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NEWS FOR BEE LOVERS

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Establishing the Superiority of Florida Honey

Dr. Liwei Gu | UF/IFAS Department of Food Science and Human Nutrition

THIS IS THE TITLE of a new research project funded by the Florida Department of Agriculture through a USDA specialty crop block grant. Dr. Liwei Gu, an assistant professor in the Department of Food Science and Human Nutrition at the University of Florida, will head the project.

Historically, Florida honeys have faced competition from low-cost, imported honey on grocery store shelves. In the current economy, uneducated customers often opt for the lower-cost products, and the superior Florida honey gets passed by.

But honey is not just a food commodity. It has many other beneficial qualities.

Different honeys from around the world have been identified to have different characteristics. Some of these characteristics could help transform honey from a simple food sweetener to a viable medical product.

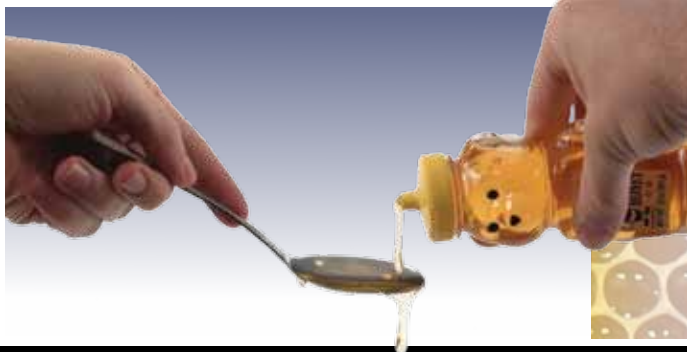
Manuka honey from New Zealand is the best example. Previously a low-quality, baker-

grade honey with little value, it is now used as a medical product for curing human infections and diseases. It has been approved for uses in human wound dressings and bandages, to treat stomach ulcers, eye infections, and numerous other medical problems. The curing capabilities of this honey have caused both its demand and price to skyrocket.

Might certain Florida honeys have similar medical properties? If so, an entire new market will open up, and the price of such honeys would leap. Dr. Gu's research aims to answer this question and to open a new, profitable industry for Florida beekeepers. But, he needs monofloral varietal honeys

and honey from mixed floral sources for his research. Monofloral types can be from any Florida crops or flowers, such as citrus, grapefruit, blueberry, watermelon, avocado, gallberry, palmetto or tupelo. Samples from all regions of Florida are needed.

Ms. Sara Marshall is the "honey coordinator" for this project. She will collect and record all samples. If you would like to participate in the project, please email her at saramars@ufl.edu, and she can answer any potential questions. A FedEx account number will be provided, so you can send samples to University of Florida free of charge. Dr. Liwei Gu is also available at 352-392-1991, ext. 210.



FROM THE DESK OF JERRY HAYES



Jerry Hayes, FDACS/DPI
Asst. Chief Apiary Inspection

HAWAII, the Aloha State: separated from mainland United States, Asia, and Australia by thousands of miles of Pacific Ocean. There were no *Apis* honey bees brought by those incredible Polynesian explorers and settlers to the Hawaiian Islands, nor did they find any honey bees waiting for them. It wasn't until 1857 that the first successful importation of honey bees as we know them (*Apis mellifera*) occurred. For approximately 150 years after this importation, Hawaii was a honey bee, beekeeping, beekeeper paradise. Just like on the US mainland, the only thing beekeepers had to manage was American foulbrood. And like Florida, the weather was better than most of the rest of the United States.

Hawaii, because of its isolation and importation laws, dodged all of the mainland's accidental introductions of mites and beetles, maintaining its paradise status. Then in April 2007, Varroa mites were found in a survey trap on Oahu. In August 2008 more were found in a survey trap near Hilo on the Big Island. This was significant because the center of a multimillion-dollar queen

industry, producing hundreds of thousands of honey bee queens, was on the opposite side of the Big Island. Then in April 2010, small hive beetles were found on the Big Island, putting extreme pressure on this significant industry.

The learning curve for Hawaiian beekeepers is steep and high, with the challenges of Varroa and SHB appearing almost simultaneously. Yes, there is a lot of information on Varroa control and SHB management as we all went through. But learning is always individual and comes at different rates, and acceptance is tied to confidence.

The Hawaii Department of Agriculture (HDA) has done a great job on short notice in an area that was, for the most part, self-sustaining for decades. Mr. Darcy Oishi of the HDA was recruited to champion the cause of the industry to ensure its stability and protection. To that end, Darcy and the HDA wanted to bring someone in from a similar climate with a large, robust beekeeping industry and who had already traveled the path they were now forced to trudge down. That was me.

