

Introduction

The Thinking Beekeeper Thinks Again

There was some discussion about calling this book *The Thinking Beekeeper Thinks Again*. I thought that might appeal to those of you who had read the first book and found it worthwhile—partly because this would be an extension of the original mindset, and it would offer more of my beekeeping philosophy and management techniques. Besides, it was kind of funny, and I thought most of you would get it.

But the world has evolved to where we now live with some terrible, tragic things:

- a profound disconnect from nature and natural systems
- a worried realization that everything is connected; when we harm a piece of the planet, or damage one of its systems, we truly harm all of it, and all of its inhabitants
- the knowledge that we have, indeed, already done this harm, perhaps past the point of no return

This can be really hard to live with on a day-to-day basis. It's frightening. It's depressing. It leaves parents worried about the world their children will live in—or be unable to live in—about whether there will be a world left for anyone to live on seven generations from now. Sometimes it can be just too hard to keep trying, to keep believing that you can make any difference at all, and we sometimes come to a point where we do “think again”—but in that case, it might mean that we give up on something important, we quit trying, and we regret all the effort we have invested thus far.

But I didn't want anyone to give up, and I certainly don't want anyone to regret their decision to keep bees, even though it's fairly complex nowadays, for all the reasons discussed in this book and more. So instead, the official title became *Advanced Top Bar Beekeeping: Next Steps for the Thinking Beekeeper*.

Around Gold Star Honeybees' Global Headquarters, we still call it *The Thinking Beekeeper Thinks Again*, or TBx2. We sort of suspect that you might too.

Questionnaire

How much poison are you willing
to eat for the success of the free
market and global trade? Please
name your preferred poisons.

For the sake of goodness, how much
evil are you willing to do?
Fill in the following blanks
with the names of your favorite
evils and acts of hatred.

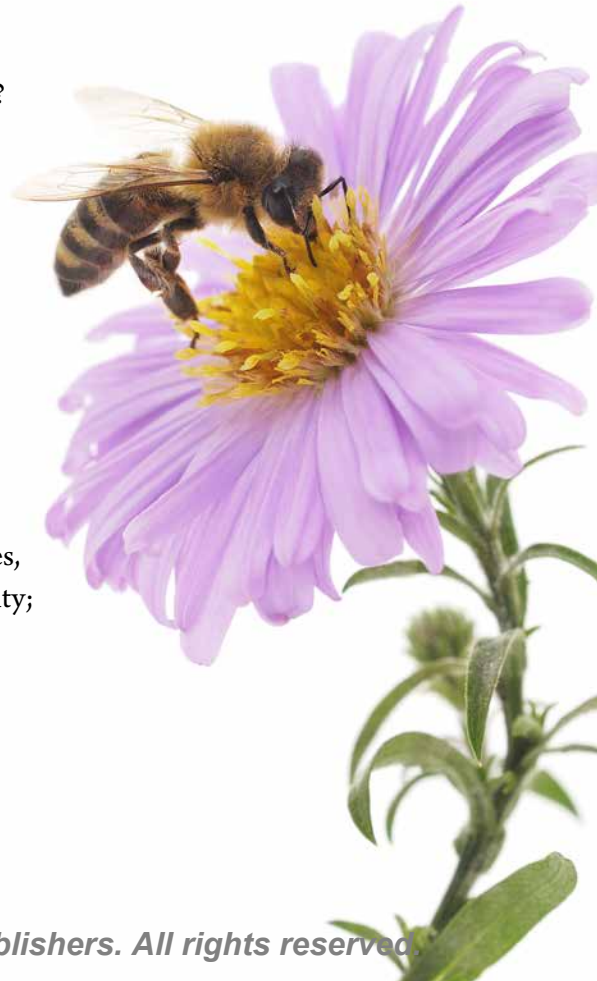
What sacrifices are you prepared
to make for culture and civilization?
Please list the monuments, shrines,
and works of art you would
most willingly destroy.

In the name of patriotism and
the flag, how much of our beloved
land are you willing to desecrate?

List in the following spaces
the mountains, rivers, towns, farms
you could most readily do without.

State briefly the ideas, ideals, or hopes,
the energy sources, the kinds of security;
for which you would kill a child.
Name, please, the children whom
you would be willing to kill.

