Seasonal Management

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Mississippi State University Extension Service

MAFES

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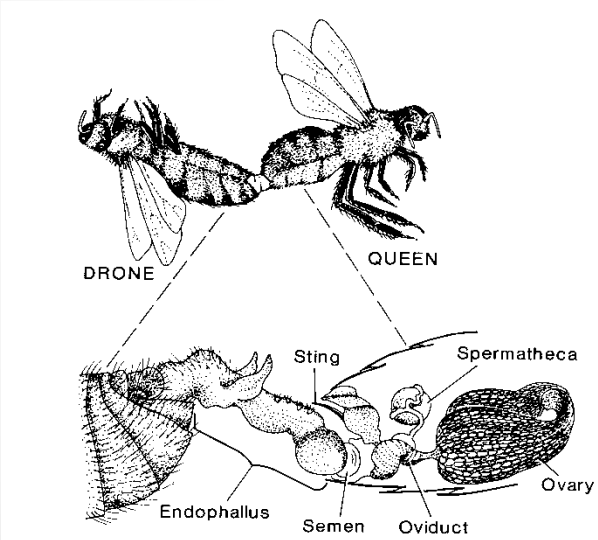
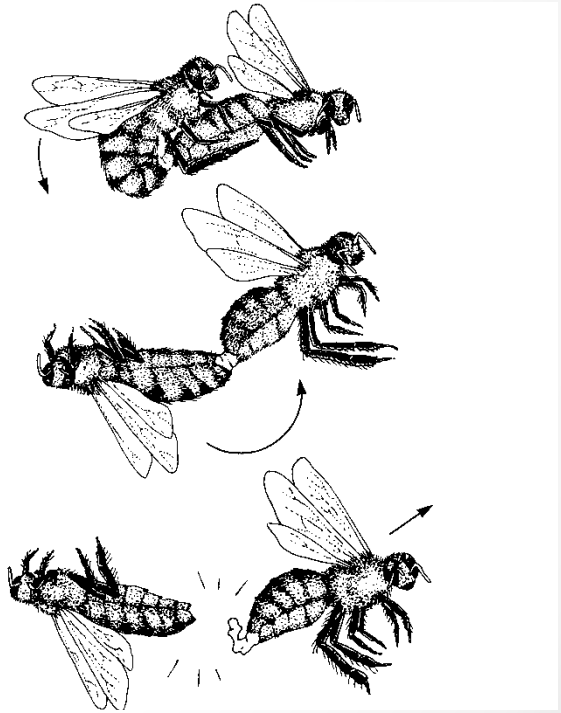
The Queen Lays All of the Eggs

Mating Occurs in the Air



A queen mates with > 20 drones and store sperm in a special gland



Mating occurs high above ground (90-120 feet)

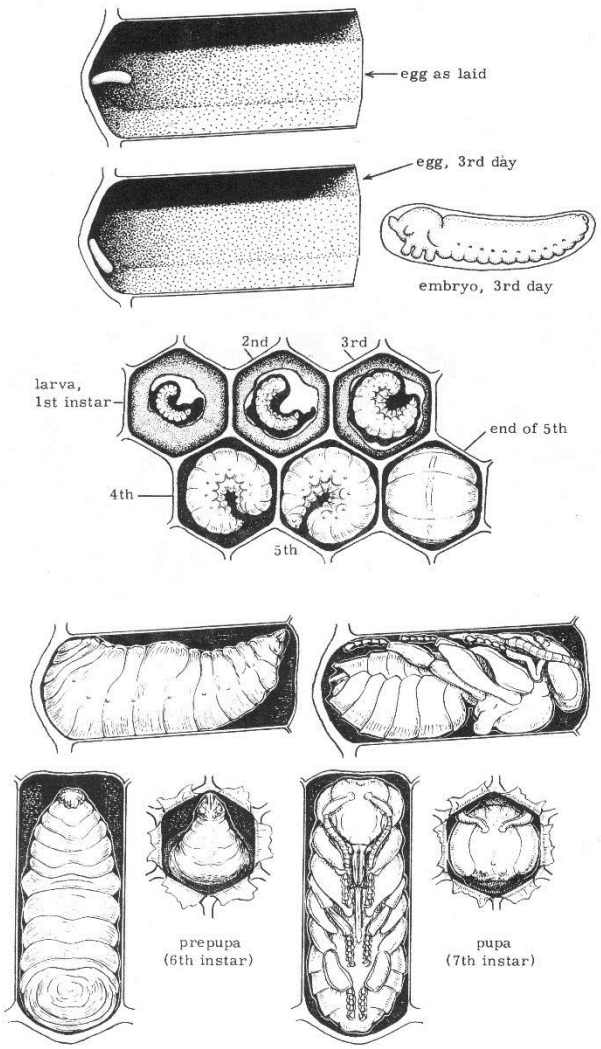
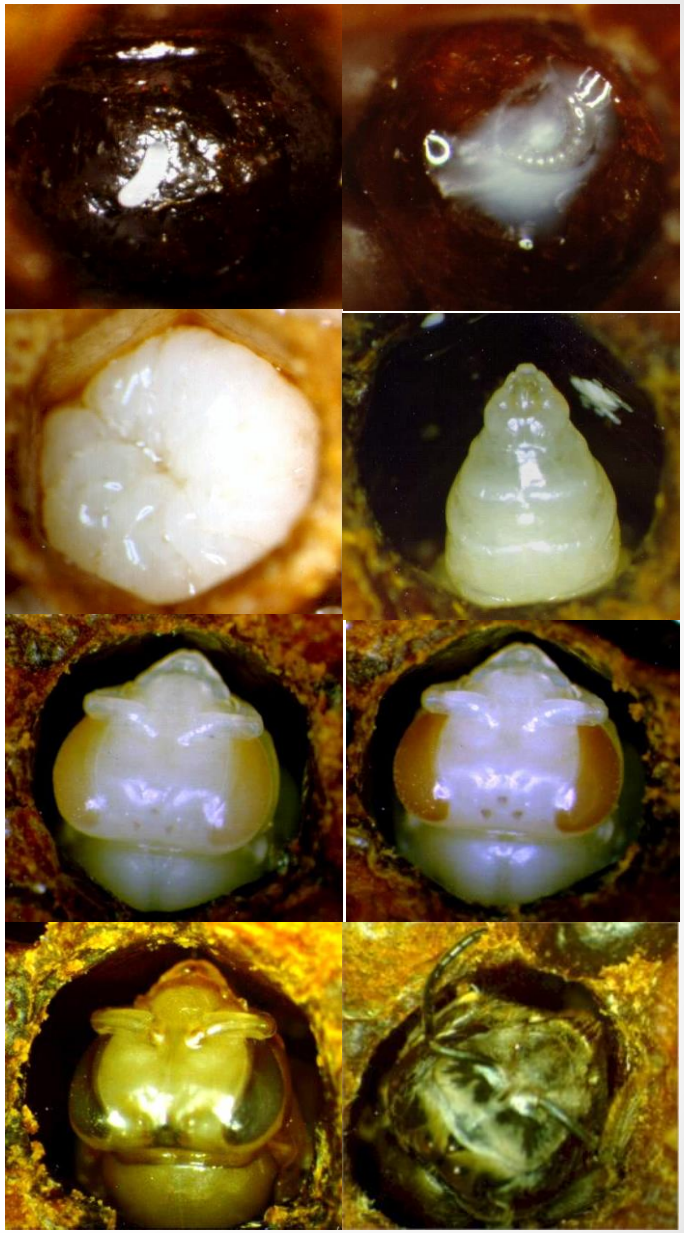
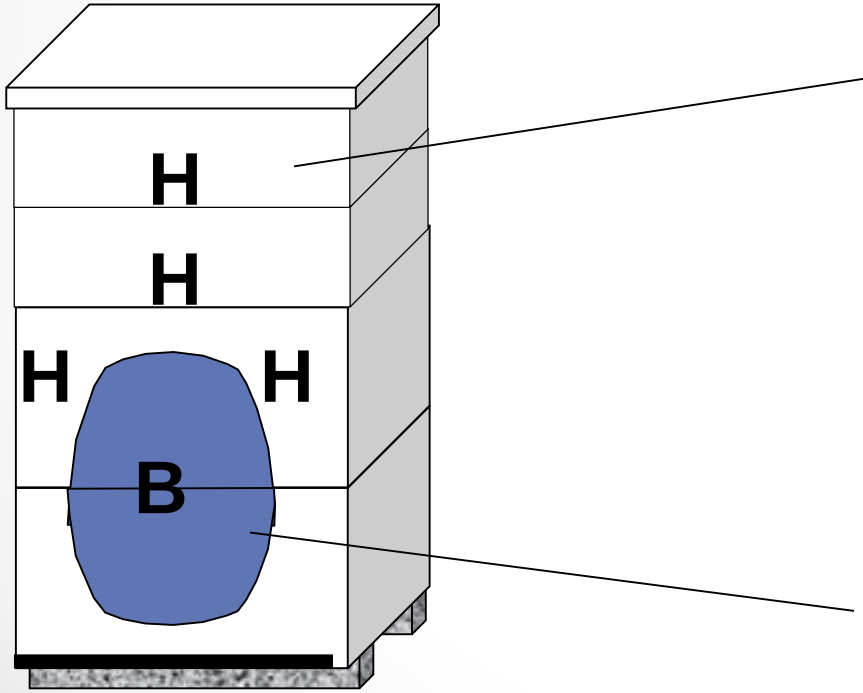


PLATE 20. Stages in development from egg to pupa (after J. A. Nelson, A. P. Sturtevant, & B. Lineburg, 1924).

