

The Problem With Queens

Jennifer Berry

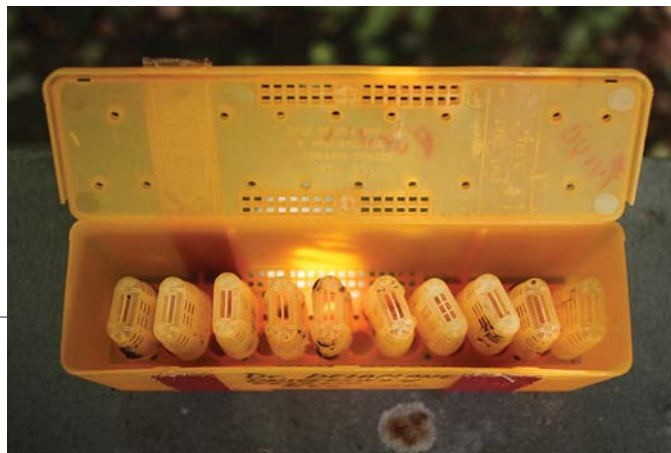
For the last several years we have had to purchase queens outside the state for our research projects, which have started so early in the Spring that our local queens are just not available. Unfortunately, the earliest we can graft here in the Piedmont region of Georgia is around March 15th. This means that we wouldn't have well-mated and mated (laying) queens until mid-to-late April, which was much too late for our recent research schedules.

Yet, I wish we could have raised our own queens because, in both years, the purchased, early-season queens were very disappointing. Honestly, they were horrible! The tragedy has not only been the material cost, but the set backs in our plans and expectations. This includes the time lost while introducing purchased queens into our research colonies and, then, dealing with all the failures that followed. It has been gut-wrenching. Over the last two years, we have had in excess of a 70% failed-acceptance rate, and, of the queens that were accepted, 20% were either superseded within the first month or so poorly mated (i.e., pitiful brood patterns, some even drone layers) that they were not worth keeping! What a mess!

Now, I have no intention of disclosing the two breeder operations who sold these queens to us; so, please don't even ask. But they know who they are! In any case, it is my intention to share our hard-earned experience, mention a few tips and tricks, and offer the names of a couple of good suppliers to hopefully assist you in the process of buying and installing queens when getting started, increasing your stock, or just requeening to improve certain traits in some or all of your existing colonies.

Like I said, we needed early queens. So, I reserved them in the previous year to ensure that our significant orders

– over 300 queens each year – would arrive on time. Orders of this magnitude typically come in what's called “battery boxes,” which can be a plastic shipping container, which holds up to 20 plastic queen cages, or a cardboard carton with screening on each side to allow ventilation, which come in different sizes and can hold hundreds of queens. Trays or compartments inside these boxes hold the



Small battery box.

queens in place so they don't get knocked about. Another advantage of these vessels is that you can ship them with an abundance of shared attendant bees and resources instead of the old practice (Benton cages) of having a few attendants in each individual queen cage.

Once the queen cages are set securely in the box, loose worker bees are shaken or brushed into the surrounding interior, along with a wet sponge and some queen candy (fondant), before it is sealed for shipping. The sponge provides moisture to the attendant bees for dissolving the candy to feed the queens as well as themselves. And, notwithstanding negligence or abuse (e.g., exposure to heat in parked trucks or black mailboxes in July, suffocation by blocked ventilation panels, or injury by throwing, kicking, squashing, etc.) by delivery carriers, they generally arrive alive.

Two years ago, our order for 300 queens was to be shipped out in early March. There were two separate arrivals (150 queens each) a week apart. Both batches arrived alive, and there were no apparent injuries to the containers, attendants, or, most importantly, the queens. Once in our hands, we jumped into action to introduce the queens to their new families. There are many different ways to introduce a queen, and I've probably done them all. But, when you have thousands of dollars invested, you want to take as many precautions as possible. For that matter, even if you have only one queen to introduce, you should take care. So, I will explain what we did this particular time and, then, explore some other techniques as well.

We needed 240 nucleus colonies. Instead of trying to make them all up as the queens arrived, we endeavored to have the nucs ready just beforehand. Since it was Spring, we split our stronger colonies by taking three frames of bees and brood, one frame honey, and one frame pollen to establish each nuc. We moved the nucs to different apiaries to discourage the bees from drifting back to their original colonies. Foragers from queenless hives tend to drift into queenright colonies despite the presence of brood. Though, open brood usually helps to stabilize a queenless colony for a short time.

Once the queens arrived, it was truly a race to insert them. Since I'm not a fan of banking queens for more than a few days, all the nucs were ready and standing by. But instead of just inserting the queen cages and walking away, we needed to be more strategic since the nucs were made up with milk brood almost a week in



advance. Because of that, what do you think that the bees had been doing? Yep, they had been making queen cells. When a colony with brood has unexpectedly found itself without a queen, the bees' primary goal becomes to rectify the situation as soon as possible. And, since it had been almost a week for some nucs, their cells were either capped or close to being capped. So, as we were inserting queen cages, we checked each and every frame and cut any queen cells found. This was very important! In my experience, I've had better luck with queens being accepted when there are no cells present. Disclaimer: Bees seem to change their collective mind on just about everything they do, how they do it, and when they do it. So, you may have had a different experience on a particular occasion. Heck, what can I say? It's a box full of women! Did I say that out loud?

