CENTRAL COAST BEEKEEPERS NEWSLETTER

December 2019

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NO MEETING IN DECEMBER

PRESIDENT'S MESSAGE

By Becca Fain

Joyous Holidays and may your New Year bring happiness and health to you and yours – including all your winter bees nestles in their warm clusters!

Hi, my name is Becca Fain and I am the new President of the Central Coast Beekeepers for 2020. As I write this, we are having a bit of a break from the rain and I'm hoping that it will get warm enough to slip in some sugar patties before the rain returns with a vengeance. Hope everyone has had a chance to get their last varroa treatment completed for the year and that all your hives have plenty of stores to get them through until the weather allows them to get out and forage for themselves or that you have utilized some form of feeding to tide them over.

We have put together programs for the first quarter of 2020 and hope that you will join us at the Newport Library for what we believe will be some very interesting and helpful sessions. Our first three sessions will focus on "Preparing for a successful year" and will cover the varroa mite, diseases of the hive and nutrition. Beginning in 2020 our club meetings will consist of two sessions – session one will be from 6-6:45pm and will be led by one of our more experienced club members and will cover the basics of the topic being addressed. We will then take a 15 minute break for refreshments, socializing and consulting before beginning session two which will run from 7-8pmish and will be led by an expert in the field who will expose us to the latest research on the topic and discuss with us how we can incorporate this information into our management practices.

Starting on January 29th (note the change of date from our regular 4th Wednesday schedule to the 5th Wednesday due to a booking conflict with the Library. This is a onetime situation and we will be back to our 4th Wednesday schedule in February.) we will begin with an early session led by Rick Olson a club member and Journey Beekeeper with the Oregon Master Beekeepers Program. Rick will be covering the basics of our arch nemesis, the varroa mite, and will discuss and demonstrate treatment options and how and when to utilize them. This session will be followed by Dr. Ramesh Sagili, Professor-Apiculture from OSU. Dr. Sagili specializes in honeybee research, primarily focused on honeybee health, nutrition and pollination. The session will cover new research regarding varroa and how we can apply this to our hive management process.

On February 26th the meeting will focus on diseases of the hive and how we can detect them. The first session will be covered by one of the club's members who will discuss how and when to do hive inspections, what to look for and how to record the information you find. This will be followed by Carolyn Breece, Senior Faculty Research Assistant at the Honey Bee Lab at OSU, who will cover diseases of the hive, how to detect them and how, if possible, to treat them.

On March 25th the a club member led early session will cover feeding to stimulate brood development, the types of feed available and methods of feeding. This will be followed by Dr. Priyadarshini(Priya) Chakrabarti Basu, Research Associate at the OSU Honey Bee Lab who will share the importance of bee nutrition and recent research findings and how we can apply them.

We have some other ideas brewing regarding future meetings and encourage your input. Some of our thoughts at this point include sessions on swarms/splits and how to catch/make them, pollination and pollinators, enhancing forage for your bees, products of the hive, Tour d'Hive – a tour of 3-4 club members apiaries and/or a trip to the OSU Apiary. If you have any thoughts/ideas about what you would like to see covered at club meetings, please let me know.

I hope to see you all in 2020!

Presidential Change

We’re ahead of the rest of the country. We already have a new President, Becca Fain. We want to thank Jon Sumpter for his dedicated service as President of the club. Becca and Jon are pictured above.

Holiday Party

On November 20 we had our annual holiday party. In addition to loads of food, we each received wonderful bee themed gifts including, honey, beekeeping equipment, cosmetics made from honey and bee-jeweled mugs, earrings and garden decorations. It was a great chance to relax and spend time with our fellow bookkeepers. In addition, we learned about a newly designed queen cage system (see next article).

Brood Breaks with a newly designed Queen Confinement Cage (QCC)

Presentation by Max Kuhn

Our November presenter was Max Kuhn, who, as part of his master's level certification in the Oregon Master Beekeepers Program, has developed a queen confinement caging system. The photo below shows Max explaining his new cage system to two of our members.

One of the reasons queens are caged is to create a brood break to allow for varroa mite treatment. An oxalic acid vapor treatment is harmful to brood, so you want no brood in the hive when you treat. The typical way to create a brood break is to put the queen in a small cage in the hive which prevents her from laying eggs. This creates an unnatural situation for the hive. Max's new system allows the queen to continue laying eggs so the bees continue their normal behavior.

