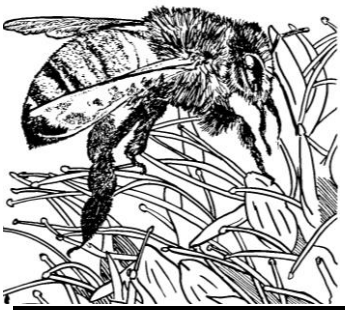

BEE NEWS & VIEWS

The Mississippi Beekeepers Association Newsletter

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March-April 2016

Beginners Workshop in Adams County

By Jeff Harris

Queen in hand

The Southwest Beekeepers Association (SWBA) and I jointly conducted a beginning beekeepers workshop on Saturday, March 5, 2016 at the Adams County Extension Office. We were asked by David Carter, the county extension agent, to provide a day-long program to help people in the Natchez area who wanted to start beekeeping.

Michael Scheel, Program Chairman of the SWBA, began the day with a discussion of the bee space, and how it influences the way bees will react to uncomfortable spacing – building burr in gaps bigger than the bee space, and filling voids smaller than it with propolis. He used the concept to show how the Langstroth hive parts are fitted together to produce a movable frame hive that allows easy removal and replacement of combs.

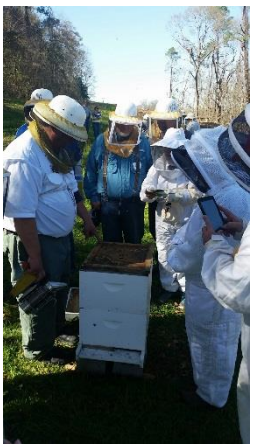
He discussed buying and proper fitting of hive equipment (*e.g.* matching the correct size of frames to a hive body). He demonstrated the use of several gadgets, such as a 9-frame spacer. His presentation also covered the basics in personal protective equipment, smokers and hive tools.

I followed with a seminar on getting started in beekeeping. Specific topics included how and where to obtain bees, how to choose apiary locations, how to install a nuc or package of bees, and how to grow that installed unit in order to survive the first season. I included a smattering of basic bee biology and the roles of the different members of the colony.

Lecture in Adams Co. Extension Office

After a brief coffee break, we continued with a discussion of seasonal management of honey bees. Emphasis was placed on swarm management and knowing when and how to feed bees during periods of dearth. We continued onward to a discussion of the control and management of Varroa mites and Small Hive Beetles before lunch. We had a pretty darned good lunch that was catered by Modie Mascagri, a beekeeper and owner of a local Italian restaurant (Lil Dagos' Café) in Natchez.

The rest of the afternoon was spent outside. We subdivided the group into smaller sets that were led by seasoned members of the SWBA. Attendees were shown the basics of how to work honey bees, and we discussed the kinds of things that one should be looking at when inspecting hives. These segments of workshops are always the best because they seem very spontaneous and natural as questions are asked by eager participants. The hands-on approach allowed us to demonstrate techniques while responding to queries from the new beekeepers. This approach feels the most rewarding to me.



In the Bee Yard

We concluded with a brief wrap up and Q&A inside after a few hours outside with the bees. The weather was beautiful, and I think that most attendees enjoyed the outing. Hopefully, they learned something new as well.

Beginners Workshop with the Central MS Beekeepers

By Jeff Harris

The Central Mississippi Beekeepers Association (CMBA) held a Beginners Workshop at the AG & Forestry Museum in Jackson, MS on March 19, 2016. As usual, this was a fantastic and well attended workshop. I do not know the official head count, but > 120 people attended the workshop. If you missed it this year, try to catch it next year – it is almost always in March.

In the morning Walter McKay provided an overview of basic beekeeping equipment: virtues and drawbacks of different sizes (deep, medium or shallow) of hive equipment, different types of foundation, plastic versus wood, and old versus new equipment. He also provided estimated costs of starting a new colony of bees, which is useful for those who have never purchased beekeeping equipment.

