

Beekeeping: A Personal Account

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In the winter of 2010, perhaps while watching a nature documentary or reading a magazine or maybe it was my version of a mild mid-life crisis, I decided to become a bee keeper. At the time, there were many news reports about the crisis of the honeybee's decline. Maybe something deep inside me led me to do my part to save the bees and in so doing, save the human race as well. Most likely, though, I just got a wild hair and wanted to try it. Plus I really like honey.

When I shared my plan with Beth, her initial response was "What? You know I don't like bees! They sting! They hurt! They are mean!" I promised her that their presence would hardly be noticed. The hives would be placed in a low-traffic part of the yard, and we would be rewarded with delicious honey, I would never enlist her help in working the hive, and that some of the hives I've seen were really attractive and would be a nice aesthetic addition to the garden. Pretty hives with copper tops was the game changer. She sighed and reluctantly bought into the idea. I knew she couldn't protest too much about the bee keeping idea because I was holding the "well, you got the chickens last year" card. She has always been supportive of my hobbies, but I think this time she was a little apprehensive.

I ordered some books and developed a plan. A couple of months later found us spending spring break in the mountains of western North Carolina not far from one of the leading manufacturers and suppliers of bee keeping equipment. A short drive up a mountain in Moravian Falls, North Carolina led us to Brushy Mountain Bee Farm where we would eventually spend a fair amount of time and money. We left with the essential

items a beginning bee keeper needs: a beekeeping hat, gloves, a smoker, a bee brush and two hive kits, both with pretty copper tops. As soon as the car was unloaded from vacation, I got to work assembling frames, painting hives and constructing hive stands. The next step was to fill the hives with bees.

There are several ways acquire bees: buy a package of bees, buy a starter hive known as a nucleus or nuc, buy an established hive, catch a swarm, or remove a honey bee colony from a building. As a beginner bee keeper, I only considered the first two options: package bees and nucs.

A typical package of bees contains 3 pounds of bees and a young, mated queen. Package bees are the most common method of acquiring bees. It is easier to find a package bee supplier than someone who produces and sells nucs. Package bees can be ordered on-line and sent through the Postal Service. I understand that when your bee package arrives at the post office you are their first call of the day to arrange a very quick pick up.

A nucleus colony, or nuc, is a smaller version of a complete colony, consisting of 4 to 5 frames of drawn comb with food, a laying queen, brood in various stages, and room for the queen to lay eggs. Nucs are typically raised locally and picked up on site. After weighting my options, I decided to purchase two nucs from a reputable beekeeper in Hendersonville, Tennessee. In mid April I picked up my two nucs and I officially became a bee keeper!

Beekeeping life was good! I found great satisfaction spending spring afternoons watching my 30,000 new pets return to the hive after the tedious task of collecting pollen. They were the coolest pets I'd ever owned! They cleaned up after themselves, found their own food, didn't require house training, and with time would reward us with the sweet honey. But I quickly learned that the bees weren't pets, and they weren't making honey for human consumption. The bees and I had entered into a very complex relationship; only the complexity wouldn't reveal itself for many months later.

Three days after the nucs had been installed into hives in our yard, it was time for my first hive inspection. This is, as you may imagine, is quite a daunting task for a beginner. Now I found myself opening a hive with thousands of angry bees trying to protect their honey. The fewer disturbances during the "get acquainted period" the better; but checking the health of the queen and the hive in general is necessary. So, I suited up, donned my beekeepers hat with veil, slipped on my gloves and lit the smoker. I was ready to inspect and prepared to be stung. My first few inspections were quite successful by my standards. The queen looked good, the brood looked healthy, and signs of honey were present. Hive inspections are typically uneventful, as long as I kept my smoker lit, and generally quite enjoyable, except for the heat; however, one particular hive inspection in the summer of 2012 was neither uneventful nor enjoyable. Into my second year of beekeeping, I was quite comfortable with inspecting hives and invited a new beekeeping friend to examine them with me. The inspection was going well when I felt a slight tickle on my right ankle, which slowly moved up to my calf. The tickle, which I realized was 6 bee legs, kept moving up my leg. Still undaunted, we

inspected on. Soon, though, I felt the bee on my knee, then my thigh. When the little spelunker reached my groin, my attention shifted from hive inspection to disaster prevention. The first rule of beekeeping is don't panic! In order to not alarm my friend or the bees whose hive we were inspecting, I calmly asked that he take over the inspection, excused myself, and slowly walked a few yards away. By now the bee was inches away from a very sensitive area, and I had no interest in bee-induced swelling from a sting in that spot. I unbuckled my belt, dropped my jeans, and encouraged the bee to swiftly leave. The bee and I both survived. Lesson learned, tape up the bottom of my pants the next time.

