BEE NEWS & VIEWS

The Mississippi Beekeepers Association Newsletter

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Mosquito & Vector Control Association Meets

By Jeff Harris

The Mississippi Mosquito & Vector Control Association held its annual workshop on March 11-12 at the Pearl Community Center in Pearl, MS. This event marked the 25th anniversary for the workshop, and our very own Harry Fulton was honored for his past service to the group. Most of you think of Harry as a beekeeper, but he helped develop the Mosquito & Vector Control Association from its beginning while he worked in State government.

I took the opportunity to discuss the MS Honey Bee Stewardship plan with the group to see if the plan could be adopted to help minimize exposure of bee colonies to the insecticides used to control mosquitos. Discussions continue, but there seems to be no reason that some of the existing plan could not be adopted.

However, the key note speaker – Dr. Janet McAlister from the Vector-Borne Division of the CCD – warned that protecting humans will always trump the protection of bees. So, if a hurricane like Katrina were to hit our coast again, the trucks and planes would need to control vector borne diseases before outbreaks could occur. The trucks would not turn off the nozzles as they approached apiaries. During none emergency situations, mosquito control trucks would be able to stop spraying near apiaries.

I also learned that honey bees are vulnerable to mosquito spraying trucks even at night. The risk is higher in the hot summer when large numbers of bees hang or beard the outside of their hives during the night. Drifting insecticide spray can fall onto these beards and kill thousands of bees in a hive. If you have bees close to a mosquito control spraying route, please consider moving your bees > 100 feet from the road and try to face the colony entrances away from the road. You can also position the hives behind bushes and shrubbery to help shield them from drifting insecticide. You can also either speak with the truck driver or call your local mosquito control district to see if they will stop spraying when they approach your house. Many of the drivers would be willing to do this (according to my interactions with them at this meeting). Some of the drivers would also appreciate the "bee aware" flag as a reminder to turn off the sprays, and you can offer the possibility of marking your property lines with flags to help them remember.

CMBA Hosts Introductory Beekeeping Workshop

By Jeff Harris

The Central Mississippi Beekeepers Association held their annual Beginners Workshop at the AG & Forestry Museum in Jackson, MS on March 14. Walter McKay kicked things off by providing an overview of basic beekeeping equipment and other helpful gadgets. He discussed the 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 followed with a comprehensive look at basic bee biology. He detailed the different age-related tasks of work bees and described the reproductive attributes of queens and drones. He gave an extensive overview of queen biology with an emphasis on queen reproductive quality. He described the role of queen pheromones in colony cohesion, and he outlined the reasons that colonies swarm.

I followed with two power point presentations. The first discussed different philosophies of approach to the Varroa mite problem. Two extremes pervade: (1) regimental chemical treatments and (2) no chemical treatments ever used in the hive. I outlined the pros and cons of both approaches and suggested that most folks are more likely to intervene with chemicals when necessary. I then championed the ideas of Integrated Pest Management as a good compromise between the two extremes.

My second presentation focused on winter feeding of bees. I provided an overview of the use of candy boards, fondant and various sucrose syrups in offsetting deficits in winter food supplies during the late autumn and in the heart of the winter. I then provided a basic outline of seasonal management of hives throughout the entire year and cycled back to winter maintenance.

After lunch, participants rotated through several field stations for the remainder of the afternoon. They had wonderful opportunities of getting into hives and learning how to work with bees. Several CMBA members manned these stations and showed participants as much about bee colonies as was possible in a few hours. I manned a separate station where I demonstrated how to sample colonies of bees for Varroa mites. I discussed treatment thresholds, and I gave participants an opportunity to see living mites within brood cells using a stereomicroscope.

As usual, this was a fantastic and well attended event. I do not know the official head count, but more than 125 people attended the workshop. If you missed it this year, try to catch it next year – it is almost always in early March.

SWBA Hosts Intermediate Beekeeping Workshop

By Jeff Harris

The Southwest Mississippi Beekeepers Association held an Intermediate Beekeepers Workshop at the Pike County Fairgrounds in McComb, MS on April 11. This workshop was designed to follow a Beginners Workshop that had been conducted at the same location in October 2014. Officers of the SWBA feel like it is more effective to teach the beginner information in the autumn, which is prior to the spring in which many new beekeepers will be getting their first colonies of bees. The Intermediate Workshop was designed to provide new information and hands-on demonstrations that would help newbies further their skill set.

