The Traveling Beekeeper

National Goal: All Resistant, All the Time

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Teaching three-day queen rearing classes in four states this 'spring' I am overwhelmed by the interest by local beekeepers to raise their own queens and propagate local and mite-resistant stocks. If even one out of four of these queen-rearing students is able to develop some sort of queen production program, there will be a significant change in the way queens are bring produced, and sold or traded within local beekeeping communities. In the past year there have been a combination of serious weather factors that have reduced bee colony numbers. The prolonged cold in the northern states and the prolonged drought and cold in the southeastern states (and elsewhere) during the spring of 2011 has been one with a tremendous loss of colonies. Add the flooding along the Mississippi River, and this has been a challenging season.

Many of the students in these classes are relatively new to beekeeping, having started their initial hives after the Colony Collapse Disorder was first experienced. They have installed bees, built them up, and watched them die over the winter, year after year. Other beekeepers have had much better success with their bees, and we need to understand the root of this difference.

Packages vs. Nuclei Colonies

In one set of data collected from beekeepers in the Mid-Atlantic region there was a three-to-one advantage in survival from nucleus colonies over package bees, with about 75 per cent survival of the small hives and 25 percent survival of packages. These numbers are telling a story, and we need to listen. At first glance it suggests that package bees are less likely to survive because they are packages and lack comb and a queen-colony relationship. The reverse is that the nuclei are better units and their success is due to their nature.

The other explanation is in the queen stock that is in the two colony types. More of the nucleus colonies are sold with mite-resistant queens. We are not talking about the conditions of queen rearing, but the genetic nature of the queens in these two hive types. Nuclei can contain inferior queens, and packages can contain superior queens for survival. Two seasons ago I had sister queens in nuclei, and about half of them were heavily infested with chalkbrood, a fungal disease that should not kill colonies. But these were the colonies that did not make it to their first birthday—they died over winter.

Resistant Queens

We have finally reached the 'Tipping-Point' regarding the use of mite-resistant queens in North America. Some beekeepers are ahead of this by over a decade, as they have been using queens that generate colonies with low mite numbers. Some queen, package bee and nucleus colony producers are breeding or buying breeder queens so there are fewer varroa mites in their colonies, and they are able to produce a good honey crop, winter well in northern areas, and have an acceptable set of behaviors. Mite resistance is the key to this entire process. During the past quarter century in

Queen rearing class participants (and a visitor) form a queen rearing class offered in Monticello, FL in mid March. A very diverse group of beekeepers across the country seek to learn ways to raise resistant queens and localized survivor stocks.

(l) Northern Vermont beekeeper Mike Palmer divides unproductive colonies into four-and-five frame nuclei (here are two four-frame nuclei in a double deep box). The top box provides food reserves. This photo was taken during my visit on December 2, 2010. (r) Top insulation material used on both ten-frame colonies and double four-frame nuclei. Roofing paper is wrapped around all colonies for wind protection and a bit of heat retention. All colonies have upper entrances.

which varroa mites have been known to be in the United States, we have seen a large number of bee breeding programs that have focused on producing stock, or queen families, with lower varroa mite numbers. There are different mechanisms of resistance: hygienic behavior, grooming behavior, and reduced mite reproduction (on the stock). There are undoubtedly other mechanisms at work in these bees and the many, many survivor colonies that dot the map with increasing density. Ironically, many of these stocks are in the hands of small- and medium-scale beekeepers who are unable to produce any more queens than they currently do, so they do not advertise or promote their bees outside of a small group of neighbor beekeepers.

Package Bee and Nucleus Producers Must Use Resistant Stock

It amazes me how many large package bee producers continue to use their best colonies in a chemical treatment program rather than work toward resistant stock. The same is true with large-scale beekeepers. Big yellow queens are desired by a large percentage of the beekeeping community. The queens are easier to find. For a large-scale beekeeper, queen finding costs labor time, and if queen-finding time is cut in half by using a yellow stock, rather than a dark or banded stock, it reduces labor costs. Somehow the decision was made that this can be combined with miticides (registered as well as illegal treatments) as the best way to keep bees on a large scale.

North American beekeepers switched to nearly all-yellow (or golden or tan) queen stocks over 100 years ago. They produced large colonies, built quickly, were more likely to be gentle and produced large crops of comb and extractable honey. Many of the big names in American and Canadian beekeeping were involved in the importation of Italian queens from Italy and propagating daughters in huge numbers. Nowadays I refuse to call these Italian bees, since they have been mongrelized with repeated mating to non-Italian drones. They are best called Italian-like. With the arrival of tracheal and varroa mites many of these yellow stocks were lost. One of the first observations beekeepers made about survivor stock was the darker color of the queens in the colonies that were left after the varroa assaults.

The simpliest way for package bee and nucleus produces to switch to resistant stock is to get breeder queens from one or more of the bee breeders who are offering them for sale. A very few queen producers select for hygienic behavior (using the methods promoted by Marla Spivak and others using liquid nitrogen). More should take the time and resources necessary to breed from their current stocks so we maintain what limited genetic diversity we have left after a quarter century of mite infestations.