Working the hives was fascinating to me. I learned so much watching the bees go about their business. Many people have the misconception that the bee colony is a perfect society of selfless individuals ruled by a queen. Perhaps this misconception is because of the term Queen Bee, which implies the queen ruling over subjects. This is not the case. Bees are much more complex than that. Jürgen Tautz, a leading bee scientist states:

“We are surprised to learn that no single bee, from queen through drone to sterile worker, has the oversight or control over the colony. Instead, through a network of integrated control systems and feedbacks, and communication between individuals, the colony arrives at consensus decisions from the bottom up through a type of "swarm intelligence". Indeed, there are remarkable parallels

between the functional organization of a swarming honeybee colony and vertebrate brains.”

There is an emerging convention that views beehives as a super-organisms, a self organizing and complex adaptive system based on a network of communication; a fascinating result of evolution. The honeybee colony is an integrated and independent being--a "super-organism"--with its own, almost eerie, emergent group intelligence. Biologist William Morton Wheeler introduced the idea of the hive as a super-organism in 1911, defining a super-organism as "a complex, coordinated, individualized system of activities directed at acquiring and assimilating resources from the environment, protecting the system and producing other systems." Honeybee colonies do just that. They live in a highly cooperative and socially integrated animal group where the colony acts like a single organism despite each animal's physical individuality.

A superorganism is governed by the collective to accomplish goals for the good of the collective. In the world of honeybees, this is called the “hive mind.” Hive mind is distributed intelligence reflecting the fact that many individuals with limited intelligence and information can pool resources to accomplish that which is beyond the capabilities of any individual within the collective.

The hive mind is demonstrated by how a swarming hive collectively decides the best nesting site. In the spring the beehive raises a new queen in a super cell. When the new queen emerges, the old queen leaves the hive with several thousand

bees. The swarming bees collect on a tree branch several yards from the hive and send out hundreds of scout bees. Once a scout bee finds a potential nesting area, it returns to the swarm and performs the waggle dance, which is a complex set of movements that relates the direction and distance to the nesting site using the sun as a reference. Somehow the other scout bees interact with each other, visit and assess each potential site, and eventually arrive at a consensus decision. The colony then flies in a swarm to the new site.

As beekeeping year one progressed, my focus shifted from hive setup and inspection to helping the hive survive winter. Most bee activity focuses on storing enough honey and pollen to survive the winter. In late summer I began noticing a declining bee population in one of the hives. I quickly became concerned with the viability of the hive. Inspections showed an inadequate number of brood cells, a troubling find for even a seasoned bee keeper. I read my beekeeping books and talked with experienced beekeepers on what actions I should take to save my hive. I learned that honeybees face many threats to their well being. The list is very long, indeed!

Two varieties of mites, Varroa and Trachea, are the greatest threat to beekeeping. These mites are greatly reducing the overall honeybee population in the USA. The mites are of no concern to humans, except for the effect they can have on honey production. Varroa mites are external honeybee parasites that attach themselves to the bees and suck the blood of both the adults and the brood, similar to a tick attaching itself to a human. However, in relation to the size of the bee, the varroa mite

would be a tick the size of a rabbit. Another major threat to the honeybee is Nosema, a fungus that attacks the bees gut, essentially causing diarrhea.

Pests such as the small hive beetle are also very destructive to the bee colony, causing damage to the comb, honey and pollen. Mice are another threat, often found nesting in a wintering hive, apparently unaffected by bee stings, gorging themselves on the bees and destroying the comb. Skunks, also immune to bee stings, will sit at the entrance of a hive and eat departing and returning foraging bees. Other beekeepers told me that it is impossible to eliminate these threats to the beehive, and that the bees can get along fine as long as the beekeeper takes actions to mitigate and prevent any one of these diseases or pests from overtaking and destroying the hives. Simply put, a beekeeper must be persistent and have a plan for medicating and managing parasites and diseases. Without a plan it is nearly impossible to successfully keep bees.

Even with what I considered good hive management and proper medications, the hive continued to dwindle until it was gone. That was my introduction to an aspect of keeping bees that every beekeeper has to learn to deal with—hive loss.

I watched my remaining hive closely, and it appeared to be thriving. It entered the winter fairly strong. Although quite inactive during the winter, the honeybee survives the winter months by clustering for warmth. By self-regulating the internal temperature of the cluster, the bees maintain 93 degrees Fahrenheit in the center of the winter cluster, regardless of the outside temperature. Bees are remarkably resilient and

survive extreme cold. North Dakota, surprisingly, is one of the top honey producing states.

It is too cold to inspect hives in the winter. On a temperate day in March of 2011 it was time to assess the health and strength of my remaining hive. Soon after lifting the hives top, I knew the hive was in trouble. Huddled in a bee ball, there were too few bees remaining for the hive to survive. A few weeks later it was gone.

Even though I knew beekeeping was not easy, I was dejected. At the same time I was determined to figure out what went wrong, make corrective actions, and get more hives. I sought answers from experienced bee keepers through the local Beekeeping Society, which I later learned is as much a support group offering encouragement to failed beekeepers like me as it is a group to educate and share information about beekeeping.