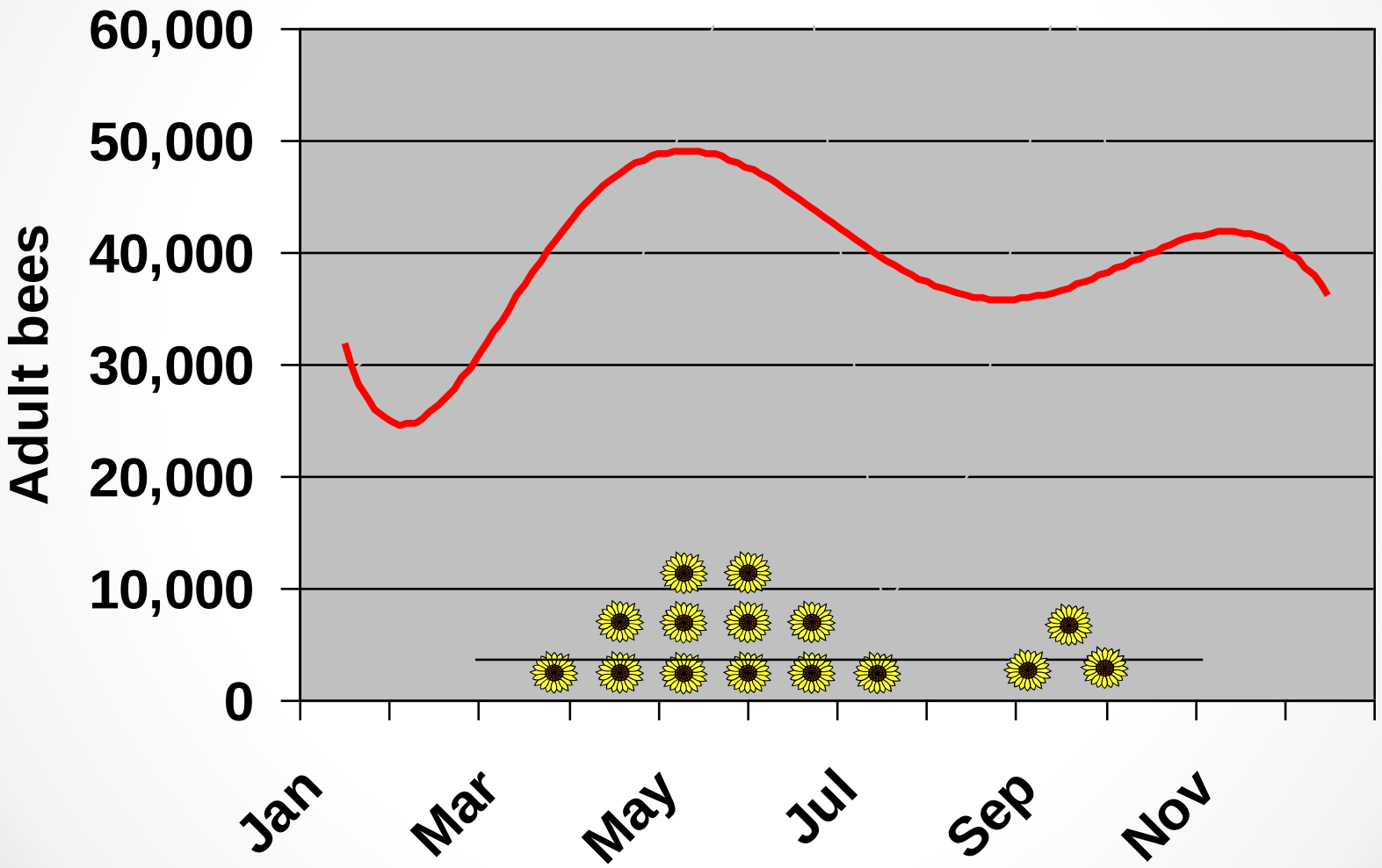


The Workers

Arrangement of the Nest



Annual cycles of colony population and food resources

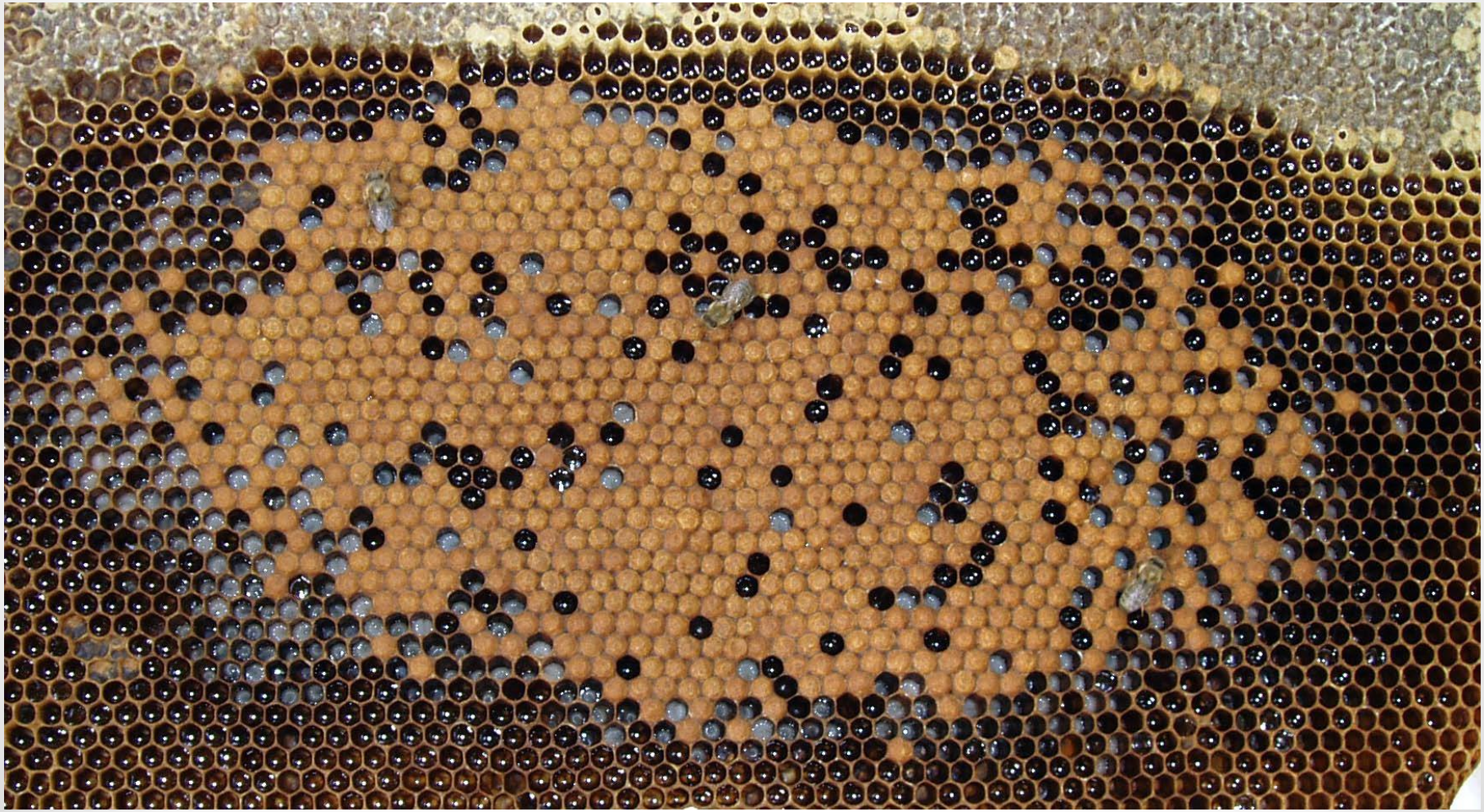


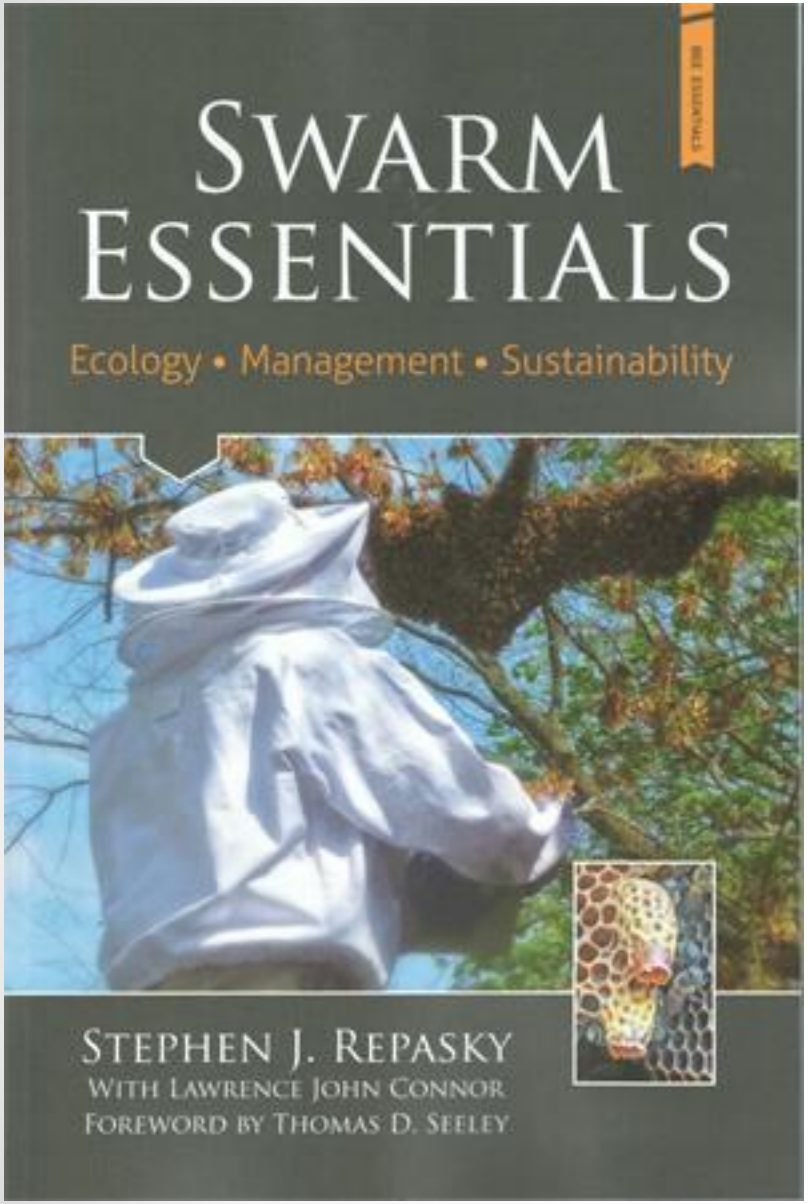
Nectar Forage

Pollen Forage

Bee Bread
Pollen + Microflora

Incoming Food Stimulates Brood Rearing




SWARM ESSENTIALS
Ecology • Management • Sustainability
STEPHEN J. REPASKY
WITH LAWRENCE JOHN CONNOR
FOREWORD BY THOMAS D. SEELEY

