

Possible new invasive honey bee pests (not currently found in the US - but we're watching for them)



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♥ **Tropilaelaps Mite** – Native to Asia. Smaller than Varroa mite, with a greater reproductive rate and shorter generation time. Feed on bee larvae, but not on adults.

♥ **Asian Honey Bee (*Apis cerana*)**

Found predominantly in China, Russia, Japan and Afghanistan. Smaller than European honey bee, with smaller colonies, less honey and a propensity for robbing honey and pollen from other bee hives. Original host of Varroa mite and may carry other diseases/parasites that could infest European honey bees.



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♥ **Slow Bee Paralysis Virus** – Vectored by Varroa mites. Only a tiny amount of material is needed to cause bee death if the virus is transmitted during mite feeding on the bee blood.

"Killer" Bees

The Africanized honey bee, also known as the "Killer bee" is the result of a science experiment gone awry. Honey bees from Europe, introduced into the Americas beginning in the 1600's are well-suited to the temperate North American climate, however they do not fair as well in the subtropical/tropical climate of Central/South America. Attempting to breed a strain better suited to that habitat, a researcher in Brazil imported one of the honey bee subspecies from southern Africa hoping to produce an insect embodying the best traits of both European and African bees. In 1957, however, during early stages of the experiment, 26 swarms of African bees escaped from quarantine and quickly interbred with local established European colonies. This interbreeding continued allowing the Africanized bee range to expand at roughly 200 miles per year. Individuals in the cross-bred colonies tend to exhibit behaviors associated with African bees including a high level of aggressiveness towards humans and animals perceived as a threat. They are physically indistinguishable from European honey bees, and are not anymore venomous, however they are more easily provoked and attack and sting in greater numbers and will follow their enemy a farther distance to protect the hive.

Many Native bees (and wasps, flies, moths, bats, etc.) are also valuable pollinators

Over the centuries honey bees have been "domesticated" to be useful, and heavily relied upon, for the pollination of crops and other plants. There are, however a host of other animals which play a large part in pollinating the plants around us. Out of about 200,000 recorded pollinators approximately 99.5% are insects and the rest are vertebrates such as bats and birds.

A few insects other than honey bees have been managed on a limited scale for crop pollination (such as some bumble bees, leafcutting bees, mason bees and alkali bees). Most of the others are out there working "below our radar". They are extremely important to maintaining a healthy ecosystem - especially since many of them are adapted to very specific climates and habitats.



Photo by Joseph Berger, Bugwood.org



Photo by Jan Vrachock, Bugwood.org



Photo by Cheryl Moonthead, BugGuide.net

Help to promote the natives by maintaining sufficient natural habitat whenever possible.

For more information about Honey bees and other pollinators check out

The Idaho Pollinator Protection Plan at:

<http://164.165.70.60/AGRI/Categories/PlantsInsects/Bees/Idaho%20Pollinator%20Protection%20Plan-%201-17.pdf>

The Bee Informed Partnership at: <https://beeinformed.org>

The National Honey Bee Health Survey at:

https://www.aphis.usda.gov/plant_health/plant_pest_info/honey_bees/downloads/SurveyProjectPlan.pdf

Idaho State Department of Agriculture
<https://agri.idaho.gov>



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It's Not Always Easy Being A

Honey Bee

Apiculture, aka Beekeeping, is the act of raising and caring for honey bees (*Apis mellifera*) which are used for crop pollination as well as for obtaining bee-derived products including honey, beeswax and pollen. In the US currently over 2 million hives are being maintained by approximately 120,000 beekeepers many being part of a large commercial industry as well as hobbyists who contribute on a smaller, but still important, scale. Raising bees can be interesting and profitable, however, it also can be challenging due to many issues that can affect honey bee health and hive survival.



