



The Managed Mentoring Program on getting started in beekeeping.

Managed Mentoring



Managed Mentoring

The Plan for Collapsing To Two Boxes

Lesson | Collapsing to Two Boxes



What is Covered in this Module

Consolidating boxes into a compact arrangement

Why Overwinter in Compact formats

Setting the state for the Future Overwinter Cluster

Thermodynamic Considerations

Addressing Honey Supers

Purposeful Nest Rearrangement



About this lesson

□ Consider this guidance

- *The basic premise of this lesson is to adjust the hive configuration for a preferred state, so the bees overwinter.*
 - The instructions are going to be based on the concept that you should 'right size' the equipment to fit the size of the colony
 - Incidentally, the overall premise of the lesson *applies to any sized colony.*
 - For example, if a colony is too small to fit in two deeps, you should collapse it down to one deep. Too small for one deep, move it into a nuc to overwinter.
- *There are many variables/factors to consider when deciding*
 - Equipment material, quilt boxes, hive insulation, are just a few examples



Bees Overwinter

Preferences Vary

You might hear...

- I overwintered my bees with two supers on full of honey and they did great...
- I used a mountain camp feeder on top of my hive and they did great...
- I run three deeps and my hives did great...

❑ Likely these statements, and other like them, are all true

- *Bees are resilient and can get through in all kinds of setups.*
- *What we are suggesting in this lesson is:*
 - Designed to be optimally best from a thermoregulation standpoint
 - Relies on the wisdom of experience through decades of beekeepers keeping bees in langstroth boxes



Two Boxes (or three if mediums)

□ Pitch for compaction

- *It is best to compact the hive down to a space that is commensurate to the colony size*
- *In this presentation we will touch upon thermodynamics and biology that articulates why*
- *And we will talk about management steps for certain conditions*



Collapsing to Usable Space

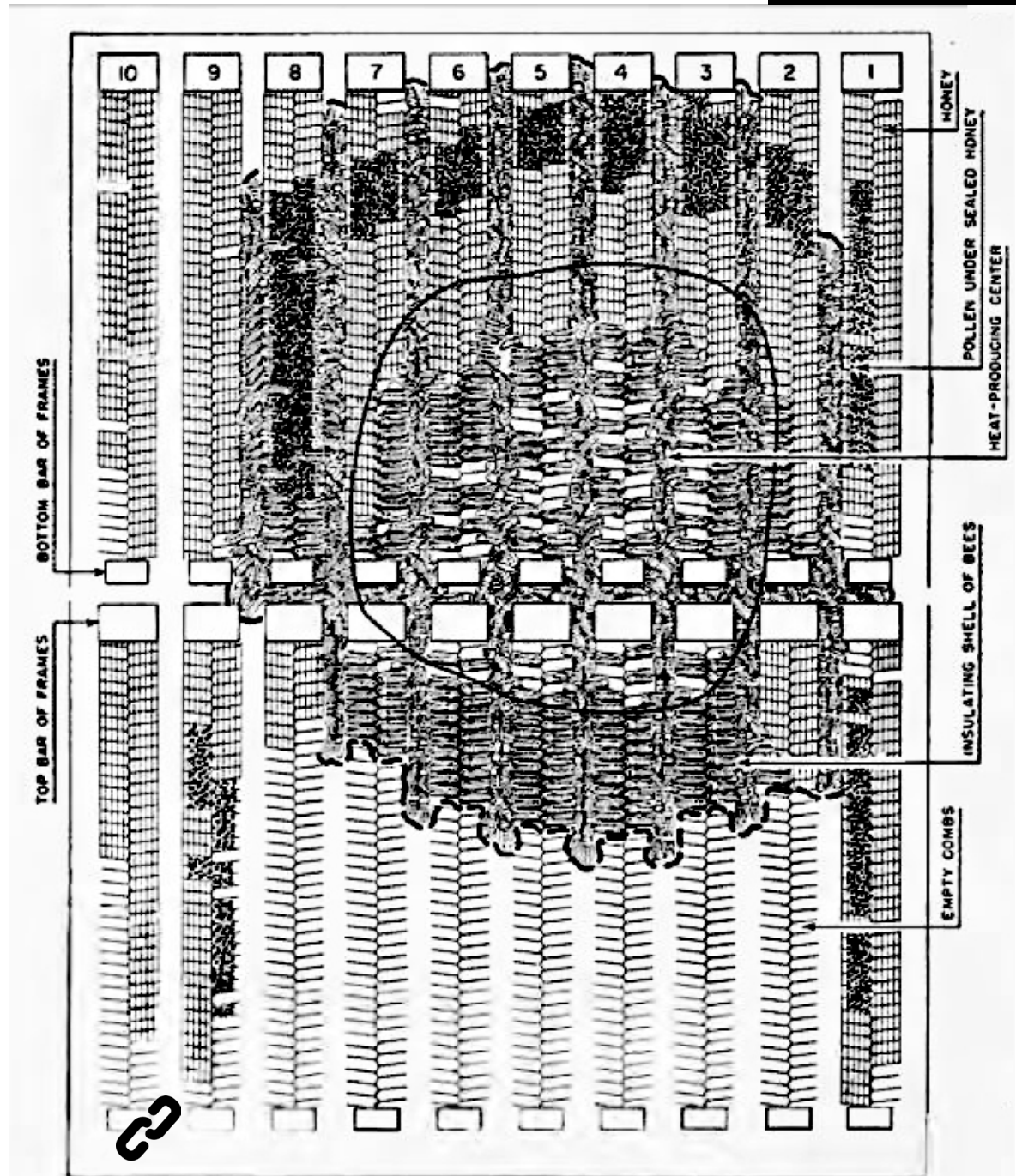
- Why have hives compact for winter?
 - *Bees maintain temperatures within the environment for many of activities within a hive operation*
 - Brood is reared in a cluster of bees that operate within a temperature range between 50 and 95°F throughout the winter
 - Bees **do not heat the interior of the hive**, but they do count on any heat that is given off of the cluster as part of the cold weather operations
 - The more contained it is, the more helpful it is to the bees



Cluster Render

□ Use of Cells

- *The visual here demonstrates how the bees occupy the space*
 - Bees occupy empty cells
 - They gather together in the gaps
 - In the center they can move around
 - At the shell they form a tighter outer barrier as a tactic to reserve heat radiating off the bees



