

The Bee Line



Newsletter of the Maine State Beekeepers Association | mainebeekeepers.org

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American Foulbrood

by Jennifer Lund

During the 2019 beekeeping season there were two separate confirmed positive cases of American foulbrood (AFB) in Maine. AFB is the most contagious and devastating of the brood diseases. It is caused by a spore-forming rod-shaped bacterium (*Paenibacillus larvae*) and is found across the U.S. and in parts of Canada. The AFB life cycle includes an active vegetative stage and the dormant spore stage. The disease is transmitted by the spore stage, but it is the vegetative stage that kills the brood. Honey bee larvae become infected with AFB by ingesting spores present in larval food. The spore germinates in the insect gut, ultimately killing it. AFB spores are resistant to heat, cold and ultraviolet radiation and can remain dormant, yet viable, for up to 80 years.

AFB can be spread by:

1. using infected equipment and tools,
2. when spore-laden honey is robbed by neighboring hives/apiaries, or
3. when bees drift from diseased hives to clean hives.

In both 2019 cases, the beekeepers bought used equipment that was not inspected or tested for AFB prior to sale.

AFB is not very common in Maine but beekeepers should be vigilant during hive

inspections. The brood pattern of hives infected with AFB will appear mottled and irregular. Pupal cappings are sunken, perforated, greasy, and wet. Larvae turn from white (healthy) to dark brown and die upright in their cells. Advanced cases of AFB have an offensive odor described as rotten meat, sulfur, dirty socks, or rotten eggs. Field diagnosis of active AFB is usually accomplished by the “toothpick test”. A toothpick or twig is inserted into the suspect pupal capping that contains the brown, collapsed pupal remains. The toothpick is then slowly removed from the cell. If the brown, sticky mass of dead tissue “ropes out” ½ inch or more, it is highly probable that AFB is present.

As pupae decay, the mass of dead tissue will dry to a rigid “scale” at the base of the cell. Each scale can contain billions of spores. AFB scale adheres tightly to the cell wall, lays flat and appears to be black and shiny. Often remnants of a pupal tongue are visible from the scale and at times are attached to the upper cell wall. Scale can usually be seen in AFB infected equipment that has been in storage for many years. Routine inspection of brood combs for the presence of scale and thorough autopsy inspections of colonies lost during winter is essential before equipment is restocked or dispersed to other hives.

The first confirmed case of 2019 AFB was in southern Penobscot County and the hives showed all the “characteristic” symptoms of AFB. The second case was in northern Penobscot County and visual inspection of old brood comb did not locate any definitive symptoms of AFB. In both cases AFB infection was confirmed by the USDA ARS Bee Research Laboratory.

If you suspect you have a hive with AFB call your state bee inspector. Your state inspector can confirm diagnosis, help with abatement, and will attempt to locate the initial source of infection (another apiary, diseased equipment, etc.). They will inspect other hives in the area for AFB. The earlier an infection is caught, the less likely it has had a chance to spread to other hives. In the case of the southern Penobscot County AFB case, the living hives were sick but still relatively strong when AFB was detected. If the infection was not caught as early as it was, the weakened/dead hives would have been robbed by other hives in the area, spreading disease to non-infected hives.

Honey bee colonies found to be infected with AFB must be abated according to existing state regulations. In most states, including Maine, hives infected with AFB are depopulated and burned. Between the two cases, six living hives and several pickup loads of equipment were destroyed.

See the Maine State Apiary Rules and Regulations for more detail on AFB abatement (https://www.maine.gov/dacf/php/plant_health/statutes_rules.shtml#bees)



Photo courtesy of Jennifer Lund

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*Open to all MSBA members for discussion with voting to be done by current BOD members only. Meetings generally held at the Viles Arboretum, 153 Hospital Street, Augusta or via conference call. Please contact a board member for details.



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Some states allow the use of antibiotic treatment as a means of abating AFB. Maine does not allow this because treatment of AFB infected hives using antibiotics has limited success and several associated problems. First, the disease is likely to reappear once the treatment ceases after larvae ingest bacterial spores originating from dried scales and contaminated honey. In addition, overuse and improper dosing of antibiotic has resulted in strains of AFB with antibiotic resistance. Currently, strains of AFB with Terramycin resistance are found globally.

Besides AFB, more than a dozen pests and pathogens are associated with honey bees. The easiest way to minimize the possibility of hive contamination is to maintain good apiary hygiene. Beekeepers should:

1. Make sure any used equipment you are planning on buying is inspected by the State Apiary Inspector and has been tested for brood disease.
2. Exercise caution with equipment of unknown health history or origin. Clean any used equipment by placing it in a deep freeze for 48 hours and then scraping any wax, propolis, and other debris from the boxes. Collect and dispose of this waste.

Finally, sterilize equipment by scorching with a propane torch. Never use old frames and comb with an unknown health history; rather discard these.

