



Winter Preparation

Three Rivers Beekeepers

David Harding

Winter is coming...

- Winter season is hard on bees and beekeepers
- Season when most losses occur
- Often, the beekeeper is to blame
- You can prevent winter losses
- Common winter problems are
 - Under performing queen
 - Starvation
 - Wet hive
 - Disease



Preparing for Winter Checklist...

My checklist for what I do to prepare my colonies for winter

Developed over many winters -11 years

Checked many resources – remarkable consistency

6 – 12 hives each winter

Early years 50% - 100% losses. Latter years 80% - 100% success

If the question in your mind starts *“how do I make the bees?”* then you are already thinking wrongly. If your question is *“how can I help them with what they are trying to do...?”* you are on your way to becoming a beekeeper



Thesis

Bees don't die of the cold weather. They die from starvation, disease, or pests. Lots of colonies get through the winter without any trouble

A healthy colony with enough bees and enough easy to reach honey or food will be able to keep itself warm

- Two primary thoughts and attitudes as I approach the winter
 - How can I help the bees to stay warm?
 - How can I help the bees to not starve?
- My checklist addresses these two concerns .
- Our hive boxes are “unnatural” in size, location, structure. We need to help our bees to protect themselves

Winter Preparation Tasks

Harvest Honey Supers

Check your Queen

Check for enough bees

Check honey stores

Check bees are healthy - Mite free

Remove queen excluders between boxes

Remove honey supers

Complete all treatments by late fall and remove

Orient boxes and crowd the bees

Feeders off

Close the bottom

Provide adequate ventilation

Place mouse guards

Check weight – Emergency feed

Oxalic treat in December

Is your hive ready to keep itself warm?

A healthy colony with enough bees and enough easy to reach honey or food will be able to keep itself warm

How do Bees Keep the Hive Warm?

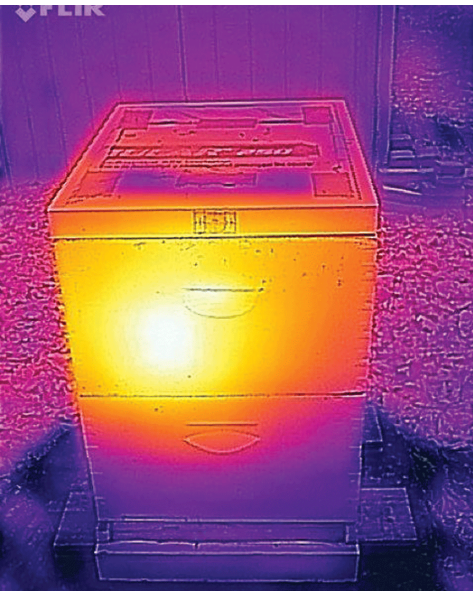
- When daily high temperature falls below 55 degrees F - frosting at night, bees cluster together
- Colder = tighter cluster
- Center of cluster the queen maybe with a patch of brood
- Warmth at the heart of the cluster is 90 F – regardless of outside temperature
- Worker bees rapidly quiver flight muscles to produce heat



Is your hive ready to keep itself warm?

How do Bees Keep the Hive Warm?

- Bees climb down into empty cells, head down and quiver muscles to heat up wax and warm brood and the center of the cluster. Radiator effect
- Layers of worker bees cover the head-down bees to insulate and trap the heat
- Heater bees then cycle to the fringes of the cluster to rest and cool as other workers cycle into the center of the cluster
- As food is consumed, cluster moves (usually up) to frames that contain food
- Bottom line – **Need enough bees**



Does your hive have enough food?

A healthy colony with enough bees and enough easy to reach honey or food will be able to keep itself warm

How much honey is needed?

- You took their winter stores, put it in bottles and gave it to your friends
- Honey is the honeybee's carbohydrate. It is the fuel they burn to get through the winter
- If there is not enough for them, you need to give it back
- If there is not enough honey, your bees will starve
- How much honey will a hive consume from November – April?

How much honey do bees need to get through winter



... How much heating fuel will your house consume? Your neighbors house? Why different?

Depends on

- Location
- Climate... early seasons or late seasons
- Size
- How many inhabitant
- Draftiness, air leaks and ventilation
- What is the "house" made of, R factor of insulation
- Wind breaks
- Average temperature each day... number of warm days... cold spells



You cannot predict EXACTLY how much honey a colony will need... Estimate

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Check for Good Queen

- As we move into the fall, first off, we want to ensure that our colony has a queen
- Critical – Must have a queen to get to Spring
- Do you have a healthy queen and vigorous brood pattern?
- Verifying the presence of the queen may be done by finding evidence of her presence.
 - Eggs (and brood). If I see eggs in the comb, I know that a queen was present at least in the last 3 days
 - But, for me, I actually find my queen
- If unable to see the queen and there is no brood, consider combining colonies



Check for Enough Population

- A small population cannot keep the hive, queen and brood warm
- Want about 20,000 - 30,000 right now.
- If small, if weak, combine soonest. Don't wait.
- Better to combine 2 hives to get 1 through the winter and then split early in spring back to 2
- If not able to combine, make a nuc.



