

BEEKEEPING EQUIPMENT – HIVE BOXES

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The most common type of hive is called a Langstroth Hive, which is named after Reverend Lorenzo Langstroth, an American apiculturist in the 1800s who discovered the “bee space.”

Bee space is a space larger than 6 millimeters and less than 9 millimeters that allows bees to fit through. If it were larger, bees would build comb, and if it were smaller, bees would propolize it to close up the space. Langstroth Hives are composed of boxes that fit on top of one another. The number of boxes used in a hive depends on the space needed for that particular colony.

There are other types of hives, such as Warre and Top Bar hives, which all utilize the bee space concept. In this factsheet, the Langstroth Hive will only be discussed because it is the most commonly used type of hive.

HIVE BOXES:

Boxes are sized and referred to as deep, medium, or shallow (Fig. 1). Frames are used inside the boxes that correspond to the size of the box (e.g., deep, medium, or shallow). Boxes may be 10 frames or eight frames in width. Boxes are usually painted white, but can be painted any color—although it would be prudent to avoid dark colors to prevent too much heat in the summer.

Deep boxes are generally used on the bottom of the hive arrangement and are often called the brood chamber. They are larger and allow the queen more space to lay eggs. When deeps become full and the honey bees have drawn, or built, comb on the frames and filled them with brood or food, additional boxes are placed on top. Boxes placed on the brood box are generally called “supers,” regardless if the boxes used are deeps, mediums, or shallows.

Medium boxes are generally placed above deep boxes for additional space for either egg laying or food storage. As those boxes are filled, additional mediums or supers can be placed on top.

Honey supers are extremely small boxes, meant for easier management of honey extraction. They are not as often used by most beekeepers, as deeps and mediums are not as readily available.

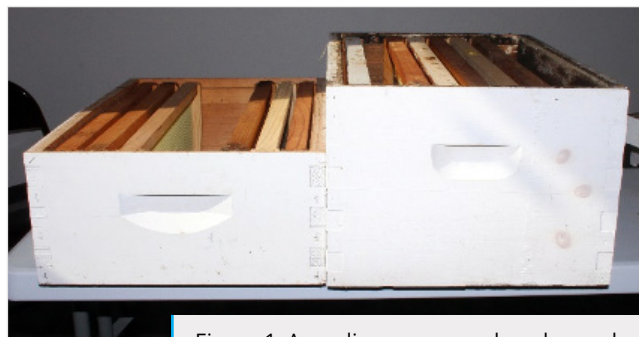


Figure 1. A medium versus a deep honey box

Boxes sit directly on top of one another and bees will propolize them together. Propolis is a substance produced by bees with saliva, beeswax, and sap, or other botanical matter. Propolis is often called “bee glue” because of its sticky nature.

Please note: The arrangement of boxes is a personal decision (Figs. 2-5). No two beekeepers are the same or share the same preference for arrangement.

Beekeepers should never provide more space than their bees need, as this is additional space they need to protect, cool, or heat. It is a good practice to wait until the bees have filled at least 80 percent of the frames in a box (or drawn comb on 8 of 10 frames) before placing an additional box on top. Beekeepers also never want to give them too small of a space. Otherwise, they may leave their hive in search of a larger home. Beekeepers

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should check their hives regularly and often during population build up in late spring and early summer to prevent absconding or swarming.



Figure 2. A hive consisting of a deep, medium, and shallow box (in order from bottom up)



Figure 3. A hive consisting of only one medium box



Figure 4. A hive consisting of a deep and a medium box



Figure 5. A hive consisting of four medium boxes

FRAMES:

Frames dangle from a ledge inside the box. There is enough space above, below, and in between frames that when the hive is closed the bees can easily move around the frames. It is important not to place medium frames in deep boxes, because bees will build burr comb to fill that space. Burr comb is comb that bees build to close up spaces greater than $\frac{3}{8}$ of an inch.

