

# 'Bout a 100 – Sideline Beekeeping

## FACING THE CHALLENGES OF SIDELINE BEEKEEPING - II

Larry Connor

### Where we have been

Last month we started to examine a list of challenges specifically facing sideline beekeepers, which is in truth a list that affects all people who keep bees. I clearly think that sideliners are taking a larger hit with the items on the list, and for a variety of reasons. We discussed various queen problems, and what we can learn from G.M. Doolittle and his work dating back over 100 years.

Here is the rest of the list of items we need to discuss.

2. Bee forage: What and where is it being produced? Is there enough to support my colonies? Or should I plan to feed colonies. And if so, when should I feed my bees? Should I be feeding in the Summer when everything is in bloom? And if so, what with – pollen, sugar syrup or both? And is high-fructose corn syrup really bad for my bees?
3. Honey: It seems I either have too much or not enough.
4. Winter losses: How to eliminate them, or at least get them to an acceptable level.
5. Fear of contamination of the hive and bee products with chemicals used in apiary work and from the environment.
6. Laws, rules and regulations restricting free trade of honey.



*Honey bee forager collecting both pollen and nectar from a sweet clover flower in Illinois. Abundant moisture in 2008 produced a lush growth of sweet clover and other nectar and pollen plants, leading to a very good honey crops. A few years ago these same fields were barren due to a death of moisture, and the honey crop was short. Plants stopped blooming in July and the bees had few resources later in the season.*

7. Neighbors: The Good, The Bad and The Ignorant.
8. Time: How can I manage it better?
9. Beekeeping is getting so expensive.
10. Allergies to bee venom in the family

### Bee Forage & Nutrition

I am amazed at the number of advertisements that have popped up in the last year for supplemental protein feed for bees. It is as if the industry just discovered that Mother Nature does not always provide the perfect nutrition for bee colonies. A significant part of this may be attributed to CCD, and the reflection that previous problems with colony failure, decades ago, were ultimately linked to poor colony nutrition. Beekeepers have forgotten, or never learned, to think of the beehive as a bank. Like many banks, there are days of heavy deposits of pollen, nectar and water, and many days with heavy withdrawals of the nutritional resources stored there as it is consumed for brood rearing. It is also important to remember that when the bank is full, the daily deposits are less important than the overall riches of the hive. Conversely, if the bank is nearly empty the daily deposits of nectar and pollen are absolutely essential for colony survival or the hive may rapidly die of nutritional starvation.

A theoretical colony enters the Winter with adequate supplies of protein (pollen) and carbohydrate (nectar/honey) resources collected the previous season. As day length increases in January (in the northern hemisphere), the colony and queen are stimulated to initiate egg laying even though the outside temperature may be well below freezing, and it is several months before the bees are able to break cluster and fly outside the colony to collect fresh pollen and nectar to replace the resources consumed during the Winter. The food reserves must be located within the area where the bees are growing and developing, in what we call the brood nest. If there are no food reserves, or if they are positioned in an inconvenient location (because the beekeeper moved them), colony growth will not restart and the population may eventually dwindle and die.

In the Spring and Summer months the colony is able to build the size of its banked food reserves and ideally produce many new combs of fresh honey and stored bee bread. Anything that interferes with the production of new bees, their work as house bees and then later as field bees will negatively influence the success of the colony. Obvious influences include brood diseases, virus infections, pesticide exposure, over-treatment with miticides, periods of weather where the bees are unable to forage, and of course mites, both tracheal and *Varroa*. Special

mention goes to *Nosema*, an adult bee mid-gut parasite that weakens queens and worker bees so they are unable to perform normally.

But then comes a dearth, a break in the production of pollen and nectar caused by a dry climate due to lack of rainfall. But there are other causes: If you are a mid-Atlantic beekeeper and you get a major freeze in April, you lose in several ways. First, the flowers that were producing your nectar crop (or were about to) are dead. Dead flowers do not secrete nectar or produce viable pollen. With trees like tulip popular, black locust and basswood, the freeze will stop production for the entire year.

Second, a dearth reduces the bank deposits to the hive, which will be forced to rely upon stored pollen (often from the previous season) and honey.