My message to them from our experiences was this: Florida is sometimes called a sentinel state by the USDA. Because we are just a couple of days' shipping traffic from South America, Central America, the Caribbean, and Mexico, we sometimes struggle with accidental introductions of invasive plants, animals, insects, and pathogens. Specifically for honey bees

we had the introduction of tracheal mites in the early 1980s, Varroa mites in 1987, and small hive beetle in 1998. Each was devastating in its own right, but we did have some adjustment time for new awareness and habits to form before the next challenge arose.

The situation in Hawaii is that you have the most damaging parasite ever for genetically based European honey bees — the Varroa mite — and the small hive beetle, for all intents and purposes, in parallel. Hawaii has transitioned from a beekeeping paradise to a location that is challenged by the most destructive of pests that negatively impact managed honey bees on very short notice.

Darwin and natural selection will be in action with honey bees and, unfortunately, with beekeepers. Honey bees will weaken and die from Varroa. Honey bees will die prematurely because beekeepers will not have adapted to this parasite and its control soon enough. Honey bees will be weakened to the extent that they will not be able to do what beekeepers expect honey bees to do, which is store honey and pollinate crops.

Both of these inevitable events will attract a secondary predator, the SHB. The SHB female is looking for a site that will allow her offspring to progress from egg to adult in an environment that supplies all of their needs. A weakened colony of honey bees that cannot police its nest full of food reserves, that cannot

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What Race of Honey Bee Will Work for Me?

David Westervelt

THERE ARE SEVERAL races of the honey bee. Each of these races has different advantages and disadvantages linked to its original regional background. Each region likely has a differing climate, topography, resources and predators. Because of differences in background, each race of honey bees has evolved in a slightly

different manner than its cousins, allowing it to better take advantage of its specific situation. Today the Italian honey bee is the most commonly kept honey bee in the United States.

Conversely, the Africanized honey bee is the most feared and is illegal to keep in many regions.

Fitting somewhere between these two extremes

are many of the other races and the feral honey bee. The feral bee, though technically not a race in its own, may be acclimated to the area in which it has been found.

The following is a partial listing of the races of honey bee that may be available to a prospective beekeeper. Also included is a brief list of some common advantages and disadvantages to each.

Italian Honey Bee

Apis mellifera ligustica

Italian bees are the most common stock bee, and likely are the race to be found in packages or as unspecified breeds and queens for sale.

PROS

- Good beginner bee
- Queens do not run and are easy to spot
- Readily builds comb
- Good honey producer
- Only moderate tendency to swarm
- Relatively easy and calm to work with
- Lower-range propolis producer
- Strong cleaning behavior

CONS

- Continuous brood rearing continues after honey flow ceases
- More likely to starve during long winters
- Poor flight orientation, highly prone to drifting
- Tendency to rob caused by aggressive foraging

New World Carniolan®

Apis mellifera carnica

Sue Cobey, New World Carniolan® Bee Breeding Program; a closed breeding population and control gene flow through instrumental insemination.

PROS

- Earlier morning forager
- Forages on colder and wetter days than most other bees
- Overwinters well on small stores, as queen stops laying in the fall
- Explosive buildup in early spring
- Exceptionally gentle and easy to work
- May interrupt brood rearing during times of drought
- Does not typically propolize heavily
- Creates less brace and burr comb
- Crosses well with other varieties

CONS

- Likely to swarm unless carefully managed
- If pollen is scarce, brood rearing greatly diminishes

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Florida Beekeeper Management Calendar Winter: January - March

	Month	Management Calendar	Blooming Plants
North Florida: Nosema can be a problem in N. FL, often in Jan and Feb. Monitor closely and treat if needed. Are you moving bees to citrus?	Jan	1) Feed colonies if light (colonies can starve!) 2) Nosema can be a significant colony problem this time of year. You can treat colonies for Nosema disease using Fumigillin. Colonies may need as much as 4 gallons of medicated syrup to control <i>Nosema ceranae</i> . 3) Repair/paint old equipment	Sand Pine ^F , Maple ^F , Willow ^{FM} ,
	Feb	1) Feed colonies if light (colonies can starve!) 2) Can treat colonies for Nosema disease as needed using Fumigillin.	Plum ^M , Cherry ^M , Viburnum ^M , Sweet Clover ^M , Blueberry ^M , Haw ^M , Fetterbush ^M , Oak ^M ,
	Mar	1) Attend UF Bee College in Marineland!! 2) Colony populations begin to grow! Add supers and/or control swarming as necessary. 3) Can treat with Terramycin or Tylan for AFB 4) Make nucs/splits	Orange, Spanish Needle
Central Florida: Citrus blooms in March. Make sure your colonies are ready. Talk with your	Jan	1) Feed colonies if light (colonies can starve!) also supply pollen supplements if necessary. 2) Nosema can be a significant colony problem this time of year. You can treat colonies for Nosema disease using Fumigillin. Colonies may need as much as 4 gallons of medicated syrup to control <i>Nosema ceranae</i> . 3) Repair/paint old equipment	Sand Pine ^F , Maple ^F , Willow ^{FM} ,
	Feb	1) Feed colonies if light (colonies can starve!) 2) Can treat colonies for Nosema disease using	Plum ^M , Cherry ^M , Oak ^M , Walther Viburnum ^M , Sweet

