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GUILFORD COUNTY BEE KEEPERS ASSOCIATION

CLUB NEWS

OCTOBER, NOVEMBER, DECEMBER, 2004

a local chapter of NORTH CAROLINA STATE BEEKEEPERS ASSOCIATION, INC.

MEETINGS & PROGRAMS:

- **Tuesday, October 12**, 7:00. No meal. Our newest Master Beekeeper, Martha Boren will provide us with a program about preparing honey for show and sale. Time permitting, Kurt Bower will review marketing strategies you may want to consider.
- **Tuesday, November 9**, 6:30. Covered dish meal. Steve Forrest from Brushy Mountain Bee Farm will be with us this evening. Bring your questions about new equipment and treatments and Steve will have an answer for you!
- **Tuesday, December 14, 6:30** This year's Christmas Banquet will take a new approach. We have arranged to meet at Parkwood Baptist Church located at 2107 Penny Road (just off W. Wendover & Hwy. 68). J&S Cafeteria will cater our meal (with BBQ from Carter Brothers). As in previous years, members of GCBA may eat at no charge. Other guests will pay for their meal. The amount will be determined by the menu selected (about $8 - $9.00.

NEEDS YOUR ATTENTION:

• **OLD QUEENS WANTED**: Dr. Olav Rueppell needs old queens for his research at UNCG. If you re-queen this season Olav will pick them up when you give him a call (256-2591). Any added information on the queen (age, race, performance, etc.) will also be helpful.

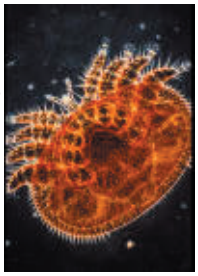
• **Formic Acid Seminar** Saturday October 9, 8:00 a.m. to 12:00 p.m. at the Nature Science Center. Cost is $10.00 per person. You may pre-register by contacting Kurt Bower at gardenapiaries@yahoo.com or 697-2811

• **A Nominating Committee** consisting of James Bennett, Judy Faircloth, and Jack Fleming has been appointed to select a slate of officers for next year. If you have an interest in serving as an officer, please contact one of these members.

• **Web site Help Wanted:** We are in need of individuals who would be interested in helping manage our web site. Specifically looking for someone who might be willing to put together a beginner FAQ section. *We are also interested in knowing about what members might like to see on our web site that would make it more relevant to them and their needs.*

REVIEW:

Question :Does varroa affect winter mortality?
Answer :Yes, and in more ways than you may realize.



If one were to ask how long a bee lives, the typical answer is six weeks: the first three weeks performing in-hive tasks (such as nursing, comb building, and honey processing), and the last three weeks for out-hive tasks (foraging). This textbook answer is misleading in several ways. First, it is clearly referring only to worker bees, and not queens or drones (who live a few years and a few weeks, respectively). Second, there is a lot of variation in worker life span and the tasks they perform. Some bees can start foraging less than a week old and die soon thereafter, while others may never forage and live for 60 days or more.

Third, such an answer refers to the typical life span of bees during the active season. This neglects how long bees can live during the non-active months, which in some regions of the country can last as long as half the year. So-called "winter" bees are reared in the late fall and stay alive in the winter cluster for months, far longer than the life span quoted from the standard textbook.

What's interesting about these long-lived winter bees is that they are not different genetically from their summer-time sisters; that is, a queen lays the same types of eggs sired by the same types of drones during both the summer and late autumn. What is different about the winter bees is that they are different physiologically , so that their internal cellular machinery causes the workers to have markedly different characteristics. These differences are manifested by the interaction with the environment, so that genes are differentially turned on or turned off depending on the bee's surroundings to create these physiololgical differences. In particular, the main stimulus for winter bees to develop is a queenright colony without any brood for their first 3 to 4 weeks of adult life.

If the brood environment has such a profound effect on a winter bee's physiology, then it stands to reason that other major environmental factors may effect this process as well. Most notably, parasitism by the varroa mite might well cause significant changes in how winter bees develop at the end of the summer. It is this effect that a research team lead by Gro Amdam from Norway investigated in a recent study published in the Journal of Economic Entomology .

The researchers created winter bees in the middle of the summer by placing newly emerged workers into broodless colonies. Since their experimental treatment was varroa parasitism, they tagged both parasitized and non-parasitized workers with individual markings and placed them into the broodless colonies to develop as winter bees. Over a period of 30 days, they removed samples of the tagged bees and took samples of their hemolymph, the insect equivalent of blood, with small

glass syringes. They then tested these hemolymph samples for the levels of several physiologically important compounds. First, they measured vitellogenin levels, a protein that serves as the major internal reservoir of protein that workers use to produce brood food. Second, they measured the proportion of normal hemocytes, a qualitative measure of a bee's cellular immune system. Third, they measured ecdysone levels, an important hormone that regulates a bee's general physiology.

