

Honey Bee & Beekeeping



Entomology Fact Sheet
Department of Crop Sciences

Honey bees, *Apis mellifera*, are native to Eurasia and Africa. They were brought to North America by early European colonists. Honey bees are domestic animals. Humans have selected for bees that are less likely to sting and are high honey producers through controlled breeding. Humans provide housing for the bees that allows their honey, beeswax, and other products to be more effectively harvested while making it easier to move colonies for crop pollination. Although wild (feral) colonies exist, they are primarily escapees from domestic colonies and carry genes selected by humans.



Honey bee on phlox

Importance

Although there are over 3000 species of bees in North America, honey bees provide 80% of crop pollination. Their large, moveable colonies are more efficient than other bee species in pollinating large monoculture fields that allow the most cost-effective planting, maintenance, and harvest. Pollination of crops by honey bees is worth \$15 billion annually to U.S. agriculture. More than 100 commercial crops in the U.S. rely on managed honey bees. The California almond crop is pollinated annually by 1.3 million colonies of bees, about ½ of all the honey bees in the U.S. with most colonies trucked in from other areas.

Illinois vegetable crops pollinated by honey bees include cantaloupe, cucumber, eggplant, okra, pea, pumpkin, summer squash, tomato, watermelon, and winter squash. Fruit pollinated by Illinois honey bees include apple, apricot, blackberry, blueberry, sweet and sour cherry, currant, elderberry, nectarine, peach, plum, raspberry, and strawberry.

Life Cycle

Honey bee eggs hatch into legless, white larvae. Workers feed the larvae primarily a mixture of pollen and honey. Fully grown larvae pupate, with adults emerging from the pupae. Almost all fertilized eggs will be raised into sterile female worker bees. When important for the hive, workers feed a few larvae a higher protein diet resulting in large reproductive females called queens. Unfertilized eggs develop into males called drones. Young queens and drones mate outside the hive. A hive contains one mated queen, workers, drones, and brood (eggs, larvae, pupae).



Comb with worker bees, white larvae, and honey-filled cells

Beekeeping

Honey bee colonies are typically started with a mated queen and several hundred workers purchased from a breeder. The queen's egg-laying results in all the workers for the hive. The beekeeper replaces the queen if she dies or deteriorates so that the hive can survive.

The colony of bees is placed in a hive body containing vertical frames. The frames include a sheet of beeswax so that the worker honey bees can more quickly expand it into comb rather than rely completely on their own beeswax production. The queen lays eggs into individual cells in the comb. The comb is used by the workers to raise the resulting larvae, house the pupae until they emerge as adults, and store honey and pollen. Pollen primarily is used to feed the larvae; honey is the primary adult food. The hive is placed in a location sheltered from weather extremes near water and near plants that produce high amounts of nectar and pollen.

During the growing season, supers are stacked on top of the hive body where the honey bees store most of the honey they produce. A super is similar to a hive body except that it is shorter. It also contains vertical frames. Honey is typically harvested in the fall by removing the vertical frames from the supers and cutting the wax caps off of the comb to reveal the stored honey. The honey is spun out of the frames and collected for human use.

Honey bees stay active during the winter; they do not go dormant or hibernate. They huddle together and shiver to produce heat during cold weather, using stored honey as their winter food. Although healthy hives produce more honey than they need, sufficient quantities need to be left in the hive for winter survival.

The beekeeper may need to move the hive during the growing season to be closer to flowering plants. The hive also is opened periodically to inspect for adequate brood (larvae and pupae) and the presence of diseases or insect pests.

Local beekeeper associations are great sources of information and assistance in getting started with beekeeping and keeping up-to-date on new developments. The Illinois State Beekeeper's Association website at <http://www.ilsba.com/> maintains a list of affiliate associations with contact information.

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Modern vertical frame hive showing internal structure



Hive maintenance