



# B-PLUS

BEEKEEPING REPORT FROM MICHIGAN STATE UNIVERSITY

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## **Miticur<sup>®</sup> USE CANCELED**

Hoechst-Roussel Agri-Vet Company has issued a cancellation of Miticur for use on honey bees. I suspect the company could not see a continuing market for this product in light of the problems that have occurred. While most of the litigation and complaints stemming from the loss of bees last winter have been handled by the previous owner, Nor-Am Chemical, Hoechst-Roussel still owns the rights to Miticur .

Nor-Am had produced the strips (certain batches) that apparently killed bees. While it is probably equally clear that amitraz itself was not responsible, bees were apparently stilled affected.

In any event beekeepers are without a possible control of both mites. In that regard, it was pointed out at a recent bee research meeting that amitraz - as a strip formulation - was not effective against tracheal mites. Thus, in the long run the only loss may be the fact that we do not have an alternative chemical when *Varroa* becomes resistant to Apistan<sup>®</sup> , and they **will** become resistant. It is only a matter of time. If you have any un-used Miticur strips you could still use them. They are just no longer being sold.

## **BIOLOGICAL CONTROL OF FOULBROOD**

It appears that colonies that have chalkbrood disease have less American foulbrood and European foulbrood diseases. In tests at the U.S.D.A. laboratory at Beltsville, Maryland they have found that the chalkbrood fungus leaves behind an unsaturated fatty acid known as linoleic acid. Linoleic acid apparently suppresses or reduces the amount of both AFB and EFB. It is possible to feed bees linoleic acid in sugar syrup or in supplement patties. Almost all of the vegetable oils are very high in linoleic acid. In the usual 20-20 hindsight, it may be one the reasons that extender patties work so well. Not only do they have the Terramycin that controls the disease they have linoleic acid as well. It is possible to treat bees with linoleic acid via feeding, but I suspect it would be far easier to use extender paties.

The more difficult problem is to control chalkbrood. In many cases it is not a minor disease. My feelings are that it has to be controlled by resistant stock. Thus, in cases where the disease seems to be serious, re-queen the colony with a different strain of bees.

## SAMPLING FOR VARROA MITES

*(The following was edited from a fact sheet written by Dr. Eric Mussen, Extension Apiculturist at University of California, Davis. We have been trying here at MSU to accumulate some data that would help in determining when we need to treat for varroa. Since there are differences in the amount of brood during the year some of the figures of Dr. Mussen may change depending on the season. However, the concept he covers in sampling for Varroa is very appropriate. Ed.)*

There is a great variety of methods by which an individual can survey for *Varroa* mites in his or her bees. Many of the methods sacrifice bees, but a couple are less destructive. A method promoted by some Europeans is uncapping and examining larvae and pupae, especially drone brood. A cappings scratcher can be run horizontally along the comb face, just below the surface of the wax. The cells are uncapped and the bees are speared and removed from the cells, all in one motion. Bee bodies and empty cells are examined carefully for adult and immature mites. Usually 100 individuals and their former cells are examined to be pretty sure what the level of infestation really is.

Mites die of old age and various other causes in the hive. By simply sliding a sheet of white paper onto the bottom board of the hive, you are likely to find mites on it in a day or two, if they are present on the bees. The bees tend to clean off the paper and even chew up and remove the paper. It is best to check within a couple of days, also, because hive debris accumulates quickly in an active colony.

Sheets of paper or shirt cardboard are more effective if they are formulated as "sticky boards." Available commercially, these boards can be made by smearing a thin layer of sticky substance (insect-sticking goop; spray non-stick cooking material or petroleum jelly in very cool weather) on paper. Since bees can get stuck, too, it is a good idea to make a frame that holds an eight-mesh (per inch) screen just above the sticky surface.

A beekeeper can enhance the effectiveness of the sticky board by applying a treatment to the colony population that induces mites outside the brood cells to fall from the bees and frames. One strip of Apistan<sup>®</sup> in the brood nest will dislodge most mites that are out in the open, in a couple days. Another product that also surveys the total adult population is a few puffs of tobacco smoke. The specially labelled, high nicotine tobacco is added to the smoker and puffed into the hive entrance. Often the beekeeper blocks the entrance with grass for a half hour or so, enhancing the effect. A little too much of this smoke narcotizes the bees, too, so be careful! After an hour or two, the sticky board can be removed and examined.