Frames generally have a foundation in which bees are given a hexagon template to draw out comb and build cells. Foundations may be made of plastic or wax (Fig. 6). Plastic foundations (Fig. 7) are coated in a

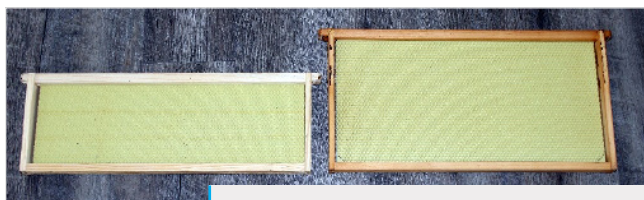


Figure 6. A medium and deep frame with a plastic foundation

thin layer of wax to promote the bees to drawn comb. Wax foundations must have wire drawn through them to support the wax from bending or falling. Some beekeepers also use wire foundation (Fig. 8), in which they simply pull wire horizontally through the frames to support the comb. While this may be more natural, it also allows bees to build comb in ways that may make it difficult to pull frames out for inspection. Plastic foundations can be cleaned, re-waxed, and placed back in hives if they are not warped or damaged. Wax and wire foundations do not always allow for this.

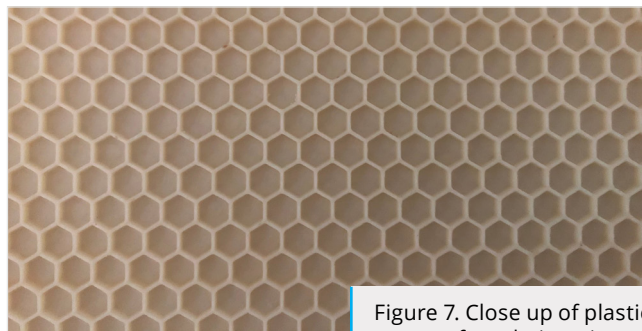


Figure 7. Close up of plastic foundation picture



Figure 8. Wire foundation frame

OTHER HIVE COMPONENTS:

The bottom box will sit on a bottom board. The bottom board allows space for the bees to enter and exit (Fig. 9). Bottom boards may be solid or screened. Screened bottom boards are a way to provide air flow in hot months and cultural control for management of many pests that may fall through and out of the hive. A screened bottom board will generally come with an insert so the hive can be closed during cold months.

Entrance reducers are important for young or weak hives. These reduce the amount of space the bees must guard and can either be purchased, or straw, bits of wood, or other objects can be used to reduce the entrance (Fig. 10). During months when bees are very active or temperatures are hot, the entrance should be increased or removed.



Figure 9. A solid bottom board and a screen bottom board



Figure 10. Entrance reducer on a hive

When using an entrance reducer, be sure to place the open notch facing down so that water can roll out of the hive and when bees die, the dead can be easily be removed. Also, be sure to place the entrance in the same location, to ensure that brood patterns stay the same within the hive.

Covers are used to close the box and protect it from sunlight, moisture, and predators. There are different kinds of covers: migratory, telescoping, and variations of each. Migratory covers consist of one piece and allow the beekeeper to place more hives together if they are transporting them (Fig. 11). Telescoping covers offer more protection from rain



Figure 11. Migratory cover

and water entering the hive. Telescoping covers also have an inner cover that is essential. If a beekeeper does not place the inner cover on the boxes (Fig. 12), the bees will propolize the telescoping cover and make it very difficult to open the box.



Figure 12. Inner cover with telescoping cover

QUEEN EXCLUDERS:

Queen excluders (Fig. 13) are used to permit the passage of workers but have spaces too small for the queen to pass through. If managing bees to produce honey, beekeepers will want to purchase queen excluders for their hives to prevent eggs from being laid in honey supers.

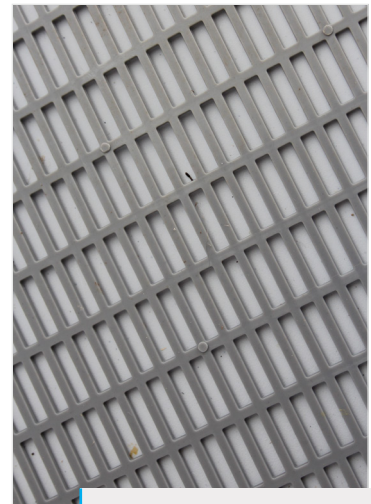


Figure 13. Queen excluder

Additional online resource available through AgriLife Learn, Beekeeping 101: <https://agrilifelearn.tamu.edu/product?catalog=ENTO-025>