

Bees in the Winter

By Hannah Beckett

During the warm days of spring and summer, the air is filled with the buzz of bees busy collecting nectar and pollinating flowers. But, you may have noticed that their busy buzz is absent with the colder weather of winter? Do you ever wonder where the bees go once flowers are gone and the air grows cold?

When we think of bees, most people imagine the better-known European honeybees. These bees form colonies with thousands of individual bees and have a unique winter survival method when temperatures drop below 50 degrees.

European honeybees do not hibernate. Rather, they brave the cold winter by “clustering”. Clustering is a survival technique in which bees form a large mass organized into layers. The outside layer of the cluster is closely packed with worker bees. They function to insulate and regulate airflow in and out of the cluster.

The inside core is much more active and loosely packed, allowing the worker bees within to care for the queen at the center of the cluster. This method of clustering reduces the heat dissipating surface and ensures that the least amount of heat is lost.

When temperatures become extreme, worker bees will begin to “shiver”. By vibrating their large flight muscles without moving their wings, they can produce heat. As thousands of worker bees vibrate their muscles, the temperature inside the cluster can reach 95 degrees Fahrenheit!

We also have several species of native bees here with a different strategy. Many of our native Texas bees are solitary insects, meaning individual bees build nests and live by themselves. Carpenter bees, for example, overwinter individually as fully formed adults, retreating into previously constructed brood tunnels dug out of trees or wooden posts.

Meanwhile, Mason bees, while completing metamorphosis, remain inside their cocoons throughout the winter. The young adults enter into winter diapause - a period of reduced

metabolic activity allowing adult bees to maintain their energy stores and emerge healthy and active the following spring. Once daily temperatures reach around 55°F, the bees emerge ready to mate and begin the life cycle over again.

Leafcutter bees and sweat bees spend the winter as dormant, mature larvae in burrows in the soil. They rely on the temperature around them to know when it is time to begin metamorphosis. Temperatures of about 50 degrees or cooler keep the larvae in an inactive state, but as temperatures rise, the larvae begin their transition. The average daily warmth dictates how long the metamorphosis lasts. For example, when daily temps are approximately 70°F/21°C, adults emerge after about 42 days, and at 84°F/30°C, adults emerge after about 20 days.

Bumble bees form colonies similar to honeybees, though the colonies tend to be smaller and start anew every spring. Queen bumble bees hibernate over the winter in warm, protected areas like rotting wood or compost piles. Once spring returns, the queens emerge and establish colonies where they produce the next generation of bees.

The newly hatched generation of queens spend the summer and early fall feeding and building up reserves needed for overwintering. As winter approaches, the old queen and colony slowly decline and perish. The only bumble bees to survive are the new queen bumble bees who search for protected shelters. There, they overwinter and wait for the return of spring and the chance to establish their own colonies.

Even here on the Texas gulf coast where our winters are mild, bees still must deal with days of cold temperatures and less food. With winter nearing its end, I look forward to seeing our bees return to the important work they do.

Photo: European Honeybee colony

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