What We Do to Successfully Overwinter in SW Michigan

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Every Fall, when I'm asked to present on *How to Successfully Overwinter,* I sigh heavily. By Fall, it is generally too late for the most crucial component of overwintering success: **keeping your bees healthy** (minimally) mid-to-late summer. Ideally, the winter prep talks needs to happen in July.

When I do present on overwintering after summer, I discuss *final* preparations, because there are important things that help optimize the apiary for what lies ahead. Having given a flurry of these talks recently, I've been repeatedly asked for a video (sorry, don't have one) or a summary.

Thus, here's a summary of that presentation, provided reluctantly. I don't mind sharing information. It's just that even after over a decade into this—when I think I finally have something about bees figured out—they'll do something quite different, and chuckle that cute little bee laugh as they propolize all the vent holes, or drag out within hours all the small hive beetle ensnaring cloths I added. Sorry winged darlings – I was just trying to do what I thought was best!

On that note, the following is what I currently think is best. Bees, and ever-evolving science in this ever-changing climate may prove otherwise. ~~And,~~ These are broad-brush recommendations for what to do before Winter sets in, because, like bees, Mother Nature often has a good laugh at we humans who think we have something figured out.

These recommendations are for keeping in climates and conditions similar to Southwest Michigan. If you're seeking advice, please listen to experts for your geographic area who have successfully overwintered multiple colonies, multiple winters. And, all of these recommendations are framed by "if weather permits" – because the days when we can deep dive or even get into hives are numbered in the Fall. Thank you.

Early September-ish

1. Make sure your Varroa are (still) under control (hopefully you've been monitoring all season long). Unsure of your mite counts, or how or what to treat with if not, etc.? Excellent resources for beekeepers may be found at www.pollinators.msu.edu.

2. Verify your colony is healthy and queenright.

3. Defend against robbing:

    a: Don't feed externally (remove that jar feeder in the front entrance). If you are feeding, it should be 2:1 sugar syrup—heavy syrup is easier for them to turn into a suitable-only-for-them version of "honey". And, feed with an internal feeder, so only the bees of that hive can access it. That jar feeder is still very useful (as are the bucket feeders among

others), but position it over the inner cover, with a hive body around it and the top cover over it. Remember, if you're feeding, your honey-for-humans supers should be removed. Be sure to close the entrance on the inner cover or you'll be providing a tantalizing buffet for all stinging insects.

b: Don't open feed (say many experts, as it spreads disease), but if you do, make it FAR from the hives so the bees at the open feed station don't consider nearby hives as other options.

c. Put on robbing screens. There are lots of DIY options on the internet, or you can purchase them.

d. Reduce the number of entrances. Unless it is a power colony or it is wicked hot or humid, it may be appropriate to have just one smaller entrance at the bottom and maybe not multiple entrances in upper hive bodies any longer … assuming you had them to help in drying down nectar. (Don't you love this ambiguity? Yes—beekeeping has a lot of art and "gut feel" experience intermingled with the science. Highly variable weather adds to the art of trying to figure out what's appropriate.)

4. Pull *your* honey – although many beekeepers pull before Labor Day and / or because of mite treatment. You want the bees to focus on filling their boxes for the winter. Should you be pulling honey? How much to leave is discussed below.

5. Remove the queen separator for the season (if it was ever on).

6. Make sure larvae are plump and wallowing in royal jelly. Sometimes a seasonal dearth can cause a shortage of critical pollen (protein), and larvae will appear parched and dry. Add pollen substitutes if need bee, but in small amounts (like perhaps a palm-sized piece) less you open up a small hive beetle nursery.

7. Ensure there's plenty of carbs (nectar and honey) to keep the workforce fueled, feed 2:1 if needed. (Remember, feed internally, see above.) The queen will slow down laying even more, or stop entirely, if there's a shortage of pollen or nectar.

8. Assess the space. Small hive beetles, wax moth, ants, etc. else can gain a foothold if there's too much space for the population of the colony to keep them at bay. Bees are now slowly moving the queen to lower levels, which they accomplish by first filling the "ceiling" with honey, and then as brood emerges toward the top, filling those cells with nectar. Boxes above the honey ceiling likely won't get used now.

9. Water? There are some years when SW Michigan is too dry. A nearby bee-friendly water source (shallow dish with landing floats, dripping garden spigot, etc.) means less mileage and work for the field bees to bring in critical water.

Mid-September-ish:

1. Make the perhaps hard decision about combining if you have weak colonies (that aren't diseased). While many experts recommend combining earlier than now, Mid-September in this area is *about* as late you can do it and still give the bees time to rearrange things the way they want them. (Of course, there isn't time if cold sets in early, so …? And I've done it successfully later as well.) Combining two weak colonies only makes one large weak colony, so combine weak with strong. And, most experts recommend you "take your losses" in the Fall. Better to go into Winter with a good colony just made more robust with a combo, than a good colony and a weaker one that would likely perish anyway.