The cluster

Brood Nest - 90 to 95°

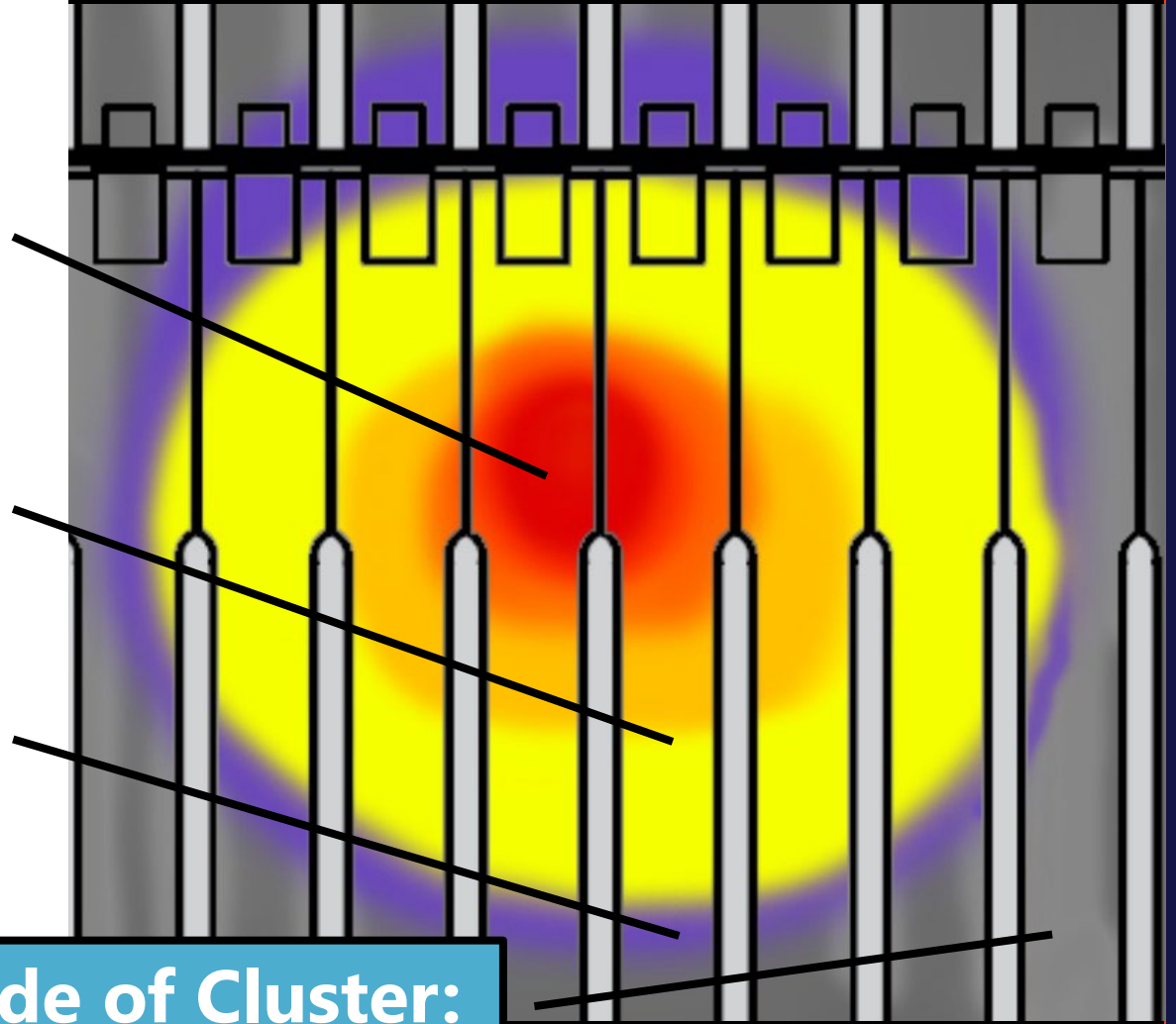
Queen, Nurse and Heater Bees

Core Bees - 65 to 85°

Mantle Bees - 50 to 65°

Space outside of Cluster:

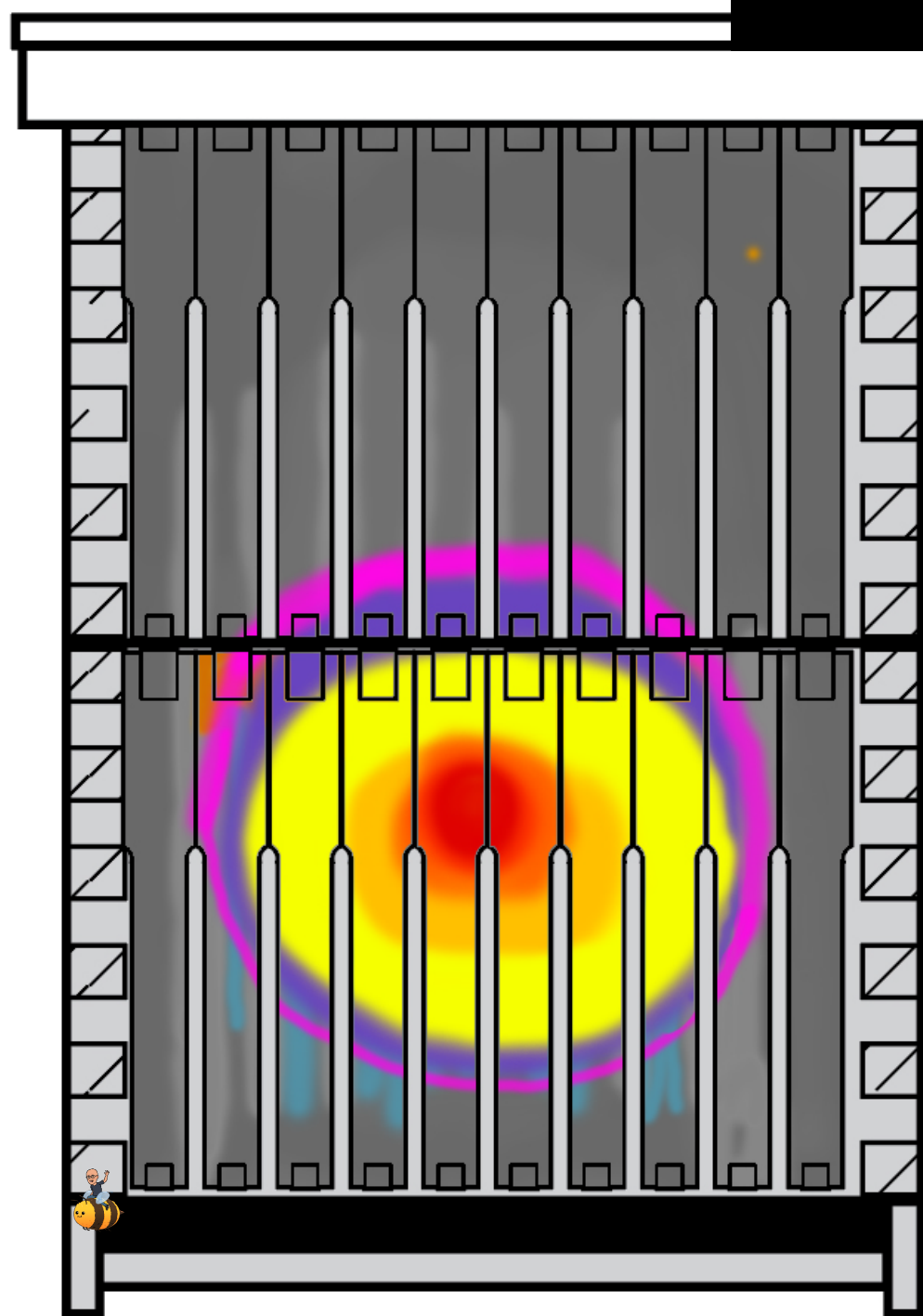
Ambient Temperature +/- a few degrees



Warmth Envelope

Surrounding Air

- *Heat radiates off the cluster*
- *This warms some of the air around the cluster*
- *But mostly the interior hive temperature is only a few degrees warmer than the outside air*
 - Some warmed air will collect at the top of the hive, as we will see later.



Heat Rising

□ Rising Over the Cluster

- *Heat will come up and over the cluster – heat rises*
- *It will center itself over the cluster*
 - Much like a fire comes together to form a pillar.



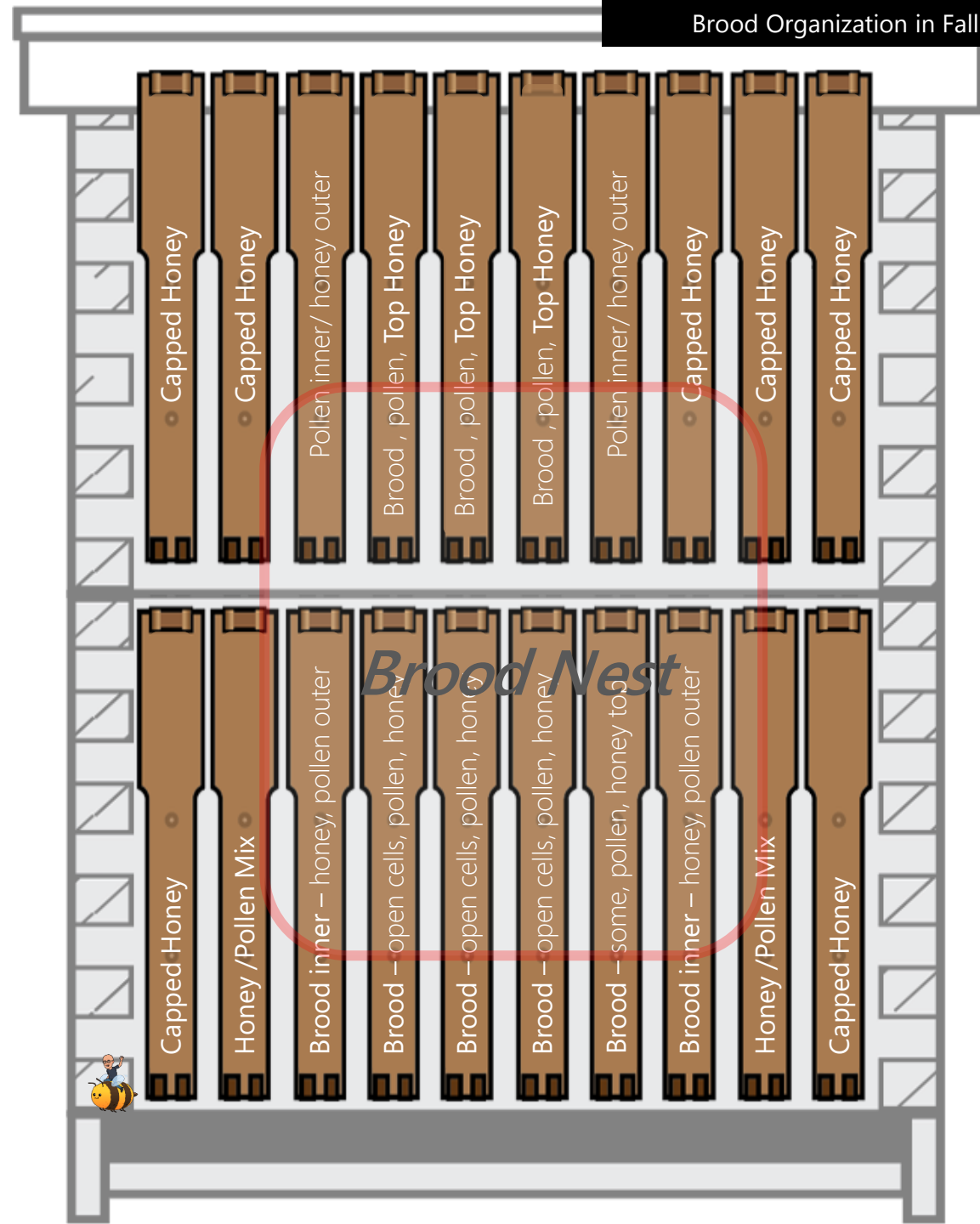
Scientists say: Heat rising near the outside edges of a heat source will fold inward and concentrate toward the center of the mass.