Third, the cold spell will often cause smaller colonies and nuclei/splits to go into a tight cluster and abandon the brood that is outside the cluster. This shock to the development of the hive means that the bees will be forced to clean out cells of dead sisters AND there will be reduced emergence of new foragers to help grow the colony resulting in a population imbalance. The combination of reduced population growth and frozen forage will overdraw the colony's bank of food reserves, especially pollen. This thwarts growth and may cause some colonies to die. While over wintered colonies are affected, new package colonies – with their absence of a balanced bee demographic – as well as Spring increase colonies, are seriously and negatively affected by a Spring freeze.

A second type of dearth we have seen in the past few years is due to a lack of rain, resulting in a totally dry Summer. Actually, for many folks the drought started in mid-Spring, and the absence of rain reduced normal plant growth and development – the bees had limited forage to visit. If not affected by late freezes, the last nectar many colonies received was from flowers on trees and shrubs: apples, other fruit trees, tulip popular, basswood, black locust and the many sumacs. In Michigan these trees are all done by some date in June. If the land is arid and the wetlands dry up, the clovers, wildflowers, looserstrife, goldenrod and asters are seriously reduced in growth. Because of this moisture failure, the bees will not only *not* produce a crop of honey essential for Winter survival (not to mention the beekeeper's survival), but the colonies will *not* produce adequate numbers of Winter bees that are ESSENTIAL for colony survival during the next Winter and for Spring buildup the following season.

### **Big o' Fat Winter Bees**

If you are raising kids, especially teenagers, you know the process makes you grow old. Any arguments out there? The effort of raising children sucks the energy right out of you. The same is true with bees. Not only does a nurse bee feed on the resources of the hive to raise brood, they must draw on the fats and nutrients of their bodies to produce new bees. This is why old field bees are unable, in most cases, to raise brood very efficiently. So while a colony must have both stored pollen and honey in the hive to feed bee larvae, the nurse bees in the colony must also contain the essential nutrients as well if the brood cycle is to be effective. That is what we mean by Fat Bees – those with abundant food (fat and protein) reserves.

If there is a dearth during the later part of the sea-

*On the farm in Galesburg Michigan in August, the bumble bees were working the start thistle and the large red clover flowers, while the honey bees were working the smaller red clover flowers for nectar and all the flowers for pollen. Red clover will dry up when the moisture fails, quickly turning brown. All the clovers are critical to many colonies for their rich protein-loaded pollen.*



son – July or August on – then there will be few Fat Bees – Winter Bees – in production. There may be some brood rearing, but not as much and the resulting bees will not be as well fed as they should be, and will be inferior as nurse bees. These poorly fed bees – Skinny Bees – are poorly prepared to raise new bees in the Winter and early Spring. If bees are produced, they will also be poorly fed. It is a vicious cycle, and both the bee colony and the beekeeper suffer.

Sideline beekeepers often lack the knowledge to care for this problem. They often work other jobs and have less time to monitor the status of their colonies. Although some sideline beekeepers are growing their operations as their “real” jobs have been put out of business – a common situation here in Michigan with the folks who are/were working for the auto industry. As folk's limited savings and bee income allows, they are growing the number of colonies they own and operate for honey production, pollination and nucleus sales. Yet, they often lack experience and training from people who have been through this before. So they make mistakes. They assume the bees will find food during a dearth only to find dead hives in the late Winter. They take out a second mortgage (if they can get financing) and purchase packages only to lose them to a combination of CCD, queen problems and inadequate feeding. It is not a very good business plan; in fact, it is not a plan for anything but disaster.

### **Fewer Hives, Better Feeding**

So many sideline beekeepers are well advised to slow down and gear back on the size of their operation. Many of the commercial beekeepers have already made this decision – where a single beekeeper once kept 1,000 colonies, he or she now keeps only 600 or 700. By keeping fewer colonies they are able to keep them well fed, better managed and subject to more effective mite control methods. The bay-back will hopefully be a larger production per colony.

