



Winter Feeding

Three Rivers Beekeepers

David Harding and Bill Kristapovich

Winter is coming...

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



Preparing for Winter...

We have talked about these things before. If you have not done them take time to do them NOW

- Checked that your bees are healthy (and treated for Varroa)
- Queen excluders removed so queen can move up with colony
- If the bee numbers are low, bring the hive back to a single brood box to make it easier for them to control the hive temperature
- Ensure that the bees have an adequate store of honey to last them through winter
 - Food stores = honey, sugar water, candy
 - More about this
- Ventilation/Condensation addressed
 - Moisture kills more bees than cold air
- Mouse guards in place

Our hive boxes are “unnatural” in size, location, structure. We need to help our bees to protect themselves

If you are unsure if your hives are ready for winter, ask your mentor, or ask for a mentor



Feed and preventing starvation

- 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?



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 people/bees
- Draftiness, air leaks and ventilation
- What is the “house” made of, R factor of insulation
- What direction does it face
- Wind breaks
- Average temperature each day... number of warm days... cold spells
- Kind of bees

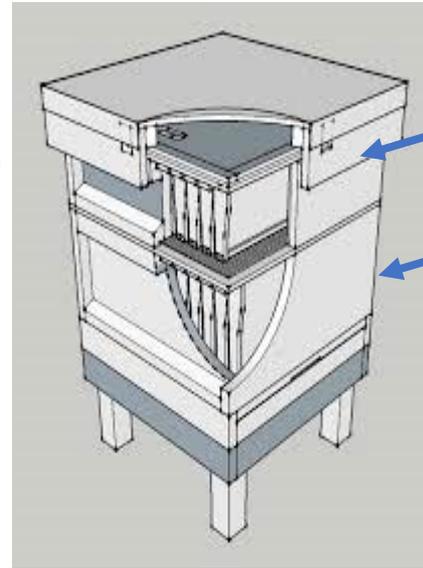
You cannot predict EXACTLY how much honey a colony will need... Estimate



What are the estimates/ guidelines

- General guidelines... average numbers for average hives
 - Southern states – as little as 40 lbs to get through winter
 - Middle states – as much as 60 lbs
 - Missouri – rule of thumb for our area is 50 lbs
- I try to go a bit higher – 75 lbs. Better to have too much than too little
- A full 10 frame deep weighs about 85 lbs. A full 10 frame medium weighs 65 lbs
- Full deep frame ~8 lbs. Full medium frame ~6 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

Proper Hive set up



Full of capped honey

Brood, with honey and pollen frames in outer positions



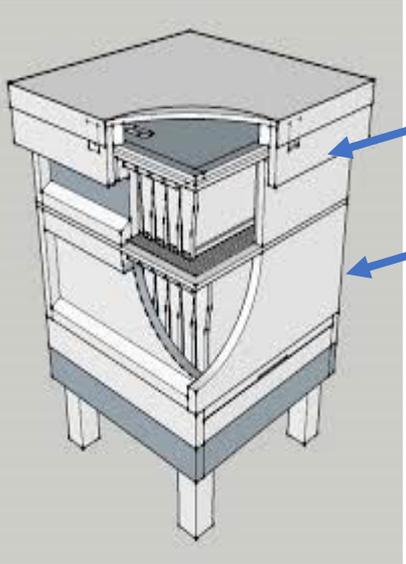
When a hive dies

- 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 many bees?... It depends
- ... and if the colony is not healthy there is no amount of feeding that will get it through the winter



How do bees keep warm

- When daily high temperature falls below 55 degrees F - frosting at night bees cluster together
- Center of cluster the queen maybe with a patch of brood
- As food is consumed, cluster moves (usually up) to frames that contain food