3. Never open-air feed honey or syrup. This includes letting bees have open access to frames after extracting honey.
4. Never leave burr comb or hive scrapings about the apiary. Carry a bucket with you to collect the waste. Dispose of it at the end of the day or store it in the freezer.
5. Store unused equipment under "bee tight" conditions to prevent robbing behavior and access to the stored equipment by rodents, wax moths and hive beetles.
6. Clean hive tools between hives while performing inspections. Scrape off any honey or wax from tools and scorch in a lit smoker.
7. Never combine sick or collapsing hives with healthy ones, especially if you do not know why the hive is sick or collapsing.
8. Replace old black comb on a schedule with new foundation. Try to rotate comb out of your hives on a 3-5 year cycle. An easy way to keep track of the age of your comb is to mark the year with marker on the top of the frame.

The brood in a healthy colony has a uniform appearance with few interruptions of the

brood pattern. Healthy larvae are pearly white and the pupal cappings should appear convex, not perforated or greasy. Larvae should move and roll when prodded. There should not be an offensive odor. When one or more of these criteria is not met, the colony needs further inspection and evaluation.

For more information on AFB please visit: https://honeybeehealthcoalition.org/wp-content/uploads/2019/06/HBHC__AFB-EFB-Final-061119.pdf

USDA ARS Bee Research Laboratory: <https://www.ars.usda.gov/northeast-area/beltsville-md-barc/beltsville-agricultural-research-center/bee-research-laboratory/>



Photo courtesy of Jennifer Lund

Bee school listings are available
to view on the website

mainebeekeepers.org

A list of beginning and intermediate beekeeping
classes across the state is available by clicking
on the link to 2020 Bee Schools

Beekeeping Symposium

by Jason Peters

The Penobscot County Beekeepers Association held its first annual Beekeeping Symposium on November 16th, 2019 at Hampden Academy. **Ian Stepler**, from Manitoba, Canada and contributor on the YouTube channel with "A Canadian Beekeeper's Blog" and **Tucka Saville** of Tucka Bee in New York were the featured guest speakers for this fantastic educational event. They provided very informative presentations about their unique operations, management techniques, and some tips and tricks which they utilize in their apiaries. This was a wonderful learning opportunity for the 150 attendees as they had the chance to hear from two very accomplished beekeepers about how things vary in different operations with a strong focus on sustainable beekeeping practices in northern climates.



Peter Cowan, Ian Stepler and Jason Peters.
Photo courtesy of Michelle Peters

Ian's first presentation was a behind-the-scenes look at a Canadian prairie beekeeper. Speaking of the many challenges he faced growing his commercial beekeeping operation from the ground up, he stressed the importance of having a solid business plan and making strategic investments to facilitate that growth. In addition, he talked about the importance of not losing focus on basics and learning to be proactive and not reactive when managing your bees.



Elizabeth Downs and her mentor David Fiacco.
Photo courtesy of Michelle Peters

Following Ian's lecture, we were fortunate enough to hear from various MSBA chapters and learn about their meetings (some with unique meeting locations), agendas, special events, bee schools and how things are going in different areas of the state. With Maine hosting the Eastern Apicultural Society's 65th annual conference in August 2020, Peggy McLaughlin addressed the group about the many unique learning opportunities and presentations by world renowned experts that will be available to beekeepers in the state.

After a delightful lunch and some time to mingle, Tucka gave a very informative presentation about queens. She demonstrated a few ways to approach a hive and what to look for in order to determine if a colony is queenless. Tucka described approaches to use when looking for queens which was especially helpful to beginners, as that can often be a significant challenge for them. Further into her presentation she talked about how to handle queens and queen cells and discussed a few different ways to introduce them into your colony. The value of using locally reared queens with good genetics to encourage sustainability was reinforced on several occasions.

Ian's afternoon presentation was about practical management strategies and lessons that he has learned along the way. The focus of this talk was colony management, nucleus production, queen rearing for sustainability and honey bee nutrition. He spoke of the importance of

colony equalization and managing for a strong winter nest as part of winter preparation.

It was great to have Jennifer Lund spend time with us without having to work in an official capacity as state apiarist. Even as a guest, Jen was found sharing information, spending lots of time speaking with many beekeepers about the various issues that we are facing throughout the state and answering questions from some of the beekeepers in attendance. I believe that she also holds the title of "winner of the most raffle items" at any event that she attends!



Jennifer Lund, winner of the rum cake.
Photo courtesy of Michelle Peters

The members of the Penobscot County Beekeepers Association would like to thank all of those who attended the symposium, donated raffle items and helped in many other ways to make this event such a success. This event was made possible because of you as well as the hard work and dedication of the members of our club. We are all hoping to offer these types of educational symposiums and unique learning opportunities in the future.



