



B-PLUS

BEEKEEPING REPORT FROM MICHIGAN STATE UNIVERSITY

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VARROA APPEARS TO INFESTS MOST OF MICHIGAN

The pattern of spread of varroa mites looks almost exactly like that of the rapid expansion of tracheal mites with about a two year delay. There are probably some locations, even some counties that are still free, the movement will surely continue until every apiary and colony in Michigan is infested.

A year or two ago I predicted that varroa would spread in a manner similar to the rapid growth we saw with the tracheal mite. There are several factors that contribute to this rapid spread. First, let me say that if honey bees were totally wild and not managed by beekeepers the spread would be just as complete, it would just take a few more years for the mites to reach the most remote regions of the state. But beekeepers do buy queens and package bees, they do move bees for pollination purposes, and they do migrate from one area to another. All of these factors helped contribute to its spread, along with the fact that bees have a large foraging range, have a large number of foragers in each colony, rob each other's honey and drift between colonies and apiaries.

You may ask, "What effect does treating with Apistan[®], or Mitecur[®] strips have on the spread of varroa?" My answer would be probably very little! It turns out to be somewhat of a numbers game. Since there is no perfect pest control, transmission still goes on regardless of the chemical treatment. For example, the very best pesticide treatment would control 97% of the mites. Often less, but for this example we will use that figure. If there are only 30,000 bees within a colony that would leave 900 bees with mites on them, and 300-500 foragers with mites. We also have data that indicate that as many as 5% of these foragers will drift **between** apiaries. That means between 15-25 mite infested bees from each colony within an apiary will be contaminating other apiaries. Thus, it would appear that treating colonies with a pesticide might reduce the level of initial infestation, but not the percentage of apiaries, or colonies, that get the mites via this route.

We can expand the problem of mite transfer if we consider the large number of colonies that are moved for pollination each year. There are approximately 30,000 colonies used for blueberry pollination. In some areas there are fields and apiaries within ¼ mile of each other. Their bees mix via drifting. Then

they are moved back to their permanent locations and some foragers drift again. It doesn't take very long to homogenize any such problem within the state.

The large number of colonies that died because of tracheal mites did not help keep varroa out either. Beekeepers needed to replace their losses with queens and/or package bees. I suspect that there were many cases where queens and packages that were "apparently" free from mites were not. You can not blame or condemn the package shipper either. If the system is not able to detect the mites then the shipper is given a permit to sell the bees. In this case the number of false negatives was probably quite high. Most sampling methods are only able to check a portion of the population, or have a fairly high "error" rate. If a package shipper had a 1-3% infestation rate most sampling methods would miss detecting the presence of varroa mites. It doesn't matter if the number is small - it only takes one mite within a package to contaminate a colony, and subsequently the apiary, and eventually the state.

Varroa is now here for everyone's "enjoyment". We now need to get on with the serious business of managing this pest.

Miticur[®] SECTION 18 ENDED MAY 30TH - WILL RETURN?

The six-month window given Michigan's beekeepers to use the Miticur strips ended on May 30, 1992. The time frame given to beekeepers was not very favorable. The six months ran from October of 1991, yet the material was not available until mid November. Thus most beekeepers were not able to try the strips until this past spring. The real test will come this next winter if the number of colonies that die because of mites is reduced.

The other problem associated with the strips was that the packaging was intended only for larger beekeepers. (The package was for 100 colonies.) Smaller beekeepers were able to get together and split up the large number of strips, or were able to buy smaller amounts from dealers.

About the time we were expecting a General Use registration in June, Nor-Am Chemical Company sold a portion of their business (including Miticur) to Hoechst-Roussel Agri-Vet Company of Somerville, New Jersey. Representatives of Hoechst-Roussel now indicate that a backlog of applications at the Federal Food & Drug Administration (FDA) will prevent a general use registration of Miticur until about the end of the year. So in the meantime we have re-submitted an application to FDA for a Section 18 emergency registration for this fall. At this time I can't tell you if, and when, that application will be approved. Hopefully not like last year when the application was approved too late to be used in the year.

SWARMS ANYONE?

We only had about 10-20% of the phone calls here at the Department of Entomology regarding swarms compared to last year. It did not seem to be a hard winter -if you did not consider the effect of mites. It was not a very good spring, however. It would seem that our prediction of a reduced feral

(wild) population of honey bees may becoming true. The effect (if our assumptions are correct) is about a year behind what we initially expected. Last year we estimated that the feral population was only down about 15% from the numbers seen in 1989 at the Trevor Nichols Experiment Station located near Fennville, Michigan. It looks like we should have waited until this year to have done our study. If the population is down, pollination will be affected, and honey yields could go up.

