

New Information on Varroa Mites

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Check-mite+[®] (also called Bayer Bee Strips[®]) is an alternative to Apistan for varroa mites. In 1999, a new type of strip for varroa control became available to Kentucky beekeepers. This is called either Checkmite+ or Bayer Bee Strips. The strips contain a chemical called coumaphos, which is highly effective against the mites. These strips are used in nearly the same way as Apistan[®]. Each strip is placed in the hive so that it hangs between adjacent brood frames. Use one strip for every five frames covered with bees. The strips remain in the hive for 42 to 45 days. Then they are thrown away.

Warning: Always wear heavy plastic gloves, like dishwashing gloves, when handling the strips. Do not use bee gloves. Wash the gloves thoroughly after you have used them to handle the strips, or dispose of them. Do not use the gloves afterward to wash dishes or handle food. Store the strips in a cool, dark location away from children. If strips are to be stored in a package that has been opened, place the package in a plastic bag and seal it well.

Coumaphos is more toxic to humans than the active material in Apistan. The beekeeper must remove the strips at least two weeks before the honey supers are placed on the hive. This is especially important when comb honey is to be produced.

Beware of varroa mites resistant to Apistan and Checkmite+.

In many states, including Kentucky, varroa mites have become resistant to the chemical fluvalinate in Apistan strips. During the past year, some states have reported varroa mites resistant to Checkmite+. It is likely that Kentucky has or will soon have mites resistant to both of these chemical treatments.

How do we know whether the mites are resistant to Apistan or Checkmite+?

After a spring treatment (February – April), check the capped drone brood in your hives. In May or June pull the developing pupa from each of 20 cells and examine it carefully for mites. Choose drone cells from different frames or different parts of the same frame to get a good, unbiased sample. The red-brown mites should be easy to see on the white pupa. Within a month after treatment, you should have at most one pupa with mites on it, out of 20 examined. If four or more pupae have mites it is likely that the mites have become resistant to the treatment you are using.

How do we control varroa mites if they are resistant to Apistan and Checkmite+?

All beekeepers should be aware of non-chemical methods for controlling the mites. The most promising are screened bottom boards and the use of bees with some resistance to mites. No method provides 100% control of the mites. The best strategy at this time is to use a combination of screened bottom boards, mite-resistant bees (see below), and chemical treatments like Apistan and Checkmite+ strips. These strips do still kill mites in most hives, even if some resistant mites have become established.

(1) Screened bottom boards (also called varroa screens and IPM bottom boards): Recent studies at KSU and elsewhere have shown that screens across the hive bottom board can help reduce varroa mite populations. This is based on the finding that live mites often fall from the bees to the bottom board, where they then try to crawl back up to the brood nest. The screened bottom board acts as a trap. It prevents nearly all of the fallen mites from returning to the bees above. This system is especially useful during very hot weather (over 90°), and during Apistan or Checkmite+ treatment. Under those conditions, many live mites are weakened and fall to from the bees to the bottom board.

Some beekeeping supply companies offer varroa screens or inserts which fit on a conventional wooden bottom board. This is an economical way to convert your existing bottom board. Alternatively, a bottom board with a large, screen-covered hole in it allows mites to fall to the ground below. Such “open bottom boards” are not sold by beekeeping supply companies at this time, but can be constructed by beekeepers. The screen covering the opening should be 8-mesh (8 openings per inch). This type of screen is often called “hardware cloth” at lumber stores. It keeps bees from going through but allows the mites to pass.

(2) Bees resistant to mites: Several research programs around the U.S. have developed strains of bees which have some resistance to varroa mites. Generally these bees still

need to be treated occasionally, but not as often as other strains or varieties of bees. **Hygienic bees** are those which destroy mites in the capped brood cells. These bees carry some resistance to brood diseases (American foulbrood and chalkbrood) also. **Russian** and **Yugo** bees are reared from stock taken from eastern Russia and the former Yugoslavia, respectively. Bees in these countries have lived for many years with the mites and seem to be better at fighting them off. **SMR (or “smart” bees)** have the ability to inhibit reproduction by the mites. Another line of research is at Kentucky State University, devoted to rearing bees from hives which have survived without treatments under Kentucky conditions and apparently have some resistance to varroa mites.

How can we keep mites from becoming resistant to these treatments?

As long as we rely heavily on chemicals to control varroa mites, the mites will become resistant to those chemicals eventually. The use of screened bottom boards and mite-resistant bees (above) reduces our need for chemicals and slows the development of resistance. Also, beekeepers should alternate between Apistan and Checkmite treatments.

How can I tell when the mites are reaching critical levels?

It's useful for a beekeeper to monitor the varroa mites in the hives, so that treatments can be used only when actually necessary. If treatments come too late, the bees will suffer. If treatments are applied before they are actually needed, the beekeeper wastes time and money.

One way to monitor the varroa infestation is to examine capped drone brood (see above). However, drone brood is usually not present in hives in late summer or fall. Sticky boards are another method for monitoring the varroa mite infestation in the bee hive. (See the KSU publication “How to Make and Use Sticky Boards to Monitor Varroa Mites in the Hive”.) These are made of heavy white paper, such as freezer paper which is available at most grocery stores, covered with sticky material and wire screen. The sticky board is placed inside the hive, on the bottom board, for a few days to a week. It is then removed and the mites on it are counted. The beekeeper may wish to use a magnifying glass to see the mites on the sticky board.

Count the number of mites on the board and divide by the number of days the board was in the hive. If more than 50 mites per day have accumulated on the board, you will need to treat for varroa mites soon.

Honey exposed to mite treatments is not safe for human consumption, but it may be left in the hive for the bees.

Occasionally the beekeeper will neglect to remove the mite treatments (Apistan or Checkmite+) before the beginning of the honey flow. In this case, the honey made while treatments were in the hive is not safe to eat. However, the small residues left in honey are not hazardous to the bees. This honey may be left in the hive for the bees, or extracted and fed to the bees later.

Treat for varroa mites in spring or fall.

Checkmite or Apistan strips may be placed in the hives as early as February, when a warm day allows the beekeeper to open the hive. The strips should be in place for 6 weeks. They must be removed at least a week before the honey supers are placed on the hives for the late-April honey flow.

A second possible treatment period is 6 weeks at some time during August to November. This second treatment period is often preferred over the first, because the beekeeper has several months in which to administer the 6-week treatment. Also, it is long before the coming year's spring honey flow.

Be sure to mark your calendar so that you remember to remove the strips six weeks after they were put in the hives. The strips must not be re-used. They should be placed in the trash after use.

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