Amy Nickerson (VP of PCBA) and Linda Dougherty
Photo courtesy of Michelle Peters

The 2020 Maine Agricultural Trades Show



Members from around the state volunteered at the Maine Agricultural Trades Show at the Augusta Civic Center on January 14th, 15th and 16th. This is the 45th consecutive year that MSBA has participated. Pictured above (left) are Tom and Sally Carey and Gordon Jones standing with Bob Foster (right). In addition to the sale of honey, there was a free drawing to attend a beginner's bee school, wild pollinator seed packets available for attendees with information on how to create bee friendly gardens and a flyer which identified plants for honey bees in Maine. A large poster highlighted the location of beginning bee schools held throughout the state. Photos courtesy of Lynn Lamb.

Oxford Hills Honey Bee Club

by Carol Cottrill

The January OHHBC meeting didn't have just one speaker, we had several. A great way to get members involved is to do a "Tips and Toolbox" meeting. We ask members to bring a few items to the meeting and explain to the group how they are used. The "tips" come from the innovative ways our members solve problems and often make their own gadgets to accomplish a task. The "toolbox" can involve showing an item purchased, or sometimes inherited from another beekeeper, and explaining how it works. Then there is the moment of truth: did the gadget work as advertised, was it worth the purchase and would you recommend it to others?



In these bee lining boxes, one is a simple box with a sliding top and the other has two separate compartments, leather hinges and a window.
Photo courtesy of Carol Cottrill

A new style package Bee-Bus, a couple of different candy boards, some uncapping devices, a favorite hive tool, a bunch of different methods to feed sugar syrup or water and some homemade queen introduction cages were demonstrated. Kenny Record kept us entertained with his Yankee ingenuity and frugal methodologies for beekeeping!

Along with things commonly seen today it is always interesting to have members show up with things no longer used. This meeting we saw bee lining boxes, a drone trap, an old capping scratcher and several old queen excluders.



On the left, new Bee-Bus plastic package with wood and screen style on the right.
Photo courtesy of Carol Cottrill



Drone trap, old capping scratcher and a hair pick that was used as a capping scratcher.
Photo courtesy of Carol Cottrill

b-Keeping Time

by Michael Donihue

The second week of January 2020 saw a 60 degree swing in temperatures and an inch and a quarter of rain at our apiary here in Central Maine. A January thaw is often a good thing for our resident *Apis mellifera*, providing an opportunity for cleansing flights and greater ease for reconstituting their winter cluster closer to stored food. Yet extreme events like this have historically been catastrophic for colonies despite our best efforts at pre-winter preparations of monitoring and treating for varroa, leaving plenty of honey, installing homosote boards over the inner cover, and insulating hives.

As I chipped the ice away from the entrance to one of our hives I recalled one of the stories from my first beekeeping class more than three decades ago. A classmate asked how honey bees survive the long cold winters and our instructor described it this way. He explained that the bees form a cluster around the queen, roughly the size of a football, and each member of the colony generated heat by shivering. The bees on the outside of the cluster would bring food and provide warmth for the queen in the middle, exchanging places with those workers next to the queen as they recycled to the outer edges. This constant shivering and movement within the cluster was how the colony maintained a core temperature near the queen of about 93 degrees even when the outside temperature fell below zero. The lower the temperature outside the hive, the tighter the cluster around the queen. The image he created was one of a vibrating mass of bees slowly moving through the hive consuming honey and keeping the queen warm until spring arrived. Truth be told, I've used this same story with good effect when I talk with honey bee-curious friends and family members.

The part of the story where workers generate heat and warm the colony by shivering is a well-documented fact. If you think about this story, there is an obstacle that is unexplained; the frames of comb within the cluster. Consider a medium-sized 'football-shaped' cluster occupying four frames inside a Langstroth-style deep. For a worker to move from the outside of the cluster to bring honey and warmth to the queen they would have to make their way up to the edge of the comb; travel across the ends of two frames, and then drop down halfway across the next comb to make a delivery of food to the queen in the center of the cluster. That's a distance of about 22 inches. For comparison, that's equivalent to this six foot beekeeper selecting a jar of honey from the middle of the baking goods aisle at Hannafords, crawling on his hands and knees to the end of the aisle, across the end of the next two aisles and delivering it to the shopping cart parked halfway down the royal jelly aisle, TWICE, surrounded by about 10,000 of my best friends.

Honey bees do shiver, and the density of the cluster does vary with the outside temperature, but they generally do not move among the combs with a shopping cart full of food for their queen waiting patiently in the royal jelly aisle.

The next question I get from my bee curious friends is whether the winter behavior of some other stinging insect is the same. The easy answer is NO, honey bees are unique in this regard. I really didn't know much about the life cycles of the most common stinging insects here in Maine. For questions like this I ask a librarian. Here's a bit of what I discovered.

Bumble Bees (*Bombus*)

Maine natives, there are 17 documented species of bumble bees in Maine. The Common Eastern Bumble Bee (*Bombus impatiens*) is probably the one we see most often in our gardens. All bumble bees die when temperatures fall below freezing except fertilized females, which hibernate throughout the winter in burrows in the

ground. In the spring, warming temperatures cause these queens to awaken and lay eggs in hollow nests of moss or grass.