Layout:

Late Summer/Early Fall

- ❑ Bees can be throughout the boxes
 - *Each hive sets themselves up differently based on what they have been experiencing.*
 - *It could look like this with bees and food distributed*

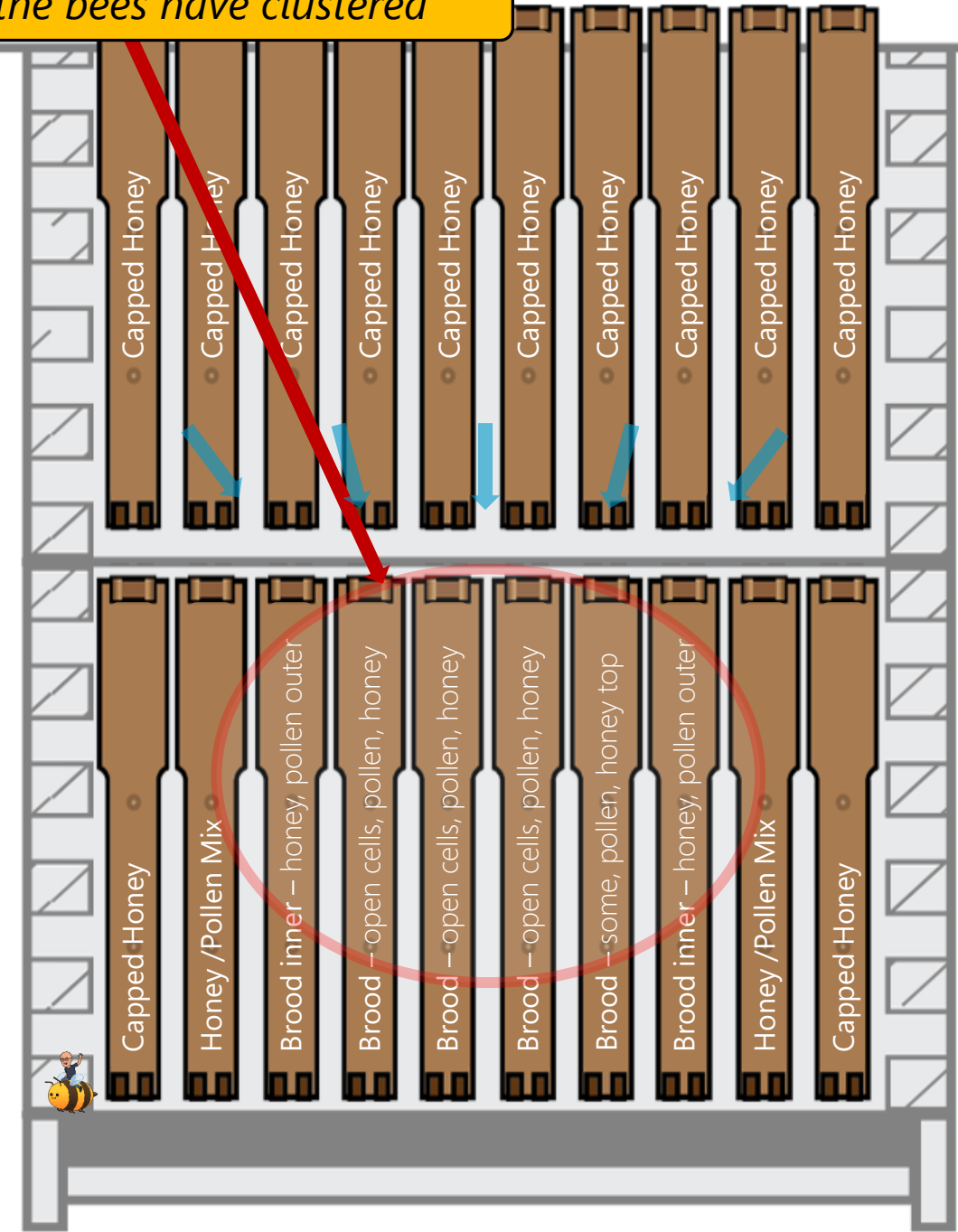


In this arrangement the bees have clustered

An Ideal Late Fall

□ Optimal Winter Layout

- *Brood in the bottom –with resources arranged in and around*
 - Surrounded by resources left and right and above
- *Winter Reserves of food above*
 - Even if they ate through much of what is above, they would still have enough resource reserves to be comfortable for spring

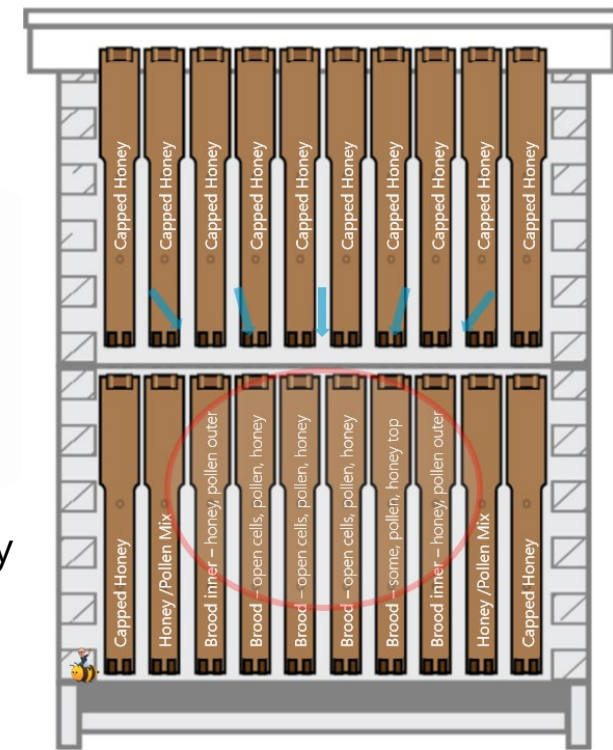


Should you re-arrange for Fall?

❑ Resources scattered in late fall - not optimal

- *Beekeepers can let the bees self-manage, **or they can intervene***
- *Ideally a large nectar flow would commence and result in the bees storing food*

