

Managing Honey Bee Populations for Greater Honey Yield



Prepared by
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for
Southern Oregon
Short Course
April 18, 2015

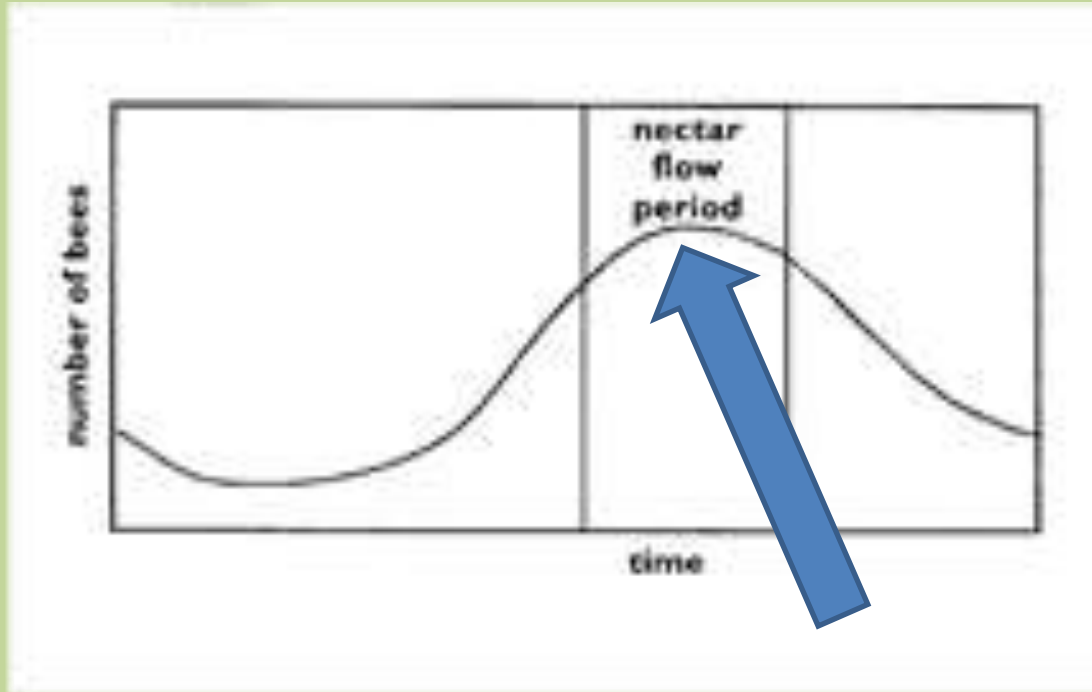
We'll discuss

- **Introduction**
- A seasonal approach:
 - Fall
 - Spring: Varroa and stimulative feeding
 - Summer
 - Winter
- An alternative configuration

Honey Bees Hoard Honey

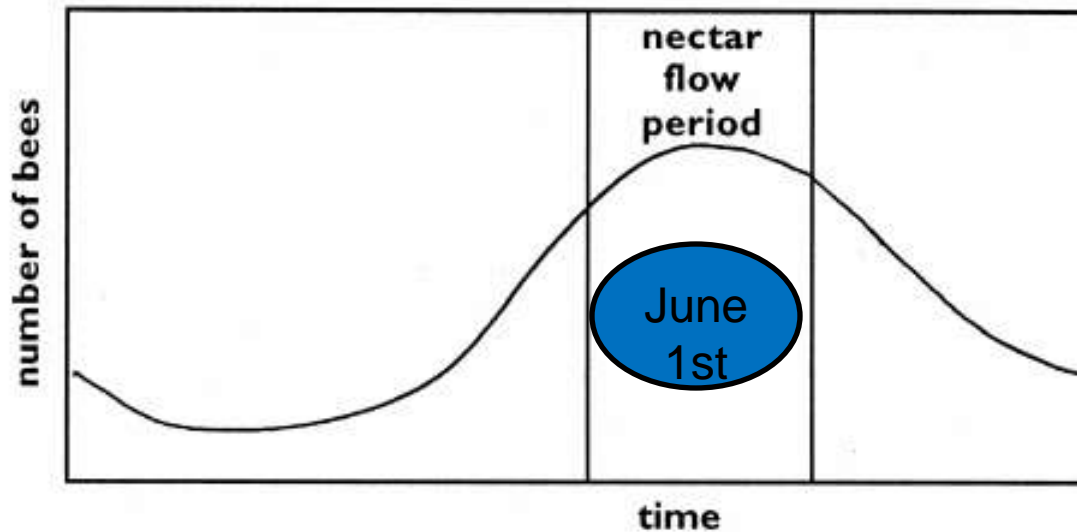
- The methods and techniques described in this program are intended to support this natural drive
- The more methods utilized, the greater the likelihood of producing large populations and honey production
- A seasonal approach is used to organize the methods

Biology of Honey Production

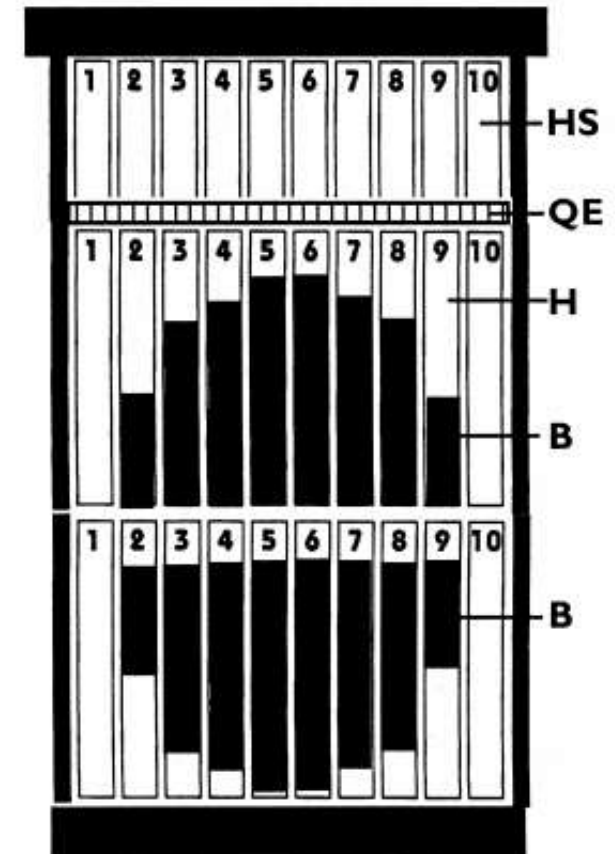


Nectar flow = major nectar producing plants bloom.
Bees collect and store nectar converting it to honey.
Winter stores for them, surplus for you

Basic idea: be prepared to take advantage of available resources and bees' hoarding instinct