Yellowjackets (*Vespula*)

I don't know anyone that likes the Eastern Yellowjacket (*Vespula maculifrons*), probably the most common yellowjacket found in Maine. Unlike bumble bees, which are mostly solitary in their nesting behavior, yellowjackets are far more social with summertime nests that can number in the hundreds. Freezing weather kills yellowjackets. A fertilized queen will only survive the cold of winter if it remains in a warm environment like a compost pile, your attic, a heated barn, or behind the siding of your house.

Paper Wasps (*Polistes*) and Bald-face Hornets (*Dolichovespula maculate*)

These are close relatives of yellowjackets and common summer pests in Maine. Their behavior and life-cycles are similar to those of yellowjackets. Fertilized females survive the winter by finding a sheltered environment and emerge in the spring to build up the new colony.

Maine has over 270 species of native bees. Sweat bees, miner bees, blue orchard bees, and dozens of other varieties have proven to be as important, and for some crops more efficient, pollinators for blueberries and other fruit crops as honey bees are in Maine.

Let's not forget the mosquitos (*Culicidae*), blood-sucking midges (*Ceratopogonidae*), and black flies (*Simuliidae*). All three are diapause insects with eggs that are able to survive extreme environmental changes like winter, drought, or heat lasting multiple seasons or even years. Diapause is an important aspect of phenology as it enables populations of these types of insects to synchronize their life cycles across events related to climate change.

It's much nicer to think about yellowjackets, wasps, hornets and black flies when the

temperature is hovering near zero. Fingers crossed that tight clusters and a whole lot of shivering in our colonies will keep our honey bees alive to see the first dandelions of spring.

For more information

Maine Bumble Bee Atlas at <https://mainebumblebeeatlas.umf.maine.edu/>

Native Bees: University of Maine Cooperative Extension Service Bulletin #7153 at <https://extension.umaine.edu/publications/7153e/>

Wild bee conservation for Wild Blueberry Fields, University of Maine Cooperative Extension Service Fact Sheet No. 630 at <https://extension.umaine.edu/blueberries/factsheets/bees/630-wild-bee-conservation-for-wild-blueberry-fields/>

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New Beekeepers and Spring Management

by Jane Dunstan

For a first year beekeeper who is on the cusp of entering the spring season with his or her first overwintered hive, colony management will look very different than the previous year. When speaking with new beekeepers about their experiences after one year, their comments range along a continuum of "my bees read the book" to "it was more than challenging". Some first year beekeepers manage to harvest a small honey crop whereas others struggle from the time of package installation with poor queens and failure of adequate hive build up over the summer months. Given the wide range of experiences, it is more than understandable that uncertainty may exist as to how the beekeeper will manage that overwintered colony. What are they apt to expect when they pop that lid off on a warm spring day in late April or early May?

Springtime in Maine looks very different in Saco than it does in Stacyville, however the one absolute fact is that spring weather is unpredictable and unstable from week to week. While the hanging wall calendar for April depicts sunshine and abundant dandelions and other flowers, a quick glance out the window may quickly confirm the reality of the situation. Although weather and weather trends are not significant for us in terms of survival, they are extremely significant to the bees. Cold, rainy, raw, damp weather prevents access to a regular and dependable food source outside of the hive. With gradually warmer springlike temperatures, bees capitalize on their ability to move about the hive. Increased activity equals increased consumption of food. If food sources within the hive are low or non-existent, starvation is a real possibility in both March and April. Sugar candy pies, fondant, candy boards or the use of loose sugar poured over a piece of newspaper placed on the top frames (Mountain Camp

Method) in a three inch rim will provide an emergency food source directly above where the bees are clustered until weather becomes warmer. It will be important to simply PEEK into those hives to monitor food intake (this is NOT the time to perform hive inspections!) You are simply checking on the presence of food stores which you placed in the top deep and approximating colony size depending on how many bees are in the top box eating winter food stores. Is there a large gathering of bees over two frames, five frames or bees covering all the frames? Despite less than optimal weather for days or weeks at a time, the days are increasing in length and temperatures are slowly warming, encouraging the queen to lay more eggs in an expanding colony with increased food demands. By mid April (2nd to 3rd week) you can begin feeding sugar syrup (1:1) to those colonies which you have been supplementing IF THEY NEED ADDITIONAL FOOD RESERVES. Keep your hives wrapped with entrance reducers in place until weather warms consistently. The temptation is to tear off those wraps and open up entrances, but resist doing so. This is an overwintered colony which has been successful. It is losing a large number of winter bees as new spring bees emerge. Give these colonies every opportunity to make a protected and strong transition to a larger work force during inconsistent weather patterns and irregular foraging opportunities.