Full of capped honey

Brood, with honey and pollen frames in outer positions

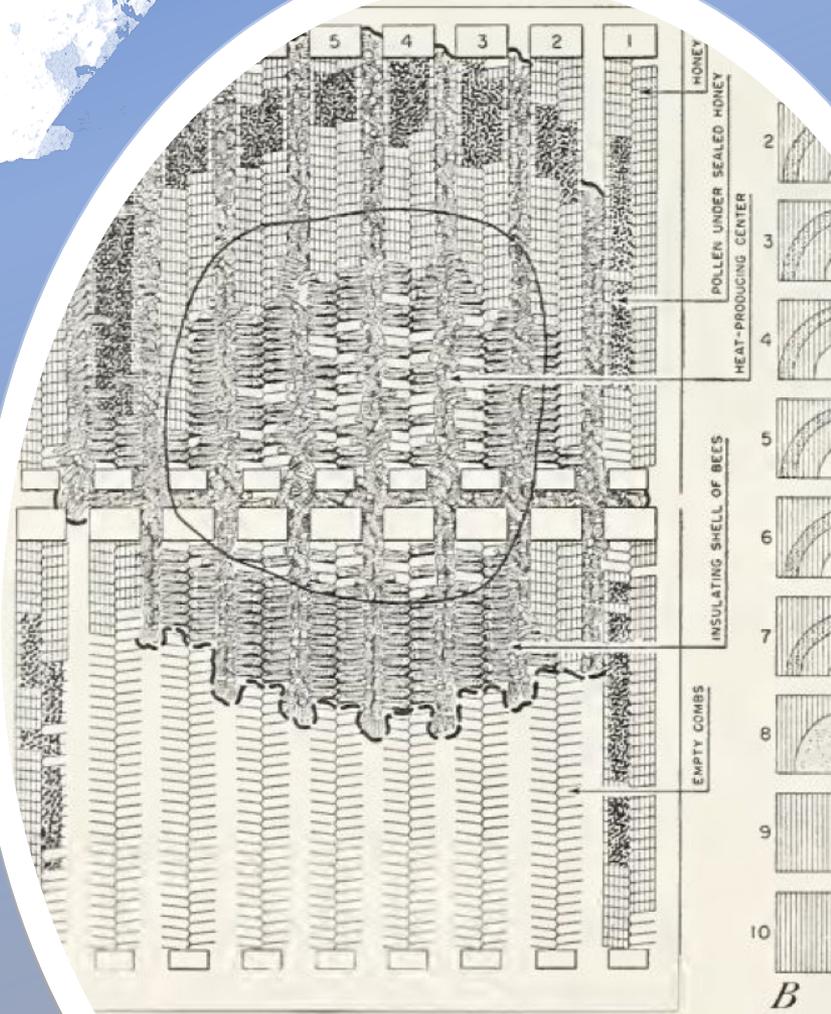
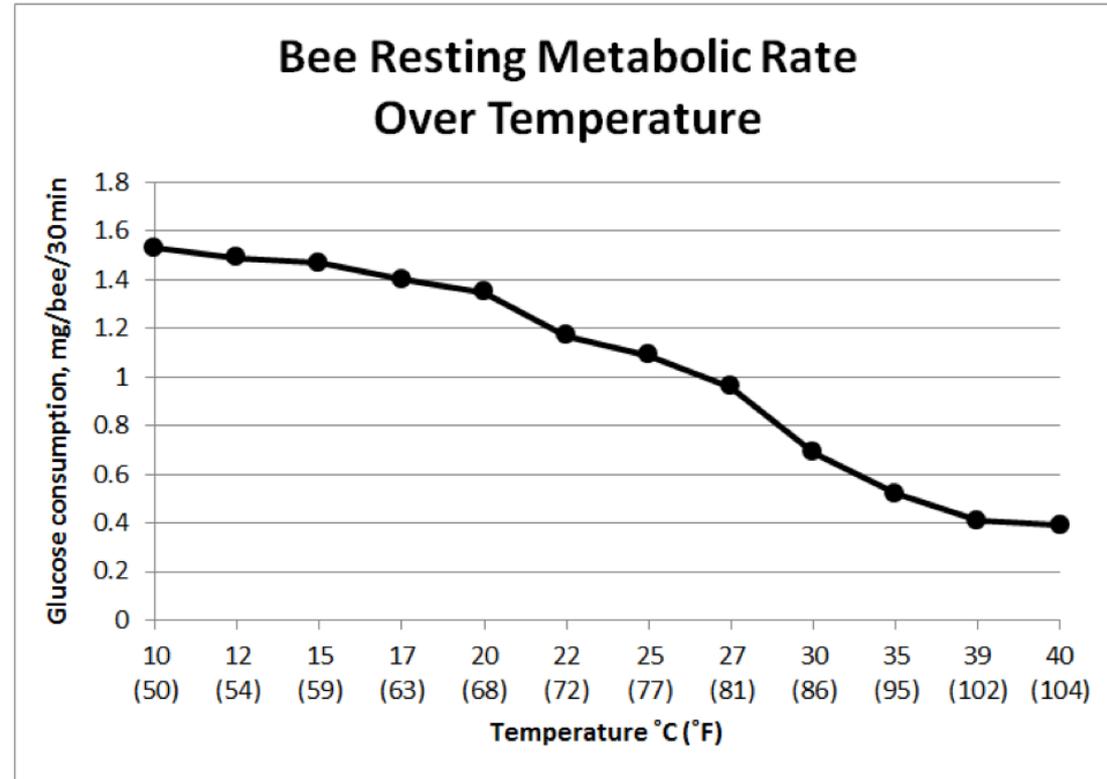


