs, and extracting and processing honey, all aimed for the small-scale beekeeper.



A new beekeeper learns how to extract honey

- **Journey Level Workshops**

- Laboratory Diagnosis of Nosema and American foulbrood
- October 29th, 2011: Ithaca

The laboratory workshop provides training in the use of laboratory equipment for the diagnosis of American foulbrood, tracheal mites and nosema. Activities vary depending on what is most important at the time, but are drawn from the following: thoracic disc assay for identification of tracheal mites, the modified hanging-drop technique for identifying American foulbrood spores, the antibiotic resistance test for AFB, and methods for identifying and counting nosema spores. Participants receive handouts to complement the lectures. This year, we will learn how to diagnose AFB with the hanging-drop technique and how to estimate the number of nosema spores in a bee.



Bart Smith checks a sample for AFB spores at the Beltsville Bee Lab

Workshop registration materials can be found at <http://www.masterbeekeeper.org/>

Other Presentations

I will be giving two talks at Dyce Lab this April. These are of general interest, but they are also available for recertification credits for NYS commercial and private pesticide applicators (categories: CORE, 1B and 31). Pre-registration is required as there are a **very** limited number of seats – please email me at nwc4@cornell.edu if you are interested.

- April 29th, 2011: Dyce Laboratory from 6:00 PM to 9:30 PM [credits TBA]
 - **Chemicals in the Hive:** provides an overview of the history of the origin and growth of the use of pesticides in hives, the regulatory environment that governs the registration and use of pesticides, tolerances in hive products, home remedies, the impacts of pesticides on human health and safe handling procedures for using pesticides.
 - **IPM for honey bee parasites in the 21st century:** a comprehensive overview of the biology and life-history of *Varroa destructor*, mechanisms by which it damages colonies and methods for managing *V. destructor*

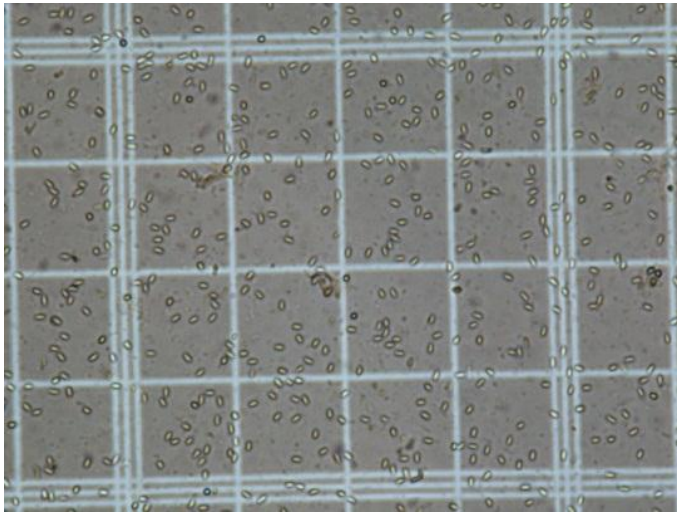
As always, I am happy to visit and make a presentation to your group. I have talks on VARROA IPM [similar to the one mentioned immediately above] and AFB IPM. As there are so many new beekeepers, and since the NYS Inspection Program has been severely cutback, these are critical topics. Historically, foulbrood rates increase in the absence of a good inspection program, especially among small-scale beekeepers; so, it is important that everyone be able to identify this disease and know how to respond. This is a good time to set up a date. I have already heard from several of you. Sometime in the fall works best.

Website

There is an excellent website with an amazing amount of information about bees at:
<http://www.extension.org/bee%20health>

Colony Collapse Disorder

To date, there have been no definitive findings regarding the cause or causes of CCD. Actually, CCD is not all that well defined a condition, and that makes it hard to study.



Spores of *Nosema ceranae* in a hemocytometer

Typically, researchers get involved when a beekeeper contacts them and reports large and unusually rapid losses. At that point, it is hard to figure out what actually caused the problem. *Nosema ceranae* has been implicated in recent losses. *Nosema* is a parasitic fungal pathogen that invades the epithelial cells lining the honey bee ventriculus (the stomach where digestion occurs). For years, it has been assumed that the only species of *Nosma* present in the US was *N. apis*. *N. cerane* is a sister species that previously has been limited to the eastern honey bee *Apis ceranae*.

