The Nevada County Beekeepers Association

Local Buzz

April 2007

President's Message

Dear Fellow Beekeepers,

Here we at the end of March and the weather couldn't be better for the bees. We have successfully transferred our bees from almonds to prunes. The colonies were very heavy and full of bees. From talking to the growers, it appears that they will get a bumper almond crop this year due to the weather improving towards the end of pollination.

This is an exciting time of year for all of us. The colonies are expanding at a rapid rate and the prospects of splitting colonies to increase our operation are exciting. We have been buying equipment over the last several months in preparation for the next couple of months. Swarm season is just around the corner so those of you that are interested in obtaining swarms need to get placed on the swarm removal list so that you are notified when the swarms are available.

As it stands now I will be at the next meeting on April 2nd. Due to my "real job" I had been out of town on business during the last few meetings and was sorry to have missed all the information that was presented. I look forward to seeing you all at the next meeting. Until then, Happy Beekeeping!

Your President, Shane Mathias

Snack Sign Up

Thanks to Deborah Morawski for volunteering to bring goodies in April. We could use a second set of goodies also, so if you feel like bringing some, please do!

April 2nd Program

The April 2nd NCBA meeting program will feature a video and discussion on the africanized honeybee.

March Minutes

Randy Oliver opened the meeting, introducing Dr. Larry Conner, publisher of 'Increase Essentials'.

Member discussions: Powdered sugar vs. Varroa--weekly dusting March thru May--two cups spread on top frames with bee brush, until some reaches bottom. Below 41°F, bees won't break cluster, may starve. Apply granulated sugar or syrup, then the cluster will move to the stored honey. If your veil has a wire screen, spray paint the outside white and the inside black for better visibility. Drone removal is critical in summer--treat before August 15 for winter strength. During mating season, the drone concentration area, 50 ft above ground, is visited by new queens from 1 to 2 miles around. The queen mates with a dozen or more drones over 1 to 2 days.

PROGRAM Dr. Larry Conner: Increases by swarms, packages and splits may introduce African genes. Favors using 5-frame nucs; two frames new foundation, two frames used comb, one frame honey from strong colony; queen stays. Shake brood bees from old box, add new queen. A month later, move them to a full size box.

Jack Meeks, sec

Bee Bits

(Note: the local Bee Bits column by Randy Oliver will return in subsequent issues. This month Randy submitted the following preview of one of his upcoming articles in the ABJ. The referenced figures are not included.)

Tactics: Biotechnical Methods II
The one-two punch
Sixth in a series on Integrated Pest Management of varroa By Randy Oliver

Introduction

None of the biotechnical methods that I detailed last month will control varroa alone. Now it's time to give you some real meat! Either of the two methods I'm about to describe have been tested and proven to keep varroa at tolerable levels if performed properly. Used together, they may be a nonchemical one-two punch that will give us the upper hand on the mite.

A note to those commercial beekeepers who are saying "Jeez, this guy is totally whacked out! I'm already maxed out for time, and can't be putting special labor-intensive gizmos into my hives—that's for hobbyists. Plus, I can't take a chance on trusting my mortgage on some untested mite control method."

In answer, my 21-year old California son would say "I feel you, man." I've got two groups of beekeeping friends—hobbyists who are willing to test new things, and commercial guys who run very efficient operations by rotating a series of ag chems. What I've been seeing the past few years, is hobbyist/sideliners maintaining strong colonies without any synthetic miticides. I was skeptical as hell at first, but they've demonstrated the feasibility. As with any historical change in an industry, the majority say "It can't be done, we can't afford it, it won't work in reality." Then, several years later, they look back and see that it *was* done, the industry *could* afford it, and it *did* work in reality."

Drone Brood Management and Trap Combs

The varroa mite reproduces rather poorly in worker brood, but has much greater success in drone brood, by a factor of nearly three to one. It's not surprising then, that female mites prefer drone brood by a factor of roughly 10 to 1 (reported figures range from 4-12:1). The mites, being tiny and blind, apparently recognize nurse bees by odor (Dillier 2004), and ride around on them until they smell a drone larva of the right age. Since nurse bees spend much more time feeding drone larvae than worker larvae (Caldrone & Kuenen 2003), the mites have ample opportunity to come into contact with drone larvae.