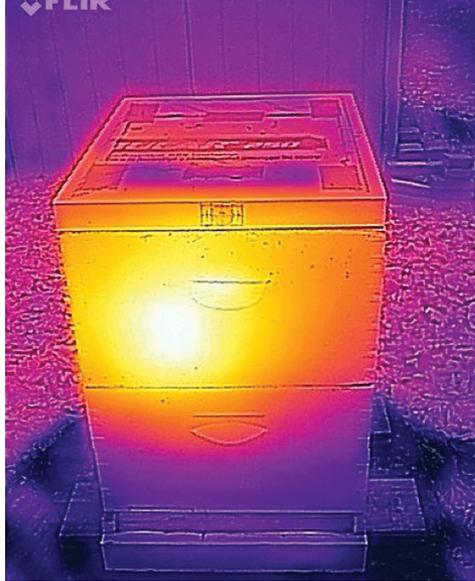
Diagram of the winter cluster as seen through a vertical cut across the middle of the cluster. B, Face of the cluster. The numbers indicate the position of the heat-concentrate between combs and in open cells to the center. The diagram indicates a much less compact heat-producing center. The shaded area indicates an accumulation of honey.

How do bees keep warm

- Warmth at the heart of the cluster is 90 F – regardless of outside temperature
- Worker bees rapidly quiver flight muscles to produce heat
- 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



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How do bees keep warm

- 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 other workers cycle into the center and comb
- This is why I find clusters bees head down in comb in a dead hive even when there are food stores nearby
- I used to think that they died trying to get the last drop of honey out of a cell. It is convenient to blame the cold, but it was something else
- Until I believed and embraced that, my winter strategy was lacking and my winter success fleeting



Is your hive
ready to keep
itself warm?

- First things, first
 - Do you have a healthy queen and vigorous brood pattern?
 - If unable to see the queen and there is no brood, consider combining colonies
 - Are there enough bees?
 - Then combine colonies – NOW, don't wait
 - Take extra measures to keep your small colony warm so fewer bees can do the work of many
 - Are the bees healthy?
 - Might be too late
 - Treat to address unhealthy conditions
 - A colony of sick bees will not make it
- A healthy colony with enough bees and enough easy to reach honey or food will be able to keep itself warm
- Thesis is that bees don't die of the cold. They die from disease, pests, or starvation. Lots of colonies get through the winter without any trouble

