

# Africanized Honey Bees in Arkansas



## Training Manual

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# **Africanized Honey Bees in Arkansas Training Manual**

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# Bee Basics

There are as many as 25,000 identified species of bees in the world and perhaps as many as 40,000 unidentified species. What we call honey bees are represented by eight to ten species worldwide, and the number is growing steadily. There are approximately 3,500 identified species of bees in the continental United States, only one of which is a honey bee.

Most of the bees found in Arkansas are solitary bees such as sweat bees, carpenter bees, leafcutter bees and mason bees. A few are social creatures like the bumble bee and the honey bee. Bumble bees are the big, yellow-and-black, fuzzy looking bees you see most often in the garden. They live in groups in nests in the ground, usually beneath shrubs, tall and dense vegetation or debris laying on the ground. Honey bees are about 5/8-inch long and are a deep burnt-orange color with alternating darker bands around their “tail” (abdomen). These bees live as close knit social colonies in a variety of locations both above and below ground.

Not all bees sting, but the lack of a stinger does not make them innocuous. Some tropical, stingless bees found in Central America can inflict painful bites.

Honey bee colonies are usually not exposed to the elements. The bees generally prefer enclosed areas, but they will sometimes construct colonies in trees or rock outcroppings. These will often feature several elaborate exposed combs full of amber-colored honey. If a colony of honey bees is managed by someone, it is usually referred to as a hive, while all the others are called feral (wild) colonies. See the **Vocabulary** section for complete definitions.

“Swarming” occurs when part of the colony breaks off with the queen and flies off looking for another place to call home. The bees engorge themselves on their honey reserves before

leaving so as to have sufficient energy to make it to a new location. There can be multiple swarms from one hive, since new queens can also emerge and fly off with part of the colony. Once the bees become established, they begin to build a honeycomb.

The six-sided, white wax chambers that make up the honeycomb inside the hive vary in size according to the purpose. Smaller chambers are for raising female worker bees; larger ones are for raising male drones. The queen’s chambers are also larger and longer. The comb is made of beeswax, a substance secreted from worker bee abdominal glands. Other construction in and around the hive is done with propolis, a sticky substance bees manufacture from the resin of trees and plants.

## Hive Produces Many Riches

Of course, the most important product found in the hive is honey. But there are other riches as well. Worker bees who take on the role of nurses also produce a substance called royal jelly from special glands in their heads. This is given to the larvae that are to develop into queens and is also prized by many health food consumers for its nutritional value. Pollen stored in the honeycomb is used as a source of protein in feeding all the developing larvae, known as the brood.

Part of the reason honey bees are so important as pollinators is that they seek out flowers with pollen, unlike pollinators such as bats and hummingbirds which are primarily interested in nectar.

Honey bees also have lots of little hairs on their bodies. Even their eyes have hairs. A furry little bee wiggling around inside the flower picks up a lot of pollen. But the thing that really makes honey bees the world’s best pollinators is that there are so many of them.













# The African Bee Traits

Other than their super defensive tendency, the Africanized honey bees have a few other characteristics that differ from ordinary European honey bees. They are slightly smaller. Even the cells the Africanized honey bees build in the honeycomb are smaller than those of European honey bees. There are also some slight differences in certain body parts, such as the veins in the wings, which can be measured.

These physical characteristics, however, cannot be distinguished with the naked eye. Even an expert looking at a European honey bee and an Africanized honey bee sitting on the same leaf would have trouble telling which is which. Extensive scientific tests are generally required for a positive identification.

One possible reason for the success of Africanized honey bees in displacing milder-tempered bees is that, in every respect, the Africans appear to be more efficient and more diligent. They get up earlier, work later and visit more flowers per foraging flight than do European bees. When the moon is bright, Africanized honey bees will often continue to forage late into the night.

This workaholic attitude even extends to reproduction. Africanized queen bees lay eggs at a slightly faster rate than do their European counterparts. Colonies of Africanized honey bees also produce a significantly larger number of drones than do those of European bees.

## Africanized Honey Bees Are Nervous

The Africanized honey bees are nervous in behavior. They tend to swarm more often, and they are also more likely to abscond.

