B-PLUS
BEEKEEPING REPORT FROM MICHIGAN STATE UNIVERSITY
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Apistan® QUEEN TAB REGISTERED

Zoecon has received permission from the EPA for the use of Apistan Queen Tab (AQT) by commercial queen producers. The AQT contains one percent Fluvalinate, and when placed in the queen shipping cage offers effective control of varroa mites during transportation. The tab releases enough chemical to kill the mites but not the queen or her attendants. The queen arrives certified apparently free of varroa.

TALES FROM THE LONESOME HIVE

The Queen is dead. Long live the Queen. The Queen is dead. Long live the Queen. No, the printer didn't get stuck. It is just that the L.H. had two supersedures. One of those unfortunate things that **CAN** happen to a hive.

I told you that I was very impressed with the hive. It had good production last year (in spite of the drought), and it is very gentle. Thus, this year I decided that I would raise a few queens from the hive to breed from at the MSU apiary. So I took my grafting needle out to the house and grafted a couple of bars of cells. I thought that I had better remove the queen and put her into a nuc as she was more than two years old. However, I waited for a couple of weeks and then when I returned they had superseded her. The young queen was out and looked quite good. Well, I philosophically decided that I would find out how well the traits were passed on, or how well the stock was in general combining ability. I checked the colony a week later and things looked normal. However, when I checked again in a week or so, the queen had been killed and more cells were present. This sometimes happens to young queens. The disturbance of the examination will cause the bees to "ball" the queen and kill her. I have opened colonies where I knew there were young queens and have had the bees ball the queen as I watched her. Sometimes they have killed these queens before I could separate the queen from the bees.

The lesson here is quite complete. May is the wrong month to lose a queen, especially two of them! This is the major reason for requeening on a regular schedule. Half of the colonies each year. If I

had been on that schedule the queen would have been replaced when I was grafting the cells. As it turns out this has been a banner year for honey in my area. The colony should have produced 150 to 200 pounds of honey. Now it may make some fall honey, but it missed the main flow. A colony can not miss even a week of no brood during the buildup period of the spring. In this case it missed approximately three weeks. Comes the beekeeper's cry..."**Wait 'till next year".**

GOOD NEWS AND BAD NEWS ON THE VARROA FRONT

First, the bad news. Varroa mites have been found in colonies in Michigan, and there are apparently colonies being killed by these mites just south of us in Indiana. I was sure that this invasion was inevitable from one direction or other. My graduate student, Walter Boylan-Pett, has been studying the drifting from colonies that are moved for pollination and the distances that bees will move from colony to colony are impressive. With a state like ours that has so many colonies moved for pollination, the homogenization of these pests will be rather complete, and rather quickly. It is time for all beekeepers to be on the lookout for these pests. The simplest way is to examine the drone brood. If there are no cells between the hive bodies when you separate them, then use a cappings scratcher to pull several white drone pupae out of their cells. The varroa mites will show up as quite large brown spots on the white larvae.

Now the good news. A team of researchers from France reported in the journal *Science* that they have found the chemicals that attract the mites to the larvae, where the mites then reproduce. There are three esters of simple fatty acids that are causing the mites to move to an open cell. The esters are found in greater quantity in the drone larvae than in the worker larvae, and the odor is used by the mites to go to the drone cells. They prefer the drones since they have a longer brood cycle, and thus allow the mites to produce more offspring. It appears that beekeepers could use these chemicals to not only survey for the mites but also to trap them.

It is research such as this that can really make progress in control and understanding of the mite. It would seem to me that by using a gas chromatograph, geneticists will be able to select for those colonies that have drones that produce more of these chemicals than others. If we can direct the mites to feed only on drones such as they do on their original host *Apis cerana*, the pest would be only a mild problem. Most colonies would not miss 50 or 60 percent of their drones. The thing we need to avoid is putting pressure on the mites to change in the wrong direction, such as when we pressure them by exposure to pesticides. Then the result is mites that are resistant to the pesticide. It may be that we will have to also select the worker bees to have a shorter brood period, as well as having the drones be more attractive. But the important point is for the mites to have a place to reproduce. If we do not provide a place for the mites, e.g., moving onto drone larvae, then the mites will adapt anyway - probably not as we would like.

Along a similar front, Dr. Roger Morse, of Cornell University, has imported queens from England into an isolation room. The purpose is to raise queens from the imported stock and to use the offspring to test for resistance to the tracheal mite, *Acarapis woodi*. Some may remember the chart from *B-Plus* No. 4 that showed the decline in tracheal mites in bees in England and Wales from 1925 to 1980. The infestation rate for tracheal mites is now under 10 percent of the bees. The rate was over 60 percent in 1925. If

the stock that has been imported have the genes for resistance to the tracheal mites, then we can begin to incorporate this resistance into our bees. By bringing the stock from England we should be able to shorten the time interval until we have resistance to this mite. Our bees have shown some resistance to the tracheal mite, but not the level that has been naturally selected in the European bees.

