BEE NEWS & VIEWS

The Mississippi Beekeepers Association Newsletter

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Commissioner Hyde-Smith Continues to Protect Mississippi's Bee Industry

By Abby Gholston

Mississippi Commissioner of Agriculture and Commerce Cindy Hyde-Smith announced that the United States Environmental Protection Agency (EPA) has once again given approval of an emergency exemption that will allow Mississippi beekeepers continued access to a miticide that helps control varroa mite infestations in honeybee colonies.

The product receiving emergency exemption under Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is manufactured by BetaTec Hop Products. **HopGuard® II** uses cardboard strips treated with potassium salt of hop beta acids to control varroa mite infestations. The strips are inserted into honeybee colonies or packages of adult worker bees prior to installation in a honey bee colony.

The destructive varroa mite is a honeybee parasite that feeds on adult bees and developing brood. If left untreated, varroa mites can lead to deformation of bees and potential loss of the entire colony affected.

The Mississippi Department of Agriculture and Commerce's Bureau of Plant Industry has authority under Section 18 of FIFRA to obtain an exemption from EPA for a non-labeled use of a pesticide if significant losses of an agricultural commodity are likely or if labeled products are not available or effective. This exemption for **HopGuard® II** expires December 31, 2015.

For additional information, beekeepers may contact the Bureau of Plant Industry at (662) 325-3390 or toll-free at 1-888-257-1285.

2015 Honey Day at the Capitol

By D. L. Wesley

Attention all MBA Members!

I am proud to report that the following members of our association took the day off from their busy schedule to promote our BEE INDUSTRY. They are Jeff Thomas president of the Marion County Beekeepers Association, and his wife Laura; Walter McKay, past president of Central Mississippi Beekeepers Association; Michael Everett; Martha Brackin; Peggy Harris; Marvin Holmes; and D. L. Wesley.

We met with Governor Phil Bryant, who was very receptive, and we discussed bees, our beekeeping industry, and the importance of bees to agriculture much longer than in the past years during our meeting. He pledged his support, and he also appreciated the work that was being carried out by the MBA.

Next we met with the Senate, where we were introduced by Senator Angelia Hill. She spoke briefly on the work that the MBA was doing, and the many problems that honey bees and beekeepers were facing. She also pledged her support.

Later we had a short meeting with the Lt. Governor, Tate Reeves, who thanked us for the honey and work that the MBA was doing.

Next we went to the balcony of the House of Representatives, and was introduced by Representative Ken Morgan, who is also a beekeeper. Rep. Morgan had done some research, and advised that this was the twelfth year that the MBA had provided Honey, as well as educated the legislators about Honey Bees, and their importance.

NOW, I AM VERY DISAPPOINTED AT THE REST OF YOU BEEKEEPERS, WHO DID NOT COME AND HELP PROMOTE OUR INDUSTRY !!

Yes, I know that you had to go to work, but if you had asked for a day off from your boss, I feel certain that he or she would have let you off, may have even joined you, so he, or she could have had a chance to see our law makers at work.

Yes, I know that it was COLD, AND SNOWING IN NORTH MISSISSIPPI; however, this did not keep the bankers association, or the ones representing the medical association, as well as several other groups from visiting the legislature. There were large groups of people supporting these different organizations in attendance.

The majority of our MBA members were notified by an E-Mail or letter, and all of you were welcomed to join our annual lobbying day at the capitol. This effort that we have made over the past dozen years is probably part of the reason that bills which have been introduced to help beekeepers have always passed.

The cost of this event includes the honey, jars, labels, would have a retail value of *ca.* $1200.00. This value does not count the volunteer work of bottling the honey and organizing the event. My question is, if you are not going to support it, should we continue this effort every year???

SHAME, SHAME, ON YOU THAT DO NOT SUPPORT OUR MBA IN THIS EVENT!!

PAY YOUR DUES, AND GET INVOLVED
D. L. Wesley - Agitator, and Past MBA President

If You Want to Build an Observation Hive…

By Audrey Sheridan

Then let me bestow some wisdom upon you which I have gathered over nearly a decade of managing observation hives so you know what you are getting into.

