"There can be no improvements where there are no standards."

-- Masaaki Imai

I mailed a letter the other day. (Remember "letters"?) I put my return address in the upper left corner of the envelope, the "to" address in the mid center and a stamp with the appropriate amount of postage in the upper right. I must have done it correctly because in a few weeks I received a response from my correspondent.

By following the standard rules of letter-sending, some people would say that I am a lackey to the system, a virtual slave who has prostituted my individuality by conforming to the external constructs dictated by a repressive society and the institutional machine. I would say that I wanted to do the best I could to ensure that my letter was delivered quickly, cheaply, efficiently, safely and with a minimum of fuss. Why argue with the conventions imposed by Benjamin Franklin, even though those conventions are clearly arbitrary, as long as "the system" is built around them and they result in a predictably successful outcome?

In beekeeping, we have certain things that are somewhat standardized, others that have popular conventions but not standards and still others that reflect the farthest disparity of human creativity. Whether that is "good" or not is irrelevant because that's just the way things are. Within my own bee yard, one key to minimizing stress is to adopt what I consider to be the right tool for the specific situation and consistently use that same tool for that same specific situation. I experiment with other tools but for everyday use, I use what I consider tried and true.

Lots of "Standards"

There have been many "standard" hive configurations over the past 160 years, not even counting skeps and bee gums. Typically, the marketplace has dictated what will be "standard", in much the same way that VHS tape format won out over the technologically superior Beta format.

A European Dartington Hive, designed to minimize the amount of lifting that a hobby beekeeper must do. The brood space is horizontal in a single, long box, as in a "long Langstroth" design. Honey supers are added on top as needed. This one has four supers; more can be added.

In Europe, there are far more "standards" for equipment sizes than we see in the US. Just a few of the types used in Great Britain include:

Hive Type	Description
National	Deep frame size: 14 x 8½" Super frame size: 14 x 5½" Frame lug (ear) length: 1½" 11 frames/box
National 14x12	Same as National except deep frame size: 14 x 12"
WBC (William Broughton Carr)	Double-walled (box within a box) Same frames as National 10 frames/box
Commercial	Deep frame size: 16 x 10" Super frame size: 16 x 6" Frame lug length: 5/8" 12 frames/box
Smith	Frames same as National except lugs are 3/4" 11 frames/box
Langstroth (US standard)	Deep frame size: 17-9/16 x 9-1/8" Super frame size: 17-9/16 x 5-3/8" 10 frames/box Frame lug length: 5/8"
Jumbo Langstroth	Deep frame size: 17-9/16 x 11¼" Super frame size: 17-9/16 x 5-3/8" 10 frames/box Frame lug length: 5/8"

Hive Type	Description
Dadant	Deep frame size: 17-9/16 x 11¼“ Super frame size: 17-9/16 x 6¼“ 11 frames/box Frame lug length: 5/8“
Dartington	Same frames as National 14x12 “Long Deep”, 21 frames/box Can be supered with 4 separate boxes, each holding 6 National super frames, placed horizontally across the top of the brood chamber

Other European hive styles include Zander, Warré and Simplicity, as well as many others. The Warré Hive is a strange hybrid of a “normal” top bar hive and a conventional box-type hive, incorporating the worst characteristics of both. It has a small but zealous following in the US.

It is very important to note that there are aspects other than the size and number of frames, and subsequently the size of the box, that define a standard. One obvious distinction is whether the box is top-loading (as is universal in the US) or back-loading (as is traditional in Europe).

Another critical factor is whether the bee space between boxes is designed to be at the bottom (as in most UK boxes) or at the top (as found in the US). With top space, we can put a flat cover directly on our boxes without squashing bees. But if we set a bee-filled box directly on a flat surface, we’ll end up with a pressed mess on the bottom. That’s why, when removing boxes for inspection, we set them either on end or cattycorner across the rim of an upturned telescoping cover.

Nonstandard Types

We also see people who deliberately defy standardization, essentially practicing “build a box, any box, and put bees in it.” Top bar beekeepers often pride themselves in this philosophy. Even so, they usually follow a common style, such as the Kenyan Top Bar Hive or Tanzanian Top Bar Hive.

Proponents of nonstandard equipment often state that their particular configuration is cheaper than standard equipment. One website boldly declares cost as an advantage of top bar hives, yet they sell a complete top bar hive for $429, a Warré hive for $249 and a conventional Langstroth hive for $199. Another site has a budget top bar hive, unassembled, for $179 and a fully equipped, fully assembled Langstroth hive for $114. I’m confused. How is nonstandard cheaper? Yes, hives can be made cheaply from material gleaned from dumpster diving, but that applies equally to any hive type, not just ones with nonstandard dimensions.

It is very important to note that there are no restrictions on how honey bees can be kept in North Carolina except that, according to the NC Bee and Honey Act of 1977, they must “be kept in moveable frame hives and be maintained in an inspectable condition.” This is necessary to allow the colony to be inspected for disease. That’s why bees cannot be kept in skeps or fixed-top-bar hives.

This requirement is very difficult to meet with Warré hives because, by design, the bees affix comb to the sides of the boxes, making the comb difficult if not impossible to remove and then replace. Proponents twist this around and call it a “feature”, saying that Warré hives “don’t need maintenance.” That assertion is clearly ridiculous and reflects both ignorance and an extremely irresponsible attitude. People who don’t perform any management of their hives are not beeKEEPERS, they are beeHAVERS, and they are a significant cause of the spread of pests and diseases to surrounding beekeepers.

