

Webmail

Understanding the life of the Honey Bee Colony

An understanding of the life of the honey bee colony

The bee is remarkable for many reasons, including its ability to live in a cooperative society, which we call the *colony*. The colony consists of the live bees, including the brood but not including the structure they live in. The *hive* is the bee colony plus the structure around them: the wooden boxes owned by beekeepers, a hollow tree, or any other structure they might find. Sometimes a colony will not have a hive, for example a swarm of bees that is searching for a place to live. In practice, many beekeepers use the terms colony and hive interchangeably.

The *queen* is the heart of the colony. She is usually the ~~mother~~ of all the other bees in the colony. Her abdomen is slightly cone-shaped and enlarges greatly when she is actively laying eggs. The *workers* are sterile females, numbering up to 60,000 per colony. They are true to their name — tending the larvae, feeding the queen, cleaning the hive, grooming each other, constructing beeswax comb, guarding the hive, foraging for nectar and pollen, making honey, and keeping the hive warm or cool as needed. *Drones* are the hopelessly lazy male bees. They do nothing but eat and wait for nice afternoons when they will fly off with hopes of meeting a young queen bee. A drone can be recognized by his enormous black eyes which cover most of the head. His thorax and abdomen are stockier than those of a worker bee. Both his eyes and his powerful flight muscles are key to his success on a mating flight.

Each bee starts as an egg, which is incubated in its hexagonal, wax cell for three days. It hatches to become a tiny, white, worm-shaped *larva* (*larvae*, plural). The larva eats food placed in its cell by the workers, and grows very rapidly for about six days. By the time the larva is fully grown it has filled its wax cell. The workers then cover the cell with wax. Soon the larva becomes a *pupa* (PYU-pah; *pupae*, PYU-pee, *is the plural*), which is the transitional stage between larva and adult. As the pupa matures, astonishing changes occur: wings, legs, eyes, antennae, hair and all the other adult bee organs develop. At the end of the pupal stage, the bee chews an opening in the cell cap and crawls out. It is now an *adult* bee. The development periods for the three types of bee are shown below in Table 1. These numbers are very useful for a beekeeper to memorize. With them we can make a lot of sense out of what we see in the hive.

Table 1. Approximate development times (in days)

Egg Larva Pupa Total

Queen 3 5 ½ 7 ½ 16

Worker 3 6 12 21

Drone 3 6 ½ 14 ½ 24

A year in the life of a honey bee colony

We will consider a natural (feral) colony, not managed by a beekeeper. From this we will understand the colony's seasonal story, and why beekeepers manage bees in certain ways.

Let's begin with February and March, when the colony experiences the first few warm days. On sunny days above 55o the bees pour out in search of early flowers, and return with the first nectar and pollen of the new year. The arrival of food in the hive stimulates the queen to begin laying eggs, which soon hatch into hungry worker bee larvae. With some luck, the spring weather is not too bad and the bees are able to satisfy these hungry mouths. The queen lays more worker eggs daily. The first young adult worker bees of the year begin to emerge from their cells three weeks after the queen began her egg laying. They join the other workers,

the *winter bees* that were reared last year, to strengthen the colony population.

As March passes into April and May, the colony develops enough worker bees to feed and incubate a larger brood nest. Also, the nights are not as cold, and this helps the bees incubate their brood. With more brood rearing the number of workers grows quickly. In May and June, the weather is almost perfect and everything seems to be blooming at once. The days are longer, so workers can be out foraging for 14 to 16 hours daily. The sheets of *comb*, many hexagonal cells of beeswax, are filled with honey, pollen and brood. This is when the colony makes most of its honey. When bees are foraging for nectar and making it into honey, we call it a *honey flow*. When they are bringing in pollen, it's a *pollen flow*.

April through June is mating time. Drones are reared in great numbers and a few queens develop in the strongest colonies. When a new queen emerges from her cell, the colony is ready to divide. About half of the adult bees leave the hive in a big cloud, along with a queen – usually the original, older queen. This colony of bees which is temporarily without a home is called a *swarm*. They soon settle near their original hive in a cluster. In a day or so the swarm moves on to a permanent home. A hollow tree or other cavity is typical.

Meanwhile, a young queen remains in the original hive. She is the daughter of the queen that left in the swarm. As soon as weather permits, she takes a mating flight. Several days later she begins to lay eggs and takes on her new role as colony queen.

The most important honey plants do not bloom abundantly in July and August. During these months the hive often experiences a summer dearth. It consumes stored honey if it isn't finding enough nectar and pollen to satisfy the larvae and adult bees. The number of brood cells diminishes. Often, a second honey flow occurs in early fall but the bees usually make less honey at this time than in the spring. In September and October, winter preparations begin, and brood rearing tapers off. When cold weather hits, the bees cluster tightly to keep warm. From November to February the worker bees are eating honey, clustering, and generating heat by shivering their flight muscles. If the bees are healthy, numerous enough to make a large, warm cluster, and have sufficient honey stored,

they should survive the winter.

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