



Springtime brings the annual return of bluebirds, dandelions and the plaintive cry of hobbyist beekeepers, “I need a new queen!” In the typical scenario, a beekeeper installs a new package in early April. Everything goes along fine for the first few weeks. The workers draw out comb and the queen lays lots of eggs which develop into fat, healthy brood and happy adult bees. Then one day the beekeeper checks the hive and doesn’t see the queen, or eggs, or young larvae. Yikes! The hive is doomed! I need to buy a queen! Right now! The beekeeper goes on-line and pays \$25 for a queen and \$20 for express shipping. The queen arrives in a couple of days and the beekeeper carefully puts the queen cage in the hive according to the instructions. In a week, the beekeeper checks and discovers that the new, marked queen has been released as planned... and is dead on the bottom board! Yikes! The hive is doomed! I need to buy a queen! Repeat steps above until money runs out.

First let me assure you that there are circumstances when you really do need to replace a queen. However for the sake of your bank account, you need to recognize when you do and when you don’t. It’s true that knowing the difference can be a bit tricky at times. The secret is understanding why you don’t see a queen and then taking, or not taking, action. As L.L. Langstroth advised us, “There are times when the worst thing you can do is ‘something’.”

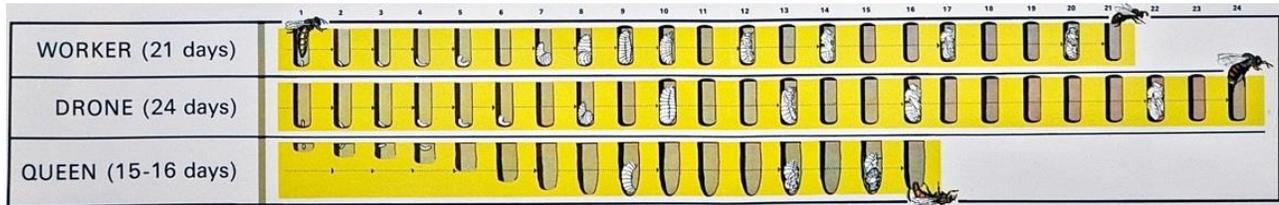
Going back to our typical beekeeper, why did the queen disappear? It is common, maybe even expected, that package bees will replace their queen once she starts laying and the colony begins to grow. This phenomenon has been studied at NC State University and elsewhere. The research has produced lots of new knowledge about queen mating behavior, pheromones, acceptance by workers and so on, but the scientifically-proven reason that colonies commonly replace store-bought queens still eludes us.

Once they’ve decided that they are going to snuff out their mom, the workers will create a new queen. They’ll do this while the old queen is still around, going about her daily duties oblivious to the fact that her days are numbered. The workers may tuck a replacement queen cell in a corner of a frame where it is difficult for the beekeeper to see. The more populous a colony is, the harder it is to find replacement queen cells because they are covered up by all those bees.

When the new daughter queen emerges, the old one isn’t needed anymore so the workers kill her. Sometimes an old queen will be allowed to stay around for a while alongside the new daughter queen, but that isn’t very common, and it isn’t what has happened in our story of the typical beekeeper.

To understand what happens next, we must know some bee math. A queen bee spends 3 days as an egg, about 5-1/2 days as a larva, and about 7-1/2 days as a capped pupa. Once she emerges, she spends a couple or so days getting fit to fly, then makes mating flights on several successive days (weather permitting). After mating, it takes a couple or so days for her to begin laying eggs. So the earliest we can expect to see any evidence of a mated queen (aside from actually seeing her) is about 10 days after she emerges. Depending on flying conditions, etc., it can be later than that. Also remember that eggs are tiny, about the size of a snip from the end of a piece of white thread, so a beekeeper may not see evidence until there are larvae several days old in the cells. It may easily be 15 days or more after emergence before it is obvious that the hive has a new queen. Since worker bee brood is capped nine days after the eggs are laid, if the old queen is killed on the day the

replacement queen emerges, any brood in the colony will be capped before the new queen begins laying. So there will be no eggs or larvae even though everything is proceeding nicely from the colony's perspective.



In the meantime, our beekeeper has bought a fancy new queen and has put her in the hive. The workers don't want or need a new queen – they've already got one in development – so they kill it. And they'll kill the next one too. If a large bunch of workers cluster tightly around the queen cage, acting as if they are trying to get inside and they resist being brushed off, that's a good sign that they have no intention of accepting your store-bought queen. They will kill her when they get the chance.

A similar situation occurs when a hive swarms. In that case, the colony builds queen cells and will swarm anytime after the first one is capped. The swarm will take the original queen and about half of the worker bees off to newfound lands. There will not be any new eggs laid from the time before a replacement queen cell is capped (the old queen ceases laying before she departs) and when the new queen begins laying, as described above. After swarming, it will take 3 weeks or more before there is visible evidence of a new queen in the old hive, during which the hive will not accept a foreign replacement.



What is a beekeeper supposed to do when a hive appears to have lost its queen? The first step is to verify that it is in fact queen less. Examine every frame slowly and carefully, looking for a queen or queen cells (shown in the photo). Don't forget to look on the inside walls of the hive bodies and the bottom board too. If a frame has lots of bees on it, shake them off so you can see hidden queen cells. A virgin queen will be very fast and is much smaller than a laying queen. Depending on the race, the coloring of her abdomen may be more similar to a worker than a laying queen.

If you find a queen, virgin queen, queen cells or recently-opened, empty queen cells, then there is a queen in the hive. You have two options at that point: let nature run its course or destroy the hive-created queen/queen cells and replace her with a store-bought one. If you choose the latter, you must first destroy each and every queen cell, or if there is an emerged queen, search for and destroy her.

If your careful search does not reveal any evidence of a queen or a queen in the making, it is still possible that the hive is in the period between a queen emerging and brood being visible. Wait ten days and check again. If there is still no evidence, take a frame of eggs and very young larvae from another hive and put it in the suspect one. Put a thumbtack on the top of the frame so you can easily identify it. Come back in two or three days and check to see if the workers have begun drawing out queen cells on the test frame. If they have, the colony

doesn't have a queen. You can either let them continue to make a queen on that frame or remove it and install a store-bought queen.

If all of this sounds very imprecise, then welcome to beekeeping! Judging what is going on in a hive takes training and experience, and the learning never ceases. Just when you've got your bees figured out, they change the rules on you, not unlike human children. Keep up as best you can, and have fun doing so.



Randall Austin is a NC Master Beekeeper who keeps a few honey bee hives in northern Orange County. He can be reached at s.randall.austin@gmail.com.

Copyright 2014, no reproduction in whole or in part without permission of the author.