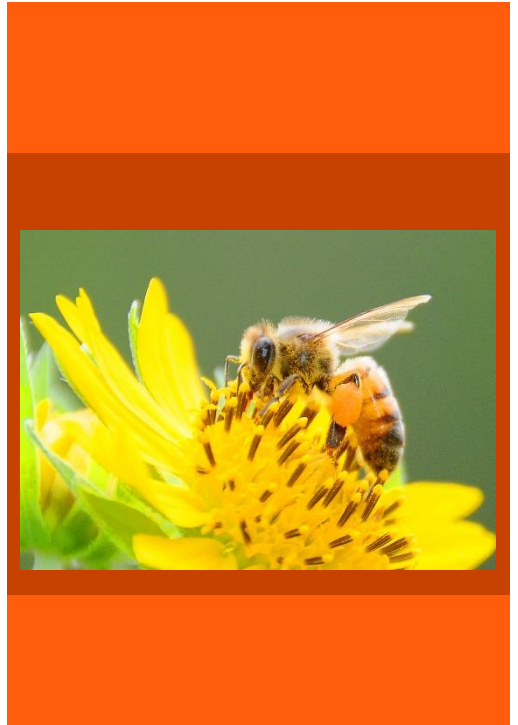


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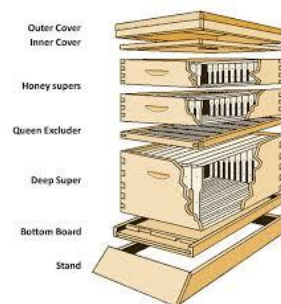
Beehive Components (Langstroth)

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Langstroth Beehive Components

Although there are several different styles and types of beehives, this section is focused on the 10 frame Langstroth hive. The Langstroth hive was developed in 1852 by the Reverend Lorenzo Langstroth, considered to be the father of American beekeeping. His key contribution was the recognition of "bee space." He realized that if the hanging frames had a separation of $\frac{1}{4}$ - $\frac{3}{8}$ inch, the bees would move through the hive and they would not build honey comb into that space nor seal the space with propolis. With removable frames and the proper space between frames, the pulling, inspecting and harvesting of the honey becomes easier without damaging the honey comb structure.

The Langstroth hive is composed of very few parts: a bottom board, inner and outer cover and supers with frames, but

several other components can be added to the hive to help encourage the bees survival and ease a beekeeper's management.



Langstroth 10 Frame Hive

Parts of a Hive from the Bottom Up

Hive Stand

Although it is not necessary to use a hive stand, it is highly recommended to keep

your beehive off the ground. Keeping the hive off the ground increases the chances of hive survival in the event of heavy rains and it discourages unwanted guests from entering the hive – such as mice. Hive stands can be purchased from bee equipment suppliers, or you can make your own from wood, or simply place your hive on a few cinder blocks or a wooden pallet(s). The bottom stand section can also support an angled "landing board" for the bees prior to entering the hive. Although the landing board is not necessary, for the hobbyist wanting to enjoy watching their bees, the landing board acts as a landing place, as its name implies, and allows for a few more seconds of observation and inspection of individual bees.



Hive Stand with Landing Board

Bottom Board

The bottom board is simply the bottom of the hive. The simplest bottom board is made from a solid piece of wood with raised a edge of 3/4 inch on three sides.



Solid Bottom Board

The second type of bottom board has an exterior wooden frame, the same as the solid bottom board and small sized metal mesh screen on the bottom. The screen is too small for bees to pass through but large enough to allow pests (Varrora Mites) and bee hive residue to fall through. The screen bottom board usually has a removable solid insert beneath the screen that can be inserted from the back of the hive. The removable insert can be used as a "sticky board" to assist in Varrora Mite counts and act as a barrier during cold weather. In warmer parts of the country, the screen serves as a ventilated bottom which helps the bees keep the hive cool during hot weather.



