Guide to Beekeeping in West Virginia

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New Era in Beekeeping

Before the late 1980s, beekeeping in West Virginia was quite simple. Beekeepers strived to keep pesticides out of their colonies and seldom lost more than 5% of their colonies during the winter. This changed when the varroa mite, Varroa destructor, and the honey bee tracheal mite (HBTM), Acarpis woodi, were discovered in the United States and eventually West Virginia. Beekeepers in West Virginia were forced into doing something they never dreamed they would have to do, they had to use pesticides to control the parasitic mites that had invaded their hives.

In an effort to help beekeepers deal with their new pest problem, the Environmental Protection Agency (EPA) and the Food & Drug Administration quickly approved two pesticides for use in controlling parasitic mites on honey bees. Mite-A-Thol was approved for the control of the HBTM and Apistan was approved for the control of the varroa mite.

The search for other ways of combating parasitic mites on honey bees has led to the breeding of honey bees that are resistant to the HBTM, thereby eliminating the need to use Mite-A-Thol. These include the well-known Buckfast strain and Buckfast hybrids, such as the West Virginia Queen. While the West Virginia Queen was rated higher in varroa mite resistance than the Russian Queen (a strain that the United States Department of Agriculture's Agricultural Research Service introduced from Russia), it is still not resistant enough to allow beekeepers to completely abstain from chemical treatment for varroa mite control.

The need to find a truly varroa-resistant bee has become an important challenge because, in many areas, the varroa mite has developed resistance to Apistan. To help counter this resistance, a relatively new product, CheckMite+, has been granted a special emergency use designation by the EPA, allowing use to treat honey bees for varroa mites. Beekeepers in West Virginia were able to obtain this product in the spring of 2001 from bee supply companies. In late July 2001, the West Virginia Department of Agriculture's (WVDA) Beekeeper Assistance Program provided registered beekeepers with a sufficient amount of CheckMite+ for each colony registered with the agency.

When varroa mites first arrived in West Virginia, there were no methods for determining economic threshold levels for varroa mite treatment, that is, the level of mite infestation that a bee colony can sustain before the health of the colony begins to decline. We now have methods for determining the number of varroa mites in our colonies and what the economic thresholds are. The screened bottom board that is used for reducing the number of varroa mites in the hive can also be used for monitoring the population of mites in the hive during the brood-rearing season. Varroa mites that fall through the screened bottom board can be caught on a sticky insert that is placed in the hive for 24 hours. When the number of mites trapped in a 24-hour period reaches 43, the beekeeper should remove all frames of honey from the hive (to prevent the contamination of honey meant for human consumption) and apply the proper pesticide to bring the varroa mites under control. A visual observation can also be added to the trapping method. You should always watch for bees that have deformed wings and brood that begins dying in the larval or pupal stages of the life cycle.

At the end of the honey production season, after all brood rearing has stopped, a second test can be used to determine a more precise number of varroa mites in the bee colony. Collect about two-to-three hundred bees from your bee colony and place them in a pint jar with a 1/8 inch screened lid. Fill the jar with water mixed with some dishwashing detergent and "wash" the bees. Then pour the contents of the jar

Preparations for Winter Survival of Honey Bee Colonies

Mid-summer is a time when beekeepers need to begin preparing their colonies for winter survival. A colony will need several things if it is to survive a severe winter involving extended periods of confinement. Among the most important components of a successful hive is a large population of young bees in the fall. To achieve this, a beekeeper must make certain that each colony's queen is young, vigorous and properly stimulated by pollen and nectar entering the hive. If an adequate number of worker bees are not hatched in August and September, the chances of the colony surviving a hard winter are slim. Each colony should be checked throughout the summer for diseases and parasites and any problem found should be promptly addressed. An infestation will likely reduce the number of young that are successfully reared to maturity. If the bees are too old in the fall, they will die in January or February leaving a cluster so small that they cannot stay warm and will quickly freeze out. A healthy colony with an adequate number of honey bees will be able to maintain a winter cluster temperature of 90 to 94 degrees.