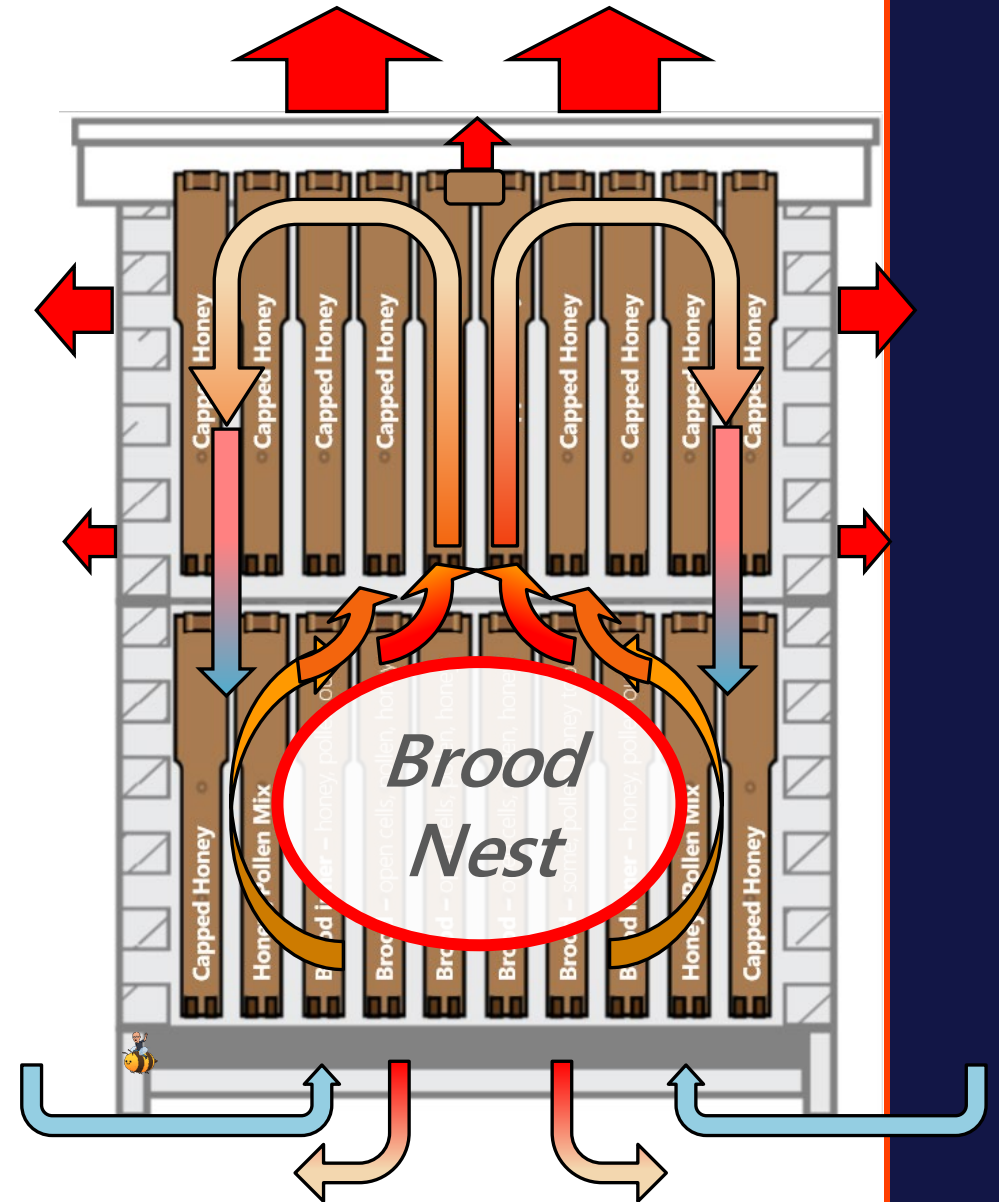
- An optimal outcome would be that the bees will store honey from wall to wall in the top box.
- This would negate any space for the queen to place brood in the top area.
- The queen would center the brood in the bottom box naturally
- You can make this happen if nature is not providing fall forage by feeding in fall



Thermodynamics

□ Conduction and Convection

- *Air comes in the entrance, hot air rises*
 - **Convection:** Heat rises, collects, circulates and subsequently dissipates
 - As it is doing so, it provides some utility for the colony in that it might warm what it is passing through
 - Through **conduction**, Heat also dissipates out through the hive walls and roof
 - This movement **also moves water vapors** within the hive space



Definition

Conduction: the process by which heat is directly transmitted through a substance when there is a difference of temperature

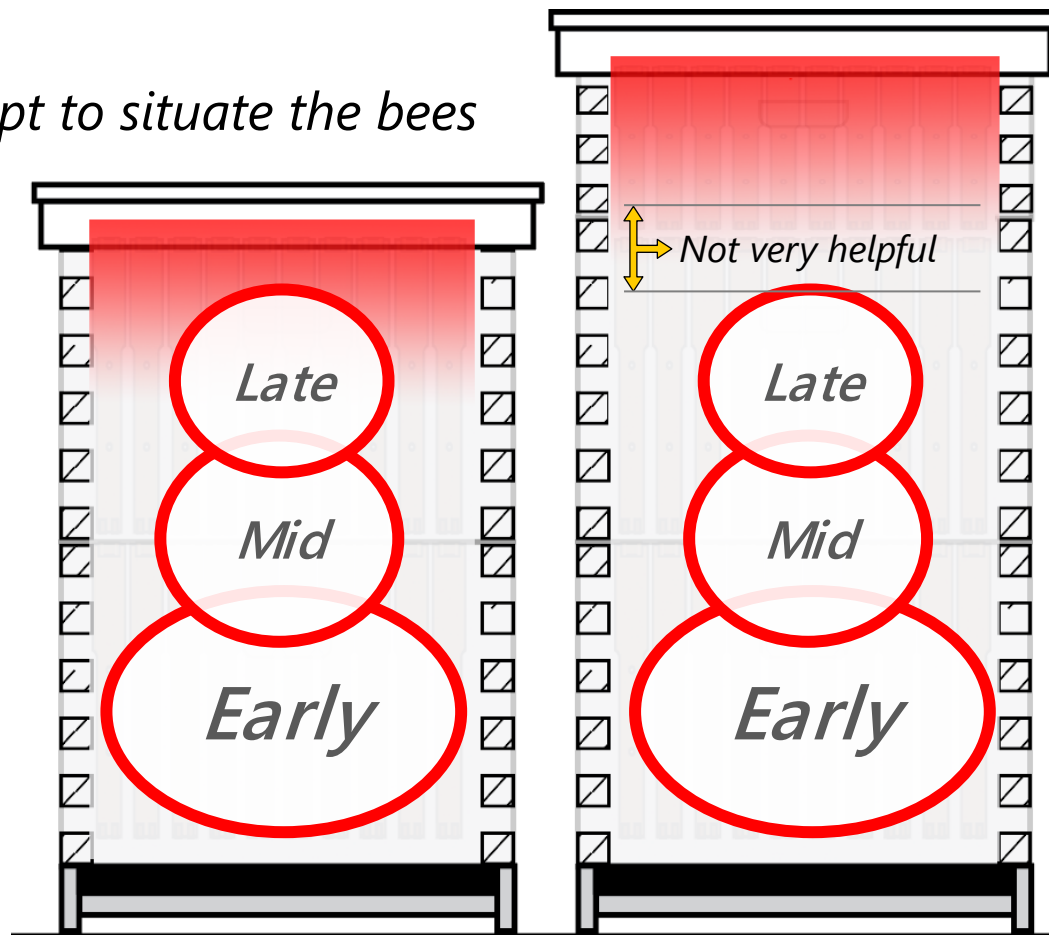
Why no honey supers in winter

□ Compact

- *The reason for compaction is in attempt to situate the bees in residual collected warmth*
- *As stated earlier, heat rises*
 - Heat rises, collects, circulates and in time dissipates. Late, smaller clusters, benefit.
 - Residual heat does provide some utility for the colony; it warms the honey dome and comb; Especially late in winter
- *Two deeps, prepped well; no real need for the honey held in the honey super*

Winter Progression: As temperatures goes down, the bees go up.

