



'If the bee disappeared off the surface of the globe, then man would have only four years of life left.' - Albert Einstein

FORWARD

Here's something you should always remember: Bees didn't write the book on beekeeping, humans did. Don't be too hard on yourself if beekeeping seems intimidating, scary, or even impossible. Keep in mind that the survival rate for bees is low - between 40-50% in Indiana. With those odds, it's easy to become discouraged. That said, the act of beekeeping, or maybe more appropriately, "bee-having" is noble, brave, important, fascinating and fun.

Honeybee Facts

- 1 out of every 3 bites of food we eat was made possible by a bee.
- We rely on pollination for most of our food: apples, avocados, blueberries, tomatoes, coffee, chocolate, the list goes on and on!
- One colony can contain 60,000 bees at its peak.
- Bees make honey to feed themselves and their babies. A single honey bee worker produces about 1/12 of a teaspoon of honey in her lifetime.
- Honeybees are not native to the US, they were introduced by European settlers.
- Bees are gentle unless threatened. Never swat or provoke and they will go about their business.
- Bees die after they sting.
- Bees live an average of 30-40 days.
- The queen bee lays 1,000 - 2,000 eggs per day, and may lay up to 1 million in her lifetime. She is the mother of every bee in the hive and can live 2-4 years.
- All worker bees in the hive are female.
- Drones, the only male honey bees, do not have stingers and die immediately after mating.
- A worker bee may visit as many as 2,000 flowers per day.
- Pesticides, habitat loss, unsustainable farming practices, monocultures, migratory beekeeping, and climate change are some of the factors threatening bees (and other pollinators).
- The best thing you can do for bees is to plant flowering plants

Setting Up the Hive

After you install bees in a hive, it's important to give them space and time to acclimate. While you don't want to open the hive for at least 2 weeks after installation, it is important to closely observe your hive during this initial period. As time goes by, you'll learn what's "normal" for your hive. If you notice anything unusual, don't hesitate to contact your beekeeping mentor.

- The ideal spot for your hive is mostly sunny, with a wind break
- Bees drink water, make sure they have access to a body of water or provide them with fresh water (a dish with corks or stones for bees to rest on is ideal. Change water every week.)

The Beehive

The hives we use are called Langstroth hives -- they look an awful lot like filing cabinets. We use these hives because the parts are easily interchangeable and people tend to recognize them as beehives right away. This helps with Bee Public's mission to raise awareness about bees by placing hives in public spaces. Each box of the Langstroth hive is called a "super". Bees live in the larger ones at the bottom, referred to as brood (brood = babies) box. The smaller supers at the top of the hive are typically filled with surplus honey.

Each super has 10 rectangular frames. Bees build foundation in these frames using beeswax that comes from their bodies. They chew it and shape it with their legs into hexagonal cells, side by side, to form the foundation which will hold eggs, larvae, pollen, nectar, and honey. Some frames come with manmade foundation to give the bees a head start on foundation building.

You need to keep the beehive off the ground to prevent flooding, mice invasion, etc. An inexpensive base can be build using cinder blocks or a wooden pallet.

Parts of the hive:

- Roof/lid
- Cover
- Super
- Brood Box
- Base

Here are the tools you'll need:

- A suit or jacket with veil
- Gloves
- Smoker
- Smoker fuel (I like to use dry grass, pine needles, wood chips, etc. Untreated paper can work, too)
- Bee brush
- Hive tool
- Beekeeping log book

Installing the Bees

You can source your bees many ways, but you'll probably purchase either a package or a nuc from a beekeeper. A "nuc" or nucleus colony is an already established mini-hive. A package, includes just a queen and approximately three pounds (close to 10,000) bees.

A beekeeper will install your bees for you initially, so you'll get a sense of how it's done. The package of bees will likely come with a can of sugar syrup to feed the bees. You will need to remove the queen, she's secure inside her own queen cage within the package. The queen is installed still inside her cage. It will take a her a few days to chew her way out, giving the other bees a chance to acclimate to her pheromone scent. This is important because this queen is not the mother of the other bees in the package. If she gets released too early, the other bees in the hive might attack her. Once the queen is installed, the rest of the package is gently dumped in and the lid is closed. Again, it's important to observe the bees for the next couple of weeks, but resist the temptation to open the hive too soon.

Inspecting the Hive

Hive inspections are often the most intimidating part of beekeeping. I recommend only doing these every 2-3 weeks, and they shouldn't take longer than 10-15 minutes. More frequent and longer inspections will disrupt the bees' workflow and/or you might find that they become increasingly agitated with you the longer you hang around the open hive. Be sure to suit up completely until you feel comfortable going without all your protective gear. In the early spring and late fall, when there's not much blooming outside, bees can become protective of their honey stores. When in doubt, suit up.

Here's a great video on how to do a hive inspection and how to tell when it's time to add a new super (box) on the hive: <https://www.youtube.com/watch?v=qseYZ0Fg22Y>

1. Choose sunny, warm weather days to perform inspections. Keep inspections short, 10-15 minutes. If you're going to record what you see, get your pen and
2. Stage your gear, put on protective wear, light your smoker.
3. Give the hive entrance a puff of smoke, if needed. Puff the smoker periodically to keep it smoldering.
4. Pry open lid and remove a frame closest to either wall using hive tool. Lean them against the hive body on the ground. It's okay if bees are on them.
5. Now you have room to move the other frames toward the empty space, using your hive tool (insert, wiggle, pry). Remove the frame with the "J" end of the tool and pull it gently, straight up and out of the hive.
6. As you inspect frames, make sure you remember the order so you can place them back in the hive exactly the way they were. Bees like that.
7. Using your hive tool, loosen frame #2 and move it into the open slot where frame #1 used to be. That gives you enough room to remove this frame without the risk of injuring

any bees. When you're done looking at this frame, return it to the hive, close to (but not touching) the wall. Do not put this frame on the ground.