A normal size colony will require 60-70 pounds of stored food to last the winter. The healthiest food for bees in the winter is darker honey, such as tulip poplar. This type of honey will granulate more slowly and will be more readily usable by the winter cluster. While sugar water and corn syrup are suitable emergency feed, these feeds can quickly granulate and will make poor winter food stores. No liquid feed should be fed to the honey bees during cold temperatures, as this will lead to dysentery and increased colony losses. Care should also be taken to ensure that colonies do not store too much honey in their brood nest. Honey bees need to have open drawn comb in the brood nest so they can cluster properly. Honey bees will freeze to death if the combs are full of honey and there is no room for the bees to cluster.

Later in the fall, colonies need to be protected against mice by placing a piece of ½ inch square wire mesh (hardware cloth) over the entrance. An upper entrance should be added at this time as well. An entrance in the top brood chamber will decrease humidity in the hive, add more potential flying days for the bees in the winter and reduce dysentery. Dysentery may also be reduced through the use of a screen bottom board. When bees are forced to defecate within the hive, due to unusually long winter confinement, their excrement will drop through the screen and the bees will not be forced to crawl through it. Honey bees that are able to remain clean and dry will normally develop less dysentery.

When selecting an apiary location, avoid areas where moisture laden air stratifies. Try to locate hives where the snow tends to melt first. This would tend to indicate that the area is quick to warm up, something that will benefit honey bees. The area should also be carefully examined for a winter windbreak. A good windbreak may consist of a group of trees, a building or ridge. If a natural windbreak does not exist, one should be provided by the beekeeper.

Resistant Bees Help Foil Parasitic Mite

The honey bee tracheal mite (HBTM), Acarapis woodi, is a microscopic organism that attacks adult honey bees. It lives within the air-conducting passages (tracheae), which perforate the body of the bee, and feeds on the bee's blood. When a high number of these mites prey upon a single bee, the bee is weakened and eventually suffocates. Colony loss generally occurs in mid-to-late winter, while any damage that occurs in the summer is minimal, due to the high turnover rate of bees during their foraging activities.

A good indication that the HBTM is present in a hive of bees is to watch the way in which the bees hold their wings. Bees have four wings, two large wings and two smaller wings. When a bee has several mites in its tracheae, it holds its smaller wings to its sides, possibly in an effort to open the breathing passages as large as possible. This condition, known as "K wing", can also be a sign of other non-mite related problems. The only positive way of identifying HBTM is through microscopic examination.

When the HBTM invaded West Virginia, about a decade ago, it was instrumental in causing the death of roughly half of the state's bee colonies each year. The surviving colonies would usually be weak and unable to produce a crop of honey. The pesticide Mite-A-Thol (which contains menthol as its active ingredient) became the standard treatment for the HBTM. However, early attempts to use the medication met with little success, as beekeepers were applying the menthol too late in the year for temperatures to be high enough to cause the menthol to fume. After several seasons of trial and error, it was determined that the first of August would be the ideal time for treatment. This time period not only provided the necessary temperatures to volatilize the menthol, it also protected the last major brood cycle.