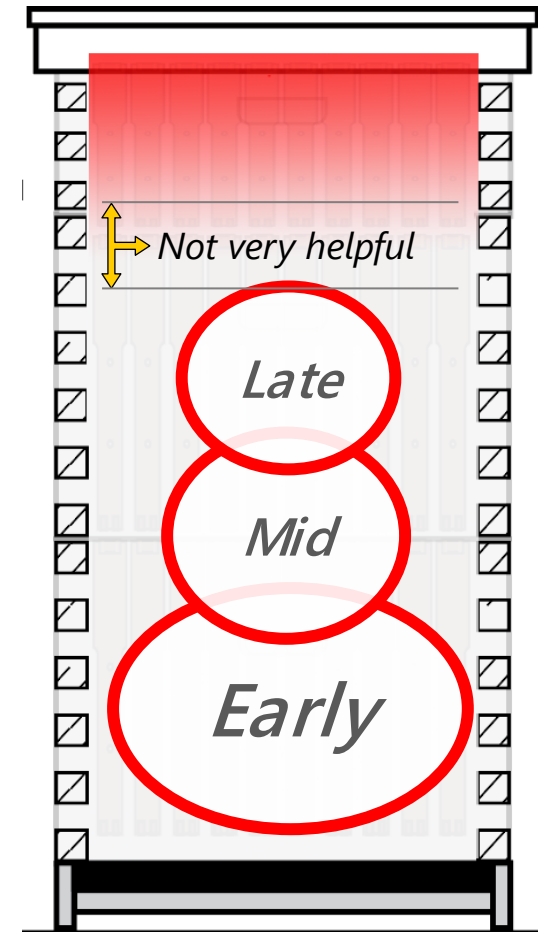
They move into any vestiges of collected heat in a compact hive.



Honey Super, Not Necessary

□ Honey Super Honey is Redundant

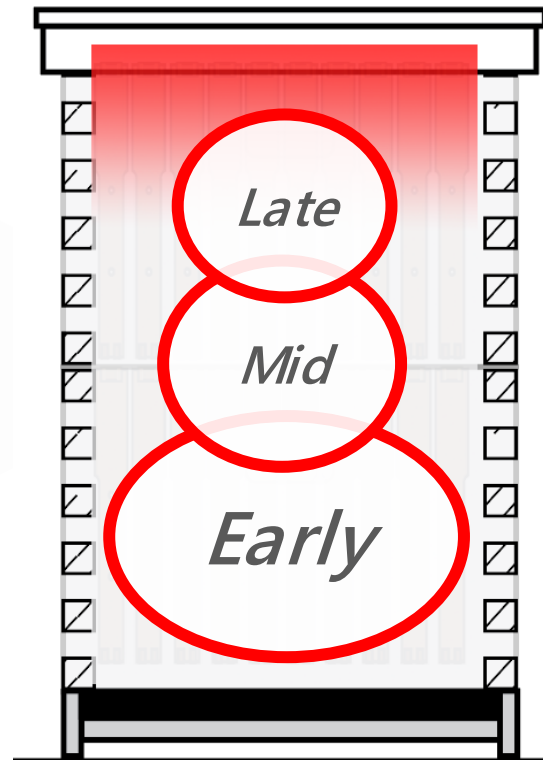
- *You might consider that it would be helpful to have the extra honey as an insurance policy*
- *The fact is, if the bottom two boxes are well provisioned, they have more than enough honey*
 - A conventional hive has more than enough space to contain the colony for winter and the 60 to 80 pounds of capped honey they need



Residual Heat Serves some purpose

□ Heating the honey above

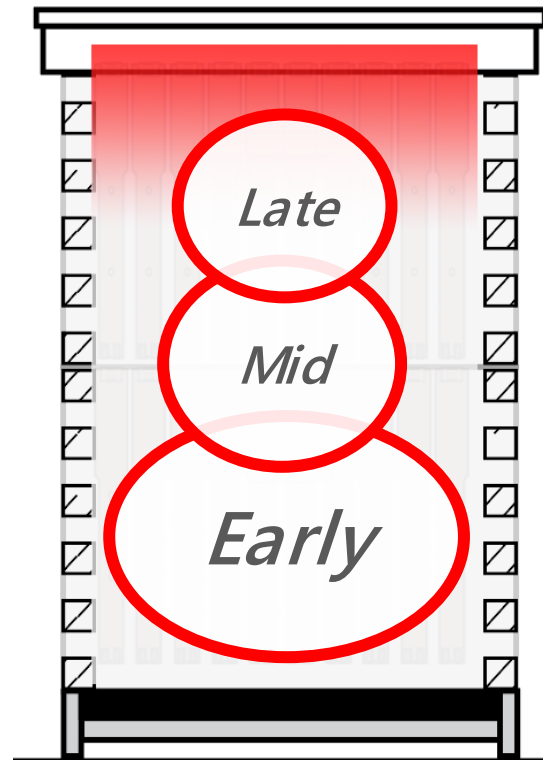
- *Residual heat given off by the cluster can serve to warm the honey above*
 - This aids in two ways:
 - Honey will hold some of that heat, and give it back to the interior of the hive
 - Even residual heat retention benefits the bees as they do not have to work as hard at generating the heat to make up any heat that is lost.
 - Honey that is slightly warmer is easier for the bees to get into when it comes time to uncap it and process it for food