Harold Watson summarized basic bee biology. He described the roles of all colony members, detailed the different age-related tasks of work bees, and described the reproductive attributes of queens and drones. He emphasized queen reproductive quality, and how a newbie can tell if there is a queen present in a hive. He also described the role of queen pheromones in colony cohesion, and he outlined the reasons that colonies swarm.

I followed with several lectures about diverse topics. Perhaps the most important one detailed the seasonal growth and management of honey bee colonies in response to changes in floral source abundance. I included swarm prevention and supplemental nutrition in this presentation. My second lecture focused on the management of our two biggest problems – Varroa mites and Small Hive Beetles. We ate a lunch provided by a local Boy Scout troop, and after lunch, participants rotated through several field stations for the remainder of the afternoon.

Participants got their hands into hives after lunch. Several CMBA members manned these stations and showed participants as much about bee colonies as was possible in a few hours. Jim Pennington showed attendees how to make a nucleus colony (or nuc), and he detailed numerous ways in which nucs could be used either to mate queens or to make increases in colony numbers. Kip Isonhood demonstrated honey removal and extraction from combs. Bill Averitt and others demonstrated various aspects of general beekeeping, such as what things to observe during routine colony exams to gauge the health and strength of colonies. I provided more information on hive diseases and pests. We ended the afternoon with an informal Q&A session and final wrap-up.

Speaking to Garden Clubs

By Jeff Harris

During every spring this time of year, I am frequently asked by garden clubs, civic organizations or groups of retired people to discuss the plight of honey bees. The media attention of the last few years has raised concerns in the non-beekeeping public, but some of their concerns are based on hyperbolic slants from different political sides of the pesticide-pollinator controversy. For example, it is astounding to me how many people think that the honey bees is dying as a species from planet earth. Many of these same people are also convinced that humans will die soon after the honey bees are lost because our food production comes from the bee's pollination service. Whew! These are some hyperboles that need adjustment, but I usually try to do so while describing the factors that cause our bees to die.

I had the opportunity to discuss problems with our honey bees to non-beekeeping audiences on at least five occasions in March and April:

Carroll County Gardeners, Carrollton, March 22

National Association of Retired Federal Employees, Starkville, March 24

Garden Club of Bay St. Louis, Bay St. Louis, April 7

Lee County Master Gardeners, Tupelo, April 12

Oktibbeha County Master Gardeners, Starkville, April 14

Generally, I started all of these conversations by dispelling the two myths. First, honey bees are not dying from the planet. Yes, many factors contribute to unusually high mortality of bee colonies, BUT it is very unlikely that the honey bee will ever be eliminated from the planet (well, at least until conditions on earth become so unbearable that all life is threatened).

For example, it seems that honey bees can even be selected to survive Varroa mites if left to natural mechanisms of selection. However, the result is usually a type of honey bee that keeps its colony size small in relatively small cavities of trees, and they swarm frequently. These are excellent ways to keep Varroa mite populations low, but they are not good characteristics for commercial beekeeping. Thus, if a population of honey bees were left untreated by man, some kind of survivor honey bee would emerge – but that bee would not support our U.S. beekeeping industry. The point – is that the honey bee will survive as a species. Similar arguments could be made for most of the stressors that kill our bees.

The second myth is that humans will starve. I usually just ask the audience to tell me which foods feed the world. It does not take long for most people to realize that most of the crops that feed the world do not require a pollinator; thus, if honey bees died, humans would continue on. However, I always remind people of the value of our honey bee pollination as a significant contribution to agriculture and their gardens. In the U.S. honey bees are responsible for $19 billion in agricultural production and about $300 million in domestic honey sales each year. These are important contributions to our U.S. economy and food supply, and I praise our beekeepers for this contribution.