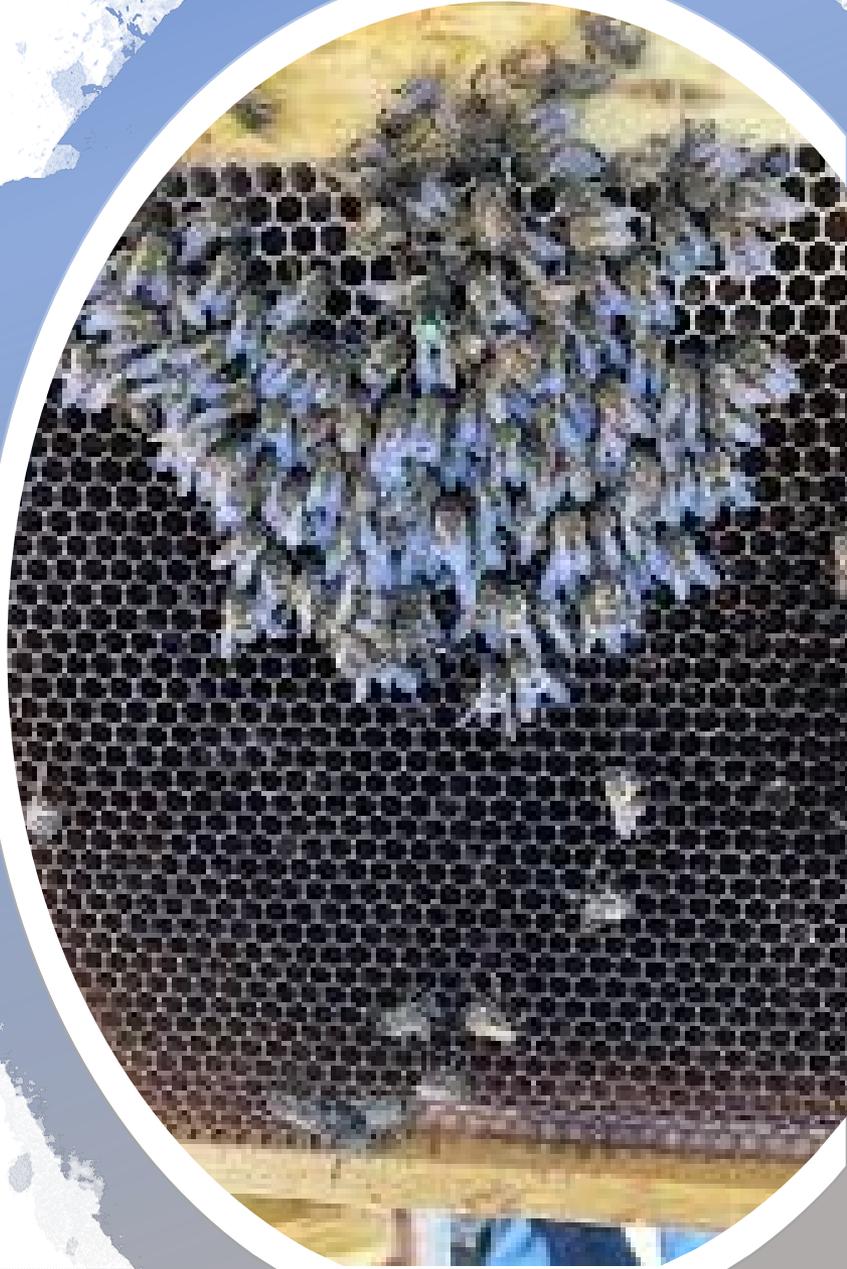
How to prevent starvation

- Late Fall/Winter Feeding
- Stop feeding liquid when the temperature of the liquid falls to 50 F
 - Bees can no longer process syrup to remove water
- 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 50 – 75 lbs – get the feel of a heavy hive
 - Do it at least each couple of weeks
- If and when weight is low, then emergency feeding



How to prevent starvation

- Feed soonest. No excuses. It is not too cold or too wet to save your colony
- Emergency Feeding
