

# The Traveling Beekeeper



## Raising and Managing Your Own Queens and Drones

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### INTRODUCTION

**T**his is the next article based on concepts presented at the North Central Queen Assembly held October, 2008 in Troy Ohio, and cosponsored by Ohio State Beekeepers Association and Wicwas Press. Part of my involvement as a speaker was to help serve as a “bridge” between some of the theory presented by the other speakers, and the reality of the beekeepers in attendance. Linking the “purists” on one side with the “give it to me now” beekeepers can be daunting. It is always a challenge and sometimes amusing to get criticism when trying to bridge the gap. Oh, the joys of working with beekeepers!

#### Are we ready to change the way we get queens?

Over the past few decades the beekeeping industry has had increasing problems with queen delivery, queen introduction failures, queen longevity issues and continued queen propagation from non-tolerant stocks (referring mainly to varroa mite tolerance). The quick answer to these points can be ‘cured’ as follows:

*Delivery problems*—Obtain queens locally and the problems will go away

*Queen introduction failures*—Use locally produced queens fresh from the nucleus

*Queen longevity*—Better-reared and locally produced queens may last longer

*Mite tolerance*—Use local survivor and proven resistant stocks to fight mite buildup, especially by using hygienic and high grooming stocks.

These criteria are being used for the development of local bee breeding programs, and were a solid motivation for the

formation of the North Central Queen Assembly. Ironically, we lack good science on some of these aspects (like the benefit of locally produced queens reducing introduction failures) so we are usually running blind, hoping our intellect will help us find answers.

#### WHO SHOULD RAISE QUEENS?

Our industry has relied on large commercial queen producers (often more propagator than breeder, in my opinion) who have the potential of producing thousands

if not tens of thousands of queens a week during the narrow queen-rearing window each spring. Their operational size and efficiency (developed over decades of hard work) make them easy targets for criticism when the sole single queen installed by a hobby beekeeper has problems.

The number of reports of wide-scale queen problems has persisted for a number of years. Beekeepers complain that over 50% of the queens they obtain in package bees either fail to lay eggs or are replaced within a few weeks of installation. While I



With selection with an improved, mite resistant stock, a small breeder can produce healthy bees with good mite resistance. This is a frame of brood from a nucleus sold by Kirk Webster of Vermont, and inspected a year later in Connecticut.



**Broken drone brood shows a drone pupa infected with chalkbrood. Hygienic stock has long been known to be resistant to American foulbrood, but it also has resistance to chalkbrood. The stock also has an increased tolerance against varroa mites. A small breeding program can use resistant stocks as part of the foundation of the breeding program.**

personally suspect that there is a problem of bee and queen biology at odds in the package colony, why are we seeing so many problems in the past years. Is it mites? Is it a narrowing of the gene pool?

I blame large-scale queen rearing of two things that affect overall queen quality: first, it is very easy to "push-the-envelope" on numbers, getting colonies to produce 120 or 180 queen cells when they might better be dealing with fewer than 30. Second, we see growing evidence that queens are not mature when they are shipped. Yes, they lay eggs, but have they had adequate time to fully develop their ovaries and pheromone-producing biochemistry? Lately we have had evidence that a queen should be kept in a mating hive for a month before she is removed. By doing so the introduction problems are reduced and the longevity is increased. No queen producer holds queens this long in normal production.

Because of mites, hive beetles, drought and economics, the number of queen producers, large operators east of the Rocky Mountains, is in a steep decline. This puts the Eastern beekeeper in a quandary. *Where will we find queens when we want them and of a stock and production standard we need?*

Commercial beekeepers must continue to raise their own queens, and I hope that more will learn how to do this correctly, since queens, their mating behavior with quality, target drones and their production standards, have a direct and almost immediate impact on the fate of the colonies.



**Sideline beekeepers (often with full-time jobs outside of beekeeping) are in good position to raise queens and do basic breeding work. Here Rollie Hannan, Jr of Southbury, CT inspects one of his cell builder colonies.**

The most successful commercial beekeepers raise their own queens or have a very close business relationship with a queen producer who knows what the beekeeper wants and how to provide it.

#### **Local queen producers**

As we look at the needs of northern beekeepers, from hobbyist to commercial, there is a valid concern over where and when they will get predictable queens. In my mind it would be great if SOME local sideline beekeepers, maybe 2-3 per bee club, and supported by members, became the local source for queens for that immediate area. For this to work we must ask a key question: *Are we ready to change the way we get queens?* If a beekeeper in Michigan or Oregon or Nebraska or New Jersey is going to produce queens, he or she must look at the calendar and agree that they cannot produce spring queens for April delivery and do it in these states. And if they migrate, aren't they going to duplicate the problems of the larger operators and lack the decades of experience these beekeepers possess?

#### **PARAMETERS OF A NORTHERN QUEEN-REARING PLAN**

Here are some of my thoughts about developing a northern queen-rearing program. My opinions on some of these issues will likely change in the future as I learn more, but this is where I am today:

*1. We must find and support financially motivated and well-trained beekeepers willing to raise queens for the local market.*

While a group of beekeepers can encourage (= finance) certain individuals, it is the local marketplace that will determine who is able to produce queens of high quality that meet the needs of that

market. When Canada closed the border to U.S. bees due to mites (which they got anyway, but the border remains closed) certain Ontario beekeepers started to produce queens. Granted, this is not a huge industry, but one that has worked. Here are a group of knowledgeable beekeepers that have developed a solid genetic stock and quality production skills and filled the need for their area for queens.