—WENDELL BERRY,
from *Leavings: Poems*, Counterpoint, 2010



PART I

Year Two: What to Do?





Year Two: How Did We Get Here?



AT THE RISK OF REPEATING MYSELF, I thought about titling this chapter “How Did We Get Here from There?” just as I had for Chapter 1 of *The Thinking Beekeeper*. But in that chapter, we fast-forwarded from the honey hunters of ancient civilization to managed beekeeping with fixed comb hives in Egypt and the unspoiled honey found in King Tut’s tomb; then we moved on to the “Greek Beehive,” generally described as the original top bar hive; and from thence to the Reverend Lorenzo Lorraine Langstroth and his movable comb, square-box beehive—a revelation to antebellum America. All this to understand why we do what we do in beekeeping today—using movable comb in managed hives.

It was a relatively short hop from the Reverend Langstroth’s patent in 1853 to the post-World War II era, and the drive to scale up and mechanize our food system, which industrialized beekeeping right along with it. Former Secretary of Agriculture Earl “Rusty” Butz and his “Get big or get out!” philosophy threw us headlong into the perpetual imbalance of large-scale monoculture agriculture, with its synthetic fertilizers and unrelenting applications of toxic pesticides. The law of unintended consequences soon revealed our shortsightedness about the sustainability of a system forced so far out of balance.

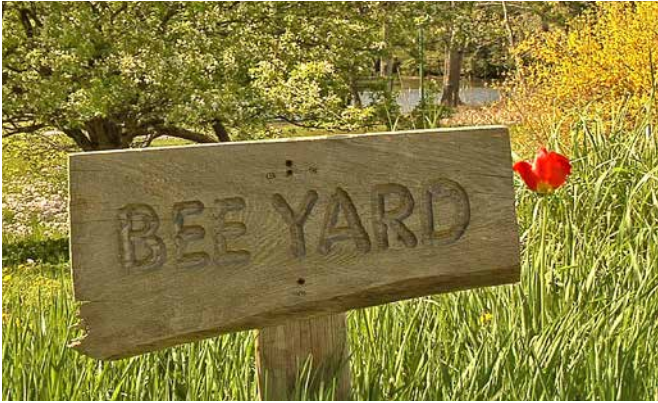


FIGURE 1.1. Zoom in to the bee yard. Credit: Harry Kavouksorian.

Today we want to narrow our focus, leaving behind ancient history, the Industrial Revolution and the cares of the modern world, zooming in really close—focusing on *your* bee yard in its second spring.

Just how *did* we get here?

At the end of Year 1, you probably invested some time and effort in preparing your top bar hive(s) to withstand winter's ravages—from careful placement of the hive before

you even installed your bees, to providing protection via insulation, hay bales, tarpaper, rigid foam or another resourceful solution that minimized the effect of the winter wind. You likely managed them in such a way that the bees built their combs in one direction, and their food stores were located on only one side of the *brood nest* (glossary includes terms in italics), not on both sides. It's likely that you were extremely conservative about harvesting honey, if indeed you harvested any at all. Or maybe you did remove a bar or two, and left the honey on the bar as a reserve for feeding back to them later if needed. (Note that this will require having a few spare top bars so that your hive can always have the full complement of bars, even if you have removed some of them.) Then in the fall, you put your bees to bed, knowing that they were on their own inside the hive.

For beekeepers, winter can be hard. Not just because the weather is seriously cold and snowy, or at least drab and dismal, but because you can't check on your bees! It's a good time for inside activities, such as building new hives, rendering wax, devising new gadgets, sorting through last year's pictures, catching up on your reading—but all the while there's a bit of an itch—wanting to know what's going on in the hive. Do they have enough honey? Are there enough bees? Is the hive strong enough to make it through what passes for winter where you are? What is happening in there!?

Then, around mid-January, we get one of those days that completely restores our belief that spring will indeed come. The temperatures rise into the mid-50s Fahrenheit, and lo and behold—there *are* still bees in that box!!! And out they come for the storied *cleansing flight*—leaving orangey-brown spots on the snow, on your car windshield and on the sheets you hung out to dry because it was just too beautiful to run the dryer. (Hey, it's a long time to go without going to the bathroom...!)