<p>growers about their pesticide use habits.</p>	<p>Mar</p>	<p>Fumigillin. 3) Can treat with Terramycin or Tylan for AFB 1) Attend UF Bee College in Marineland!! 2) Colony populations begin to grow! Add supers and/or control swarming as necessary. 3) Can treat with Terramycin or Tylan dust for AFB/EFB 4) Make nucs/splits</p>	<p>Clover^M, Blueberry^M, Haw^M, Fetterbush^M Orange, Spanish Needle</p>
<p>South Florida: Varroa numbers begin to grow in S. Florida in Feb. Monitor closely. Are you ready for the Feb citrus bloom? Talk with your growers!</p>	<p>Jan</p>	<p>1) Feed colonies if light (colonies can starve!) also supply pollen supplements if necessary. 2) Nosema can be a significant colony problem this time of year. You can treat colonies for Nosema disease using Fumigillin. Colonies may need as much as 4 gallons of medicated syrup to control <i>Nosema ceranae</i>. 3) Repair/paint old equipment</p> <p>Feb</p> <p>1) Feed colonies if light (colonies can starve!) 2) Can treat colonies for Nosema disease using Fumigillin. 3) Can treat with Terramycin or Tylan dust for AFB/EFB 4) Make nucs/splits</p>	<p>Maple, Willow, Spanish Needle^{FM}, Mexican Clover^{FM}, Primrose Willow^{FM} Orange^M, Sweet clover^M, Oak^M</p>
	<p>Mar</p>	<p>1) Attend UF Bee College in Marineland!! 2) Colony populations begin to grow! Add supers and/or control swarming as necessary. 3) Can treat with Terramycin or Tylan for AFB</p>	<p>Same as above</p>

^FContinues to bloom in February, ^MContinues to bloom in March, ^{FM}Continues to bloom in Feb and Mar

Russian Honey Bee

Apis mellifera hybrid

In 1997 the USDA imported 100 queens from Primorsky territory of Russia. Forty of these queens were selected to breed from to start the Russian Queen program.

PROS

- Resistant to Varroa mites
- Resistant to tracheal mite
- Winter tolerant
- High honey yield

CONS

- Brood rearing is highly dependent on forage availability
- Increased tendency to swarm
- Tend to propolize

Caucasian Honey Bee

Apis mellifera caucasia

PROS

- Low swarming instinct
- Large, strong population
- Calm when on comb
- Overwinters well by stopping brood production in the fall
- Forages earlier and on cooler days
- Has a longer tongue than most races and can thereby take advantage of more nectar sources than most

CONS

- Purebreds not widely available in the U.S.
- Slow spring startup
- Produces an abundance of propolis, which makes the hive more difficult to work
- Makes wet-capped comb, which is poor for honey comb sale
- Once brought to a level of alarm, they are difficult to calm and they readily sting
- Susceptible to nosema
- Prone to rob

These are just the most common races of bees in Florida. There are several other races, which may in fact be more suitable for different climactic conditions or are not widely available in the United States. Before requeening with a new race, always be sure to do your research and ask around. Some other potential honey bee races to choose from are listed at right:



Minnesota Hygienic

Apis mellifera ligustica hybrid
(strong resistance to AFB and chalkbrood)

SMR Honey Bee

Apis mellifera hybrid
(Suppression mite reproduction, can be bred into any population)

Western European Honey Bee (German Black Bee)

Apis mellifera mellifera

Starline Honey Bee

Apis mellifera hybrid
(Italian hybrid)

Cordovan Honey Bee

Apis mellifera hybrid (Italian hybrid)

Midnight Honey Bee

Apis mellifera hybrid
(Caucasian and Carniolan)

Buckfast Honey Bee

Apis mellifera hybrid
(Many-race hybrid)

Yugo Honey Bee

Apis mellifera carniola
(Yugoslavian bee bred by artificial insemination)

FROM THE DESK OF DR. JAMIE ELLIS

RESEARCH at the UF Honey Bee Research and Extension Laboratory — Part 3



Dr. Jamie Ellis
UF Assistant Professor

IN THE PREVIOUS two issues of the *Melitto Files*, I shared (1) how and why we do research and (2) how we initiate the process of research by conducting a literature review of the topic, developing a purpose and hypothesis, and securing funding. With all of those pieces in place, we can design and implement the project.

