WINTER SURVIVAL

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There are some basics your bees need to survive Winter.

WILL YOUR BEES SURVIVE THE WINTER?

As another beekeeping season comes to an end, our job now is to be sure our colonies are in proper condition for Winter. It's not as simple as lifting the back of the hive to see if it's 'heavy' and hopefully has plenty of honey. Although food stores are probably the most important, good hive management requires much more.

WINTER PREPARATION LIST:

* Food Stores
  - ✓ Position of those food stores
  - ✓ Pollen stores
* Brood
  - ✓ Brood rearing activity
  - ✓ Age and condition of the queen
* Parasites (Bugs!)
  - ✓ *Varroa* Mites
  - ✓ Small Hive Beetles
* Disease
* Colony Population
* Moisture Control and Wind Protection

FOOD STORES

In my area (Southeast Arkansas), 60 to 75 pounds of honey is enough to get a colony through even a cold, wet Spring next year. How much is 60 pounds of honey? One deep super wall to wall with 10 full frames is 60 pounds (five gallons) of honey. This means two-deep hive bodies are necessary. The bottom box is for the brood with three or four frames of honey on the outside *plus* the full top super. If you're using medium hive bodies, figure on 36 pounds of honey per full super so you need two medium supers full of honey.

Occasionally you will have to re-arrange the frames to get the brood and honey in position for Winter. Since the bees will move up during the Winter, put honey in the top super. Move all brood to the center of the bottom hive body with pollen next to the brood. Finish the bottom hive body with frames of honey or maybe dummy boards on the outside for insulation if you have lots of honey and only a few frames of brood. You can't always get the brood box perfectly arranged, but put the brood in the center and leave some empty space for the bees to cluster when the weather turns cold.

BROOD

There should still be a small amount of brood until around the first frost or a bit later. At some point, the queen will stop laying for a while. If you don't find eggs or young larvae, it's important to find the queen and see that she looks and acts healthy. A queenless hive may survive the Winter only to die next Spring because there are no replacements.

After a few days, inspect again for the queen – she's easy to miss. If you still can't find her, either re-queen the hive or use the bees from this hive to strengthen other hives.

PARASITES

Hive beetles are not likely to kill your hive this late in the year, but remember they spend the Winter *inside* the bee cluster. The more we kill now, the fewer we have to deal with next year. Obviously, I use my own Freeman Beetle Trap. We have a heavy infestation of SHB in our area and no other trap or chemical is effective enough to control the beetles.

***Varroa* Mites**

Previously, I recommended treating for *Varroa* mites in late Summer ***before*** Fall brood rearing begins. Healthy Fall babies are essential to next year's honey crop!

I've had to change the timing of that recommendation to **mid-Summer** because of the viruses associated with *Varroa* infestation. (See disease section below.)

Randy Oliver suggests using an alcohol wash with ½ cup of bees. Finding six or more mites indicates treatment is needed. That's only two mites per 100 adult bees – 2%!

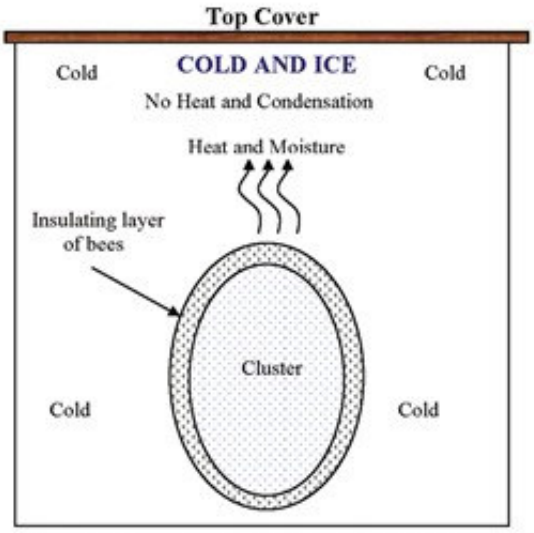
I use powdered sugar dusting to check for *Varroa* mites. Instead of a sticky board, I use a Freeman Beetle Trap with a little oil in it. I shake the sugar from the top, and as it falls, and the bees do some grooming, mites will fall into the oil in the trap below. After 30 minutes or an hour, if I see 10-15 mites in the oil tray, I treat with Apiguard.

We've discovered that dusting with powdered sugar (to check for *Varroa* mites) usually irritates the bees and causes them to chase the hive beetles more aggressively. To escape the bees, the beetles crawl through the screen into the oil. The sugar dusting method allows you to check the *Varroa* population *and* kill up to 75% of the beetles at the same time.