A feral colony of bees builds about 17% drone comb, and produces 5-15% drones (Seely 2002). The stimulus to build drone combs is good forage (at any time of the year), with a negative feedback from drone brood already existing (Charriere, et al. 2003). Beekeepers, by using worker-sized foundation, can typically keep drone cells down to about 4% if they regularly cull old combs. However, colonies will normally produce temporary drone cells in the space between the brood chambers in spring. Indeed, a quick inspection of the exposed drone brood when you break the brood chambers apart can give you an indication of varroa infestation level.

The beekeeper practicing varroa IPM can minimize varroa reproduction by managing the drone comb in his colonies. It is especially important since hygienic bees remove only infested worker pupae, not drone pupae. I've already mentioned the importance of culling old combs with drone cells. Wilkinson and Smith (2000, 2001) modeled the effects of drone brood management. They state: "At 5% drone brood, as many mites are emerging from 50-60 drone cells as from 1000 worker cells. This certainly emphasizes the importance of drone brood in mite population growth, and the need for beekeepers to prevent large quantities of drone brood being reared unnecessarily and being left to emerge in the hive." They suggest "regular and ruthless 'culling' of the old combs and the badly built combs."

Their model predicted that reducing drone brood from 4% to 3.2% would reduce the mite population growth rate by 25%! They suggest that drone brood is more important to mite growth at low mite levels, since drone brood capacity for mites reaches its limit before that of worker brood.

Clearly, the beekeeper should cull frames containing drone comb. However, we can go even a step further, and use drone comb to "trap" mites, and then remove those mites from the colony. This process is called "drone comb trapping," and is widely used with great success in other parts of the world. The concept is simple: insert a frame of drone comb into a colony at the edge of the brood nest, allow the queen to fill it with drone eggs, wait while the mites infest the cells, then remove the frame before the mites emerge.

Theoretically (Wilkinson & Smith 2002), trapping with one deep drone frame once a month for four months will delay the mite population from reaching a damaging level for 2-4 months; two frames monthly will delay it

for a year.

So, you ask, theory is fine, but how effective is drone trapping in real life beeyards? The short answer is, surprisingly effective! Dr. Nick Calderone has an excellent guide at http://www.masterbeekeeper.org/pdf/dronecomb_exchange.pdf. In his study (Calderone 2005), two combs were replaced monthly from June through September. Mite levels were kept about 2.5% (ranging from 0-7%)—up to 10 times less than control colonies! The drone-trapped colonies also made more honey!

In Europe, Charriere, et al. (2003) report that drone trapping has no negative effect on the development of the colony and honey production. In their tests, which used the equivalent of one drone frame per colony, removed regularly, they found varroa buildup was suppressed enough that only a fall treatment with a natural chemical was required.

Drone trap combs clearly work, but are they practicable? For the hobbyist, the green plastic drone combs (Figure 1) available from several bee catalogs are great. You put them in, wait **exactly four weeks** (a few days until the queen can lay, then 24 days for the drone development period) and remove them. The brood and mites can be killed by removal with a cappings fork, scraping, freezing, heating, or treating with formic acid. The combs are then replaced for another cycle. Reusing drone comb may have an added benefit, that it may be more attractive to mites. In an experiment where old combs were placed side by side with new combs in colonies of Brazilian AHBs, Piccirillo and DeJong (2004) found that cells of old combs were four to five times more attractive to varroa than same-sized cells on new combs. The authors concluded that "it is clear that these mites strongly preferred old worker brood comb cells to new worker brood cells." Drone cells were not tested, but this avenue calls for further study.

One doesn't need to purchase plastic trap combs. A medium frame, a deep frame with a section of comb cut out, or even a foundationless frame, will allow bees to produce volunteer drone comb, which can be cut out and discarded (or melted for the wax).