In 2012, package and nucleus producers should be able to offer their customers a choice between a resistant and a non-resistant queen stock. Lots of the small-scale beekeepers taking my queen rearing course are already doing this, and there is absolutely no reason why commercial queen producers cannot do the same.

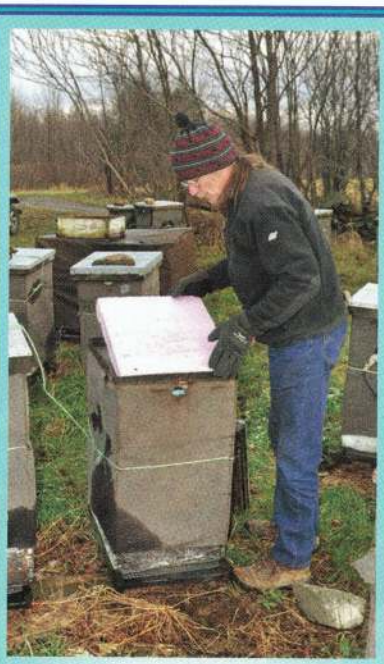
Requeening With Resistant Stock

Clearly, any beekeeper who has bees from packages or nuclei colonies purchased this season can still obtain mite-resistant queens and requeen the colony during the nectar dearth or after it has ended. If the colony has built into a good population, this may represent a challenge to a new beekeeper, so you should get your mentor to help you with the requeening process. Timed during the nectar flow makes acceptance rates go up. By June and July the supply of locally produced mite-resistant queens will be at its peak for the season.

Some common sense should be used here. If a colony is huge, producing or has produced a huge crop of honey, and has a low mite drop or count, I would leave the colony alone. But if there are a large number of varroa mites following a sugar dusting, or another sampling method, it is very likely this big, beautiful colony will be dead next spring because of the increased mite infestation. Sure, chemical treatment remains an option, but something better can and should be done!

"Palmerize" Colonies

In my first book *Increase Essentials* I discuss the work and methods used by northern Vermont beekeeper Mike Palmer. Now, through the continued work Mike has done around the country, beekeepers use his name



Vermont beekeeper Mike Palmer overwinters successful honey producers in ten-frame double deep boxes, wrapped in roofing paper. He places a foam board on top of all colonies for insulation. Notice the hardware cloth mouse guard he keeps on these strong hives all year.

as a verb to describe the process he uses to manage nucleus production and introduce resistant queens into them.

The process consists of dividing colonies into two groups: Those able to produce a big crop of honey, and those that are unlikely to produce enough to survive the winter. The colonies in the first group are managed for nectar production from the clover crop along the Canadian border. The other colonies are subjected to Palmerization. These colonies are simply divided into nucleus colonies and ***given ripe queen cells grafted from Palmer's mite-resistant stock***. Pull two frames of brood and bees early in the season, (perhaps more later), plus frames of honey and pollen, and put them into five-frame nuclei boxes. While some of these colonies may grow big enough to become full sized colonies, most are built up from two frames of brood, bees, and food frames to two-story five-frame nuclei colonies. These are wrapped and wintered.

Mid-Honey Flow Replacement

Many large-scale beekeepers produce queens during the start of their major nectar flow and place 'ripe' queen cells, those within 24 hours of emergence, in the honey supers of the colonies. Using queen stock of a color different than the production colonies, they experience a 30 percent or more replacement of the current (and older) queen in the colonies. The method appears to incorporate the less-defensive nature of bees toward queens found during a nectar flow, the related dilution of the queen's pheromones during this period, and the colony's natural instinct to replace queens during a nectar flow, when the bees being produced as brood are not likely to be old enough to help with the flow as it is likely to be finished in about six weeks. If a queen (from last season or new this season) is at all at risk due to lack of physical vigor, poor mating, nosema infection, or chemical exposure, she can be replaced without a great deal of expense, time, or mental effort. Using a mite-resistant stock to produce these queen cells will increase the colony's liklihood to survive the next winter. The break in the brood cycle also generates a critical gap in mite reproduction.

In Summary

- If you produce queen bees, produce them from resistant stock, and test the offspring using a powdered sugar test, ether roll, or another standardized test.
- If you buy queen bees, insist they be from resistant stock, and ask for data showing this resistance.
- If you have non productive colonies, "Palmerize" them and develop a number of strong two-story nucleus colonies for wintering.

End the season with mite-resistant stock in all your hives. Feed the bees so they have good pollen (protein) reserves, starting perhaps about August 15, so the bees that produce the bees that go into winter will be well fed. Feed enough sugar syrup or leave enough honey for proper wintering. Reduce the entrances to minimize robbing and access to mice. Wrap the colonies if this is advised for your latitude.

Off to the Heartland Apicultural Society in July. On August 20 and 21 I offer a Beekeeping Master Class in Denver, Colorado. In September I will be at the Western Apicultural Society meeting on the Big Island of Hawaii, and will teach a one-day Master Class on September 16 on Rebuilding and Growth of Colonies. Information on the last two classes, as well as PayPal registration, is at my website www.wicwas.com