SEMBA NEWS

Volume 25 Number 4 Newsletter of the Southeastern Michigan Beekeepers' Association
August/September 2015

SEMBA FALL MEETING
Hosted by Schoolcraft Beekeepers' Club

When: Sunday, September 27, 2015
Where: Lower Waterman Center, Schoolcraft College, 18600 Haggerty Road, Livonia, MI
Potluck: 1:00 p.m. Bring a dish to pass and your own table service. Coffee and tea provided by SEMBA.
Program: **2:30 p.m.**
"Bringing Bees Back For Better Berries"
Dr. Rufus Isaacs, Professor of Entomology, Michigan State University
"Shims the Amazing Little Tool with many Wonderful Uses"
Carl Daleo, Hardy Honey Bee Farms

A refractometer will be available to check the moisture content of your honey.

NEW LOCATION CHOSEN FOR 2016 SEMBA BEEKEEPERS' CONFERENCE

Where: Wayne County Community College, Western Campus
9555 Haggerty Road, Belleville, MI
When: Saturday, March 19, 2016
(The conference will be free to all.
A potluck lunch will probably be held.)

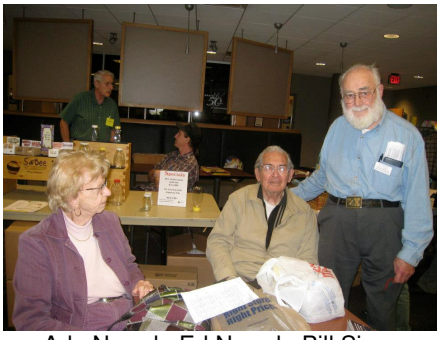
****

SEMBA BEEKEEPING COURSES
The 2016 SEMBA Beekeeping Course for Beginners will be offered at the same cost as offered in 2015. The Advanced Course will not be offered in 2016.