Since we're talking about Winter survival, what should be done if mites are found in late Fall? Again, I treat with Apiguard (or formic acid – Mite-Away Quick

Honey	Honey	Honey	Honey	Honey	Honey	Honey	Honey	Honey	Honey
Honey	Pollen	Empty	Brood	Brood	Brood	Brood	Empty	Pollen	Honey

My Suggestion For Winter Set-up



Strips). Treatment when temperatures are low is not as effective as we'd like, but it still kills mites. Check the weather forecast and look for days when the high temperature will be 50ºF or more. Since brood rearing is greatly reduced, most of the mites will be on adult bees and susceptible to the treatment. This is not the best option, but it helps.

First, we have to know what healthy brood and healthy adult bees look like. Open brood should be pearly white and moist. If you find open brood cells with dark 'goo', call your bee inspector at once – it may be foulbrood but whatever it is, it isn't good. Find out. Capped brood should have a barely rounded dover. If you find capped brood with sunken caps – or pinholes – use a toothpick to open the cell and see what's inside. Check several.

Open brood, or larvae are grub-like and white. Pupae should be capped. Sometimes we see a few pupae without a cap. This may not be a serious problem, but if there's more than a dozen, call the bee inspector.

Look carefully at *individual* bees. You will quickly learn what healthy, fuzzy little worker bees look like and how they behave. Look for anything unusual. Two or three sick bees may not be a problem – a dozen or more, call for help.

You may see bees that are bald - not 'fuzzy' and may appear shiny. Bees crawling on the ground and having difficulty flying may indicate a problem. Most problems today are the result of viruses. Deformed-Wing virus comes to mind.

The need for proper treatment of Varroa Mites cannot be over-emphasized!

The damage to the brood and adult bees caused by the bite wounds of the mites weakens the immune system of the entire colony. Randy Oliver has a nine part series on 'Sick Bees' on his web site at: **http://scientificbeekeeping.com/colony-health/**. Despite the name of the site, Randy writes in an understandable style and has a 'Practical Application' paragraph for explanation.

Colony Population

A large population is required for the bees to be able to stay warm during cold weather. The colony population necessary for winter survival depends upon your location and the health of the bees. Honey bees do not hibernate, but instead form a cluster – a tightly packed group of bees on the frames. The group may take the shape of a ball, but mostly there are more at the top than bottom. They generate heat by vibrating their wing muscles (without moving their wings). The outer layer of bees serves as insulation so the inner portion of the cluster stays warm. As the bees on the outer layer get cold, they may crawl toward the center of the cluster and other bees take their place on the outside, but if there's enough food they may not move all Winter.

Colonies in southern states may survive with three full frames of bees whereas colonies in the middle latitude states will require six or more full frames of bees. Farther north, even more frames of bees are necessary. If the bees are not healthy (maybe from *Varroa* infestation or viruses) their lives will be shorter and the population will dwindle before warm weather arrives. A late freeze with a reduced population could kill the colony. There simply won't be enough bees to keep the cluster warm.

Even here in the South and with healthy bees, I want a large colony population going into Winter. For me, that's 15 frames of bees or more at Thanksgiving. That leaves no question of survival and allows for a strong spring build-up.

Moisture Control and Wind Protection

As with other beekeeping issues, opinions and remedies vary on the question of how to best keep colonies warm and dry in Winter. To be successful, we have to understand how wind and moisture affect the bee cluster.

As mentioned in the Population paragraph, honey bees do not hibernate – they cluster. As the outside temperature falls below 55ºF, the bees move close together and generate their own heat. Their respiration and metabolism also generates water vapor just like you do. In freezing weather, the moist air rises in the colony until it reaches the bottom side of the cover or inner cover. If it's extremely cold the moist air condenses immediately and forms a liquid. This will eventually drip, but it may freeze first, then melt later. In either case, water is dripping on your bees, and your bees are getting wet.

Wet bees cannot stay warm! The colony may freeze to death.

To successfully Winter bees in cold climates, the hive must have top ventilation to allow moist of the water vapor to flow out of the hive. Also, the top cover must be insulated so the remaining water vapor will not freeze into ice. How much ventilation and insulation is needed depends upon your location. It usually does not take a lot of ventilation, but it may require quiet a bit of insulation. Talk to successful beekeepers in your area for guidelines.

Finally, wind protection reduces heat loss and makes it easier for the bees to keep the cluster warm. Tightly wrapping a hive with waterproof material is probably more harmful than helpful because of the moisture issue. Some beekeepers use only a wind break. Others cover their hives with some type of box, leaving an air space between the inside of the box and the hives. That provides good wind protection and allows for ventilation. Loosely wrapping a colony with any of the many commercial colony insulating products works, as does roofing paper. Be sure to leave an opening at the top, and bottom to facilitate ventilation.

To get your bees through the winter, pay attention to Food, Brood, Bugs, Disease, Population and keep the colony warm and dry. BC

Mr. Freeman Winters his bees in SW Arkansas. Visit his website www.freemanbeetletrap.com for information on his product.