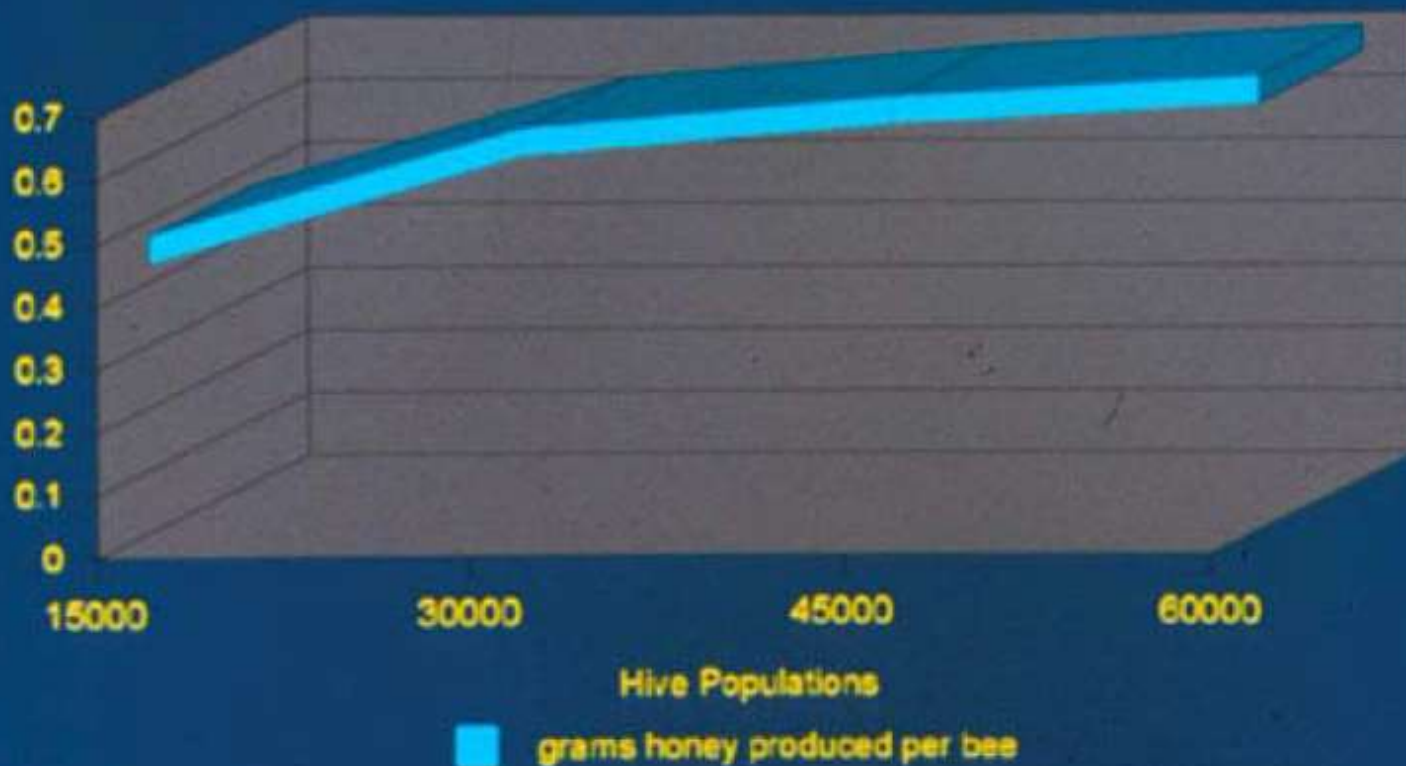
Spring colony expands & prepares for the summer nectar flow



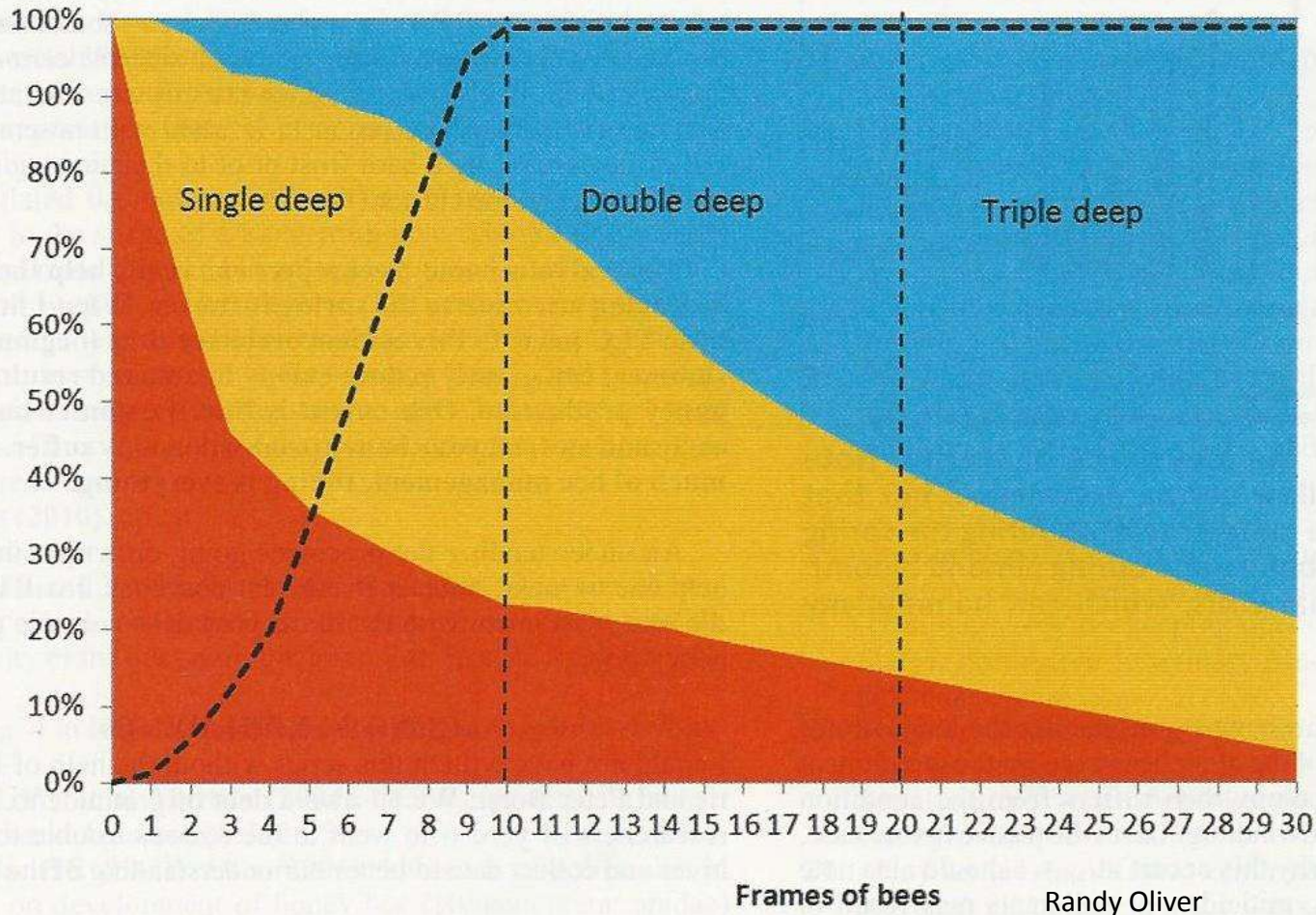
Fully expanded colony

Hive Populations and Honey Production per Bee

Farrar 1944



Hive population and honey production per colony



% of bees making honey

% of bees covering brood

Frames of bees

Randy Oliver

Bottom line: Going from single deep to double deep means triple number of bees available for honey production

Big diversity means big population



- Location – location – location
- Where you set up your colonies affects quantity and quality of the food they collect

We'll discuss

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Seasons are circular like a merry-go-round; you can jump in at any point