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Honey Bee Facts

- ♥ Honey bees are not native to the US – they were brought to North America by European settlers
- ♥ Approximately 1/3 of all food Americans eat is pollinated by honey bees
- ♥ At peak population (mid-summer) the average honey bee hive contains roughly 60,000 bees
- ♥ A healthy hive consists of one queen – she lays all of the eggs (up to 2,000 per day), a small percentage of drones (male bees that exist only to mate with a new queen) and an army of workers (the majority of bees, all female, which do all of the work including building, cleaning and protecting the hive, collecting nectar and pollen and rearing all of the bee brood)
- ♥ The average life span of an adult worker bee is 6 weeks and a queen can live up to 5 years
- ♥ Inside the hive a bee can communicate to other bees the direction and distance to a newly discovered nectar source by doing a “dance” on a vertical surface
- ♥ A bee can fly up to 15 miles per hour with a wing-beat frequency of 200 strokes per second
- ♥ Honey bees can maintain a constant temperature of about 93 degrees F within the hive, when necessary warming it by clustering together to generate heat and cooling it by moving air through the hive by beating their wings
- ♥ Wax, to build the comb in the hive, is created from glands on the underside of the abdomens of young worker bees



Photo by David Cappardi, Michigan State University, Bugwood.org

Some of the problems bees (and beekeepers) face right now



Photo by Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Varroa mites (*Varroa destructor*) – Originally found in Asia, attacking the Asian honey bee (*Apis cerana*), they spread to North America during the late 1980's and now infest over 80% of the honey bee hives in the US. Mites weaken and kill bees by sucking the bee's blood (hemolymph) and transmitting disease-causing viruses.

American Foulbrood – A disease caused by the bacterium *Paenibacillus larvae*. Bee larvae die after ingesting spores and from each dead larva millions of new infectious spores are generated and can be easily spread. They are extremely difficult to kill and can remain viable for over 70 years.

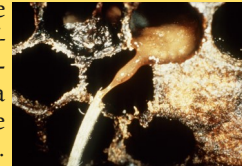


Photo by Georgia Dept. of Agriculture, Bugwood.org



Photo by Georgia Dept. of Agriculture, Bugwood.org

Nosema Disease – Caused by a spore-forming protozoan it attacks the bee digestive tract causing dysentery and weakness which can be fatal to bees when under stress, especially when hibernating during the winter or when being transported for pollination purposes.

Virus diseases – Honey bees are attacked by a number of viruses that result in stress or death of bees, depending on type of virus and level of infection. Some of these viruses are: Acute Bee Paralysis Virus, Kashmir Bee Virus, Deformed Wing Virus and Black Queen Cell Virus.

Small Hive Beetle (*Aethina tumida*) – A relatively new honey bee pest, first identified in the US in Florida during the late 1990's. Larvae of the beetle consume pollen and wax, as well as honey bee eggs and larvae.



Photo by Mandy Frake, Bugwood.org



The National Honey Bee Health Survey

Beginning in 2009 federal funding (through the Farm Bill program) has been available to collect data for a National Honey Bee Health Survey project. Research began in California, Florida and Hawaii apiaries, but over the years, the number of states has increased and now generally each year about 35 states take part in an effort to:

1. Monitor the absence/presence of several potential new honey bee pests
2. Collect baseline data for various honey bee diseases/parasites known to be present in US hives to understand how much pressure each might exert on the industry and where/when these stresses might be greatest
3. Collect data on what pesticides might be appearing in honey bee hives and how those chemicals may be impacting bee health

Survey protocol

In each participating state:

- ♥ 24 apiaries are sampled
- ♥ 8 hives are sampled at each apiary
- ♥ ¼ cup of live bees are collected from each hive to test for the presence of several virus diseases
- ♥ ¼ cup of bees are collected and put into alcohol to test for mites and protozoan (*Nosema* spp.) spores
- ♥ A “bump sample” is taken from each hive to look for parasites and predators attacking honey bee larvae
- ♥ Wax samples are collected from 10 of the 24 apiaries to look for the presence of over 170 possible pesticides



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