

# Fall and Winter Preparation and Management

## Getting the bees ready for Spring



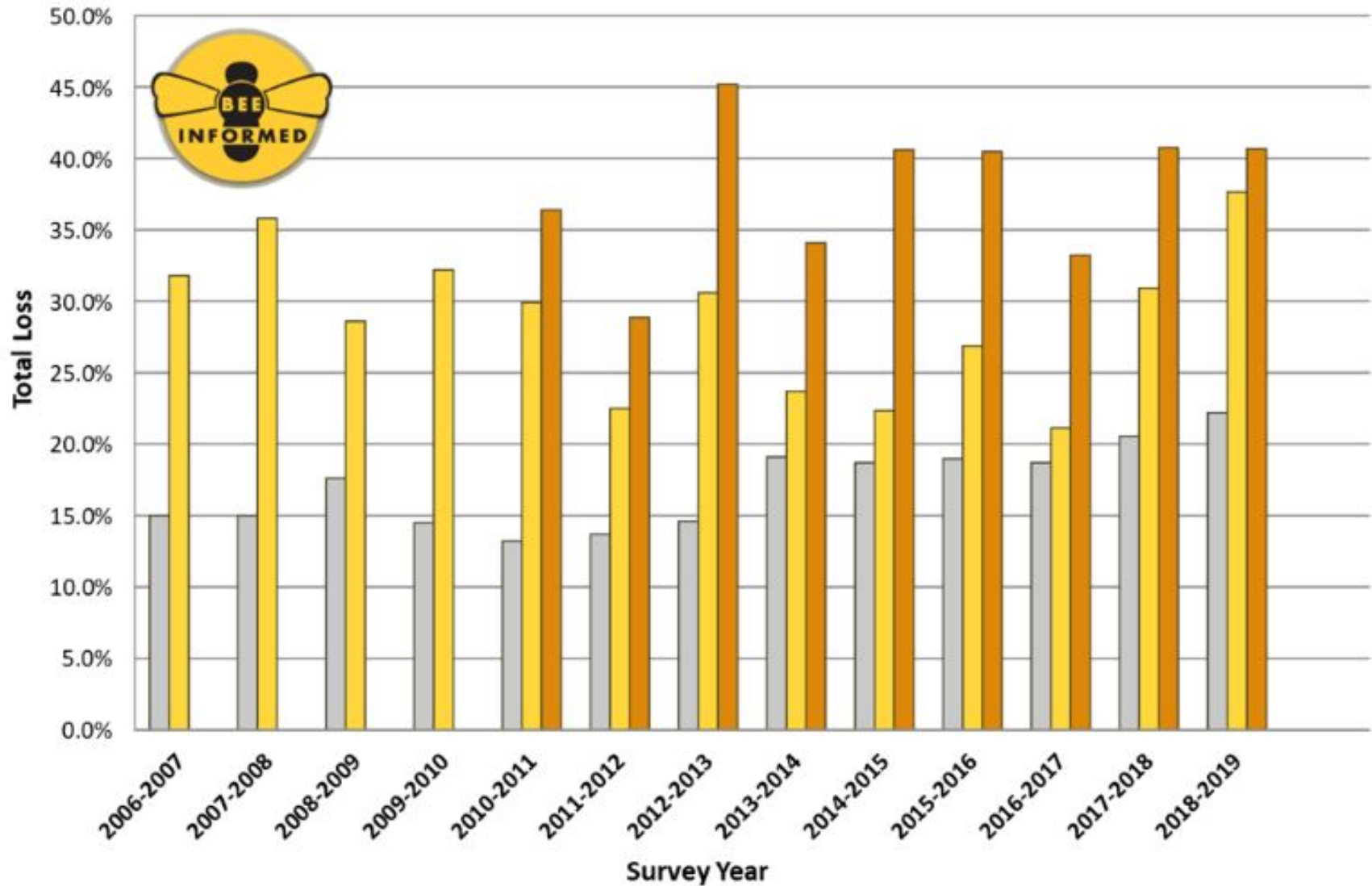
# This is what we want in February





## Total US managed honey bee colonies Loss Estimates

Acceptable Winter Loss    Total Winter Loss    Total Annual Loss



# August is the Beginning of the Beekeeping Year

**Preparation in August thru December will Determine your success in the Spring**

- August thru December are the Winter buildup months
- If you don't have good bees in the fall, you will not have good bees in spring for honey flow.
- Must have young and healthy bees and **LOTS** of them
- Keep queen laying into the fall and winter
- **Bees you see in September and October are winter bees**
- January thru March are the survival months
- February thru April are the Spring buildup months
- May thru July are the honey production months



