

THE MARIN BEEK NEWS

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What You Missed

Our last meeting featured a presentation by Anne Leonard PhD, Associate Professor in the Biology Department at UNR. Dr. Leonard studies the intersection of animal cognition and pollination biology.

Her talk discussed how do floral shapes reward interactions between bees and plants?

Bee perspective – visiting different flower types.

- Some flowers are great nectar and/or pollen sources.
- Bees have to choose which flowers are valuable to them.

Plant perspective;

- Plants will be similar (same color or shape) but the bee only benefits the plant if the bee lands on a plant of the same species and pollination occurs.
- Pollen from other plants can actually block the receptors of a plant so that pollination doesn't occur.

Studying bees in the lab – she studies bumble bees (mainly because the colonies are smaller). Since the colonies are smaller, you can mark each bee individually.

Bumble bees – you can control feeding much easier than honey bees.

- They use artificial flowers (basically a pot with different colors of paper on top).
- They also use pipe cleaners (like anthers) that they can place pollen on for the bees to collect.

Why have floral signals evolved to be as they are?

- People have been interested in floral signaling for a long time.
 - Von Hess (a German ophthalmologist) was interested in how animals interact with nature. Are they able to see different colors, etc.? He concluded that bees were color blind.
 - Karl von Frisch disagreed “it was easier to believe that a scientist had come to a false

What's the Buzz?

Our next meeting will be on Thursday June 4, 2020. The meeting will be held online, via Zoom, NOT at the Log Cabin. There is no need to register in advance for the meeting. Look for the link on the Buzz. The meeting will feature a presentation by Meredith May. Meredith May is an award-winning journalist and fifth-generation beekeeper.

Her memoir, [THE HONEY BUS](#) (HarperCollins/Park Row Books 2019) reveals the life lessons she learned in her grandfather's Big Sur bee yard that rescued her from a difficult childhood. The book has been published in eighteen countries and translated into eleven languages.

Meredith is a former professor of journalism and [podcasting](#) at Mills College in Oakland, CA. She lives in Carmel Valley where she spends her time writing, beekeeping, and volunteering for the Monterey Bay Aquarium as a scuba diver.

Upcoming Meetings:

July 2020

Marin County Fair - **CANCELLED**

August 2020, TBA

Annual Marin Beekeepers Pot-Luck

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conclusion than that Nature had made an absurd mistake.

Dr Leonard issued what she calls “The von Frisch challenge” to her students:

- Much less of an idea of how vision works than we do today (Germany 1914)
- No material costing more than a dollar
- Demonstrate color vision, win a noble prize

Von Frisch trained bees to visit feeding stations. Would have them visit sugar water on a variety of colored cards. Also, used grey scale cards so that it wasn't just about brightness. Measured how often the bees would visit various colors.

In her lab they only use blue and yellow in their “foraging arena”. They studied whether bees would learn to forage a certain color based on pollen availability. In the experiment, only Yellow “flowers” had pollen, which was the reward.

After allowing the bees to forage several times they removed the pollen from all the flowers. They found that the bees still visited the yellow flowers more often, expecting a pollen reward.

Why do flowers have patterns?

- Patterns might function as nectar guides
- Christian Sprengel first studied this in 1793.

How do flowers function as nutritional resources?

How do we affect these interactions?

- Bees that have used a nectar guide persist in landing on patterned flowers, even when they are unrewarding.
- Nectar guides may sometimes promote pollen transfer at the expense of pollinator's forage efficiency.

What do various flowers taste like to bees?

Is the forager assessing rewards?

Is assessment accurate?

Why offer this amount of nectar and pollen?

Nectar – carbohydrates

Pollen – protein

But there are salts, lipids, amino acids, secondary compounds.

Floral rewards vary in composition

Some plants only offer nectar (hide their pollen away). Others offer only pollen.

Then there are many plants that are in-between.

Conflict

- Bee – plants are a nutritional resource (pollen particularly)
- Plant – pollen is a reproductive resource (loss of pollen to bees cost the plant)

Looking at pollen chemistry

Do foraging bees assess the pollen they collect?

Took commercially available cherry pollen and flavored it with quinine, sucrose, or cellulose.

She then put the pollen on artificial flowers. She measured time spent collecting the three types of pollen. They spent less time collecting pollen with quinine more time collecting pollen with sucrose. Also they collected less of the bitter pollen

Plant pollens vary in protein and lipid content. Current research suggests that bees are aware of this when they collect pollen.

