Small Hive Beekeeping

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Introduction

New Urban Bees – This is the name for a hobby/project aimed at increasing the dwindling number of pollinators in urban spaces.

I am an amateur beekeeper. This is my third summer of beekeeping. I have a different goal compared to most beekeepers because I am not trying to harvest a lot of honey. What I am trying to do is to build hives that supports a small colony of bees in such a way that they are enjoyable residents in an in-town garden. The colony size and hive box size is kept small to let the bees and the gardener enjoy a close relationship.

A typical "big-box" hive designed for honey production will have 60,000 to 80,000 bees. About a quarter of those bees will be foragers during the peak nectar and pollen season. That means there are 15,000 to 20,000 foragers from each hive during the summer.

My Small Hive is about $1/10^{th}$ the size of a big box colony. The bees make honey for the colony to use, but not much extra to be harvested. With 6,000 to 8,000 bees in the small colony there will only be 1,500 to 2,000 foragers during the summer. That makes for an easier relationship between the bees and the gardener.

A **Small Hive** probably will have a small amount of honey to harvest. When the trees and flowers are blooming the small colony will put honey in the frames for itself and also put some honey in burr comb on the top bars. I remove the burr comb whenever I inspect the hive and you will probably get a jar or two of your very own honey that way a few times each year.

A **Small Hive** is one piece of hardware unlike a big box hive. There are no spare pieces with a **Small Hive**. There is the box and the bees in the box. That is it.

Chapter 1. Project Goals

A Small Hive is a modified 5-frame deep "nuc" (nucleus) box. It is NOT designed to be expanded or produce a lot of excess honey. The plan is to split the colony when the hive starts to get crowded. This is different from a "big-box" hive where the beekeeper tries to make the colony larger and larger to maximize

honey production.

The **Small Hive** is designed to SLOW colony growth, not maximize colony growth. We will use foundation-less frames because it takes the bees longer to build new comb than it does to build comb on foundation. Slower colony growth means fewer foraging bees impacting the garden area and longer stretches between splits.

The Small Hive has a smaller entrance than many beehives have. This makes it easier for the bees guarding the entrance to detect and stop any robber bees that might show up to steal honey from the colony. The small entrance will become congested at times of maximum nectar and pollen foraging. This just another way to slow down the brood production and thus slow colony growth.

We won't feed the colony unless they are running short of honey. Supplemental feeding stimulates brood production and we don't want that.

The Small Hive has a transparent inner cover whereas the inner covers on most big-box hives are opaque. A transparent inner cover allows the beekeeper to see a lot of what is going on in the hive without having to pry apart the hive top and frames. One big advantage of the transparent inner cover is that we can detect any young Varroa mites on the bees. Young mites usually start out on the ventral surface of the bees and can be spotted more easily because bees often walk around upside down on the inside of the clear inner cover.

Full hive inspections are still needed but these can be done less often. Disturbing the bees less, because you can see a lot about the inner hive workings through the clear inner cover.

The **Small Hive**s also have a larger space above the top bars of the frames. This space is 1” in the **Small Hive** compared to the typical big-box hive. We can use this extra height for feeding, beetle traps, and hive monitoring electronics like temperature and humidity sensors or cameras.

The **Small Hive** has a hinged top cover. This reduces the chance that the lid might blow loose. It also speeds up entering and leaving the hive during inspections.

The **Small Hive** has adjustable ventilation in the bottom and back sides to accommodate different hive needs between summer and winter.

There is not a need for storage space for unused hive parts with the **Small Hive**. That can be an issue with big-box hives.

A **Small Hive** is designed to be mounted about waist high on a standard metal fence T-post. This makes it easy to work around the hive without bending over all the time.

The **Small Hive** weighs less than a big-box hive and is a single item to lift or move. A big-box hive usually has at least 5 parts and weighs much more than a **Small Hive**.

Chapter 2. Planning for the Small Honeybee Hive

Barriers Between Bees and Visitors – Use a low fence or plant barrier to create a bee "flight path" about 10' wide and 20' long in front of the hive. This will keep pets and people away from the hive entrance. It is best to have this open area so the honeybees can come and go safely.

