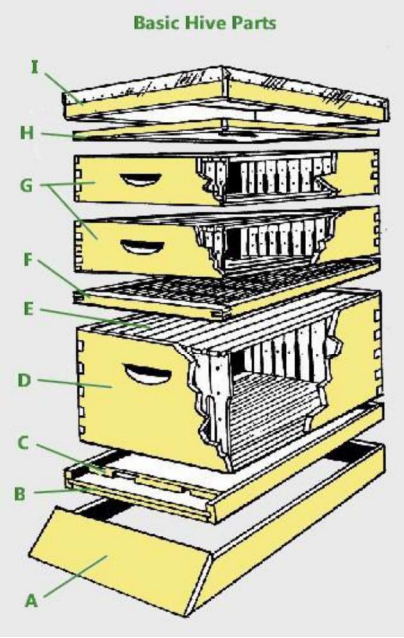
KANAWHA VALLEY
BEEKEEPERS ASSOCIATION

Beekeeping 101



Equipment Required for Starting a Colony of Honey Bees

Hive Stand (A) Used to keep bottom board up off the ground, keeping it dry and stopping it from rotting quickly. You may buy commercial stands or use concrete blocks, wood 4×4 or 6×6, or hardwood pallets. A hive stand also serves as a landing board for returning bees.

Bottom Board (B) Brood chambers are placed on a bottom board to provide an entrance for bees to use. This board may be treated with copper naphthenate to help extend its life.

Entrance Reducer (C) Used to control the size of the hive entrance at various times of the season.

Brood Chamber(s) (D) This is the area in which the frames are used by the colony to raise new bees. These boxes are also called hive bodies.

Frames (E) These are rectangular structures made of wood or plastic and are used to hold wax foundation embossed with hexagonal worker cells.

Queen Excluder (F) These are used between the brood boxes and the honey supers to prevent the queen from laying eggs in the supers. Some beekeepers also call these honey excluders as they report smaller honey crops. Opinion varies about the need, but a first-year beekeeper will probably want to use one until you learn management techniques that allow you to produce honey without an excluder.

Honey Super(s) (G) These come in three sizes: deep, medium and shallow. All are great and the difference is in weight. Medium and shallow supers are much lighter when full than a deep so if the heaviness of a honey super is a concern go with medium or shallow. There are also comb honey supers used to produce comb honey – you should wait until after your first year before attempting to produce comb honey.

Inner Cover (H) This is a plastic or wooden board usually used with an oblong hole in its center. Its purpose is multiple: it keeps the bees in the hive when the outer roof is removed, may be used with a bee escape to remove honey, and assists in feeding bees. Also serves to rid the hive of excess moisture, particularly in the winter.

Outer Cover (I) Made of metal-covered wood or plastic and used to protect the colony from the weather. Each cover should be secured by a weight (brick or stone of similar size) to prevent wind from blowing it off.

Personal Equipment

As an aspiring beekeeper, you should make sure that you have all the personal equipment you need to handle your bees before they arrive. This equipment would consist of protective clothing, hive tool, smoker, and a good reference book on beginning beekeeping.

Protective Clothing

There are basically two methods to choose from. First, a hat and veil along with coveralls or your own clothing like jeans, etc. Second, a commercial suit or jacket with veil attached.
A veil is the most important and should always be worn when handling bees. It's no fun getting stung in the face! If your pants are not elasticized, always tuck them into your socks to keep the bees out.

Gloves

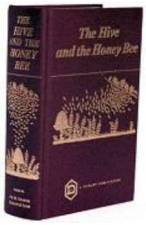
I advise the new beekeeper to wear gloves. This will help to build confidence in handling the bees and prevent a lot of stings. Gloves as well keep the hands clean as they would soon get sticky and full of propolis. Gloves should be a comfortable fit with long gauntlets.

Hive Tool

This is an important tool to the beekeeper. It is used to lever the hive bodies apart, or for separating frames. Screwdrivers or old chisels are not recommended as these will damage the hive parts, often leaving holes for the bees to get out or wasps and ants to get in.