Types of Swarming

- **Reproductive swarms (primary)**
- **Afterswarms (secondary)**
- **Absconding swarms**

The function of primary swarms is reproduction by colony fission

Pre-Swarm Conditions

Crowded with Good Nutrition

Crowded Colony

Timing of Swarming

- **New York: May-June, peaks in June**
- **Pennsylvania: May-June, peaks in late May**
- **Arkansas: April-May, peaks in early May**
- **Louisiana: March-May, peaks in April**

Many Queen Cups → weeks from swarming

Getting Ready to Swarm

Broodnest	Time until Swarming
• Many queen cups	go time, swarming in weeks
• Eggs in cups	will swarm in 8-10 days
• Capped cells	any moment

Swarm Cells located on bottom of combs (easily seen by tilting back brood boxes)

Emergency Queen Cells located anywhere, and they are usually shorter than swarm cells

While In Flight

- **Worker and queen pheromones hold the mass of bees together**
- **Appears wildly chaotic, but calms quickly on landing**
- **Bees assemble on a structure (bush, tree or building) within a few hundred yards of original nest site**

Finding the New Home

1. Scouts search out cavities
2. Scouts communicate cavity information using dances
3. Colony-wide debate
4. A choice is made (all dances are the same)
5. Chaotic exodus (again)
6. Land at new site

Back at the Old Nest Site…

- **Virgin queens emerge from cells**
- **Multiple virgins tolerate each other only for a brief period**
- **Queens do fight to the death on occasion, but workers often "ball" unwanted queens**
- **Virgin queens participate in afterswarms**

Queen cells being chewed down after a virgin queen has emerged

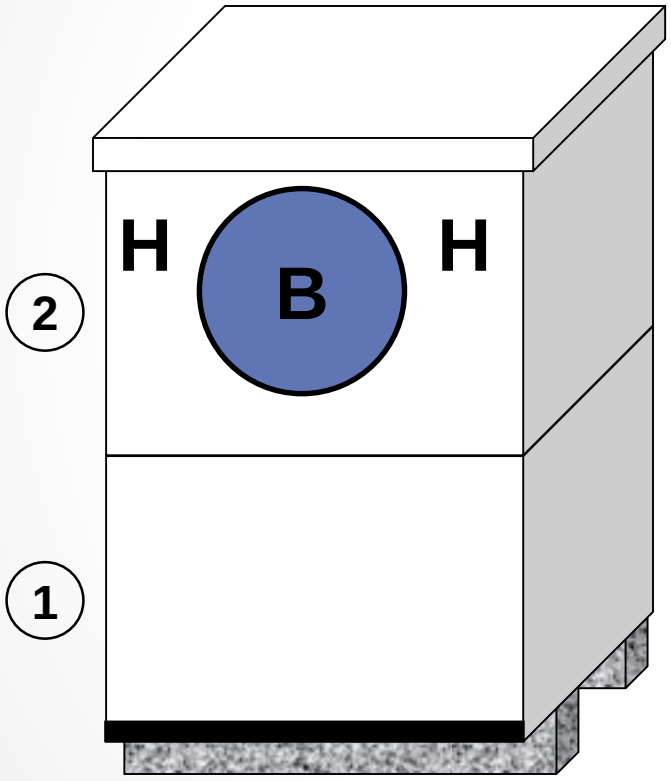
It Already Swarmed!

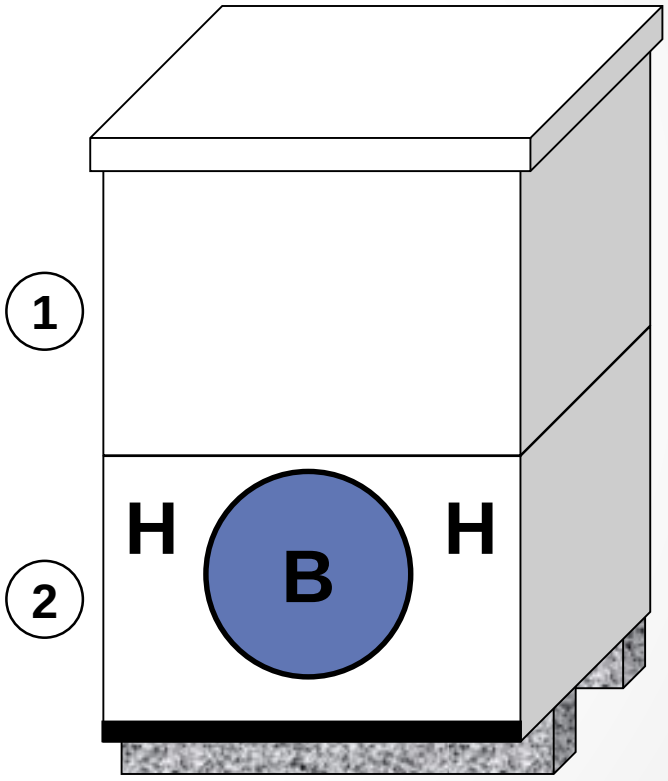
Broodnest	Likely time of Swarm
• Open brood is present	recent, 0-4 days
• Sealed but no open brood	more than 4-5 days
• No brood but there are remains of queen cells	swarmed > 3 weeks, new queen not laying yet
• Multiple eggs in cells	> 28 days ago, new queen failed, laying workers

Preventing Swarming

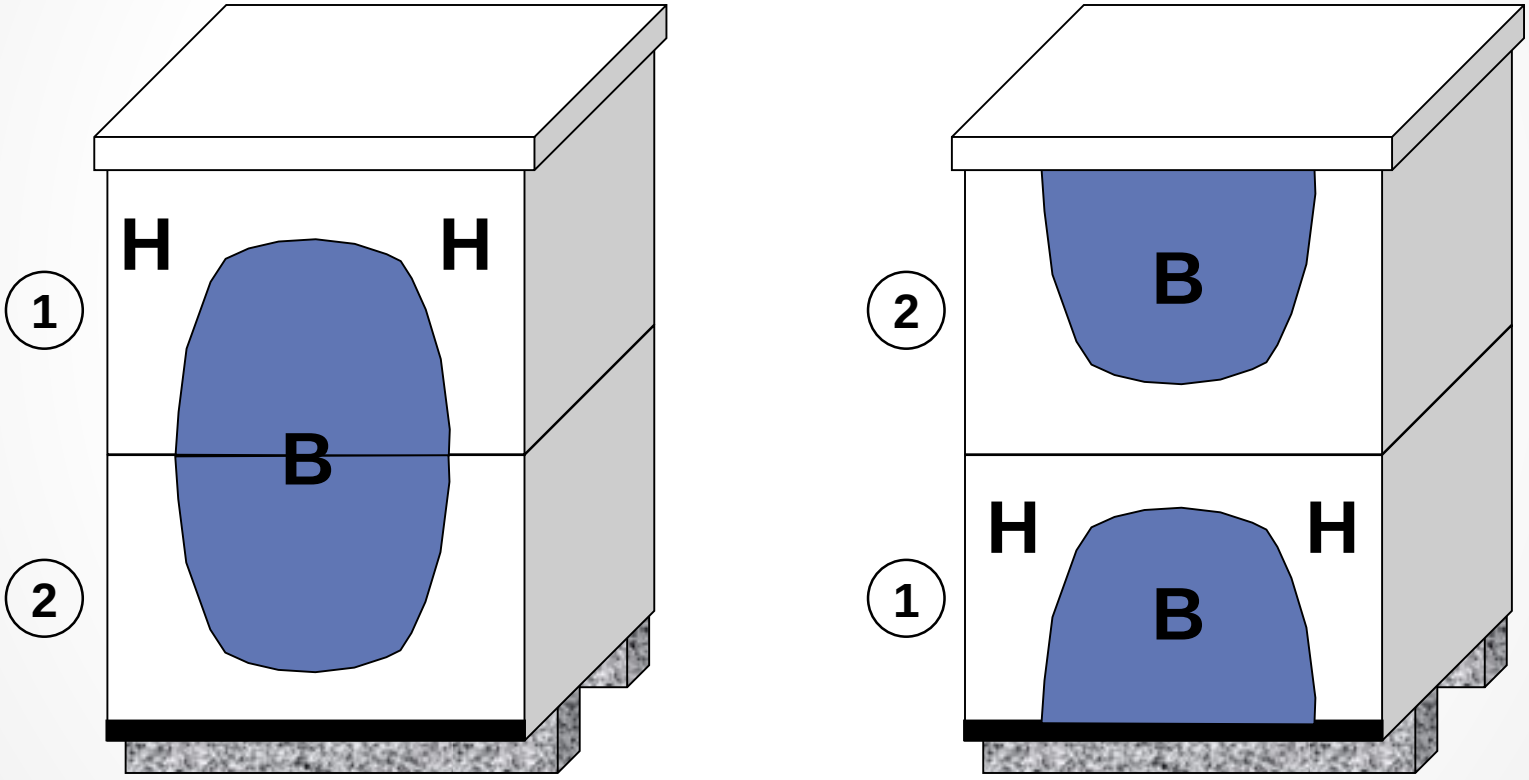
1. Reversing hive bodies
2. Adding supers
3. Splits / nucs / increases
4. Shake nurse bees in front of weaker colony
5. Checker boarding

