

# The Traveling Beekeeper



## VARIATIONS ON NEW QUEENS

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**B**eekeepers are skillful at finding ways to use available resources in their operations. Nowhere is this more evident than when it comes to finding ways to add queens to an existing or new colony. The queen rearing industry and the teachers of basic beekeeping tend to focus on the use of newly mated queens as the 'correct' way to introduce new queens. I have reviewed the many other options of queen introduction elsewhere and in my books. This past season I have had the opportunity to make further observations on two methods for new queen introduction that are not widely accepted by beekeepers in North America—48-hr queen cells and virgin queens. If you have read what I have written about these two subjects, this is an update.

### 48-HOUR OLD QUEEN CELLS

About two years ago Dr. John Kefuss of Toulouse showed me the practice of shipping and using queen cells that are two days past grafting. Allowing that the larvae in the cells have a three-day existence as eggs, plus about a one-day existence before grafting, the individual bees in these 48-hr cells are approaching the end of their sixth day of development in a metamorphosis of a total of 15 to 16 days. The larvae are about midpoint in their larval development. John argues that the larvae are large enough to withstand time outside the colony and away from nurse bees, but still small enough so they will not crawl out of the cell when stressed.

At the three-day queen rearing class taught at the Farm in Galesburg, Michigan in July, one of the students, Dwight Wells of Troy,

OH, asked if he could take some of the cells grafted on Friday evening to Ohio to see if they survived. He ended up taking 14 48-hr cells out of the cell finishers and put them into holders inside a small plastic insulated thermos. He did not heat or cool the cells, but put a damp paper towel over the top for a little humidity. (I feel that the royal jelly provided the needed humidity for the larvae). Within five hours he was outside Columbus (in a drive that takes me longer) and placing the cells into a cell builder owned by experienced queen producer Dana Stahlman.

The attached photo shows the cells that were produced. Of the 14 transported cells, 12 cells were drawn out and sealed. From this point on they were handled as ordinary queen cells.

At an earlier class in Lainsburg, MI we



(l) Queen cells about 48 hours after grafting. (r) Dana Stahlman of Ohio shows queen cells finished in his cell finisher/builder after being transported from Galesburg, Michigan in a small cooler, without bees, heat or cooling. Of the 14 cells moved, 12 reached the finished cell stage (Dwight Wells photo)



**(l)** A day or two before emergence, queen cells are placed into wood and screen emergence cages and put into a queen bank. **(r)** Eight frame queen bank holds emerging virgins. The bank has brood, but no queen. It is checked frequently for queen cells.

had a similar experience. Each student was able to take home 48-hr cells and place them in hives when they got home. Many were drawn out, mated and now head big colonies. The source colony for the graft was a hygienic queen with a measured egg-laying rate of 2200 eggs per day. It was an amazing queen and colony and this was a method for folks to take a genetic sample from that queen.

The potential for this is huge. Even a small hobby beekeeper can produce queen cells for his or her own operation and carry them to a second location. Or share these cells with another beekeeper located some distance away. Urban beekeepers can produce cells at home, in the city, and carry them to another location in the city or out into the country.

I am excited about the use of these cells as a way to 'swap' genetic stock between areas of a state or region. These are low-cost cells, since they do not represent the labor of completed cell construction and queen mating. The cells that develop will result in virgin queens that will mate with the local drone

supply, an advantage if area beekeepers have set up a selection program to promote production of desirable, mite and disease resistant stocks. It is a low-cost way to 'sample' different bloodlines and evaluate the resulting queens and their colonies. It helps demystify the process of selection.

These cells are moved bee free and mite free. There is still the risk of transporting disease, but there is no brood comb involved in the transport, just a cell (I use plastic), royal jelly secreted by the nurse bees, and the larva.

Local bee clubs can sponsor cell swaps at summer field days, and each beekeeper who brings in cells could potentially return home with a variety of queens to observe in their hives. If these cells are finished and mated in strong five-frame nuclei hives, the queens can be evaluated for physical features (color, damaged legs and wings) and the brood pattern checked. Under-performing queens should end up in a bottle of alcohol to serve as a source queen pheromone in swarm boxes, while the best queens may be built into full-sized colonies or wintered in the

nucleus the same way Brother Adam did in Buckfast England. That way only the best colonies and their queens start the next spring season.

#### **TEACHING BEEKEEPERS TO USE VIRGIN QUEENS**

Since April neighbors Cathy King, Craig Fuller and I have been producing queens by grafting. We have used a number of the resulting queens to install into new colonies, nuclei mostly, for mating and establishing new colonies. Extra virgin queens are sold to local beekeepers for pickup at the Farm, and this comes with a mini-short course on how to use virgin queens. Craig and Cathy are swapping the opportunity for training in queen rearing and beekeeping for a full range of beekeeping activities. This way they are not employees.