# Beekeeping Calendar

August-December	January-February	March-April	May-July
<ul style="list-style-type: none"><li>• Treatment for Mites</li><li>• Re-queen (keep young queens)</li><li>• Winter Preparation</li><li>• Develop Strong Colonies</li><li>• Feed and Keep Queen Laying</li></ul>	<ul style="list-style-type: none"><li>• Survival Months</li><li>• Top Insulation</li><li>• Candy Boards / Sugar Cakes</li><li>• Protein Patties</li></ul>	<ul style="list-style-type: none"><li>• Rapid Spring Buildup</li><li>• Bees and Queen Evaluation</li><li>• Hive Re-arrangement</li><li>• Hive Reversal</li></ul>	<ul style="list-style-type: none"><li>• Prevent Swarming</li><li>• Produce Honey</li><li>• Make Nucs for Hive Increase</li><li>• Raise Queens</li></ul>

## Factors for Success with Bees:

- **Overwinter Strong Colonies**
- **Rapid Spring Buildup**
- **Preventing Swarming**
- **Add Multiple Honey Supers Early**
- **Harvest Early and Often**
- **Adapt and Open Minded**



# August:

- **Remove Honey Supers**

- I like to have all my supers off by August 1<sup>st</sup>
- Extract honey and put wets supers back on hives for cleanup
- Remove cleaned up supers and store for winter
  - Wrap supers in garbage bags and freeze for 48 hours and then store
  - This destroys all eggs and larva of wax moth and SHB
  - Stack supers and use Para-Moth (don't do this in the basement)

- **Perform hive inspection**

- Perform inspection to determine the follow:
  - Strength of hive, **you want really strong hives headed in Fall and Winter**
  - This is not a detailed inspection, should take 5 minutes
    - Keep hive open minimal to avoid starting robbing
  - Presence of a good laying queen
    - Mite treatments will affect queen laying
    - You want to see good amount of eggs and young larva, don't need to see queen
  - Determine the number of brood frames you have
    - You need to have 9-10 frames of brood minimum at this time in a double deep
  - Determine the number of food frames you have.
    - You need 5-6 frames of honey and pollen



# Hive Strength



**Super Strong Hive**



**Strong Hive**



**Fairly Strong Hive**



**Weak Hive**



- How many bees do you have in the hive?
  - Fully covered brood frame is about 1500 bees per side
  - Approximately 2450 capped cells per side if 70% capped brood
    - A deep frame has 7000 cells both sides
    - Need 50,000-60,000 plus bees in August
    - Need 40,000-50,000 bees in October
    - Need 30,000-35,000 bees for winter



Frame with  
3000 bees  
and 5000  
capped  
brood



Hive has 12  
frames  
brood  
(50,000 plus  
baby bees)  
with  
Approximate  
ly 45,000  
bees in hive



# Hives After Honey Supers Removed









# Feeding right after final honey supers removed

- I remove all supers no later than August 1st, sometimes mid July
- Large honey producing hives can crash because you have removed 90% of their food source once supers are removed
- As soon as last supers pulled I feed all honey hives 4-5 gallon 1:1 syrup in one – two feedings and 2-4 sugar/protein patties
- Continue to feed 1:1 as needed though August and September
  - **August is usually a very poor month for nectar and pollen**
  - August dearth in most of Kentucky
- I switch to sugar/protein patties (9 sugar to 3 protein ratio) and continue to feed them regularly through October
- Watch out for Robbing
- Treat for mites (this is when mites are at their worst)
- Importance of summer feeding 1:1 syrup and protein is to keep brood production going to produce winter bees
- The bees you see in October and November are the bees you see in March