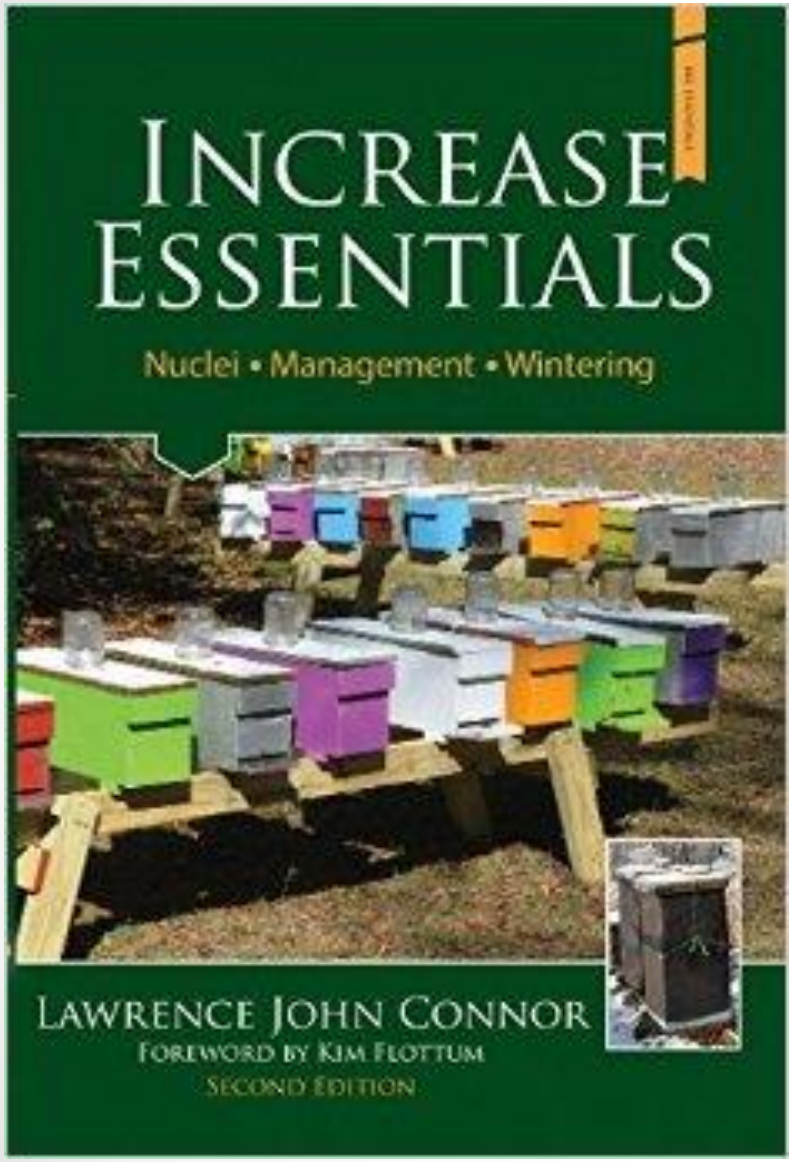
EARLY SPRING





Incorrect




INCREASE ESSENTIALS
Nuclei • Management • Wintering
LAWRENCE JOHN CONNOR
FOREWORD BY KIM FLOTTUM
SECOND EDITION

Keys to Solid Beekeeping

- Constantly evaluate honey productions from bee yards
- Push your mean honey production to be better all of the time
- Understand that colony loss is a reality – accept that 25% loss may be normal
- Use increases (splits) to either keep number of colonies stable through time, or to increase the size of your operation

Definitions

- A split is separating the two hive bodies from a colony to make two colonies
- A nuc is a fully balanced but miniature colony
- An increase is simply adding to the number of colonies that you manage

Why Make Splits and Nucs?

- To grow your business
- To replace winter losses
- Foolproof requeening
- Management tool for swarm prevention
- Queen rearing / mating nuc

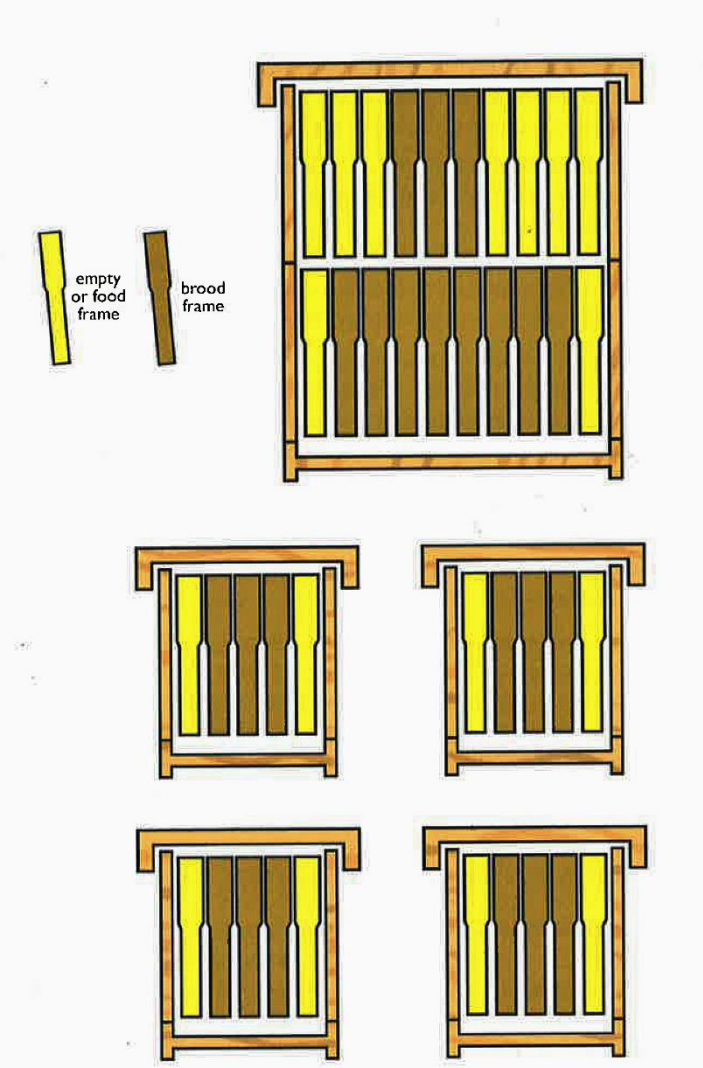
Things Needed to Make Splits

- Strong and productive colonies (A and B students) coming out of the winter are kept as your honey primary producing colonies (manage these for swarming)
- Poorer colonies – your C students and lower are all candidates for splits
- Queens or queen cells
- Nucleus hive bodies (or other hive sizes)
- A location for new nucs that is far from source yard (> 3 miles)

Basic Rules to Making Nucs

- Make them in middle of the day when field bees are out of the hive
- Keep the nuc in progress protected from the sun to avoid baking uncapped brood
- Use a minimum amount of smoke
- Nucs should have reduced entrances and/or robber screens

