HONEY BEE
ENEMIES

Ants

Ants are not usually serious pests in honey bee colonies. Occasionally, however, certain species may enter colonies to search for food or establish nesting sites. Ants are typically found between the inner and outer covers of the hive and in pollen traps. Even though ants seldom disturb the bees, they can be a nuisance to the beekeeper.

Once ants are established in a colony, they are difficult to control. To minimize ant problems, maintain strong colonies and keep bottom boards raised off the ground. Also, remove brush, rotten wood, grass, and weeds from around the colonies. Single colonies can be placed on stands with oil or sticky barriers. Ant problem may also be reduced by allowing the bees access to the space between the inner and outer covers.

Bears

Because much of the prime bee forage in the United States is wild or feral in nature, honey bee colonies are often located in prime bear habitat. This is particularly true in the northeast, southeast and west. Black bear is a significant predator on colonies and does a great deal of mechanical damage to a colony. The key to avoiding bear damage is a well-maintained electric fence.

The fence must be put up before colonies are located in bear habitat, otherwise it often will not stop depredations. Research suggests fences to have two or more “hot” wires, one eight inches off the ground, the other about forty inches high, with perhaps a third in the middle. Woven wire is also recommended for an inside fence and a wire mat about two feet wide should be laid around the fence base. Both fencing and mat should be connected to the ground wire of the fence controller. Controllers should be powerful enough to deliver 4,000 volts with a current of 20 mA.

Mice

Mice are a serious pest of stored combs and active honey bee colonies during the fall and winter months. These rodents chew combs and frames to make room for building their nests. Mouse urine on combs and frames and bees are reluctant to use the combs or clean out these nests in the spring.

Adult mice move into bee colonies in the fall and usually nest in the corners of the lower hive body away from the winter cluster. Bee colonies located near fields or at the edge of wood lots where mice are common are especially vulnerable. Mice can successfully build a nest even in a strong colony. They move in and out of the colony while the bees are inactive, and their nests furnish additional protection. Their activity may disturb the bees but the greater damage is to combs and equipment from their nest building.

Early in the fall, the entrance to bee colonies should be restricted with entrance cleats or hardware cloth (three mesh to the inch) to keep the mice out. Chase away any mice found inside a colony, then remove the nest and restrict the entrance. If comb chewing is extensive, replace the frames. When bees repair damaged beeswax comb, worker-sized cells are often replaced with drone comb.

Small Hive Beetles

Originally from Africa, the first discovery of small hive beetles in the US occurred in Florida in 1987. They are mainly limited to the southeastern portion of the United States, but are slowly spreading with the annual migration of honeybee colonies used for pollination in other areas of the country.

The life cycle of this beetle includes part of its development in the ground outside of the hive. Controls to prevent ants from climbing into the hive are believed to also be effective against the hive beetle. Several beekeepers are experimenting with the use of diatomaceous earth around the hive as a way to disrupt the beetle's lifecycle. The diatoms abrade the insect's surface, causing them to dehydrate and die.

Several pesticides are currently used against the small hive beetle. The chemical is commonly applied inside the corrugations of a piece of cardboard. Standard corrugations are large enough that a small hive beetle will enter the cardboard through the end but small enough that honeybees cannot enter (and thus are kept away from the pesticide).

Skunks

Skunks are members of the weasel family. They dig under foundations and take up residence under homes or in other buildings.

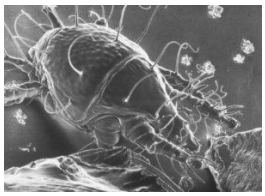
Skunks are disliked mainly because of their ability to voluntarily discharge an obnoxious odor when provoked, this scent is released primarily in self-defense.

Skunks can also be a serious threat to successful beekeeping, since they hamper the development of strong colonies. Being insectivorous (insect-eating), skunks will raid bee yards nightly, consuming large numbers of bees. While such attacks are most common in the spring, they also can occur throughout the summer and fall.

To capture bees, skunks scratch at the hive entrance and as guard bees come out to investigate the disturbance they are eaten by the skunk. A successful skunk will repeat the process several times and may feed at the hive entrance for an hour or more to rapidly depleting the bee population. Colonies visited by skunks may become defensive since skunks usually return night after night. Skunk predation can be detected by the front of the hive being scratched and muddy and the vegetation in front of the hive packed down or torn up.

In addition, skunks leave behind small piles of chewed-up bee parts. The skunk chews the bees until all the juices are consumed, then spits out the remains. These remains resemble cuds of chewing tobacco. Opossums and raccoons sometimes attack an apiary in a similar manner and the damage they do is similar to that of skunks. The feces of these animals also contain large amount of honey bee exoskeletons since this material cannot be digested by animals.

Skunks may be discouraged by screens or queen excluders attached to the hive entrance. These devices hamper the skunk's efforts to scratch at the front entrance and if it climbs up the screen over the entrance, its belly becomes vulnerable to stings.



