

The Traveling Beekeeper



A CALL TO ACTION FOR ALL BEE CLUBS: TIME FOR RESISTANT BEES

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In the last issue I described some of my visit to California. From there I met with folks in Challis, Idaho about getting started with bees. My brother Jim has lived in Idaho for decades and he arranged a few folks to get together and talk bees. It is an interesting contrast to go from a highly organized beekeeping area like San Francisco to one with just one professional beekeeper with permanent locations and no local beekeepers' organization. The rest of the folks at the meeting are interested in bees because they are involved in a local farmer's market. Human population density certainly makes a difference.

It is time to issue a challenge to bee clubs everywhere. Now is the time to develop a program to convert the entire county or club service area of the organization into a zone where only varroa-resistant queen bees are installed in hives. This may seem to be downright militant or socialist or way too nosy, but there are strong reasons why the local bee clubs in North America (and elsewhere, for that matter), may be the best organizations to develop programs that promote resistant stock.

Why this? Why now? Simply put: We need to work together on varroa resistance. Bluntly put: We are stupid if we don't convert our colonies to mite-resistant stocks, and we could have done this years ago.

So, let me argue my case:

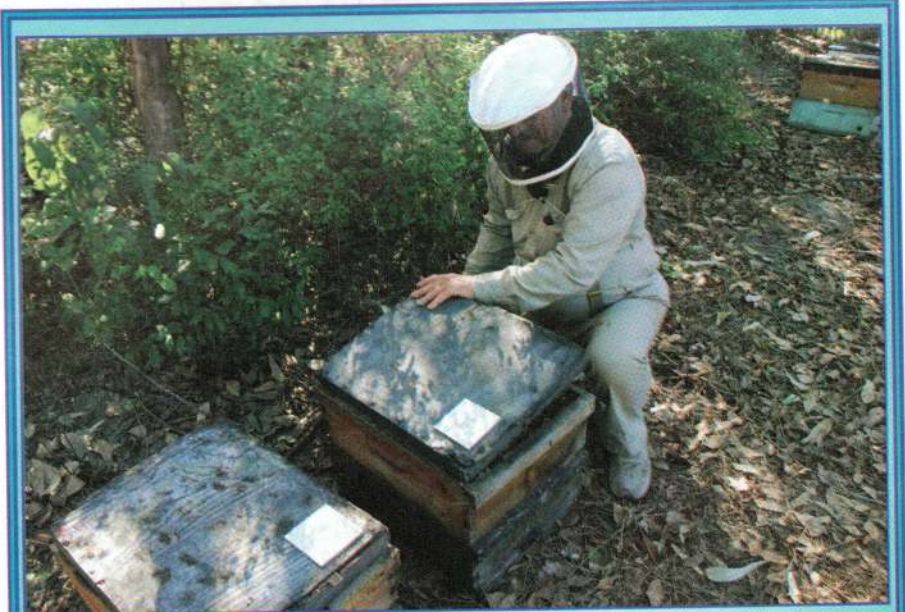
First, we have abundant supplies of tested, some well researched, and quality bee stocks that carry genes for varroa resistance. The USDA has developed two quality stocks: The Russian lines and the VSH lines, both from the Baton Rouge ARS Bee Lab, under the leadership of Dr. Tom Rinderer. I have known Tom since his grad school days at The Ohio State, and I also know he takes a lot of heat for bringing these stocks to the industry (most of the heat is because the bees are not Italian-type bees and are differ-

ent. Beekeepers don't like different.)

Then there are stocks from various university-related programs like the Minnesota Hygienic stock. When we add up all different bee breeding programs around North America, we probably have several dozen tested lines we can select from and have some degree of resistance (or tolerance) to varroa mite infestation.

Second, these stocks have had different methods of development, so there are undoubtedly different genes being selected that contribute to resistance. Some of the factors we know are:

1. Hygienic removal of mite-infested pupae from sealed cells;
2. Increased grooming behavior;
3. Physiological inhibition of mite develop-



Groveland, Florida queen producer Dave Miks opens a breeder colony in the family operation. Why is this important? Because Dave produces queen cells, he sells to Scott Barnes, a local professional beekeeper based near my home in Michigan. His operation is a model for what Sunbelt and Northern beekeepers should consider for queen and cell production using known, tested and proven mite-resistant stocks. Any saturation breeding program will require cooperation of all beekeepers: queen cell producers, commercial and small-scale beekeepers alike!

ment on the pupae.