*2. If we purchase 100 \$20 queens and lose half, we may be better off paying \$40 for 50 queens that really produce.*

Even the most gifted and proficient beekeeper is not going to eliminate queen problems, but a smaller operator may well be able to reduce this to an acceptable level of 5 to 10% loss over the summer. Such an accomplishment would be absolutely huge in the history of beekeeping, especially when done year after year.

But if a local beekeeper produces a few hundred queens each week, and does it well, I feel that these queens should command a premium price.

*3. If you produce queens in the Northern States, the production calendar must change.*

Most of the queens will be produced in the late spring and summer when the colonies are in their normal buildup/swarming cycle. Rather than fight this behavior, utilize it. Use the colony's queen rearing instinct to rear queens. Use the colony's urge to reproduce to make strong nuclei hives for mating. Queen production in February and March will not be possible with accepted technology.

*4. Many queens will be overwintered in nucleus units and sold in these nuclei the next spring.*

Some beekeepers, like Kirk Webster (Vermont), have done exactly this, produc-

ing queens in the summer months and overwintering the nucleus hive and selling it in the spring. This is a radical change for most beekeepers. Yet the folks who have purchased these sorts of hives seem quite pleased with the bees and the queens.

5. *We would like to think that local queens have been genetically selected for local conditions.*

At the Univ. of Guelph, the staff apiarist over-winters *locally adapted* Buckfast stock in single hive bodies! By carefully selecting from the original tracheal mite resistant stock, this segment of the Buckfast Bee has been adapted for local conditions. Left on their own, the bees left every spring are there because of a non-directed selection. Those that died are out of the running as grafting mothers. Local queens and their colonies are constantly being subjected to the pressures of the environment, as well as the management practices of the beekeeper.

6. *Beekeepers use increase nucleus colonies, not packages.*

I am tired of poor results from package bees. They are not productive enough for me. The queens have problems in packages that I do not see in nuclei hives. Since the price of the two have gotten so close, I am willing to pay a little extra for a good strong nucleus hive with a proven queen than a few pounds of bees with a strange queen, newly mated but virgin-like in her physiology.

7. *Make increase colonies, not honey*

One experienced beekeeper in Michigan is taking overwintered colonies and splitting them 4 to 1 in the spring, and then again in July or early August and supplying them with locally produced queen cells. Two 4 to 1 splits gives you 16 nuclei entering the winter with locally-produced queens, hopefully carrying traits you have added to improve the line. If the beekeeper gets even half of these nuclei to overwinter, he ends up with 8 colonies the second spring. These he could sell (for \$100 or more) or use to build up his pollination/honey producing operation. Or the nuclei could be moved to California in the fall and fed heavily to make minimum strength standards for almond pollination the second year.

#### **Calendar for a Northern Model Breeding Plan**

1. *Raise queens after fruit bloom (mid May at 43rd parallel)*

This point should be clear, don't try to compete with southern and western queen producers for the very early queen market. Your customers will need a great deal of re-education as to the time of the year they obtain queens. If they understand the role of late spring and summer increase colonies and how they can be



**A reminder that any beekeeper seeking to raise queens and breed up a stock must have a good knowledge of bee behavior. These two worker bees are licking spilled honey in a colony. What will they do with this honey?**

used in hobby and sideline operations, then you can develop a market for your queens or your ripe queen cells. With new beekeepers, it is much less stressful to start with a nucleus hive in the late spring or summer and grow in beekeeping skills as the colony grows in size. And, if you have done your job, the queen and the colony will grow nicely, and with a minimum number of routine problems and learning opportunities.

2. *Raise queens 10-12 weeks instead of producing a summer honey crop.*

Of course, this is the trade-off. If you want to produce quality queens during the nectar flow, you will need to manage the colonies in such a way to minimize honey production and optimize queen cell production, drone rearing and mating between the virgin queens and drones.

3. *Produce ripe queen cells for use by larger operators.*

Commercial beekeepers are often looking for ripe queen cells for increase production. If you have a line that has demonstrated survivor skills and is available on a predictable schedule, you have a potential local customer base. Beekeepers say they want these queens. Time will tell if they are willing to PAY for it! For sideline beekeepers and all the hobby beekeepers, you can charge a premium for queen cells in smaller quantity, and might want to have a class to show them how to use the cells. Working with local clubs and mentor groups will further your interests.

4. *Develop a local market for home-grown queens.*

As with queen cells, the market for local queens should grow nicely. If you develop strong standards for quality during cell production, and keep the mated queen in the nucleus hive until the day the customer schedules a pickup, the

queen will be fully developed sexually, physiologically and physically. This minimizes introduction issues and should keep the queen in the hive for a much longer time.

5. *Over-winter queens in new increase colonies, and sell in the spring, or use to restock.*

These queens and their nuclei can be overwintered as new increase colonies. There is some strong evidence this minimizes varroa mite populations.

Also, there is no reason why you cannot sell the newly-mated queen in her mating nucleus (which is a 4- or 5-standard frame unit), and let the purchasing beekeeper prepare them for winter or almond pollination.

6. *Grow as your skills improve/as your queens improve.*

I really need to say this. If you have not raised queens before, don't even think about selling any the first year. Use them yourself, and give away some samples to understanding friends and associates who will give you feedback, good and bad. Your understanding of queen and drone production, mating and nucleus management will be critical to your success as a queen producer. Plus, you will need to deal with the stock or line of bees you are producing queens from.

Well, those are some of my thoughts and a plan for queen rearing at a local level. Next month I want to address the question: *I have 60 colonies. How can I raise quality queens?*

If you are interested in more about the reproduction and mating of queens and drones, email Dr. Connor at [ebce-books@aol.com](mailto:ebce-books@aol.com) for details on how to purchase a copy of his brand new book *Bee Sex Essentials*. Or contact your nearest Dadant bee supply dealer and ask for a copy.