- **Bees are hot in August and beard up on front of hive**
  - Providing vent spacer on top and SBB helps with ventilation
  - In a super strong hive add a super of comb or just an empty super for extra room
- **Robbing**
  - Robbing can be a real problem any time there is death, which is common in August
  - Keep top entrances screened
  - Reduce bottom entrance
  - Use a robbing screen if necessary
  - Keep hives open minimal
  - Don't spill syrup or break honey open
- **Queens may slow down laying In August, Russians and Carniolan especially**
  - You can keep her laying some by feeding 1:1 syrup but that is a gamble
  - More bees equal the need for more food
  - Must have pollen for queen to continue to lay, protein patty may be necessary
- **Small Hive Beetle**
  - Keep hives very strong, they will overtake a weak hive
  - Don't have empty spaces, supers, foundation, etc., bees must protect those areas
  - Use Beetle-Be-Gone Sheets, vegetable oil traps, use swifer dryer sheets
  - Spray Guardstar, saltwater around hives, use Diatomaceous Earth around hives
  - Use traps inside of hives
  - Mash those suckers!!!



## August Dearth

- Typically there isn't much for bees to eat in August
- If you determine food stores is low, feed a lot fast **(do not trickle feed)**
  - Some hives may need 2-5 gallon 1:1 or 2:1 syrup (your choice)
  - Also feed a combination sugar/protein patty (9 parts sugar/3 parts Protein)
    - They will consume this, not store it
    - It is a quick boost of carbohydrates for the bees
    - Feed only an amount that bees can consume in 5-7 days because of SHB
    - Feeding dry protein powder can be a option but bees tend to not take in the Fall
- **August is usually the when mites reach their highest level in a hive**
  - Testing for mites with sugar roll or alcohol wash

# Mite Testing Methods

- **Sticky Board (I don't use this one)**

- The least accurate varroa testing method
- Spray PAM or use petroleum jelly on white corrugated board used in Screen Bottom Boards
- Leave in 24, 48 or 72 hours
- 72 hours best, count mites on board and divide that by 3 to get the mite drop count for 24 hours
- Threshold to treat is 12 mites per 24 hour drop

- **Powdered Sugar Roll**

- Does not harm the sample of bees
- Collect ½ cup (300 bees) from brood frames and place in a jar
- Add 2 tablespoons fine powdered sugar to jar and shake, let jar sit 1-2 minutes
- Replace lid with screened lid and shake sugar out onto a white paper plate, spray with water to dissolve sugar
- Count mites
- 9 mites or more per sample is threshold for treatment
- Return bees to inside of hive

- **Alcohol Wash**

- Most accurate varroa testing method but it does kill the bees
- Collect ½ cup (300 bees) from brood frames and place in a jar
- Add enough alcohol to cover bees and shake jar 2 minutes to dislodge mites
- Pour alcohol through screened lid into another jar or white pan
- Counts mites and then rewash sample 1-2 more times for more accurate count
- 9 mites or more per sample is threshold for treatment



## Mite treatments

- should begin once supers are off and cleaned up. You also want temperatures in low 80 range.

## Apivar

- Not affected by hot temperatures and doesn't really affect the way bees act to it
- 2 strips are placed in brood chamber with 2 frames between strips
  - If you have brood in 2<sup>nd</sup> box it will need strips also
- Strips are left in hive for 6 weeks
- Can apply strips as soon as honey supers are removed
- Can leave screen bottom boards out and vent spacers on, which helps with ventilation
- **Average cost to treat one hive is \$11 for four strips**

## Apiguard

- For normal two deep hive apply two 50g treatments two weeks apart (total treatment is four weeks)
- Place Apiguard on frames of top box with a 2-3" spacer.
- Screen bottom boards must be in and no vent spacers on top
- Bees will react to the Thymol on hot days, you will see many more bees on outside of the hive
- Queens tend to stop laying during the treatment process
- Don't apply Apiguard right after you have re-queened a hive
- **You can also apply Apiguard in a 25g dose between brood boxes each week for four weeks. Bees and queens seem to handle this dosage better, especially if it is hot.**
- If you have a single deep box hive, apply two 25g treatments two weeks apart.
- If you have a double nuc, apply two 25g treatments two weeks apart.
- **Average cost to treat normal hive is \$6.50 with pre-packaged or \$3.00 with tub**