Smoker

A smoker is necessary when working the bees. Smoke is used to control the bees, and a little smoke goes a long way! A reasonably large smoker is a good investment. It is easier to use and does not need refueling as often.



Books

A Good Beginner's Reference Book
Generally, you will have to rely on books to guide your progress. A good starter reference is essential. We recommend any of the following:

The Honey Bee — V.R. Vickery
Starting Right with Bees — A.I. Root
The How-To-Do-It Book of Beekeeping — Richard Taylor
Beekeeper's Handbook — Diana Sammataro and Alphonse Aritabile

Equipment Preparation

Preparing Equipment

It is best to paint the outside of your hives, especially new equipment, with a good primer coat followed with two coats of a good quality light-colored paint. A good outdoor latex will work just fine. Alternately, you can use copper naphthenate to preserve the exterior wood surface. Do not paint or apply anything to the inside surfaces of your hive bodies. The bees will take care of the inside surfaces.

Used equipment should be scraped on the inside to remove all the old wax and propolis. A propane torch should then be used to lightly scorch the inside of the super to kill any foulbrood spores that might be present.

Bottom boards and the OUTSIDE of hive bodies and the OUTSIDE of other parts can be painted with copper naphthenate as a preservative. Allow to air-dry forty-eight (48) hours before using on your bees.

Used Equipment – IS IT SAFE?

Yes, some parts of used equipment can be cleaned up with a propane torch and would be fairly safe to use, especially for an experienced beekeeper.

Where the big problem lies is in the brood chamber. Here the Queen lays her eggs. Most diseases that threaten the hive health are brood diseases, one of the worst of these being American Foulbrood. This is a spore-producing disease. These spores have been found to remain active for over forty (40) years. If the spores are present on the used equipment, they can multiply and become a big problem.

Old brood comb can be a problem as well. Each cycle of brood will leave behind a cocoon, thus making the cell progressively smaller and smaller, resulting in each generation of bees becoming smaller until finally a point is reached where the Queen refuses to lay an egg in these cells.

Moldy, white-ish pollen, not fit for the bees to use and too hard to remove, can also restrict the area that the Queen has to use.

The solution for the new beekeeper for the above problems is to start with new equipment, new frames and new foundations. The investment will more than pay for itself in healthy bees and satisfaction to the beekeeper. There is plenty of time to get into second-hand equipment once you get to know what you are doing.

Stocking Your Hives

The beginner will usually obtain his bees in one of two ways. He may order a package of bees or a nucleus colony.

Package bees are usually sold as a 3-lb. package with a single Queen. These are shipped in a sturdy box covered with hardware cloth mesh. The Queen is suspended in a Queen cage inside the package. The Queen cage has a store of hard Queen candy and several attendants to look after the Queen's needs. In transit, the bees are being fed by a suspended container of sugar syrup.

Installing Package Bees

When your package finally arrives, make sure everything seems in order. If you are not going to install the package right away, place in a cool (not cold), draft-free, quiet, darkened area. At this point you may feed the bees. With a spray bottle filled with a mixture of sugar syrup, mist the bees. Feed them liberally with the sugar syrup; do not soak them. The sugar syrup should be prepared ahead of time and consists of a mixture of either one part sugar one part water, or two parts sugar, one part water.

Your equipment should be ready and in place before the bees arrive. Close the entrance to keep mice out. The best time to install the package is in the late afternoon. If the weather is unusually cold, wait for the weather to improve. However, your package should not be kept more than a few days. It's best to hive them as soon as possible.

Take the package to your hive. Open the hive front entrance. Take off the outer and inner covers and set aside out of the way. Next, remove four or five of the frames from the middle of the super; gently lay these frames against the side of the super. Take your package and shake or jar the package so the bees drop to the bottom of the box. Now with your spray bottle of sugar syrup, spray the bees to coat their wings — do not soak them.

Next, take the wrapping off the top of the package, exposing the top of the feeder can and Queen cage (if with the package). Queen cage is usually hung next to the feeder can by a wire. Grasp the wire tab to keep the cage from falling into the package; remove the feeder can and set aside. Remove the Queen cage. Check to see the Queen is alive, then place the cage in your breast pocket, screen side out, until you are ready to install the Queen. If the Queen is dead, you can proceed with installing the package but you'll need to contact your supplier to get a new Queen as soon as possible.