Tracheal Mites

Acarapis woodi is a microscopic parasitic mite that infests the airways of the honeybee. The first known infestation of the mites occurred in the British Isles in the early 20th century. First observed on the Isle of Wight in 1904, the mystery illness known as Isle of Wight Disease was not identified as caused by a parasite until 1921. It quickly spread to the rest of Great Britain. It was regarded as having wiped out the entire bee population of the isles (later genetic studies have found remnants that did survive) and dealt a devastating blow to British beekeeping. Brother Adam at the Buckfast Abbey developed a resistant hybrid bee known as the Buckfast bee, which is now available worldwide to combat acarine disease.

Diagnosis for tracheal mites generally involves the dissection and microscopic examination of a sample of bees from the hive.

Acarine mites, formerly known as tracheal mites are believed to have entered the US in 1984 via Mexico.

Mature female acarine mites leave the bee's airway and climb out on a hair of the bee where they wait until they can transfer to a young bee. Once on the new bee, they will move into the airways and begin laying eggs.

CONTROL AND TREATMENT: Refer to Menthol

Varroa Mites

Varroa destructor and Varroa jacobsoni are parasitic mites that feed off the bodily fluids of adult, pupal and larval bees. Varroa mites can be seen with the naked eye as a small red or brown spot on the bee's thorax. Varroa is a carrier for a virus that is particularly damaging to the bees. Bees that are infected with this virus during their development will often have a visible "K-wing" deformity.

Varroa has led to the virtual elimination of feral bee colonies in many areas and is a major problem for kept bees in apiaries. Some feral populations are now recovering — it appears that they have been naturally selected for varroa resistance.

Varroa was first discovered in Southeast Asia in about 1904, but has now spread virtually worldwide. Varroa was discovered in the United States in 1987, in New Zealand in 2000.

Varroa is generally not a problem for a hive that is growing strongly. When the hive population growth reduced in preparation for winter or due to poor late summer forage the mite population growth can overtake that of the bees and can then destroy the hive. Often a colony will simply abscond (leave as in a swarm, but leaving no population behind) under such conditions.

Life Cycle

The life cycle of the varroa mite is very much synchronized with that of its honey bee host; it may be that hormones or pheromones of honey bees are necessary for the mite to complete its development. The female lays eggs in bee brood cells. Developing mites feed on developing honey bee larvae. Males and females copulate in the cell. The male dies, but pregnant females emerge from the cell along with their bee host and seek another cell to repeat the cycle. It is thought the length of the postcapping period in honey bees is an important indicator of eventual infestation. The longer the postcapping time, the more time there is for more female mites to develop.

Control methods in beehive

Synthetic chemicals

-pyrethroid insecticide (Apistan) as strips

-organophosphate insecticide (Coumaphos (Check-mite)) as strips

Natural occurring chemicals

-Sugar esters (Sucrocide) in spray application

-Oxalic acid trickling method or applied as vapor (Dany's BienenWohl or VARROX-Vaporiser)

-Formic acid as vapor or pads

-Food grade mineral oil as vapor and in direct application on paper or cords.

-Essential oil especially lemon, mint, and thyme oil

Physical

-Screened bottom board with sticky board is a purely physical method. It separates mites that fall through the screen and the sticky board prevents them from crawling back up.

-Dusting with powdered sugar (Dowda Method)

-freezing or heating of capped drone brood method

Behavioral
swarming or queen arrest method. When the honeybee brood cycle is interrupted the mites cannot multiply either.

Preventive measures and treatment
Varroa mites can be treated with commercially available miticides. Miticides must be applied strictly according to the label in order to minimize the risk of contamination of honey that might be consumed by humans. Proper use of miticides will also help to slow the development of resistance among the mites.
Varroa mites can also be controlled through non-chemical means. Most of these controls are intended to reduce the mite population to a manageable level, not to eliminate the mites completely.

Many beekeepers use a screened bottom board on their hives. When mites occasionally fall off a bee, they must climb back up to parasitize a new bee. If the beehive has a screened floor with mesh the right size, the mite will fall through and cannot return to the beehive. The screened bottom board is also being credited with increased circulation of air which reduces condensation in a hive during the winter. (Studies at Cornell University done over several years found that screened bottoms have no measurable effect at all. Northeast Beekeeper Vol 1 #1 Jan 2004)
Powdered sugar (Dowda Method), talc or other "safe" powders with a grain size between 5 and 15 micrometers can be sprinkled on the bees. The powder does not harm the bees (and, if you use sugar, can even become a small source of feed), but does interfere with the mite's ability to maintain its hold on the bee. It is also believed to increase the bees' grooming behavior. This causes a certain percentage of mites to become dislodged. Powdered sugar works best as an amplifier of the effects of a screened bottom board.