There are two versions of observation hives—the permanent version and the portable version—and we have both here at the Bee Lab. The portable hive holds one deep and one medium frame, and has a place for a mason jar syrup feeder, a carry handle, and an exit door if you want to take it outside and let the bees forage a bit (Fig. 1). Ours was purchased through a major beekeeping supplier, but the design is simple enough to replicate should a person desire

Figure 1. Portable observation hive

To build their own. A frame of brood (with queen) and a frame of honey can hold up in this hive for 3 or 4 days if kept in a warm location. We like to cover our portable hive with an insulating wrap (a.k.a. when not in use to keep the bees warm and in the dark (simulating their natural environmental conditions within a hive). When preparing the portable hive for show, make sure you don't overstock it with bees. This makes it very difficult for observers to view the comb, brood and the queen. Even if your beekeeping instinct tempts you to stuff the 2-framer full of workers, remember this is only a temporary setup and it does not need to be a functional colony.

The permanent observation hive that we currently maintain at Clay Lyle Entomology is a prototype designed by myself and the carpenter/entomologist who built it, Jack Reed. When I first came to work in the department, there was a 4-frame observation hive already set up in the lobby. That hive was built more-or-less to specifications based on Langstroth parameters, but it was not very practical to maintain. Furthermore, bees burred up the Plexiglas viewing panels, obscuring the activity of the hive (though you had a good view of bees building burr comb). The "bee space" in this observation hive was too big, the Plexiglas eventually clouded, and the bees had difficulty thermoregulating in the winter. I decided

Figure 2. A 6-frame permanent observation hive

to build a bigger, better observation hive that would address these problems; the end result held 6 deep Frames between two hinged tempered glass doors which allowed a gap of 1/8" from the edges of the top bars of the frames when the doors were closed (Fig. 2). This narrower gap prevented bees from building burr on the glass, but allowed them enough wiggle room to move in and out of the combs. I also asked Jack to add solid wooden outer doors to the glass panels that could be opened for viewing and closed the rest of the time. These doors also provided some insulation from the cold. Last fall, I placed a sticky reptile heating mat against one of the glass panes over the brood nest to keep the bees from chilling when the building heat was turned down at night since they cannot really cluster in this kind of hive.

Observation hives can get pretty nasty after a while, especially if your colony has become diseased and dead bees are piled on the floor, so it is a good idea to periodically break it down and give it a thorough cleaning. I clean my 6-frame every other year, and though it is quite a chore unloading the bees, hauling the hive to my lab and spending several hours scraping wax and propolis off of every surface, it is easier to clean one year's worth of buildup than several years.

Cleaning your observation hive.

This is much easier to do if you use glass instead of Plexiglas, but there is a method to cleaning both. For glass hives, you will need a razor blade, paper towels and a hair dryer. I have used every chemical solvent that I could get my hands on (and there are several available solvents in a research facility), but I have found these two tools to be the most helpful for cleaning up wax and propolis. Scrape as much wax and propolis as you can off the glass doors with the razor blade, then set the hair dryer to 'high' and melt the residue while mopping it up with paper towels. To "unclog" the screen vents, place the hair dryer nozzle directly over the vents and watch the propolis magically melt away. Easy.

For Plexiglas hives, cleanup is more of a challenge and requires a lot of patience. Plexiglas is an acrylic material and is chemically reactive to lots of household cleaners and super easy to scratch. Many solvents, such as acetone and Windex, will fog the Plexiglas or cause tiny cracks in the surface, so you need to use something a little higher on the polarity index, such as a vinegar/water solution. The hair dryer comes in handy here, too. Soak, melt, wipe. Repeat. That's the best advice I can give you here, and this is also the reason we have Plexiglas only in the portable hive.

Just to be on the safe side, I wipe down the interior with a very weak solution of bleach (approx. 3%), but this is just a personal preference. I am a clean freak, what can I say. I also periodically replace the clear 1.5" vinyl tubing that serves as the bees' passageway to the outside world. The vinyl becomes stained with pollen and other residues and takes on a rather yellow hue after a while…not pretty.

Things to consider when designing your hive:

1. **Serviceability**. Probably your first colony will not make it a whole year in your new observation hive; it may become overloaded with mites or lose a queen and you will have to restock it. Considering that it is enough of a challenge to stock a 6-frame observation hive without squishing a bunch of bees, any features you can add to the standard full-length swinging door design to make it more accessible for mite treatments, feeding pollen or requeening would be worth the effort.