When exploring for cells, it is best to use a quick, single shake over the hive box to knock most of the bees off the frame. Since there's no queen, you don't have to worry about losing or injuring her, and you will be amazed at how much better you can see the nooks and crannies in the comb where queen cells hide. The girls will tuck cells in the frame corners, as well as in gaps and other odd formations in the comb, where it's virtually impossible to see under one or more layers of bees. Be sure to check both sides of a frame before deeming it safe. Also, check all the frames (even honey and pollen) since you never know where you may find those cells. A mated queen is no match against a virgin - especially a virgin from the original colony.

Once the frames were void of queen cells, we would push the edge of the queen cage into the center comb of a brood frame with the screen side facing the area between the frames (not against the comb) so the bees could feed her and spread her pheromones (Figure 3). It's helpful to mark the top bar of the frame where the cage is located (with an arrow pointing at the cage) to save time later. I also like to put a dab of honey on the screen for the queen to eat. This also brings the bees to the queen immediately, and just seems to make their introduction a little bit nicer - like meeting someone new at a dinner party (Ok, I might be anthropomorphizing just a bit . . .). Avoid pressing cages into honey, which can drown the queen, and try to avoid brood and pollen. Note that small hive beetles LOVE to lay eggs underneath queen cages because the bees can't get to them. You will come back a few days later to release the queen and find a wiggling, boiling mess of beetle larvae behind (and, sometimes, even inside) the queen cage.

Another precaution is that I never like the bees to release the queen on their own. So, we always leave the plastic cap or cork in the end of the queen cage for at least a few days. For the California cages we add duct tape on the bottom of the tube just to make sure that the bees won't get through too early. I prefer to release the queen myself. It is just too unpredictable as to when she may get out when left to the bees. Different fondant amounts and concentrations, weather conditions and other factors can yield a premature release; then, boop, there goes \$25 (or more!), dragged out and dropped off the edge of the bottom board along with the other pieces of debris. I want to make sure that she's given three to five days (depending on our research schedule and/or when I can get back to the hive) of undisturbed opportunity to be accepted by

(chill out with) her new family. Also, when you manually release a queen, you can watch the reaction of the other bees when she crawls down between the frames; you may have an opportunity to rescue her (put her back in the cage for another day or two) if it seems like she's getting balled (attacked by the others).

After the allotted period of time has elapsed, it's time to release the queen. When opening the colony, use as little smoke as possible. I'd rather not disrupt the girls too much. It's bad enough to take off their roof, rearrange their furniture, and confuse them into thinking there's a "forest fire" since we are filling their hive with smoke. This can be a little disrupting, don't you agree?

Begin by removing an outer frame or frames in order to create an open slot (some space). Next slowly slide the two frames (with the cage between) apart before lifting out the marked frame with the cage embedded in it. If you don't create this space first and try to remove the frame with the cage, it will scrap and damage the wax comb and kill numerous bees and brood on its way up. Now observe the bees on the frame with the queen cage. How are they treating the queen? You want to see the bees walking calmly around the cage, feeding the queen, but not attacking, biting or trying to sting her through the screen. Also, while the hive is open, it may be a good time to sweep all the frames again for queen cells; you never know what those girls have been up to, and it's worth the extra few minutes.

Now, depending on time, we can either: [1] open the access to the candy (remove the cap, cork, and/or tape) and allow the bees to eat through to the queen, or [2] manually release her (pull the cork from the non-candy end, remove the screen, or open the plastic cage). I prefer to manually release because I like to see the queen walk out of the cage and onto the comb. A word of caution here: whether you're releasing her into the hive entrance, onto the top bars, or directly onto the comb, keep her covered with your other hand while she exits the cage because she may try to fly. If you are new to beekeeping or nervous about manually releasing, just open the candy end and let the bees do it. I confess, it's even happened to me several times. I opened the door and off she went . . . up, up, and away. There went my beautiful, my beautiful Queenie. I must have looked pretty silly to those bystanders across the road one particular day, as I went running around and around a field with my arms in the air, jumping up



Large battery box.

and down, and yelling “Here Queenie, Queenie, Queenie! Here Queenie, Queenie, Queenie!”

Male: “What the heck is that woman doing over there, Mildred?”

Female: “I don’t know Fred, from the looks of her, probably been in the sun too long. We better start locking the doors.”

Remember, the queen has slimmed down a bit since she’s not been laying eggs. It’s similar to the queen’s condition in springtime leading up to swarming. That helps her to be a good flyer. Actually, any queens that have been kept from laying (caged) for a few days begin to look small, skinny, and “virginesque.” But once they start laying eggs again they will plump up to their normal “queenesque” size and shape.