What they found was that varroa parasitism does indeed have a significant effect on these physiological characters of induced winter bees. For example, non-infested workers increased their vitellogenin levels by almost 30 to 40-fold as they aged, whereas parasitized workers increased their levels only by 5 to 10-fold. Similarly, they had fewer normal hemocytes and higher ecdysone levels, although these trends were less clear and not consistent. Nonetheless, parasitism appears to play an important role in how winter bees develop and how good they turn out to be.

There are some caveats in this study. First, the winter bees were artificially created and therefore may not be representative of the physiological effects in "real" winter bees. However, it has been shown in previous research that the methods used by the authors are analogous to using actual winter bees. Second, because of limited sample sizes, the analyses did not incorporate the different levels of parasitism among workers in the parasitized group, so it is unclear if the variability in the results are a function of differential infection rates or if there are actual hidden effects.

Regardless, these findings raise some important issues about bee management for varroa. If winter bees that are parasitized by varroa have lower protein titers in their hemolymph, then colonies may not have sufficient protein reservoirs to last them throughout the winter months, particularly when brood rearing begins again the following spring. Thus the indirect effect that varroa has on the development of winter bees may be a major cause for winter mortality experienced by many beekeepers. This can be problematic because many varroa treatments, particularly the chemical treatments, are normally performed after the future winter bees emerge, so the winter bees are reared in high varroa conditions (in fact, among the highest levels a colony experiences, since it occurs at the end of the season). Thus some varroa treatments may be applied too late to address the negative impact that varroa has on winter bees. Clearly additional work is needed to determine the indirect effects that varroa has on colony survival, but this study suggests that the future research should bear in mind the important role that winter bees play in the life cycle of the colony.

Reference: Amdam, G. V., K. Hartfelder, K. Norberg, A. Hagen, and S. W. Omholt. (2004). Altered physiology in worker honey bees (Hymenoptera: Apidae) infested with the mite Varroa destructor (Acari: Varroidae): a factor in colony loss during winter?Journal of Economic Entomology ,97 : 741-747

ARTICLE(S) OF INTEREST:

Down In Smoke by Jim Ovbey & DuRant Warwick

September 2004 Bee Culture Magazine

The writers decided they wanted to try some "home remedies" which would avoid toxic chemicals. They chose to work with smoke from pine straw, cedar shavings from pet bedding, and dried staghorn sumac gathered from areas near their beeyard.

After evaluating their mite presence using a sticky pad under their screened hive bottoms they determined that most of their hives met "the threshold".

In order to be "scientific" they numbered each hive and plotted their location and took another count of the mite drop in each hive over a 24 hour period (no smoke or chemicals, just bees & gravity). Selecting the pine straw (needles) first, they gave each brood chamber 7 slow, long, robust puffs of smoke and quickly closed the inner & outer cover. This produced a mite drop of 70 to a max of 90 mites in 24 hours.

Next, after waiting 3 days & with a new sticky board, the cedar shavings were used in the smoker. Following the same procedure as before, 7 slow, long puffs. The mite count was from 8 to 20 mites in the nine hives used.

After another 3 days, the sumac was tried using the same procedure as the previous two methods. The little berries were more difficult to get burning, requiring shredded newspaper to stoke the fire until the sumac caught up. With another clean sticky board underneath, they waited the 24 hours as before. They were amazed to find the count with a low of 124 to a high of 220. (One heavily infested hive belonging to the partner dropped 394 mites in a 24 hour period.

"This little indicated to us that we could have some effect on the mite population by utilizing particular smoker fuels, and that sumac appeared to have the most significant effect with regard to the fuels we were using."

Staghorn sumac is prevalent in North Carolina. Harvest mature heads and let them dry. The authors also stated that one does not need to use the sumac as a primary fuel suggesting it be used once every third or fourth visit to the bee yard which will keep the mites in check.

Like to join Guilford County Beekeepers Association?

Meetings are held on the 2nd Tuesday of each month. (Odd months @ 6:30 p.m. with a covered dish meal, even months @ 7:00 p.m.)
Just come to our next meeting at the Guilford County Agricultural Center and join in. Dues are $25.00 per year (that's $10.00 for GCBA and $15.00 for expanded membership in the North Carolina State Beekeepers Association).

- Don Hopkins, State Inspector: (336) 376-8250
- Guilford County Beekeepers Association web site http://www.guilfordbeekeepers.org
- North Carolina State Beekeepers Association web site http://www.ncbeekeepers.org

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