Again, spray the bees in the package with syrup. Take the package and place over the hive where the frames have been removed and shake the bees into the hive. You do not have to shake out every last one: place the package at the hive entrance so "stragglers" can enter the hive.

Now you will have a large mass of bees in the center of your hive. Slowly replace the frames you removed. Just lay them on top of the bees; do not push or shove them in place, you'll only squash bees. Allow the bees to climb up onto the frames. You'll find the frames will settle into place. Now, open up a small space between frames five and six for your Queen. When the Queen is shipped inside the package, use one of the indirect methods to release her. Remove the cork (if present) from the candy end of the Queen cage. With a small nail (1 1/4" frame nail works nicely) make a small hole through the candy, being careful not to impale the Queen. The cage can now be suspended between the two frames. The bees will eat through the candy, releasing the Queen (about 24 hours).

If the Queen is shipped separate from the package, to install her, leave the cork in place. If no cork is present, take a piece of masking tape and cover up the opening to the candy. The Queen cage can now be suspended between the frames.

Come back in two days. Remove the cork or tape, allowing the bees access to the candy, which they can now eat through. This method delays the Queen's release and increases the likelihood of the bees accepting her.

In both methods, once the bees have access to the candy, come back the next day and remove the Queen cage. Make sure the Queen has been released. If she hasn't, leave the cage in place another day. If bees have not released her by then, you can do so yourself. Carefully open the cage, place on the top bar of the frames and allow the Queen to walk out. She will soon disappear into the hive.

When closing up your hive, put feeder with medicated syrup in place (more on feeding later). replace inner and outer cover. Put your entrance reducer in place so bees only have a small opening to guard. Leave, and come back when it is time to remove the Queen cage. remember, when you remove the Queen cage, to reposition your frames. Place the end of your hive tool between the first frame and the super wall, to lever the frames towards the center. Keep the frames parallel and tight together.

Nucleus Colonies (NUCS)

These are starter colonies consisting of four or five frames with a laying Queen. Usually, they are made up of two or three frames of capped brood, a frame of honey and pollen, and may have a frame for the Queen to lay eggs in.
If you are buying a nucleus colony, get it from a reputable dealer, someone who maintains a disease-free apiary and good quality stock. Often this person will have you bring your equipment to their establishment. Then they will put in the frames of brood and install a new Queen. They will then usually wait a week or two to make sure the Queen is laying and everything looks right. You will then receive a call to come and get your colony. The hive entrance will be sealed and top ventilation (screened) will be provided. Take your bees to your chosen location and set the hive in place. Remove the entrance seal and walk away. Your bees will be excited from the trip movement and will usually come rushing out. Once they have settled down, put your entrance reducer in place allowing a small opening for access and for guarding.

Feeding your bees

Types of Feeders

There are three main types of feeders you can use for starter colonies:

Tray Feeder — This is a large box type feeder that sits on top of your hive. Access for the bees to the syrup is either on the end or in the middle. This is a large capacity feeder which can hold thirty (30) pounds or more of syrup and is recommended for use in fall feedings.

Feeder Pails — Come in two sizes: fifteen (15) and thirty (30) pound size. It has a stainless-steel mesh in the middle of the cover. This pail is inverted over the hole in the crown board (inner cover). This provides access for the bees. If you are using feeder pails, you must place an empty super over the pail and then cover it with an outer cover.

Frame Feeder — This is usually a plastic frame-sized container that can be inserted in the hive in place of a frame removed from the deep super (brood chamber). This type of feeder must have some kind of flotation that allows bees to reach the syrup without drowning. A piece of wood cut to fit makes a good float. Remember as the colony grows to remove the feeder and replace the frame removed.

Boardman Feeder — These are the simplest to use, no manipulation of the hive is necessary. But there are Robbing and Ant issues. Although ants seem to be less of an issue as the bees tend to keep them away from the lid of the jar, Boardman feeders are the worst when it comes to robbing. It is impossible to install a Boardman feeder without spilling some syrup on the hive or ground, which is an attractant for robbing bees.

