CENTRAL COAST BEEKEEPERS NEWSLETTER

May 2023

NEXT MEETING MAY 24, 2023

General Meeting and Roundtable Discussion at our May 24th Meeting

Join us on Wednesday, May 24, from 1:30-3:30PM at the Newport Public Library.

Now that we have all the officer positions filled, we will be discussing the future of the club and various policies including the timing of Board meetings. As always, there will be plenty of time to discuss beekeeping issues and to answer your questions. I'm sure after this weird weather, there may be lots of questions!

PRESIDENT'S MESSAGE
By Max Kuhn

Greetings fellow bee clubbers!

Just when it seemed it would never happen…it did! We have a club president and vice president. Wow. Who would have thought it? Certainly not I. But stranger things have happened. For those who were not in attendance at the last (April) meeting, let me summarize. I (Max Kuhn) was elected Club President and Jacob Helton was voted in for the Vice President's position. I think most of you are familiar with us both already, but for those who may not know us I will attempt a brief introduction. Jacob is a long-time club member and one of the most helpful, eager to learn, and appreciative people you will ever meet. We are very lucky to have him in this club. And he is young!

I have been a club member since the club's formation. I have participated in club events, mentored a few new beekeepers and served on the board of directors. I look forward to working with Jacob and all the other officers and members of the board as we work through 2023 together. I think it will be an interesting year. I do have some ideas that, if adopted, will change our club dramatically. If you attended the April club meeting, you may have caught a glimpse of my hopes for our club in 2023. I will spare you the details for now, but just know that my wishes are for a stronger, more vibrant club in the future. I can't do this without your agreement and your help. Let's get started! Let's all make an earnest effort to attend the May 2023 club meeting, where more plans for the future of our club will be revealed as we move forward together.

Expect a request for volunteers to help with the bee booth at the Lincoln County Fair June 30th- July 2nd. We will need your help!

See you at the May Meeting.

Bee banks

In many ways honeybees are the engines that make our agricultural food systems run — and they're in trouble. Parasites, pesticides and climate change have contributed to staggering colony losses.

Beekeepers employ many strategies to keep their colonies strong, including "queen banking," a process of maintaining and storing excess queen bees in cages over the summer so they're available to replenish hives that fail.

Researchers at Washington State University have found a more successful and efficient way to manage the bank. By keeping the bees indoors and applying a little refrigeration, they recorded survival rates more than 15% higher than the current ambient-temperature method. The refrigeration also cut down on the amount of non-bee (human) maintenance needed to keep the queens healthy.

This new discovery may prove useful as climate change makes the old methods of queen banking outdoors in increasingly hotter conditions more difficult.

Read the paper in the Journal of Apicultural Research here.

Swarm Cell vs Supersedure Cell – What's the Difference?

Funtastici

Bees are fascinating creatures that have a highly organized social structure in their colonies. Within these colonies, different types of bees perform various tasks that contribute to the overall function and success of the colony.

One of the unique aspects of a bee colony is the creation of different types of cells, including swarm cells and supersedure cells. In this article, we will explore the differences between these two types of cells and their purposes.

What are Swarm Cells?

Swarm cells are a fascinating phenomenon in the world of bees. These specialized cells are created by worker bees when colonies become overpopulated or when a queen is preparing to depart along with a portion of the colony in order to start a new hive. This chapter delves deeper into what swarm cells are, their purpose, and their significance in the life of a bee colony.

Overview of Swarm Cells

Swarm cells are unique cells that are created by worker bees in order to produce queen bees. The workers build these large, elongated cells in which a new queen will develop. The life cycle of a queen bee is remarkable: she emerges from the cell as an adult, mates with drones outside of the colony, and then returns to lay eggs for the rest of her life.

Purpose of Swarm Cells

The primary purpose of swarm cells is to ensure the survival of the bee colony. When a colony becomes too crowded, a portion of the colony will leave with the old queen in order to establish a new hive. The swarm cells allow the newly formed colony to have a new queen, ensuring its survival.