How do bees navigate the floral marketplace for nectar and pollen?

Reward strategies in a community context (nectar vs pollen sources)

How does a plants nutritional neighborhood impact fitness?

Dr. Leonard mapped foraging behavior for bumble bees – finding that neighboring plants can affect the success of pollination.

Bumble bee declines:

- Wide declines in North America and Europe, 1/3rd are threatened.
- Loss of nesting areas (ground nesting bees) – take over other animal burrows.
 - Mulching and hardscape take away habitat.
- Loss of nutritional resources.
 - Lawns and groomed habitat provide less nutritional value
- Parasites and Pathogens.
 - Trypanosome gut parasite.

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Intersection of nutrition and pathogens

Do secondary compounds help bees with parasites? Dr Leonard screened 8 nectar compounds. She found that various compounds can have effect on gut parasites in bumble bees.

Neonicotinoid pesticides in nectar and pollen
Not outright lethal to bees in doses typically used but are finding that they can have serious sub-lethal effects on bees. Studies by chemical companies usually use a simple sugar laced with neonics in their studies.

Dr Leonard did a study using more realistic nectar chemistry to determine how neonics impact bee health.

Preliminary data shows that nectar chemicals can have complex and varied effects on bee health when combined with neonics.

Hive Tips

By Bonnie Morse, [Bonnie Bee & Company](#)

Depending on where you live in the county, conditions can be very different for bees at this time of year.

Our iconic hills are turning / have turned brown. Depending where in the county you live, you may have noticed that the flow is slowing and your bees have finished comb building for the season.

- If your colony is new from this season, keep an eye out for food resources over the next few months. Blackberries are now in bloom, but when they slow down; your bees may need a hand with food resources until the coyote bush starts to bloom in late summer/early fall.
- Overwintered colonies tend to fare better with food resources because they had an opportunity to take advantage of early season nectar / pollen flows. Hives acquired in April or May did not have that same benefit. If you see very little nectar and/or honey, you might consider feeding a 2:1 ratio sugar to water syrup to help them store some carbs.

Another issue to keep an eye on: is your colony queenright?

- Drone laying queens vs laying workers
 - Chances are, a new queen (whether due to supercedure or swarming) will

successfully return from her mating flights, there are a percentage that do not.

- How do you determine whether it's a drone laying queen or laying worker?
- A drone laying queen will tend to have a regular brood pattern (tight, centered in the hive) and single eggs in the center of cells. To correct:
 - Find the drone laying queen and then introducing a frame of brood with eggs/ young larvae so they can make a new queen, OR,
 - Then combining (preferably with newspaper method to slow the combination of the two colonies) with queenright colony
 - In either case – it is imperative that you find and remove (aka kill) the drone laying queen. If not, they will either not make a new queen, or if you combine with a queenright colony, the queens will fight and the queen capable of laying fertilized eggs might not win the battle.
- Laying workers will tend to have more of an irregular brood pattern and you will find multiple eggs – not centered – in cells. To correct:
 - Combine with stronger queenright hive and newspaper method.
 - Shake / brush all bees out 20+ yards from the hive. Return hive / frames to original location. Foragers will return. Laying workers – who have not been outside the hive – will not. Introduce a frame of brood and now bees will create a new queen.

Bee Classes

NOTE:

Field workshops are currently on hold. Classroom sessions to be via Zoom.

Upcoming classes:

Integrated Pest Management (IPM) Class (Saturday, July 11, 9am – 12pm, \$65.

The challenges of managing pests and diseases in your colony can be overwhelming. We will look at the potential risks and benefits of various tools and techniques available to manage common pests and diseases in your colony.

Register through [The Fairfax Backyard Farmer](#)
Class via Zoom

Overwintering Your Bees: Class (Saturday, September 19, 9am – 12:00pm, \$65

Preparing for winter, how to handle common winter problems, how to clean up / store equipment.

Register through [The Fairfax Backyard Farmer](#)
Class via Zoom



Cleaning and Storing Equipment for Winter

Need Equipment Fast?

If you find your growing colony – or recently acquired swarm – or split made to prevent a swarm – is in need of equipment ASAP, we have a source in Marin County for bee equipment! The Fairfax Backyard Farmer is open Wed – Sun. Call in advance and Jim will have your order ready for pickup.

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