Check for Healthy Bees

- You must treat bees. If sick, you must help them.
- Scientists believe that many of the problems with beekeepers losing colonies during the winter may be attributable to poor integrated pest management.
- Colonies that enter winter with diseased bees are far less likely to survive the winter months
- The problem actually begins in late summer. Sick and severely diseased bees during late summer are not capable of caring for the winter bees that they will start raising
- If the colony is not healthy there is no amount of feeding that will get it through the winter
- Apiguard and Apivar Strips – I switch each year

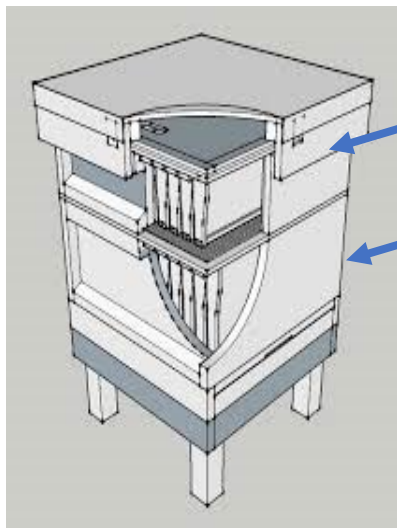


Check Honey Stores

- Honey is the honeybee's carbohydrate. It is the fuel they burn to get through the winter
- How much honey will a hive consume from November – April?
- General guidelines... Missouri – rule of thumb for our area is 60 - 70 lbs
- Full deep frame ~8 lbs. Full medium frame ~6 lbs
- A full 10 frame deep weighs about 85 lbs. A full 10 frame medium weighs 65 lbs
- Ideal set up is brood box on bottom with a couple of frames of honey and pollen on the outer sides and a full deep over top = 12 frames of honey = 100 lbs



Orienting and Setting up the Boxes



Full of capped honey

Brood, with honey and pollen frames in outer positions

- Conventional wisdom is 2 boxes.
- Any empty boxes are removed
- No Honey Supers
- Move all brood to bottom and middle, with stores on the outside
- In the top box put honey over the brood. Bees will move up.

- Honey stores in the outer two frames
- Get boxes as small as able so they can conserve heat.
- Crowd bees toward the end of the season. Having fewer boxes on your hives, each densely filled with both bees and honey, is better than having too many boxes sparsely populated.



Setting up the Boxes - Ventilation

- Wet bees are dead bees
- During the winter, the temperature at the center of the cluster is maintained at a temperature of 90 F
- Without adequate ventilation, the warm air from the cluster rises and hits the cold inner cover, and condensation will drip down onto the bees as ice-cold water. This will cool and kill the bees in the cluster
- For a Langstroth hive, **place the inner cover on the top deep body, flat side down. The oval hole on the inner cover and its notched cut is left open.**
- **Push the outer cover forward so the notch in the ledge of the inner cover remains open. And make sure outer cover is equidistant from side to side**
- **Lean hive forward to drain out**, not in, by propping up back by 1 – 2 inches
- The result will be a gentle flow of air that carries off moisture from the underside of the inner cover and thus keeps the colony dry.
- Can also use of "wicking" materials, such as a burlap sack or wood shavings over the inner cover, to absorbing moisture

Setting up the Boxes – Other

- **Queen excluder OFF**

Leaving a queen excluder in place under a super that you're using for winter stores will trap the queen underneath it when the bee cluster needs to migrate upwards past the excluder to access the winter honey. This could lead to the loss of the hive.

- **Remove any Mite treatments** - Don't leave Apivar strips or trays in hive

- **Feeders OFF**

Remove any feeders, including any boxes that surround them. You don't want to have any empty space on top of the hive.

You can leave a frame feeder in place.

Setting up the Boxes – Other

- **Close the bottom** if you use a screened bottom board.

Put in the IPM Board, set on wood or insert wood

- Install Entrance Reducer and **Place Mouse Guards**

Close entrance reducer. Make sure there is no mouse inside before you close.

As the bees start to cluster together, they pull away from guarding the entrance, so mice can slip inside. Mice will make a mess in your hive deep gnawing on frames, making a nest, and generally being a nuisance.