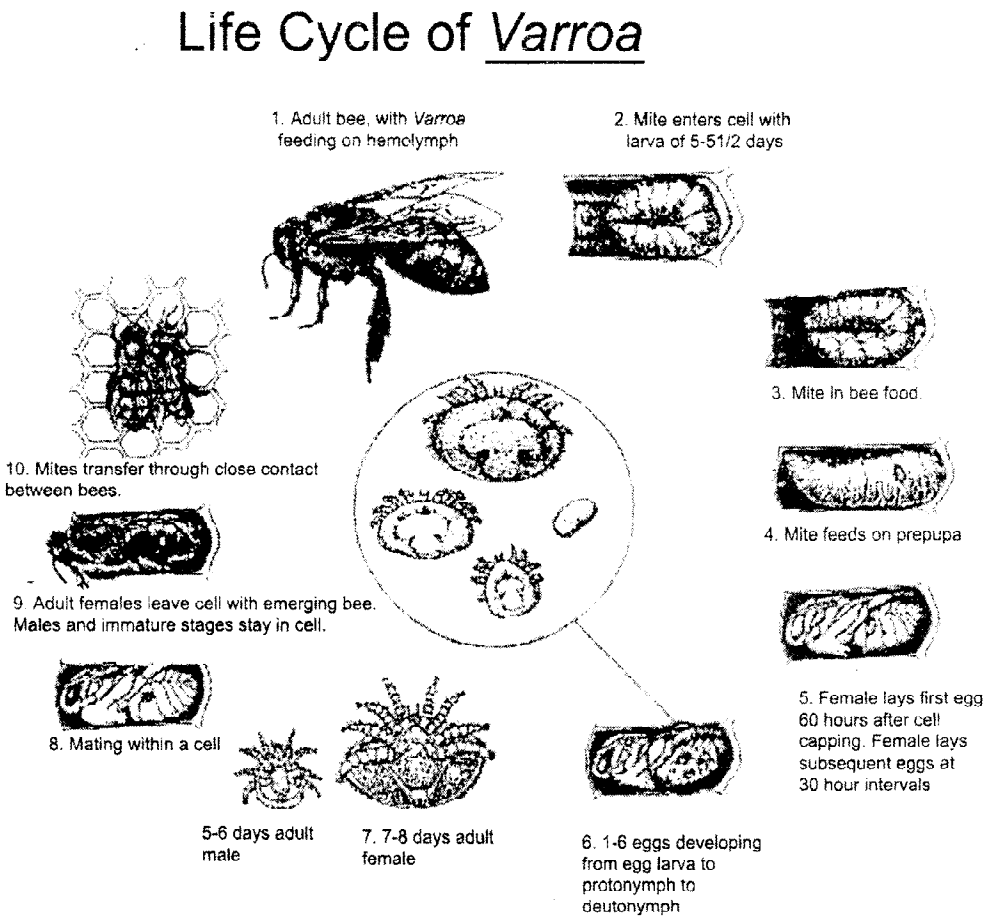
Some genetic lines of honey bees show a high degree of resistance to infestations of the HBTM and are seldom damaged by it. Beekeepers in Europe, for example, no longer treat for the HBTM because most of their bees have developed at least some tolerance to the HBTM, due to long-term exposure to this parasite. Comprehensive research studies in England and Canada have shown that the Buckfast strain of honey bee tends to be one of the most resistant of these strains. The Buckfast has developed a mechanism, called "auto-grooming", that controls the HBTM during the migratory phase of the mite's life cycle. This trait of grooming the mites off their bodies and physically removing them from the hive was also found to be a dominant trait in the Buckfast strain. This dominant trait allows Buckfast queens to be mated with non-resistant drones without losing the auto-grooming trait, at least in the first generation of descendants. Further studies have shown that this trait may possibly be carried to the third generation. Since drones carry only the genetic material of their mothers, they may be capable of spreading this genetic resistance to other non-resistant colonies throughout an area. However, care should be taken to keep the strain as pure as possible.

Initial field observation studies in West Virginia seem to confirm that beekeepers may no longer need to use menthol or other organic solutions to control the HBTM, provided they keep HBTM-resistant stains of honey bees. As with so many other agricultural endeavors, today's beekeeper needs to look for pest resistance when obtaining honey bee stock.

A third method of determining Varroa mite populations requires the sacrifice of 150 to 200 bees, or about 1 cup full. Take 1 cup of bees from the brood nest in the fall, when brood rearing has stopped, and place them in a pint container full of soapy water. Shake the container thoroughly, then pour the contents through a screen strainer with a white cloth lining it. Fill the jar with water one more time and again pour the contents through the strainer to remove any Varroa mites that may have stuck to the sides of the jar. Count all the mites, then multiply that number by 100. Divide that number by the exact number of bees you sampled. If this number is less than 17% the colony will not need a miticide treatment.