2. **Ventilation**. From my experience, providing a lot of ventilation holes is more important to the beekeeper than it is to the bees. Our 6-frame observation hive has 15 ventilation holes (not including the exit that leads to the outside of the building; last time I serviced the hive, the bees had filled 14 of the holes with propolis. Ventilation IS important if you are treating your observation hive for mites with a fumigant product. I can tell you this from first-hand experience, for I made the

mistake of treating our hive with Apilife-VAR without first opening up the clogged vent holes and our bees suffocated. Of course, so did the mites, but it was a rather disastrous situation and a nasty mess to clean up. Since out hive is covered with solid wooden doors when not in use, I did not notice the masses of dead bees right away, and by the time I realized something was amiss, small hive beetles had found their way into the hive, laid eggs, and larvae of all ages were squirming about the frames and heaps of dead bees. Not something you want a bunch of touring school groups to see! Also, if you use plastic or vinyl tubing for your exit tunnel, it is a good idea to perforate the tubing to allow moisture to escape and air to enter if the bees get congested in the tube. I discovered this trick after watching bees clog up the tunnel as they hurried to return to the hive before a summer rainstorm. I have had no incidents of smothered bees since I made this alteration.

3. **Move-ability**. It makes much more sense to service and stock your observation hive outside and then bring it indoors than to bring a colony of bees in your house (or wherever you decide to put your observation hive), so you need to have a way to transport the hive safely. When Jack and I designed the 6-frame hive, we set it on a wooden platform fitted with rubber swivel casters. Unfortunately, there was not enough clearance between the floor and the already present exit hole that we were trying fit the hive to, so the casters we had to use were too small for the weight of the hive and broke apart after just a few trips outside. I eventually took the casters off and replaced them with wood blocks, and now I simply load the hive on a dolly and cart it out the door.

4. **Stability**. Our observation hive is a large, heavy monolith with a relatively small base, and because it juts out into the lobby very near to the traffic stream we needed to add some extra support to prevent it from being knocked over. Carpenter Jack added a short wooden arm about halfway up the hive on the same side as the exit hole. The arm slides into a socket on wooden rail that runs the length of the big glass window that separates our observation hive from the outdoors (see Fig. 2). Once the arm is bolted into the socket, the hive is extremely stable on its narrow base.

5. **View-ability.** Glass is very reflective and if your observation hive is under lights or next to a window (ours is both), you will have an annoying glare on the viewing panes, *constantly*. Try to position your hive in indirect light if you can. I am toying with LED lighting ideas for the hive itself, as well as window screening for ambient sunlight. I will let you know if I come across a solution to the glare problem.

6. **Mites**. Unfortunately, chemical treatments are about your only option for varroa control in a permanent observation hive, so it is important to start off with as clean and healthy a colony as possible to reduce or at least delay chemical mite treatments. I lost two colonies in the permanent observation hive to varroa because I did not take care of the mites before I stocked the hive. I also neglected to design the hive with varroa treatments in mind, so there is currently no easy way to get mite treatments to the brood. This year, I will rectify this problem by adding a feature that will enable me to treat for varroa without having to open the hive. I suggest that anyone building their own observation hive take this feature into consideration.

Now, these are just tips for building indoor observation hives of single-frame thickness, but there are other designs that have fewer intrinsic problems, such as the Ulster hive or modified Langstroth hive with viewing windows—both of which simulate a more natural colony architecture. I

encourage everyone wanting to design their own observation hive to first brush up on their honey bee biology…the more you know about bee behavior, the fewer pitfalls you will encounter in your design. Good luck!

Science Review: Neonicotinoids and Honey Bees in the South

By Jeff Harris

The use of a class of systemic insecticides called neonicotinoids remains a highly controversial issue for the general public, beekeepers and government regulators. Some people, including beekeepers, suggest that use of these insecticides have mediated large die offs of honey bee colonies during the last decade or so. However, there remains no unequivocal evidence linking episodes of high honey bee mortality (termed Colony Collapse Disorder) to neonicotinoids or any other insecticides. It is a 'no brainer' to say that insecticides have a great potential for harming bees – insecticides kill insects, and honey bees are insects. However, a much higher standard of proof must be met before assigning blame for CCD to any single factor or class of insecticide.

The debate over the use of neonicotinoids swirls. Science-based answers need to guide governance of these chemicals, and unsubstantiated and often emotional claims do not foster a rational and fair approach to deciding the future use of these insecticides. The mammalian acute toxicity of the neonicotinoids is relatively low as compared to many other insecticides that have had extensive use in agriculture, which means that the risks to humans are greatly reduced. The neonicotinoids are relatively more acutely toxic to honey bees than some insecticides of recent popular use in agriculture; however, the class tends to be middle of the pack and generally less acutely toxic than organophosphates or pyrethroids. Acute toxicity does not tell the whole story. The potential harm to honey bees must also include some measure of exposure to bees in order to assign the relative risk.