Up to 4 Nucs from One Colony

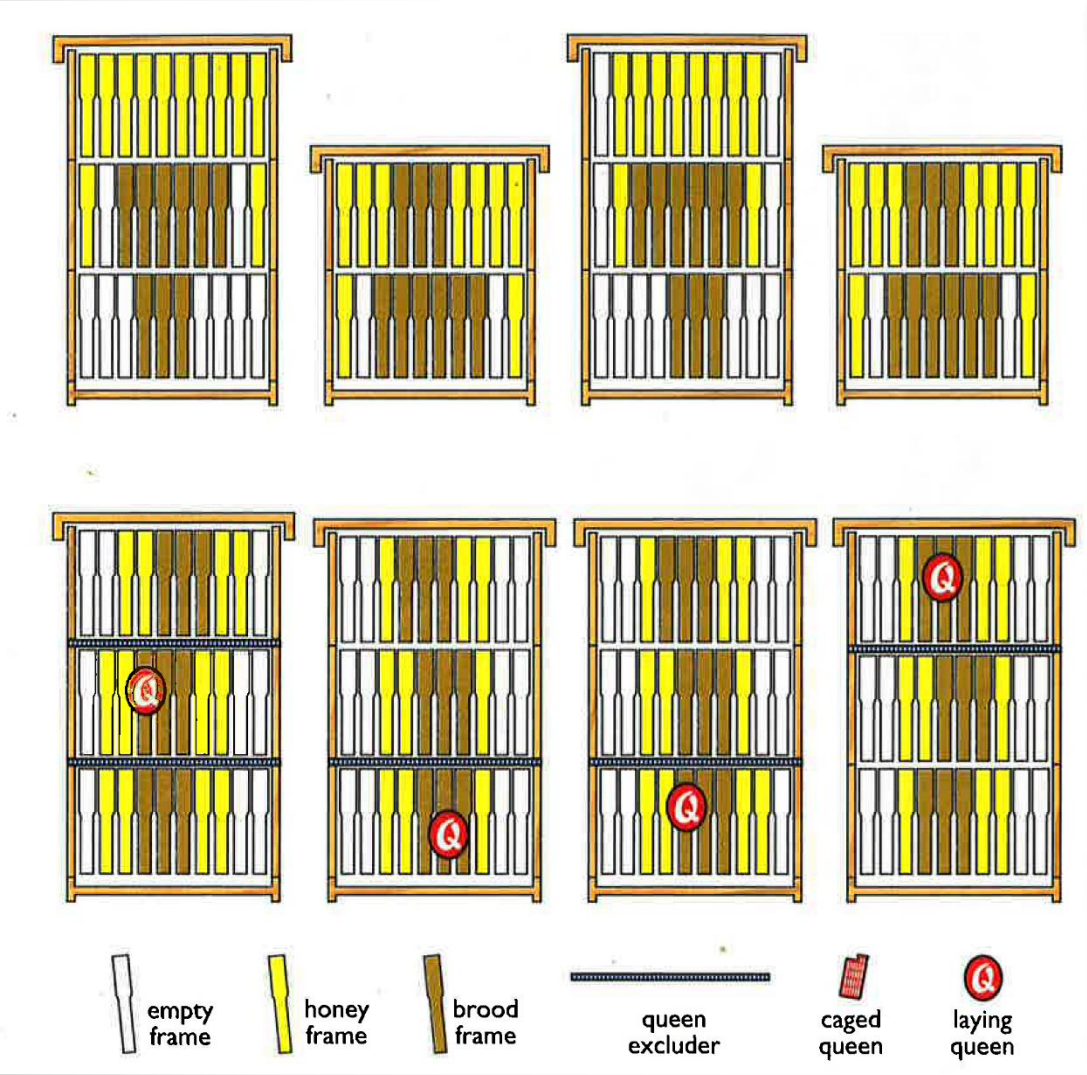


1 frame of brood for mating nuc

2 frames of brood for an increase colony

3 frames to make a split that should produce honey

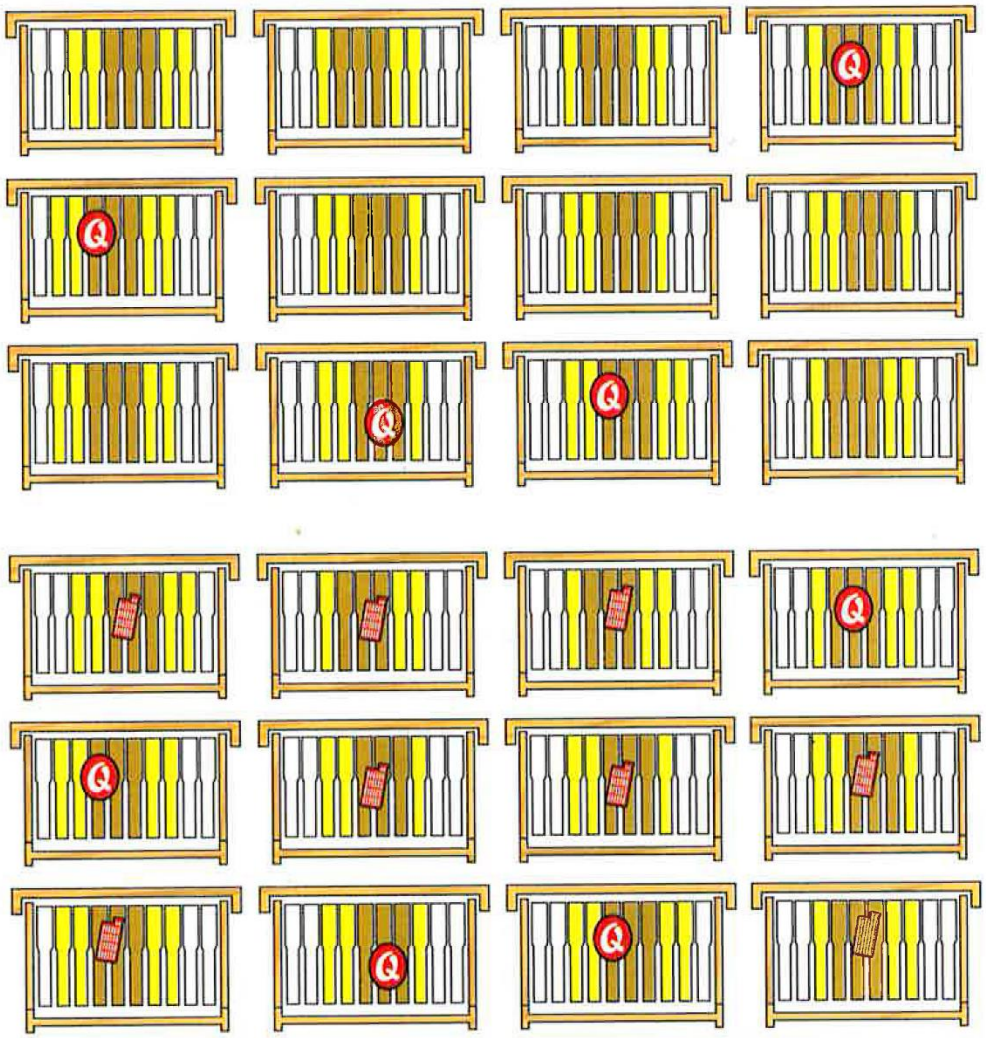
Texas Set-Off Splits



colonies of varying strength in the spring time

<u>arrangement after workup</u>: each box has 3 frames brood, 3 frames of honey/pollen, and excluders used to pin queen

Texas Set-Off Splits

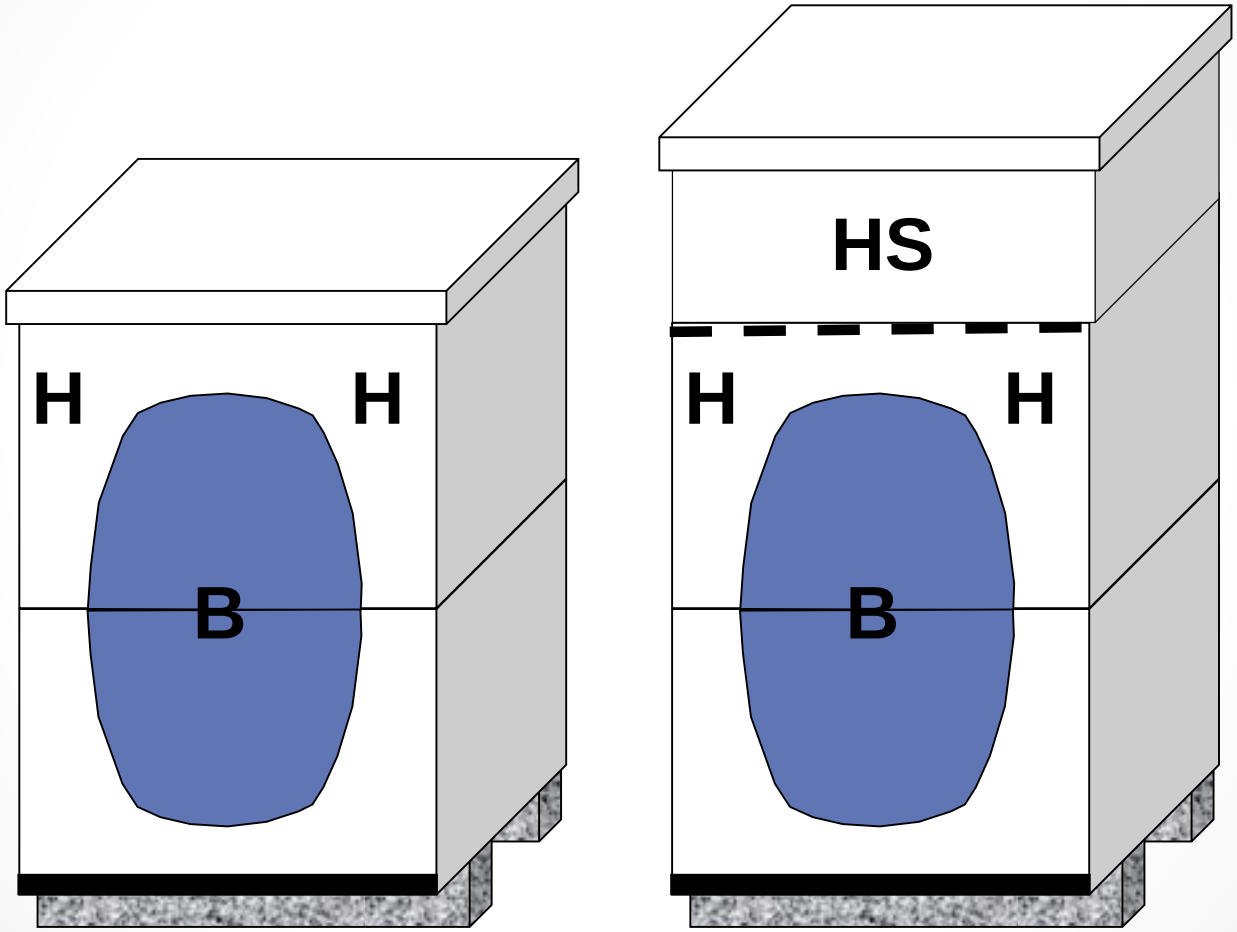


<u>Night after workup:</u> all boxes placed onto bottom boards

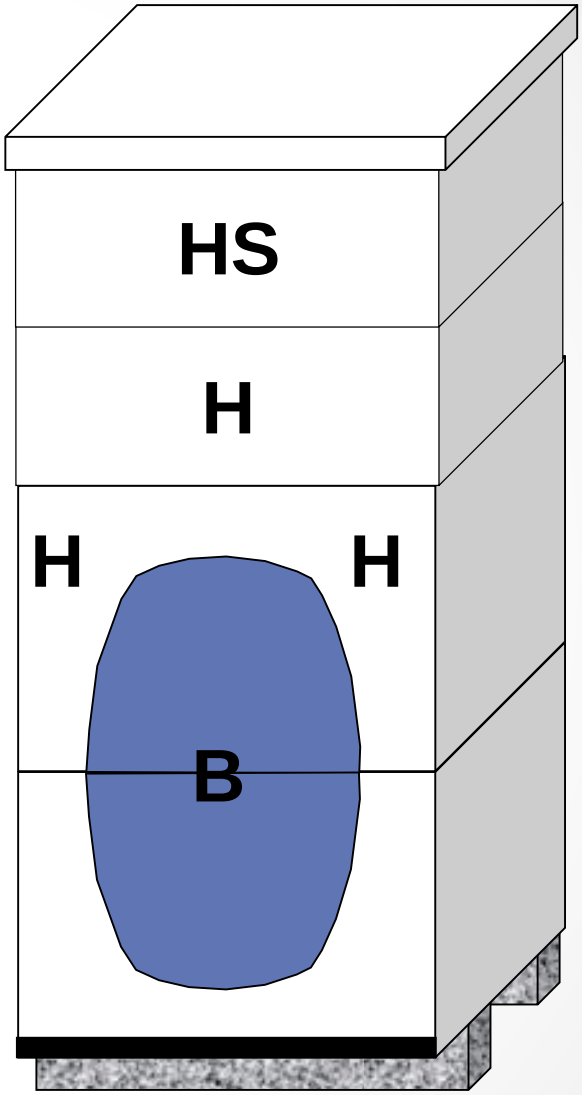
<u>Next day:</u> caged queens placed into queenless units