# Mite Treatments

- **Oxalic Acid**

- Two methods of application
  - Vaporizer or Drizzle
- Only Kills mites on the bees, not in the brood
- Vaporizer, use 1 gram (1/4 tsp) per brood chamber
- Drizzle, use 2 grams mixed with 1:1 syrup and drizzled on the cracks of bees per brood chamber
- Treat 4 times 7 days apart between treatments
- Treatment cost is about \$1.00 for four treatment's

- **Api-Life VAR**

- Organic soft treatment
- Three treatments every 7-10 days
- Place 4 wafers around brood nest
- Treatment cost is \$6.00 per hive

- **MiteAway Quick Strips**

- Formic Acid, kills mites under capped brood
- Can be used during honey flow
- Seven day treatment of 2 strips
- Apply in 50-85 degree
- Treatment cost is \$7.00 per hive

- **Integrated Pest Management (IPM)**

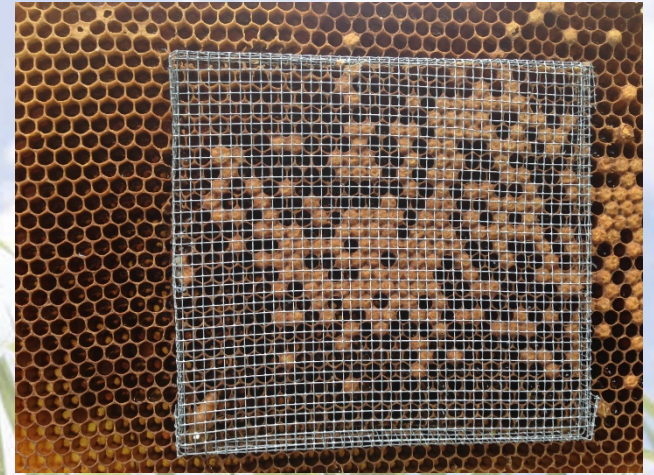
- Screen Bottom Board
- Drone Trapping
- Powdered Sugar

# September:

- Start or finish up mite treatments
- Check hive every two weeks to make sure you have a queen
  - Just look for eggs, don't need to see queen
- **September is a great time to re-queen a hive**
  - The queen needs to be laying good to produce winter bees
- Monitor for honey bound hives
- In late September, if you have a weak hive combine it with a strong hive
  - Never combine two weak hives
- Continue to monitor amount of feed hive has
  - Checking out two frames for food is a quick and easy check
    - Always like to see 4-5 frames of food in a hive at any given time, minimal
  - Lifting the top box can tell you a lot about food supply
- If you think hive is light **FEED, FEED, FEED**
  - Feed a lot of 1:1 or 2:1 syrup quick (2-5 gallon) and or feed sugar/pollen patties
- **Never let your bees go hungry**
- Monitor hive for strength
  - We want strong hives headed into winter
  - How strong is your hives



# Re-queening





# Queen Production













# Fall Feeding

- From August through October we feed 1:1 syrup depending on strength of goldenrod flow
  - Our goal is to keep queens laying heavy to produce large amounts of winter bees
  - This can be modified if supers pulled early or hives that don't have supers.
- Normally we feed 2:1 syrup in November and December if needed once goldenrod is gone
- If you have to feed 2:1 **don't trickle feed**, determine how much that hive needs and feed it in one or two feedings
- Continue to feed sugar/protein patties through December



# Fall Feeding Options

- **Fall feeding options:**
  - Sugar water
    - In top feeders, jugs, buckets, jars, Ziploc bags or directly into empty comb
    - 1:1 keeps queen laying but risky in fall, more eggs equal more food needs
    - 2:1 best choice for late fall (November and December)
    - HFCS or granulated sugar
    - No real cost difference in HFCS and sugar water
    - 1 gallon 1:1 syrup equals about 6.5# food
      - 5 gallon 1:1 syrup equals about 32.5# food
    - 1 gallon 2:1 syrup equals about 9# food
      - 5 gallon 2:1 syrup equals about 45# food
    - Honey Bee Healthy additive (optional)
    - Amino –B-Booster (optional)
  - Sugar/Protein Cakes
    - Excellent Fall feeding option
    - Bees won't store solid sugar, they consume it
    - 9-3-2 Sugar/protein/1:1 or 2:1 syrup mixture