Screened Bottom Board with Mite Board

Entrance Reducer

As the name implies, this hive component reduces size of the entrance. As you will notice when you place the first super on top of the bottom board, there is an opening measuring 3/4 inch x 14 inches. The entrance reducer is made of wood that fits inside the entrance opening between the bottom board and

the first super. The entrance reducer has two notches cut on different sides. One measures 1 inch and the other measures 3 inches giving you two opening options by simply turning the reducer.

The principle reasons for the entrance reducer are: 1. to reduce the entrance area that the guard bees protect; 2. Assist new or weak hives in protection from honey robbing bees from other neighboring hives and other critters attempting to enter the hive; 3. to help control the ventilation and temperature of the hive.

There is a general opinion that during the spring and summer, the opening should face down so the bees can fly out and remove dead bees from the hive. In the warmer months, the bees do a very good job of keeping the hive clean, which includes the removal of dead bees. During the winter the opening should face up so that the bees can still fly out in the event the entrance gets blocked by dead bees.

If an entrance reducer is not available you can place small clumps of grass or small sticks in the opening entrance. Both provide a barrier similar to the entrance reducer.



Entrance Reducer

Slatted Rack

A slatted rack (sometimes called a Brood Rack or Vertical Slatted Rack) is an optional piece of beekeeping equipment used in the Langstroth hive to help with ventilation and hive congestion (overcrowding). The rack provides air space below the brood chamber (bottom super) which keeps the colony cooler in the summer and warmer in the winter (air is an excellent insulator). It provides the bees an additional two inches of space between the bottom of the hive and the bottom of the brood chamber. The ten slatted rack has the same outside dimensions as the 10 frame Langstroth hive and the slats run the same direction

as the brood box frames with approximately 11/16" space between each slat. By raising the brood chamber up higher, the slatted rack allows the bees to get fresh air into the hive cooling the hive down in the summer, reducing the bees need to beard on the front of or below the hive from overheating. With the slatted rack the bees will gather inside the additional space as opposed to the brood area. This extra space makes the job of ventilation fanning the hive easier for the bees. There is also an opinion that the extra space may reduce swarming caused by congestion.



Slatted Rack

Super(s)

As noted by Daydant and Sons, Inc. "A beehive super is like an extra fuel-tank for your honey bee colony. Supers stack on top of the hive and provide the bees a place to store pollen and honey for the months without nectar flow or pollen. The bees will eat their way up the hive body to the super and consume the stockpiled honey and pollen for survival."

According to the dictionary, a definition of "super" is: A prefix from Latin, with the basic meaning "above, beyond." Occasionally, the term "hive body" is used to identify a super box of any size.

The box in which brood is raised is known as a "brood box." (In beekeeping, Bee Brood or Brood refers to the eggs, larvae and pupae of honeybees.) The brood box houses the area where brood is raised and is usually one of the lower boxes in the beehive. The brood inside the brood box is sometimes referred to as the brood nest. The brood nest or cluster and the area containing the brood nest is called the brood chamber.

All Langstroth hive supers have the same dimensions: Width 16 1/4 inches and length 19 7/8 inches. The difference is the height or depth of the supers. The deep super is 9 5/8 inches high, the medium (sometimes called the Illinois) is 6 5/8 inches high and the small super is 5 5/8 inches high. Although all three have frames and provide storage of honey the same way, the key difference is the weight of the super once its filled with honey. The deep super can weight 70 pounds, the medium 50 pounds and the small 30 pounds. This weight difference is one of the key reasons most beekeepers chose the medium super to collect honey.

Super Frames

As described by Daydant and Sons, Inc. "Frames provide the structural support for the honeycomb that the honey bees utilize for egg and food storage. The frames and beeswax foundation are assembled together and placed in the hive body or super.

Frames in the super can be taken out of the beehive and the honey extracted. The beekeeper can also cut the honey comb to consume it in its natural state. After the honey has been extracted, the frames can be placed back on the beehive for the honey bees to store more honey. The frames and foundation can be cross wired for additional strength when extracting.

In recent years, plastic frames have become a popular option for all ranges of beekeepers. These plastic frames provide the dependability that experienced keepers require, and can replace the traditional wood and beeswax frames."

