



# B-PLUS

BEEKEEPING REPORT FROM MICHIGAN STATE UNIVERSITY

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**No. 17 Winter, 1990**

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## **PESTICIDE(Apistan®) CERTIFICATION PROGRAM?**

Plans currently are that all beekeepers that wish to use Apistan<sup>(R)</sup> strips for the control of varroa mites will have to become certified by passing a pesticide applicator exam. This exam, and training materials, will be developed by the Plant Pest Management Division of the Michigan Department of Agriculture. The plans are now to have this exam and certification to be specific for beekeepers. If a beekeeper already had a private applicator license then this exam would not be necessary. Under the rules developed from the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), in order to use a restricted-use pesticide an applicator must be certified (licensed) before the material can be purchased and used. Fluvalenate, the pesticide in the Apistan strips, is a restricted use pesticide. Currently, the strips are being used under a Section 18 (Emergency) use and are applied under the direction of MDA, Plant Pest Management personnel. Further instructions as to the availability of training materials and the location and times of the exams will be upcoming from MDA.

Generally, the goal of these certification exams is to ensure that pesticides are used safely and in accordance with the label. Concerns are directed at knowing when a pesticide can be applied, proper disposal of used containers, etc. Beekeepers have generally been the recipients of the benefits of this law. Proper pesticide use has helped control the poisoning of honey bees on crops and on non-target crops. Now the shoe is on the other foot. We will probably need to use chemicals to control varroa for at least some period of time. We may find resistance to tracheal mites rather soon, but will probably be some time before that is true for varroa.

## **WINTER FEEDING**

Time to put on candy boards. Information on the making of these boards was given in B-Plus No. 3. Essentially, you make fondant candy and pour it into the boards before it sets up. These boards are then put over the top frames of the colony. When the bees reach the top they can use the candy. Before it warms up enough for the bees to move to the outside frames of the colony these boards allow the colony to get enough food to survive.

## VARROA MOVEMENT THROUGH EUROPE

Many of you may have seen this map, in one form or another, in recent publications. I reproduce it here to point out an important lesson that this map give us...the inevitable progression of this pest. The movement was sometimes helped by man by moving it to a new location. However, it would have continued without that extra help. In the U. S., or Michigan, the pattern should not be much different. We probably have more migration due to pollination. We certainly sell more package bees and queens than they do in Europe. Therefore, you will probably have varroa mites earlier than if the pattern of movement was similar to Europe. There were several man-aided jumps of the varroa migration, though it kept right on moving in those areas where no help was given. Walter Boylan-Pett, a Ph.D candidate in apiculture, has some new data that helps explain that rapid movement. He has found a significant amount of long-distance drifting. This is especially true when the bees have been moved, such as during pollination. He will show you some of this data at the ANR WeekBeekeeping program.

Now that *Varroa jacobsoni* has been found in Michigan, it is important for all beekeepers to monitor their colonies for the presence of these parasites. Often colonies will place drone brood between the hive bodies, and this brood is exposed when they are lifted apart. Be sure to always examine these pupae. Varroa mites prefer to lay eggs on the drones. The dark brown mites are easy to see on these exposed white pupae. You can also remove drone pupae from sealed cells by using a cappings scratcher. Just poke it into the tops of the arched caps of the drone cells and pull several of them out of the cells. It will probably be a little while before some of you see mites, however it is important to keep looking. The mites are much harder to see on an adult bee since their brown color is similar to the bee.

## TALES FROM THE LONESOME HIVE

With the warm January that we have had, I took a quick look at the hive. Often at this time of year I just ski by the hive and hope for the best. However, I have been able to do a little looking. Things look very good at this time. This examination was a couple of days after looking into the colonies at the University Apiary, so I had some idea what I should expect. At first I was a concerned when I took off the top cover. I could not see, or hear, any bees. Most of the colonies at MSU were in the top hive body and some were already at the top. The Lonesome Hive had its cluster still in the bottom of the second hive body. (It has 2-deep bodies and a shallow super) It obviously has plenty of food and the bees were very quiet. They have had some marginal flight days so the build up of feces has not been great.

However, the thing that strikes me about this colony I have seen a few times before. The "temperament" of the cluster is decidedly different than most other colonies. The amount of honey eaten is apparently less than other colonies. You know that the colony that will come through the winter in great condition. It is too bad that we really don't have more information regarding these desirable wintering traits. We don't have much information on what I call "wintering behavior". Getting such information is difficult since any disturbance to obtain the data probably changes the behavior. We know that some of this good wintering ability probably starts in the early fall as the

colony places its stores in the proper place. I saw some colonies that still had brood in the top hive body as late as the first of October. I know that those kinds of colonies will not survive without help. I suspect that what is desirable in a colony is to

have it stop rearing brood earlier in the fall and start again soon after the first of January. Having bees stop rearing brood in the fall will be especially helpful when we begin to treat for varroa mites. The best treatment time is when there is no brood within the colony yet is still warm enough for the bees to crawl over the treated surface of the Apistan<sup>®</sup> strip. If it is not warm enough the bees do not contact enough chemical to control the mites. If the colony has brood, those mites within the cells escape the chemical. Good reason to have the colony stop rearing brood earlier in the fall while it is still warm enough for the bees to contact the pesticide.

I will begin to feed pollen supplement patties to the LH by the end of February. I might start sooner if the warm weather continues. I want a strong colony early so I can begin to raise queens from this queen. The stock from the LH seems well worth propagating. I would also like to have many drones as well. I will use them to do some early artificial matings at the University Apiary. I also think it pays to do some very early natural matings in your apiary. The colonies that were the strongest over winter will be the ones that have drones early.