Honey Production

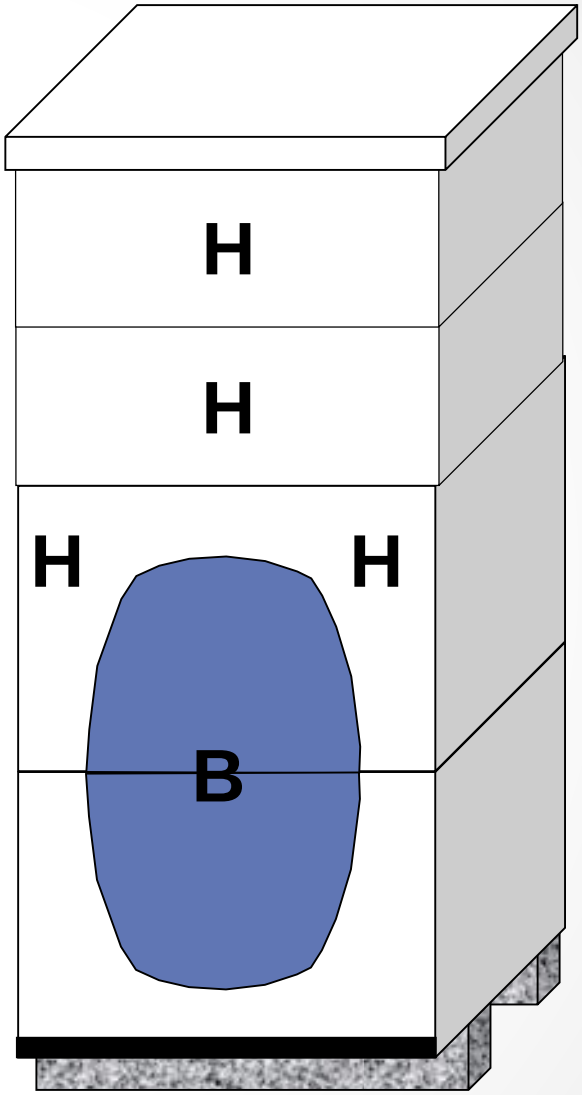
LATE SPRING



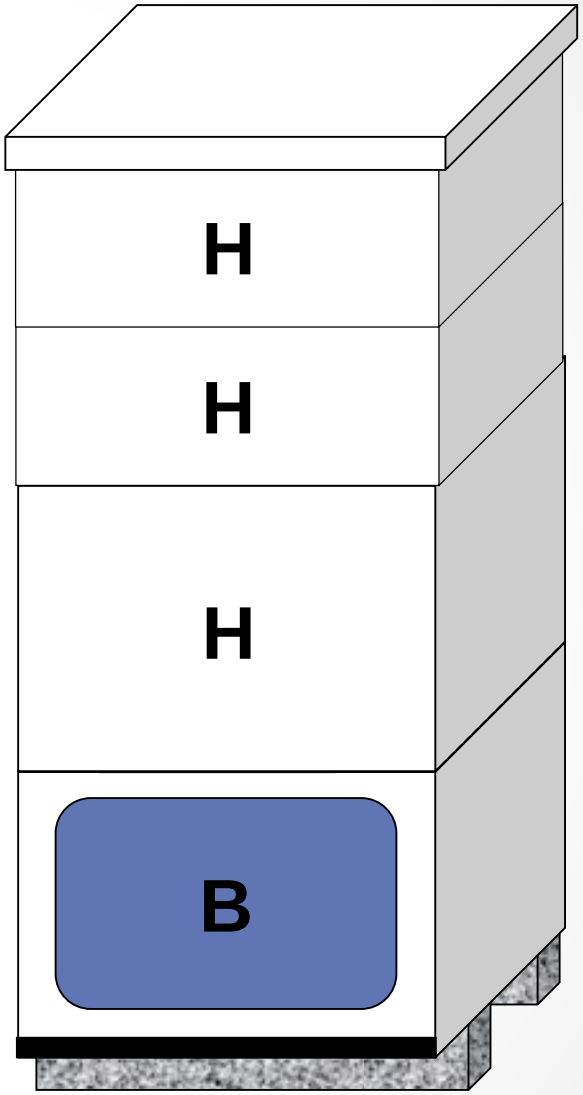
EARLY SUMMER



MID-SUMMER



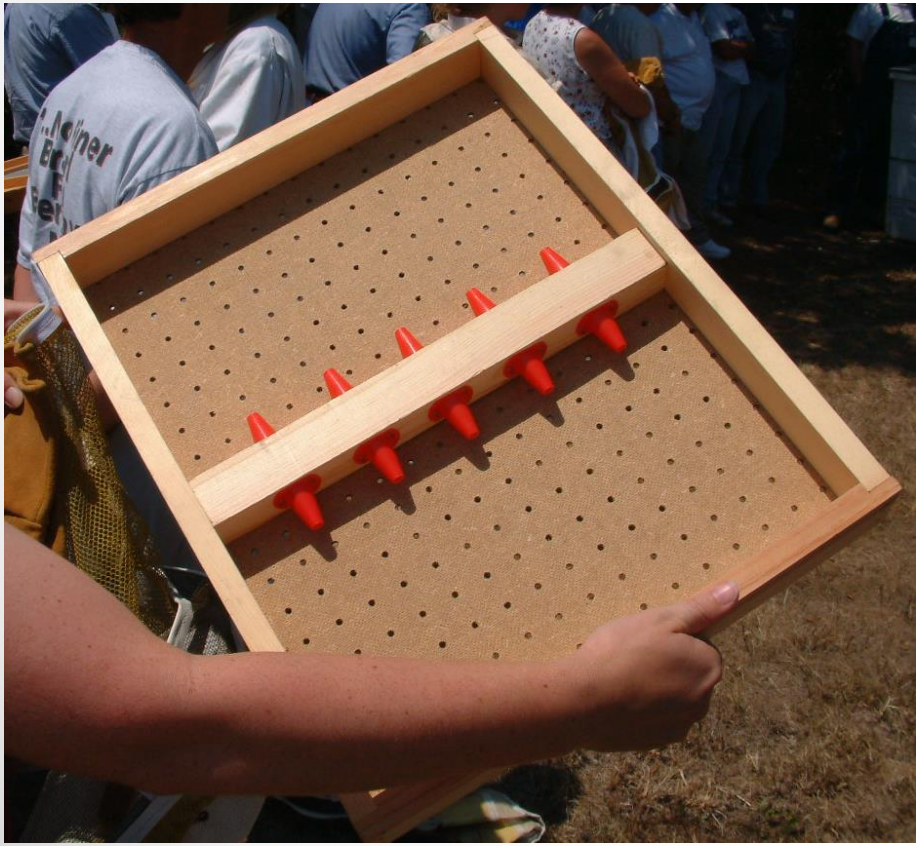
LATE
SUMMER



Nectar → Honey

- Nectar is a dilute solution of fructose, glucose and some sucrose
- Bees add the enzyme invertase to nectar, regurgitate the mixture into honeycomb, and evaporate the excess water
- The fully ripened and capped product is a complex mixture that we call honey