After the usual disasters, counting errors and missing paperwork, we have developed a good system of grafting 12-24 hr old larvae into clean plastic cell cups, putting them into a cell starter (a closed, screened box filled



**(l)** Placing cap onto the queen cage used for holding virgins 3 to 5 days prior to emergence. **(r)** Placing the virgin between two frames of sealed brood in a nucleus made up in late August for overwintering.

with the nurse bees from one hive plus frames of honey and pollen and a sponge filled with fresh water). The cells in the starter are moved the next day to a cell finisher/builder. This is a two-story colony with the queen confined below a queen excluder and 2-4 frames of open brood above to attract nurse bees.

Once the queen cells are sealed and before the first one emerges (and destroys her sisters and our hard work), we place the cells into a wood and screen cage on a bar holding about 20 of these cells. The queens are emerged in these cages, protected from each other's intent to cause harm. After the queens are emerged, we remove the cell base and let the queen crawl out of the cage. Then, we pick her up, mark her, and place her into a JZsBZs plastic queen cage with queen candy. These are then put onto a rack, back in the builder/finisher hive that now serves as a queen bank.

Of course, a few queens have been lost during this marking process, but that is a reflection of our inexperience. The advantage I feel this system offers is that we know that we have a good queen. We can pinch small queens at this time, and select only queens that were well fed in the builder/finishers and have wide thoraxes. Rather than losing queen cells during introduction, we know we have placed a live, viable, marked queen in each hive.

#### THE EDUCATION AND TRAINING PART

Many beekeepers have been told that they should never use virgin queens. This is wrong. I have used virgin queens since the mid 1970s with good results. Do I lose queens? Of course. They must be freed from the cage and mate. I look for an 80% or higher success rate with this process when there are adequate drones and good weather for mating (higher than with queen cells).

Virgin queens are queens, and must be protected before they are released to a new group of bees. The cage provides this protection, and allows bees to feed and obtain pheromone from the queen.

We instruct beekeepers to place the caged queen with the plastic cell cap firmly pushed in so the bees cannot release the queen too quickly. It is my observation that queens that are freed from a queen cage in less than three days are more likely to disappear from the colony. For that reason we ask beekeepers to keep the queens in the cages with the cell caps on for a period of three to five days. Then, they are instructed to remove the cap, check the queen candy in the tube for softness, and then return the caged queen to the hive, right were she was. Most of these queens are liberated within one day.

If the queen is dead in the cage at three days, I see that as a good thing. No time wasted wondering. Get another queen in there after you search for a side-comb virgin the bees have produced or you moved by accident.

Some beekeepers like to direct release the queens into the colony by opening the



Newly caged virgin queens (all with colored marks to determine mating accuracy) are ready to go to the mating yard. They may be banked for a week or more before being used in mating colonies.

cage (after a minimum 3-day confinement) and letting the queen walk out. The challenge here is that this is a virgin queen and she is still very good at flying. I did a few of these this summer and found that many of the queens took to the wing. The cooperative ones flew up and promptly returned. A few flew off and some made it back and others did not. These are marked queens, and we look for that mark to confirm that it is our 'lady'.

We have been blessed with a good amount of rainfall this summer, but there have been many days for good mating flight. We continued to mate queens into September. These head nuclei colonies that we plan to winter.

#### VIRGIN AGE

To play it safe, we try to provide virgins that are under 14 days of age (post emergence). While we have had some success with 28-day-old virgins getting mated, we also had a few that went into drone production, and did not mate. I admit we need more data on the age of these virgin queens for release and mating, but it is encouraging to have a stockpile of virgin queens in a queen bank that are available for making increase, replacing failed matings or to sell to local beekeepers.

#### BIGGEST PROBLEM

Our biggest problem using virgins this way is to maintain paperwork or mark the colony that needs to be revisited to remove the queen cap. By sheer forgetfulness we have kept virgins caged and unable to mate in nucs for two to three weeks with the queen alive. By then the brood has all emerged and the bees are expressing various types of displeasure with beekeeper brain failures! Many times the queen is dead, but you know she is dead and can deal with the situation right then. When you have two or three dozen nuclei hives and you know you have one which has a cage that must be removed, and you forget which one, it gets frustrating.

Customers seem pleased to use virgin queens, which we sell for much less than a mated queen. The more experienced beekeepers are getting about 80% successful mating with these queens, and I am very pleased with that. We are trying to graft only from stock that has demonstrated some resistance to varroa mites, is free of any bee disease (especially chalkbrood) and survived the past winter. I see this as a key step in developing a locally adapted bee that can be kept chemical free. That is what smaller beekeepers want and expect in this market. We make no guarantees about performance of the queens, but will replace a queen that is not accepted by the colony. The loss may be due to beekeeper error, but we have found that it is important to educate the customer, and a free replacement is a small cost for customer satisfaction. Since we do not ship queens, the beekeeper must pick up the replacement.

#### ACKNOWLEDGMENTS

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The three books by Dr. Lawrence Connor are *Increase Essentials*, *Bee Sex Essentials*, and *Queen Rearing Essentials*. They may be ordered from most bee supply dealers or via PayPal from the [wicwas.com](http://wicwas.com) website.

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