What a heartening sight, that bee poop! Now you know they're alive... but it's terribly early still. There may be months to go before the weather truly breaks, and the local early nectar sources begin to *bloom*. You may be worried about their food stores. If supplementing their honey stores mid-winter is part of your paradigm, this is the kind of day to check on their stores.

Because opening the hive when the bees need to be clustered is not something to do casually, be sure to get your ducks in a row first—before you crack open the box, breaking their propolis seal and disrupting their winter cluster.

What do you feed honeybees in winter? The syrup feeder you used last spring is not an option now—for one very important reason: It's too cold! To survive cold temperatures, bees must *cluster*. An individual bee at temperatures below 45°F becomes paralyzed and cannot even return to the cluster. The syrup feeder will be located much too far away from the cluster for the bees to access it. So perhaps it's more a question of *where* can you feed honeybees in winter? Bees clustered for winter need to be touching their food source—like they would if they were clustered on full, ripe *honeycomb* made of natural wax. You may have some bars of honey in reserve—and that's the ideal food for bees.



FIGURE 1.2. Top bar hives in winter. Credit: Christy Hemenway.



How to Make Fondant for Winter Bee Food in Your Top Bar Hive

Notes

1. You will need a candy thermometer; this recipe is temperature sensitive!
2. Do not use raw, turbinado, beet, or brown sugar. Organic cane sugar is fine. Read the label closely. If it doesn't say cane sugar, it is probably beet sugar.
3. 2¼ cups of sugar weighs 1 pound.
4. When made using 1 cup of water to 4 cups of sugar, this recipe will fill a typical fondant feeder frame.

How to Make the Fondant

Combine:

- 1 part water to 4 parts sugar
- ¼ teaspoon of vinegar per pound of sugar (this helps break down the sugar)
- ¼ teaspoon of salt (preferably a salt containing beneficial minerals)

1. Bring to a boil, stirring constantly until the mixture boils. (Very important!) Cover and boil for 3 minutes WITHOUT stirring. Continue to boil until the temperature reaches 234°F. (Exceeding this temperature will caramelize the fondant, which is harmful to bees.)
2. At 234°F, remove the mixture immediately from the heat and allow it to cool to 200°F.
3. Meanwhile, arrange your fondant feeder frame on a flat surface covered with

waxed paper. Put the thicker edge of the top bar over the edge of the flat surface, so that the frame itself lays flat and works to contain the fondant.

4. At 200°F, use a whisk to whip the mixture until it turns white.
5. Quickly pour the mixture into your feeder frame. Allow the fondant to cool completely. Remove the waxed paper.
6. The fondant feeder can then be stored in the freezer in a plastic bag.
7. If you determine that you need to supplement your bees' natural honey stores, place the fondant frame in the hive beyond any existing bars of honey so that they first devour their own honey stores before moving into the fondant frames.



FIGURE 1.3. Commercial fondant is available in larger quantities. Check the ingredients list!

Credit: BeeCurious on BeeSource.com.

But if we are assuming you don't have any of your bees' own honey to feed back to them, then the food of choice would be *fondant*. As a solid, fondant adds little moisture to the hive, and it does not require a distant feeder jar in order to work. Fondant can be hung from the top bar, imitating a comb filled with honey, and this top bar can be placed right next to the cluster of bees. This is crucial, since bees must stay in cluster to survive. They cannot survive away from the cluster, nor can they move as a cluster across empty comb to get to a distant food source. This is why it sometimes happens that there may be plenty of honey in the hive, but the bees can starve if it is not located where they can get to it.

So you're prepared for the eventuality that your bees may need food when you check them. You've got your bee gear on, and now you're ready to go look. You're ready with a bar of honey or fondant if they do need food. If they don't, you can just grin and close up.

Here's how to check. Begin at the honey end of the hive. There is no reason to start in the brood nest; it is too cold to tear into it, and you are only here to check food stores. Once you have opened the hive, starting at the honey end and moving toward the brood nest, click through bars until you come to bars of either bees or honey. If you run into honey without seeing any bees—great! You don't need to feed them! But, if you run into bees first—place your bar(s) of fondant or honey right there next to them. Put the rest of the bars back in, close up and cross your fingers. It's still a long way to spring!

So let's fast-forward another little bit. You probably did that food check in January, possibly February. If you live in the South, your bees will likely be all set with natural food sources shortly, and they'll be humming along. But perhaps where you live, the growing season doesn't really get started until closer to April, or even May. So your bees have got more hanging on to do.