Finally, I end with what is really hurting in the U.S. – our commercial beekeeping industry is what has been threatened over the last 25 years. The introductions of tracheal and Varroa mites, the rise of viral pathogens associated with Varroa mites, the replacement of *Nosema apis* by *N. ceranae*, the introduction of the Small Hive Beetle, and the ever-present danger of exposure to toxic agrochemicals have all increased production costs on our beekeeping industry. The price of honey does not always keep pace, and many beekeepers have simply left the industry for better ways of making a living elsewhere. All of these problems have made U.S. commercial beekeepers endangered of being lost from the planet and not the bees. That is the more correct perspective on our issues.

First Multi-Year Study of Honey Bee Parasites and Disease Reveals Troubling Trends

By PHYS.ORG, April 26, 2016

This bee is infected with Deformed Wing Virus, one of many viruses spread by varroa mites. Credit: Bee Informed Partnership

Honey bee colonies in the United States are in decline, due in part to the ill effects of voracious mites, fungal gut parasites and a wide variety of debilitating viruses. Researchers from the University of Maryland and the U.S. Department of Agriculture recently completed the first comprehensive, multi-year study of honey bee parasites and disease as part of the National Honey Bee Disease Survey. The findings reveal some alarming patterns, but provide at least a few pieces of good news as well.

The results, published online in the journal *Apidologie* on April 20, 2016, provide an important five-year baseline against which to track future trends. Key findings show that the varroa mite, a major honey bee pest, is far more abundant than previous estimates indicated and is closely linked to several damaging viruses. Also, the results show that the previously rare Chronic Bee Paralysis Virus has skyrocketed in prevalence since it was first detected by the survey in 2010.

The good news, however, is that three potentially damaging exotic species have not yet been introduced into the United States: the parasitic *Tropilaelaps* mite, the Asian honey bee (*Apis cerana* F.) and slow bee paralysis virus.

"Poor honey bee health has gained a lot of attention from scientists and the media alike in recent years. However, our study is the first systematic survey to establish disease baselines, so that we can track changes in disease prevalence over time," said Kirsten Traynor, a postdoctoral researcher in entomology at UMD and lead author on the study. "It highlights some troubling trends and indicates that parasites strongly influence viral prevalence."

Varroa mites (dark red) primarily feed on honey bee larvae, but spread from hive to hive on adult bees. The mites transmit disease, including several debilitating viruses. Credit: Bee Informed Partnership

The results, based on a survey of beekeepers and samples from bee colonies in 41 states and two territories (Puerto Rico and Guam), span five seasons from 2009 through 2014. The study looked at two major parasites that affect honey bees: the varroa mite and nosema, a fungal parasite that disrupts a bee's digestive system. The study found clear annual trends in the prevalence of both parasites, with varroa infestations peaking in late summer or early fall and nosema peaking in late winter.

The study also found notable differences in the prevalence of varroa and nosema between migratory and stationary beehives. Migratory beekeepers—those who truck their hives across the country every summer to pollinate a variety of crops—reported lower levels of varroa compared with stationary beekeepers, whose hives stay put year-round. However, the reverse was true for nosema, with a lower relative incidence of nosema infection reported by stationary beekeepers.

Additionally, more than 50 percent of all beekeeping operations sampled had high levels of varroa infestation at the beginning of winter—a crucial time when colonies are producing long-lived winter bees that must survive on stored pollen and honey.

"Our biggest surprise was the high level of varroa, especially in fall, and in well-managed colonies cared for by beekeepers who have taken steps to control the mites," said study co-author Dennis vanEngelsdorp, an assistant professor of entomology at UMD. "We knew that varroa was a problem, but it seems to be an even bigger problem than we first thought. Moreover, varroa's ability to spread viruses presents a more dire situation than we suspected."

Varroa mites (dark red) primarily feed on honey bee larvae, but spread from hive to hive on adult bees. The mites transmit disease, including several debilitating viruses. Credit: Bee Informed Partnership

For years, evidence has pointed to varroa mites as a culprit in the spread of viruses, vanEngelsdorp noted. Until now, however, much of this evidence came from lab-based studies. The current study provides crucial field-based validation of the link between varroa and viruses.