2. Honey. This beekeeper likes to see about a hundred pounds of honey going into Winter in each colony, although many other seasoned beekeepers recommend 80-100. I like more because you never know when Winter is coming, and bees can consume lots of honey if they're trapped inside during rainy but not yet too cold days Fall days, or if the cold doesn't show up until perhaps the first of the year, so bees are out flying and burning fuel in a search for pollen and nectar that stopped with October's killing frosts. You also don't know when Spring is coming. March? April? I recall it was early May one year before bees put down their knitting needles and began foraging in earnest, and the bitter cold until then had held back the nectar and pollen flows as well. Their hundred pounds of honey had been all but consumed by then.

Do they need 100 pounds by mid-September? No, but I just sort of assess to bee sure they're well on their way to 100 (less for a nuc)[1] at this point. With luck the weather cooperates, allowing bees to get out and work some hopefully not dried up good fall forage perhaps even into October. If they're not well on their way to 100, perhaps time to start feeding 2:1.

3. Is the mite level still under threshold?

[1] About six pounds for full, capped medium frame, and eight or more for a deep frame Google tells me.

End of September-ish to mid-October:

1. Honey: depending on the weather (still forage available? Weather allowing them to fly?) … I'll hope to find them at nearly 100 pounds of honey, and feed if I don't think they can get there on their own.

2. Rearrange stores and frames to help me help them next Spring, and support their forthcoming winter configuration.

What's their Winter configuration? By December-ish, their interior is generally something like this:

- At the top of the hive, there's a "honey ceiling" – and perhaps (and hopefully!) it is a very thick ceiling, like 1-2 boxes of capped honey. (Aggressive for a first-year colony.)
- Below the honey ceiling is the brood, likely toward the middle of the box.
- On either side of the brood they'll place pollen and honey.

It's a marvelous arrangement to be in when Winter finally hits. The bees will cluster about the brood toward the bottom, keeping it warm. Heat rises; that heat will soften the honey next to and above the brood. The bee cluster will slowly move upward as that honey is warmed. And hopefully, the magic all works out such that they don't get to the top of the top box before Spring starts to provide new food sources. (Sometimes it doesn't work out that way, which is why below I suggest an emergency sugar ceiling.)

I always feel intrusive rearranging their home; bees probably know best where to put things. But, a couple things I am comfortable doing:

- Remove any unfilled boxes above their honey ceiling. That's just empty space at this point that won't get filled. I want to not give them more room than they need, and not have the hive profile higher than necessary (think about strong winds topping things over).
- Consolidate the honey ceiling. There might have been a couple of boxes with most of the frames capped and filled – that gets consolidated to one box full of frames. (The partials go into a freezer.)
- If I have a broken, old, or a predominantly drone cell-sized frame of capped honey, I put it toward the outer edges of the boxes. I know come Spring I'll likely want to get that frame out. Putting them on the outsides means come Spring when I can finally deep-dive in the hive, those frames likely won't have brood in them and can be pulled.
- Remove the undrawn frame in the middle of the brood nest that they 've barely worked and that contains no resources. (I was hopeful … but it is (past) time to replace it with a drawn frame if I have it, or move the frame to the far outside of the box.) An undrawn frame in the central part of the colony is a heat, communication, food and travel impingement at this point.

3. Relocate the hive if need be, before cold makes the wax too brittle to move without cracking. Why might you relocate a hive? We like to position our nucs adjacent to large colonies for a wind break and shared warmth through the touching walls. But also consider – can you get to your apiary in Winter and mud season for occasional checks? Are the hives safe from rising

waters or low-lying fog come Spring? Is that nearby tree or building liable to crash on them in a storm?

4. Mites. Oxalic acid is highly effective when there's minimal brood. If you don't know your levels are acceptable, you might want to monitor, and consider this treatment.

5. Install critter guards. If the colony's "front door" (or "top window" aka a small upper entrance) is open, when bees go into cluster and stay there (cold days and nights), a variety of critters may look at the warm, dry honey cupboard and move in. Wooden entrance reducers will only slow them down a bit; you need something non-chewable. And please listen to the voice of experience: put on the critter guards when it is warm enough such that you know there are no critters already in the hive. (On warm days, active bees keep critters out.)

6. Install the slider bottom. We use screened bottom boards throughout the active season, but late Fall, we put in the slider boards to help bees better control the inside temperature. If we remember of course … and if we can find one that fits the bazillion hive configurations we have. (Sometimes we have to wait until after elections so we can recycle a few political signs, but then that means we have to remember which hives still need them. The good news: Healthy bees have made it through just fine without them.)