## RESEARCH REPORTS FROM THE ESA MEETING

The Entomological Society of America's national meeting, in December, was especially informative. The talks on the honey bee, as well as other social insects, was some of the best that I have seen. I will try to give some of the bits that I captured in my notes.

Vegetable oil treated bees seem to have fewer mites. This data is not well documented at this point. However, the first indication of suppression was from those colonies that had antibiotic extender patties on them. More research will have to be conducted, but the results seem exciting. It would be easy to put extender patties into a colony to control both brood diseases and mites at the same time.

Changes in cuticle oils from young to old bees. The ratio of hydrocarbons (oils) found on the bee's body change from the 1st day to the 4th day of age. This may help explain what attracts mites to young bees. It also could be the reason that vegetable oils are disrupting the infestation rate within those colonies that have been treated with extender patties or with oils. It also could be the explanation of how colonies gain resistance to tracheal mites by changing these hydrocarbons or by "aging" the cuticle of a young bee at a faster rate.

Bee's life not shorter when infested with tracheal mites. This seems to be contrary to the observation of all of the beekeepers that are losing colonies over winter, apparently from mites. This may or may not be a contradiction. Under the conditions of the experiment the bees may not have been able to "escape" from the hive. Thus, they did not die by flying out into the snow. Of the colonies that are lost to tracheal mite infestations, during winter, we find that the bees are not dying within the hive. In any event, it was interesting to find that the bees were not dying early be

cause of the mites. The cause of death of the colonies may be from some other reason, such as increased agitation or feces build up within the bees. We do know that there is often a lot of spotting of colonies that have died from mite infestations. The bees do not have nosema as might have been suspected.

Tracheal mite life cycle. It takes about 14 days to complete a cycle within the trachea of a bee. From egg to larvae is 4 days. From egg to adult male takes 9 days, and from egg to adult female is 11 days. From egg to the next generation egg takes the 14 days. Because of the average longevity of a bee, that equates to about one generation per bee.

Soldier bees? It seems there may be a new class of bees identified in the colony. They appear to be different than guard bees found at the entrance. These bees may be genetically determined, and this would explain why some colonies seem to sting more than others. This group also seems to build up over the season. Live longer? We will just have to have the bees reduce their defense budget!

Repellents for African bees. DEET will help control the attacks of aggressive bees if the material is sprayed onto the bees. The material (DEET) is the most common insect repellent found in such mosquito sprays as OFF<sup>(R)</sup>. The material was put into a mist sprayer and the bees were sprayed when they were trying to spray the beekeeper.

#### Winter death rate of colonies infested with tracheal mites

In a study done in New York, by Dr. Gard Otis of the University of Guelph, if a colony had between 0 and 20 percent infestation the average winter loss was about 8 percent. Maybe what one would expect from normal winter mortality. When the rate of infestation was 21-60 percent of the bees found with tracheal mites, the result was 48% loss of colonies during winter. In colonies where the infestation rate was from 61-100% the over winter mortality of colonies was 80 percent. It seems from this data that we need to control the mites to a level of 20%, or lower, to reduce the winter loss caused by these pests.

Mating of queen honey bees. A virgin queen on a mating flight, flies beyond the average peak density of bees from their own colony. They apparently do not select mates. They will mate with their brothers, and do not select against mates that may have the same sex alleles. It seems that the queen avoids inbreeding mostly by flying a longer distance from the hive than most other bees from the colony. Once the queen is in the drone congregation area matings will take place with any drones that are present, regardless of parentage. The success of the resulting colony will be a measure of the number of "good" drones that mated with the queen. The large number of matings that a queen has probably helps overcome those times when a queen mates with a brother. A brother would have a similar sex allele. When the egg contains a pair of chromosomes with similar sex alleles the egg does not hatch. This is the basic biological reason that the queen has to fly a long distance in order to have a minimum of inbreeding.

Over wintering of Multiple Queens in a Hive. Queens were kept in standard mailing type cages, and as many as possible put into a standard size frame. The research, done in Canada, used several different types of colonies. The most successful method was to: 1) use heavy insulation

around the colonies so they did not have to cluster, 2) made large populations in the colonies by providing them with two-queens in July, 3) made sure there was a lot of surplus honey, 4) made the colonies queenless prior to putting the caged queens into them, and 5) switched the queens to a new colony each month during the winter. When this was done they were able to over winter about 75% of the queens. I think with a little more research in this area we may be able to do even better.

## **1990 - THE YEAR OF THE AFRICAN BEE**

As most of you are keenly aware, sometime this year the African bees will cross the Rio Grande into southern Texas. It will be in either the spring swarming season of March and April or the fall period of September and October. You will most likely will hear the news via the local press or TV. It is probably time to make preparations for that event. In order to do that you should do at least two things. First, it would be wise to scout out some alternate apiary sites. Some of the landowners where you currently have your bees are going to become frightened and ask you to move your apiary. We experienced this kind of hysteria when the movie, "The Swarm", was released. You can be sure that when the real threat arrives other persons will become concerned about their property and bees. So it might be best if you had alternative locations -just in case. The other thing that might be appropriate for you to do is to anticipate this hysteria from the landowners and pay them a visit yet this winter. Take along some extra honey, and talk to them very frankly about the African bees.

The African bees should not be a threat to Michigan for at least a little while. They may never be. The area of the South that produces the queens and packages for the North will be the area that most likely will be the home for this sub-species of honey bee. The transporting of these packages and queens to the North could be a source of local problems. However, it is not anticipated that this tropical-type bee will be able to over winter in Michigan.

In any event be prepared. Visit these people and de-fuse the concerns before the news reaches these people from some other source.