"We know that varroa acts as a vector for viruses. The mites are basically dirty hypodermic needles," Traynor said. "The main diet for the mites is blood from the developing bee larva. When the bee emerges, the mites move on to the nearest larval cell, bringing viruses with them. Varroa can also spread viruses between colonies. When a bee feeds on a flower, mites can jump from one bee to another and infect a whole new colony."

Nosema, the fungal gut parasite, appears to have a more nuanced relationship with honey bee viruses. Nosema infection strongly correlates to the prevalence of Lake Sinai Virus 2, first identified in 2013, and also raises the risk for Israeli Acute Paralysis Virus. However, the researchers found an inverse relationship between nosema and Deformed Wing Virus.

Some viruses do not appear to be associated with varroa or nosema at all. One example is Chronic Bee Paralysis Virus, which causes loss of motor control and can kill individual bees within days. This virus was first detected by the survey in the U.S. in 2010. At that time, less than 1 percent of all samples submitted for study tested positive for the virus.

Since then, the virus' prevalence roughly doubled every year, reaching 16 percent in 2014.

"Prior to this national survey, we lacked the epidemiological baselines of disease prevalence in honey bees. Similar information has been available for years for the cattle, pork and chicken industries," Traynor said. "I think people who get into beekeeping need to know that it requires maintenance. You wouldn't get a dog and not take it to the vet, for example. People need to know what is going on with the livestock they're managing."

While parasites and disease are huge factors in declining honey bee health, there are other contributors as well. Pesticides, for example, have been implicated in the decline of bee colonies across the country.

"Our next step is to provide a similar baseline assessment for the effects of pesticides," vanEngelsdorp said. "We have multiple years of data and as soon as we've finished the analyses, we'll be ready to tell that part of the story as well."

More information: Kirsten S. Traynor *et al*, Multiyear survey targeting disease incidence in US honey bees, *Apidologie* (2016). DOI: 10.1007/s13592-016-0431-0

Making Splits: Workshop in Pike County

By Jeff Harris

On Saturday, April 2, 2016 the Southwest Mississippi Beekeepers Association (SWBA) and I conducted a workshop on how and when to split hives. The event took place at the Pike County Fairgrounds in McComb, MS. The weather was beautiful with clear sunny skies, but there was a bit of a steady 15-20 mph wind from the passing of a weather system overnight. As is usual with this group, there was much jovial comradery and joking among the membership throughout the day. I enjoy hanging out with these folks, and we always seem to have fun outside in the bee yard at these workshops.

We considered this an intermediate level workshop, and some of the ideas discussed were probably beyond the skills of a brand new beginner. However, learning how to make splits is an essential part of becoming a seasoned beekeeper, and I expect this topic to be repeated every year or so. The primary purpose for making splits is to increase the number of colonies in an operation or business. However, colonies can also be split to make mating nucs and other more ethereal units that might be used to either hold a queen temporarily or to be combined with an established colony as a boost in colony population.

Morning lectures focused on growing strong colonies from over-wintered hives and on the different philosophies that people use when deciding on which colonies should be split. I endorsed the ideas of Dr. Larry Connor who believes that one's best colonies should be spared extreme splitting (except maybe as a form of swarm management) and that your poorest performing colonies from the previous season should be dismantled and requeened – and therefore, the prime candidates for being split.

After a catered lunch, we spent the remainder of the afternoon outdoors. Members of the SWBA and I subdivided participants into 5 or 6 groups to work hives in the bee yard. We demonstrated several ways of making hive splits, and all groups actually split colonies that needed to be split (or otherwise some were definitely going to swarm). We also showed how to install a nuc and discussed the feeding regime needed to get it ready for the late summer dearth. As is typical with the outdoor demonstrations, participants always seem to loosen up and ask the most questions while we are in the hives. I felt like most of the information needing to be communicated was exchanged in the bee yard!