One of the earliest forms of mite surveying to be used in the U.S. was the "ether roll" method. Just as the name suggests, 150-300 bees (**Not the queen!**) are collected in a screw-top jar. The bees are sprayed with a two-second blast from a can of ether-based automobile starter fluid. Quickly cover the jar and shake the bees very hard for 30 seconds. Any *Varroa* mites should have been separated from the bees. They are likely to be stuck on the inside surface of the jar in the syrup regurgitated by the dying bees.

Other forms of sacrificial surveying include the "washing" techniques. Approximately 150-300 adult bees are collected as above into either detergent water or an alcohol solution. The bees are shaken vigorously, as above, then the bees and liquid are poured through sieves. A top sieve collects the bees. Bee bodies are stirred and rinsed well with water. A second sieve, often covered with white cloth, catches mite bodies for counting.

Simply finding a certain number of mites does not necessarily help that much in mite control. The next step is to interpret your results. When brood is present in the colony, only about 20% of the *Varroa* mites are out on the adult bees or combs. The rest are buried in the brood. Only the uncapping method can tell you what is going on in the brood. Other approaches need more interpretation.

The Apistan and tobacco smoke methods are supposed to survey whole adult bee populations. In those cases, you would multiply the number of mites found on your board by 5. I believe that Apistan would give more reliable results.

The ether roll and wash methods only sample about 1% of the adult population. Therefore, with brood in the colony, those determinations have to be multiplied by a factor of 500. A few mites by any of these sampling techniques means big trouble for your bees.

When there is little or no brood in the colony, such as late fall and winter, the mites are forced to stay on adult wintering bees. Each mite needs to feed on bee blood about every six days in order to survive. Surveys at that time can be related directly to the total bee population, and no mathematical manipulations are need to allow for mites buried in brood.

No one has really equated numbers of *Varroa* mites in colonies to exact negative effects, but here are some guidelines:

1. Less than 100 mites per colony (after applied math, if necessary)
  - a) Not currently a problem
  - b) Plan to treat in September and October, unless a large increase in mites appears.
  - c) Continue to monitor bimonthly
2. Between 100 and 999 mites per colony
  - a) Economically important number of mites.
  - b) Treat as soon as possible after removing honey; start in August, even if you lose some of your crop.
  - c) continue to monitor bimonthly

3. mites or more
  - a) colony is rapidly approaching collapse.
  - b) remove supers and treat **immediately**
  - c) treat again in October
    - i) Your bees are very likely to become reinfested
  - d) Continue to monitor bimonthly

Apistan® strips can be used at any time of the year, if certain precautions are followed (consult the label). However, full strips work best only under certain conditions. Obviously, you get the best results when the mites are out on adult bees and most likely to contact the acaricide. Late fall probably is the time of year with least or no brood rearing in most parts of the country. Mites should be most susceptible to treatment at that time. If you wait too long, and winter cluster gets tight, many mites will escape the treatment.

Remain alert. Monitor your colonies for mite infestations. Interpret accurately the levels of mites when you do encounter them. And use registered control products in compliance with the label and unity with the biology of the bees. This way you will be able to **Keep Varroa mite Under Control**.

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A note from Florida indicated that colonies died in July from *Varroa* after a good Apistan treatment in February. Control was monitored after treatment and found good. Continuous monitoring is necessary!

## **VARROA RESISTANCE SEARCH OFF TO A GOOD START**

Through a contract from the Michigan Department of Agriculture we were able to identify several colonies that had some apparent resistance to *Varroa*. We have to say apparent resistance, at this point, since the colonies have not been screened against *Varroa* in a scientific manner. We looked for colonies that had been exposed to the mites and had either a low number of mites or showed other signs of resistance, and had not ever been treated with acaricides. The colonies had not been treated for probably a variety of reasons; from an unwillingness to use chemicals within their hives to neglect of the bees.

We inserted sticky boards under the broodnest of the potential colonies and then after 24 hours removed the boards to examine the number of mites and the physical condition of the mites. If the number of mites was low within a colony and the number of mites in other colonies in the apiary were moderate to high then we noted the colony. The boards were also examined under a microscope to assess the extent of damage to the mites. If bees clean (groom each other) of the mites, the mites are often damaged. Dents in their body wall and legs chewed off. We were able to find colonies that had more than 70% of the mites damaged in some way. We then grafted queens from these colonies and have put these queens into colonies for overwinter.

If funding continues, we want to carry the analysis further. We need to be sure that these colonies are truly resistant in at least a moderate way, and then to also incorporate such other resistance features as hygienic behavior and shorter brood period into these various stocks of bees.