 - Honey frames from other hives or from removed in fall
 - Bee candy or bee boards
 - Dry sugar
 - Fondant
 - 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
 - add a box on top and put the sugar on the newspaper (as in the photos above).
 - Some put it in a frame feeder (the black plastic trough kind).
 - Sometimes the house bees carry it out for trash if you don't clump it.
- 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 to 1 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

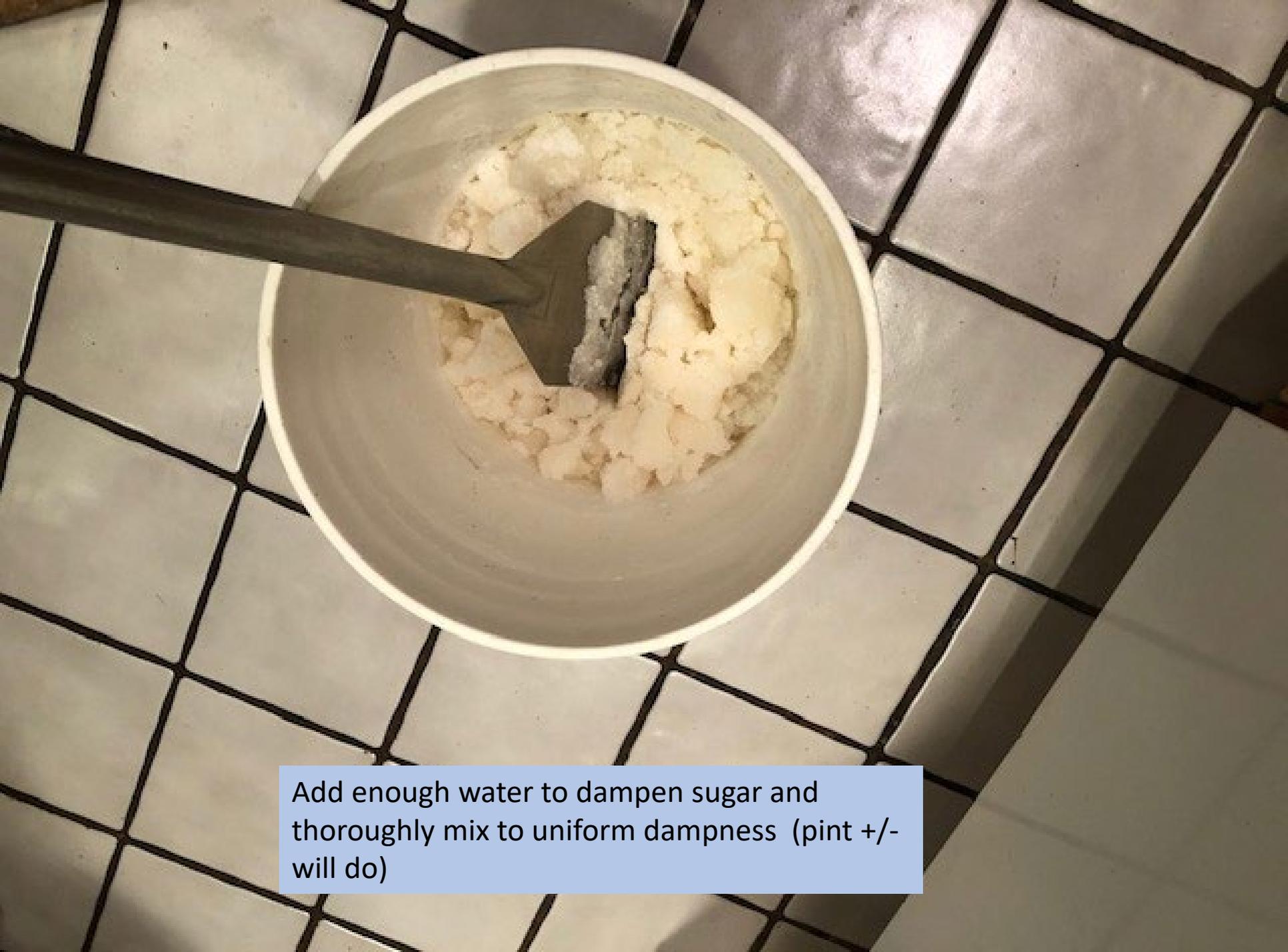
Bill Kristapovich ...