I knew I made novice mistakes with my first hives; but I also knew that beekeepers nationwide were facing staggering honeybee losses. Historically, the expected annual attrition rate for bee hives was around 5 to 10 percent. In 2006, for unknown reasons, that rate skyrocketed to roughly one third. For 2013, the attrition rate for hives was one half. Now granted, the loss of my two beehives shadows in comparison to a 30 percent hive loss to a large beekeeping operation supplying pollinators to the almond groves of California, where upwards of one million hives work over 700,000 acres of almond trees. Something was happening to the bees that scientists could not explain.

My hive loss research led me learn more about Colony Collapse Disorder. CCD is characterized by the sudden disappearance of the hive's worker population. According to the USDA, symptoms of CCD include “few or no adult honeybees present, honey and immature bees remain present in the hive suggesting a sudden abandonment of the hive--a possible response to stress. However, the bees are never found elsewhere, they simply disappear and die. Usually, the queen bee is left behind but dies without establishing a new population. I'm not convinced that CCD was the cause of my hive loss, but I cannot dismiss that it wasn't.

Determined to succeed, I re-bee'd in the spring of 2012, and had more success the second year. I managing to pull off some honey and had two hives survive into winter. However, I lost the hives again that winter. Four hives lost in two years. This bee keeping hobby was difficult on the wallet and the ego! Perhaps I needed to let go of the notion of “save the bees, save the world.” But I couldn't do that altogether. I wasn't going to give up.

The importance of bees is well known. Bees are essential because aside from producing honey, they pollinate most of the fruit and vegetable supply in the United States. Just how important are honeybees to the human diet? According to the U.S.D.A., these under-appreciated workers pollinate 80 percent of our flowering crops which constitute 1/3 of everything we eat. Losing them could affect not only dietary staples such as apples, broccoli, strawberries, nuts, asparagus, blueberries and cucumbers, but may threaten our beef and dairy industries if alfalfa is not available for

feed. In the summer months you will notice bee hives in Christian County the corner of Mennonite farmers' fields pollinating watermelon, cantaloupe, pumpkins and many other vegetables.

Albert Einstein is credited with saying that "If the bee disappeared off the surface of the globe then man would only have four years of life left. No more bees, no more pollination, no more plants, no more animals, no more man." Although there is no substantive evidence that Einstein ever made the remark, it does leave us to wonder if the bee is the canary in the coalmine. And if Albert Einstein said it, it must be true!

Exactly what is killing the bees remains a mystery and a complex issue. A number of beekeepers blame pesticides for the loss of their bees, specifically a new class known as neonicotinoids, a form of pesticides that work by blocking the nerve endings in insects, paralyzing them so that they die slowly by starvation. Neonicotinoids persist much longer than typical pesticides, greatly increasing exposure to effected bees, making it more difficult for bees to break it down further weakening the bees. Most beekeepers believe their bees are being exposed to the pesticides and are dying as a result, but research on dead bees confirms the pesticide is only occasionally present in CCD cases. As we have often seen, though, profits and politics can skew research in any direction. Researchers also have widely observed that bees are being exposed to a wider variety of chemicals in the environment that previously supposed. Other research has examined the possibility that diseases such as parasites or viruses are to blame for hive loss. No single factor has been found causing CCD and the high

fatality rates that beekeepers are reporting. What do I think is happening to the bee population? I agree with the beekeepers and biologists, who believe that hive loss is more complexly attributed to a combination of these natural and man-made factors, and combined, overwhelm the bee's ability to cope.

Beekeeping is a hobby that is both challenging and tremendously rewarding. In becoming a beekeeper I had to analyze, research, and solve problems. Beekeeping has provided me with a heightened awareness of nature. Beekeeping made me aware of the nectar and pollen sources such as locust trees, flowering garden plants, fruit trees, and even thistle. The bees changed my perspective on the environment in my own backyard garden, where I would not use fungicides or pesticides. I recall after getting my bees my heart sank one afternoon when I saw a crop duster spreading chemicals in a nearby wheat field.

My first couple of years as a beekeeper were full of excitement, curiosity, amazement, humility, one case of controlled panic, a few jars of honey, and two bee stings. I had a great sense of satisfaction watching the bees return to the hive on summer afternoons, their back legs full of pollen and nectar, seeing the guard bees diligently protecting the hive entrance, and hearing the buzz from the thousands of bees in the hive. I tasted the most delicious honey I ever had from my own backyard. I learned an incredible amount about this complex, fascinating, and important creature. Most importantly, I realized the real, profound and dangerous consequences of man's abuse of the environment. I don't consider myself a tree hugger, but beekeeping has

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opened my eyes to serious environment issues we need to address. I have much more to learn about beekeeping. Beekeeping has been a great experience. I look forward to keeping more hives in the future. If I could just get the bees to read the same books that I read it would make beekeeping a lot easier.

Thank you.