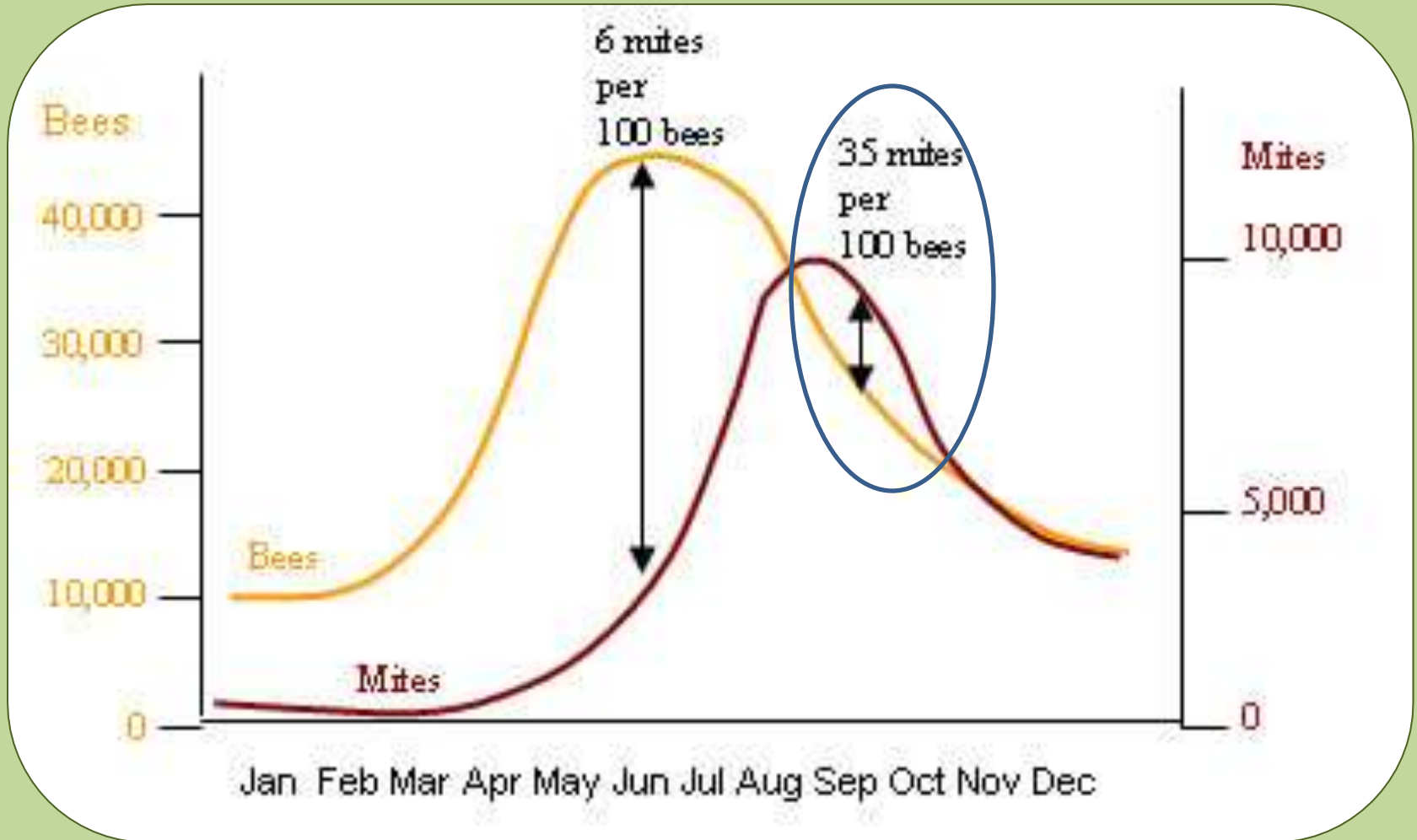
A Seasonal Approach

- Fall
 - Make sure they are strong and healthy
 - Well provisioned going into winter
 - Re-queen?
 - Store drawn brood and honey frames

Strong & Healthy Bees = Maximum
Population = Maximum Honey Yield



If the ratio of mites to bees is high in the fall, the bees will suffer and so will honey production