A Common Characteristic

One common trait shared by all of the various hive types is that not a single one of them is magic. Whether a box is tall or short, long or narrow, large or small has no bearing whatsoever on the prevalence of varroa mites and the diseases they transmit, the basic biology of the honey bee or whether the bees are “happy”. Within fairly wide parameters, the bees don’t care what their cavity is like, as long as it is sufficiently large inside and is dry. The reason that there are so many different hive types is that they all work remarkably well from

the bees' perspective. The real difference between them is how easy it is for the beekeeper to use the various components to meet his/her goals, and often that comes down to personal preference.

US Conventions

In the US, most beekeeping equipment follows the Langstroth standard as described in the table above. But even though we have a "standard", the choices we face can be overwhelming. For example, for our standard frame, do we need a wedged or a grooved top bar? A split, solid or grooved bottom bar? The answer depends on what type of foundation, if any, we will use. Do we want pure wax foundation or wax-coated plastic? If pure wax, do we want it to be wired or unwired? "Thin surplus" or regular? If we don't use any foundation, will we use a starter strip? Wooden, wax or both? If plastic foundation, do we want "transit holes" in the lower corners? Do we want all-plastic frames or just plastic foundation? Should the foundation be worker sized, drone sized or small-cell sized?

What about our boxes? For hive bodies, do we want deeps, mediums or a combination? For honey supers, we could choose deeps, mediums or shallows… which is best?

Straying from the original standard, do we want 8-frame boxes instead of the conventional 10-frame ones? Do we want to use 9 frames instead of 10 in our 10-frame boxes? Why would anybody do that, and is there a trick to it?

Don't forget bottom boards… should we go with screened, solid or even absent? If screened, what do we do with the checkerboard thingy that goes underneath the screen? Does it stay there? If not, when does it get used?

What about those cute landing boards that often come with kits… do we need one? If not, do we want one anyway?

How about the cover… should it be telescoping, migratory or English Garden? With or without an inner cover? If with an inner cover, is one end notched or not? If notched, does the notch go in the front or the back? Should the inner cover be solid or screened?

Once we get all of that sorted, what color do we paint the hive?

On Your Own

With the dizzying array of options, clearly there isn't one single configuration that suits everyone's needs. Your hive choices should reflect your preferences and be aligned with your goals. These are your bees, not anyone else's, and that's that. I recommend making friends with an experienced beekeeper and asking her/him for advice before spending money or investing time in construction. Also, look at other beekeepers' hives, particularly those of old-timers. If that shiny new device in the store window is so life-or-death important, why doesn't everybody use it, and how did those old geezers ever get by without it?

So… I'm not going to tell you what hive arrangement to use. But I can offer a few helpful tips to help you decide what is best for you.

1. The dimensions of 10-frame Langstroth boxes tend to be reasonably consistent across manufacturers, so it is usually easy to mix-and-match boxes, lids, bottom boards, top feeders etc. from Bailey, Dadant, Brushy Mountain and other well-known suppliers. However, 8-frame and 5-frame (nuc) boxes don't have a well-defined, well-recognized set of standard dimensions. Often one seller's boxes won't line up perfectly with those from a different seller. For example, I have 2 store-bought nuc boxes and the telescoping cover of one is too narrow to fit the other. *Caveat emptor*.
2. Using the same size boxes for your entire operation (e.g. all mediums or all deeps) makes a lot of sense. That way frames can be indiscriminately swapped around between boxes and between hives. If one hive needs a frame of brood or a frame of honey from another one, it is simple to move a frame if all the frames you own are the same. I <u>almost</u> do this; all of my brood frames are deeps and all of my honey

supers are mediums. Mixing deeps and mediums in the brood boxes reduces flexibility.

3. A recent trend is for hobbyists to use 8-frame instead of 10-frame boxes and mediums instead of deeps. That is great for literally lightening the load, making beekeeping easier for the young, the elderly and many people in between. However, I see folks who think they can substitute two 8-frame mediums for two 10-frame deeps as the year-round brood chamber. They still have two boxes, right? Isn't that plenty of space? Well, there are 272 square inches of comb space on one deep Langstroth frame and 170 square inches on a medium frame. So two deep hive bodies (20 deep frames), which is what I prefer to use as a year-round brood chamber, have 5,440 square inches of usable space, whereas two 8-frame mediums (16 medium frames) have 2,720. That's 50% less. Many beekeepers feel that a 10-frame deep and medium are sufficient as a year-round brood chamber; that's 4,420 square inches. Two 8-frame mediums are still only 62% of what is considered minimally acceptable. The table below shows roughly equivalent configurations.

Equivalent Brood Chamber Sizes		
Size	**Boxes**	**Square inches**
10-frame deeps	2	5440
10-frame mediums	3	5100
8-frame mediums	4	5440

4. I enjoy making my own equipment, although the high price of lumber often makes buying ready-made equipment a smart choice compared to building it. If you do choose to build it yourself, I recommend buying or borrowing a store-bought version to use as a template for your first attempt. There are subtleties to even a basic box and having a "gold standard" to work from helps ensure that the finished product is interchangeable with other equipment you'll acquire or build later.

The author (on right) helps a new beekeeper in the Dominican Republic build a standard Langstroth hive. Standard specifications leave nothing to chance or whim. This equipment will be compatible with any other Langstroth equipment the beekeeper encounters.

Bottom Line

Just as following standard procedures for mailing letters make communication more efficient and outcomes more predictable, the use of standard beekeeping equipment enables components to be interchanged within your bee yard as well as with other beekeepers. It helps ensure that ancillary equipment will fit properly, regardless of the supplier. It allows us to take advantage of advancements made by others, since those advancements build upon a common foundation. Instead of rebelling against conventional equipment, why not embrace it and continue to make it even better? After all, it is widely used for a reason!

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