Max's cage consists of two plastic queen excluder sheets, which slide into wooden frames and are attached to a brood frame using rubber bands. The queen is placed in a queencatcher and then placed in the QCC via a hole in the excluder sheet. The brood frame should have openings at the bottom edge to allow the queen access to both sides. You can find Max's presentation materials on the uses of a QCC and instructions on how to build a one at the following two links:
http://lcbaor.org/Supportfiles/QCC_uses.pdf
http://lcbaor.org/Supportfiles/QCC_building_instructions.pdf

Two frames are removed and the QCC is then placed in the hive and left there for 24 days to ensure that all the brood in the rest of the hive has hatched out. (Mark the frames that were removed so that they are returned to the same hive.) After 24 days, the QCC is removed and the queen and the bees can be returned to the hive, or they can be used to start a nuc. Just remember that the QCC is now full of mites and needs to be treated with oxalic acid vapor multiple times until all capped brood have emerged, or frozen (if the bees are removed). The hive now has no brood and can be safely treated with oxalic acid.

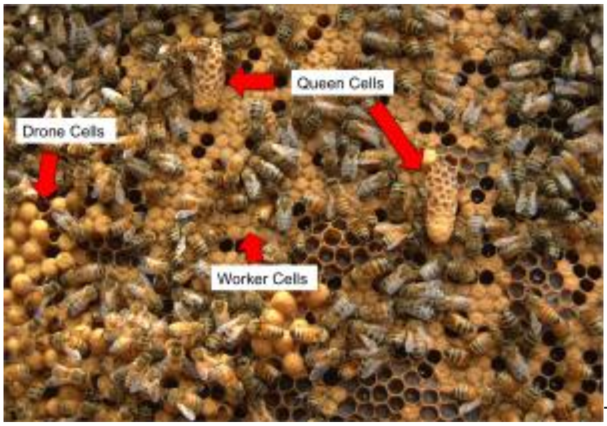
This system appears to have no negative effect on honey production. If you have neighboring beekeepers, you may want to coordinate their mite treatments with yours so that they don't transfer from one hive to another. The QCC can also be used for swarm management and queen grafting. See the next article for more on grafting.

GRAFTING

AUGUST 31, 2011 BY KATIE LEE

FROM BEE INFORMED WEBSITE

https://beeinformed.org/2011/08/31/grafting/



The different types of pupae cells (you can't see the actual pupae because the bees put a wax capping over the developing bee).

Thousands of queens are raised and sold around the country. But how does one get their bees to raise all these extra queens? The secret lies within manipulating the bees own biology (as does most of beekeeping). There are two types of eggs in the colony: unfertilized and fertilized. The unfertilized eggs will become drones and the fertilized eggs will become female bees, either workers or queens. A bee must be born a queen, but there is no difference in genetics. She becomes either a worker or queen depending on how she is raised and what she is fed. Bees destined to become workers develop in the same type of horizontal cells that honey or pollen is stored in. Future queens develop in cells that hang vertically from the comb (see picture). The position and size of the cell gives nurse bees cues of what diet to feed the developing larva, with the future queens getting a higher proportion of a food secreted by the nurse bees we call "royal jelly." Understanding this is the key.


Grafting worker larvae by scooping up a larva and putting it into artificial queen cups.

Since it is the cell that make a queen a queen, and not genetics, we can take advantage of this by removing larvae laid in worker cells and transferring them into queen cells. This process is called "grafting." You can literally scoop up a larva and put it into an artificial queen cell (either made of beeswax or royal jelly) and the bees will raise you a queen. The artificial queen cell cups are made of either beeswax or plastic. Once you have all your larvae grafted, you put them in a colony that “thinks” they are queen-less and the bees will raise your properly grafted larvae into queens.

It gets quite a bit more complicated to actually produce queens to sell (as one of the queens producers says: anyone can raise a queen, but it takes lots of planning and hard work to get 1,000 queens ready on a specific date), but the concepts are the same.

Raising queens is my favorite part of beekeeping.

Grafted queen cells almost ready to emerge.

When honeybees get stuck in water, they create their own waves and 'surf' to safety

RUSSELL MCLENDON

Mother Nature Network

November 26, 2019, 8:17 a.m.