VARROA MITE TREATMENT

During the early 1990's, the only reliable treatment for the Varroa mite was the Apistan strip. However, since 1998, Varroa mites have been developing resistance to this treatment. This led to the use of Check Mite+ as an alterative control. Similar to its counterpart Apistan, Check Mite+ comes in the form of a plastic strip with a surface coating of chemical coumaphos. It can be purchased from most of the bee supply dealers. As with all pesticides, the applicator must read, understand and follow all labeling instructions. This treatment, like Apistan, will not be the final solution to the Varroa mite problem. The USDA is currently working to develop strains of honey bees that are resistant to the Varroa mite. While it may be some years before they develop a honey bee that is resistant, gentle and a good honey producer, this work offers hope to beekeepers.



West Virginia Department of Agriculture
Plant Industries Division
Apiary Inspection and Registration Program
Charleston, WV 25305-0191
(304) 558-2212 Phone
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Application for Apiary Registration

Name _____

Address _____

City _____ State _____ ZipCode _____ County _____

Telephone (Home) _____ (Work) _____ (Fax) _____

E-mail _____

I am no longer keeping bees, please remove my name from your mailing list ☐

In compliance with the Code of West Virginia, Chapter 19, Article 13, I (we) hereby apply for registration as follows:

Number of Colonies	Location (if different from above)	Comments

Requesting Inspection for: **Interstate Movement** ☐ **Parasite/Disease Problem** ☐
****Sale or Distribution of**
Queens, Packaged Bees or Nuclei Colonies ☐ **Beekeeper Information** ☐

If you are requesting assistance, please provide additional directions or a map of the location of your apiaries on the reverse of this form.

_____ _____
Date Signature

05/11/04

The West Virginia Apiary Act

ARTICLE 13. INSPECTION AND PROTECTION OF APICULTURE.

§19-13-1. Short title.

This article may be cited as "The West Virginia Apiary Act".

§19-13-2. Definitions.

For the purpose of this article, the term:
(1) "Abandoned apiary" means any apiary in which twenty-five percent or more of the colonies are dead or diseased, or the death or disarray of the colonies exposes them to robbing, or diseased or potentially diseased abandoned bee equipment which may jeopardize the welfare of neighboring colonies.
(2) "Apiary" means any place where one or more colonies or nuclei of bees are kept or where bee equipment is stored.
(3) "Appliances" means any apparatus, tool, machine or other device, used in the handling and manipulating of bees, honey, wax and hives. It also means any container of honey and wax that may be used in any apiary or in transporting bees and their products and apiary supplies.
(4) "Bees" means any stage of the common hive or honey bee (Apis mellifera), or other species of the genus Apis.
(5) "Bee equipment" means hives, supers, frames, veils, gloves or any other appliances.
(6) "Bee products" means honey, bees wax, pollen, propolis and royal jelly.
(7) "Colony" means the hive and includes bees, comb, honey and bee equipment.
(8) "Commissioner" means the commissioner of the department of agriculture of the state of West Virginia or a duly authorized employee.
(9) "Control agents or control mechanisms" means any method of chemical or mechanical control to suppress or eradicate an apiary disease, pest, or parasitic infestation in an apiary or the colonies contained therein.
(10) "Department" means the department of agriculture of the state of West Virginia.
(11) "Hive" means a frame hive, box hive, box, barrel, log, gum, skep or any other receptacle or container, natural or artificial, or any part thereof, which may be used or employed as a domicile for bees.
(12) "Honey bee pest" means American foulbrood (Bacillus larvae), European foulbrood (Melissococcus pluton), Varroa mite (Varroa destructor), honey bee tracheal mite (Acarapis woodi), or any other virus or infectious or parasitic organism determined by the commissioner to be transmissible to other bee colonies and that represents a threat to beekeeping in West Virginia.
(13) "Nuclei" means the removal of a split portion or division of any colony of honey bees for the express purpose of creating a numerical increase in colonies for honey production, pollination service or monetary gain through sale of honey bees.
(14) "Packaged bees" means bees shipped in combless packages accompanied by a valid certificate of health from an authorized state or federal agency verifying the absence or presence of any infectious or communicable diseases or parasitic infestations, and further providing that no honey has been used for food while in transit or that any honey used as food in transit was properly sterilized.
(15) "Person" means corporations, partnerships, associations, societies, individuals or group of individuals or any employee, servant or agent acting for or employed by any person.