Garden Planning – A garden planning kit is a helpful tool for planning a new garden or for redoing an existing garden. Keep in mind where the bees will be flying and where visitors (pets and people) will be sitting or walking. Use taller plants to separate bees from garden visitors. The **Small Hive** can be a focal point in your garden or it can be blended into the plantings out of view.

A Sunny Spot – A spot that is sunny most of the day and then has some late afternoon shade is ideal. South-facing or Southeast-facing spots are good choices. Some beekeepers like a more shady spot during the summer and then move the hive to a more sunny spot during the winter. That is easy with the T-post suspension.

Plants for Foragers – Books are available at the Botanical Garden Gift Shop. Lists of bee-friendly forage plants are available at Coffers or on line.

No Noisy Power Equipment Near Hive – The bees can get upset by noisy gas-engine-powered equipment (like lawn mowers or string trimmers) near their hive entrance.

Water – A pond, a creek or a bird Bath with stones or sticks in it will do nicely. Not Your Neighbor's Pool!

Chapter 3. Building Small Garden Honeybee Hives

My Plans – One of my **Small Hive**s is about 9" X 11" X 20". Plans are available on the www.NewUrbanBees.com website.

A single 4' X 8' sheet of 3/8" sheathing has enough

wood to make three **Small Hive**s. The cost for a completed and painted hive with T-post support is about $25. That compares with a couple of hundred dollars for a big-box hive.

Chapter 4. Beekeeping Equipment

This chapter only applies IF YOU WANT to take up beekeeping yourself. You don't need this equipment if you would rather have me manage the hives.

Honeybees can sting – When a honeybee stings she dies. The queen won't sting you and the drones can't sting you. Only the older worker bees do the stinging.

Veil – I have decided to always wear a veil if I am going to be working inside the hive. I got stung on the face once and it convinced me to avoid that happening again.

Jacket and Gloves – Adding a bee-proof jacket and bee-proof gloves to your veil will deter most stings.

Full Suit – Good for anyone sensitive to bee stings.

Hive Tool – Bees like to glue parts of the hive (like frames and covers) together with a special secretion they make called "propolis". This dark brown sticky stuff gets put any place there is a gap on the inside of the hive. A hive tool is used to pry stuck parts apart when you are working in the hive.

Smoker – A smoker does two main things. Smoke drives the bees away from the source of the smoke and into the space between the frames. This reduces the number of bees around where you are usually trying to work. Smoke also masks the fear/sting pheromone and thus reduces the chance of getting stung. I show you how to make your own smoker for less than $10 on the www.newurbanbees.com Web site. It also is nice to have a spray bottle with half-strength sugar water in it (2 parts water to 1 part sugar). I use the sugar spray whenever I can to reduce the stress of smoking on the bees.

Chapter 5. Obtaining Bees

Swarms – The honeybee's natural way to deal with crowding in their hive is to swarm. In preparation for swarming the worker bees will create queen cells in the comb and feed ordinary eggs in an extraordinary way. The new developing queen(s) will be left behind while the old queen and roughly half the workers will fly

away as a swarm. The exiting swarm will look for a new place to live and leave behind the old hive which is now not so crowded. Beekeepers try to increase their number of colonies by luring swarms into a swarm trap.

Splits – An experienced beekeeper can detect when a colony is about to swarm and "split" the colony ahead of the swarm's exit. A new hive is prepared and some of the frames from the old hive, with worker bees on board, are moved into it. Empty frames are used to fill in the slots where the frames were removed. Care and experience are required to determine where the queen ends up and where a new queen will be needed. Some beekeepers then sell the new split hive as a "nuc".

Purchasing - A 5-frame "nuc" is a good way to buy a colony of bees with a laying queen included. They are a bit more expensive than a package of bees, but the bees are less stressed and adjust to their new home sooner.

Purchasing – A "package" of bees can sometimes be purchased from a bee breeder. The package will contain 2-3 pounds of bees (3000-6000 individuals) and a queen. This is often the cheapest way to start a new hive but it is also the most stressful way for the bees.