The morning was spent in the classroom, and after lunch, field activities dominated our time. The first lecture focused on the different reasons and methods for feeding honey bees. The use of sugar and protein supplements as ways to offset deficits in diet were discussed. The pros and cons of the different feeding methods were highlighted. The second lecture detailed the swarming biology of honey bees. The causes of swarming were described, and methods for preventing or deterring swarm were also discussed.

The importance of young queens and the need to requeen colonies of bees was the third featured topic. Different methods of introducing and releasing new queen bees were shown. Problems with candy or self-release methods were outlined, and the use of push-in cages and hand release of queens was also demonstrated.

Pike County Fairgrounds Lecture Hall

The final power point lectures focused on practical aspects of managing Varroa mites. Initially, different methods of sampling and treatment thresholds were discussed. Of course, the talk progressed to an overview of the IPM of Varroa mites – something that I have been known to drone on and on about…

After lunch, Michael Scheel and Chris Roberts led the group through various hive inspections. An assortment of colonies with varying conditions had been brought to the venue, and a random opening of

the different hives led to a pleasant, if not adventurous, educational experience. We also examined the Varroa mite load in a couple of colonies using two or three different sampling methods to see how the methods might relate. We also examined mites in the capped brood from these colonies under a stereomicroscope.

Michael Scheel and Chris Roberts showing hives to participants.

I created a little excitement when I found an unusual mite on a sticky board. It looked amazingly like *Tropilaelaps clareae* – which is an Asian mite that is more destructive to honey bees than Varroa mites.

Tropilaelaps does not occur in the U.S., but APHIS has been watching for its appearance in samples taken from beekeepers throughout the country during the last few years. I took the sample to our resident mite expert, Dr. Gerald Baker, here at the MSU Entomology Department on the following Monday. He quickly identified it as a predatory mite commonly found in tall grasses. Thank goodness!

Comparison of Varroa mite (left) and *Tropilaelaps clareae* (right)

First Beginner's Workshop Ever in Marshall County

By Jeff Harris

A year or so ago, I conducted a half-day Beginning Beekeepers Workshop in Corinth, MS. Mr. Lemon Phelps, Extension Agent for Marshall County, was in attendance, and he asked if I would be willing to give a similar workshop to folks in his county. I agreed that it was a good idea, but we never could settle on a good time in 2014.

Displaying immense patience, Lemon and I finally managed to get our schedules coordinated. The Beginners Workshop occurred at the Marshall County Fairgrounds in Holly Springs, MS on April 18.

Structure of the workshop was similar to most others that we at MSU Apiculture organize. The first hour or so was spent discussing how to get started, the ins and outs of beekeeping equipment, and all about personal protective equipment.

Lemon Phelps, Marshall County Extension Agent

Colony growth and seasonal management of colonies were presented next. Emphasis was placed on how newly established colonies need to be fed in order to support growth and the drawing of comb from foundation. This lecture was followed with one about swarm biology and ways to prevent swarming.

After lunch, we went outside to work a couple of colonies of bees that I had hauled to the Fairgrounds. The weather was rainy, and the bees were less than hospitable after being transported that morning. We limited our time in the hives to keep folks from getting too many stings – but, alas, I was the only one to receive any stings.

We ended the day with a discussion about Varroa mites. I did not want to overwhelm the newbies with the full blown assault of an impassioned IPM lecture, so I kept it simple. I told the new beekeepers that Varroa mites were their biggest health issue, and it deserved close attention. I also recommended that they treat there colonies every year after extracting their honey – and do this until you have learned an IPM approach to the Varroa problem. I explained that long term regimental treatment of hives with chemicals is not the best approach, BUT for new beekeepers, it is a start that is not confusing.

All in all, this workshop was quite enjoyable despite the rainy weather. I think that part of this joy for me

was the hunger that the audience had for any information about honey bees. Lemon told me that this may have been the only beekeeping workshop to ever be held by the Extension Service in his area. It was clear to me that the participants appreciated my efforts, and I will gladly come again.

Neonicotinoids Revisited

By Jeff Harris

I recently summarized (*Bee Culture*) some research that had been conducted in our mid-south area on the possible effects of neonicotinoid seed treatments in cotton, corn and soybeans on honey bees. The study showed that the risk of exposure to bees seemed minimal and not likely to cause them a major problem, but admittedly, more research is needed to determine the complete risk that honey bees may face in our farmlands.