Freezing drone brood takes advantage of varroa mites' preference for longer living drone brood. The beekeeper will put a frame in the hive that is sized to encourage the queen to lay primarily drone brood. Once the brood is capped, the beekeeper removes the frame and puts it in the freezer. This kills the varroa mites that are parasitizing those bees. It also kills the drone brood, but most hives produce an excess of drone bees so it is not generally considered a loss. After freezing, the frame can be returned to the hive. The nurse bees will clean out the dead brood (and dead mites) and the cycle continues.

Drone brood excision is a variation applicable to top bar hives. Honeybees tend to place comb suitable for drone brood along the bottom and outer margins of the comb. Cutting this off at a late stage of development ("purple eye stage") and discarding it reduces the mite load on the colony. It also allows for inspection and counting of varroa on the brood.
Small cell foundation (4.9 mm across – about 0.3 mm smaller than standard) is believed to limit the space in each cell that varroa mites have in which to inhabit and also to enhance the difference in size between worker and drone brood with the intention of making the drone comb traps more effective in trapping varroa mites. Small cell foundation has staunch advocates though controlled studies have been generally inconclusive.

The Konya revolving or rotating hive design is a patented invention of Lajos Konya, a beekeeper in Otteveny, Hungary. The hive has a cylindrical brood chamber, circular frames and an apparatus to rotate the frames according to a specific schedule. The rotation is believed to disrupt the varroa mite reproduction cycle with this rotation thereby reducing fecundity of the parasite.

Several attempts have been made (and are continuing) to breed bees with an increased "resistance" to varroa mites. In fact, the Africanized honeybee was originally an experiment to cross-breed mite resistance into the European honeybees common in the Americas.

Wax Moths

Galleria mellonella (greater wax moths) will not attack the bees directly, but feed on the wax used by the bees to build their honeycomb. Their full development to adults requires access to used brood comb or brood cell cleanings — these contain protein essential for the larvae's development, in the form of brood cocoons.

The destruction of the comb will spill or contaminate stored honey and may kill bee larvae.

When honey supers are stored for the winter in a mild climate, or in heated storage, the wax moth larvae can destroy portions of the comb, even though they will not fully develop. Damaged comb may be scraped out and will be replaced by the bees. Wax moth larvae and eggs are killed by freezing, so storage in unheated sheds or barns in higher latitudes is the only control necessary.

Because wax moths cannot survive a cold winter, they are usually not a problem for beekeepers in the northern U.S. or Canada, unless they survive winter in heated storage, or are brought from the south by purchase or migration of beekeepers. They thrive and spread most rapidly with temperatures above 90°F, so some areas with only occasional days that hot, rarely have a problem with wax moths.

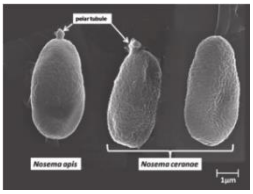
Control and Treatment

A strong hive generally needs no treatment to control wax moths; the bees themselves will kill and clean out the moth larvae and webs. Wax moth larvae may fully develop in cell cleanings when such cleanings accumulate thickly where they are not accessible to the bees.

Wax moth development in comb is generally not a problem with top bar hives as unused combs are usually left in the hive during the winter. Since this type of hive is not used in severe wintering conditions, the bees will be able to patrol and inspect the unused comb.

Wax moths can be controlled chemically with naphthalene (mothballs) or paradichlorobenzene (urinal disks). If chemical methods are used the combs must be well aired out for several weeks before use. The use of naphthalene is discouraged because it accumulates in the wax.

Control by physical means can be done by freezing the comb to about zero degrees Fahrenheit overnight to kill the eggs, larvae and moths.



Nosema

Nosema is caused by the protozoan, Nosema Apis that lives in the mid-gut of the adult bee. Indications usually are defecation on the front of the hive and inside the hive. Sometimes the bees will crawl in the grass in front of the hive because they are unable to fly. If the day is warm but the weather cools early in the day they will die there as they are unable to get back into the hive. In its more developed state it is characterized by bees with distended abdomens, disjointed wings, absence of sting reflex and reduced life span. Treatment is Fumidil-B in 1/1 sugar syrup. Usually one gallon is sufficient if fed in the spring. Two gallons are required for fall treatment in 2/1 sugar syrup. If fed in the fall Nosema usually won't appear in colonies in the springtime.

Beekeepers sometimes confuse Nosema disease with other adult honey bee maladies such as pesticide poisoning and dysentery. The effects of some pesticide poisoning can include any of a number of traits common to Nosema disease due to the way that certain pesticides work. Dysentery is caused by bees being unable to retain waste products within their bodies during long periods of confinement within a hive. This is sometimes due to poor quality of food stores but most frequently due to the unavailability of suitable conditions for cleansing flights. While dysentery is mostly a wintering disorder characterized by defecation within the hive, Nosema disease peaks during the springtime and is usually marked by defecation around the hive entrance.