There are other ways to introduce queens, like I mentioned, and I’ve tried most of them. When time is short, I will pinch the old queen and immediately introduce the new, caged queen. The cork or cap is left on to keep the candy covered. Then, in a few days, I will remove the cork/cap to expose the candy and let the bees release the queen. When introducing a new queen, I’ve heard that feeding the colony helps with her acceptance. But be very careful not to induce robbing. This will surely reduce her chances of being accepted if the house bees have to fight off unwanted robbers!

Once the queen successfully integrates with the general population, I make a point of leaving her alone in the hive for several days before returning to look for eggs. Once it is established that she’s laying, I won’t check back again for several weeks. At that point, I’ll want to see her brood pattern. If you don’t see eggs after a week or so, the queen is probably a dud. You’ll need to find her, if she is still there, and remove her. If you wait too long, the workers will resort to laying eggs themselves, which is not a good thing! My recommendations to folks in this situation are as follows:

1. If you can get another queen sooner than later, add a frame of milk brood (eggs, and young larvae) from another hive to keep the bees occupied in the mean time. The pheromones from young larvae help to suppress workers’ propensity to start laying themselves (unfertilized eggs).
2. If you can’t get another queen, depending on time of year you have a few options:
 - a. In early Spring, give them a frame of milk brood and let them rear their own queen.
 - b. In late Summer or early Fall, combine the queenless with queenright hive.

Once Fall starts rolling in, the drone population rolls

out and diminishes. So, queens produced late in the year rarely have the appropriate number of drones to mate with, unless they’ve been “artificially” stimulated in the vicinity (drone comb added to hives).

Now back to our bad experience with queens. Once we realized the queens were no good, we called the producers to see if they would either send more queens or give us a refund. The first year producer did neither. He kept saying that we must have done something wrong because none of his other clients had had issues. HmMMM?? My crew and I have only been doing this for . . . over 15 years! Yet, we did “something wrong” to three-quarters of the queens? This is very unlikely, my friends. And he stuck to that story even after I presented numerous other corroborating complaints about their queens that people I knew had shared with me.

My thoughts of what went wrong center on the idea that we were shipped inferior queens. Whether this happened due to poor grafting techniques (larvae were too old when transferred or not kept at temperature), insufficient mating (too few couplings due to not enough drones in the area or bad weather keeping the queens from flying enough), or poor quality mating (poor genetics

in the local drone pool or low sperm loads), the sale of these queens could have been prevented if they’re performance was properly validated before they were pulled from the mating nucs and shipped. In other words, it has become standard operating procedure for many, large queen producing operations to pull and ship queens simply by the calendar or when they first begin to lay eggs. They claim not to have the luxury of waiting several weeks to verify solid brood patterns due to the

demand of the market. And I do understand, since they are shipping out thousands of queens each week, they don’t have the equipment, manpower, and time to leave queens in their mating nucs for 21 to 28 days after they’ve started laying. But at the same time our research projects, the bees and we suffered the consequences.

Unfortunately, this year wasn’t much better than the year before. Predictably, we spent time wrestling with the introductions of 300 queens. Then the time spent on checking them, requeening when most ended up failing again, and dealing with the unavoidable side-effects such as laying workers, which all contributed to a huge mess and blown project schedules. Regarding the material cost, it’s not just the price of the queens that went down the drain. There is only so much brood available in our healthy hives to set up nucs. Then, if we have to re-supply brood to failing nucs during re-queening, it is very easy to over-tax our base of established hives. Their populations have been subsequently jolted by these interruptions in the brood cycles and many of our hives (as well as nucs) succumbed to the certain demise of small hive beetle and wax moth infestations. Hence, the accumulated



The three most popular queen cages.

costs in dollars, lost time and bee/brood stock is easily underestimated.

Most of the queen producers that I've dealt with over the years have provided good to excellent queens, and, if not, they stood behind their products and rectified their gaffes. Sadly, there are a few bad apples out there who don't see it that way. They clearly put short-term profits above client satisfaction and long-term client retention.

This past month, we ordered queens from Michael Palmer from Vermont and John Jacobs at Old Sol Apiaries in Oregon. Out of the 116 queens ordered, all were accepted and have proven to be good layers. That's

100%, folks! I've used these fellows' queens before, but, understandably, they can't raise queens in Oregon and Vermont in late February to be ready to ship by mid-March. Although, when particular projects call for later season queens, these operations are certainly on our short list of quality suppliers. I just find it interesting, after conversations with each, to find out that both of these gentlemen leave their queens in their respective finisher colonies until they see the kind of brood patterns that they can be proud to sell. I think that this is a key ingredient to successful queen production.

If you plan to re-queen next year, increase your colonies, or you're just starting out, order your queens now. But be sure to read and ask around to improve your likelihood of ordering from reputable producers who not only produce an outstanding product but stand behind their queens. And don't complain about spending a bit more for that "bug". A well grafted, cared for, mated queen that's been laying eggs longer than a day is well worth the extra \$10-20 dollars. Trust me, it could save you a lot of headaches, heartaches, money and TIME, something we all need a little more of.

As a precaution when purchasing queens **ALWAYS** ask the producer if they are participating in the BIP queen Testing Program run by David Tarpy.

See ya! **BC**

Jennifer Berry is the Research Director at the University of Georgia Honey Bee Lab.

All photos taken by Ben Rouse.