Significance of Swarm Cells

Swarm cells are significant in the overall health and longevity of a bee colony. They provide a way for the colony to expand and flourish, leading to the creation of more honey and more bees. However, the formation of swarm cells can also be a signal of problems within the colony, such as disease or environmental stressors.

How to identify swarm cells in a hive

Swarm cells are different from other cells in the hive. They are larger and hang vertically. They are usually located on the bottom of the frames and look like elongated peanuts or tear drops. Swarm cells are also sometimes called queen cells.

What are Supersedure Cells?

Supersedure cells are specialized cells that are built by worker bees when they perceive that the queen bee is no longer capable of laying enough eggs or producing healthy brood. These cells are typically larger and elongated compared to the regular brood cells found in the hive. Supersedure cells also differ in their placement within the comb.

Location and Design of Supersedure Cells

Unlike swarm cells, which are found on the bottom or edge of a comb, supersedure cells are usually located in the center of the comb. This is because worker bees build them with the purpose of replacing a failing queen. They need to ensure that the new queen will have ample space to move around and lay eggs.

The shape of these cells is also unique. They are elongated and point slightly downwards, allowing the new queen to develop without disturbance from other bees. Unlike swarm cells, which are sterile, supersedure cells contain royal jelly, signaling that they are meant for a new queen.

What Do Supersedure Cells Mean for Your Hive?

If you come across supersedure cells in your hive, it generally means that the current queen is underperforming, and the colony is attempting to replace her. As a beekeeper, this can be a useful sign to look out for.

It's important to note that supersedure cells do not necessarily mean that the colony is in crisis, but rather that the bees are proactively ensuring the health and productivity of the hive.

Differences Between Swarm Cells and Supersedure Cells

Now that we understand the characteristics of each type of cell, it is important to discuss the differences between the two.

The following are some of the key differences between swarm cells and supersedure cells:

- Swarm cells are larger than supersedure cells.
- Swarm cells are typically found on the edges of the comb, while supersedure cells are found in the middle.
- Swarm cells are created when the hive is overcrowded and needs to find a new home, while supersedure cells are created when the existing queen is no longer able to support the hive.
- The process of creating a new queen in swarm cells involves the new queen killing the existing queen, while supersedure cells create a new queen without killing the existing one.

Implications for Beekeepers

Understanding the differences between swarm cells and supersedure cells is important for beekeepers. Knowing when each type of cell is created and why they are created can help beekeepers manage their hives more effectively.

While both types of cells are involved in the reproductive cycle of the hive, they serve different purposes and have distinct characteristics. By understanding these differences, beekeepers can ensure the continued health and productivity of their hives.

How to Manage Swarm and Supersedure Cells in a Hive

How to Prevent Swarming

Swarming can be prevented by:

- Providing Adequate Space

Bees require enough space to prevent congestion in the hive. Ensure that the hive is of the appropriate size to accommodate the colony's growth. Add supers, boxes or frames during the honey flow to accommodate increased brood and honey production capacity.

- Removing Queen Cells Early

Identifying queen cells early can help prevent the bees from swarming. Remove all queen cells except one that's less likely to swarm.

- Performing Regular Inspections

Regular inspections of your hive can assist you in identifying and correcting potential swarming issues before they occur. Inspect your hive every 7-10 days during the swarm season (April- June) to determine if there are queen cells present in the hive.

How to Manage Supersedure

Supersedure cells can be managed by:

- Identifying the Existing Problem

Determining the underlying issue behind supersedure can aid you in solving the problem. This could include a lack of adequate nutrition or the presence of disease.

- Queen Replacement

One of the most straightforward remedies is replacing the queen with a new one.

- Stimulating the Queen to Lay More Eggs

By providing supplemental nutrition, such as pollen patties, you can help the queen lay more eggs. This helps to keep the bee population well-fed, healthy, and happy.