Of course, many people are examining various aspects of the neonicotinoid seed treatments on honey bees and other pollinators. The following four excerpts from the press are about neonicotinoid seed treatments and pollinators. The first two are summaries of scientific studies that were reported in *Nature*. The first of these studies shows that there may be a detrimental effect of these insecticides on honey bees – they are attracted to them in choice tests under laboratory conditions. However, it is not clear if free-flying bees in a field study would behave the same way that the bees did under lab conditions.

The second study shows that neonicotinoid seed treatments in canola had no effect on honey bees, but it negatively and severely impacted bumblebees and a native bee, *Osmia bicornis*. This was a well conducted study, and it shows that honey bees probably should not be the "poster child" for all pollinators.

The third excerpt is a popularized headline that is an example of hyped information that one can find on the internet. Some of the content is correct, but the information is slanted against the use of pesticides, and these authors tend to suggest that there is an absolutely known connection between insecticide use and CCD (which is not the case). They even say that there is a correlation between pesticide use and colony mortality in the U.S., but this is not the case. The author even refers to the seed treated plant as a GMO (genetically modified organism). The seed treatment is applied to the seeds and is not a genetic modification of the plant.

Here's the crux of my problem with this third paper. Colonies of honey bees were killed during the planting of corn that was treated with neonicotinoids. Dusts from these planters drifted onto the bee colonies and killed them – there is no doubt about that. However, the article suggests that the colonies died from ingestion of tainted nectar and pollen that was derived from the seed-treated corn. This was not the case. The problem with the dusts from planters is well known, and many people are scrambling to fix that problem.

The paper concludes that scientists are coming around to believing that insecticides are a part of the problem of CCD. I would argue that scientists have always known that insecticides are part of the stressors that kill bees. The paper says that finding 121 pesticides in beeswax combs is starting to convince scientists of the problems with pesticides. What they fail to say is that the top two most commonly encountered and highest concentrations of chemicals found in beeswax are miticides that beekeepers use to control Varroa mites.

The interesting fall-out from the attitudes presented by this third article is that the Provincial government of Alberta, Canada has recently banned the use of neonicotinoid seed treatments in canola. I wrote Dr. Medhat Nasr, the Provincial Apiculturist for Alberta to get his opinion about the matter. He said that prior to the ban, 98% of the canola in Alberta was treated with neonicotinoids. He also has data from 54 previous years in which the mortality of honey bee colonies was 10-20%, and that mortality of honey bees has not changed significantly with the use of the seed treatment.

Dr. Nasr was disappointed by the knee-jerk reaction of the regulators because canola is the major honey source for beekeepers in the province. He worries that loss of the seed treatment will result in increased spraying of older insecticides, which will increase bee mortality. He finished by telling me that beekeepers in Alberta have learned that controlling Varroa and *Nosema*, proper nutrition, and proper overwintering procedures are the best things that

beekeepers can do to help their bees. The seed treatments have not been an issue for honey bees. The fourth excerpt was written by a staff writer for MSU Ag Communications, and it states my opinions about the major health issue for honey bees.

Bees Eat Less Food due to Pesticide Consumption

By The Hoops News

Scientists have recently unearthed an amazing fact about bees and their relation with pesticides. According to scientists, pesticides provide these insects with a smoking-like buzz; bees get stimulated by nicotine-like pesticides in the same manner as smokers get stimulated by tobacco.

During a study involving a series of experiments, researchers found that honeybees and bumblebees preferred sugar solutions containing neonicotinoid chemicals over solutions devoid of any such chemical. This finding stands true despite satisfactory evidence suggesting that the insects couldn't taste the pesticides added to the solution.

The bees, instead of enjoying the taste of the solution, appeared to be experiencing a pleasurable high. Scientists are saying that this happened as the chemicals present in the sugar solution resulted in activation of reward centers in the tiny brains of these insects.

Like avid smokers, who always look for another cigarette after finishing one, these bees were also found to be returning to the food tubes filled with the spiked solution time and again. They clearly chose the spiked sugar solution over the solution devoid of any pesticide.

This research holds great importance for the scientists as it reveals that due to their affinity towards nicotine bees might end up getting exposed to harmful quantities of neonicotinoid chemicals.

The lead author of the study Prof. Geraldine Wright of University of Newcastle's Institute of Neuroscience said that bees don't possess the ability to taste neonicotinoids present in their food, as a result of which they end up consuming food containing these chemicals. This in turn, according to Prof. Wright, is putting them at high risk of poisoning.