These early spring interventions mostly related to assessment of food stores all occur with little or no manipulation of the colony itself, primarily due to temperature constraints. There is no advantage to remove frames, chill brood and disrupt a colony to simply check things out. Your initial role in early spring management (March and April) when you PEEK under the inner cover is simply to assess how much emergency food stores remain and whether you need to supplement. When temperatures warm to the mid to upper 60's with bright sunshine and no wind, this is the perfect time to conduct your first hive inspection. The following guidelines will

hopefully allow for a timely and targeted inspection of your hive(s) following winter.

The Inspection

- Plan your inspection on a WARM day with bright sun and little or no wind toward the end of April into early May. Schedule it when you will have unlimited time.
- Be prepared. Pack your smoker so it will stay lit. You may need extra equipment, so bring undrawn frames, drawn frames, an extra box, etc. with you.
- Know why you are inspecting. To assess colony health? To assess the queen and her pattern of laying? To evaluate the size of the hive to consider making a split or nuc? To perform an alcohol wash?
- Take a moment to simply observe. Are bees entering and exiting from all openings? Are they bringing pollen in? If so, what type of pollen are they collecting?
- After removing the telescoping cover, take a moment to simply listen to the hive. Is it quiet with bees working on frames or is it loud and sounding tense or agitated?
- After you lightly smoke, slowly and methodically examine each frame, noting what comprises the frame: honey, pollen, empty space, brood, location of eggs and larva, and the queen. Take a moment to remove burr comb as you move from frame to frame. *Record your findings.* You will be unable to recall what you observed from one inspection to the next which is why it is so very important to keep detailed notes which you can refer to at a later date. A historical narrative of life within your hive may help answer questions if problems arise during the course of the year.
- After you have examined your top hive body, remove it to the side and cover it with an extra inner cover. Continue the same manner of inspection in your bottom hive body. When completed, remove your bottom deep and scrape the bottom board removing dead bees and any hive debris.
- This is where it is helpful to stop and ask yourself some questions: What is the size of my hive? Will this hive need to be split in the near future? Are there ample food stores or should I continue to feed? What

does the brood pattern look like: is it consistent or spotty? Is this a queen that may need to be replaced?

-Your first hive inspection is a perfect time to perform an alcohol wash. Do not assume that your bees are free from varroa following winter. Select a frame that has emerging bees as a sample source frame once you have verified that the queen is not present on that frame. Record your mite count and treat if warranted.

Honeybeehealthcoalition.org is an excellent internet resource which is home to the Varroa Management Decision Tool. This tool directs you through evaluative steps concerning when to treat based upon threshold levels and which miticides are recommended based on presence or absence of brood, honey supers and colony population (increasing, peak, decreasing or dormant).

-Some folks rotate their hive bodies placing the top hive body in the bottom position and the bottom hive body is then placed on top to afford the queen room to "move up". This practice recognizes that the queen and

majority of the cluster is in the top box during the spring. Others do not rotate hive bodies at all. As a beekeeper who may have had hives for a few years, this is a great opportunity to use this inspection time to remove older frames with darker wax and either replace those frames with undrawn foundation or newer drawn foundation. Another option is to organize the bottom hive body with a frame or two of honey and pollen on either end followed by occupied frames of eggs, larvae and open drawn comb for the queen to lay. The top box is then filled with two frames of eggs and larvae in the center flanked by drawn and undrawn frames with a few frames of honey on the outside edges. This arrangement affords room for the queen to deposit eggs in both top and bottom hive bodies.

-If you have two hives or more, this is an optimum time to equalize existing colonies by adding frames of brood and nurse bees to weaker hives while providing space to larger colonies who will rapidly increase their numbers. As colony population increases, provide empty frames of drawn

comb for the queen to have ample room to lay to avoid hive congestion.

-The hive will build up rapidly. Part of an ongoing hive management plan is to assess for hive congestion. Does the queen have adequate space to lay eggs? Are open cells being packed with pollen or nectar, thus limiting brood space? Are there adequate numbers of honey supers on the hive? If signs of hive congestion are present, this is the perfect time to make a split or create a nuc while foraging sources abound and there is ample time for the new colony to develop over the year.

The word is MONITOR, MONITOR and MONITOR! Hives are fluid; they are ever changing. During peak expansion periods of the hive, it is very necessary to evaluate your hives for potential queen problems, mites, swarm cells, hives that become nectar bound or hives that suddenly drop off in production of eggs and larvae. *Most importantly have a plan.* Assume these problems may occur, and if they do, have a management plan of action.



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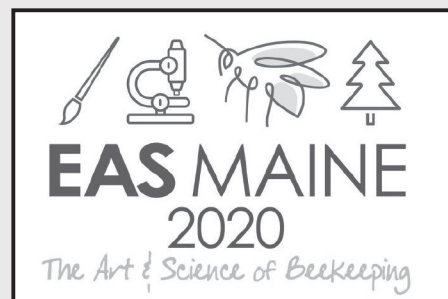
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Make a beeline to the 2020 EAS Short Course and Main Conference! August 3-7 University of Maine in Orono



We are very fortunate to be living in the state hosting the Eastern Apicultural Society's 65th annual Short Course and Conference this coming August at the University of Maine at Orono. If there is anything to mark "MUST ATTEND" on your calendars, this is it. Complete immersion in beekeeping classes, workshops and on-site apiary experiences for five entire days!