For the commercial beekeeper, it's obvious that an extra piece of equipment, or the concept of freezing combs is impractical. Also, reaching down to remove broken off pieces of drone comb build on the bottom of frames would be too time consuming. To address those issues, I designed and tested a dedicated trap comb that can remain in the hive all year. I knew that the bees would store honey at the top of a comb, so I made a provision for that. I also wanted a wooden rim all around the drone brood so that I could quickly cut the comb out with a hive tool in the field.

See Figure 2 for the design. I simply take ordinary deep frames, and an extra top bar. I cut the ends off the top bar and install it upside down, slid onto a piece of plastic worker foundation ripped down to 2½" (Permadent fits in the grooves better than deep cell). There is a little over 2" of foundation remaining exposed at the top of the frame. This design works great! We tested 300 of them last year. Virtually every colony builds them out as illustrated—honey in the top, drone brood below (do not increase the 2" foundation dimension, or some colonies will produce worker brood above. We may wish to even decrease this dimension—let me know if you try).

Here are the advantages of this design:

1. It takes only about 15 seconds per colony to open the lid, remove the comb, cut out the drone comb with your hive tool, replace the frame, and close the lid. It's so fast that we don't even close the door to the truck when we get to a yard! No freezing or extra work is required.
2. Since the combs returned to the same hive, there is no spread of disease from colony to colony.
3. When you are done with drone trapping for the season, move the comb to the outside of the cluster to produce comb honey for sale or winter stores (Figure).

We found that colonies with drone trap frames tended not to produce drone comb between the boxes. This observation is supported by Seeley (2002), who found that colonies with added drone comb build 7½ times less volunteer drone cells as those provided with 20% drone comb. So by adding drone comb, you actually remove the incentive for the bees to produce drone cells elsewhere in the colonies. In effect, drone trap frames allow you to *manage* drone production in your operation. Indeed, in our queen rearing operation, by removing the unwanted drones from poor queens, and by leaving extra drone combs in our drone mother colonies, we produce an excess of genetically superior drones for mating, while suppressing the population of genetically undesirable drones. Since we breed for mite tolerance, our drone mothers have fewer mites to start with, and the extra drone comb is less of an issue for mite buildup.

You may ask whether it is worthwhile to extract the wax from the cut out drone comb. We boiled 200 cutouts, and produced 10 lbs. of wax (Fig.). It wasn't worth our labor, so we now just feed some drone brood to the chickens, and compost the rest for the garden. If you had a better means of extracting the wax, you might be able to reclaim it. Or, you might find a market for it as livestock or pet feed, or sell it in Asian markets as a delicacy!

As I mentioned in the previous installment, using these combs in conduction with queen restriction can nearly completely eliminate varroa from a colony (Calis, et al. 1999).
Zachary Huang is developing the Mitezapper—a drone trap frame with heating wires in the foundation. Once a month, the beekeeper would hook up wires to a car battery for a few minutes to kill the mites with heat. The colony would not even need to be opened!
Hoopingarner (2001) does raise one potential objection to trapping with drone brood: "it exerts constant selection against the mites that prefer drone brood. This is not in the long-term best interest of a varroa reduction program" because, it defacto selects for mites that prefer worker brood. However, upon further analysis, Charriere (2003) states "The often expressed fear that removal of drone brood will select for a population of varroa that prefer worker brood does not seem to be justified. We should remember that the removal of drone brood occurs only during a short period, and for the rest of the year the mites are obliged to breed in worker cells." Indeed, if we breed for varroa sensitive hygiene, the mites don't stand a chance in worker brood.

Bottom Line

Drone brood trapping works great, and can be done very quickly and cheaply. It doesn't decrease honey production, and keeps the bees from building volunteer drone cells elsewhere. It may keep mites below economic injury levels alone, but will likely require supplemental treatments.
Points to remember:

1. A full comb removed monthly will generally keep mite levels below threshold.
2. Two full combs would be even better.
3. Two combs, alternately removed every other week, would likely be best.
4. Do not forget to remove the combs at 4 weeks, or you'll be breeding mites!

Recommendations

I'm not suggesting that you commercial operators forswear all miticides. That would be unrealistic for me, and foolhardy for you. I'm just suggesting that you start to ease in a few trials of alternative mite management methods.