Potential risks and consequences of mismanaging swarm and supersedure cells

Here are some of the potential risks and consequences of mishandling swarm and supersedure cells:

1. Loss of Honey Production: Swarming and supersedure cells lead to a loss of worker bees that would otherwise be gathering nectar and pollen. This can reduce honey production and result in less honey for beekeepers to harvest.

2. Spread of Disease: Introducing new bees to the colony or disturbing the hive during a swarming or supersedure event can spread diseases and parasites between colonies. This can lead to colony collapse disorder, which is a significant threat to bee survival worldwide.

3. Queen Absconding: If a colony's queen is lost or removed during a swarming or supersedure event, the remaining bees may leave the hive in search of a new queen. This is known as absconding, and it can result in the complete loss of a colony.

4. Superseding Weak Queens: Supersedure cells are created when the colony detects a weak queen. If a beekeeper fails to replace the queen or remove the supersedure cells, the colony may become queenless and eventually die off.

5. Aggressive Behavior: Bees can become more aggressive during a swarming or supersedure event. This can result in stinging incidents, which can be dangerous for people and other animals in the area.

Conclusion: It is crucial to understand the difference between swarm cells and supersedure cells when engaging in beekeeping. Swarm cells signify burgeoning populations, and beekeepers are advised to take appropriate steps to manage their colony's growth. Supersedure cells, on the other hand, indicate a decline in performance by the existing queen bee, and beekeepers must exercise care in handling them to prevent any damage to the overall health of the colony. With a little knowledge and care, beekeepers can maintain a healthy and thriving bee colony.

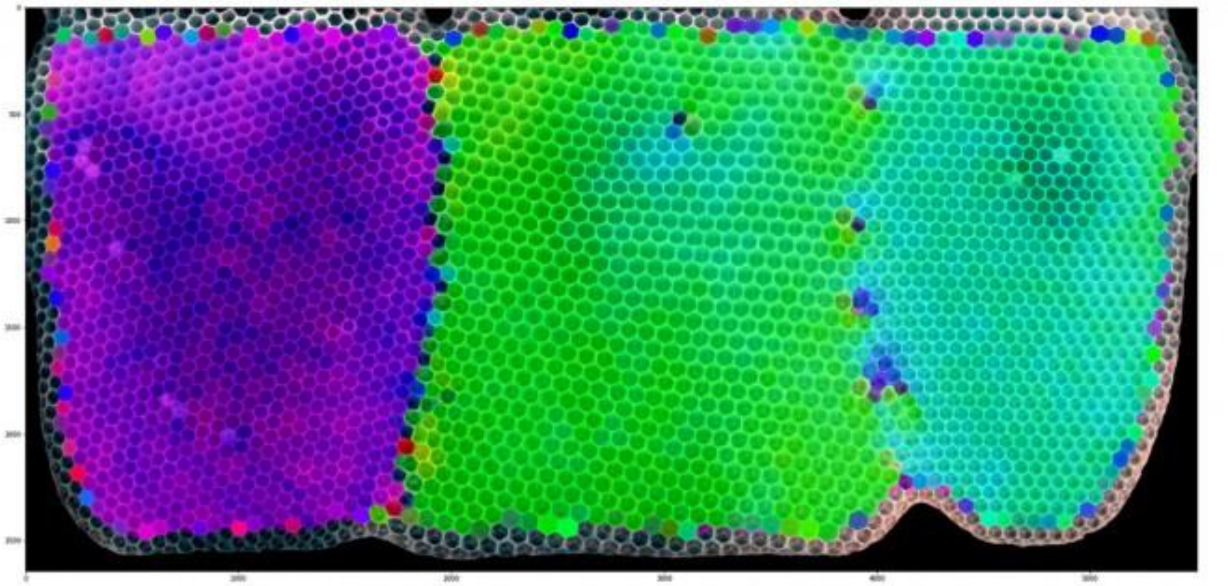
Engineers may learn from bees for optimal honeycomb designs

By Krishna Ramanujan July 26, 2021

Perfect hexagonal structures inspired by honeycombs in bee nests are widely used to build everything from airplane wings, boats, and cars, to skis, snowboards, packaging and acoustic dampening materials.