- 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



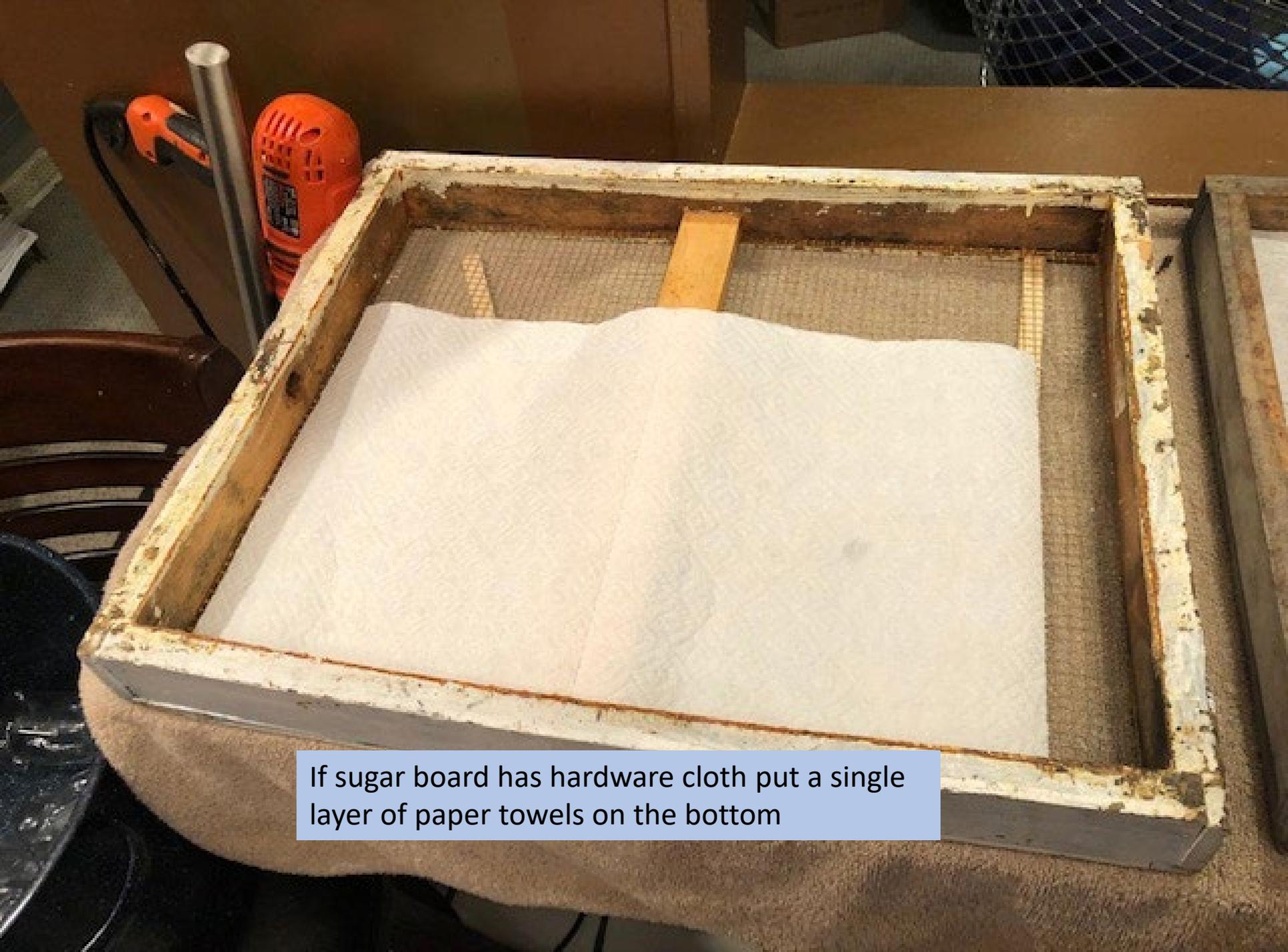
Making Bee Boards

- 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
- If sugar board has hardware cloth put a single layer of paper towels on the bottom
- Add damp sugar evenly across sugar board and compress/pat sugar-if uneven drag board or what ever you are using to reposition sugar mix (pressing it should be sufficient-do not need to overdo it)
- Make a hole in center – about 1 ½ inch diameter works (or before adding sugar place a round (or square) spice jar or salt/pepper shaker in middle and press sugar around it)
- 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



