

# Bee Survival Through Winter

Bees are wonderful creatures. It is from them that we get honey and they also pollinate many plants for our food. Today, I will be telling you about how these marvelous creatures stay warm through harsh, cold winters.

The majority of bees hibernate during the winter season, but honey bees continue to stay active. At this time the bees live off the honey that they have made throughout the year. This is the entire reason that bees make honey. They make honey to live on during the winter. Eating honey also helps to keep them warm. They collect nectar to make honey to use for food and warmth.

In some species, the queen bees are the only bees that live through the winter. The queen bee also stops laying eggs in late fall/early winter. This is to preserve the food source. The drone bees are forced out of the hive by the worker bees and they starve. This is because the drones would eat too much of the honey that the colony needs to survive.

When it continues to get extremely cold, the honey bees flex their flight muscles. They are not trying to fly away, but the vibration keeps the bees warm. They do this for two reasons - if they get too cold then they freeze and can't move to their food source. When all of the bees are vibrating, it raises the temperature to 93 degrees on average.

Every year, the bees make about 2 or 3 times more honey than they need to survive the winter. Then, when the beekeepers collect honey from the bee hives, they are extra careful to leave enough for the bees to survive the winter.

The bees crowd around the queen when the temperature drops a lot in the hive. The bees on the outside edges of the cluster sometimes rotate with the bees closer to the center. They rotate so that all of the bees can stay warm enough to survive. When the temperature rises back to the normal 93 degrees, the queen starts laying eggs again.

When the bees are in the cluster, they always make sure to keep their faces turned inward. This is so that the bees that are in the middle of the cluster can eat the stored honey. The bees on the outside insulate the bees in the middle so they can stay warm. They do this by staying completely still and not vibrating at all. Once the temperature rises, the bees on the outside separate slightly to let fresh air in.

There are bees whose jobs are to vibrate their abdomen so that they heat up their bodies. This type of bee is called a heater bee. Doing this can raise the bee's body heat to 111 degrees, 16 degrees warmer than their typical body heat. Another thing that heater bees do is to crawl into empty cells to heat the other cells. Also, a single heater bee can keep up to 60 cells warm that are next to the heater bee's cell.

Some scientists have observed that a lot of the weaker colonies don't make it through the winter season, even when they have plenty of honey! This is because they are smaller and they don't have enough bees to spread the warmth and to get to all of the honey. The stronger colonies have enough bees and can move their entire colony to where the honey is.

A lot of beekeepers have thermal cameras. These fascinating cameras are used to show a picture of where the heat is inside of the hive. Beekeepers use this information to attempt to see how the colony is doing, and how many bees are left.

Some essentials for bees to live through the winter are a healthy queen, a strong colony, a good food source, and warmth. They need a healthy queen because if the queen doesn't lay enough eggs before the harsh cold, then there isn't enough heater bees to keep the colony warm. You need a strong colony so that there are enough bees to insulate the rest of the colony. They need a good food source so that they have enough food to eat. They need warmth so that they don't freeze.

In conclusion, to keep warm in the winter bees eat honey and nectar, huddle together, and heater bees vibrate and raise all of the bee's body heat. Overall, I hope that you learned something and feel the same about bees like I do.

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Biographical sketch

Lucy Easter

Date of birth:

Gender: Female

Mailing address:

Telephone number:



# Honeybee survival through the cold season

I look forward to going to my uncle Carl and aunt Beverley's house. They live in the country and I love it there. While I am there I play outside the whole time. My favorite thing to do is play in the creek. Last fall, while looking for salamanders and crawl fish, I noticed bees were landing on the rocks. I ran to Carl (Pap) and asked him why. He laughed and said those are my honeybees. He explained the bees were drinking the water off the rocks and taking the water back to the hive. I realized right then I wanted to learn more about honeybees.

There are three types of honeybees that are in the hive. The three types of honeybees are the drones, the worker bees, and the queen bee. Most of the colony is made up of worker bees which are females. Worker bees only make 1/12 teaspoon of honey and 1/80 teaspoon of beeswax. However, the entire colony can produce two hundred pounds of honey! Worker bees are the hardest works I know. They gather all the nectar and pollen. They feed young larvae, they keep them warm and protect the eggs. They also bring water to the hive, just like I saw. Workers also secrete beeswax and build combs.

The queen bee keeps the colony alive because she lays the eggs. Without the queen the whole colony dies. She can lay two-thousand five-hundred eggs in a day! Now that's a lot of eggs just in a day. She is fed and protected by the worker bees. She can live for three years. The last type of bee are the drones, which are all males. These bees are bigger than the worker bees, but smaller than the queen bee. They do not collect pollen or nectar.

They do not make beeswax to. They mate with the queen bee. During the winter the drones die from being kicked out of the hive.

I went back to Pap's house last month and the first thing I noticed there were no bees flying around like during the fall. Pap explained to me the winter is the hardest time for honeybees. During the winter the flowers die leaving no pollen or nectar for the bees. The worker bees get around the queen to keep her warm, they all eat honey, and keep the hive ninety-five degrees. The drone bees are driven away from the hive and starve. The Queen bee lays eggs, eats honey, and stays warm. Some bees stay at the hole and protect the hive.