Challenges arise when space constraints or repairs require engineers to keep a structure mechanically strong when linking together industrial honeycomb panels that each have cells of different sizes. High performance computers used with 3-D printers may solve this problem in the future, but could bees provide a more efficient and adaptable strategy?

A new study finds they can. It turns out that honey bees are skilled architects who plan ahead and create irregular-shaped cells and a variety of angles to bridge together uniform lattices when limited space constrains them.



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Credit: Kirstin Petersen/Nils Napp/Provided

Cells marked with different colors to show their orientations reveal how different patches in the comb are built with a consistent tilt when the bees merge two patches. Note that irregular five- and seven-sided cells are also used along the merge lines.

Special imaging of natural honeycombs and computer modeling revealed that worker bees will change the tilt, size and geometric shapes of cells to meet different building challenges, according to the paper, "Imperfect Comb Construction Reveals the Architectural Abilities of Honey Bees," published July 26, 2021 in the Proceedings of the National Academy of Sciences.

"In this fundamental study, we looked at a naturally evolved system which solves similar challenges in a near-optimal manner," said **Kirstin Petersen**, assistant professor of electrical and computer engineering in the College of Engineering and a co-author of the paper.

"Understanding how evolution can lead to these organisms that have architectural tricks gives us insights into how you can build structures that are multipurpose, strong, and resilient to different environmental perturbations," said first author Michael L. Smith, Ph.D. '17, assistant professor of biological sciences at Auburn University, who began this work while he was at Cornell.

Bees are known to build two types of hexagonal honeycomb cells: small ones for rearing worker bees and larger ones for rearing drones, the male reproductive bees. A challenge – and some forethought – arises when the bees must link lattices made of smaller cells with the larger ones, because the geometries don't allow for a seamless fit. One issue is that bees don't remodel their cells. "Whatever action they take in one place effectively decides what's going to happen later," Petersen said. Also, for honey bees, wax is the most expensive material energetically, Smith said.

"When they build something out of wax, they're being as frugal as possible," said Smith, who is also an affiliate member of the Max Planck Institute of Animal Behavior at the University of Konstanz in Germany.

As a result, the bees employ other shapes – pentagons or heptagons – in order to link together panels of perfectly hexagonal drone and worker cells. Along with building cells of different shapes, the bees also build irregular-sized cells, and sometimes even combine multiple types of irregular cells. The authors refer to these pairs and triplets of irregular cells as "motifs" and show that particular combinations occur more often than expected by chance.

Sometimes the bees will switch from building one type of cell to the other, but they make that change gradually, over multiple cells, which suggests they are thinking ahead, Petersen said.

In the study, Smith set up 12 colonies in the field with frames that lacked the usual wax and wire inside, so the bees could build natural honeycombs without guides. At the end of the season, the researchers took specially lit images and then wrote custom software to automatically identify, sort and measure the vertices, angles, sizes and geometries of thousands of cells. Coauthor **Nils Napp**, assistant professor of electrical and computer engineering in the College of Engineering, developed a theoretical computer model that allowed them to analyze configurations, and test optimal ways cells might fit together in a continuous manner under the space constraints. They used the model to ask, how much better could the bees do? "And it turns out, not that much better," Petersen said.

More than 200 years ago, Swiss entomologist Francoise Huber suggested that bees might use intermediate cells to merge a honeycomb together, but he lacked the modern tools to measure thousands of cells and validate his idea.

“It really required these tools to rigorously show that,” Smith said. “So it’s not surprising that no one has done this before.”

The study was funded by the Simons Foundation, the National Science Foundation, the German Research Foundation, a Packard Fellowship for Science and Engineering, and GETTYLABS.

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Club Info

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