TALES FROM THE LONESOME HIVE

And a tale it is! The colony came through winter in apparently very good shape. I had checked them a couple of times during the winter, but the first real check came the first week of March. During that very warm weather we had then I examined the colony and was very surprised to see three hive bodies full of bees. Lots of food and began to worry about too many bees - again. I fed them with a pollen patty and then worried because it then became so cold for so long. I was able to check them again the first of April and everything still seemed to be very good. Then on the first of May I returned to decide how I was going to manage such a strong colony through the swarming season. Much to my chagrin I had the queen and about 500 bees. The rest had all absconded and left 5-6 frames of brood un-attended. Tracheal mites had finally caught up with the LH.

With the cold nights we were having the first of May the brood was all dead. I still wanted to try and save the queen. I think there are some good genes in this stock. So I cut the hive size down to a nuc so they did not have to warm a very large cavity, and started trying to nurse it back to health. About two weeks later I found a small swarm that I joined to the hive. This was done by putting the swarm above a double screen division board that I often use to produce queens. After about a week I went into the swarm, killed the queen, and united the two colonies. As of last week (Mid July) they were doing quite well though they had not yet stored any meaningful amount of honey.

The interesting thing to me was how late the colony had absconded - it was some time after the first week in April. Really too late to plan on replacing the colony with a package of bees. Why do the bees just leave? I was talking to Dr. Gordon Waller (retired from the U.S.D.A.) right after the bees had left. He said they had a hive with continuously recorded weight and that 20,000 bees had left within one hour. You could see them walking across the desert. One idea that he suggested was that the adult bees have the parasites and by all leaving at once the brood left behind could emerge and the colony would be essentially free of mites. The trouble with bees in the north is that the brood then dies because it is too cold. In the tropics (where bees probably evolved) the technique makes some sense. I have seen nucs abscond because of poor conditions; too hot or not enough food, etc. I have often heard of swarms placed into hives that have left because of some condition they didn't like. Maybe they have more sense about the problem than we have given them credit for. Now if we can get them to abscond in June maybe we can

clean up the whole country! The LH certainly absconded much later than has been common with most colonies over the last few years.

PESTICIDE MISUSE AGAIN HITS MICHIGAN HONEY

On July 28, 1992 the AP News Service carried a story on the use of Taktic[®] in the beehives of Michigan and thus contaminating? honey. The difficulty in trying to counteract such stories can not be under estimated. It does not matter that Taktic strips is the same material as Miticur^(R), (10% amitraz) and were purchased because they were cheaper than the strips sold to beekeepers. What matters is first, it is against pesticide laws, and secondly it can seriously hurt the honey industry.

Lets look at the U.S. and Michigan pesticide laws regarding the use, or misuse of this product. We were allowed under a special exemption (Section 18 of F.I.F.R.A.) to use Miticur for the control of tracheal mites. This exemption was for the period October 3, 1991 to May 30, 1992. This was the **only** registered product labeled for this use. All other products are illegal and their use subject to a fine. In this case it may be difficult to determine if the product was Taktic or Miticur since they are probably the same material. And it was unfortunate that Nor-Am Chemical Company decided to sell one so much cheaper than the other. The problem comes in that the use of any other material (or formulation) is illegal under the guidelines of the law.

Beekeepers complained for years about the misuse of insecticides that killed their bees. Poisoning of bees happened sometimes because of misuse; spraying in high winds causing drifting onto non-target crops, etc. We can't expect the rules of F.I.F.R.A. to work for us in one case and not another. Just because we do not see the logic of some rule does not excuse us from not following the intent of the law.

I realize that beekeepers are in a real economic and management squeeze. I have been studying the economics of the industry for some years. The mites have also been taking their toll of colonies the last three winters. I can then see how easy it would be to take a less expensive route (Taktic) to control these pests. I guess we have to look at the long-term picture. We may save our colonies (or business) only to lose the market of our product, which will cause us to go bankrupt just as surely. All beekeepers, either directly or indirectly, depend upon the good name of honey. We have sold this product for centuries as pure and wholesome. We can spend all the money we want to advertize honey and with one bad story and we will spend years trying to win back our customers. Consumers do not have to buy honey. It is not a required dietary supplement, and they can switch to any other similar product, such as jams or jelly.