A GREAT TED TALK
There have been a number of TED talks about honey bees. A recent one you may want to check out can be viewed by going to a search engine like Google and typing in: *A Thrilling Look at the First 21 Days of a Bees Life.*

~~~~~~~ IN MEMORIAM~~~~~~~~

EDWARD NOWAK
(1927 –2015)
Edward Nowak, long-time SEMBA member, past president and founder of the SEMBA-sponsored beekeeping class, passed away on August 7, 2015 in Lake Charles, Louisiana. Ed was a frequent presenter at beekeeping meetings and conferences. In retirement, he and his wife Ada sold honey and bee products at farmers' markets and other venues. He is survived by his wife Ada and their son and daughter.


Ada Nowak, Ed Nowak, Bill Sirr

PAM HARLESS
(1946 – 2015)
Pam Harless, wife of Winn Harless, (a SEMBA bee-class instructor) passed away on August 19, 2015. Pam grew up in Massachusetts where she became a registered nurse. Survivors include Winn, two daughters, three grand children and one great grandson. A potluck and memorial service will be held at Murray Lake, 7994 Plymouth Road, Ann Arbor, Michigan at noon on Saturday, September 26, 2015. Bring a dish to pass, your table service and a lawn chair. No gifts or flowers, please.

****

MECHANICAL POLLINATION OF APPLES AND CHERRIES--A GAME CHANGING REALITY!
Matthew Whiting, Cherry Horticulturist at Washington State University has identified mechanical pollination to be effective in cherry and apple operations. Researchers are using an orchard sprayer to pollinate tree fruit.
"We're doing it for yield security and resilience to

colony collapse disorder, variable environmental conditions, poor bloom overlap, insufficient pollinizers/pollinators – all of which threaten the ability to set a crop," Whiting said. The study in a number of orchards with multiple apple and cherry varieties involved conducting six field trials, along with laboratory research.

Aided by support from Washington Tree Fruit Research Commission, an electrostatic sprayer was used to make two applications of pollen at three different rates. Trees were netted to keep bees out, and pollen was sprayed when 50 percent and 90 percent of the flowers were open. Two different systems were used for artificial pollen, Whiting said.

Evaluations targeted pollen viability of three sweet cherry pollen genotypes and developed a formulation that would suspend pollen in solution, move through the sprayer without clogging, and maintain pollen viability long enough to stick to the flower stigmas and fertilize the ovules.

"With the supplemental pollination, the grower does everything normally with pollinators throughout the orchard, and they don't interfere," he said. The other scenario is most compelling. It's replacement pollination in which only the pollen transferred to the flowers comes through an artificial system."We're envisioning a scenario down the road when there will be no need for pollinators and no hiring and production of bees," Whiting said.

Fruit set was 15 percent higher in one cherry orchard that was mechanically pollinated, compared to natural pollination. In the apple trial that looked at two different pollen solutions, fruit set increased 56 percent and 75 percent compared to natural pollination.

"We had good results in 2014 using both approaches," Whiting said. "Our proposed solution is to collect pollen, suspend pollen, apply it via a sprayer. The challenges are the stigma is a small target, and pollen loses viability

Work continues this year in five cherry trials, and one each in apple and pear. Goals are to improve pollen application rates and timing and determine any impacts on fruit quality and yield."We're getting out much more this year with growers," Whiting said. "There hasn't been a single orchard manager who didn't understand that this could be a real game changer for us."

Source: Catch the Buzz, 06/24/2015

THE BASICS OF HONEY BEE HEALTH

STARKVILLE, Miss. "My top three reasons for honey bee colony death are Varroa mites, Varroa mites and Varroa mites," said Mississippi State University Apiculture Extension Specialist and *Bee Culture* contributor Dr. 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 honey bees," 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 honey bees 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 freezing, 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.

Source: *Catch the Buzz, 6/22/2015,* Keri Collins Lewis, MSU Ag Communications

WHAT BEE-KILLING MITES CAN TEACH US ABOUT PARASITE EVOLUTION

An infestation of speck-sized *Varroa destructor* mites can wipe out an entire colony of honey bees in 2-3 years if left untreated. Pesticides help beekeepers rid their hives of these parasitic arthropods, which feed on the blood-like liquid inside of their hosts and lay their eggs on larvae, but mite populations become resistant to the chemicals over time.While exploring plant-based alternatives to control *Varroa* mites, Chinese bioagricultural and Japanese cell physiological labs saw that certain tick repellents repress mites from finding their honey bee hosts. In a paper published on July 2 in *Cell Reports*, they describe how the repellents activate a sensory protein (the transient receptor potential or TRP channel) found on the mites' front legs. That a single protein could influence something so important for mite survival is evidence that the protein may have helped the mites adapt as honey bee parasites in the hive environment.

"Several plant-derived tick repellents activated the TRPA1 channel in *Varroa* mites but had no effect on the TRPA channels in honey bees and fruit flies," said senior study author Tatsuhiko Kadowaki, an associate professor of biology at Xi'an Jiaotong-Liverpool University. "This is a good example of TRP channel evolutionary plasticity since the mite version was capable of acquiring new activation mechanisms during evolution."

"The *Varroa* TRPA1 channel is the first TRP channel TRP channels have a known role in sensation across many living things. The proteins, found along the surface of various cell types, are used to detect whether the environment is hot or cold for some organisms, while for others they are important in vision, hearing, smell, and taste. When Kadowaki's team activated TRPA1 channel activity in *Varroa* mites, it could repress them from entering honeycombs with bee larvae, where they

reproduce characterized in Acari, which includes mites and ticks, representing the majority of external parasites of various animals and plants," Kadowaki said.

Source: Catch the Buzz, 07/03/2015

Ypsilanti area looks to get Michigan's first Bee City designation