Fall has Fallen, but You Can Still Get into the Hive Weather-wise (typically November-ish)

1. Mites—maybe an OA treatment if you haven't done it yet?

2. Install an emergency food ceiling. It's cheap insurance, as explained previously. We personally like to use the Mountain Camp Method if weather allows, but sometimes we run out of warm days, and we pop in a candy board instead. Google explains those well. Or, that box of *bee* honey leftover from a colony you combined? Why not store it on the hive instead of in the freezer? (A good reason not to store a box of honey possibly for human consumption is if you are treating with oxalic acid.) Please note, if you install the emergency sugar ceiling too early, sometimes bees see it as foreign material, and work diligently to remove and dump the sugar outside the door. Thus, we wait until that warm day in the midst of generally cold days. A balmy Fall once pushed this to early December.

3. Install an absorbent attic. As bees cluster and shiver to stay warm, they generate heated, moist air, which of course rises. If that air hits the hive top--which for example might be six degrees in January (or November, or whenever), the moisture in it condenses, and drips down upon the bees. Wet cold bees don't do well, and they have plenty of other challenges to face without that. Thus, something above the emergency sugar ceiling (which itself does have some absorbent properties) to mitigate the temperature differential between the warm colony inside and the outside temperature, and absorb the moisture, is helpful. We like a quilt box; lots of styles to DIY, or purchase.

Some beekeepers don't add absorbency, as bees need some moisture in the hive (just not falling down upon them). They'll direct the moisture to the sides, and there's some compelling scientific research to support that approach. We've tried both, and find our quilt boxes that both absorb excess moisture and mitigate the heat differential, work best for us.

External Activities (mid-November to early December-ish)

1. Put up a wind block against prevailing winds if there isn't a natural one. Lawn chairs, pallets, junk cars or something that won't offend the neighbors – anything to keep the colony from those relentless northwestern blasts.

2. Make sure there's a higher entrance, like a 3/8" hole in the hive body. Although please read all of this section, because some successful beekeepers don't believe in the higher entrance.

Yes, drilling a hole in woodenware might make you cringe a bit. But consider two things: ventilation is critical, and if the snow is 14" deep over the front entrance on that January day when there's finally enough warm such that bees can take a much-needed bio-break, how are they going to get out?

We don't put the hole at the very top—that would let their warmth just pour out. It is positioned mid-lower portion of the upper hive body, on the non-prevailing wind side. And sometimes, they propolize over the hole.

Some beekeepers whom I turn to for their expertise don't have higher holes, because "my equipment is so old there are all sorts of ventilation opportunities and little doorways." Or, their management approach is to make the colony moist and very enclosed (tree-like), with a lower entrance that never gets snowed over … which also works. Sorry to those of you who want to specificity about exactly to do: successful beekeeping demands constantly thinking about everything and often readjusting that thinking.

3. Wrap the hives? We *generally* wrap in one-inch foam. It's probably not needed, but we have a lot of tall colonies in windswept, distant fields; I sleep better knowing they have both that warmth and extra stabilization … especially because I can't readily check on them. Nucs and other watch list colonies (they never made it to "booming" but we liked the way they looked going into fall) get wrapped first and best, the rest may only end up with foam on only two sides, or one. (The good news? Strong healthy colonies do just fine.)

4. Stabilization. Pile up the bricks and decorative lawn gnomes on the top, perhaps even straps. As we trudge through Winter, the hives will get increasingly top-heavy (bees are eating their way up through the pounds of honey in the lower boxes), and increasingly unstable. Make sure the hives aren't going to blow over.

About That Little Bit of Luck

You may have robustly healthy bees and prepared them splendidly for overwintering, but some of overwintering success is still out of your hands. A tree may topple over on the colony; we could have (seemingly) endless days of bitter cold weather such that the bees can't break cluster and skootch toward more food (although a large cluster of healthy bees minimizes that possibility); hunters shoot holes into the hive; the hive stand unexpectedly collapses. Do what you can to prepare, and then dream, of seeing your winged angels relishing dandelions come Spring.

Appendix

We've had great success with a **quilt box style** Hubby designed (modified from others he's seen, so thanks to lots of folks for the inspiration.)

We purchased unassembled hive bodies, and cut down the top edges of the long sides 3/8 - 1⁄2 inch. We paint them battleship grey, so we can quickly identify quilt boxes in our inventory, and at a glance know which colonies have them installed.

The side cut-down allows some air to move ABOVE the chips, helping to promote keeping them dry as they absorb the colony's moisture. The colony's telescoping top cover ensures rain / snow doesn't blow onto the chips.

We then install bee-proof screen about two inches above the bottom, across the box. This provides room for the sugar ceiling.

Above the screen gets a couple inches of absorbent material (aka gerbil bedding--a few flakes are shown in the photo.)

To use:

1. Add the absorbent materials to the box.
2. Open the colony, add the emergency food ceiling.
3. Put on the quilt box.
4. Add the top cover (and bricks / rocks / whatever for wind protection.) We remove inner covers for the season.