There will be all the great things the EAS conference is known for: nationally and internationally recognized speakers; a wide variety of short course tracks; apiary demos; top bee supply vendors, and a children's program. More hands-on workshops are scheduled this year, including cooking with honey, mead-making, photography and crafting with beeswax. We've planned multiple recreational events so you'll have plenty of time to relax and socialize. Our aim is to cover it ALL during a week of "The Art and Science of Beekeeping."

The conference is divided into two sessions:

The "Short Course," consists of over 50 one-hour seminars and workshops running all day Monday and Tuesday. Some are organized by beginner, intermediate and advanced skill levels, while others pertain to a specific topic such as queen rearing, microscopy, beeswax products, and education (teaching kids about bees, preparing honey show entries, how to run open hive sessions, etc). The majority are held in a classroom but several take place in the temporary apiary set up on campus. (Don't forget your veil!)

On Wednesday the Short Course overlaps with the opening of the Main Conference, which features keynote speakers all morning, and breakout sessions and apiary demos in the afternoon.

Beekeeping's best and brightest professionals continue to share their knowledge during the Thursday and Friday Main Conference sessions. Prominent 2020 speakers include Sam Ramsey, Sue Cobey, Dewey Caron, Tom Seeley, Ernesto Guzman, Matt Scott and Juliana Rangel.

If you've ever thought about becoming a Master Beekeeper, this is a great opportunity. The deadline to apply is June 1st and acceptance is limited. Some people do the written, lab, oral and field exams over a period of two years; since the 2021 conference is being held in Massachusetts, there will never be a better time than now! Learn more about the Master Beekeeper program on the EAS website.

An optional social event will be held every evening, including Bee Olympics, Story Concert*, Bangor restaurant tours, Honey Bee Buzz-In trivia contest, a lobster bake/BBQ picnic, visits to Swan's commercial beekeeping operation and Humble Abodes woodenware manufacturer, and much more. A buffet dinner and benefit auction takes place on Thursday evening, followed by a banquet with awards ceremony on Friday. Family and friends are welcome to participate in all EAS social events. *If you have a story to tell, we want to hear it at the EAS Conference! See details at easternapiculture.org, and be sure to apply by the March 1st deadline.

This is a great time to stock up on everything from a new bee jacket to candle molds, extractors and much, much more at the vendors' show Tuesday-Friday. See first hand products you may have been considering and discover new gadgets designed to help make apiary tasks and honey production more efficient. It's also a great opportunity to have a book signed by your favorite beekeeping authors.



*Social events at EAS.
Photo courtesy of Judith Stanton*

We encourage every beekeeper to enter the EAS Honey Show. Check out the Resources section of the website easternapiculture.org for tips on proper ways to present your honey and other hive products. Did you know that the show goes way beyond honey? Other categories range from beeswax creations, mead & honey beer, home cookery, artwork, sewing, crafts, photography, and gadgets. With six awards being given in over 30 categories, the odds are good that you'll have a shot at winning a ribbon! Even if you do not submit an entry, the Honey Show room is an amazing place to visit with jar after jar of honey in a wide range of colors, an array of handicrafts and artwork, and so much more.



Accommodations include hotels, nearby campgrounds and campus dormitory rooms. A special conference rate is currently available at several hotels in limited numbers and dorm rooms can be reserved now. **August is high tourist season in Maine** so reserve rooms ASAP to get the best rates. Listings can be found at easternapiculture.org.

Ideally, everyone could stay for all five days, but some attend either the Short Course or the Main Conference. If you're only able to come for one or two days, there is also a per-day option available. The important take-home message is to make the time to attend, especially if you have never been to EAS. Acadia National Park, Baxter State Park and many other major sights are within easy reach of Orono, so you may want to extend your trip and spend a few days exploring these beautiful places.

Registration will open soon so be sure to check out the website for more information. There will be limited opportunities to receive a discount on registration fees by serving as a conference volunteer. For more details contact: director.me@easternapiculture.org