“Swarming” occurs when part of the colony breaks off with the queen and flies off looking for another place to call home. The bees engorge themselves on their honey reserves before leaving so as to have sufficient energy to make it to a new location. There can be multiple swarms from one hive, since new queens can also emerge and fly off with part of the colony.

When bees “abscond,” they all take off to find a new nest. Bees typically abscond when they sense a threat to their colony or when foraging opportunities have almost been exhausted in the present location. Africanized honey bees are more sensitive to threats than are other bees. They have also been selected over centuries to survive in areas where scarcity of resources is common and absconding is the only alternative if the colony is to survive. The tendency of Africanized honey bees to leave home at a moment’s notice makes them more difficult to manage and can limit the amount of honey that can be harvested from their hives.

The honey produced by Africanized honey bees is the same as honey produced by other bees. Eating the honey produced by these aggressively defensive bees will not lead to aggressive or defensive behavior in humans.

## Bee Hive Is Self-Sustaining Community

Bees produce honey and other products useful to humans as part of their natural mission to create a self-sustaining community. Honey is produced from nectar collected from flowers combined with enzymes produced by the bees. The flower advertises itself to the bees with colorful petals, some of which contain streaks of ultraviolet color invisible to the human eye. Like airport runway lights, these ultraviolet streaks guide the bees to the nectar.















**Head.** The first or front section of the insect's body where the eyes, antennae and other sensory apparatus are located.

**Hive.** A managed bee colony. The modern hive includes a bottom board, cover and one or more boxes, stacked one above the other. Inside each box or hive is a series of movable frames of comb held in a vertical position.

**Honey.** A sweet viscous material produced by bees from the nectar of flowers. It contains two sugars dissolved in about 17 percent water, small amounts of sucrose, mineral matter, vitamins, protein and enzymes.

**Honey bee.** A social, honey-producing bee of the class Insecta. In 1758 Linnaeus named the honey bee *apis mellifera* (honey bearer) and three years later changed the name to *apis mellifica* (honey maker). The American Entomological Society has ruled that *apis mellifera* is the correct scientific name for the honey bee.

**Honey comb.** A mass of hexagonal cells of wax built by honey bees and used to rear their brood and store honey and pollen. The cells are built back-to-back with a common wall.

**Hymenoptera.** The insect order to which honey bees belong. Ants and wasps are also members of this order.

**Larva** (plural, **larvae**). A developing bee in the worm or grub stage; unsealed brood. Second stage of bee metamorphosis.

**Mandibles.** The chewing part of the mouth of an insect. In the honey bee and most insects, the mandibles move horizontally rather than vertically.

**Mating flight.** The flight taken by a virgin queen during which she mates in the air with one or more drones. She then returns to the hive.

**Metamorphosis.** Honey bees change considerably as they grow and develop. The developmental process is divided into four stages: egg, larva, pupa and adult. In insects such as the honey bee, the change is called a complete metamorphosis. Other insects have incomplete metamorphosis because the immature forms closely resemble the adults.

**Nectar.** A sweet liquid secreted by nectaries located chiefly in flowers and on leaves of plants. Nectar is converted into honey and stored.

**Nectar guides.** Contrasting colored stripes or spots on the petals of flowers that attract bees to the area where nectar is found.

**Nurse bees.** Young worker bees that feed the larvae and do other work inside the hive. They are generally three to ten days old.

**Ocellus** (plural, **ocelli**). One of the three simple eyes of the honey bee having a single lens and limited vision, often seeing only light or dark. Found on the top of the head in a triangle between the compound eyes.

**Ovipositor.** Tube on an insect's tail for laying eggs.

**Pistil.** The female portion of a seed plant containing the ovules. After fertilization, the ovules become the seeds.

**Pollen.** Dust-like grains formed in the anthers of flowering plants within which are produced the male elements or sperm. Pollen is a nutritious, protein-rich food essential to bees for the raising of brood.

**Pollen basket.** A flattened depression surrounded by curved spines or hairs located on the outer surface of the bees' hind legs adapted for carrying pollen gathered from flowers to the hive.

**Pollination.** The transfer of pollen from an anther to a stigma of a flower.

