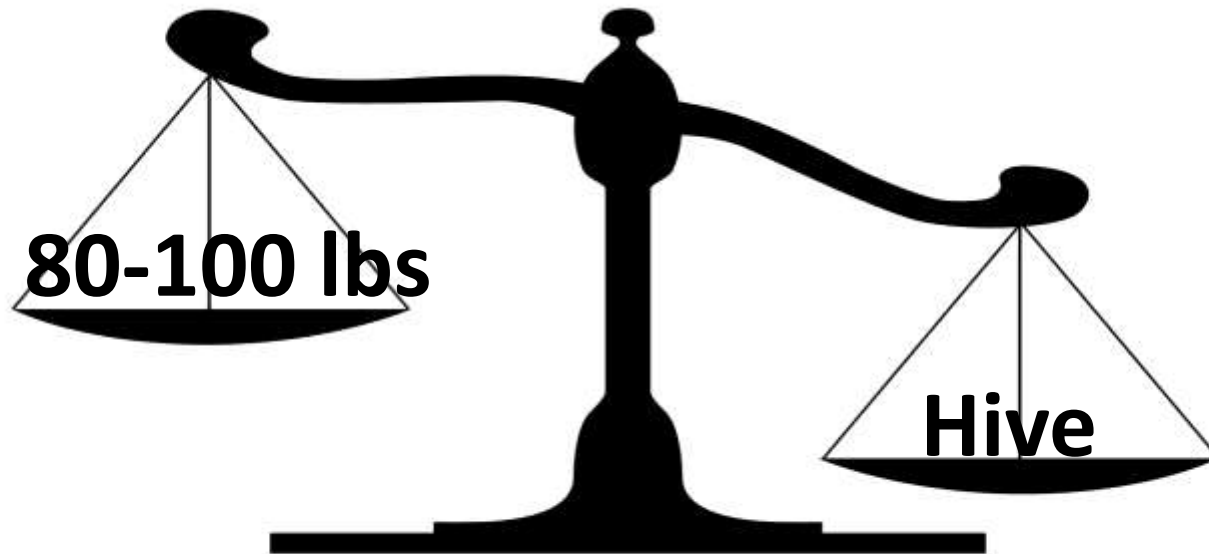
Beyond the economic threshold



Well provisioned and staying that way: unloading free loaders



Honey Stores



Fall is your last chance to feed syrup to the bees



Feed

Feed

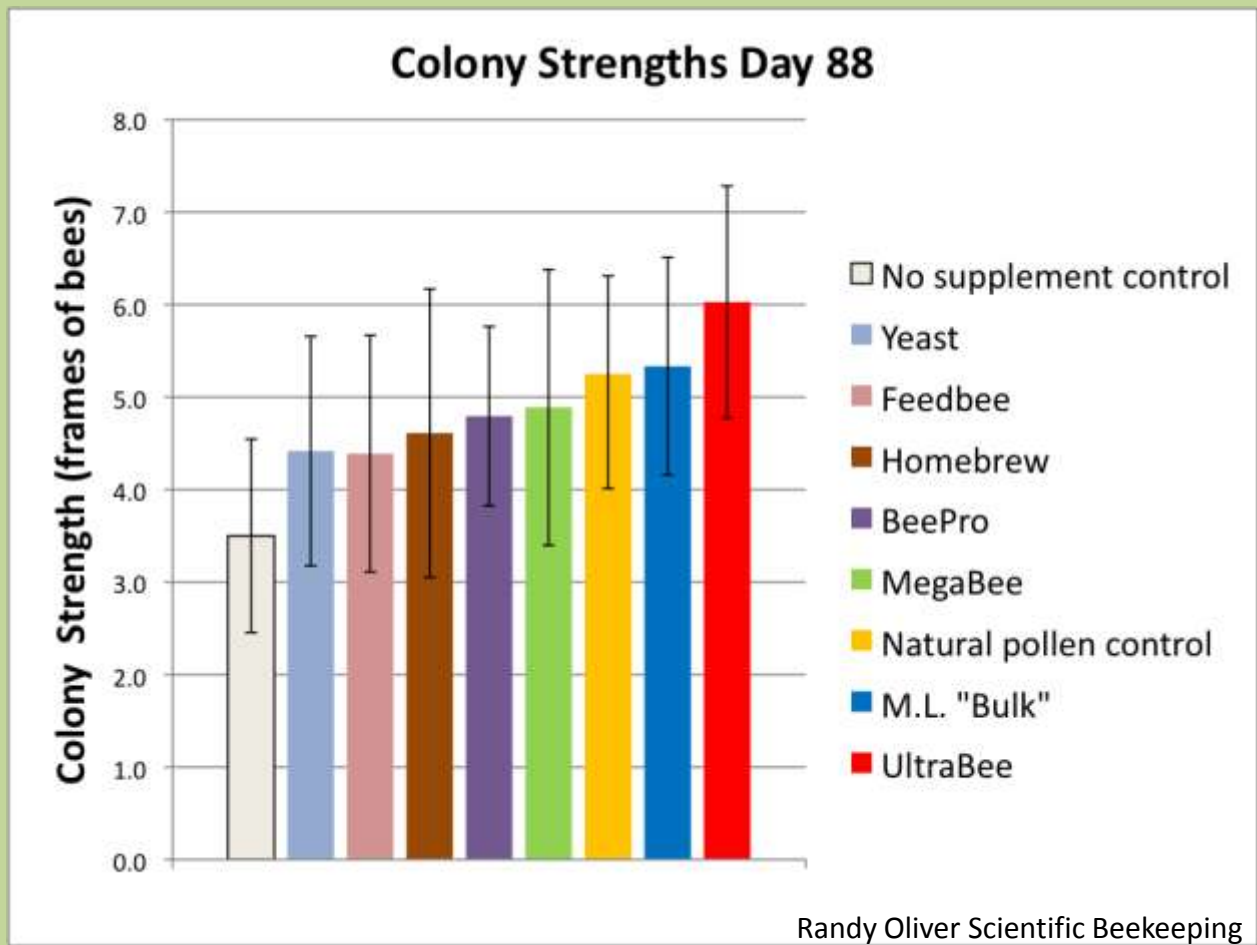


Feed

When being fat is a Good Thing



Protein Substitute is Necessary to Make Fat Bees



A young queen is necessary for a strong population and honey production

“Young queens prevent swarming better than one year old queens and much better than two year old queens.”

George Imerie



What, you raise green bees!

Years ending in 1 or 6 WHITE

Years ending in 2 or 7 YELLOW

Years ending in 3 or 8 RED

Years ending in 4 or 9 GREEN

Years ending in 5 or 0 BLUE

I thought
she was
lying about
her age!

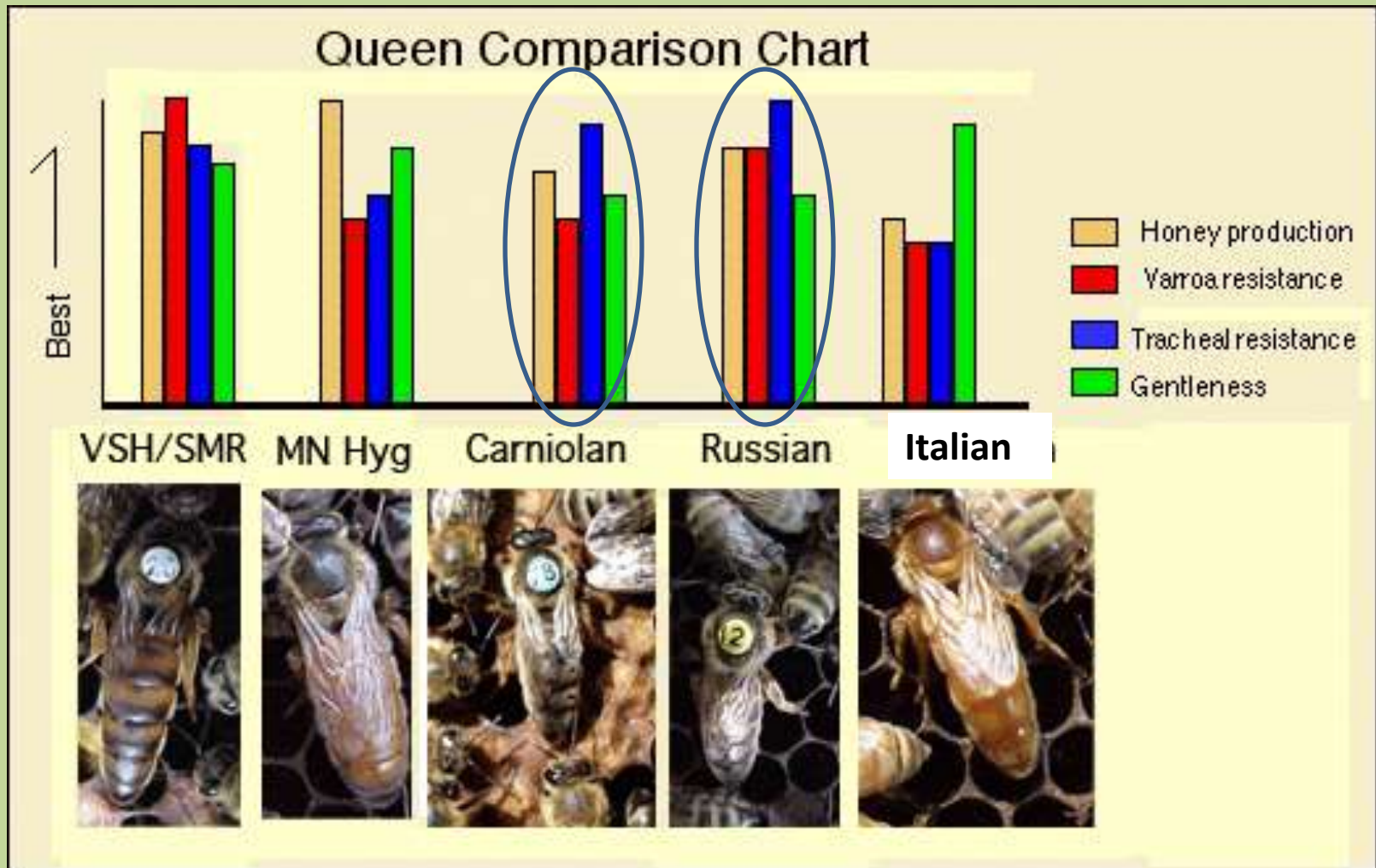


(c) Kathy Keatley Garvey

Fall Requeening

Pro	Con
Timing breaks brood cycle helps reduce pest problems	No honey flow = more irritable bees
Better mated	Hive more populous; harder to find old queen
Less expensive	More difficult to introduce
Faster population build up in later winter/early spring	Less time to assess queen's performance
Better availability; no back log	

Race and Honey Production



Source: Glenn Apiaries

“Carniolans are known for their explosive, early spring build-up at the first sign of pollen.”

Brother Adam

Pros

- Earlier morning forager
- Forages on colder and wetter days than most other bees
- Overwinters well on small stores, as queen stops laying in the fall
- Explosive build up in early spring
- Exceptionally gentle and easy to work
- May interrupt brood rearing during times of drought
- Does not typically propolize heavily
- Creates less brace and burr comb
- Crosses well with other varieties



Cons

- Likely to swarm unless carefully managed (no room to expand)
- If pollen is scarce brood rearing greatly diminishes



Hubert Tubbs shared that his Russian hives produced 130-150 lbs of honey. This compares to approximately 84 lbs of honey for non-Russians.

Pros

Cons

•Resistant to [Varroa Mites](#)

•Resistant to [Tracheal Mite](#)



•Quick Spring build up

•Winter tolerant

•Brood rearing is highly dependent on forage availability

•Increased tendency to swarm



•Tend to propolize

•More time needed to introduce to non-Russians

Note: Russians require different management; they are NOT for beginning beekeepers

Stored and Stacked



Winter

Keep them dry and well provisioned



Stay on top of food stores



When do you need to feed?