There are undoubtedly many more genes that control behaviors of bees that reduce the mite load on a colony of bees. I have heard estimates that there are at least thirty different genetic mechanisms bees can use to control varroa mites. If that is the case, we want different bee breeding programs in place and working at full production.

Third, these lines may behave differently than the bees we have been getting and hate to give up. Well, deal with it! Once the colonies are established in an area, some fine-tuning WILL be required to develop localized stocks that are better adapted to the area and will provide all beekeepers with manageable productive colonies. This localized selection is inevitable, since colonies that are not fit for your climate will die out and leave just those that carry resistance AND have traits that are successful in your region.

Fourth, bee clubs are in an ideal position to influence the beekeeper's thinking and behavior. Beekeepers are strongly influenced by peer pressure, direct or indirect. One of the interesting observations I have made in my travels is how trendy different clubs are in their equipment, management practices and bee stocks. If a well-spoken leader of the bee club recommends something, the group often follows that line of thinking, regardless of how well it works. Often the new, inexperienced beekeeper thinks it is something they are doing wrong when the equipment or management technique or queen source fails to perform as marketed. This is a dominant factor in small-scale beekeeper clubs. "How can I argue with the leadership of the club?"

Fifth. So we need to steer the group's thinking toward a club-wide program to introduce resistance. How does a club do that? It is really pretty simple (but certainly not apolitical). Each club should have a stated policy that *all queens brought into the club's territory be of known varroa-resistant stock, or propagated from such a stock within the area*. The potential conflict with this, in some clubs at least, will be with the local package bee suppliers who brings packages in from Sunbelt states without proven resistant stock in those colonies.

Setting my issues with package bees aside, the key here is to find those package suppliers who are also producing known resistant queens. AND mating them in their mating yards with known resistant (and unrelated) drones! It is not adequate just to graft from resistant grafting mothers, but essential that the drones that the queens mate with be from selected stock as well.

If the market shifts to resistant queens, mated to resistant drones, the successful queen and package bee producers will quickly move to producing packages with these traits. But if the market does not make these demands (with the ability to provide research data, showing test results for mite levels), then the package producer can continue to ignore the issue and go back to business as in the past.



The powdered sugar technique is widely used as a mite-control method, at least in Integrated Pest Management plans. Using this method in an area-wide saturation program is one way to see how well the plan is working. The fewer the mites, the better the program results.

The club does not need to select the breeder stock, in fact, I hope they recommend a diversity of resistant stocks so the area is flooded with different genes contributing to resistance.

Sixth, the professional, commercial and semi-professional beekeepers are part of the solution, and are not necessarily the problem. In the summer I had a great conversation with Scott Barnes of Schoolcraft, MI, a local commercial beekeeper who does a lot of pollination in the region. What he said to me was that "we want resistance, we don't want to use chemicals. Any good commercial beekeeper is interested in reducing the chemical load going into their hives."

Every club needs to invite their professional beekeeper members to the table to discuss the various methods and options they can use to develop area-wide resistance. That way we know that only resistant queens are in the area. If Scott, for example, brought in 500 colonies to our county for pollination, and if all 500 colonies were started in North Florida (outside the African bee zone) with mite-resistant queen cells from Dave Miksa (Groveland, FL), and mated to resistant drones produced the same way the previous year, then these queens and these drones will make a huge positive contribution to the development of resistance in the area.

Everyone benefits. Larger beekeepers have the confidence that supersedure queens have a higher percentage of resistant drones in the queen assembly areas available for mating. Smaller beekeepers do not need to avoid the professional beekeeper locations, but can be a mile away or two and be assured that the majority of drones in the area carry resistance of some sort.

Seventh, we can expand the entire area of drone management so that we control the entire area with only desired mite-resistant drones. Okay, we have to deal with the non-managed population of colonies in the area. At first they will issue drones that do not carry resistance, but as time passes and these colonies undergo supersedure and swarming, the queens they produce will mate to resistant drones, and eventually the area will become remarkable for the level of resistance it carries.