Jumping ahead on the list about time and resource (fuel) costs, most beekeepers with a large number of apiary locations know that there are some apiary sites that are not as efficient as others. They may produce a crop of honey in some years, but not in all years. They may



*Honey bee on Fall aster flower in September in Michigan. The fall flowering plants like the goldenrod-aster complex are critical for the development of fat bees full of the nutrients needed for brood rearing during the Winter. Just a few years ago there was no bloom from the asters and goldenrod for a wide area of the country. It may be a coincidence that the first reports of CCD were made following this general dearth. Or is it?*

be the farthest from the home base, or the most time consuming because of the demanding, high-management landowner. These are the yards that should be eliminated, or the site sold to another beekeeper, with or without bee colonies.

Other factors come to mind that can cause a reduction in the size of an operation. Common issues are health and aging, and the lack of help. Like all of agriculture, beekeepers are aging and fewer young people are entering the profession – it's a double whammy for the industry.

With fewer colonies, and hopefully only the best locations, the beekeepers are able to spend more time per bee colony on management, cutting out queen cells to prevent swarming, and feeding bees when they require it. The key here is simple – since they are in the colonies so much they see the problems as they develop. It is not rocket science, but it is good beekeeping.

*Protein feeding of bee colonies is traditionally classed three ways:*

**1. Pollen cakes or patties** – a mixture of real bee-collected pollen mixed with sugar and water to form a cookie dough mixture to put onto colonies in the late Winter and early Spring to stimulate brood development. Supplemental sugar syrup feeding balances the nutritional mix. This is the best way to feed bees IF the pollen is free of foulbrood scale/spores and chalk brood mummies. I only recommend feeding in this manner if you use pollen from your own colonies. There are times of the year I would not use pollen from my hives since I would not be sure that there is not a low level of insecticide



*A honey bee pollen forager on the brood comb of a growing Spring colony.*

residue in the pollen. There are other times when I know that very little is being sprayed, and the pollen collected is fresh and nutritious.

Pollen should be air dried for a day or two, screened to remove debris, and frozen. Unlike the fermentation process the bees use to convert bee pollen to bee bread, pollen from pollen traps has inadequate honey or beneficial microbes added to insure the preservation of its nutrition. Freezing it keeps it fresh. Sideline beekeepers are smart to research the use of pollen traps and a chest freezer.

A variation on this theme is to pour fresh frozen pollen pellets into empty brood combs and work them into the comb with your hand or a spatula. These pollen frames are wonderful for Spring buildup and also for use in queen rearing. When raising queens, why depend on the pollen the bees are collecting, since there are variations every day in their foraging patterns? The addition of a man-made frame of pollen will do what is needed. Because of the risk of wax moths feeding on these pollen frames, only put them into strong colonies.

**2. Pollen Supplements** – are mixtures of natural pollen and some other mixture of protein foods. These may include soy flour, brewer's yeast, and a wide range of specialty yeasts and proteins. The pollen must be from the local operation or treated by irradiation to kill disease spores but maintain the nutritional value of the pollen. The addition of pollen to a diet is a stimulus to the bees to feed. These phago-stimulants are essential to the bees taking the pollen, especially when natural pollen is available. Usually a relatively small percentage of pollen is needed to stimulate the bees to feed.

**3. Pollen Substitutes** – contain no pollen, and are mixtures of only protein and nutrient mixtures. The majority of the diets being advertised fall into this category. A successful bee diet was the Beltsville Bee Diet developed by the late Dr. Elton Herbert from the Beltsville Bee Lab, but it is no longer available. There are other products on the market now that rival that diet. Ask or research yourself to see which works best for your bees, your management style, and your budget.

A key component of all these feeds is sugar. The addition of sugar stimulates feed as well, and it is used by the bees to stimulate brood food production.

### **Feeding During a Dearth**

There is growing evidence that beekeepers must recognize the times when the bees are not collecting adequate reserves, and colonies need supplemental protein and carbohydrate feeding to insure their survival. This feeding of bees from July to October when food deposits are not coming into the colony food reserves – such as during a dearth – should stimulate a colony to produce an adequate population of fat Winter bees, and thus improve the colony's chances of surviving into the next season. **BC**

*Copies of a new reprint of G. M. Doolittle's Scientific Queen Rearing are now available from Wicwas Press. Check out the website [www.wicwas.com](http://www.wicwas.com) for the on-line bookstore. Or write Dr. Connor directly for a copy of this valuable book at 1620 Miller Road, Kalamazoo, MI 49001. [LJConnor@aol.com](mailto:LJConnor@aol.com)*