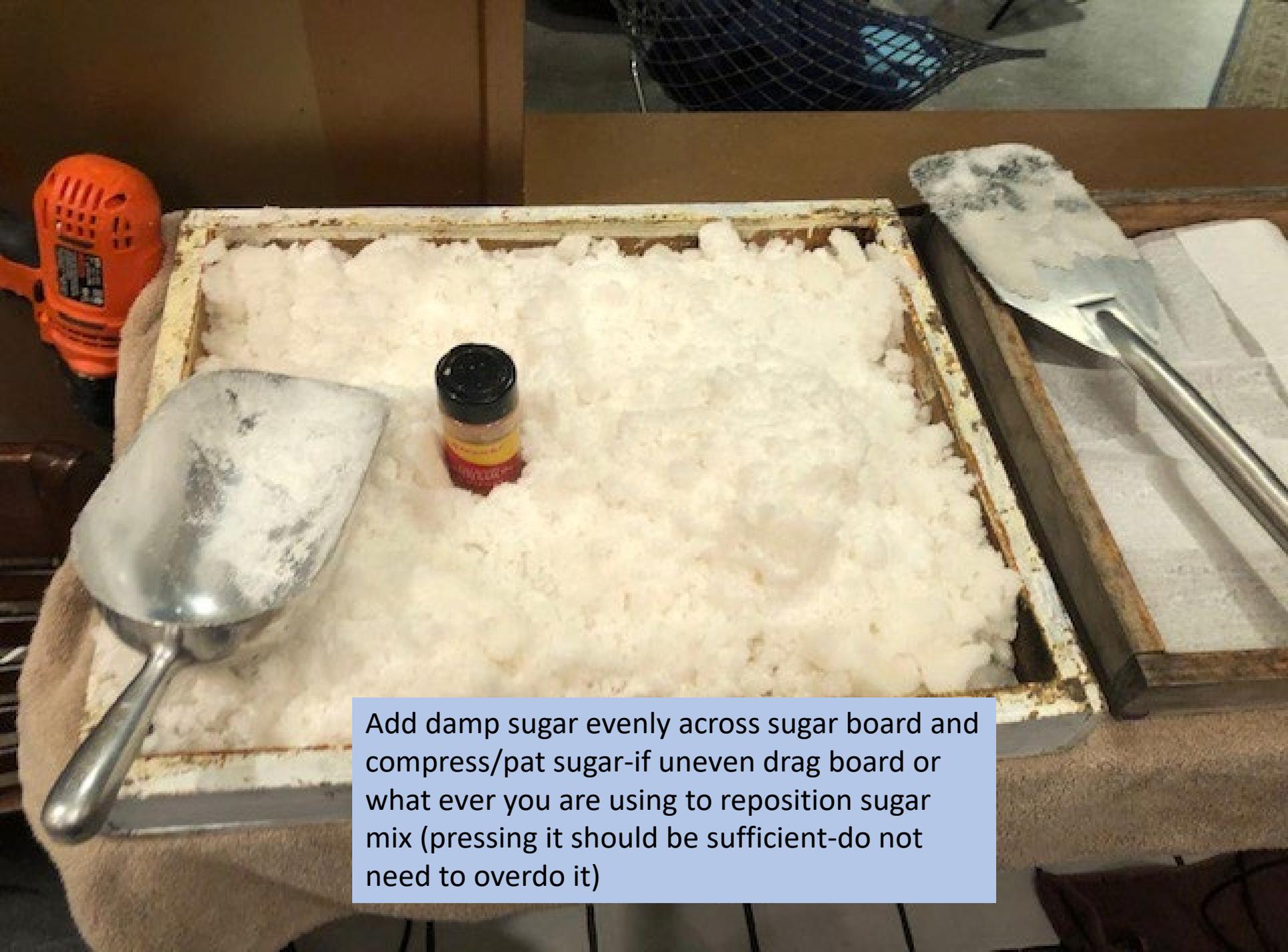
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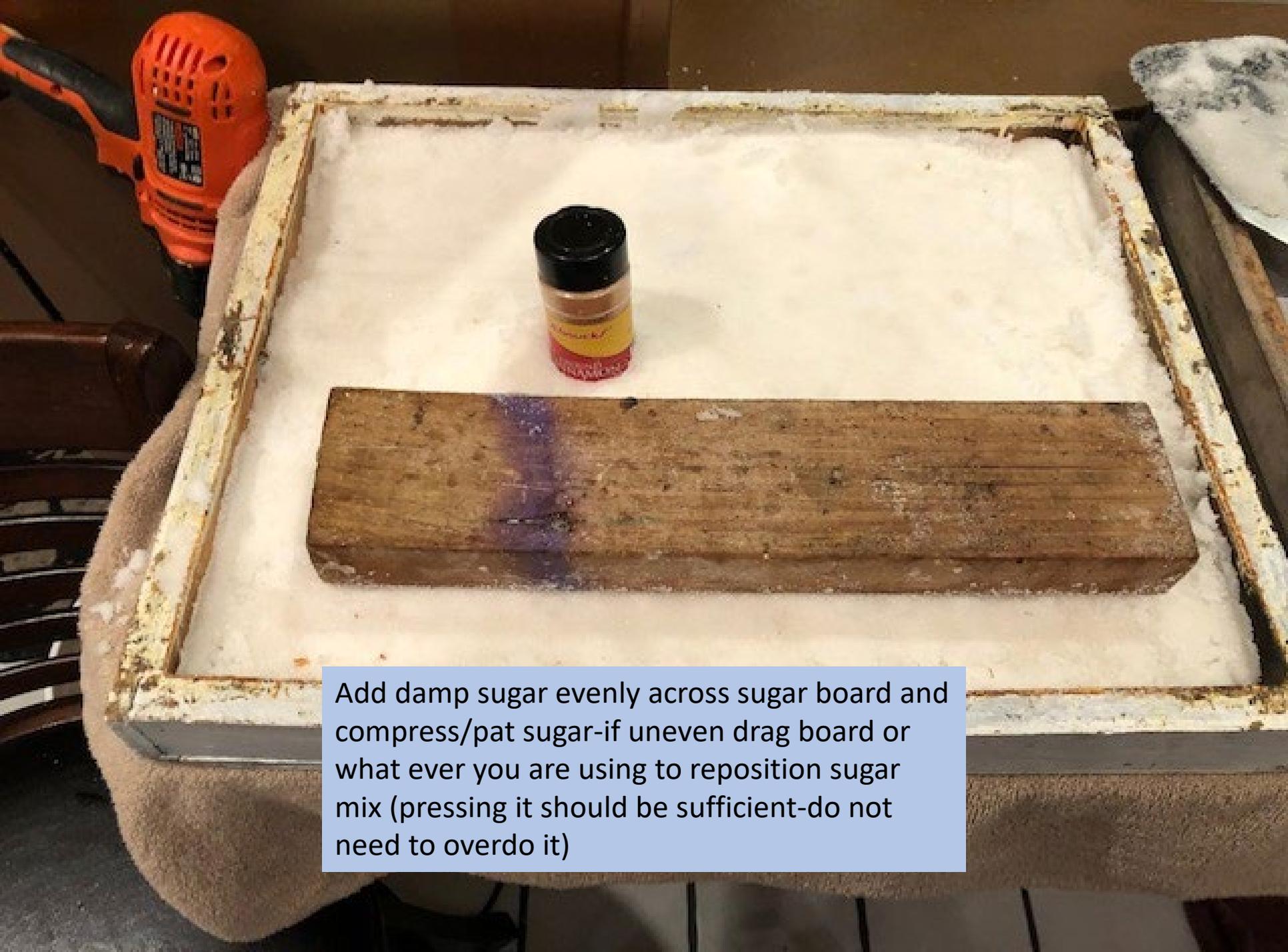
A wooden tray with hardware cloth and paper towels. The tray is rectangular and made of light-colored wood. It contains a piece of hardware cloth (a fine mesh) stretched across its bottom. A single layer of white paper towels is placed on top of the hardware cloth. The tray is sitting on a brown surface. In the background, there is a red power drill and a silver metal rod.