In the winter some hives are dormant, the bees will die in these hives. If the temperature gets too cold and the walls are not thick the bees will die because it is not warm in the hive. There are also diseases, including bee mites and moths. In the winter beekeepers like Pap make sure the bees have enough honey and food, make sure the hive is warm enough (95 degrees), make sure there are no pests or predators.

I asked Pap is there anything he does to help the bees during the winter. Pap told me that everyone does things a little different to help their bees get through the cold season. Starting in late fall, Pap puts out sugar water for the bees to eat. This is how they made the sugar water. Pap uses two cups of sugar and one cup of water. Other beekeepers put out syrup and salt. Pap also does another thing to winterize his beehives. The bees need honey to eat. Pap makes sure they have enough honey by leaving only two hive bodies

and removing the shallow supers that help makeup the hive box. This allows the hive to have more honey than usual. Each colony must contain 40 to 50 pounds of honey. He changed pieces of his hive called a summer reducer to a winter reducer. This is a piece of wood that allows the bees to go in and out.

Carl (Pap) is my great uncle he helped me with all the facts about what he does in the winter to protect his honeybees. He has had bees for four years. He got his bees from an organization called Grow Appalachian. He got a two-hundred-dollar grant for one swarm and the hive. He now has four hives. He lost two swarms last winter. He thinks it is because of the big change in temperature. He is hoping all the hives live this year. Pap lives there with all his animals and his wife Beverly(Bev).

After visiting Pap in late fall, I started by wondering why I did not see one bee flying around. After talking with Pap I learned bees have a hard time during the winter. I learned the bees were not flying around because they were all in the hive. I learned that people can greatly help bees stay alive during the winter. I also did my own research and found there are other ways to take care of bees. I am glad to know there are many people who help bees survive. I think one day I might raise bees. I think I can help them in the harsh cold winter.



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## Author Bio

My name is Harrison Blakeley, I am in the 4<sup>th</sup> grade. I am a boy.



# Overwintering of Bees

Did you know that the queen bee only survives winter, emerging into spring to re-establish a colony? Science bees are active all winter long they start to make their own heat source. If the temperature drops to about 45F the bees start to get sluggish it happens to a lot of bees but the smart bees move around a lot instead of staying still for a long time. Another way bees stay alive is that they collect a lot of honey and eat it all in the wintertime. Japanese bees can survive winter by their energy because all of their energy makes 117 degrees F. The only time bees leave the hive is when the hive in the winter is when the outside temperature drops to 55 degrees or higher. Since bees are cold-blooded they have to get heat in their hive before winter comes because they are already cold-blooded they can't take on so much heat. In the winter beekeepers put a lot of food in bee boxes so the bees don't die in the winter. Honey bees keep the queen bee alive as they make a ball around her to keep her and her eggs warm so they don't die. In the wintertime, most of the bees die except for the queen bee because she makes enough heat because she is laying a lot and lots and lots of eggs so that whenever winter is over she has a new colony of bees. Honey bees are active all winter long by collecting honey so they don't starve they also get honey and bring it back to the queen bee because she is laying so many eggs she doesn't have any time to leave the hive and go get honey for herself to eat. Did you know that honey bees will consume 30 pounds of honey just over the wintertime? Most bees in the winter that can survive in the winter because most bees live underground. In the winter beekeepers put hot boiling water over the bee boxes so that they don't freeze up. Some winters it is really hard for bees to get honey because since they are cold-blooded and more coldness enters their body they start to move very slow. The only time bees leave the hive in the winter is when the temperature gets to 55 degrees

or higher. Did you know that an average over the 13 years 29 percent of colonies have died each winter? And again since bees are cold-blooded the beekeeper has to put lots of heat in the bee boxes so that they won't freeze to death and die. Also because I don't think that the beekeeper wants to lose tons and tons and tons of honey that year. When bees live in a hive, not bee boxes they flutter their wings to keep the hive warm and because they don't want the queen bee to get cold and die even though the worker bees are freezing trying to keep the queen bee alive. Each colony of bees must store 50 to 60 pounds of honey to prevent starvation for all of the bees. Normally bees are divided into 3 groups: drones, workers, and queens. But in the wintertime, the male drone bees die off leaving only the female bees and the queen bee. Whenever the male bees die the female bees have to make a cluster around the queen bee and the core of the circle can get up to 100 degrees Fahrenheit. In the wintertime, bees collect a lot of honey so that whenever all of the flowers try to grow back they won't have to worry about starving to death. Did you know that winter bees can live up to 6 months in their hive? While summer bees leave the hive hundreds of times a day a winter bee can stay inside the hive for months at a time. And the only time bees leave the hive in the winter is when the temperature gets to 55 degrees or higher. Summer bees only live for 4-6 weeks, as for winter bees can live 4-6 months. Some ways beekeepers help their bees in the winter is that they feed them syrup in the fall, leave enough honey in the bee boxes, and they also wrap up their hive to prevent any more cold air to get inside of the bee boxes. In conclusion, the overwintering of bees is a very difficult process but is also necessary.

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## Author Bio

Name: Alivia Sunderland

Address:

Gender: Female

Phone:

DOB:

I am a fifth-grader. My favorite subjects are math and art. I want to be a veterinarian or a lawyer when I grow up.