Bee escape boards




Bee escape
board

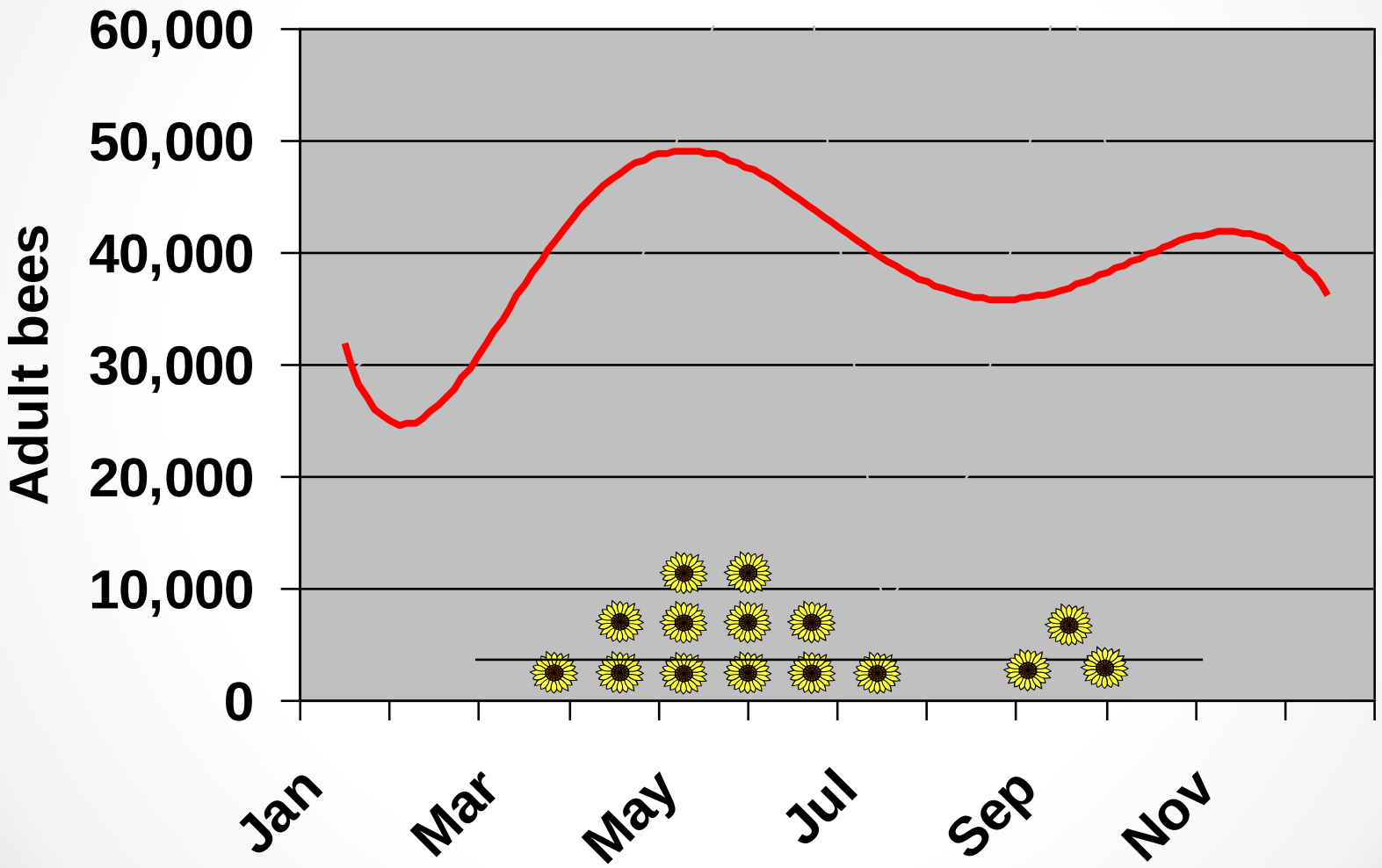
Bee repellents

Honey Harvest

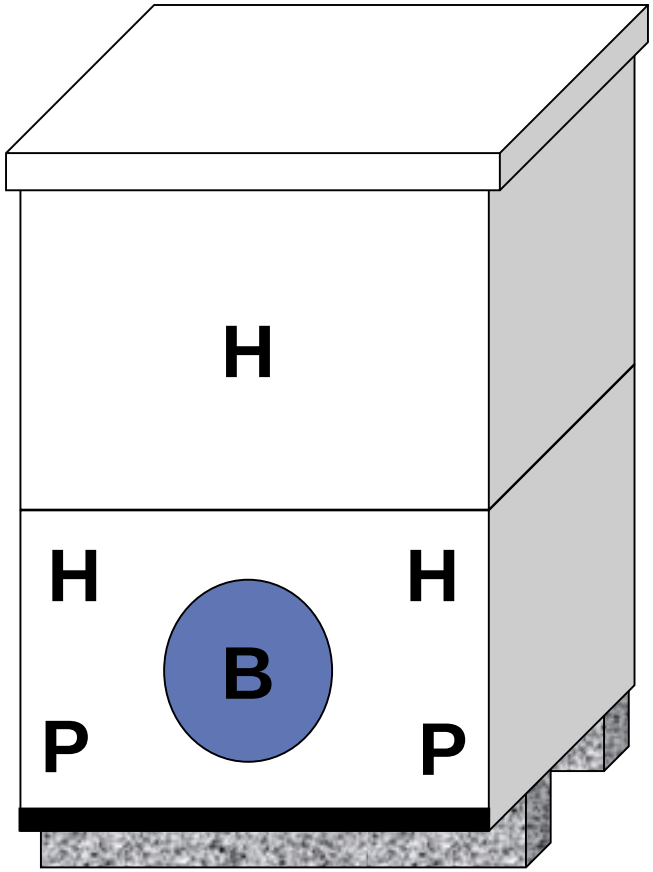
Honey Production in 2011

State	No. Colonies	Yield per Colony (lbs.)	Avg. Price per pound	Total Value ($ million)
Mississippi	16,000	98	$1.44	2.2
South Dakota	265,000	58	$1.51	23.2
North Dakota	510,000	91	$1.50	69.6
Montana	157,000	74	$1.58	18.4
all of U.S.	2.6 million	66	$1.73	285.7

Annual cycles of colony population and food resources



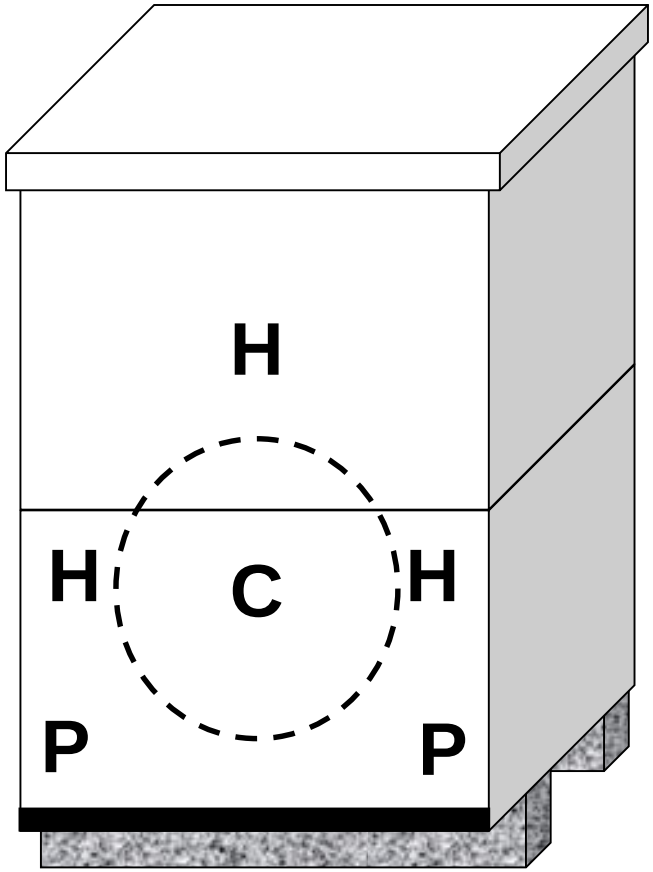
EARLY FALL



Combine weak hives

- Newspaper method

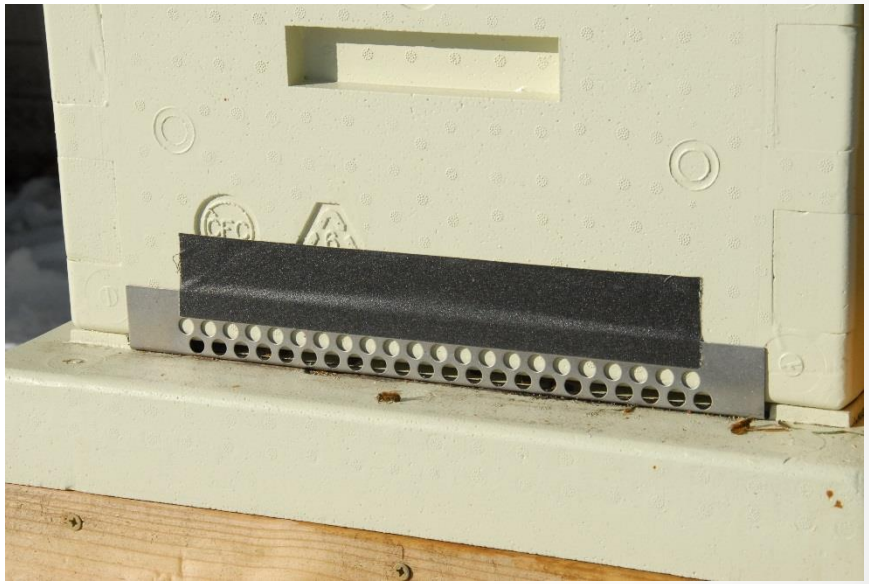
LATE FALL



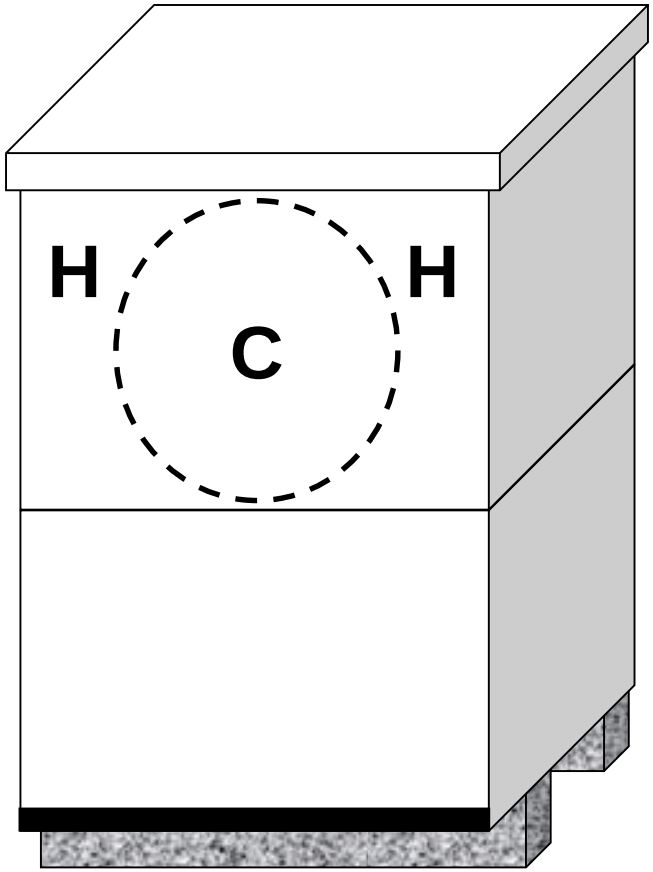
Final Check

- Install mouse guards
- Ventilate moisture
- Heft for estimating proper weight
- In warm winters, re-check in early January

Reducers & Mouse Guards



WINTER



Colony Needs

- 50-60 pounds of stored honey or sugar to survive a winter
- 50-60 pounds of pollen per year to grow normally
- Be sure to leave the old fall pollen in the hive during winter – the bees will need this as soon as the queen begins laying eggs in January
- Always provide protein supplement in winter sugar food (it won't hurt and it probably helps)

