

# The Research Buzz

by Hannah Whitehead, Honey Bee Extension Educator, UMass Amherst

Welcome to the first article of **The Research Buzz**, a recurring column where I will summarize some of the newest and coolest in honey bee research. For all studies, I will provide a link to the full research paper so that you can dive deeper. If you can't access the full paper from your home computer, you can usually download it for free at your local library or university. Of course, don't worry if you don't have time to track down academic papers – that's why I'm providing the highlights!

Each Research Buzz will highlight five new studies. **For some of the studies, I will link to a more detailed description on the UMass Extension website.** This first installment brings you some interesting research about Varroa mite biology, locally adapted genetics, the meaning of a "good" brood pattern, and some fun facts about bee behavior during a solar eclipse!

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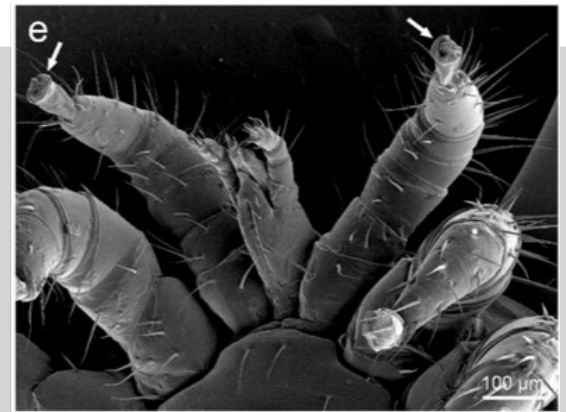
## Re-Thinking *Varroa*

Researchers from the University of Maryland showed that ***Varroa* mites feed on honey bee fat bodies and not hemolymph.** Sam Ramsey spoke about this research at the Mass Bee Fall Conference, so it may not be news to many of you, but this is an EXTREMELY IMPORTANT paper, overturning a 50-year old "fact" and changing the way we think about the relationship between honey bees and *Varroa* mites.

### Why is this research important?

This discovery has huge implications for *Varroa* research and control. Fat body tissue detoxifies harmful compounds, plays a role in bee development, and synthesizes and stores proteins and fats (including antimicrobial compounds and wax precursors). This research explains why *Varroa* infested bees have a lower pesticide tolerance, lowered immune response, lowered ability to store protein and synthesize fat, and earlier foraging. It suggests that it is important to treat for *Varroa* as early as possible to have healthy bees going into winter! This discovery will hopefully pave the way to new *Varroa* control methods.

You can read a more detailed summary on the UMass website [here](#). If you missed Sam's talk, you can watch a short video [here](#). Or you can read the full study [here](#).



Ramsey et al. 2019



## A New Science-Based Guide to Hive Care

The Honey Bee Health coalition recently published a list of Best Management Practices for hive health! It is long, but does a good job summarizing the latest knowledge on honey bee management and is well worth exploring. (TIP: to make this guide more manageable, skip to the sections that you are most interested in – no need to read it from cover to cover!).

You can find the full guide [here](#).



## Comparing Northern and Southern Queens



Hannah Whitehead

A research team from Penn State University compared the performance of queens bred in southern vs. northern regions at three apiaries in a northern climate (central PA). **They found that queen origin did not impact colony weight, population or overwintering success. However, colonies that were heavier and more populous in the fall were more likely to survive the winter.** In fact, *apiary location*, not genetic stock, was most related to hive size, honey stores, and overwintering success. The researchers concluded that floral resources and fall weight/population may be more important for overwintering success than queen origin.

### Why is this research important?

In a previous study from the northern US, **packages that were re-queened with stock from northern queen breeders had better overwintering success compared to colonies left with the original “package” queen** (more info [here](#)). This study is different because it compares northern and southern queens from queen breeders (rather than package producers). **It suggests that, when comparing carefully-selected queens from different regions, floral resources may have a bigger impact than genetic stock.** The researchers point out that larger clusters have an advantage going into winter: they are able to maintain the same temperature as smaller clusters while consuming less honey. Overall, this study underscores the importance of going into winter with a robust population and adequate honey stores.

Read a more detailed description on the UMass Extension site [here](#). Read the full study [here](#).



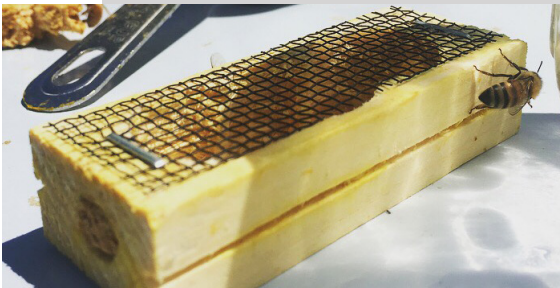
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## Can Brood Pattern Tell us about Queen Quality?

A research team from the University of Minnesota explored the relationship between brood pattern and queen quality. **The researchers found no differences in queen size or sperm quantity/ viability between good-brood and poor-brood hives.** They also found no differences in Nosema, Varroa or virus levels. **However, when choosing colonies, the researchers found it hard to select poor-brood colonies that did not have clinical signs of brood disease. They also found that the number of pesticide residues was higher in poor-brood colonies.** Additionally, the brood pattern of poor-brood queens improved significantly when they were transferred into good-brood colonies, suggesting that environmental conditions might affect brood pattern.

### Why is this research important?

Many beekeepers and queen breeders use brood pattern as a tool for choosing high-quality queens (find more info about brood pattern [here](#)). This study suggests that a poor brood pattern might be more related to environmental factors (like brood diseases and pesticides) than queen failure. The researchers propose other factors (irregular egg-laying, supersedure, low brood production, etc.) that may be more reliable than brood-pattern for diagnosing queen failure. However, certain genetic lines may be more or less susceptible to brood diseases, which do affect brood pattern. In short, more research is needed to understand the complex interactions between genetics and environment.



Bryanna Joyce

Read a more detailed description on the UMass website [here](#).  
Find the full article [here](#).

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## What do Bees do During a Solar Eclipse?

A team of researchers studied bee navigation during the total solar eclipse of August 2017. They found that foraging decreased during the eclipse but did not totally stop. The number of bees returning to the hive increased before the eclipse, and decreased during the totality of the eclipse, suggesting that the bees' homing behavior may be impaired during a total eclipse – and that **bees might treat the eclipse similar to other adverse weather conditions.**

You can find the full article [here](#).



Wikipedia: Luc Vatour

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