

TWO TOOLS

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2009 Beekeeping students at the Farm set up two colonies and two nuclei hives. This increases the chance of more colonies available in the early spring when the season really gets started.

Two Valuable Tools Or Possible Problem Areas For Beekeepers.

When my schedule and access cooperate, I am on the Internet several times a day. The landline is quiet nowadays since I rarely use the local phone and the only calls I get anymore on that line are from politicians and wrong numbers. To keep the Email from piling up I like to check email messages several times a day. The key emails are answered, the fluffy stuff deleted, the Re: Re: Re: forwards are never opened and the SPAM is scanned for something it would not pass on to me. It is rare when a message does not make it into the box, and when it fails, it usually has nothing in subject field. As a result I probably miss one or two very important emails a week. I am not happy about that, but I am not Mr. Gore and do not know how to fix this problem. Certainly when I send someone an email and I do not get a reply, I simply resend with a note asking "Did you get this?" Quite often they have not.

No longer do I receive emails or summaries from Internet chat lines, Bee-L and others because of two reasons. First, there are some wrong things promoted on the Internet. Second, some of the writers sure do not like



Queen cell produced by the grafting (transferral) method. Pushed into the side of the brood, it will allow the virgin queen to emerge and reestablish the colony.

being challenged that they may not be right.

Don't Trust the Internet!

After a few months of beekeeper meetings this year and after dealing with four or five thousand beekeepers at those meetings, I observed that many conversations lead to verification of something they saw on the Internet. As a person who writes for the Journals the beekeeper wrongly assumes I know all about the subject they have seen. I should have kept a list this past winter of some of the things people have read on the Internet. It scares me when otherwise intelligent acting people buy into some of the claims made online. They do NO apparent fact checking (until they ask me, and I often know nothing about the subject at hand), and they are very trusting of what they read on a blog or Facebook or other social network.

It is clear to me that some folks do not want to get facts, but instead seek support for their opinions and beliefs. There is a lot of Internet information on the effects of small cell size in controlling *Varroa* mites. The belief system states that smaller cell size creates smaller bees with fewer mites. The science shows, under the parameters of the testing procedure, that there is no reduction in mite numbers when bees are produced in smaller cell sized. So the reader needs to ask a few questions: Did the research work with the same bee population as the folks on line (European vs. African is one example)? Did the folks with the belief system run any scientific tests (hard data vs. experience).

One could accurately argue that I am a scientist, I write for the trade publications, and I write and sell books, and therefore I have a strong opinion on the role of science in beekeeping. But I also attempt to have a solid base within the Art and Craft of beekeeping too. With the books I write I attempt to get others to read the manuscript before I send it to the printer. I want a range of readers, scientists and non-scientists; small scale to large scale beekeepers, chemical users and non-chemical users, etc.

The reality is that I use the Internet all the time for



March (2010) nucleus colony at the Farm in Galesburg shows several frames of bees and partial brood. Frames of honey are added to a second box to insure survival into mid Spring.

my own fact checking, for further information on subjects I do not know, and for other uses. The difference is that I attempt to sort out the opinions (and rants) from the facts. I read many entries in Google and other search engines on a certain subject and often find research on the topic to review and digest. I am a fan of the new Extension website eXtension.org¹ compiled by Michael Wilson at the University of Tennessee. As an old Extension guy myself (Ohio State Extension Entomologist, 1972-1976), it is my opinion that this is one very excellent use of the shrinking resources at State Universities with a huge tradition of Extension Education and Outreach.

Set Up and Keep Nuclei All Year

This Spring I am asking my new beekeeping students to set up and manage a four or five frame nucleus hive as part of their first year training. This may seem to be an advanced beekeeping technique to some readers, but the more I have worked with the new generation of newbie beekeepers, they both want and need this experience the first season of keeping bees. My big fear is that beekeepers will set up a nucleus hive and NOT have success with them because they expect the bees to make a queen and rapidly produce a booming increase colony. Let's check the math on this. Here is a chart showing the time from nucleus setup to the appearance of the first eggs and the first emerging worker brood. The chart shows the pros and cons of using nuclei in ANY operation, small scale or large scale.

No queen is introduced. Bees are forced to produce a queen from the larvae given on brood frames. The table nicely shows the differences in time for various methods of getting a queen into a colony. It shows the slowest method, that of letting the bees raise their own queen from larvae provided on the brood frames. In this method beekeepers take brood frames covered with bees from a strong colony and do not move or add a queen, thus forcing the bees to make a queen from the proper aged

¹http://www.extension.org/pages/Bee_Health_Update_2.2_February_March_2010 In this issue: 32 new pages to Bee Health at eXtension.org! *New Content Category: Basic Beekeeping Techniques *Bee Anatomy Illustrations from Snodgrass and Nelson *CAP updates *Multi-State Research Updates *Examining colonies for Nosema *Native Bee Profiles *New FAQ's *Review Process

eggs on the comb. These eggs are often zero to 36 hrs post hatching. In this system, the time from set up of the colony to the emergence of the first daughter worker bees produced by this queen is at 37 to 42 days (six weeks). That means that if a colony was set up without cells on June 1st, it would be July 11-14th before the first brood would emerge! True, this may be acceptable for beekeepers wanting to make up Summer increase to overwinter, but the risks are huge. There are many things that can go wrong with a colony in 51 days, from starvation to small hive beetles. Also, the bees must produce a queen from the larvae given to them and produce her under the conditions of the colony. If there are no young larvae they may produce a queen from an older individual at her limits for queen production, and then not have adequate bee numbers for quality queen production.