Feeding



Bees' reward for being good



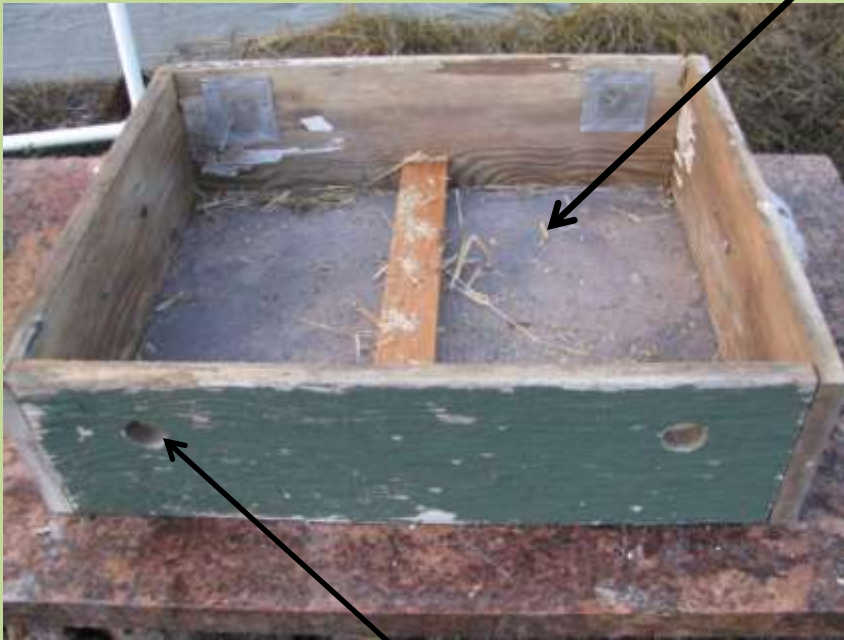
Winter



Insulation Box

Insulation Box

Screen to hold hay in place



Screened ventilation holes



Spring

When you see
Red Currant
blossoming,

it is time to ramp up your population
management activity

A Seasonal Approach

- Spring
 - Control Varroa
 - Stimulative feeding
 - Balance population with growing room
 - Re-queen
 - Pyramiding
 - Reversing
 - Supering

Maintain Varroa below the economic threshold: Do a Varroa Count



You MUST control Varroa mites!

Economic threshold

- Point at which the level of infestation is too high
- Various ways to determine this
 - Alcohol wash
 - Sugar shake
 - Collection board

 - For more details go to www.scientificbeekeeping.com

Alcohol wash = Gold Standard
Goal = Less than 5%

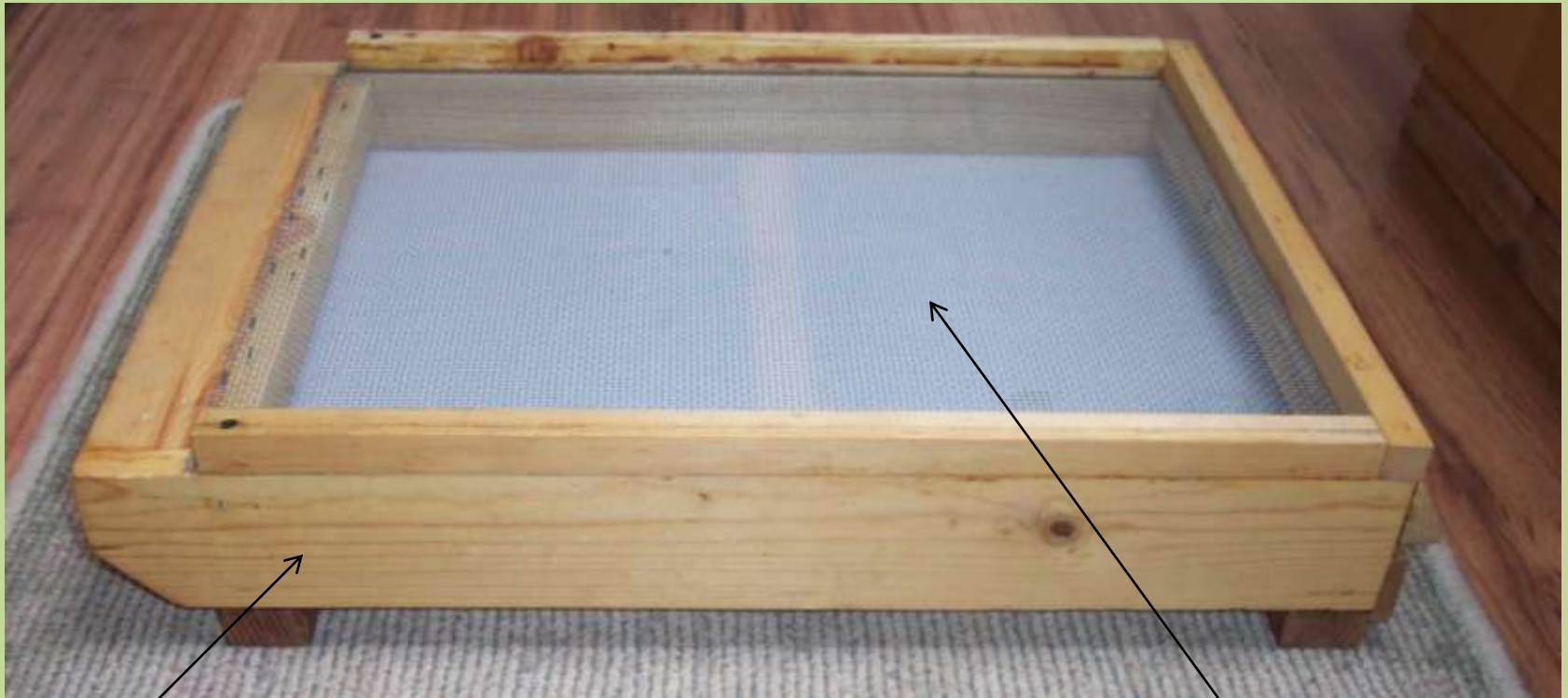


Sugar Shake



24 hour natural drop

Does not give % of infectation



Screened bottom
board

Collection
board

Collection board for 24 hour natural drop



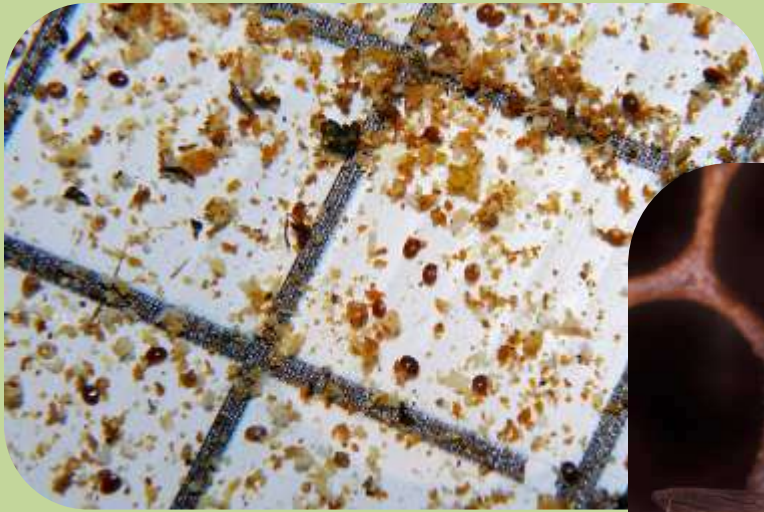
Use hard plastic

Draw a counting grid

Spray with Pam

Slip into slot in screened
bottom board

Frequency: monthly
except winter



Notice the 8 legs

How are your mite numbers trending?

The trend is what is important



Early season (March)

Less than 10 mites
on the collection board
in a 24 hour period

Watch for false negatives



WANTED

DEAD OR ALIVE



Varroa destructor

April Fools Day

Don't be foolish. Start building your population now.



Don't leave them searching for a stimulating meal!