easternapiculture.org



Demonstration by EAS instructor.
Photo by Judith Stanton

Eastern Apicultural Society's

65th SHORT COURSE & CONFERENCE

August 3-7, 2020 University of Maine in Orono

EAS MAINE
2020
The Art & Science of Beekeeping

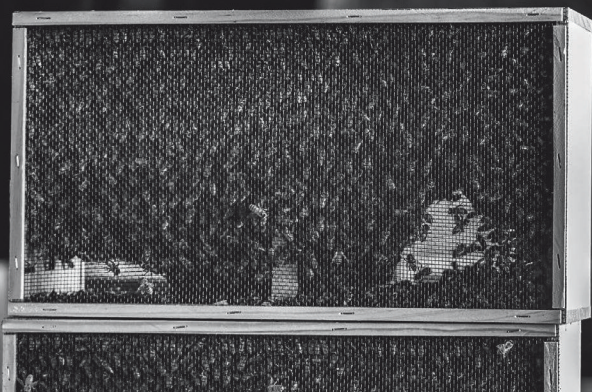
SPEAKERS

- Dr. Ernesto Guzman, University of Guelph, ON
- Sue Cobey, New World Carniolan Breeding Program, WA
- Dr. Samuel Ramsey, USDA-ARS, Bee Research Lab, Beltsville, MD
 - Dr. Tom Seeley, Cornell University
- Dr. Dewey Caron, University of Delaware, Oregon State University
- C. Bee, Master Beekeeper, Appalachian Beekeeping Collective, WV
 - Sam Abban, USDA-ARS, Bee Research Lab, Beltsville, MD
 - Phil Craft, Veto-pharma, ABJ contributor
 - Jennifer Lund, Maine State Apiarist
 - Kim Skyrn, Massachusetts State Apiarist
- Andrea Nurse, Climate Change Institute, University of Maine
- Eric Venturini, Pollinator Conservationist, Xerces Society & NRCS
 - Maggie Wachter, Second Nature Honey, Urbana, IL
 - Tucka Saville, Queen Rearing
 - Michael Young, MBE
 - Sarah Red-Laird, "Bee Girl"
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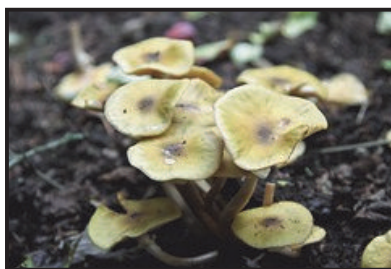
LYON

Who Put Sugar in the Manure Pile

by Mike McNally

How often have you heard beekeepers talk about why their bees are all over compost piles, manure piles or sawdust piles. The answer is always the same, who knows?

We actually do know the reason. This behavior typically occurs when there are minimal plants in bloom. The answer is quite simple: the bees are after sugar. I know!!! How did the sugar get there? To answer that question we need to revisit high school Biology class. Remember photosynthesis? Green plants with chlorophyll take in carbon dioxide and water, add a little sunshine and out comes oxygen and complex carbon compounds. Sugars are some of those complex carbon compounds. All of nature's chemical processes require energy. Most of that energy comes from sugars tied up in organic compounds. Microorganisms such as bacteria and fungi break down large organic molecules into smaller ones and in the process take their sugars to drive their own chemical processes. Remember only plants can make their own sugars, all other organisms need to get it from plants one way or another.



Fungi. Photo courtesy of Creative Commons

Fungi, in particular mushrooms, are the world's big time disassemblers. Without fungi we would have nothing but dead plants and trees cluttering our landscape. Fungi break down mostly cellulose and

lignin from plants and trees but they are also able to break down long chain carbon and hydrocarbon molecules. In short they are able to break down pesticides and petrochemicals. Yup, you read it right. Some mushrooms are able to detoxify pesticides and break down petrochemicals in oil spills. For those of you that would like to read more on this subject I would recommend the book *Mycelium Running* by Paul Stamets. Now back to the manure pile.



Oyster mushrooms and mycelium. Photo courtesy of Creative Commons

When any organic waste sits, be it manure, wood, straw or whatever, it quickly becomes populated with microorganisms and the breakdown process begins. Mushrooms put out spores (seed) and when they land on suitable organic piles they start to grow strands of thin, white filament called hyphae which in turn, grows into mycelium, the primary body of the mushroom organism. It is this portion of the mushroom that is out of sight, found solely underground. There may be hundreds of miles of mycelial strands in a compost pile. At this point the mushrooms produce many enzymes that break down the organic matter into sugars, peptides, polypeptides, alcohols and other organic compounds. Each mushroom specie produces its own cocktail of enzymes which is unique and favors that particular mushroom. During times of rapid metabolism, mushrooms excrete moisture droplets called guttations which contain many of the organic compounds listed above.

One very important acid that is contained in the guttations is p-coumaric acid. It is responsible for turning on the honey bee's immune system via the cytochrome P-450 pathway and very recently it was found to suppress ovarian enlargement and development in worker bees and is usually found in bee bread. Thus the development of queen bees depends on being fed royal jelly with no p-coumaric acid in it. Who knew??? P-coumaric acid is ubiquitous in nature and found on many flowers as well. (Mao et al, 2015; Mao et al, 2013) Honey bees feed on these guttations and get fungal sugars and important phytonutrients like p-coumaric acid and others. When I give talks on the relationship of honey bees and fungi and why we find them feeding on compost and manure piles, there is always a curmudgeon in the back that yells out, "what does the honey taste like?" Being a curmudgeon myself I yell back, "it tastes like crap". Not really but we are both pleased with our quips. In the next issue of The Bee Line, I will outline how we can beef up our compost piles and establish mushroom beds that can benefit us and our honey bees.