Designing a project well is critical to the success of an experiment. For the sake of continuity with parts 1 and 2, I will use varroa as an example. Imagine that a new varroa control product has been developed but not tested in field colonies. The purpose of the study would be to test the product's varroa control efficacy. Considering the fact that it is being advertised as a miticide, we would hypothesize that the product will kill varroa in honey bee colonies. We cannot stop with a hypothesis. We must determine if the hypothesis is supported or if it is simply hogwash. One must test something experimentally in order to address a hypothesis adequately. I cannot say that the product will kill varroa and begin selling it if it has not been tested. Its efficacy or lack thereof must be verified through experimentation.

How does one test a new miticide? This is done best in experimental conditions that most closely mimic actual field

conditions while controlling for variables that will affect the data. For example, it often does me no good to test a product on varroa in the lab. Bees do not live in plastic containers in an incubator. Just because a product kills varroa in the lab does not mean that it will do so in the field. In order for the product to be useful to beekeepers, it must be tested under conditions in the field that mirror those under which it will be used by beekeepers.

When we design studies, we try to do so in a way that permits us to trust our data. For example, we could put product A in a colony and all the varroa die. However, what if the queen in the colony was hygienic? What if the weather was conducive to varroa mortality? What if the colony had been treated recently with another varroa miticide? These and other issues must be controlled in order to know if product A really works. We have to design a study in such a way that the outcome (in this case, varroa mortality) only can be a result of the administered treatment. The fancy way scientists say this is that we try to “reduce variability” in our experiments. We attempt to do this by (1) including controls in the study and (2) replicating the experimental unit.

Beekeepers are among the most ingenious people I know.

Beekeepers always are trying to invent/create ways to keep bees better. When talking to beekeepers, I regularly hear some say “I created a way to control ‘pest X’ in my colonies. I gave the new product to all of my colonies and wham-o, they are all alive.”

Unfortunately, it is not that simple. The problem is not that their idea is not capable of working, it is that we cannot know for sure that it does work because no controls were included in the study. In this case, a control colony would be one that did not receive product A but was treated the same otherwise as colonies receiving product A. Many times I fear that beekeepers invent and administer treatments to their colonies that they are convinced work simply because their colonies did not die when the products were administered. However, it is equally possible that the colonies would not have died anyway. Without control colonies, one will never know.

All studies also must be replicated. This means that a single colony cannot be given product A. I like to see 20+ colonies given product A and 20+ colonies serving as a control.

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In coming issues of the *Melitto Files*, I look forward to continuing to discuss how and why we do research at the HBREL.

*Varroa and small hive beetle,
continued from page 2*

be protected, is a great location for SHB females to lay up to several hundred eggs per day. A weakened colony of honey bees, attractive to tens, hundreds or thousands of SHB females, laying eggs simultaneously, is a destructive, disgusting sight.

In Florida, SHB and their larvae occur as a result of Varroa or other primary problem that weakens the colony. SHB are a secondary problem in response to a lack of honey bees in a colony. A lack of honey bees in a colony is the result of untreated Varroa in most cases.

I expect the situation in Hawaii to follow the same scenario. SHB can identify the stress pheromone produced by a colony dropping in population from a distance of 10 miles or so at 4–5 ppm. Similar alarm/stress pheromones are created when stressors such as some miticides, colony manipulation, or diseases are impacting a colony of honey bees. SHB move toward these beacons of

opportunity. In Florida it is not unusual to find hundreds of adult SHB in colonies, waiting for the population to drop and the opportunity to reproduce. Beekeepers in Hawaii will be confronted with a similar scenario in the near future. They will have to adapt, create new management habits, and be better managers themselves, or they will not be beekeepers.

Control Varroa sanely and rationally. There are proven regimens for this; no need to reinvent the wheel. Varroa is 80% of all problems in a colony of honey bees. SHB is an ugly secondary predator that can be controlled by controlling Varroa or by addressing other colony growth maintenance issues.

In 1987 when Florida first was introduced to Varroa we had approximately 1,000 registered beekeepers. When SHB came on the scene in 1998, we had 800 registered beekeepers, and it dropped to a low of approximately 650

beekeepers. Today we have close to 1,800 registered beekeepers representing 275,000 colonies of honey bees. The sky is not falling with Varroa and SHB, but there will be a transition period, and some beekeepers who cannot or choose not to adapt will be gone. But there is light at the end of the tunnel. Hang in there.

*HBREL research,
continued from page 7*

As you can imagine, the more replicates (experimental units – in our case, the colony), the better the project. However, the more replicates, the more costly the project. At the end of the day, there is a fine line between the # of replicates needed to give one an accurate result and the overall cost of the project. The take home message here is you cannot treat only one colony with product A and “prove” that the product works. Replicate, replicate, replicate — when in doubt, replicate more.

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