Carbohydrate Feeding



- 1:1 sugar to water ratio with Honey Bee Healthy added
- Mimics the honey flow
- Workers feed queen more
- Queen responds by laying more eggs

Protein Feeding

- Simulates a pollen flow
- Insures that there is available protein for the colony
- Stimulates the bees to feed the queen more
- Queen responds by laying more eggs



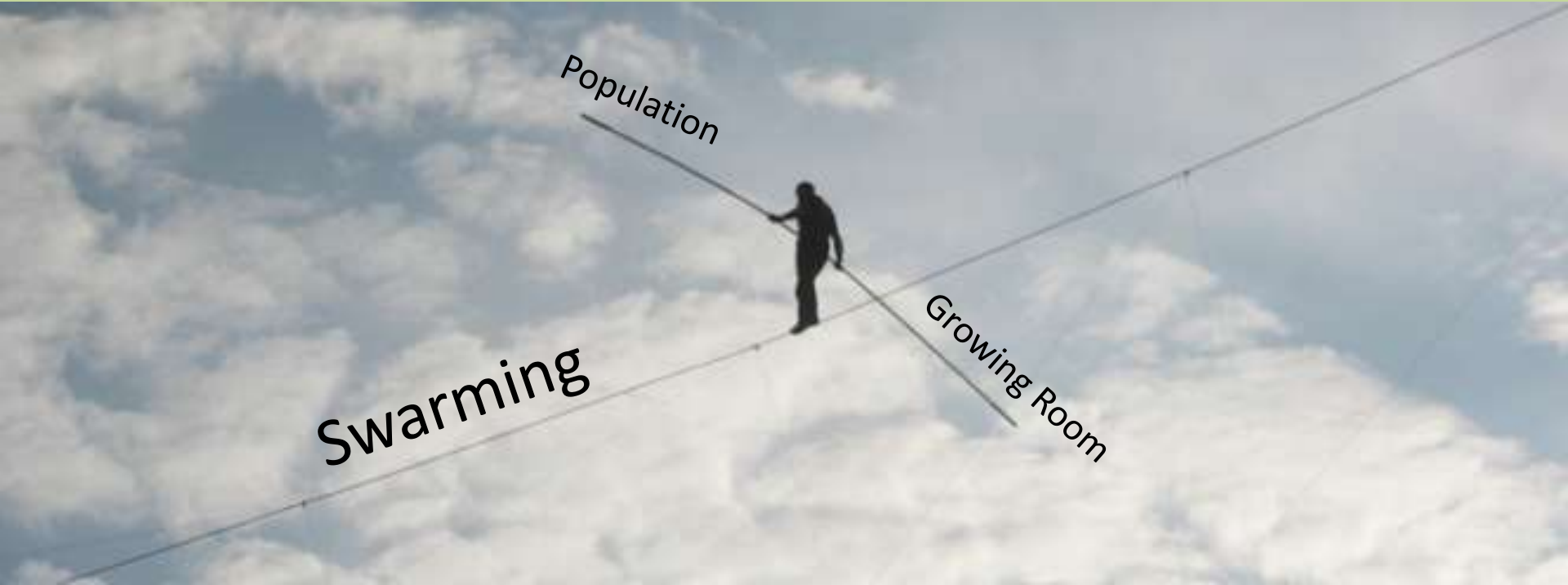
Feed carbohydrate & protein simultaneously
to build population BEFORE
the nectar flow NOT ON the
nectar flow



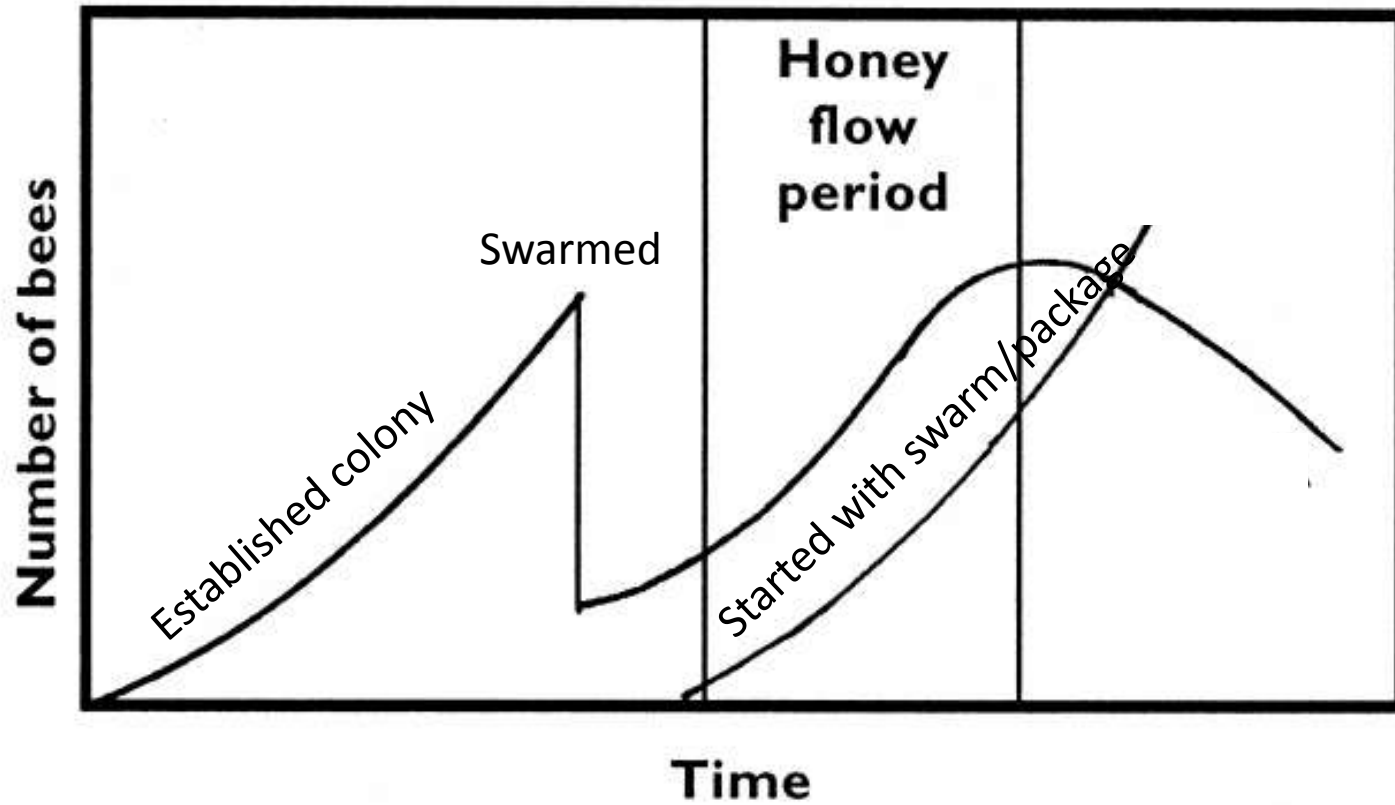
Once you start simulative feeding, you
CAN NOT STOP