SHOULD I GO INTO THE POLLINATION BUSINESS?

The answer should be yes! But it may be a qualified yes. Certainly there are many things that you must consider if you want to enter that aspect of the bee business. Moving bees can be hard work and you certainly don't have regular hours. However, in a recent survey of commercial beekeepers it was very apparent that the most successful were those that had pollination as a major part of their business. The reason these beekeepers appear to be more prosperous may be the result of more than just pollination.

First, let us look at some of the reasons that you should go into pollination. By being a pollination agent you become linked to an important agricultural process. Even if you are a small beekeeper you can become an important advisor, or consultant, in the production of fruit, seed and vegetables. This role as an agricultural consultant should not be ignored. The survival of beekeeping may be dependent upon that role. Pollination gives the beekeeper a constant source of income, providing that you charge a sufficient price per colony. Some beekeepers have left the pollinating business because they could not make a profit. However, understanding the **real** costs of pollinating is a major error of those who undersell the service. Those beekeepers that tool up for pollination with proper moving equipment, e.g., fork-lift loaders, can use this equipment to advantage for timely moving of apiaries to better locations. In essence, the beekeeper that moves into pollination with the proper tools is in a good position to become migratory, at least to a limited extent.

Now for some of the problems with going into the pollination business. First, there is a real cost of moving bees in a timely manner. This means palletizing the bees and purchasing a fork-lift to move the bees onto a truck. The truck would have to be larger, in most cases, and therefore more costly. The apiary locations may have to be upgraded to be able to use a fork-lift.

I commented above about moving bees in a timely manner. Thus, the beekeeper has to be able to move bees upon a short notice. Moving bees usually means night time work. Moving bees in the dark also usually means more stings, and the colonies will lose more queens. The colonies may be exposed to more pesticides. Finally, the moving of colonies probably will shorten the effective life of the equipment.

About this time you are probably saying that there seems to be more negative aspects than positive ones. That may be true except for the one most positive item. The steady, regular income from pollination. The economics are hard to refute. With the national average price per colony used for pollination at $26 in 1988, a beekeeper would have to produce nearly 50 pounds of honey for the same gross income. There are more costs associated with pollination, but the point is that you need much less honey per colony to break even. How much less would depend upon your fixed and variable costs.

There are some intangibles associated with being involved in the pollination side of beekeeping. I think that the beekeeper must have the colonies in better shape early in the season in order to use them for pollination. This may call for stimulation of the bees through pollen supplement feeding or other manipulations. The net result of this early management is that the colonies are in better shape for the honey flows that follow as well. Maybe it is that getting the bees ready for pollination, as well as moving them, makes the beekeeper more aware of the colony's needs. There is also the aspect of the beekeeper-pollinator knowing more about the plant species important to bees. In any event, it seems to me, that by providing a pollination service the beekeeper becomes more complete.

In a survey of beekeepers around the nation last year I was surprised to find that over 45 percent of the colonies were used in pollination. This high figure may have been the result of the sample that I took, though I would like to believe that it is representative of the commercial beekeepers. If we compare that to the figure from Michigan of about 35 percent, it makes beekeepers here somewhat low. And this is in a state where pollination of fruit is very important! I can only guess that there should be more bees moved for pollination, or that most growers are getting free pollination.

In that regard, with the advent of the parasitic mites, the number of feral colonies will certainly decline. The story from Europe is that **all** un-managed colonies die from the effects of *Varroa jacobsoni*. This means that without chemical control of the mites these colonies die out. Current estimates indicate that about 50 percent of all honey bee colonies are wild, or feral. Thus, if this half dies, the number of bees available to give free pollination will decline. This should increase the demand for managed colonies for pollination service.

In summary, by including pollination as part of your beekeeping operation you become a vital cog in an important agricultural service, you stabilize your income, and you often become better managers of your bees which leads to more honey production.

FALL FEEDING

A nice sugar feeding study was done more than 40 years ago by C. Ribbands in England. He found that concentrated sugar syrup (66.7%), fed to colonies of honey bees in the fall, produced about one-third more stores than the same weight of sugar fed as dilute syrup (38%). The elimination of each pound of water probably required 4 to 5 ounces of sugar.

Concentrated syrup encouraged brood rearing more than dilute syrup, so the loss of sugar due to feeding dilute syrup did not relate to increased brood rearing.

Feeding concentrated syrup in mid-September gave about 10 percent more stores than feeding an equal amount in August. The difference was attributed to a greater stimulation of brood rearing by the earlier feeding. Feeding with concentrated syrup in mid-September produced at least 11 pounds of stores for each 10 pounds of sugar fed. Syrup of 67 percent sugar content may granulate in the feeder; it is better to feed a 64 percent solution produced by dissolving 20 pounds of sugar in 4 1/2 quarts of water.