Northern or cold winter bees are doing an amazing balancing act inside their hive at this time of year. Believe it or not, the queen begins laying eggs while it is still quite cold, and the bees need to cluster over those new baby bees, to warm and feed and protect them, especially through the egg and larvae stage. Meanwhile, the older bees—the ones that were

FIGURE 1.4. A fondant feeder must suspend the fondant where the bees can access it.

Credit: Christy Hemenway.



FIGURE 1.5. This fondant feeder supports the fondant with ½-inch hardware cloth.

Credit: Maury Hepner.



born in fall and are anatomically different so they can live through a cold winter but did very little foraging—are dying off pretty rapidly. New bees are being born. Nectar and pollen may or may not be scarce, thanks to whatever the weather is doing.

Welcome to April, known for being “the cruelest month in beekeeping.” How heartbreaking it can be to see bees in January, and in March perhaps, but then, thinking all is well, discover in April that the hive is dead. It’s entirely possible that a hive may *overwinter*, but then not *overspring*. (And yes, sometimes we make up words in beekeeping to get across what we mean...)

It’s likely that the new beekeeper is doing one of two things at this point: Either celebrating success or mourning a dead-out hive. Of course we would much rather see a thriving hive come through a cold winter with flying colors, but if this was your first winter, and you are mourning the loss of your first hive, fear not—all is not lost!

Consider where you were last spring, such a short time ago, with an empty top bar hive, waiting for your first bees. Today you have some precious things: a year’s worth of knowledge and experience; and something else—bars of naturally drawn beeswax honeycomb, wax that was made by bees, for bees. If you did not use any toxic treatments in your hive, then your natural wax comb is incredibly clean, containing only those environmental toxins that were brought in during the season by your foraging bees.

One of the most important things you can do in the way of letting bees act in accord with their natural systems is to leave the making of the wax entirely up to them. Commercially available wax *foundation* has been tested and found to be contaminated with the persistent pesticides and chemicals that were purposely introduced into the hive by beekeepers, and plastic foundation is,

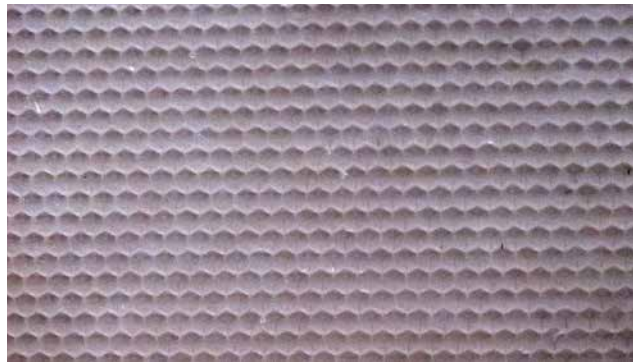


FIGURE 1.6. Foundation wax. Credit: Christy Hemenway.

well, plastic. You’ve probably heard me say this before, but the truth bears repeating: For the bees, “It’s all about the wax.”

Because wax building is resource-intensive for a new package of bees—and, of course, there are a million other variables and opportunities for failure in the first year of a top bar hive—it’s really worth appreciating just what your bees actually did accomplish, even if they did

not overwinter. They left behind this precious gift of natural comb. So yes, let’s mourn the loss of your bees, but let’s also celebrate this new and very important resource.

Let’s take a look at these two different scenarios and plot a path forward for this new season.

If your hive succumbed to the stresses of winter, your next steps are fairly straightforward, even if somewhat uninspiring. They include cleaning dead bees out of the hive, diagnosing any disease symptoms that might exist and resetting for new bees.

Note that this task list *does not include* destroying the existing comb! You may be uncertain about the condition or cleanliness or safety of reusing the comb, since now it looks so much different than when it was first drawn by the bees. Fresh, white, beautiful *honeycomb* is a long way from dark brown *brood comb* that may even contain bee carcasses. So what should it look like?



FIGURE 1.7. Fresh white comb. Credit: Dana Gray.



FIGURE 1.8. Freshly capped honeycomb. Credit: Christy Hemenway.



FIGURE 1.9. Brown brood comb.

Credit: Christy Hemenway.