BioBlitz on the Natchez Trace in Tupelo

By Linda Garnett and Jeff Harris

The 2016 BioBlitz occurred on Saturday, April 16, at the Natchez Trace Parkway Visitor Center in Tupelo, MS. During a BioBlitz, students, teachers, citizens and scientists work together to identifying as many species in a given area, and in a given amount of time as possible. A BioBlitz provides a picture of the amount of biodiversity in a place and sparks interest in ecology and living things.

It was a very fun and educational event for the entire family. There were live snake presentations, native plants walk, bug searches, tree walks and bird walks. Additionally, there were booths featuring fun with fish, mammals of Mississippi, hunter education and wildlife law enforcement, black bears, endangered bats, honey bees and other insects, and historical events of the Natchez Trace. I of course, discussed the value of honey bees as a pollinator of agricultural systems and landscapes with wildflowers and native plants.

In the Bee Yard with NE Beeks

By Jeff Harris

Before going home after the BioBlitz, I helped Dr. Ben Kilman conduct a hands-on workshop with beekeepers from the Northeast Mississippi Beekeepers Association (NEBA). Ben is the current President of NEBA, and he is also physician in the Tupelo area. He has loved beekeeping since he was a child. He is extremely knowledgeable, and he enjoys sharing his love of bees with his friends. Ben and I have collaboratively worked on a couple of occasions, and I always enjoy these interactions.

Dr. Ben Kilman, President of NE Beeks

The event was held at the home of Roland Barnes in Mooreville, MS. Roland had about 60-70 colonies on the property, and he graciously allowed us to use whatever we wanted for instruction.

Additionally, Romona Edge, the Itawamba County Extension agent was on-hand to help with organization and logistics (and I stole the photographs in this article from her Facebook post). Although the work with bees extended to near dark, there were very few stings received by participants.

Ben and I subdivided the group into halves. We both demonstrated the basics of working bees and assessing hives for presence and quality of queens and problems with diseases, etc. We also discussed making splits, installing nucs, sampling for Varroa mites, and any topic that was asked by our beekeeper audience.

Beekeepers in Mooreville

Ben demonstrated the vaporization of oxalic acid using his hot air gun invention – and I am finding that Ben has many of the genes found in beekeepers, including the one for tinkering and making gadgets.

I greatly enjoyed the event, but I think that it was too short on time. We could have spent more hours in the hives. Next time we do something like this, we will plan it in the morning so that we are not squeezed by the approaching sunset.

Lectures on Emergency Queen Replacement

By Jeff Harris

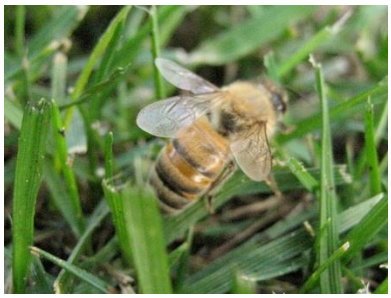
On two separate occasions I was asked to address the consequences of natural queen replacement at different times of the year. The first was with the Southwest Beekeepers Association in Meadville on April 19, and the second was with beekeepers at the Monroe County Extension office in Aberdeen on April 26. Both meetings were well attended with *ca.* 25-30 participants each venue.

I outlined the basics of queen metamorphic development before discussing the consequences of producing a queen from naturally raised queen cells at different times of the year. I also contrasted natural queen replacement to purposeful replacement using queen cells made under optimal conditions during the spring time of year. Of course, not all queens are created equal. However, a poor tiny queen is better than no queen at all!

Prior to the meeting in Aberdeen, we briefly examined a couple of hives outside. I discussed installing a nuc and growing it into the summer dearth. We also had a participant beekeeper bring a colony that was dying from unknown causes. This was a great impromptu moment. Many of the workers in his colony were displaying K-wings, which is a classic symptom of tracheal mites.