8. Work your way through all 10 frames (from the outside in) in this manner, moving the next frame to be inspected into the open slot. When you're done looking at a frame, always return it snugly against the frame previously inspected. Use your eyes to monitor progress as the frames are slowly nudged together. Move slowly and gently.
9. Holding and inspecting an individual frame the proper way is crucial. Be sure to stand with your back to the sun, with the light shining over your shoulder and onto the frame. The sun illuminates details deep in the cells and helps you to better see eggs and small larvae.
10. Hold the frame firmly by the tabs at either end of the top bar, Turn the frame vertically., Then turn the frame like a page of a book. Now smoothly return it to the horizontal position, and you'll be viewing the opposite side of the frame.
11. Every time that you visit your hive you're looking for indications that the queen is alive and well and laying eggs. Rather than spending time trying to see the queen, look for eggs. Although they're tiny, finding the eggs is much easier than locating a single queen in a hive of 60,000 bees. Look for eggs on a bright, sunny day.
12. Each deep frame of comb contains about 7,000 cells (3,500 on each side). Honeybees use these cells for storing food and raising brood. When you inspect your colony, noting what's going on in those cells is important because it helps you judge the performance and health of your bees.
13. Examining brood pattern (baby bees) is an important part of your inspections. A tight, compact brood pattern is indicative of a good, healthy queen. Conversely, a spotty brood pattern (many empty cells with only occasional cells of eggs, larvae, or capped brood) is an indication that you have an old or sick queen and may need to replace her.
14. Other stuff you'll see: Pollen comes in many different colors: orange, yellow, brown, gray, blue, and so on. You'll also see cells with something "wet" in them. It may be nectar. Or it may be water.
15. Have a bottle of water or other water source handy to douse the smoker when you're all done. Be careful, it gets really hot. Sparks can fly out and burn you. Don't underestimate the smoker. A back-up lighter or book of matches and some extra burnables wouldn't hurt, either.

Feeding Your Bees

Bees eat both honey and pollen (pollen is their protein source). In general, bees do just fine making enough food to feed themselves. In some cases, the bees need a little supplemental feeding, especially when a hive is weak or when plants are not flowering in the early spring and late fall. Making sugar syrup is easy -- just bring water to a boil, add and sugar, stir until it dissolves. Take care that the syrup doesn't get moldy or fermented. I don't recommend feeding your bees during the winter months - it can bring in too much moisture to the hive and freeze. Mason jars with holes punched in the lid make great feeders and are easily refilled. Of course the best way to ensure your bees get enough food is to plant flowering plants and trees that bloom early spring, summer, and late into the fall.

What to Expect in Each Season

Winter: Winter is a crucial time for bees and the time they are most likely to die. Before the temps dip below freezing, you'll want to wrap light insulation or roofing paper around the hive (DO NOT block the entrance). Bees only leave the hive when the temps are above 40-50 degrees during the winter months to take "cleansing flights" - they never go potty inside the hive. Make sure the entrance is clear of snow and debris. Another good practice is to tip the hive slightly forward to allow condensation to run out of the hive instead of onto the bees.

Spring: This is the time to establish a hive so they'll have plenty of time to make honey stores for winter. This is also when colonies might start to divide in two and swarm. Half of the bees will leave the hive with the queen and find a new home. The remaining bees will raise a new queen. Now there are two colonies where there was one!

Summer: Bees use the same technology as air conditioning. To cool the hive, they gather water and put it in the wax cells within the frames. As they fan their wings over the water, it creates a cooling effect. Ensure your bees have access to fresh water. Your bees may also come outside the hive and sit on the "front porch" to cool off. This can look kind of scary as thousands of bees sit on the outside of the hive, but don't worry too much about it. This phenomenon is sometimes referred to as "bearding" because it looks like a beard of bees on the outside of the hive.

Autumn: The population of the colony will start to decrease as drones (male bees) start to die off. Because the drones don't do any work around the hive, they female worker bees force them out to ensure there's enough honey for them in the winter months. Autumn is a good time to start feeding the bees sugar syrup.

Diseases and Pests

Every beekeeper will contend with diseases and pests at some point. Regular inspection and maintenance can help you avoid or manage these issues without the use of chemicals or antibiotics.

Read These:

The Beekeeper's Lament
The Rooftop Beekeeper
The Queen Must Die

Watch These:

Wings of Life
More Than Honey
The Vanishing of the Bees
Queen of the Sun
TED Talks

Other Resources

Plant a Bee Garden: <http://thehoneybeeconservancy.org/act-today/plant-a-bee-garden/>

Sugar Syrup Recipe:

<http://www.motherearthnews.com/homesteading-and-livestock/sugar-syrup-recipe-for-feeding-bees-zbcz1403.aspx>

NY Honeybee Conservancy (apply for grants, download curriculum):

<http://thehoneybeeconservancy.org/our-work-2/education/>