

# Update, Burr Comb, And Breeding Lines

Larry Connor

## *It's Not As Complicated As It Seems*

I write this at the middle of June and I just checked the electronic version of the July *Bee Culture* and boy, it is sure nice to have the fast turn-around that offers me (The e version is released about two weeks before the printed copy), since I can keep current in the real-time world as I work bees and write about it.

In that article I discuss the conversion board and the use of the Doolittle method of making new colonies. That was done in mid-May, one month ago.

The basswood flow is about done, but the sumac and sweet clovers are going strong. The spotted knapweed is a few days away from flowering. There is new honey in all the hives.

### **The new nuc**

Let's start with the new colony, or the new nuc made in mid May. I made it up with one frame of brood, two to three frames of bees, and a frame of pollen and honey. I installed a virgin queen grafted from an instrumentally



*A little over a month after I installed a virgin queen into the new nucleus colony (new nuc) the queen had produced 4+ frames of brood, two like this, and was doing a wonderful job. I personally think this is why so many people keep bees, taking a small group of bees, a new queen, and turning them into a booming colony.*

inseminated Carniolan breeder queen (Tom and Suki Glenn apiary in California). The bees were shaken off the frames at the entrance and the nurse and other bees walked back into the hive, through the hive bodies and through the excluder to cover the brood. The next day I moved the frames to a new location next to the parent hive. Doolittle used this system in his out-apiary as a way to make new colonies and keeping them in the same location. (His *A Year in the Out-Apiary* was published by Root in 1908 and is based on his beekeeping year of 1905.)

Now, just a month later, I am pretty excited about what I found. First, the virgin queen successfully mated and has generated solid brood on four frames of the five in the polystyrene hive. There are eggs in the center of the fifth frame, the food frame. The queen laid eggs corner to corner, and I fished out the iPhone to take the photo of the brood. The queen still has the yellow mark on her thorax that I gave her BEFORE I put her into the introduction cage. She was held in the nucleus for several days and then the plastic cap was removed. This allowed the bees to liberate her, not me. The marked empty cage is still in the nucleus as my record of what I did. There are already new worker bees emerging (because the queen was a virgin, we gained a few days on the mating schedule), and a few days later I moved the nucleus into an eight frame hive body. I could just as easily have split the nucleus, with the new part getting another virgin. Instead I removed one frame of emerging brood to boost another nucleus colony.

### **Last year's nuc**

This is the colony that gave up the new nuc. It is now in three deep 8-frame hive bodies, with pretty good brood strength in the first two boxes, and honey storage on half of the frames in the third box. This is in June, when many nectar flows often start in this region. The weather forecast is for hot days and clear skies, so we should have good nectar as the clovers, sumac and star thistle bloom.

The colony was overwintered in the same polystyrene hive as the new nuc is now in, and grew rapidly over the late Winter and early Spring. It has been a very early Spring and as I write this, Summer is still days away! Here is a summary of what this colony has done:

#### August to March

Five-frame overwintered nucleus with summer of 2011 mated Carniolan queen

#### April

Colony moved to eight-frame single box

#### Late April

Colony given a second eight-frame box

#### Early May

Swarmed, no queen found but two frames of old brood still present. One brood frame was used to make the new nuc.

#### Mid June

The replacement queen (grand daughter of the II breeder queen) has brood in two deep eight-frame

boxes and has taken off. Because this queen is the granddaughter of an II breeder, all her drones are Carniolan (see below), and are useful to boosting the genetics of the area's bee genetics. This is one of the great unappreciated features and benefits of a bee breeding program using instrumentally inseminated queens! The mother queen that swarmed.

### Another new nuc

Because this overwintered colony is doing so well, I made up a second new nuc, removing two frames of brood and a frame of food this time. I will place this hive in the area on my city lot behind the garage. This cycle could be repeated in July and August. I am not sure I want six colonies behind the garage, but using the conversion board and the nucleus, it sure is easy to make up a new colony. I never even needed to find the queen, which is a huge advantage for less experienced beekeepers and on those times when the most experienced beekeeper cannot find a single insect in a box of tens of thousands, or lacks the time to look!