Residual Heat Serves some purpose

□ Compact

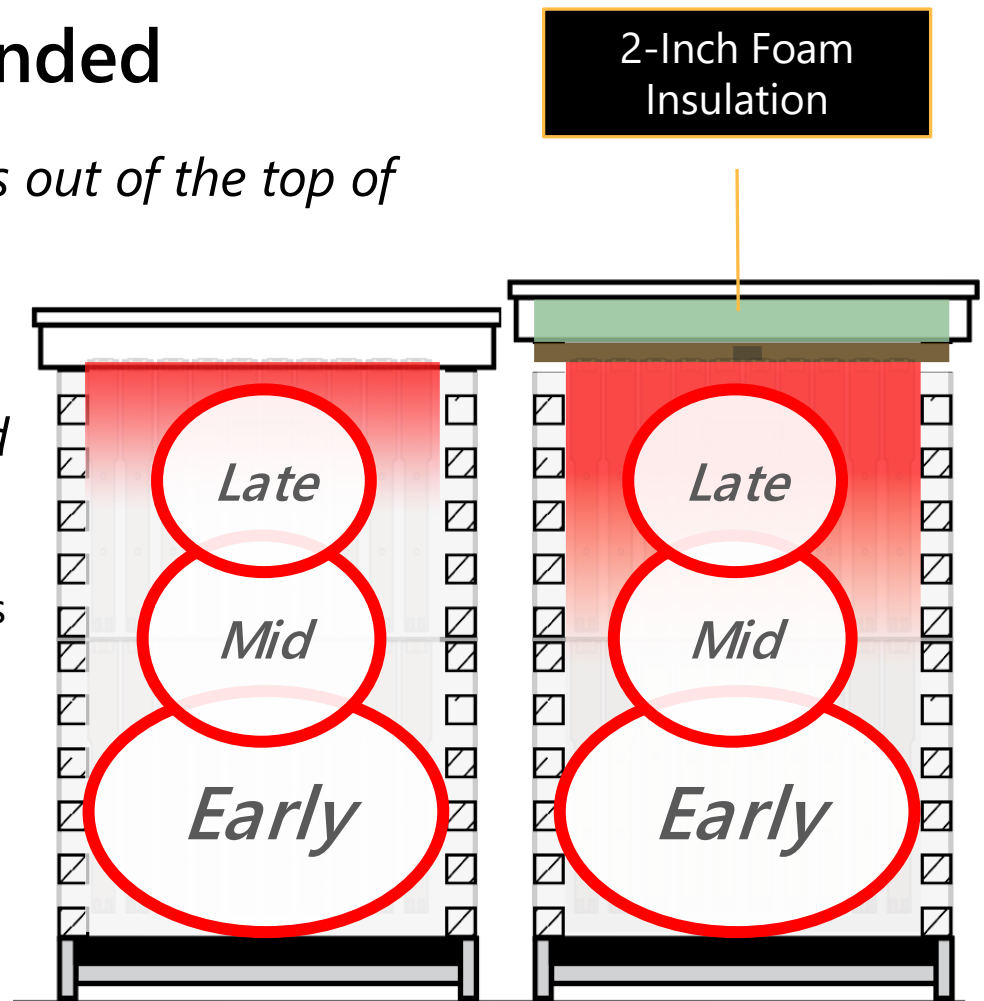
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Insulated Top

□ Insulated Tops are recommended

- *Most of the heat exchange in a hive goes out of the top of the box (heat rises)*
- *A 2-inch insulated piece of foam in the size of the inner cover is a recommended practice*
 - You do not need to fully insulate your hives in the mid-Atlantic region.
 - But if there is on thing to do – **this is it**



Partially Filled Comb – What to do with it?

□ Collapsing to two boxes (or 3-mediums)

- *What does one do if you have honey supers on top?*
 - There are a few options – and some of it is dependent upon the moisture
 - If the nectar in the comb is ripened, but not capped, pull it and extract it. As long as it has the moisture in the right zone, you'll be good to extract.
 - Use a refractometer to test the moisture level
 - If frames are close, but not capped, consider extracting it and you can possibly dry it out
 - Set it in a room with a fan running and dehydrate it some – pulling down the moisture post extraction – then bottle it.
 - If frames are wet, you can extract them, and use the extraction to feed back to the bees



Collapsing

❑ Boxes with honey supers

- *If the honey supers are full, pull and harvest the top two boxes*
- *If they are partially drawn:*
 - Consider the options provided on the previous slide.
 - You might also **move a spare inner cover under** the partially drawn honey supers.
 - ❑ The theory is that the bees will pull resources down into the nest. This is a hit and miss practice. Sometimes bees do what you want, and other times the leave it there.
 - Another option is to put an additional empty box over the inner cover so there is a space in between the supers and the nest