The use of neonicotinoids as seed treatments has been thought to offer little risk of direct exposure to honey bees (except at the time of planting, see below). The chemicals are under ground with the planted seed, and of course, honey bees forage above ground. Neonicotinoid seed treatments may also reduce risk of insecticide exposure to honey bees because applications of pre- and post-planting insecticides (applied as foliar insecticides to seedlings or within the seed furrows at planting) are no longer needed to control insects that attack young seedlings of cotton, soybeans and corn. One consequence has also been a general reduction in total amount of active ingredient (insecticides) applied per acre as compared to the use of other classes of insecticides. Banning neonicotinoids in seed treatments may significantly and adversely change methods of food production and may actually increase harm to honey bees and other pollinators if there is a return to more foliar applications of older insecticides to control pests affecting the young plants.

What is so special about this class of insecticides that evokes so much concern? The primary reason is the way these insecticides work as systemic chemicals absorbed into plants. Here's how they work: Seeds of cotton, soybean or corn are coated with a material that forms a crust around the seed, and this material is laced with a known level of a neonicotinoid insecticide. The three most commonly used neonicotinoids in the South are imidacloprid, thiamethoxam and clothianidin. These insecticides leach into the living plant tissue as the seedling grows, and the concentrations in the plant tissue are high enough to kill insects that begin to feed upon the plants. Thus, the plants are protected by the systemic poison adsorbed into their tissues. Obviously, there is some potential for these materials to persist in plant tissues, and there has been much concern about the neonicotinoids remaining in either nectar or pollen when the treated plants begin to flower.

A second major concern is the discovery that residues of some neonicotinoids remain in the environment (e.g. in soil) for more than a year after being applied as seed treatments. The consequences of this persistence are largely unknown. For example, are these chemicals sequestered away in the soil, or are they freely moving about the environment into water and or secondary off-target plants like wildflowers? There are many more questions than answers, but many laboratories are investigating various aspects of these chemicals as they relate to bee health.

In 2012 a group of university researchers from Arkansas, Mississippi and Tennessee collaborated and began investigating various aspects of the relationship between neonicotinoid seed treatments and honey bee health (Stewart *et al.* 2014). The research team includes entomologists specializing in pest management of row crops, toxicologists and apiculturists. The first series of experiments sought to determine how seed treatments in cotton, corn and soybean relate to subsequent residues of these chemicals and their metabolites in various matrices in agricultural environments that included soil, flowers, nectar and pollen in plants, and honey bee foragers and their pollen loads. The research is pertinent because all of the cotton and corn and 70% of the soybean seed planted in our area are treated with neonicotinoids.

The work in our area was stimulated by reports from the Midwest of neonicotinoid seed treatments potentially affecting honey bees through several routes of exposure. Krupke *et al.* (2012) showed that exhausts from corn planters created dusts that carried neonicotinoids away from corn fields during planting. They also reported on the persistence of neonicotinoids in the soil long after planting. The dusts drifted onto wild flowers (e.g. dandelions) along field margins, but re-uptake of neonicotinoids from soil may also play a role in high levels of the chemicals in wild flowers. Neonicotinoids were also found in dead bees from colonies kept near fields at the time of planting. Additionally, the group showed expression of neonicotinoids in corn pollen during anthesis (tasseling), and the chemicals were also found in corn pollen stored by the bees.

Thus, the main possible routes of seed treatment chemicals moving to a bee hive include (1) drift of neonicotinoids onto off-target wild flowers in planter exhausts, (2) re-uptake of neonicotinoids from soil into flowering plants, and (3) retention of neonicotinoids in either pollen or nectar (or both) of seed treated plants. Various researchers (including our Southern group) have replicated the results of Krupke *et al*. (2012) in which planter dusts carry neonicotinoids to off target wild flowers. Fortunately, this may be the easiest problem to rectify. Mechanical modifications of planter exhaust systems and changes in lubricants that are used in seed planters can greatly reduce the expulsion of neonicotinoid dust clouds. Education about the dangers of planter dusts can help mitigate procedures that might inadvertently expose bees to the dusts. For example, farmers can be instructed to load planters or to clean planters far away from apiaries or wild flowers to minimize the chance of drift of chemicals either onto bees or their food sources.