Over the last year alone, the planet's bee population has dropped by 42 percent. That's a significant issue given the role pollinators play in the ecosystem, says Jamie Berlin, founder of the beekeeping group Ypsi Melissa, and she has set out to increase their population and raise awareness of the challenges they face. While there are a wide range of issues behind pollinators' decline – the increased use neonicotinoid pesticides in agriculture, habitat loss, disease, residential pesticide use and pests among them – changes can be made at a grass roots level, and the city of Ypsilanti and Ypsilanti Township are partnering with Berlin and Ypsi Melissa to help promote the issue and increase the population. In Ypsilanti Township, the Board of Trustees approved moving forward with applying to become a designated "Bee City," approved installing 10 hives outside its township hall and will plant a bed of sunflowers and other local flowers that are attractive to bees. In the city of Ypsilanti, the Ypsilanti City Council read a proclamation declaring its intent to apply for designation as a Bee City, though it's still awaiting that approval. Berlin said partnering with the municipalities is a great opportunity to educate residents on the issues around pollinators and get people more involved. The township will become the eleventh municipality nationwide to be designated as Bee City, The township and city - if its application is approved - will form subcommittees that Berlin says will lay the groundwork for increasing available information, will create opportunities for the community to take action, and hold an annual celebration. Ypsilanti Township is taking the effort a step further. It allotted $4,500 to install an apiary on the east side of the township hall with hives, a water source, sunflowers and native perennials. Source: M-Live August 2, 2015

SOME INTERESTING READING MATERIAL

THE BEELINE **http://www.apinews.com/en/component/k2/item/28465**

ENTOMOLOGY: THE BEE-ALL AND END-ALL
http://www.apinews.com/en/component/k2/item/28464

UNIVERSITY PROFESSOR SAYS: THE ONLY REASON FOR THE BEE COLONY DEATH IS VA*RROA*
http://www.apinews.com/en/component/k2/item/28451

BARGAIN CORNER

For rent:
~Two-frame and eight-frame motorized extractor, $25 a day. Weather permitting, I will be extracting my honey on 9/5 to 9/7. If you want to extract honey at my place (Romulus, MI) call me at 313-999-3180 or email m7mav@yahoo.com.

Wanted*:*
~A student in the beginning class is looking for a hive location within five miles of Farmington Hills. Contact Julia at 248-615-0233 or email at julia@foxthorn.com

For sale:
~5 gallon honey pails. Call R. Sutherland 734-668-8568.
~Cut-comb honey. Call Winn at 734-546-4563.

THE EFFECT OF LANDSCAPE ON HONEY BEE COLONY PRODUCTIVITY. A LOT OF LUCK IS IN LOCATION, LOCATION, LOCATION

Over the last few decades, a gradual departure away from traditional agricultural practices has resulted in alterations to the composition of the countryside and landscapes across Europe. In the face of such changes, monitoring the development and productivity of honey bee colonies from different sites can give valuable insight on the influence of landscape on their productivity and might point towards future directions for modernized beekeeping practices. Using data on honeybee colony weights provided by electronic scales spread across Denmark, we investigated the effect of the immediate landscape on colony productivity. In order to extract

meaningful information, data manipulation was necessary prior to analysis as a result of different management regimes or scales malfunction. Once this was carried out, we were able to show that colonies situated in landscapes composed of more than 50% urban areas were significantly more productive than colonies situated in those with more than 50% agricultural areas or those in mixed areas. As well as exploring some of the potential reasons for the observed differences, we discuss the value of weight monitoring of colonies on a large scale.

Read the rest of this paper at http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0132473#pone-0132473-g007

Catch The Buzz for 07/16/2015

PINE RIVER BEEKEEPING CLUB

Don McChristian, of Columbus Township, has been keeping bees for five years. He's the president of the club, which meets at the Pine River Nature Center and which has three more outside hives on the grounds. He said about 40 to 50 people now are in the club.
"One of the goals of our club is to propagate Michigan bees," The beekeeping club also received a $1,000 grant from the Master Gardeners of St. Clair County for an equipment shed or trailer, McChristian said.

Boy Scout Elias Pagurko of Troop 106/169 built two of the outside hives for the club for his Eagle Scout project, McChristian said, and the third outside hive was obtained through St. Clair County 4-H.

"Our goal with the honey is to give it to the Pine River Nature Center and let them sell it," McChristian said. The club's primary goal is to increase the number of beekeepers in the area."We probably have 100 to 150 hives in the area that wouldn't otherwise be here," McChristian said.

Members of the Pine River Beekeeping Club have installed an indoor display hive at the nature center. The hive has two walls of glass — with insect access to the outside through a hole in the center's wall — so kids can watch the honey bees at work without fear of stings. Dave Richmond, from Ruby, built the hive, which members Christine Campbell and Liz and Todd Masters populated with a queen and her worker bees.
Source: Bob Gross, Times Herald, July 26, 2015

Catch The Buzz, Honey Bee Research August 24, 2015

CATCH THE BUZZ – MITE RESISTANCE NOT ONLY POSSIBLE, IT'S ALREADY HAPPENED

An international research team has some good news for the struggling honeybee, and the millions of people who depend on them to pollinate crops and other plants.

These valuable pollinators have faced widespread colony losses over the past decade, largely due to the spread of a predatory mite called *Varroa destructor*. But the bees might not be in as dire a state as it seems, according to research recently published in *Nature Communications*. Researchers found a population of wild bees from around Ithaca, New York, which is as strong today as ever, despite the mites invading the region in the mid-1990s."They took a hit, but they recovered," said Alexander Mikheyev, a professor at the Okinawa Institute of Science and Technology Graduate University (OIST) in Japan and lead paper author. "The population appears to have developed genetic resistance."