# Fall Feeding













# October:

- **Perform hive inspection first or second week of October**
  - Mite treatments should be completed
  - To determine amount of food hive has for fall and winter
    - Determines how much if any you need to feed in fall
    - You need to have 5-6 frames of food minimum at this time
    - By the end of November you will need 50# honey or syrup and pollen for winter months
    - Italians need the most food reserves and Russians the least
    - Frame food weights
      - Deep frame = 8-9# food
      - Medium frame = 3-4# food
- **Make sure you have a queen and she is still laying (just look for eggs and larva)**
  - Mite treatments will affect queen laying
  - You want to see a good brood pattern, 5-6 frames brood
  - By November – December the queen will really slow down laying, Russians almost stop laying completely
- **Honey Bound Hive**
  - In October if feeding or good nectar flow you can quickly get a honey bound hive
  - As bees in brood nest hatch out bees will fill cells with honey leaving little room for queen to lay
  - Can add a frame of empty comb into center of brood nest to give queen laying room
  - If feeding, feed only sugar/protein cakes
  - Bees won't store solid food, they consume it



## Brood Frame Becoming Honey or Pollen Bound



## Queen Looking For a Place to Lay





- **Bees should be bringing in nectar and pollen from Goldenrod and Asters**
  - Goldenrod has a distinct smell
  - Goldenrod lasts until frost
  - Goldenrod yellow pollen, Asters white pollen
- **If a double hive isn't very strong, cut down to a single box.**
  - If bees can't use and can't protect it, condense them to one box
  - Easier for small hive to survive in a smaller space
  - Protect comb from wax moths and hive beetles
  - Comb is worth its weight in gold, store and preserve it well!!!
- **Reverse hive bodies (you must monitor closely and feed quickly)**
  - I have done this with good success
  - Sometimes in the fall if you have a small population they will completely move up into top box
  - This also depends on nectar flow coming in and if they can fill the top box
  - You should plan to feed 4-5 gallon 2:1 syrup unless you have a good nectar flow
    - 5 gallon of 2:1 syrup can add about 45# feed to a hive
- **Combine weaker hives with stronger hives**
  - Never combine weak hive with another weak hive
  - Newspaper combine method best, make sure to remove queen from the one you are combining



**Goldenrod**



**Asters**



**Pollen coming in**





- 
- **Reduce or block entrance from wind**
    - Keep wind from blowing directly into hive entrance
  - **Mouse Guards**
  - **Close bottom board off in SBB**
    - Can monitor bee strength by looking at mite board
  - **Prop outer cover open with stick (I do this year round)**
  - **Beetles**
    - Mash them!!
    - Not much you can do right now, they are not too bad in winter but they will cluster with bees



# November:

- Perform brief hive inspection mid November if weather permits
  - Determine amount of food supply in the hive for winter
  - Look at outside frames for food
  - If food supply low, feed a lot fast
  - Feed 2:1 syrup or sugar/protein patties or both
  - Do not worry about hive having a queen or brood
- Turn top entrance away from wind direction
  - Depends on nightly temperatures, average 45-50 degrees
- Top Insulation ½" to 1" board above inner cover (on by December 1<sup>st</sup>)
  - Help with condensation (warm air hitting cold inner cover)
- By the end of November you need 50-60# honey or syrup and pollen for winter months
  - Italians need the most food reserves and Russians the least
  - Feed only 2:1 syrup in November and sugar/protein patties
- Frame food weights
  - Deep frame = 8-9# food
  - Medium frame = 3-4# food



**Insulation board**



**Screened top entrances**



**Reduced entrance and mouse guard**



**Mite board to view hive strength**





## December:

- Last Chance to make sure hives have adequate food supply for winter
  - Can still feed 2:1 syrup if weather warm enough (need about 45 degree days)
- Put hard sugar blocks on for winter feed source mid December, no later than Christmas
- Keep protein on the hive, either in patty form or hard sugar blocks with protein mixed in
- Put screen bottom boards in, I leave mine in until May 1<sup>st</sup>
- Check hive every 2 weeks to make sure they still have food
  - Don't open hive for any type of inspections
  - Keep hive open only minimal time to add food
  - Move food on top of cluster if necessary
- Wrap hives if you choose.
  - I have seen no difference in wrapping and not wrapping in survival rate