Chapter 6. Bee Temperament and Life Cycle

Weather – Bees are more likely to feel stressed (and sting more quickly) when they cannot get out of the hive to forage or cleanse themselves. Cold weather, rain and wind can confine the bees to the hive and make them more temperamental.

Time of Day – Bees start foraging in the early morning when it gets above about 60 degrees. They return to the hive for the last time each day at dusk. The bees are sometimes more likely to sting as dark approaches because they might think you are a bear ready to rob them of their honey.

No Sudden Shakes or Noises – Bees naturally live in hollow trees so they are OK with gentle movement. Sudden movements and sudden loud noises are not welcome by the bees. Move slowly, methodically and always be quiet and gentle around the hive.

Clothing Color – Bees can't see red. It looks black to them. Black (dark) clothing makes bees think a honey predator (like a bear) is closing in. Wear light colors to appear more friendly to them.

Nearby Animals (Humans, Dogs, Cats, Skunks, Etc.) - Bees fly in and out of the hive in a roughly 20 foot path in front of

the hive entrance. Keep animals out of this zone with fences or plants that limit access.

Approach from behind – The bees don't like you walking up to their entrance. Do all your work on the hive from the back side.

Smoke – Smoke is used to calm nervous bees but a sugar-water spray is less stressful for the bees and works like smoke to calm the bees.

Honeybee worker life cycle – A worker bee in the summer will live about five weeks. During the first three weeks of their life they live inside the hive and progress from cleaners to nurse bees to comb builders and on to be guards at the entrance. The last two weeks of their life they are foragers and make hundreds of trips a day looking for water, nectar, pollen and tree sap (to make propolis)to carry back to the hive.

Chapter 7. Bee Calendar

Spring – the bees are just beginning to find nectar and pollen. Once the spring "flow" of nectar and pollen gets going the colony can raise lots of new bees. Watch for swarming.

Summer – Still some new bees being produced but at a slower rate. Not a lot of honey being stored. This is described as a "dearth" time.

Fall – Some late blooming plants (like goldenrod) may provide nectar for honey, but production won't be as strong as in the spring. Bees are getting ready for the winter hard times.

Winter – The bees form a "cluster" near the center of the hive. They keep the queen at the core of the cluster and take turns flexing their flight muscles to generate heat. The core of the cluster is maintained at about 90 degrees. The bees will fly out on "cleansing" flights if the outside temperature gets above about 55 degrees.

Chapter 8. Hive Inspections

Every Two-Three Weeks in Summer – The beekeeper will open the hive and lift out each frame one at a time. Many things are checked to make sure the colony is healthy and "happy" at this time.

Expert Help – Beekeepers are always learning from the bees.

It may take years of experience to be able to understand what is happening and what needs to be done with each colony.

Do It Yourself - Buy protective equipment, read a lot about bees, attend classes on beekeeping, find a beekeeper mentor, etc.

Join A Bee Club – A local bee club is a great way to get into beekeeping and find out what the experts are observing in their colonies. Beekeepers are almost universally friendly and helpful. See the New Urban Bees website for local club information,

Chapter 9. Winterizing

Insulation – We can help the bees maintain their core cluster temperature by providing extra insulation for the hive in winter and by reducing ventilation ports as the weather cools.

Food – We will not need to feed the bees unless they run low on honey in the Spring. We will monitor the honey stores in late winter to be sure the bees don't starve.

Heating – I sometimes provide hive-warmimg heating elements under my hives in the winter. This is easier if there is AC power available but can be done using solar panels in a pinch.

Chapter 10. Bee Pest and Disease Control

Small Hive Beetles (SHB) and Wax Moths – These two pests can overcome the defenses of a weak colony and destroy the comb, larvae and honey in a hive.

Varroa Mites – These parasites infest and weaken bees in a colony and lead to all kinds of secondary bacteria and viruses. They are a constant threat to all honeybee colonies.

Others – The beekeeper needs to be on the alert for spiders, ants, roaches, skunks and other beasts of various kinds that can invade and attack the bee colony.