

The Traveling Beekeeper



EQUIPMENT FOR BEEKEEPING

by LARRY CONNOR

Wicwas Press

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In 1851 a combination of ideas came together in the mind of Lorenzo Loraine Langstroth, a Yale-trained minister who developed the first movable frame bee hive in Western culture. He took the idea of framing each honeycomb in wood, separated these frames by a distance we call "the bee space", and placed it into a top-loading box. "The Bee Space" describes the distance between the removable wooden frames that Langstroth observed altered the behavior of the bees within. He observed that if he left a space less than one-quarter (6.4 mm) of an inch to a colony, the bees filled it with propolis (natural plant resins), making it nearly impossible to remove. If there is a space larger than three-eighths (9.5 mm) of an inch, the bees will build beeswax comb. Though Langstroth earned a patent on the "first movable frame beehive in America" in 1852, Langstroth was unable to collect royalties even as his design became the industry standard.

Today, deep and medium sizes of Langstroth boxes are commonly used in the Americas and elsewhere. In the photo you see the key features of the hive, modified from Langstroth's original plans. Most beekeepers keep the immature bees or brood in the lower box or boxes, generally known as the brood chamber. The boxes on top, superior to the brood chamber, form the honey supers.

The standard is a deep hive body, a ten-frame hive that may be repositioned by the beekeeper. Two significant advantages in the Langstroth design are (1) the ability to make new colonies, or nucleus hives, by removing combs from one hive and creating another from the parent. (2) The frames that contain honey can be removed by cutting, or harvested using the force of a honey extractor that acts as a centrifuge, and spins the honey out of the combs onto the side of the extractor where it drains to the bottom and can be drained into containers.

Failure to respect the bee space is the pri-

mary hazard of building or buying bee equipment with the wrong dimensions.

Langstroth Variations

The standard Langstroth bee box holds ten frames and is 19 7/8 inches in length and 16 1/4 inches wide. The common deep box is 9 5/8 inches deep, holding frames that are 9 1/8 deep. Most beekeepers use ten-frame hives, but a lighter 8-frame hive is common with keepers who do not want to lift as heavy a box. Some beekeepers use the deep hive body for both the brood chamber and for honey production. This is the default size

of most commercial beekeepers, who place beehives on pallets of four or six hives, and use forklift trucks to move the pallets. Crews work the colonies like one might on an assembly line—to establish new hives, feed, add additional space, harvest honey, and medicate. A deep box, or hive body, filled with honey will weigh nearly 90 pounds, making beekeeping backbreaking work.

The standard medium depth box is 3 inches shorter, or 6 5/8 inches in depth. Many beekeepers use a combination of deep boxes for the brood chamber and the shorter medium depth boxes for honey production.



Open Langstroth hive (8-frame) with caged queen cells. Moveable frame hives with top access are the standard configuration in North America. Keeping the tops and sides of the frames clean reduces issues with frame removal and starting sites for small hive beetles and wax moths. While queen rearing and cell emergence can be done in either the Top Bar Hive or the Warré hives, there is no standard system for more advanced beekeeping activities. Every beekeeper should start with and keep some Langstroth hives in their first season.



A top bar hive with inspection access at the side of the hive. Designed and built by Ed Simon--see *Bee Equipment Essentials*.

The advantage here is that the honey supers are never used for brood comb, which naturally darken from pigments from pollen and the accumulation of pupal cocoons, and thus affect the color of the honey.

Small-scale beekeepers seeking simplicity use only the 6 5/8 inch boxes for both brood chamber and honey super, giving them just one size box. A few beekeepers use 8-frame hives in the medium depth, but they are harder to find and more difficult to resell.

Which box sizes do the bees like? The answer is that bees adapt to many sized chambers, and will do well in any of these

configurations. Some experience the same results with 8-frame equipment as with 10-frame hives in terms of brood rearing and honey production. The 8-frame deep hive body has a strong following by people who are not willing to lift 90 pounds. The author is one of these people, and likes eight-frame boxes because of the reduced weight, and the behavior of the bees to better utilize the space it provides, albeit twenty percent smaller in volume. The use of all 8-frame deep hive bodies encourages me to add frames of honey to the brood nest for feeding.