Your package or nucleus colony should be fed sugar syrup to help them build quickly. As well, these bees are stressed either from a long trip or being removed from a parent hive and are susceptible to Nosema disease. The feeding of Fumidil B as a preventative measure helps to ensure a healthy colony. As well, Terramycin (Oxytet) can be added to prevent foulbrood disease.

The recommended dosage is:
– Fumidil B — 1 rounded teaspoon per gallon
– Terramycin (Oxytet TM-25) — 2 teaspoons per gallon
The sugar syrup may be either 2:1 or 1:1; that is, two parts sugar to one part water (by volume), or one part sugar to one part water (by weight).

When to add supers

Once the frames in the first super have been drawn out and filled with brood, pollen and honey, you will need to increase the size of the brood nest by adding another super of frames and foundation. If you have started with undrawn frames of foundation, it will sometimes assist the bees in drawing the outside frame foundation by moving the frame over one place or so and replacing it with a drawn frame. Do not spread your brood out; the frame you are moving should not have brood on it.

Once your second brood super is drawn out and eighty to ninety percent full, and there is still a good honey flow on, you will need to add a honey super. Usually with nucs or packages you will not get a lot of surplus honey, the bees are using the nectar to build comb and strength. They need both brood chambers full to survive over winter.

When placing honey supers on the colony, most beekeepers like to use a Queen excluder to keep the Queen from laying brood in the honey super. If your honey super has undrawn foundation, it is not prudent to use a Queen excluder: the bees will often not go through the excluder to get to the foundation and may swarm instead. In this case, you would put the super on without an excluder. Once the bees are established in the super and are drawing the wax into comb, the frames can be checked to be sure the Queen isn't on the drawn foundation. If she is here she can be put down into the brood chamber and the excluder put in place. To assist in getting the foundation in this super drawn out, you may move the drawn comb to the outside against the super wall and the undrawn to the center of the super where heat from the brood chamber is greatest, giving considerable help to the bees making the comb.

The rule of thumb for honey supering is that the bees should never be using all the comb available to them. When the super is one-half to two-thirds full, add another super. When the second super is half full and the first completely full, add a third super, etc. The honey crop may be removed when the frames are fully or two-thirds capped with wax.

Keeping Records

It is a good idea to keep records as memories aren't as good as we'd like them to be! Especially if you're tracking for a period of years. A sheet of paper tacked to the underside of the outer cover is a good place to keep records. Also, a hive diary can be kept and filled out each time the hives are worked. Referring to the diary before going to the apiary will assist in remembering any needed supplies or equipment.

The information on each hive kept will vary with the beekeeper. Some general areas would be:
– Has the colony sufficient room? Number of frames of sealed brood, number of frames covered by adult bees.
– Hive characteristics: gentle, aggressive, productive, etc.
– Is the Queen present and laying the expected quantity of eggs? Is the brood pattern tight and even?
– In early season, is the colony building up in size as fast as other colonies in the apiary?
– Mid season, are there any Queen cells present in the colony? Swarming record (how often, what time of year).
– Effects of last manipulation and time elapsed.
– Are there any signs of disease or abnormality?
– Are there enough stores to last until the next inspection?
– Medication schedule (type, when, for what reason).
– How much honey was obtained.
– Wintering ability and stores.
– Requeening, year and date.

Additional Equipment

As your colony grows and fills both brood chambers, you will need additional equipment for excess honey storage, removal of honey, medicating and wintering.

Queen Excluder A metal grid that the workers can pass through but the queen and drones cannot. Used to restrict the Queen to the brood chamber.
Honey Super and Frames These supers could be either deep, deep shallow (three-quarter depth) or shallow.
Bee Escape A mechanical method of getting bees out of the honey supers.
Bee Brush A horse hair brush used to move bees off frames, etc.
Medication These are needed at various stages of colony growth. For example: during brood rearing, spring and fall feeding, testing or treatment for parasitic mites, etc.
and …
You will need some method/way of extracting the excess honey stores your bees have gathered.