Prof Wright feels that the worse thing is that the research team under her has managed to gather evidence supporting the fact that bees prefer eating food items contaminated by pesticides. This is because neonicotinoids have the same effects on the brains of these insects as nicotine has on human brain.

In other words, like nicotine, the neonicotinoids might also act as drugs and make foods contaminated by them more rewarding. Prof Wright, when talking about the effects of pesticides on bees, said that if the foraging bees collect nectar contaminated by these harmful pesticides, the action might have a negative impact on the well-being of the entire bee population.

Original publication:

Kessler, S. C., et al. (2015). "Bees prefer foods containing neonicotinoid pesticides." Nature 521(7550): 74-76.

A Pesticide Is Harmful to Wild Bees, Study Finds

By The Associated Press APRIL 22, 2015

A common type of pesticide, known as neonicotinoids, is harming wild bees, according to a new study that experts say may help shift the way the United States government looks at a controversial class of chemicals. But in a surprising finding, the study, published by the journal Nature on Wednesday, found that honeybees — which get trucked from place to place to pollinate major crops — did not show the significant ill effects that wild cousins like bumblebees did. A second study (see previous article) published in the same journal showed that in laboratory tests, bees were not repelled by the pesticides and may even prefer pesticide-coated crops, making the problem worse. Exposure to neonicotinoid insecticides reduced the density of wild bees and resulted in less reproduction as well as colonies that did not grow when compared with bees not exposed to the pesticide, the study found. Scientists in Sweden conducted a study using

16 patches of landscape, eight where canola seeds were coated with the pesticide and eight where they were not. In areas treated with the pesticide, there were half as many wild bees a square meter than there were in areas not treated.

Original publication:

Rundlöf, M., et al. (2015). "Seed coating with a neonicotinoid insecticide negatively affects wild bees." Nature **521**(7550): 77-80.

37 Million Bees Found Dead in Canada after Large GMO Crop Planting

By Christina Sarich

The makers of neonicotinoids, the bee-killing insecticide that was banned all over Europe, won't be able to refute this latest phenomenon. Millions of bees were found dead after GMO corn was planted in Ontario, Canada. This isn't new news, but it should be known news.

The keeper of these bees, Dave Schuit, who produces honey, reported that **he lost over 600 hives – around 37 million bees.**

"Once the corn started to get planted our bees died by the millions," Schuit said.

With increasing bee deaths and consumer petitions targeted to places like Home Depot and Lowe's who sell neonics, the U.S. Department of Agriculture has failed to ban neonicotinoids, manufactured primarily by Bayer CropScience Inc., as well as other biotech companies.

Two of Bayer's best sellers are suspect this time around: Imidacloprid and Clothianidin. They are both known to seep into pollen and nectar, damaging beneficial insects such as bees.

The more widely they are used, the more bees seem to die.

Schuit's report of dead bees is corroborated by other farmers, too. Nathan Carey is another local farmer who noticed a disappearance of bees on his farm this past Spring. There were so few that he could not count on them as he normally did to help pollinate his crops. He correlates their absence to the use of these toxic insecticides.

While many scientists are still unconvinced that "colony collapse disorder" (CCD) is caused by neonicotinoids, there has been a consecutive die-off of bees in the U.S. for seven years now – directly correlated to higher insecticide spraying.

Even U.S. scientists have found 121 different pesticides in samples of bees, wax and pollen, lending credence to the notion that pesticides are in fact a problem.

Bee Health Complexity Requires Scientific Solutions

By Keri Collins Lewis
MSU Ag Communications

STARKVILLE, Miss. -- A lifelong beekeeper and Mississippi State University Extension Service apiculture specialist offers an unusual list of reasons for bee colony death.

"My top three reasons for bee colony death are Varroa mites, Varroa mites and Varroa mites," said bee expert Jeff Harris. "This is my sarcastic response to the heavy emphasis in the press on the effects of insecticides and other pesticides on honey bees.

"Please don't misunderstand me. Insecticides and other pesticides kill honey bees, either acutely by direct exposure to the chemicals or as part of a group of stressors that kills honeybees," he said.

But, Harris said, there is no conclusive link between insecticide or pesticide use and the widespread deaths of honey bee colonies that have been occurring in the U.S., Canada and parts of Europe.