Combine Nucleus with a Laying Queen to a Colony Needing a Queen

The opposite extreme of letting a colony raise its own queen is to add an established laying queen from a nucleus, or combine the two or three center frames of the nucleus, the frames holding the queen and her brood, with the colony. Some layer newspaper between the frames, while others smoke and syrup the colony so the bees are busy taking up syrup when the frames are combined. The outside frames of the colony receiving the nucleus are removed (or any undrawn or empty frames). Whatever was wrong with the queen in the colony, it is highly likely the new queen will fix the situation. Of course, if the old queen is still alive it is absolutely essential that she be removed to prevent any biological confusion and bee losses.

As the table suggests, the advantage with this system is to provide an immediate replacement queen for a colony that suddenly loses its queen or it needs to be replaced. Queen losses inside strong colonies are common in the late Spring and Summer months, and indeed are undoubtedly part of the natural cycle of the hive, where the old queen produces daughters and one of them takes over the hive. Other reasons for a beekeeper to replace or restore a queen include:



In May 2009, this nucleus colony was ready to replace a queen that failed during the season. This colony was then overwintered.

Stage of queen introduced to the Nucleus	Days as larva	Days as pupa	Days as a Young Queen Up To Mating	Days To Start Laying Eggs	Days For Worker Bees To Emerge	Total Days To New Brood
No queen is introduced. Bees are forced to produce a queen from the larvae given on brood frames	1-3	5	7-10	3	21	37-42
48-Hour Old Queen Cell	1	5	7-10	3	21	37-40
Newly sealed swarm cell			9-10	3	21	33-34
Ripe Queen Cell (one day to emergence)			8-11	3	21	32-35
Virgin Queen			2-7 ²	3	21	26-31
Mated Queen Introduced in Push-In Type Cage				3	21	24
Combine Nucleus with a Laying Queen to a Colony Needing a Queen						0

Presence of chalkbrood, sacbrood and European foulbrood
 Accidental injury of the queen (dented abdomen or thorax)
 Accidental death of the queen
 Increasing defensive behavior – stinging, helmet hitting, etc.
 Queen is not up to the standards of the other colonies in the apiary.

Bottom line, instead of waiting several days or weeks for a queen to arrive and be installed into the colony, a laying queen in a nucleus is one of the fastest and safest methods I know that will continue the productivity of the hive. Old school beekeeping teachers recommended that every beekeeper have one nucleus for every 10 hives, but I strongly encourage all beekeepers maintain one nucleus for every hive up to five, and then two or three for every five to 10 hives beyond that.

Natural Timing for Nucleus Set-up

Many colonies, even new packages and installed nuclei, instinctively produce queen cells during the late Spring season. Timing of nucleus building to coincide with the swarming season ideally uses abundant brood, young nurse bees, stored food frames, and naturally produced queen cells as the basic components of Increase Nuclei. Failure to remove queen cells often leads to a 50-60% reduction in the population of worker bees when the swarm leaves the colony. Using the queen cells in the colony is moderately controversial since it is possible to select for the swarming tendency over a number of generations of doing this. But most beekeepers know it is better to use a well-produced, large and vigorous queen at the peak of the season rather than any other queen. Ultimately the beekeeper has the option of replacing the queen with another bloodline. If the Nuclei Increase colonies are made

up in late May, they can be requeened a month or more later after the queen has mated and has reestablished the brood nest.

Remove two to five frames of sealed and emerging worker brood from each colony – the number of frames of brood will determine the strength of the colony in less than a month. Brood frames can be combined from different colonies to make them stronger. The nurse bees on the frames should not be removed, but moved with the frames of brood. To reduce the swarming instinct, make sure the frames you remove have the swarm cells on them. Do not move the old queen. If necessary return to the parent and increase colonies to check for the old queen. The colony with new eggs five days later holds the old queen!

Nuclei hives may be kept in four or five frame boxes. Additional nucleus boxes and frames may be added as the colony grows. These may be split and brood removed from as the Summer progresses. As queens are needed from the nucleus restore the missing frames with at least some brood and add a queen, virgin queen, queen cell or a 48-hr cell. If you are not producing queens yourself, you can dequeen a top quality colony and let them raise queen cells, and remove frames to restore the nuclei. The old queen can then be re-introduced into the original colony.

Nuclei are wintered in most of North America as Increase colonies. Increase Essentials covers this topic in detail. **BC**

Interested in Queen Rearing? Check www.wicwas.com for classes this summer offered by Dr. Connor. And pick up a copy of Queen Rearing Essentials from that website or your very most favorite bookseller.

²If a virgin queen is newly emerged, expect a delay of 7 to 12 days prior to mating. For a queen one week old, expect only 2-4 days if the weather cooperates.