

HONEY BEE DISEASES AND PESTS

George Martin, Martin's Honey House
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Honey bees play a vital role in the environment by pollinating both wild flowers and many agricultural crops as they forage for nectar and pollen, in addition to producing honey and beeswax. The essential and valuable activities of bees depend upon beekeepers maintaining a healthy population of honey bees, because like other insects and livestock, honey bees are subject to many diseases and pests. The apiculture industry plays an important role in generating employment and in increasing family income in the rural areas of the world. Many developing countries are trying to improve the quality of their honey products but they frequently encounter the main obstacle in apiculture; control of diseases and pests of honey bees.

In ancient times, honey bees were thought to be prophetic. Honey gathering is depicted in cave paintings that date back to the Paleolithic Age. The ancient Egyptians floated bees on rafts down the Nile to get them from one crop to another. While honeybees are not native to North America, they were deemed important enough to be packed up by the Pilgrims, and crossed the Atlantic around 1622 (according to Thomas Jefferson, the Native Americans referred to them as "white man's flies"). Today, bees are responsible for one out of every three bites of food you eat and are an agricultural commodity that's been valued at \$15 billion annually in the U.S. alone. They are a major workforce with a dogged work ethic — bees from one hive can collect pollen from up to 100,000 flowering plants in a single day, pollinating many of them in the process. Americans wouldn't necessarily starve without them, but our diets would be a lot more bland and a lot less nutritious.

A hungry, stressed-out bee will be more susceptible to toxins, and eating neonics has been shown to cause bees to eat less. (In fact, a recent study published in *Nature* showed that rather than avoiding neonics, as had been hypothesized, bees actually prefer them — they are related to nicotine, after all.)

To assess how, or how much, neonics affect bees, many look to Europe, where the neonic ban has been in place for almost two years; yet the ban's outcome is still inconclusive, in part because of the persistence of the chemicals. Studies have shown that neonics can persist in the ground for years and that some neonic compounds break down into substances even more toxic than the parent product.

Many agree that the rise of neonicotinoid-coated seeds, like corn kernels, has contributed to the steep decline in bee populations.

Through it all, the loss of honeybees has continued a pace with an average of 30 percent of hives dying every year. Classic cases of CCD — in which the bees literally vanish — are now relatively uncommon. These days, beekeepers often find dead bees in or near the hive, implying that whatever is killing them is doing so acutely — or the colonies slowly dwindle until there is nothing left.

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- 1. Microbial diseases**
 - 1.1 Bacterial diseases**
 - American foulbrood disease (AFB)
 - European foulbrood disease (EFB)
 - 1.2 Fungal disease**
 - Chalkbrood disease (Ascospaerosis)
 - 1.3. Viral diseases**
 - Sacbrood disease
 - 1.4 Protozoan disease**
 - Nosema disease (Nosemosis)

- 2. Parasitic bee mites**
 - 2.1 Varroa mite (Varroasis)**
 - Cause
 - Symptoms
 - Chemical control
 - Etheric oils
 - Synthetic chemicals
 - Control by hive manipulation
 - 2.2 Tropilaelaps mite**
 - Cause
 - Symptoms
 - Control
 - Chemical control
 - Colony manipulation techniques
 - 2.3 Tracheal mite (Acarapidosis)**
 - Cause
 - Symptoms
 - Control

- 3. Insects**
 - 3.1 Beetle**
 - Small hive beetle (SHB)
 - 3.2 Ants**
 - Control
 - 3.3 Wasps and hornets**
 - Control
 - 3.4 Wax moths and other Lepidoptera**
 - The greater wax moth (*Galleria mellonella*)
 - The lesser wax moth (*Achroia grisella*)
 - Other Lepidoptera