Beeswax comb starts out white, and it is very soft and extremely fragile. It has just been excreted fresh from the wax glands in your bees' bellies. Over time, things happen that alter this ethereal beauty: the wax hardens, it oxidizes, it yellows, it turns brown. The bees walk on it, staining it with pollen, nectar and propolis resins. They store honey and pollen in the cells, and the color changes again, affected by the elements that make up the honey and pollen. But brood comb changes the most; it actually turns brown. This is due to the part brood comb plays in the life cycle of the bees—that magical moment when the bee pupae, capped inside their tiny hexagonal cells, spin a very thin silk cocoon around themselves as they begin their metamorphosis from grub-like larvae to newly hatched honeybees. When the bees hatch from their cells, these cocoons are left behind, causing the brood comb to become dark brown. We humans tend to associate brown with dirty, but brown does not equal dirty in this case! Brown is good, and from the bees' point of view, the browner the better. Brown brood comb is the perfect *anchor* for a new hive of bees. It also works beautifully for luring a swarm into your *swarm*

trap should you decide to do that. In any case—don't destroy the natural wax comb your bees have made.

If you have doubts about disease issues, consult your state apiarist, local extension agent and/or and experienced beekeepers. You don't want to perpetuate a disease problem. But you sure don't want to waste all the hard work done by your first year's bees either.

Another opportunity is also at hand: It's much easier to make a change to your hive when there are no bees in it! Take advantage of this time to resolve any design issues you found with your hive. Changes to bottom boards, entrances, roofs, legs and observation windows are all much simpler to implement with no bees in the box! If you should decide to make a major changeover in your top bars, to which the comb is attached, again, *do not destroy* your first-year bees' comb. It can be removed from the old top bars and rehung from new ones. The bees are quite capable of reattaching it to the bar.

Here's how to rehang the combs. (You may recognize this from page 87 in *The Thinking Beekeeper: A Guide to Natural Beekeeping in Top Bar Hives*.) Carefully cut the comb from each of your old bars. Try to cut a reasonably straight line across the top edge, as you will want to have as straight a surface as possible touching the new bars' comb guides.

Then for each bar that needs to be rehung:

- Cut two ½-inch wide strips of some slightly stretchy fabric. (T-shirt material works well for this.) They need to be a little more than twice as long as your comb is tall, or twice as tall as your hive is deep.
- Have on hand 4 flat-head thumbtacks. They work better for this than push pins because they do not stick out so far as to get in the way of the top bars when you put the bars back into the hive.
- Tack two fabric strips to the underside of the top bar. Turn the bar over on your work surface, placing it with the tacks down and the fabric strips extended toward you.
- Lay the piece of comb down on top of the fabric strips, as near to the top bar as possible.

- Bring the other ends of the fabric strips up and over the comb, and attach them to the underside of the top bar as well, using the other 2 tacks. Adjust if needed so that the comb is touching the bar when you lift it.

Tips

This method supports the comb from below. The fabric strips will act as a sling, supporting the weight of the comb and holding it aligned with the top bar. The weight of the comb can cause wires or string that have been used to “sew” the comb to the bar from above to cut through and the comb to drop off. This is especially true if the comb is fresh and soft.

Space the strips for each bar as necessary to provide the best support; this will be based on the size and shape of each individual comb.

Avoid using bulky things (such as plastic hair clips) that force the top bars apart, as this will change the all-important spacing of the combs in the brood nest. A working top bar hive needs to have all its bars touching each other, with no gaps in between, and no way for the bees to access the space above the top bars.



FIGURE 1.10. The sling method of rehanging broken comb.

Credit: Christy Hemenway.

This sling method can also be used to correct a *cross comb* problem, or to reattach a comb that has collapsed off the bar due to heat or other factors. *Comb collapse* can best be avoided by giving your bees nothing but a dry wooden top bar to build from. The bees do the best job of attaching their comb to the bars that way, without any other input. Applying wax to the top bars is often linked to a comb collapse.

If your hive overwintered and is thriving in April, you have very different concerns than you did last year. Your next steps include a food check and a brood check, to be confident that things are on track. Then what? Now you should be thinking: Swarm alert! It's become more common in recent decades for colonies started from packages to *swarm* during their first year. It is even more likely—probable, in fact, and important—that a colony will swarm in their second year.

So let's move on—we'll cover the details of your second-year bees and their reproductive process in Chapter 2.