Sacramento Beekeeping Supplies

- Complete line of all beekeeping supplies
- Candle making supplies (molds, wicks, dyes, scents)
- Glycerin soap making supplies (soap base, molds, scents, and dyes)
- Honeycomb sheets for rolling candles (50 colors and in smooth)
- Beeswax and paraffin, special container candle wax
- Gifts, books, ready made candles

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Colony Collapse Disorder

An informative article, submitted by Barton Ruud, entitled "Are GM Crops Killing Bees?", by Gunther Latsch from the German publication 'Der Spiegel' Thursday 22 March 2007 is available on the web at:

http://www.spiegel.de/international/spiegel/0,1518,grossbild-747943-473166,00.html

The article talks about how German beekeepers have been experiencing losses similar to U.S. beekeepers, and expands on the potential effects on agriculture. Albert Einstein is quoted as having said "If the bee disappeared off the surface of the globe then man would only have four years of life left. No more bees, no more pollination, no more plants, no more animals, no more man."
The work of various researchers is cited in an attempt to explain the phenomenon. One researcher states that the

collapsing colonies do not exhibit symptoms of any known diseases, which is especially confounding because existing research cannot be used to help troubleshoot the problem. The few bees that remain in some collapsed colonies carry one or more viruses, and sometimes fungi, which indicates that the bees' immune systems aren't working. The fact that the collapsed colonies are not robbed out by other honey bees or invaded by other parasites indicates that there is something in the hive repelling or toxic to them. The main gist of the article is to suggest that genetically modified organisms (GMs) may be the culprit. The problem seems to be more prevalent in the U.S. where, for example, 40 % of the cornfields grow GM corn. A small study at the University of Jena looked at the effects of pollen from GM Bt corn, which has had a gene inserted that makes it toxic to pests. The study concluded that the Bt corn had no effect on healthy bees, but bees infected with parasite(s) and exposed to Bt corn showed a "significantly stronger decline", indicating that CCD may result from a combination of effects.

2007 Membership Dues Due!

Janet will still be collecting 2007 membership dues at the April meeting. Dues are a bargain at $12.50, or $10.50 if you receive your newsletter electronically. If you are paying in cash, please try to bring the exact change. Or mail dues (make check out to Nevada County Beekeepers Association) to her at:

NCBA c/o Janet Brisson
20693 Dog Bar Road
Grass Valley, CA 95949

Questions? Call Janet at 913-2724 or email rubes@countryrubes.com

On The Road Again

By Janet Brisson

The March 10th, Santa Rosa Beekeeping Symposium was a gathering of over 150 environmentally seeking beekeepers put on by Beekind Supplies. The all day event featured four speakers; Randy Oliver, Eric Mussen, Pricilla Coe, and Apitherapist Serge Labesque, Innovator of the year (2006).

Eric touched on subjects like nutrition (not all pollen is suitable as bee food) and how many pollinators are disappearing, not just bees, due to stress, pesticides and predators like the Invasive Paper Wasp, a yellow jacket type insect that feeds heavily on caterpillars.

There were various hives set up for viewing, Langstroths with extra features such as shaded entry ways, top bar hives that encourages bees to build comb in a more natural way that supports small cell development and a giant mud & cow dung straw skep from Germany.

The Nevada County Beekeepers Association is dedicated to apiculture education and promotion of the art and science of beekeeping among beekeepers, agriculturists, and the general public. This is a "not for profit" organization.
Meetings are held the first Monday of each month at 7 PM at the Grass Valley Veteran's Memorial Building at 255 South Auburn Street in Grass Valley. All visitors are welcome. The newsletter is published monthly as a service to the membership. Articles, recipes, commentary, and news items are welcomed and encouraged. Submission by email is encouraged. Please submit to Leslie Gault at lesliegault@yahoo.com . The deadline for the May 2007 edition is April 24th . A limited amount of advertising space (business card size 3" by 2") is accepted and need not be bee-related. Rates are $1 per issue or $7 per year for NCBA members and $16 per year for non-members. All revenue from advertising goes to the Association treasury and helps offset the cost of producing and distributing this newsletter. To receive the *Local Buzz* via email: please email your request to lesliegault@yahoo.com

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