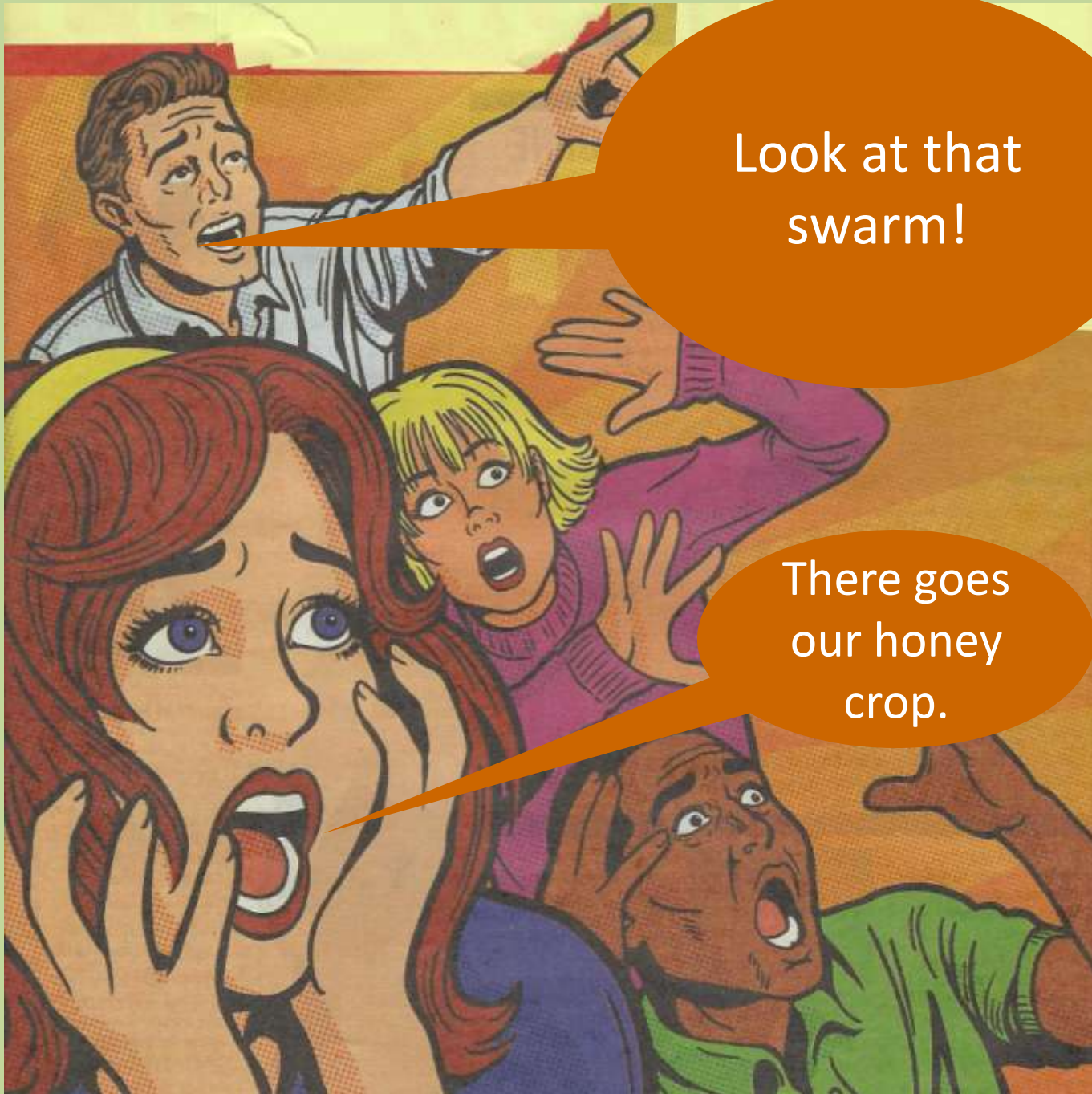


Your Balancing Act



When the balancing act is off balance

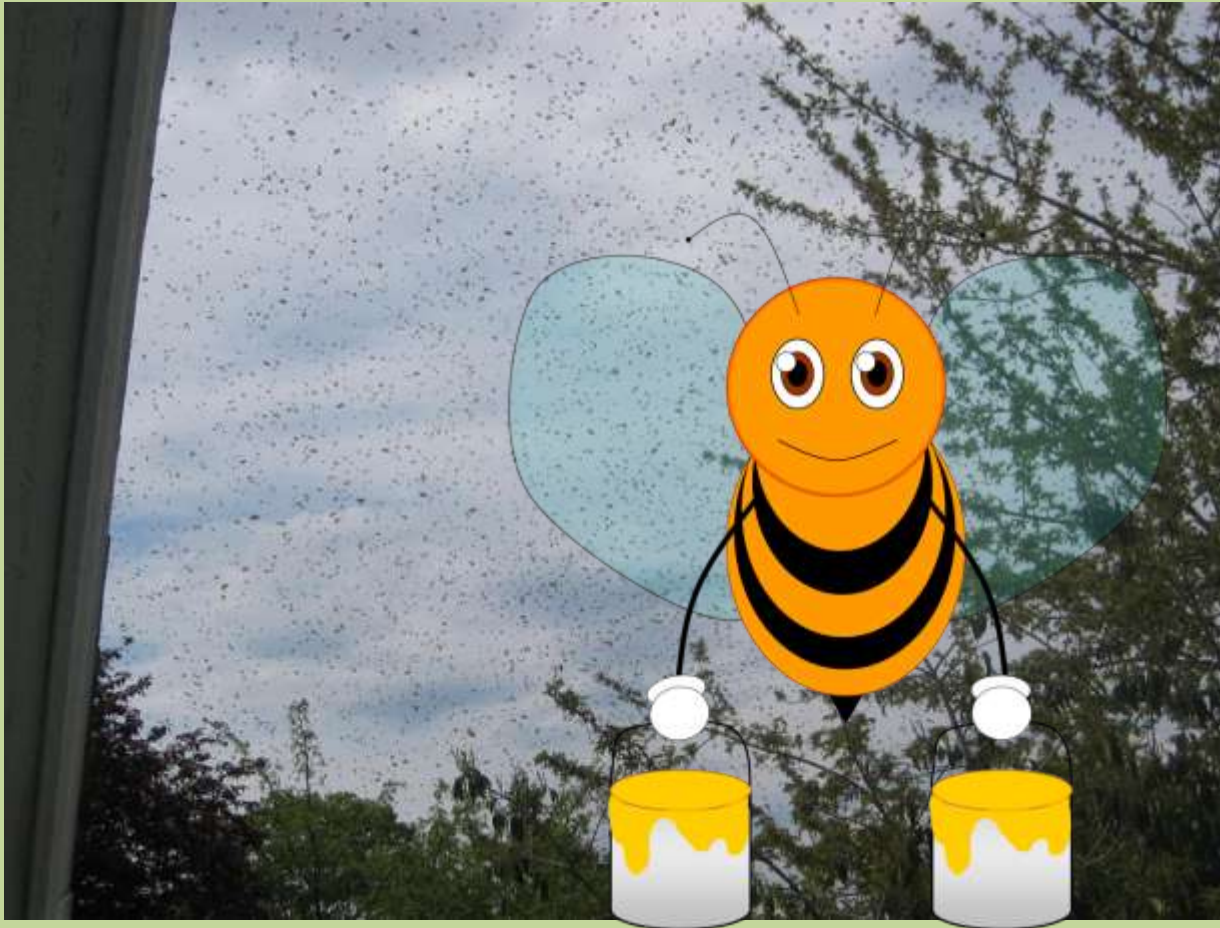




Look at that swarm!

There goes our honey crop.

There goes the queen & your future
honey



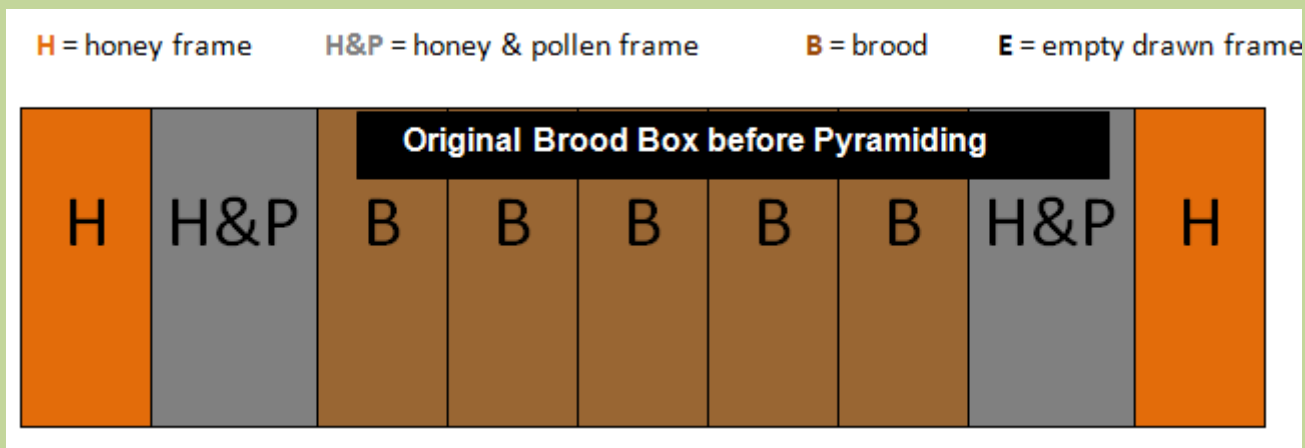
Requeening: Swarm Prevention

Spring Requeening

Pro	Con
Smaller colonies	Interferes with spring build up
Less likely to swarm	Good mating early in season less likely
Easier to introduce	More competition to purchase queens
Vigorous egg layer = large population for nectar flow	Dependent on variable weather
Large population going into winter	
Time to assess queen performance/replace if needed	