Winter Preparation Tasks

All completed by November 1

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Provide adequate ventilation

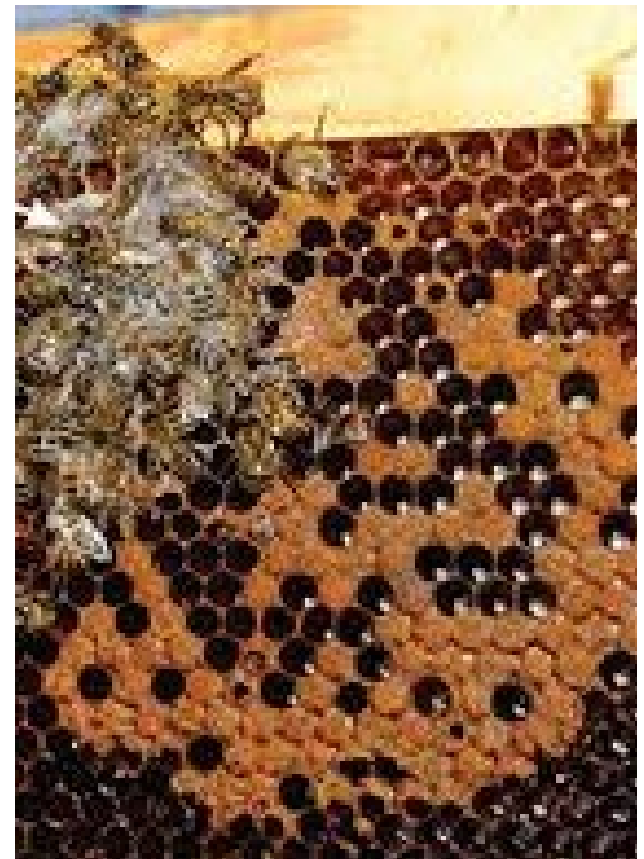
Place mouse guards

Check weight – Emergency feed

Oxalic treat in December

When a hive dies

- When my bees die, they die in March. So often in March. So frustrating...
- Did they die of cold or starvation? Sometimes there is some honey in the hive
- It always seems that there is a warm up. The bees are active. Then a cold snap. And the bees going in and out are from my other hives robbing out the dead hive
- The bees are piled up in the bottom. Between the frames. Many are head down in empty cells
- Bees die of cold when there are not enough bees to keep itself warm
- **HEALTHY, well fed bees keep the hive warm**



How to prevent starvation

- Monitor the weight of your hives through the winter.
 - Perform the lift test on your hives. Pick up the rear of the hive to feel the weight.
 - Do it now – Should be 60 – 75 lbs – get the feel of a heavy hive
 - Do it at least each couple of weeks. Every week starting February
- If light. Feed soonest. No excuses. It is not too cold or too wet to save your colony
- Emergency Feeding
 - Honey frames
 - Candy boards
 - Dry sugar
 - Mush
- Use emergency feed until bees can start processing syrup in the spring



Dry Sugar

Very easy. Very Inexpensive

- A few different approaches
 - (Only if solid bottom) Pour directly into hive
 - Some put it on top of the inner cover
 - Some put a sheet of newspaper on top of the top bars
- Drizzle some water on it you can get the bees interested in it.
- The finer the sugar the better they take it
- What kind of sugar? Must be cane or beet sugar (regular sugar)
- Powdered sugar, brown sugar, molasses and any other unrefined sugar is not good for bees



Mush

Very Easy. Very Inexpensive

- Use a ratio of 8 to1 by volume
 - 8 parts sugar to 1 part water or 8 cups sugar to 1 cup water
- Mix sugar and water thoroughly
- Place in 1 gallon plastic freezer bag. Fill to 2/3 full
- Seal bag
- Make an X slit in plastic bag and place X over opening in inner cover or lay directly on the top frames
- Can also feed in division board feeder or candy tray



Candy Boards

Bill Kristapovich ...

- They are for **cold weather feeding**.
- Can put candy tray **on a hive anytime**
- Candy trays can serve as your **inner cover year round**
- **Stores well**, can make in advance and take to the bee yard as needed
- It **absorbs moisture** in the hive



Making Candy Boards

- Weigh desired amount of sugar and put into pail (13 to 14 pounds will do)
- Add enough water to dampen sugar and thoroughly mix to uniform dampness (pint +/- will do)
- Add any stimulants to water before adding to sugar. I add honey



Making Candy Boards

If sugar board has hardware cloth put a single layer of paper towels on the bottom



Making Candy Boards

- Add damp sugar evenly across sugar board and compress/pat sugar
- Drag board reposition sugar mix (pressing it)
- Make a hole in center Let board set/dry over night-should be a solid piece of sugar
- Make sure the center hole has paper and sugar removed so both air flow and the bees can freely move to the top of the sugar board



Late December Mite Treatment

- Oxalic Acid Dihydrate - 95% to 100% pure
- Perfect time to treat your hives - broodless
- Ideal treatment window (late Nov - late Dec)
- Ideal temperatures (32 - 50 degrees)
- Always follow manufacturer instructions!
- Oxalic Dribble Method
 - Less risk for beekeeper – no vapor fumes
- Oxalic Vapor Method
 - Research suggests this method is less detrimental to adult bees and hive strength
 - Use respirator to avoid inhaling vapor fumes



Oxalic Treatment

- Weigh oxalic acid dihydrate and stir into 1:1 sugar syrup
35g per 1 liter of warm 1:1 sugar syrup – 20 hives
- Fill syringe with oxalic acid solution
- Dribble solution between frames where bees are present . Max 5ml per seam of bees. Max 50ml per hive
- Dribble lukewarm solution directly on the bees



Fall and Winter Tasks

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AND so is Spring