Beekeepers have always been great experimenters. Some of that behavior is good. I think it may help us over some of the trouble that we are now experiencing. But please, don't use unregistered chemicals on your colonies, unless it is a couple of colonies that are clearly marked and the honey is never used. The temptation is very clear. For example, we have the alternative chemical for mite control - formic acid. It has been tested by U.S.D.A. scientists and shown to be effective. Formic acid is even found in **trace** amounts in **some** honey. It is relatively cheap. However, it is not a registered chemical. If you want to do something, call your congressman and ask them why a chemical is not registered. Explain

why the industry needs the product, and ask them if they can't expedite the registration process. This will do more to help the industry than anything else.

NATIONAL HONEY BOARD INTRODUCES PRIDE PROGRAM

The NHB sent me a video tape and also an information packet on this new program. It is certainly in tune with the above story. By participating in the program, beekeepers will show their commitment to the safe beekeeping and honey handling practices that contribute to honey's image - an image as a pure and natural product. These educational packets are available to any beekeeper by writing to the NHB, 421 21st Ave. #203, Longmont, CO 80501, or call (303) 776-2337.

It is important that beekeepers take pride in their product. This means that you take special care in removal of the honey from the colony, and in extracting. Equipment should be cleaned regularly with hot water, or steam. For example, would you be willing to let the TV crew from 60 Minutes film you while you are extracting your honey? Would the national audience that watches the show buy your honey? Think like a very concerned consumer when you are dealing with any food product. Lets work together to preserve honey's golden reputation.

VARROA AND TRACHEAL MITES NEED MANAGEMENT CHANGE BY BEEKEEPERS

I suspect that the two parasitic mites are going to cause more changes in beekeeping management than almost anything in recent memory. Antibiotics have effectively controlled diseases. If a beekeeper uses Terramycin carefully and completely the foulbrood diseases are essentially eliminated from the colony. With a regular prophylactic treatment a beekeeper probably does not need to examine a colony very carefully. This will not be the case for mites. They are **NOT** eliminated by using a chemical strip. Their numbers will be reduced, and the amount of reduction will be dependent upon how well the treatment was conducted. Careful monitoring will now be needed. You should have to only treat once a year, but if the treatment was not effective you may have to treat again. Only by examining your colonies regularly will you be able to know. The Europeans said that honey production went up after varroa came - better beekeeping management was given as the reason.

CHALKBROOD - ANY HELP?

On my most recent quick trip to Taiwan I was confronted with a real dilemma about this disease. I have always thought of chalkbrood as being most common in cool, wet spring weather. When summer and the honey flow the disease almost disappears. This was not the case in many apiaries in Taiwan. We were in mid summer and quite hot (95° F.) but I had never seen so much of the disease in a comb. What may be the most important thing about the cause is stress within the colony. Stress caused by too few

nurse bees for the amount of brood, maybe lack of sufficient pollen for building the brood-food glands of the nurse bees, or other similar problems. It was still humid so that part of the formula seems to hold.

In discussions regarding the problem with Dr. Shu-Young Chang, and the rest of the staff of the Taiwan Apiculture & Sericulture Experiment Station, the question about chemical control came up. The more I thought about a fungicide being used to stop chalkbrood the more I began to realize that for many beekeepers that would mean almost constant treatment. Chalkbrood is spread by airborne spores and an apiary must be saturated with them. The answer to control of this disease has to be resistance. If we can't have the fungicide treatment in the colony on a constant basis then control will be almost impossible. Is there resistance out there? Yes. At least I think there is some. It is possible for every beekeeper to select for hygienic behavior. This is the ability for bees to uncap and remove dead larvae (or pupae) from the cells. The way to select for this trait is by using the frozen-brood technique of Dr. Walter Rothenbuhler. He cut an approximately 2 to 4-inch square of sealed brood from a comb and froze it overnight. He re-inserted it into a comb of the colony to be tested. Then watched, on a 24 hour basis, to see how long it took the bees to uncap and remove the larvae. A good colony will do this in 24-48 hours. Once you have these genes in your stock they should remain with moderate attention to selection.

Hygienic behavior is probably not the only resistance mechanism available. I have some meager empirical evidence that other resistance genes are out there. It should be possible to select for these as well. With genetic resistance the bees will be constantly controlling chalkbrood and you will not have to be concerned with the development of some "magic" chemical to do the job.