The Southern research group (Stewart *et al.* 2014) examined neonicotinoid levels in soil, flowers, and forager bees & their pollen loads from numerous fields of corn, cotton and soybean throughout Arkansas, Mississippi and Tennessee. Over 80% of soil samples taken before planting showed detectable ($\geq$ 1 ng per g) levels of neonicotinoids. The average level for all samples (n=112 samples from 28 fields) was 10 ng per g (or parts per billion = ppb). As with the Krupke et al. (2012), these finding suggest that neonicotinoids persisted from the previous growing season. However, it is not clear in all cases if the insecticides came from seed treatments or foliar applications of neonicotinoids, which are a common form of control for certain pest insects.

The team also examined about 78 samples of wild flowers that were collected from field margins within 0-3 days of planting. Almost one quarter of these samples showed detectable levels of neonicotinoids, and the average concentration was 10 ppb. However, two samples accounted for more than half of the total insecticide levels that were detected in all flowers. One flower sample came from ground immediately adjacent to where a corn planter had been loaded prior to planting. The flower sample had 257 ppb of neonicotinoid. The second highest came from a flower collected within 2 hours of planting, and it registered 115 ppb. The results suggest that the exposure of bees to neonicotinoids from wild flowers in recently planted fields is patchy or mosaic, and at least in this study, 70% of the wild flowers had no detectable levels of neonicotinoids. Reduced exhaust dusts and better safety precautions with planters should reduce the risk of exposure to neonicotinoids from wild flowers on field margins.

The researchers also collected bee samples from colonies of bees during two periods of the growing season. The first was at the time of planting (April-May), and the second was the flowering periods (June – September). Colonies were located at an average of 180 meters of field margins. Returning foragers and their pollen loads were monitored from

60 hives kept in 15 apiaries. A total of 74 bee samples were collected, and only two exceeded the detection limit (1 ppb). One of these samples had 48 ppb of neonicotinoid, and the bees in the sample associated with a foliar application of imidacloprid. Another bee sample from a different field was found with 10 ppb of clothianidin. Only 1 of 24 samples of pollen loads removed from foragers had a neonicotinoid level just over the detection limit (1 ppb).

The research team also examined flowers from soybeans, corn and cotton from fields that were planted with varying rates of active ingredients (neonicotinoids) applied to seed coats. In four trials with soybeans, no soybean flowers were found with detectable levels of neonicotinoids. Whole flowers were used in the samples, so there was no separation of nectar and pollen here. The researchers also found no detections of neonicotinoids in cotton nectar. The mean neonicotinoid levels in composited samples (n=15) of cotton pollen was under the detection limit; however, 1 sample cotton had two neonicotinoids detected at a total concentration 4 ppb. Corn pollen varied in concentration of neonicotinoids with the amount of chemical used in the seed treatment. Thiamethoxam averaged less than the detection limit. Clothianidin was detected at 3 and 6 ppb for the two highest seed coat treatment rates. These results for corn are similar to those of Krupke *at al.* (2012). Soil from two thirds of the soybean and corn fields and 100% of the cotton fields in this study had levels of neonicotinoid > 1 ppb at the time of flowering. The highest level recorded was 18 ppb. Thus, these chemicals persisted in the soil into the flowering periods.

What does it all mean? Neonicotinoids used in seed treatments for crops grown in the southern U.S. were found in the soil in a majority of fields, in wild flowers immediately after planting, and in the pollen of corn and cotton from at least a few samples in this study. Neonicotinoids were not found in either the nectar of cotton or in whole soybean flowers. One question the researchers tried to answer was whether the average levels of neonicotinoids found in various samples reflected a high risk of acute oral toxicity to honey bees. They used a previously reported $LD50_{oral}$ = 0.004 µg per bee, which is the dose for oral intake at which 50% of the tested worker bees died after acute ingestion of any of the three commonly used neonicotinoids (imidacloprid, clothianidin or thiamethoxam) (Stewart *et al.* 2014).