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Honeybees can't fly with water on their wings, but they can generate tiny waves and 'surf' on them. (Photo: Wattlebird/Shutterstock)

Bees need water just like the rest of us. A honeybee might fly several miles to find a good water source, both for drinking and to help regulate the temperature of her hive. Sometimes, though, a thirsty honeybee gets more than she bargained for, and instead of water ending up in the bee, the bee ends up in the water.

That's worse for the bee than it might sound. Honeybees can't swim, and when their wings are wet, they can't fly, either. But as a new study reveals, honeybees do have another, less obvious option to save themselves from drowning: surfing.

This discovery started with a lucky accident. As research engineer Chris Roh was walking through the California Institute of Technology campus, he passed by Caltech's Millikan Pond, which was still because the fountain had been turned off. Roh saw a honeybee stranded in the water, and since it was midday, the sun cast shadows of the bee directly onto the bottom of the pool. What really caught his eye, though, were the shadows of the waves created by the bee's wings.

As the bee buzzed in the water, Roh realized the shadows showed the amplitude of the waves kicked up by its wings, along with the interference pattern created as waves from one wing collided with waves from the other.

"I was very excited to see this behavior," Roh says in a statement about the research, "and so I brought the honeybee back to the lab to take a look at it more closely."

Back in the lab, Roh recreated the conditions he'd seen in Millikan Pond. With his advisor, Caltech aeronautic and bioengineering professor Morteza Gharib, he placed a single bee in a pan of still water, then shone filtered light on it from above, casting shadows on the bottom of the pan. They did this with 33 individual bees, but only for a few minutes at a time, and then gave each bee time to recover afterward.

Making waves

While water prevents a bee from flying by clinging to her wings, that same phenomenon apparently provides another way to escape. It lets the bee drag water with her wings, creating waves that can propel her forward. This wave pattern is symmetrical from left to right, the researchers found, while the water behind the bee develops a strong, large-amplitude wave with an interference pattern. There is no big wave or interference in front of the bee, and that asymmetry nudges her forward with a tiny amount of force, totaling about 20 millionths of a newton.

To put that in perspective, an average-sized apple exerts about one newton of force due to Earth's gravity, which we experience as the apple's weight. The honeybee's waves only generate about 0.00002 of that force, which might sound too weak to be useful, but apparently it's enough to help the insect "surf" to safety.

"The motion of the bee's wings creates a wave that its body is able to ride forward," Gharib says. "It hydrofoils, or surfs, toward safety."

Surfing to survive

Hydrofoiling can't lift a bee out of the water, but it can propel her to the water's edge, where she then climbs to safety. (Photo: Chris Roh and Mory Gharib/Caltech)

Instead of flapping flatly, honeybee wings curve downward as they push into water, then curve upward as they pull back to the surface. The pulling motion generates thrust, the researchers explain, while the pushing motion is a recovery stroke.

The bees also beat their wings more slowly in the water, based on a metric known as "stroke amplitude," which measures how far the wings move while flapping. The stroke amplitude of a honeybee's wings is about 90 to 120 degrees while flying, the researchers note, but in the water it drops to less than 10 degrees. This lets the top of the wing stay dry, while water clings to the underside, pushing the bee forward.

"Water is three orders of magnitude heavier than air, which is why it traps bees," Roh explains. "But that weight is what also makes it useful for propulsion."

Honeybees store water in their honey stomachs and take it back to their hive. (Photo: UrbanRadim/Shutterstock)

There are some limitations to this technique, since the bees apparently can't generate enough force to lift their bodies out of the water. It can propel them forward instead of just flailing in place, though, which might be enough to reach the water's edge, where they can then crawl out and fly away. But the behavior is more tiring for bees than flying, and Roh estimates they can only keep it up for about 10 minutes before wearing out, so the opportunity to escape may be limited.

This behavior has never been documented in other insects, Roh adds, and it might be a unique adaptation in bees. This study focused on honeybees, but future research could investigate whether it's also used by other bee species, or possibly even other winged insects. Anything that helps us better understand bees is likely worth the effort, given the ecological importance of bees and their widespread declines in recent years — a problem plaguing many wild species as well as honeybees.

As engineers, Roh and Gharib also see this discovery as an opportunity for biomimicry, and they've already begun applying it to their robotics research, according to a news release from Caltech. They're developing a small robot that can move on the surface of water like a stranded honeybee, and they envision the technique eventually being used by robots that can fly and swim.