### The package hive

The last hive in the bee yard is a three pound package of bees from California, sold to me as Carniolan. The colony was installed in late April and now is actively filling the second eight-frame deep with new brood and new honey. It has nothing to build on but black plastic comb because there are no more drawn frames anywhere in all my colonies and nucs. (Many are filled with honey that will be given to new nucs as needed for extra food reserves and build up for winter.)

I am not comfortable making a new nuc from the package hive, at least not yet. It has only been six or seven weeks since the bees were installed. If I had purchased new queens for mid-June delivery, I certainly could remove a frame of brood and bees and a frame of honey and pollen, and use it to set up the colony.

Instead I plan to remove a nuc from this colony when I return from several weeks of travel, sometime in mid July. That will give the colony plenty of time to buildup and Winter as a five-frame colony. The package colony will give up these frames of brood that will, be supplemented with a frame of bees, pollen and honey from another hive to produce another new nuc! Leaving most of the adult bees in the package hive lets the them build for the Winter, which as far as I am concerned, is it's job this year.

### Growth and Treatments

Should the season's weather and plant growth continue to be as favorable as it has been I hope to take one overwintered nucleus and one package of bees and build them into strong hives by late Summer. They will have all the food and drawn comb they need for successful wintering. They will need to be sampled for *Varroa* mite populations and treated with powdered sugar or another mite treatment. *Varroa* is what seems to kill these colonies during winter at my latitude – one Ontario survey shows that nearly 90% of the colonies that die during the winter die due to factors linked to *Varroa* mites. We are at the same latitude, so mite control is huge.

*One of our own queens, grafted from Tom Glenn's Carniolan instrumentally inseminated breeder. We mark the virgin queens prior to mating, making sure the queen in the nuc is the one we installed. This does not seem to interfere with mating. This year the dragonflies are taking a toll on bee matings everywhere.*



I am reluctant to use chemicals unless forced into it. If possible the colonies will be sampled (powdered sugar roll does not kill bees and gives good results), and if the mite counts are high I will treat the colonies with powdered sugar twice a week for four weeks. This will expose all the mites in the colony to powdered sugar for over two sealed brood cycles (12 days for worker brood). The goal is to hit the colonies hard with the powdered sugar and reduce mite loads to an acceptable level for Fall feeding and Winter preparations. Should that fail, a treatment with a low-impact miticide will be selected and used.

Now with two nuclei, it seems logical that I could produce three or four more, using the Doolittle method. Generating six nucs for wintering will require good pollen and nectar forage, a good supply of virgin or mated queens, and all the equipment needed. My first new nuc could be split or allowed to grow. One of the amazing aspects of beekeeping is the tremendous reproductive rate of really good colonies with the essential combination of right-aged bees and a vigorous queen

### New queens don't swarm

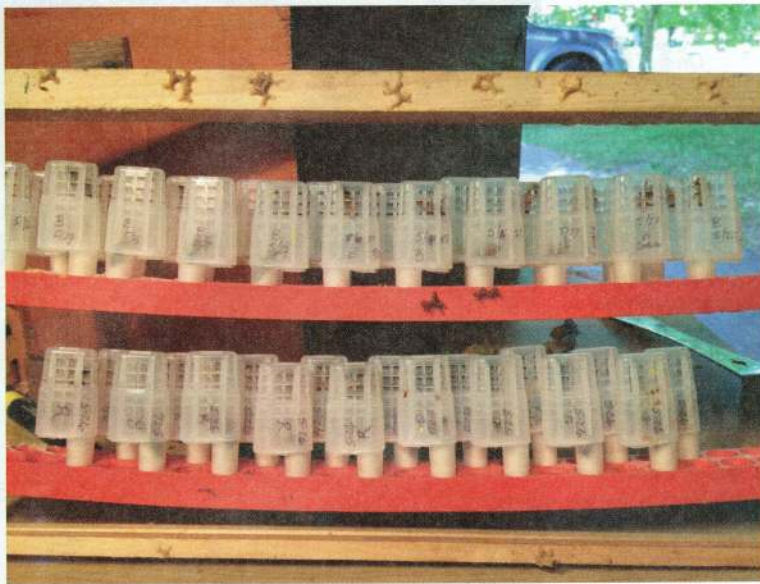
Maybe you were taught that new queens, those less than one year old, do not swarm. Sounds pretty familiar to me. This season my overwintered nuc, and my overwintered colonies (including many at the farm) have disproved this concept. Early hot weather alternated with cool spells to stimulate five frame nucs to swarm. If you left your hive untouched because you believed 'new queen don't swarm' well, they probably did. Like mine.