However, in 2007, reports of *N. ceranae* in the western honey bee were published by scientists from Taiwan. It soon became apparent that *N. ceranae* was widely distributed throughout much of the world, including Europe where scientists believe that it is responsible for significant losses experienced there. A study by Chen et al. (2008) at the ARS Bee Research Lab in Beltsville, MD reported detecting *N. ceranae* in archived samples of US honey bees from as early as 1995. Several studies have suggested that *N. ceranae* is a major contributor to the recent spate of losses both here in the US and Europe. However, pesticides, especially pesticides used by beekeepers to control mites, poor nutrition, exotic pathogens and beekeeper management practices are all still suspect.

A recent article suggests that CCD is a result of *N. ceranae* in combination with a honey bee virus (<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0013181>). Like most studies on CCD, the results are based largely on correlations. While the research community may not yet have identified the exact cause of CCD, a great deal is being learned about honey bee diseases that can only benefit the industry as we go forward.

A recent paper by Wu et al. (2011) out of the Sheppard lab at WSU in Pullman, WA reported that residual pesticides in comb wax can significantly affect the health of workers reared in those combs. They found that workers reared in contaminated combs had delayed larval development and adult emergence and shorter lifespans as adults. They point out that these affects can extend beyond just the immediate observations. Delayed emergence may result in greater numbers of varroa mites reaching maturity before the host emerges. Shortened worker life-spans translate directly into a reduced ability of workers to provide the colony with the resources it needs to thrive. They also found that pesticides in contaminated combs migrated relatively quickly to uncontaminated combs. You can read the article at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0014720>. If you have used Apistan or CheckMite+ in the past, your combs probably have some level of contamination with these products. One solution is to replace 10-20% of your worst combs every year with foundation and stop using these products. Some of the contamination comes from non-beekeeper applied chemicals, and there is no easy way to solve that problem.

Colony numbers in the US

Interestingly, the number of colonies in the US rose last year to 2.68 million, up for the second consecutive year since the low of 2.3 million colonies in 2008 and the highest level since 1994 when the number of colonies was 2.78 million.

New miticides

NOD Apiaries has stopped production of Mite-Away II™ and replaced it with Mite-Away Quick Strips™ (MAQS™). Both products use formic acid as the active ingredient for the management of *Varroa destructor*. MAQS has received a Section 3 registration from US-EPA. Section 3 registrations indicate that the product is approved for General Use, as opposed to being classified as a Restricted Use Pesticide which requires users to be Certified Private or Commercial Pesticide Applicators. The second part of this process involves state by state approvals. Application to NYS-DEC was made in early March, but it may take two or more months to receive the registration. I have written NYS-DEC, encouraging them to put this registration on the fast tract because beekeepers need it now for spring treatment. You can reach NYS-DEC to encourage them (politely) to move as rapidly as possible on the MAQS registration at:

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From the proposed MAQS label

For hives with single brood chambers lay two strips across the top bars of the frames of the brood chambers, staggering them so they lay flat and across the full width of the hive body, with approximately 2 inches between strips and 4 inches between the ends of the brood chamber and the outer edges of the strips. For hives with two brood chambers place the strips as described above on the frame top bars of the lower hive body, so the strips are in-between the brood chambers. Put on honey supers, if a honey flow is anticipated. The active ingredient dissipates after 3 days however, do not disturb the colony for 7 days to allow it to recover from any side-effects that may have occurred. Spent strips need not be removed after treatment.

The bottom hive entrance needs to be fully open for the entire duration of treatment. Entrance reducers MUST be removed to prevent excessive damage to the colonies. Treat all bee colonies in the apiary at the same time. Allow a minimum of one month between applications.

There are two MAJOR improvements with MAQS. First, you can use the product during a nectar flow. Second, you do not need to remove it at the end of the treatment period – the bees will take care of that for you. This means one trip to the bee yard rather than multiple trips as required with Mite-Away II and other products. You must read the entire label for a complete instruction on the proper use of this product. Be sure to follow all requirements for Personal Protection Equipment (PPE).