References:

- Mao, W., Schuler, M. A., & Berenbaum, M. R. (2015, August 28). A dietary phytochemical alters caste-associated gene expression in honey bees. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4643792/>
- Mao, W., Schuler, M. A., & Berenbaum, M. R. (2013, May 28). Honey constituents up-regulate detoxification and immunity genes in the western honey bee *Apis mellifera*. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3670375/>



Hyphae. Photo courtesy of Creative Commons

Thank You

Thank you to all who participated in The Bee Line newsletter survey! There were a total of 115 respondents and many of you added additional comments which

were most helpful. Some of the primary areas of interest in terms of topics desired to be addressed included:

- queens and queen rearing
- nucs and splits
- hive management strategies
- a column for beginner beekeepers
- a question and answer section with our master beekeepers
- opportunities for continuing education
- disease management
- mites and mite control

There were several very interesting suggestions, such as providing a link to board meeting minutes, having more current statewide assessments by Jen, reviews of new tools, books, and links to relevant research. Just over half of the respondents indicated they would be interested in viewing The Bee Line online. I will be working to incorporate your feedback and suggestions into The Bee Line content over the next year.

Thank you once again for your feedback! I am most appreciative!

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Sentinel Apiaries In Maine

by Maine Bee Wellness

Sentinel Apiaries are a kind of early warning system for bee health, allowing beekeepers to better manage their bees. A project of The Bee Informed Partnership (BIP), the weight of a single colony in an apiary is tracked and samples from four colonies collected monthly during flight season are examined for varroa infestation and Nosema infection.

According to the BIP website, "The Bee Informed Partnership is a dynamic, interdisciplinary team who is passionate about saving honey bees." In addition to the Sentinel Apiary program, BIP organizes an annual colony loss survey and other programs, including data gathering Tech Transfer Teams. BIP is headed by

Dr. Dennis VanEnglesdorp, speaker at the MSBA Annual Meeting in 2011.

In 2018, The Maine State Beekeepers Association (MSBA) sponsored three Sentinel Apiaries in Maine. Data from sample analysis was published in the MSBA newsletter, The Bee Line. In 2019, there were two unsponsored Sentinel Apiaries in Maine, helping BIP pass the 100-participant mark! This year (2020) Maine Bee Wellness (MEBW) has committed to sponsoring five Maine apiaries in the Sentinel Apiary project! Data will be published on the MEBW web site (mebw.org) and included in national analysis. Find out more for yourself at: <https://beeinformed.org/citizen-science/sentinel-apiaries/>

Why should YOU get involved?

To become a better beekeeper, to find out what is going on in your hives, and to share your data with others so they can see what is happening regionally. And participants typically lose fewer colonies!

What does The Bee Informed Partnership do with your data?

Your data is displayed on the web, and anonymously combined with data from others for further analysis.

What do I need to do to participate?

Send an e-mail to info@mebw.org, indicating your willingness to participate, and that you manage the necessary colonies (4) and that you have the experience to successfully participate.

Why is MEBW involved?

MEBW thinks BIP's program is great and wants more Maine beekeepers involved!

What is "sponsorship"?

BIP fees are paid and \$500 in expenses reimbursed to the selected beekeepers. (\$300 paid when accepted, \$200 paid when testing for the year is completed.) More details are at: <https://www.mebw.org/grants>



COMING SOON February 17 at 7 pm EAS Honey Show Primer

MSBA will be hosting several webinars over the course of this year in an attempt to offer a greater number of educational opportunities. The addition of webinars is very much in the infant stages of its development for MSBA however we are hoping to pilot the first webinar on February 17th at 7 pm. Further communication regarding how to access the link along with instructions will be communicated via email. All webinars will be recorded. If you are unable to attend a specific webinar at the time it is scheduled, you will have the opportunity to view it during a later time at your convenience. This first webinar allows for 100 live participants.

The title of the first webinar is **EAS Honey Show Primer** given by Brutz English. Brutz has been keeping bees for 12 years and has been a licensed commercial honey packer for eight years. He is a University of Georgia Master Beekeeper, an internationally certified honey judge, and the Program Director of the Welsh Honey Judge Training Program at the Young Harris-UGA Beekeeping Institute. The webinar will cover the basics about honey shows, including a little history, their benefits and value to us as beekeepers and a detailed examination of the EAS Honey Show rules and exhibition categories. He will discuss the following subjects in detail: the general rules of most honey shows and things you need to pay attention to early on, the 2020 EAS Honey Show Rules, what the honey show judges are looking for, the tools you are going to need to be competitive and preparing your honey show exhibits. Following the presentation there will be a Q&A session.

Watch for more details!!

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*Membership is per calendar year (**not** pro-rated) and includes a subscription to *The Bee Line*, the MSBA's newsletter. **Current membership is a pre-requisite for attending the MSBA Annual Meeting.**

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