Winter Stores

- ≥ 70 lbs. stored food → 18% colony loss
- < 60 lbs. stored food → 55% colony loss
- Typically, 45-65 lbs. stored food should be sufficient in moderate winters

Feeding Sucrose

- Dry Sugar – does not stimulate foraging activity
- Thin Syrup (≤ 50%) – stimulates foraging, comb construction, and brood rearing if trickled to colony
- Thick Syrup (67%) – usually does not stimulate; used in autumn feeding to offset short-falls

Feeding Sucrose

- **33% Syrup: trickle; stimulates brood rearing**

4.2 lbs. sucrose + 1 gallon water (makes 1.2 gallons syrup)

- **50% Syrup: spring feeding**

8.3 lbs. sucrose + 1 gallon water (makes 1.6 gallons syrup)

- **Thick Syrup (67%): autumn feeding**

16.6 lbs. sucrose + 1 gallon water (makes 2.3 gallons syrup)

Making Fondant (soft candy)

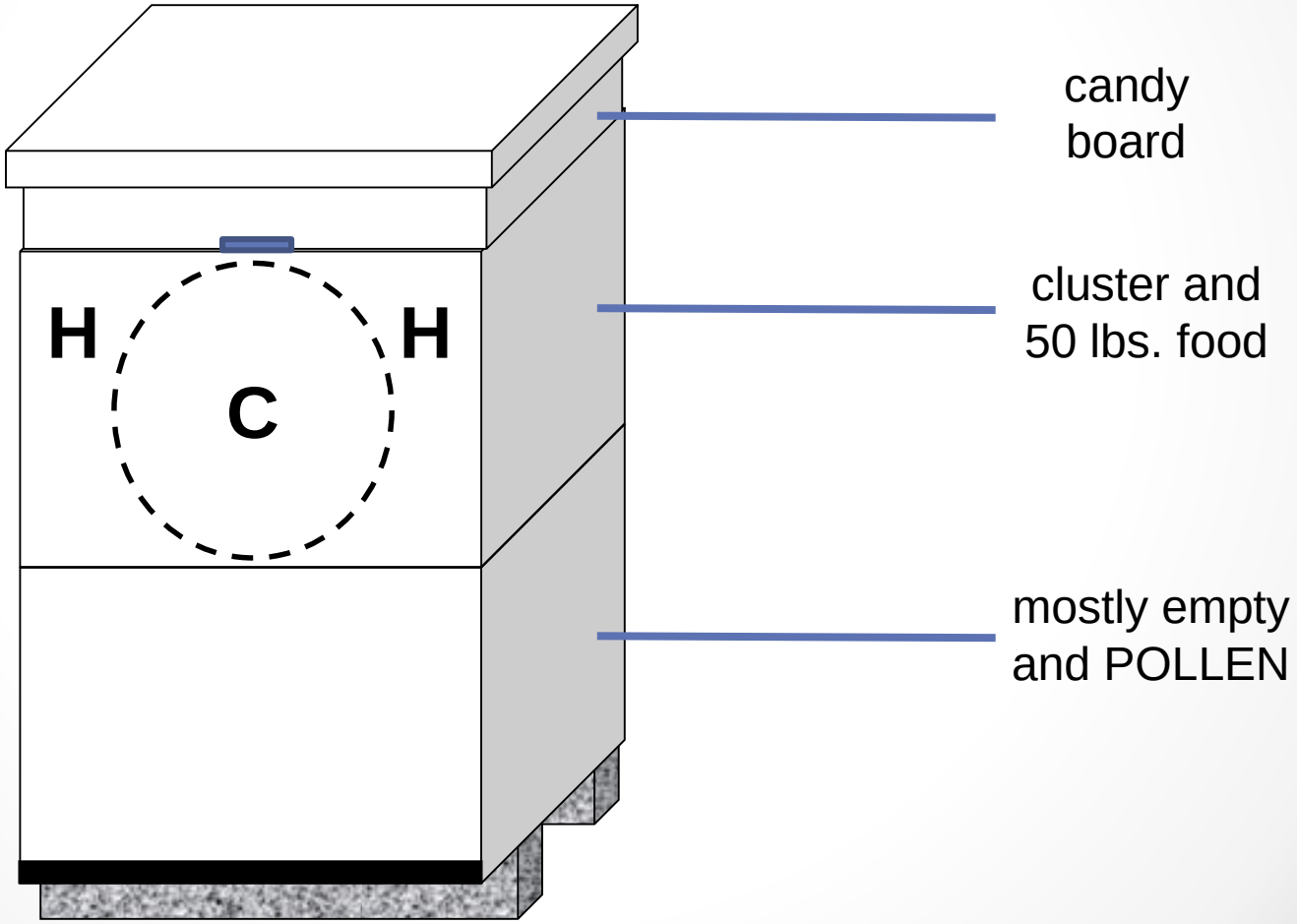
- 10 lbs. table sugar (sucrose)
- 4 cups water
- 1 tbsp. white vinegar or lemon juice
- 5 drops essential oil (lemon grass)

Feeding Fondant

Candy Boards

- Better than syrup during cold weather (syrup will chill your bees)
- Easy to keep above cluster and check; can be changed in 15-30 seconds
- Easy to add protein supplement at the same time
- Allows an upper entrance to help get rid of moisture and allow the cluster ease of access to the outside

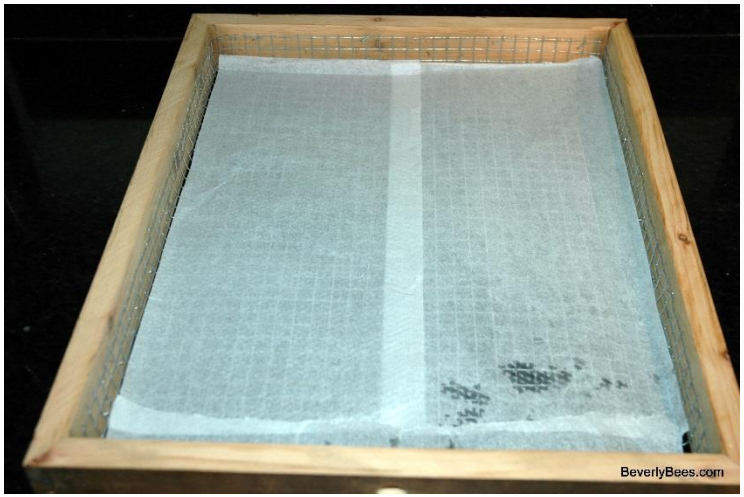
WINTER


H
H
C
candy board
cluster and 50 lbs. food
mostly empty and POLLEN

Making Hard Winter Candy

- 10-15 lbs. table sugar (sucrose)
- 3 cups water
- 1 tbsp. white vinegar
- 1 pollen patty (any brand)

Wire Candy Board



Add Protein Supplements

Feeding Protein to Bees

- Pollen Substitute: 1 part dry mix to 2 parts heavy syrup; dry mix is 1:3 pollen/soybean flour
- Soy-sugar Patties: 1 part dry mix to 2 parts heavy syrup; dry mix is 4 parts soybean flour + 1 part Brewer's yeast

When to Feed Pollen Supplement/Substitutes?

- When flight is restricted (e.g. cool weather in spring)
- Boosting weak or nucleus colonies
- During pollen deficient honey flows
- When pollen source is poor quality, or monofloral

Commercial Protein Supplements

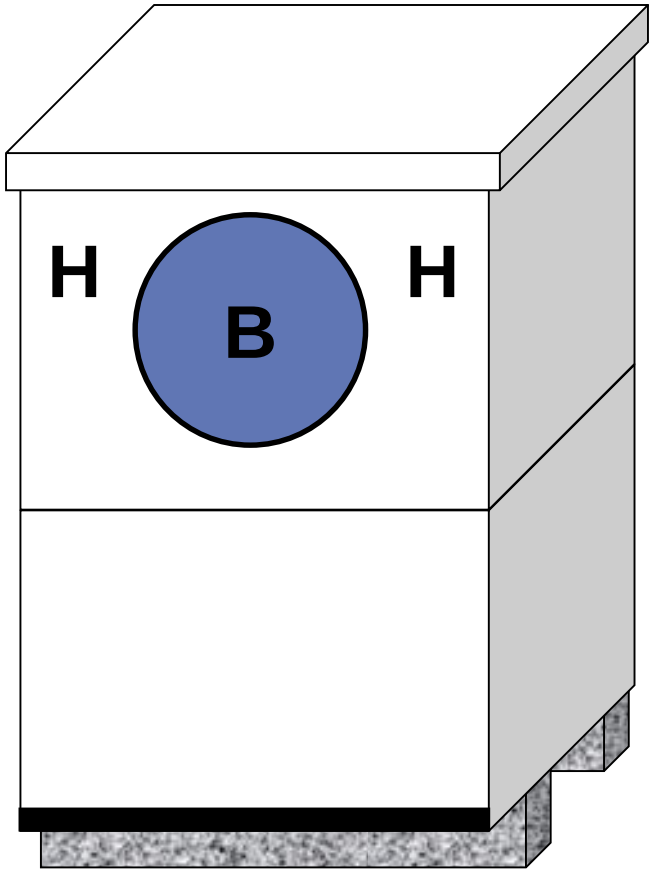
- Global Patties
- MegaBee
- BeePro
- Bee-Pol
- Feed-Bee

Protein Supplements

- Place patties close to broodnest
- Feed a light syrup at the same time; helps stimulate brood rearing
- Be careful in cooler periods!

Newbie Mistakes

LATE WINTER



Final Thoughts

- Leave candy board in all winter
- Check it 3-4 times during winter and replenish when necessary
- Provide protein supplement by January to help brood rearing
- Do not begin syrup feeding until mid- or late March

Primary Goal

- Colony strength is important
- **Winter Bees** are most important
- **Good Queens** essential
- Control Varroa
- Consider a brood break with requeening

Spring Colony Size

8 to 10 frames bees

4 to 5 frames brood

At least 15 lbs. honey

At least 1 to 2 frames pollen