I have not seen any data on the efficacy of this product, but the manufacturer claims it to be as good as Mite-Away II or better. Since it is based on the same active ingredient as its predecessor, I am giving it the benefit of the doubt; but I am anxious to test this new product. Randy Oliver published a nice article on miticides, including MAQS, in the Feb. 2011 issue of American Bee Journal, and it looked very promising

There is another miticide – Hopguard™ – that is in the registration process. It is derived from natural hop compounds. Right now, the only way to obtain it is through a Section 18 – Emergency Exemption from Registration. I have not seen any data on the efficacy of this product, and I am unfamiliar with its active ingredient. I would like to evaluate the product before seeking a Section 18. You can view the manufacturer's webpage at: http://www.betatechopproducts.com/sites/all/themes/betatec/images/BETATEC_HopGuard_Rev_3-4-11.pdf (hold CTRL key down while left clicking with mouse).

Starting with bees?

You will need to make a lot of decisions that will affect your success. Two of the biggest are your selection of a queen and your selection of the location for your apiary. Good queens in bad yards and poor queens in any yard are recipes for failure. You need both a good queen and a good location. Here are a few tips for picking that ideal apiary.

Your location needs to be with range of adequate pollen and nectar resources to support a reasonable number of colonies. Most small-scale beekeepers keep fewer than five hives, and most locations will support that many. However, you will find that a location may provide abundant nectar one year, but not so much the next. It will take 3-4 years to get a feel for the value of a location, so be patient; but if you come up empty two years in a row, start looking elsewhere. Also, you will probably find that the nectar flows in a yard, even a good one, may not be continuous throughout the season, and bees will go downhill during an extended period when nectar is not available in the field – known as a dearth. If you run into a long dearth, you should feed sugar syrup (one-to-one, sugar-to-water, by weight) and a pollen substitute/supplement until a flow starts. If you don't, you will end up with weak colonies that cannot take advantage of the next flow and that may not make it through the winter.



Cinder blocks make good hive stands

Accessibility should be high on your list of considerations. You will want to get into your yard in the late winter, early spring and early fall; and you may need to carry feed to your bees. During the season, you will be putting supers on your hives and taking them off to extract. Getting your pick-up stuck in the mud can be more than a minor inconvenience. It can be expensive; and if you are stuck too far from a road, the towing truck may not have sufficient cable to get to your truck.

A gently sloping hill with some southern exposure is best. Avoid low-lying locations that collect cold air (like gullies) and locations that are wet; and, of course, keep your bees high and dry on a hive stand of some sort. Eight to ten inches off the ground is good, but be sure the hives are stable. Too much of a tilt may not seem like a problem when your bees are in two stories, but can become problematic when they reach four to six stories in the summer. Use wood scraps to level your hives, but leave a 2-3 degree forward tilt to allow rainwater to run away from the entrance and help the bees keep the nest dry.

Avoid open hilltops and any other unprotected areas where your bees will be exposed to winds. A windbreak to protect your bees from prevailing winter winds is essential. Sunshine throughout the day will get your bees out earlier and keep them working later. It will also help warm your hives, which is especially important in the winter.

Security is important. Putting your hives out in the open seems to discourage vandals and thieves who fear getting caught. If you can locate them in a fenced in area or within sight of a friendly neighbor, but not too close, you will have better security and peace of mind.

Your bees will collect water on hot, dry summer days. If your neighbor has a swimming pool, water bowl for a pet, or almost any other outside water source, you may find your bees becoming pests. If your neighbor has caged pets outside, your bees may attack them and possibly kill them. Don't be surprised if someone complains about your bees in their bird feeder or other source of cracked grain. The bees see this as a legitimate source of protein and will often visit these sources, especially in the spring. Keep your bees as far from a neighbor's property line as possible, and inspect your bees on warm, sunny days during a good nectar flow. If you need to feed syrup, start in the evening and then leave it on until consumed.

You may find that a location is ideal for summer, but not so good for winter; so, consider one location for the summer and another for winter. If you have several apiaries, you can combine them into a single winter yard. When I was at Ohio State, I ran about a dozen out yards with 16-24 hives in each location. Some were good year round yards, others were not. I moved 40-60 colonies into one well-protected winter yard and moved them out the following spring.



Marketing varietal honey with attractive labels will increase your sales

GO TO PART B: STATE APIARIST'S REPORT