The U.S. Environmental Protection Agency suggests a conservative approach to deciding acute toxicities for honey bees, and they recommend that real exposures should not exceed 40% of the acute $LD50_{oral}$. Thus, a conservative value of 0.0016 µg per bee was used to estimate the "levels of concern" for ingested pollen or nectar. For example, a previous study found that the maximum amount of pollen ingested by an adult worker bee per day was about 9.5 mg. If a worker honey bee received 0.0016 µg neonicotinoid after eating 9.5 mg pollen, then the level of concern for acute toxicity from pollen would be (0.0016 µg neonicotinoid ÷ 9.5 mg pollen), which is equivalent to (1.6 ng neonicotinoid ÷ 0.0095 g pollen) and equal to 168 ng per g (ppb). For nectar, the maximal amount of nectar eaten per day by a worker bee is about 292 mg. If the worker received 0.0016 µg neonicotinoid in 292 mg nectar, then the level of concern for nectar would be (1.6 ng neonicotinoid ÷ 0.292 g nectar), which is equal to 5.5 ppb. Clearly, in terms of acute oral toxicity, nectar has a much lower critical threshold than pollen.

The researchers concluded that the use of seed treatments in corn, soybean and cotton do provide a potential risk of exposure to neonicotinoids through multiple routes of entry. However, the levels detected in flowers, pollen and nectar suggest that there is no serious health risk to honey bees – at least in terms of acute oral toxicity. The group concedes that more work is needed to get a fuller picture of the potential health concerns for honey bees. For example, they are currently measuring the rates of degradation of neonicotinoids in the tissues of the plants and in the soil. They are also testing whether residues in soil can enter plants through the root system and pose a threat by sequestration into pollen and nectar. They also admit that the current study cannot answer questions about chronic exposure of bee colonies to sub-lethal doses of neonicotinoids through time. Additionally, future experiments need to include measurement of colony health to provide a better assessment of risk. Clearly, more work is needed to assess the total risk profiles for honey bees from neonicotinoids in seed treated plants.

You might wonder, "How come it takes so long to do these studies?" One factor is the cost: consider that

560 samples were analyzed in this study at a cost of $200 per sample to give a total cost of $112,000 just to pay for the chemical analyses. This does not count the labor of researchers and their graduate students. Research requires extensive time and money. The good thing is that at the moment there are many research groups trying to better describe the relative risks of exposure to various insecticides for honey bees.

Sources Consulted

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Upcoming Events

Saturday, March 14 - *Beginning Beekeeper's Workshop*; all day event; Ag & Forestry Museum in Jackson, MS; contact Justin Hamilton at djustinh@gmail.com for more information; sponsored by the MSU-ES, a MDAC Specialty Block grant and the Central Mississippi Beekeepers Association.

Saturday, March 28 – *Dr. Jerry Hayes (Head of Bee Research at Monsanto)* will speak to the Southeast Mississippi Beekeepers Association at 7:00 PM; topic TBA; Dixie Electric Power Association Bldg., 1863 HWY 184, Laurel, MS. All are welcome to attend.

Saturday, April 11 – *Intermediate Beekeeper's Workshop*; all day event; Pike County Fairgrounds near McComb, MS; contact Michael Scheel at Michael.e.Scheel@gmail.com for more information; sponsored by the MSU-ES, a MDAC Specialty Block grant and the Southwest Mississippi Beekeepers Association.

Saturday, April 18 – *Beginning Beekeeper's Workshop*; all day event; Marshall County Fairgrounds in Holly Springs, MS; contact Lemon Phelps (662) 252-3541 for more information; sponsored by the MSU-ES and a MDAC Specialty Block grant.

Saturday, May 2 – *"A Day at the Hive 2015"*; all day event; Meridian, MS; contact Gary Smith at gary@accessdrive.net for more information; sponsored by the MSU-ES, a MDAC Specialty Block grant and the Meridian Beekeepers Association.

Saturday, May 23 – *Making Splits and Other Hands-On Activities*; TBA; contact either Randall Nevins (jrnevins@ext.msstate.edu) or Reid Nevins (rnevins@ext.msstate.edu) for details; sponsored by the MSU-ES and a MDAC Specialty Block grant.

June 21-25 – *MSU Beekeeping Summer Camp*; Clay Lyle Bldg. at the Starkville Campus; please contact Dr. John Guyton at jguyton@ext.msstate.edu or 662-325-3482 to register; a registration form can also be obtained from the MSU Apiculture web site (http://blogs.msucares.com/honeybees/) under the Resources heading.

Note: Two other workshops will likely be scheduled for later in the year (September). One will be on Queen Rearing at our lab in Starkville, and the other will likely be a hands-on workshop focused on management and control of varroa mites somewhere on the Gulf Coast.

Bee News and Views is brought to you by support from:

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

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