Mikheyev and his collaborators at OIST and Cornell University studied the population genetics of the wild colony by comparing the DNA of specimens collected in 1977 with bees collected from the same forest in 2010. To conduct the study, they developed a new DNA analysis tool that works especially well for degraded DNA stored in museum samples.

Such a study is extremely rare, especially with bees. Few people collect them, and even fewer collect in a way that is good enough for a population level study. Luckily, Cornell Professor Tom Seeley worked in this area during his Ph.D., and deposited his samples in the Cornell University Insect Collection. This is the first time scientists have been able to observe genome-wide changes after a specific event like the mite invasion.

"By using museum specimens, we see how evolution happens as compared to how we think it happens," said Mikheyev, who runs OIST's Ecology and Evolution Unit.

Many people think of evolution happening over thousands or millions of years, but in fact, it is happening from generation to generation. External forces cause certain traits to be selected and passed on to offspring to enhance

their chance of survival and reproduction. By comparing bees from the same colony only a few decades a part, the team was able to see this natural selection in action.

The bees changed in several different ways.First, mitochondrial DNA, the genetic material stored in cells" power plants, changed significantly from the older generation to the newer generation. That genetic material is only passed on from the mothers, so a major change indicates the old queen bees were wiped out and there were large-scale population losses. Even so, the population still maintained a high level of genetic diversity throughout the rest of genome, which is stored in the cell nucleus. Genetic diversity is the raw material for evolution, and high genetic diversity increases the chance for successful adaptation.

One of the most interesting changes in the bee population was in a gene related to a dopamine receptor known to control aversion learning. Another study has suggested this receptor is involved with bees grooming themselves to get rid of the mites by chewing them up.

The researchers also found many changes in genes associated with development. Mites reproduce and feed on the bee during the bees" larval stage, so the researchers hypothesize that bees evolved to disrupt that process. Also, there were physical changes " today's bees are smaller than the older bees and their wing shape is different.

The researchers note changes observed cannot be prescribed to any one factor, such as the mites, because the timeframe is too long. However, many of the changes are too large to be due to random genetic fluctuations, or the introduction of genes from other sources, like Africanized bees, and found the strongest driver of the observed changes was still natural selection.

"These findings identify candidate genes that could be used for breeding more resistant bees, such as the dopamine receptor gene," Mikheyev said. "More importantly, it suggests the importance of maintaining high levels of genetic diversity in domestic bee stocks, which may help overcome future diseases."

Beyond Royal Jelly: Study Identifies Plant Chemical that Determines a Honey Bee's Caste

University of Illinois at Urbana-Champaign

CHAMPAIGN, Ill. -- A closer look at how honey bee colonies determine which larvae will serve as workers and which will become queens reveals that a plant chemical, p-coumaric acid, plays a key role in the bees' developmental fate.

The study, reported in the journal *Science Advances*, shows that broad developmental changes occur when honey bee larvae - those destined to be workers - are switched from eating royal jelly (a glandular secretion) to a diet of jelly that includes honey and beebread (a type of processed pollen).

Beebread and honey contain p-coumaric acid, but royal jelly does not. Queens feed exclusively on royal jelly. Worker bees known as nurses feed the larvae according to the needs of the hive.

Experiments revealed that ingesting p-coumaric acid pushes the honey bee larvae down a different developmental pathway from those fed only royal jelly. Some genes, about a third of the honey bee genome, are upregulated and another third are downregulated, changing the landscape of proteins available to help fight disease or develop the bees' reproductive parts.

"Consuming the phytochemical p-coumaric acid, which is ubiquitous in beebread and honey, alters the expression of a whole suite of genes involved in caste determination," said University of Illinois entomology professor and department head May Berenbaum, who conducted the study with research scientist Wenfu Mao and cell and developmental biology professor Mary Schuler. "For years, people have wondered what components in royal jelly lead to queen development, but what might be more important is what isn't in royal jelly - plant chemicals that can interfere with development."

"While previous molecular studies have provided simple snapshots of the gene transcript variations that are associated with the exposure of insects to natural and synthetic chemicals, the genomics approaches used in this study offer a significantly more complex perspective on the biochemical and physiological processes occurring in plant-insect interactions," Schuler said.

Honey Heals Canker Sores?

Canker sores have plagued mankind throughout recorded history." That's the opening line to a new study published in latest issue of *Quintessence International*. Dramatic? Sure, a little—but if you've ever felt the mind-boggling sting of a canker sore in contact with a hot swig of coffee, "plague" doesn't seem like such an exaggeration after all. (We could probably come up with a few more choice words, too, come to think of it). Docs still don't know exactly what causes these painful oral lesions—it could be anything from stress to food allergies to genetic predisposition—but this new study suggests that a fast, effective canker sore treatment is hiding in our kitchen cabinets.

Researchers at Saudi Arabia's Salman bin AbdulAziz University gathered a group of 94 people suffering from canker sores and randomly separated them into three groups. The first treated their sores with plain old commercial honey, the second used an oral corticosteroid cream, and the third got an over-the-counter product that forms a protective paste to cover sores while they heal. Participants applied their respective treatments three times daily while researchers observed the effects.

Southeastern Michigan Beekeepers' Association

SEMBA Membership
5488 Warren Road
Ann Arbor, MI 48105-9425

Organized April 1, 1934

Oakland Beekeepers' Club

Schoolcraft Beekeepers' Club