My queens all have marks on them, yellow for 2012. We keep waiting for someone to catch a swarm or do a cutout with a marked queen heading the colony.

Predicting bee behavior requires some experience and a strong stomach for the unexpected.

### Burr comb and small hive beetles

The warm weather opens the flood gates for small hive beetles and wax moths. Both favor the warm,



We emerge virgins in wood and screen cages, mark them and then transfer them to JZsBZs plastic cages, with queen candy in the tube. So far we seem to have good success with virgins, especially under 14 days of age (post emergence).

humid Summer and Fall days and will explode in populations. With the small hive beetles, I want to share an observation made to me when I visited Hawaii. There the beekeepers were fighting a huge load of beetles. They found that it was very important that all colonies NOT have combs that touched, either each other inside the hive or the bottoms and sides of the combs. This is a pretty good reason to keep the combs trimmed of all burr comb (also called ladder comb as the bees have a continuous link from frame to frame as they climb the comb to the honey storage supers). As I close a hive, or reposition a brood comb or honey super I now check to make sure that every frame is evenly spaced, and I use the hive tool to push the combs toward the center, leaving a bee space along the sides of the box. This also is better for ventilation I am told.

Wherever combs touch each other or the sides of the hive, the female beetles are able to deposit a large mass of eggs that hatch in two days *where worker bees cannot reach*. Colonies with some marginal conditions – poor strength, queenless, or even going through natural queen replacement (supersedure) – will not be able to overwhelm this mass of evasive larvae and the colony will be slimed in a matter of a few days. Since I observed overwintered beetle adults in the Winter clusters of bees this past Winter, I know the beetles are here, and waiting for me to make a stupid mistake. Pushing fat combs of honey together is one of those mistakes. It would be costly if it cost me my hive.

#### Drones from daughter queens

Because diploid queens produce unfertilized haploid sons, these male bees possess only the genetics of that queen, which comes from the queen's mother and single drone father that fertilized the queen's mother's egg. If it seems complicated, I first learned it this way: A drone has no father, but has a grandfather.

When you purchase a queen from a breeder that is naturally mated, she will provide genetically true drones while she is alive, and also when her daughters are

alive. This means you can purchase a naturally mated queen and generate daughters from her that will provide drones for mating in a mating plan, or just for kicks. A simple family tree from my Starline days would look like this. (GH is the queen line and AeF is the drone line. Ra is a random or wild type drone, one you expect to find in nature. NM = Natural Mating, II = Instrumental Insemination).

In the first example we are grafting from a GH breeder queen and naturally mating her daughters to Random drones:

Natural Mating:	Workers	Drones
NM Mother	GH x Ra	pure GH
NM Daughter	GHRa x Ra	pure GH
NM Grand daughter	GHRaRa x Ra	half GH

But when you purchase a queen from a bee breeder that produced the breeder by instrumental insemination, you have an additional generation of genetic fidelity in the drones. Here, two lines of queens, not related to prevent inbreeding, are mated in the lab to eliminate random drones. It looks like this:

Instrumental Insemination:	Workers	Drones
II Mother	GH x AeF	pure GH
NM Daughter	GHAeF	pure GH
NM Grand daughter	GHAeF x Random	pure GHAeF

*Because the initial instrumental insemination used two quality lines and the mating was controlled, you have drones that are identical to their aunt workers of the previous generation.* In the example mentioned above, my granddaughter Carniolan colony (workers half Carniolan) produces drones representing both sides of the controlled mating, and are thus pure Carniolan.

This has a huge impact on the potential for bee breeding and integrating quality characteristics into a gene pool at a very reasonable cost to the beekeeper. **BC**

A queen rearing class will be offered by Dr. Connor in Galesburg Michigan on August 24-26. For further information consult [www.wicwas.com](http://www.wicwas.com) or [LJConnor@aol.com](mailto:LJConnor@aol.com).

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