Petro Prokopovych, a Ukrainian beekeeper, invented the world's first beehive which used hive frames in 1814. The Langstroth hive, discussed previously, is the main hive used today.

A Langstroth hive is designed to hold ten frames with the following dimensions:

The top bar length on all three supers is 19 inches, which has two protruding end tabs (ears) to hang the frame on the hive box. This is the only part of the fame

touching the hive box. Bees will glue the ears to the hive body with propolis – creating the need for a good hive tool. The bottom of the top bar has grooves to attach the plastic insert.

There are two side bars to support the top and bottom bar. It usually has three or four small holes used to attached the wire for a wax foundation. The length of each side bar is determined by the depth of the super box:

Deep: 9 1/8 inches

Medium: 6 1/4 inches

Small: 5 3/8 inches

The Fame has one bottom bar. It also comes with a groove to attach the plastic insert.

As noted earlier the frames can be used to house wax foundation or left empty and the bees will fill the entire frame with honey comb. Decide which foundation works best for your needs and use that type of foundation for the entire hive. For beginner beekeepers the frame with plastic inserts should be considered as their first choice allowing for easier inspections and honey extraction.



Super with Frames

Queen Excluder (optional)

The queen excluder is a flat rack made of metal wire or plastic. The holes are large enough for the worker bees to pass through, but not the queen (generally). The excluder is usually placed between the brood super and the first honey super. It is used to keep the queen in the brood box and not allow her to enter the honey super to lay eggs. When the queen lays eggs in the honey super it can lead to darker honey during extraction. Some beekeepers are of the opinion that the

excluder can inhibit the worker bees from passing into the honey super and thus reduce the amount of honey. During winter it is advisable to remove the queen excluder. As the bees consume the honey in the brood super they will move to the honey super. If the queen excluder is still in place, the queen will be left in the brood super and she will starve or freeze since she will not be with the 'cluster'.

Helpful tip: If you capture a swarm, you might want to consider installing the queen excluder between the bottom board and the brood super, this prevents the queen from leaving the hive. After the hive is clearly established you should remove the queen excluder.



Queen Excluder

Inner Cover

This is a wooden cover that has an entrance hole on the outside of the wooden frame and a hole in the middle. This cover goes on top of the top-most super and provides additional airflow, insulation and helps with the removal of moisture and CO₂. The notch on the end of the cover provides an additional entrance for the bees. All of which can be manipulated by the beekeeper.

Another extremely important function of the inner cover is it prohibits the bees from propolizing the hive cover, which is usually a 'telescoping cover' that fits over the hive inner cover and top super. Honey bees apply propolis to all cracks and small gaps inside the hive. By placing the inner cover on top of last super, the bees will propolize it and it can be easily removed with a hive tool. It can be very difficult (if not nearly impossible) to release a telescoping top cover with sides that fit down along the sides of the top super.

The hole in top of the inner cover can be used as an easy way to feed bees. By

placing another super box (less the frames) on top of the inner cover you can feed the bees using a jar of sugar water or a pollen patty. By placing these inside the empty box it provides easy access for the hives bees and will discourage other bees from raiding the hive. The bees in the hive will come up through the hole in the inner cover to access the food. The hive cover will be placed over the empty super box.

If the inner hive cover has an oblong hole in the center you can add a "Bee Escape." The escape is placed in the hole and then the inner cover is placed beneath the super where the honey will be extracted. The bees pass through the one-way door, allowing the bees to leave the super and not return. This process may take a few hours to a few days.



Bee Escape

The notch on the end of the inner cover serves two purposes. First it can be used as an upper entrance for the bees to enter and leave the hive. As more honey and supers are added the upper entrance provides an opportunity for the bees to travel less distance to the nectar storage area, as apposed to entering through the bottom hive entrance and traveling up through the queen excluder and the entire hive. To act as an entrance, the opening must face down. Remember to move the hive cover forward to leave a gap sufficient for the bees to access the upper hive entrance notch.

When the notch is facing down it also acts as ventilation hole allowing for airflow through the hive. The airflow helps eliminate CO₂ and humidity which keeps the hive dry.