Wings of worker bee uncoupled after infection by tracheal mites

I took a subset of workers home with me, and I did find tracheal mites in his bees. This may seem unusual, but it appears that many people have elected to no longer treat colonies of bees for Varroa mites. The result has been an increase in colonies suffering from tracheal mites – this suggests that the treatments against Varroa mites have also been controlling tracheal mites. I am not sure if the individual who provided the sick bees had been treating for Varroa mites, but it was a little unusual to see tracheal mites in high levels.



Foragers with K-wings cannot fly and fall into grass in front of hive

Earth Day Celebration at Tishomingo State Park

By Jeff Harris

Dr. Lelia Kelly

School children from several schools within proximity to Tishomingo State Park were bused there for an Earth Day celebration on Friday, April 22, 2016. The event was sponsored by the MSU Extension Service, park staff and the Friends of Tishomingo State Park. Dr. Lelia Kelly, the consumer horticulturist specialist for the MSU Extension Service, was the primary organizer of the event.

The children sequentially visited educational stations in which they learned about a variety of nature-related topics including animal hides and furs, termites and forest products, GPS locating devices and using them during trail hiking, and pollination & apiculture. They also participated in wildlife and bird-watching outings. A catered lunch and daytime snacks were also included.

The weather was absolutely spectacular that day, and it was a joy to be outside with so many eager faces wanting to know more about bees. This was the first year for the event, but the enthusiasm by kids and the instructors ensured that the park will likely make this an annual event.

Pollination and Honey Bees

Furs and Hides

Tips on Viewing Wildlife

Termites & Wood Products

Queen Rearing Workshop in Starkville

By Jeff Harris

The MSU Apiculture team held a Queen Rearing Workshop on Saturday, April 30, 2016 at the Clay Lyle Building on the main campus. Although the attendance was only about one third of the pre-registered pool, the people who attended seemed to have a good time while learning techniques for raising queens. The threat of rainy weather probably

scared many folks away, but we stayed dry the entire day!

The day began with an introductory lecture by Heather Blackwell, Master's student, on why and how a beekeeper might want to raise his or her own queens. She covered the basic principles and provided an overview of the philosophy that a truly independent beekeeper is one who can expand the beekeeping operation by raising queens and building new colonies from existing colonies.

The formal indoor lectures included two additional power point slide shows. Audrey Sheridan, Research Associate, described the basic principles of grafting. She highlighted several types of cell builder-finisher combinations, and she also discussed the various tools needed for the grafting technique. She also demonstrated the correct size of larvae to graft by using a video camera that projected images to a TV from her microscope – allowing everyone to see the relative size of different larval instars and eggs.

Audrey showing a 1-day old larva using a video camera

I followed with a description of non-grafting techniques for raising queens. I emphasized the nutrition required for effective queen production, which explains why the best queens are usually produced during the swarm season. I demonstrated three non-graft techniques: the Miller, Alley and Hopkins methods for getting queen cells.

After a catered lunch, participants cycled through various stations in which queen rearing techniques were demonstrated, and the stations were both inside and outside with the bees. Audrey showed everyone how to assemble and maintain a cell builder using the Arthur Cloake method of queen rearing. Additionally, Audrey, Heather and Kelly Gillette, a student worker, showed everyone how to graft using lamps or headlamps and magnifying visors.

Audrey demonstrates assembly of Cloake-type cell builder

Meanwhile, I showed how old blind folks like me could use a cell punch to obtain a bee larva or egg without having to lift it out of the cell with other tools. I also showed the Miller and Hopkins methods under field conditions. We are likely to repeat this workshop because it is one of the most frequently requested topics. So, look for future announcements as we approach September and October.

Attendees being taught to graft

Outdoors with different types of cell builders

MSU Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology

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