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

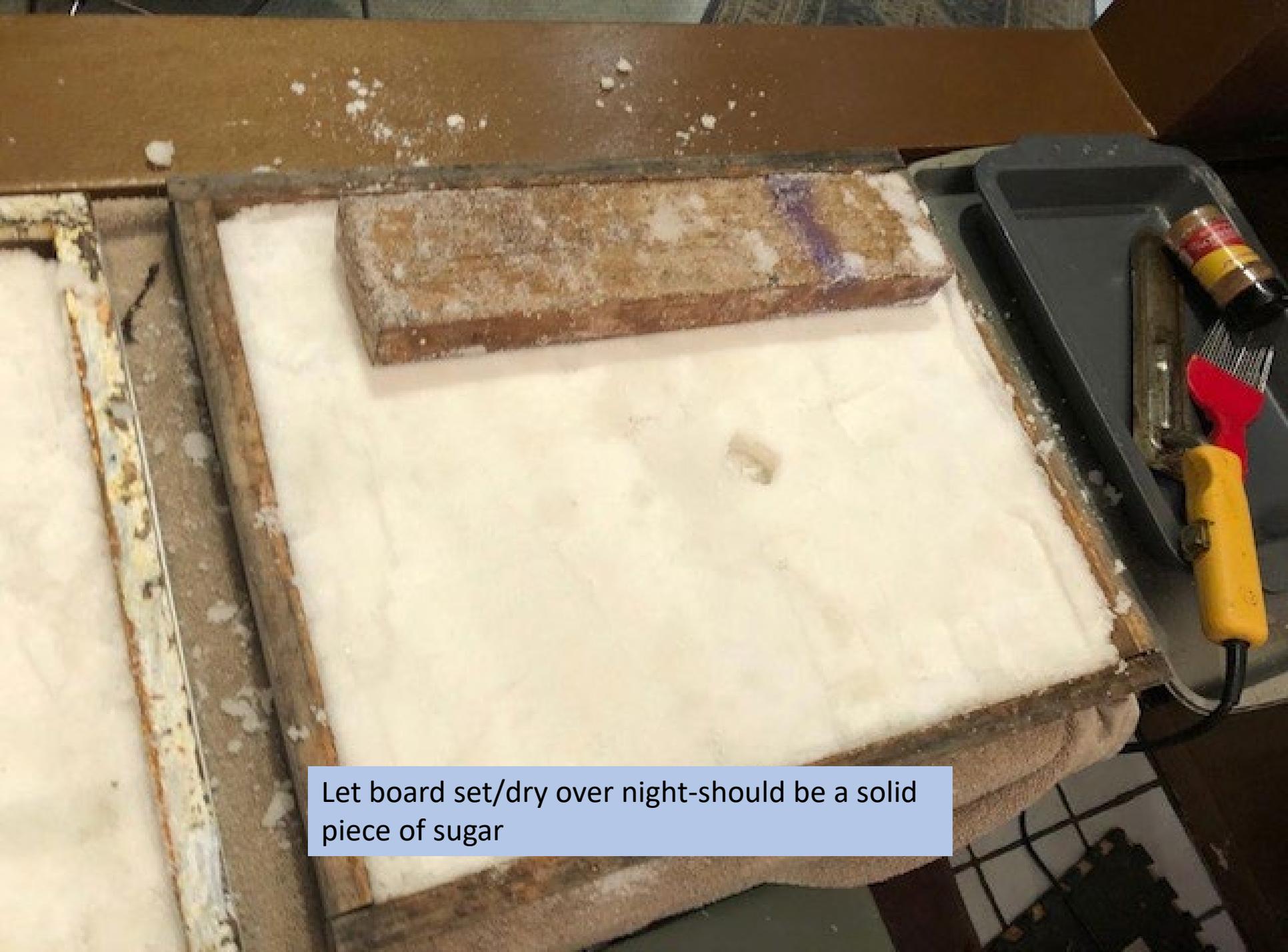




Add damp sugar evenly across sugar board and compress/pat sugar-if uneven drag board or what ever you are using to reposition sugar mix (pressing it should be sufficient-do not need to overdo it)

A wooden tray is filled with a layer of white sugar. In the center of the tray, there is a small jar with a black lid and a wooden board. The tray is placed on a brown cloth. An orange power tool is visible in the background on the left.

Add damp sugar evenly across sugar board and compress/pat sugar-if uneven drag board or what ever you are using to reposition sugar mix (pressing it should be sufficient-do not need to overdo it)



Let board set/dry over night-should be a solid piece of sugar



Fondant

Fondant is softer than hard candy. It is squeezable and pliable like dough

Can make in own kitchen

Don't use bakery fondant. Same word. Different stuff





What about protein

- Lots of different opinion on adding patties in November, December, January
- Perhaps “a small amount” of protein powder or bee pollen will help
- Can add to candy boards or mush
- Too much will overstimulate the hive, result in more laying too early, and greater food/sugar consumption
- Most agree that adding protein in late January/February will boost brood production
- When reading articles about protein, know the location and climate of the beekeeper promoting protein
- Be careful, too much brood, too fast leads to early swarming... or swarming before new queens can be made or bought

Winter is coming...

AND so is Spring