Alternatively, the inner cover comes in a screened version. Essentially it has a wooden outer frame with small screen mesh. The screen is small enough to not allow bees to exit or enter. This screen allows for good ventilation in warm

weather. It should be changed out to the wooden cover during cooler weather.



Inner Cover

Outer Cover

As the name implies, the Outer Cover or Top Cover "covers" the hive. It is essentially the roof of the hive and its main purpose is to protect the hive components from the elements – rain, snow, etc. There are several styles of hive covers and most have either a flat top surface or a pitched or gable top like a roof. Most hobbyist us a telescoping outer cover with sides that hang down a few inchers over the top super and inner cover. This overhang adds additional protection from the elements and provides additional insulation.



Outer Cover

Feeder

A feeder is used to provide sugar syrup and granulated sugar to your bees at different times of the year when outside resources are not available or when the bees need a little assistance. Honey Bees have been around for over 25 million years and don't need a lot of help, but with our modern day practices of establishing beehives from packages or nukes, it's a good practice to give them a little help in getting started by providing a feeder and the sugar syrup.

Once the bees are established and gathering available natural resources, the bees will care for themselves and usually ignore supplemental feeding. Once this begins you should remove the feeder. Depending on how the hive develops and its ability to gather and store resources for the winter, additional feeding may be necessary in cooler months.

Generally, your bees will have used the resources available in the spring, summer and fall to build up sufficient honey reserves for the winter. However, In some situations, depending on the environment, the honey flow and so on, the beekeeper may want to help the bees along, by feeding in the fall as winter approaches.

Types of Feeders:

Entrance Feeders

An Entrance feeder is a simple feeder made from a jar that sits inverted into a platform inserted at entrance of the hive between the bottom board and the brood super. The bees access the sugar water by traversing through the platform and drinking through small holes tapped into the jar lid.

Since the feeder sits outside the beehive and is transparent glass it is easy to see when the feeder is empty. To add more sugar water you simply fill the jar.

Situating the feeder outside the hive also eliminates the need to open the hive and disturb the bees. The one drawback is the invitation to "robber" bees from other hives.



Entrance Feeder

Division Board Feeders

Division board feeders or Frame Feeders have the shape of a frame and hangs inside the hive body in place of the frames. To install the frame feeder, one or two of the frames must be removed. The feeder should also have some form of built-in float or entrance attachment to keep the bees from drowning as they feed.

Since this type of feeder sits inside the beehive it is not susceptible to robber bees from other hives. However, because it's inside the hive in order to fill the feeder you must open the hive and potentially expose the bees to cold to fill.



Division Board Feeders

Hive-Top Feeders

Hive-top Feeders have the same dimensions as the hive supers and sit on top of the upper super, but underneath the top cover. Some feeders provide bees access up and through the middle of the feeder allowing the bees to traverse from the hive supers into the feeder. Some feeders have a form of screen mesh separating the bees from the sugar syrup and allowing them to drink the sugar syrup but not enter the liquid chamber and drown. Other top feeders allow the bees to access the liquid by standing on wooden floats.

Since this feeder sits inside the hive it is protected from robber bees. Although checking the feeder requires removal of the top cover, it does not expose the bees entirely to the elements. It is also easy to add additional sugar water to the feeder.



Top Hive Feeder

Propolis

Propolis: Although propolis (also known as bee glue) is not a part of a hive, it's important to realize that it will be a component of the bee hive you will need to deal with. Bee propolis is a sticky, brown substance bees use to cover the interior surfaces of the hive and fill gaps, holes and cracks to protect the hive. Within the hive, bees will seal the hive boxes, frame tabs and the inner cover together with propolis. Propolis is made principally of the resin of tree sap. Bees add salivary secretions and beeswax by chewing on the resin. The propolis mix contains approximately 50% resin, 30% wax and oils, 10% salivary secretions, 5% pollen, and 5% amino acids, vitamins, and minerals.

A hive tool is needed to break the propolis seal and separate hive parts.



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