Now, let's talk a little bee biology. For realistic purposes, consider this: queens and drones will fly up to six miles to mate on a regular basis. Six miles is a huge geographical area. Last month I mentioned that the city of San Francisco is an area roughly seven miles wide by seven miles long. That means that the drones and queens can cover most of that city in order to mate, assuming the fog lifts for them to fly.

Apply that to a county bee club, and you have to draw a line six miles all around the county to get the kind of saturation of genetic stock that you want. So the club not only needs to educate the beekeepers in the county, but along the borders as well. It is a huge challenge.

How do you do this? Here is a suggested plan.

During the first year it would be useful to declare one area of the county or region as a 'varroa resistant zone'. Take a six by six mile square and publish the region on the website and send this to local media. Make sure every known beekeeper receives a copy and instructions on what the club is trying to do, and what the beekeeper is expected to do. Offer free queens, if necessary.

In the second year, expand to the entire

county, or the region the club represents. This could be an enormous piece of real estate (the county my brother lives in in Idaho is larger than several eastern states, but with far fewer beekeepers). I expect this may take several years to accomplish.

Here in Michigan, I want to convince the Kalamazoo Bee Club, the Center of Michigan Beekeepers Association (meeting in East Lansing) and the Southeastern Michigan Beekeepers Association (meeting between Ann Arbor and Detroit), to establish areas of resistance-only stock supplemented with drone saturation programs. Once these three clubs have established the programs, then the territory can spread, ultimately covering the entire southern part of the Lower Peninsula, including a major portion of the fruit-producing region along Lake Michigan.

Peer pressure and the copy-cat nature of beekeepers will help supplement this program, and will potentially develop a big part of the state that is mite resistant. Then, working with our beekeeper brothers and sisters in Indiana and Ohio, we can expand this region across state lines, so bees from Toledo or Fort Wayne will also be 'on the program.'

The benefits to the local small-scale and the large stationary and migratory professional beekeepers would be considerable. If the need for medications is put on the shelf for emergency use only, and the number of colonies lost each year drops from 30 to 90 percent to an average of 10 percent (the levels of pre-mite losses), there would be greater stability in the beekeeping community, fewer dollars spent on queen replacement, but more dollars spent on selected resistant stocks and breeder queens. New beekeepers would have a higher success rate with their first-year colonies, and the bee clubs would develop a more stable membership/participation.

The small-scale beekeepers within these areas will find a market for resistant queens, producing a few dozen a season to many hundreds. These queens will be used for summer increase colonies and late summer requeening. This will reduce the demand for Sunbelt queens. If these queens are carefully selected for their mite resistance, the smaller queen producers can fill a market niche with locally adapted stock that will serve local needs.

This past season I have obtained a number of queens from beekeepers working with the Purdue program run by Dr. Greg Hunt and university beekeeper Krispn Given. These are bees selected for mite resistance, but not necessarily based on hygienic traits. Since these queens were daughters that were open-mated to surrounding drones, there was a great deal of variation in the mite resistance. My students found a range of mite drops when they used powdered sugar as a treatment and sampling test (they are students, so they are expected to learn). One colony may have had only 4 mites ave. per dusting, while several had 40 or more. All I am saying is that these bees have not ob-



Poor drone pupa, with at least three (and probably more) female varroa mites feeding on his body. Area-wide selection programs should eliminate this. Period.

tained resistance (I would have been pleased if they had, but did not expect this), but these queens are one step closer to where we want to be in a few years. There was considerable chalkbrood in the colonies with higher mite counts, so the bees were clearly not hygienic.

A club or area-wide beekeeper driven program, independent of government and corporate domination, would produce a market-driven approach to varroa mite control. The time for bee clubs to set this up is now, this fall and winter, and plan an educational program to present to beekeepers before they order packages and queens for 2010.

If we had done this ten years ago, we would be done now.

Hear Dr. Connor, Dave Mendes and Randy Oliver discuss these topics at the Southern New England Beekeepers Assembly in Hamden, CT on November 21. Register on line using PayPal at www.wicwas.com. Connor's new book, *Queen Rearing Essentials*, is now being reviewed and is scheduled for release in early 2010.

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