The **Research** Buzz

by Hannah Whitehead, Honey Bee Extension Educator, UMass Amherst, **May 2020**

Welcome back to the Research Buzz, a recurring column that summarizes some of the newest and coolest in honey bee research. It's been a challenging spring for everyone. For those of us lucky enough to hunker down at home (and looking for a break from the news) it's a good time tend to your bees and catch up on the latest research. This week, you will learn about a study from Georgia, where researchers tested the impact of apiary design on inter-colony drift. We'll also exlore two recent studies about the value of urban and suburban yards for pollinators, and review research on screened bottom boards and small hive beetles. We will end with an interesting discovery about bee dance dialects. You can also read this column on the UMass Extension website.

1

Visual Complexity in the Apiary Reduces Drift

Photo by UMass Extension

Researchers from UGA tested the impact of apiary arrangement on drift, mites and colony growth. In three "uniform" apiaries, they placed eight white hives 1m apart, at the same height and orientation. In three "complex" apiaries, they arranged eight multi-colored hives face-out in a circle, 10m apart, at different heights. Two colonies in each apiary were inoculated with mites, and all colonies were monitored for two years. **Researchers found that foragers in uniform apiaries were 3x more likely to drift, stored less honey, and had higher overwintering mortality.** They hypothesize that bees in these apiaries may forage less efficiently due to confused signaling. Inoculated hives in uniform apiaries had the highest mite levels; however, hives in uniform apiaries did not have more mites overall than those in complex apiaries.

Why is this research important?

This study builds on past research about apiary design and mite transmission, which found that dispersed colonies (~20-100m apart) harbor fewer mites, foster less bee drift, and die less frequently than clustered colonies (read here and here). However, it can be inconvenient to place hives far apart, especially if black bears are a concern. **This study tested whether hive color, orientation, and height (which can also help bees to correctly identify home), could reduce drift and thereby impact mite transmission and growth.** The researchers did not find fewer mites in visually complex apiaries; however, they did find reduced bee drift (which could reduce disease transmission) and other benefits like improved honey production and better overwintering survival.

Read the full study here.

2

Mow Less to Help Bees

Lawns blanket 50% of US cities and suburbs, but can be sterile habitats for wildlife. In this study, **UMass researchers asked: if lawns are mowed less frequently, do they support more flowers and benefit more bees? In other words, could they become better pollinator habitats?** Researchers collaborated with 16 families in Springfield MA and mowed their lawns every one, two or three weeks for two years. They also recorded the flowers and bees present in each lawn. **Unsurprisingly, flowers were most abundant in 3-week lawns and least abundant in 1-week lawns. Pollinators were most abundant in 2-week lawns**; the researchers suspect that grass may have started to overshadow the flowers when mowed infrequently. Additionally, they found that 2-week lawns were aesthetically pleasing to homeowners, while 3-week lawns looked unkempt.

Why is this research important?

This study suggests that homeowners can improve pollinator resources by simply mowing less (the authors call it the "lazy lawnmower" approach to conservation). If you don't have the time, money or ability to replace your lawn with a pollinator garden, **it turns out you can help bees by simply mowing every two weeks, instead of every week!**

Read the full study here.

Lerman et al. 2018

3

Woody Ornamentals are Best for Bees

A multi-university group recently explored another yard favorite: ornamental plants. Ornamental flowers can be showy but may not be attractive or nutritious to bees. Researchers placed honey bee colonies in commercial nurseries and assessed the floral origin of collected pollen. **They found very little pollen from herbaceous ornamentals, but copious pollen from some ornamental trees, shrubs and woody vines (such as hydrangea, holly, rose, elderberry, lilac and viburnum).** They also found lots of pollen from plants outside the nursery, including trees (maple, beech, oak, willow), woody plants (sumac, holly), weeds (clover, mustards, plantain), and a variety of fall asters.

Why is this research important?

Previous studies have found that a few ornamentals attract pollinators, but most are ignored. This study also found that a handful of ornamental trees shrubs and woody vines (as well as wild trees and weeds) accounted for a disproportionate amount of collected pollen. There are two take-aways from this research: **(1) if you are going to plant ornamentals, woody plants are better for pollinators than showy forbs** and **(2) wild trees, weeds and meadow flowers are important resources for bees, even in managed environments.** Overall, there is a need for more research on the value of ornamental (and wild) plants for bees in urban and suburban habitats.

Read the full study here.

4

Screened Bottom Boards do not Increase Small Hive Beetles

Researchers at the USDA bee lab in Baton Rouge LA tested whether screened bottom boards increase small hive beetle (SHB) invasion. They placed 36 colonies in an apiary that had been devoid of bees (and SHB) for several months. Half of the colonies were installed with screened bottom boards, half with solid bottom boards. They then released lab-reared small hive beetles into the apiary. **They found equal numbers of SHB in screened and solid bottom board hives**, and observed beetles entering through hive entrances, not screens (the beetles are small enough to fit through the screens).

Photo by Marc O. Schafer

Why is this research important?

Previously, screened bottom boards were thought to encourage SHB infestation because attractive colony volatiles can easily pass out of the hive. This study found that screened bottom board hives were not more attractive to SHB. This means that screened bottom boards can be used for *Varroa* control and ventilation without increasing susceptibility to small hive beetles.

Read the full study here.

5

Decoding Dance Dialects

Since Karl Von Frisch discovered honey bee dance language in the 1940s, **researchers have known that different bee species and sub-species have different "dialects".** For all bees, the *angle* of the dance indicates the *direction* to the food source, and the *length* of the dance indicates the *distance* to the food source. However, the distance "translation" varies by species: in one species, a 3cm dance may indicate a 1/4 mile; in another, a 3cm dance may indicate 2 miles. **This variation has vexed researchers**. Is it random divergent evolution? Or is it biologically significant?

Recently, researchers from Germany and India found an answer. They recorded honey bees from three species (*Apis cerana*, *A. florea* and *A. dorsata*) as they danced directions to known feeders. **They found that the distance translation consistantly matched foraging range.** In other words, for species with larger foraging ranges, every cm of dance corresponded to a larger distance on the landscape. The researchers also analyzed data on *A. mellifera* and *A. cerana* sub-species and found that bees adapted to temperate climates, who had to forage further for food, had similarly adapted dialects. **In short, dance dialects are biologically important: they are optimally calibrated to the foraging range of the species or sub-species!**

Read the full study here.

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