Top bar hive in use. Corks are used to increase/decrease bee access to the hive. Designed and built by Ed Simon--see *Bee Equipment Essentials*.

Kenya Top Bar Hive (TBH)

In the 1970s in Guelph, Ontario a research team working in Kenya developed a hive that combined top bars (used by early Greeks) with a box with sloping slides. The program wanted a hive that provided movable frames to the bee nests made from hollow logs (often hung in trees) used in that country, and could possibly transition to a Langstroth hive plan. The sloping sides produced a comb that is stronger and rarely attached to the sides of the box. This differs from the bee hives I see in the U.S. Virgin Islands where some beekeepers use Langstroth boxes but only a Langstroth top bar. Without sloping sides and the side and bottom bars, the combs are often attached and must be detached by machete to remove the frames.

Top Bar Hives have become quite popular with garden beekeepers and those interested in forcing bees to produce their own beeswax comb without use of potentially contaminated foundation. These hives are not standardized in dimensions, but provide an alternative to beekeepers. They are not as mobile as Langstroth hives, and honey is either crushed or cut into pieces and sold in containers. There is a chapter on building your own Top Bar Hive in Ed Simon's *Bee Equipment Essentials*.

I have encountered some TBH beekeepers who think that their hive design is better for the bees, producing better quality honey, and is less expensive than a Langstroth hive. It is true that the home carpenter can make TBH's from scrap lumber and a bit of effort in the wood shop. Yet there are some pre-made TBH's that are expensive to purchase.

Top bar hives must convert a considerable part of their honey production to new comb, which is a goal of TBH beekeepers. They appreciate the reduced honey production, the increased production of natural wax, and the ability to leave a lot of the honey for the bees for winter or dearth periods.

One concern is proper comb development on the top bars. With only top bars in a hive it is easy for the beekeeper to walk away from the boxes and the bees build comb across the top bars, defeating the purpose of the movable frame. This makes the comb hard to inspect, and violates apary laws in most areas. From that observation, keeping TBH's seems to require even more management and attention to comb construction than completely enclosed frames. One advocate of top bar hives suggests that beekeepers visit the hives every few days to check on new comb construction, and 'fix' anything that is not being suitably constructed by manipulation and repositioning. The top bar hive is clearly not a leave-alone hive design during the period of comb construction.

What concerns me is that some of these keepers often believe that this design is immune to bee diseases and pests. All bee colonies require management, can become contaminated by various sources, and are equally subjected to diseases and pests. *Any beehive system requires a fully engaged bee-*

keeper who must work to support and provide husbandry to the bees, regardless of their domicile design.

Honey handling with these frames must be done either as cut comb (put into containers or jars and surrounded by the liquid drained from cutting) or mashing the comb to remove the honey. While beekeepers have tried a variety of presses and honey removal methods, the best way to separate the honey from the comb is in a mesh bag, squeezing by hand to extract the honey. Then, the final bit of honey is removed by washing the wax in cool water, and to use this water in mead



The cover of the English translation of *Beekeeping For All* by Abbé Warré shows the Warré hive. This colony was designed for the very minimum of beekeeper involvement. For example, the original management consisted of undersupering the hive in the spring and removing the top box in the fall—that's it! The colony uses top bars only. The top insulation and ventilation area duplicated the hive in a hollow tree. There are strong merits to this natural design concept. If started with a swarm or package, there is an excellent chance the bees will leave the nest, so some method of holding the bees in the hive is advisable. Options for feeding, medicating, and other management activities go against the original vision of the hive's use. Some of these issues are discussed in David Heaf's *The Bee-friendly Beekeeper A Sustainable Approach*. Both books, published by Northern Bee Books in England, are available from Wicwas Press.

production. Some people keep this honey water in the refrigerator and use it to sweeten tea, other sweet drinks, and whenever a sweet liquid is needed in cooking and baking. Not needing to buy a comb uncapper and extractor is a huge savings.