"What is lost by an oversimplified view of colony health is that honey bees suffer from myriad parasites, diseases and other stressors that are more commonly associated with the death of the colony," he said. "Most scientists studying honey bees would rank Varroa mites and the viruses they vector to honey bees as, hands down, the number one killer of

honey bees in the world. Most non-beekeeper members of the public have never heard of Varroa mites. Even some new beekeepers don't know what they are."

Varroa mites are external parasites that lay eggs in the brood cells within the hive and emerge attached to the host when the bee hatches out of its cell.

"Imagine a tick the size of a basketball attached to your neck," Harris said. "Varroa mites attach to honeybees and suck their hemolymph, which is similar to blood in humans."

Varroa mites also transmit diseases to honey bees. Harris estimated mites vector about 18 different viruses.

"Varroa mites reproduce rapidly and reduce the health of the colony to the point the colonies fail, or collapse," Harris said. "We have found colonies with ample stores of honey and either no bees or a handful of bees left in the hive. As scientists, we had no doubt: high mite populations vector high levels of viruses to honey bees that will ultimately kill the colony."

Beginning in 2006, when episodes of high colony mortality were first reported, millions of dollars have been spent on research into the causes of what became known as Colony Collapse Disorder.

"Scientists came to the conclusion that multiple factors cause these unusually high death rates of bee colonies in some commercial operations," Harris said. "It also became apparent that different sets of stressors cause losses for different beekeepers."

Some beekeepers lost colonies because of a combination of inadequate nutrition related to periods of agricultural drought, stress related to honey bee transportation, and parasitism by Varroa mites.

"Although insecticides were acknowledged as contributing to the demise of bee colonies, in most of the key studies into the causes of Colony Collapse Disorder, scientists emphasized the factors causing the most significant problems for honey bees were Varroa mites and the viruses they transmit to honey bees," he said.

At first, the primary method for treating Varroa mites was insecticide, but some mite populations became genetically resistant to the insecticides. Other treatment options with limited effectiveness involve mechanical methods, such as drone-brood trapping, or natural methods, such as dusting colonies with powdered sugar to increase the bees' grooming behaviors, which results in mite removal.

"One extremely bright glimmer of hope in the battle against Varroa mites is the selective breeding of lines of honey bees that exhibit strong mite resistance," said Audrey Sheridan, entomology research and Extension associate with the Mississippi Agricultural and Forestry Experiment Station. Sheridan said Harris has brought to MSU his extensive bee breeding experience from his former employment at the U.S. Department of Agriculture Bee Lab in Baton Rouge

Beginning in 1997, Harris and his USDA colleagues selected for bees that have a trait termed Varroa Sensitive Hygiene. Bees with the trait can detect Varroa mites in the combs of their nests, and they remove the bee pupae infested by the mites.

This nest-cleaning behavior stops the mites' reproductive cycle.

"Jeff is working to improve stocks of VSH bees specifically for Mississippi's beekeeping environment," she said. "The big take-home message from scientific research is that our biggest single health issue in beekeeping can be mitigated by using stocks of bees bred for resistance to a parasite.

"We just need to get people to try and use these important lines of bees and do what they can as beekeepers to keep mite populations under control," she said.

[EDITOR'S NOTE: This article is the final installment in a three-part series on the relationships between pesticides and row crops, farmers and beekeepers, and factors influencing honeybee health. The first two stories are online at http://www.msucares.com.]

Good Thing Bumblebees Don't Have Car Keys

By Sindyan Bhanoo

Bumblebees can remember the patterns, colors and scents of different flowers, researchers have discovered. But memory can fail in the bumblebee, just as it does in humans.

In a laboratory, Lars Chittka, a behavioral ecologist at Queen Mary University of London, and his colleagues trained bumblebees to expect a reward when they visited a solid yellow artificial flower and one with black and white rings.

In a follow-up test minutes later in which no rewards were offered, the bees were shown the same two flowers, as well as one with yellow and white rings — a combination of the two originals. The bees showed a clear preference for the original flowers.

But a day later, when Dr. Chittka ran the same test, the bees became confused, sometimes heading toward the hybrid flower. After three days, the bees opted for the hybrid flower half the time.

Like humans, bees use memories to create rules about their environment — in this case, rules about flowers that provide nectar, Dr. Chittka said. Now, he and his colleagues are using radar to monitor bees' flower choices over their lifetimes.

New York Times, March 3

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