# Winter Feeding

- Winter is not a survival time, just another phase in beekeeping
- **Winter feeding should never be considered emergency feed**
- In January, February and March I use sugar blocks and sugar/protein blocks on top frames in 3" spacer
  - Place 4-5 on each 10 frame and 2-3 on nuc hives mid to late December
  - Be careful placing too early or bees will move up to them
    - » Make sure bees have clustered a couple times
- Winter patties, or candy boards also good options
- **I am a firm believer of providing protein all winter**
- My sugar/protein blocks contain about 15% protein, most purchased winter patties contain about 4% protein



















## January:

- Check hive every 2 weeks to make sure they still have food
  - Don't open hive for any type of inspections
  - Keep hive open only minimal time to add food
  - Move emergency food on top of cluster





## February:

- February is the month we start building bees up.
- Put 1:1 syrup and protein patties on when daytime temperatures reach 45 degrees.





# Spring Feeding





# Recipes

- **1:1 Sugar Water:**
- 2 gallon syrup
  - 10 lbs. granulated sugar
  - 5 quarts water
  - Add 6-8 teaspoons of Honey B Healthy and 4 teaspoons Amino-B-Booster per gallon
- 5 gallon syrup
  - 25 lbs. granulated sugar
  - 12.5 quarts water
  - Add 6-8 teaspoons of Honey B Healthy and 4 teaspoons Amino-B-Booster per gallon
  - Add one-two caps full of bleach (helps prevent mold)
- **Protein/Sugar Patties:**
  - 9 cups AP 23 protein powder
  - 3 cups sugar
  - Add enough 1:1 or 2:1 syrup to make consistence of peanut butter and form into patties on wax paper.
  - You can also add corn oil to help keep patties moist, Approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  cup



# Recipes

- **2:1 Sugar Syrup:**
- 1.5 gallon syrup
  - 10 lbs. granulated sugar
  - 2.5 quarts water
  - Add 6-8 teaspoons of Honey B Healthy and 4 teaspoons Amino-B-Booster per gallon
- 5 gallon syrup
  - 25 lbs. granulated sugar
  - 6.25 quarts water
  - Add 6-8 teaspoons of Honey B Healthy and 4 teaspoons Amino-B-Booster per gallon
  - Add one-two caps full of bleach (helps prevent mold)
- **Sugar/Protein Patties:**
  - 3 cups AP 23 protein powder
  - 9 cups sugar
  - Add enough 1:1 or 2:1 syrup to make consistence of peanut butter and form into patties on wax paper.
  - You can also add corn oil to help keep patties moist, Approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  cup



# Recipes

- **Hard Sugar Blocks:**

- 1 quart water
- 12 lb. sugar (24 cups)
- 6-8 teaspoons Honey B Healthy
- Five 7"x7"x1.25" cake pans or five 9" pie pans (makes five 2 lb. pans)
- Heat water to boil, add Honey B Healthy, add sugar and mix, heat to 250 deg. mixing occasionally, remove from heat and let cool to 210 deg., stir quickly and pour into pans, let harden (don't let it get too hard while cooling or you can't pour it)

- **Hard Sugar/Protein Blocks:**

- 1 quart water
- 12 lb. sugar (24 cups)
- 3 cups protein powder (I use AP 23 protein powder from Dadant)
- 6-8 teaspoons Honey B Healthy
- Five 7"x7"x1.25" cake pans or five 9" pie pans (makes five 2 lb. pans)
- Heat water to boil, add Honey B Healthy, add sugar and mix, heat to 250 deg. mixing occasionally, remove from heat add protein powder and mix in quickly. Once mixed, pour into pans, let harden.



# Summary

- Bees are livestock
- Nobody has the answers, just opinions
- Feed anytime and every time it is necessary
- Fall bees determine your spring honey crop

**Honey Bees survival depends on you, the beekeeper.**