Warré Hive

The Warré Hive (the People's Hive) was developed in France by Emile Warré, and has a key feature: Extra boxes are placed below the ones that have been built by the bees, thereby mimicking the comb and nest construction found in a bee tree. This 'undersupering' allows the bees to build down as the colony grows, and then move up as they enter the winter. The top box is harvested, constantly removing the oldest comb and keeping only young combs in the colony. IF you elect to try such a hive design, please use top bars in the boxes to support moveable frames. Warré Hives without such supports would likely be in violation of an apiary law in your area. Warré's design did not use foundation or frames, but includes a top insulation box which provides moisture capture. Similar hive designs were developed in Germany and Japan. Always keep the colonies well managed so the bees are properly fed and kept with low mite levels as you would in any other hive. Again, though some beekeepers think this design does not require as much work as the Langstroth hive, the reality is quite different. All hives require management to be successful by most beekeeper's standards! With this in mind, there are free plans for construction of this hive on the Internet.

Support

Because the Langstroth design is the most commonly used hive with tens of thousands of beekeepers who use it and who have experience with that equipment management, this design is the best hive option if only because of the network of potential for support and mentoring. *I recommend all beekeepers start with Langstroth hives, at least two, in their first season.* As the beekeeper becomes more experienced other hive types may be tried. The Top Bar and Warré hives are niche designs, kept in small, local, close-knit beekeeping communities. Should you move or trends change, you may not be able to find necessary support, leaving you on your own. You will have trouble selling these designs to other beekeepers.

Regardless of the design, however, the bees will do their best in each design when correctly supported by a beekeeper.

References:

- Caron, Dewey, *Honey Bee Biology and Beekeeping*, Wicwas Press, Kalamazoo, MI
- Heath, David, *The Bee-friendly Beekeeper A sustainable approach*, Northern Bee Books, ISBN-978-1-904846-60-4
- Ed Simon, *Bee Equipment Essentials*, Wicwas Press, Kalamazoo, MI
- Warré, Abbé, *Beekeeping for all*, Northern Bee Books, ISBN-978-1-904846-52-9

Increase Essentials will help you with nucleus setup and management. Consider Ed Simon's new *Beekeeping Equipment Essentials* for nucleus construction (go to the website www.wicwas.com and click on the bee book store). For the new speaker's bureau, go to www.honeybeespeak.com and sign up as a speaker, a potential user of the bureau, or both.

Travel plans include the Florida Bee College March 9 and 10, then (with Dr. Dewey Caron) the Kalamazoo Bee Club March 13 and 15, the South-Eastern Michigan Beekeepers Association Bee School March 17, Medina County Beekeepers Association March 18 and 19, Central Ohio Beekeepers Association March 22, and (solo) the South Western Ohio Beekeepers School March 24. In April, look for the program on *Two and a Half Hives* with Denver Bees on April 21, and the club meeting on April 24. There will be a *Queen rearing retreat* May 4 to 6 in Virginia. Check out www.wicwas.com or sign up for our newsletter at www.honeybeespeak.com.

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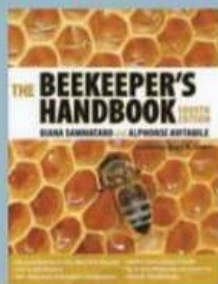
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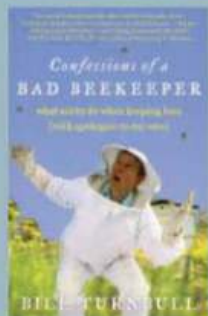
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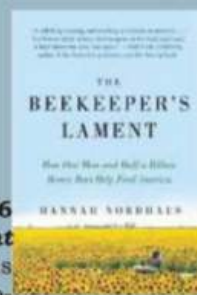
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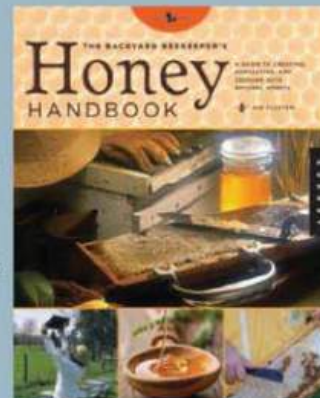


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