2 deeps with
honey supers



3 mediums with
honey supers



*Covered on the
next slide*



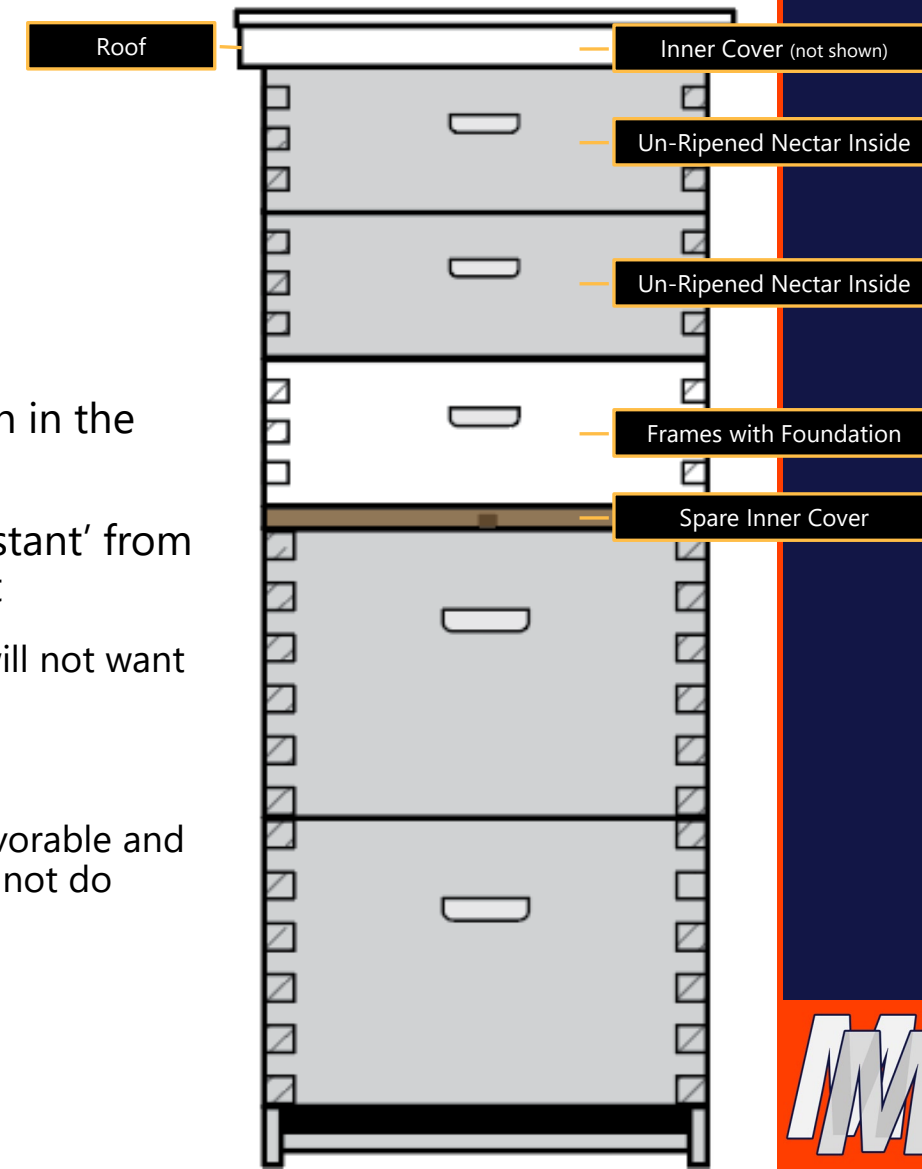
Further Elaboration

Note: This management technique requires additional equipment

□ Separating supers from the nest

● *Why it works..*

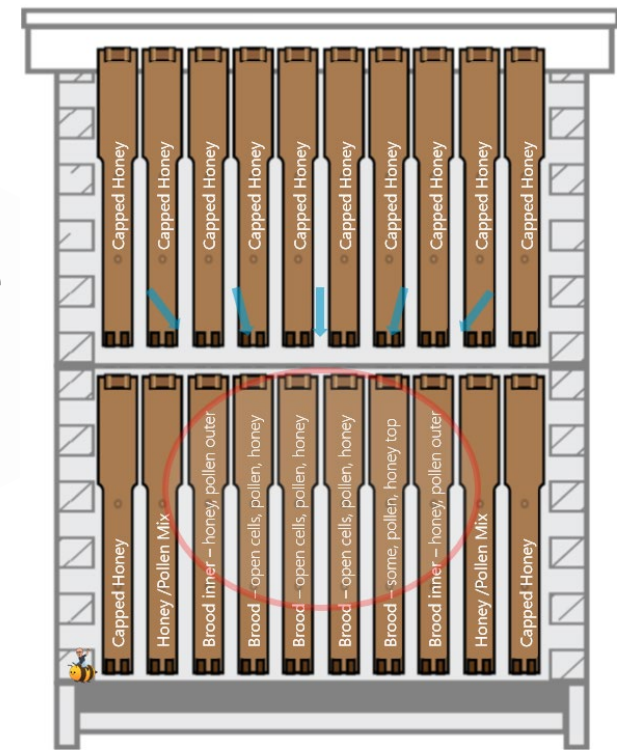
- On the cool nights of fall the bees will want to be down in the warm nest with the other bees
- If you separate what is above, and it is perceived as 'distant' from the nest, then the bees may draw it down into the nest
 - Adding the extra empty space creates a gap that the bees will not want – especially when it is over an inner cover
 - With enough time for rearranging, the bees will pull it down
 - This is a hit and miss practice. Sometimes conditions are favorable and it goes according to plan and sometimes the bee simply do not do what you want.



Purposeful Rearrangement

□ An optional, but useful practice

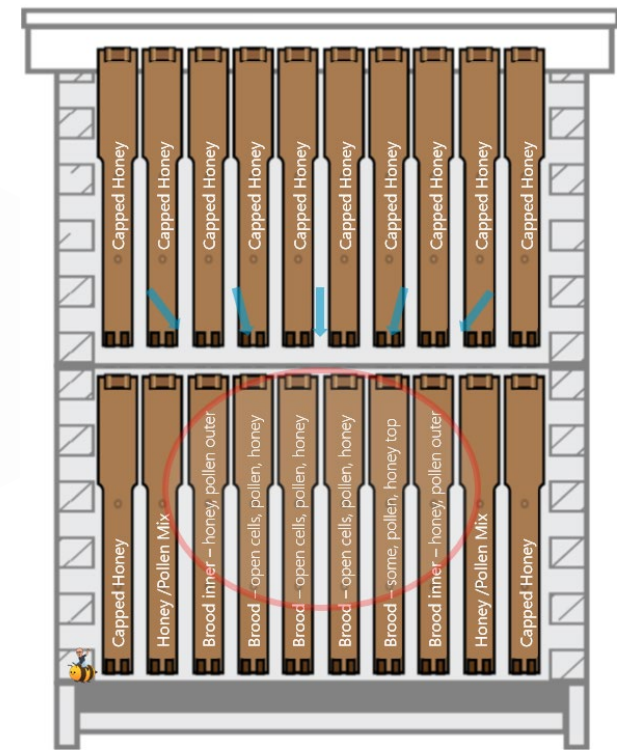
- *The first thing to say about this suggestion is if you feed the bees in fall they will naturally organize in an optimal manner*
- *You can proactively organize the box by adjusting the brood nest to the center of the bottom box*
 - Late in summer, early fall on a warm-ish day, go through the hive and move the brood frames to the center of the bottom boxes
 - Place pollen frames to the left and right
 - And fully drawn honey in frames 1 and 10



Rearrangement (cont.)

❑ Feed and/or continue organizing

- *Any residual nectar & honey frames go over the brood nest.*
 - Place all stored honey frames over the brood nest in the center
 - If the box top box is not full, feed the bees so they can fill out the remainder of the comb and create a honey dome over the nest.
 - ❑ Feeding will result in storage in the comb and prevent the queen from coming up into the drawn comb above
 - Feed and make the bees flush through to mid-October
 - ❑ Watch the weather – time the feeding to finish so the bees can cap the comb before cold weather sets in



Closing Comments

- **Customary Close**
 - Where we stand, where we are going...
 - *This module reviewed the premise of overwintering in compact hive equipment setups*
 - *Our next topic moves to the preparatory steps for getting started:*
 - Storing/Protecting extra drawn comb in reserve during winter
 - Dealing with Waxmoth
 - Winterizing Hives



Q&A

- **What Questions did we not anticipate?**
 - If you have feedback, you can leave a constructive comment; but be nice.
 - You could also send an email to comments@managedmentoring.com
 - *Please refer to this video in the subject so we know what the reference is.*