Growing Room: Pyramiding

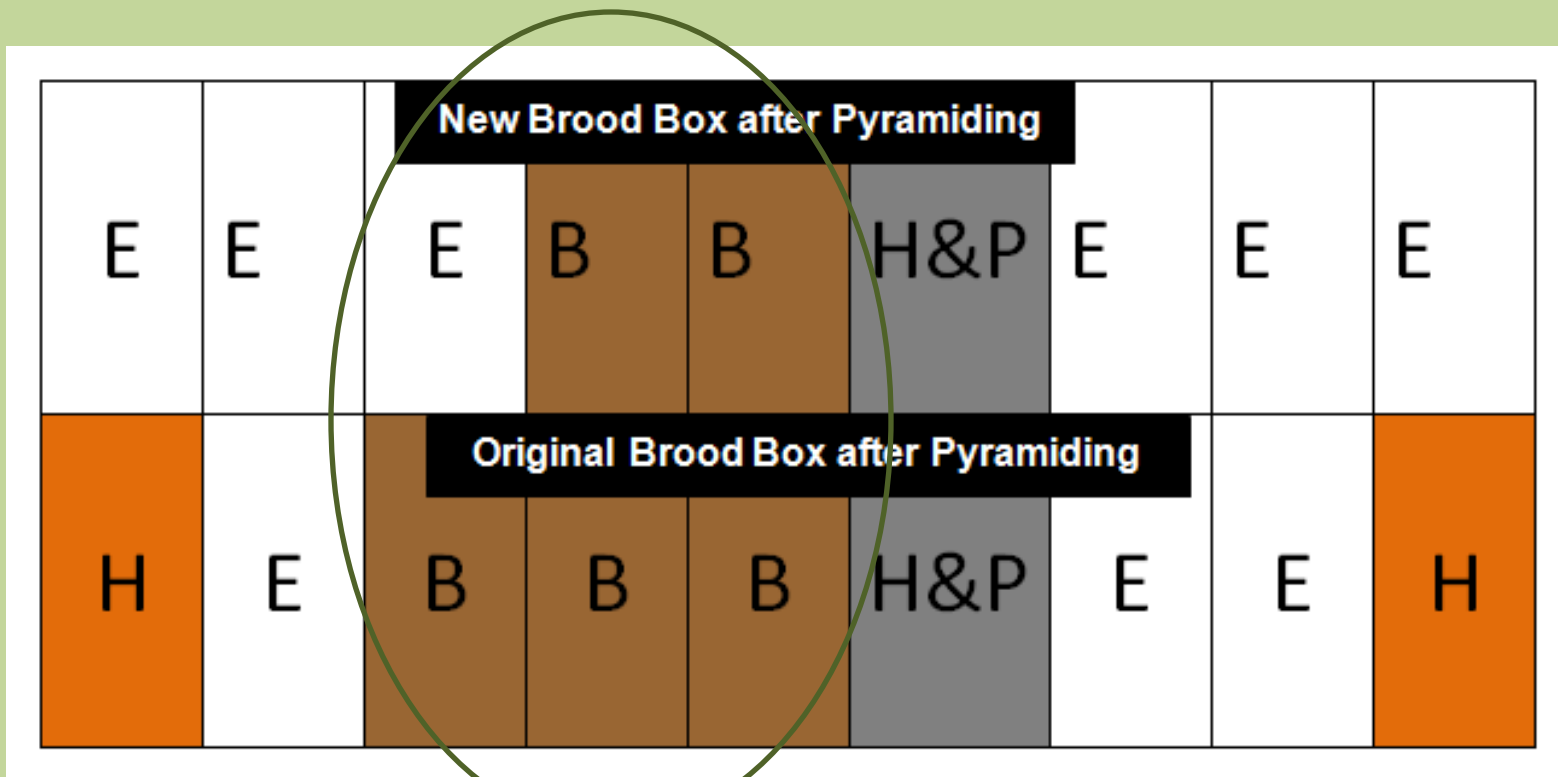
Going from 1 to 2 brood boxes



1. Make space in the center of the new brood box by removing about 3 empty frames
2. Take less than half the brood from the original brood box & place in the space created in new brood box
3. Center remaining brood frames in original brood box & fill the space created on the sides with frames (preferably drawn) removed from the new brood box

Pyramiding after adding 2nd brood box

Why must the top & bottom brood frames be adjacent!



Adding empty frames

Empty drawn frame

Preferred



Empty non-drawn frame

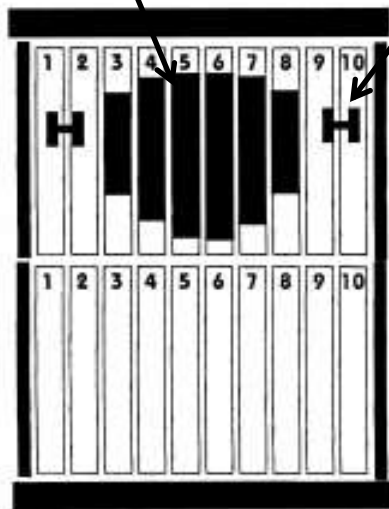
2nd best



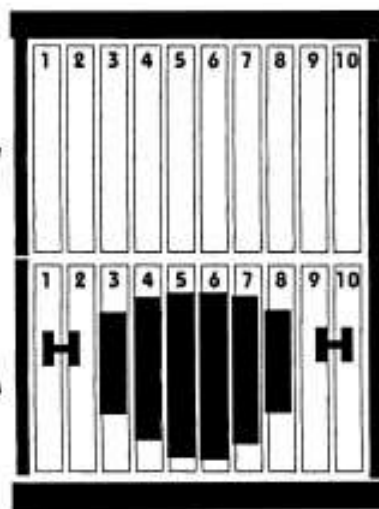
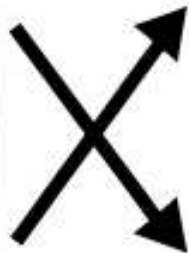
Growing Room: Reversing starting with 2 brood boxes

BROOD↓

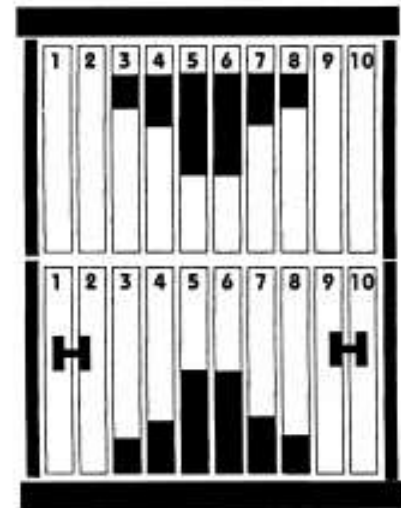
HONEY
↓



Before reversing



Correct reversing



Incorrect reversing

Reverse Brood Boxes



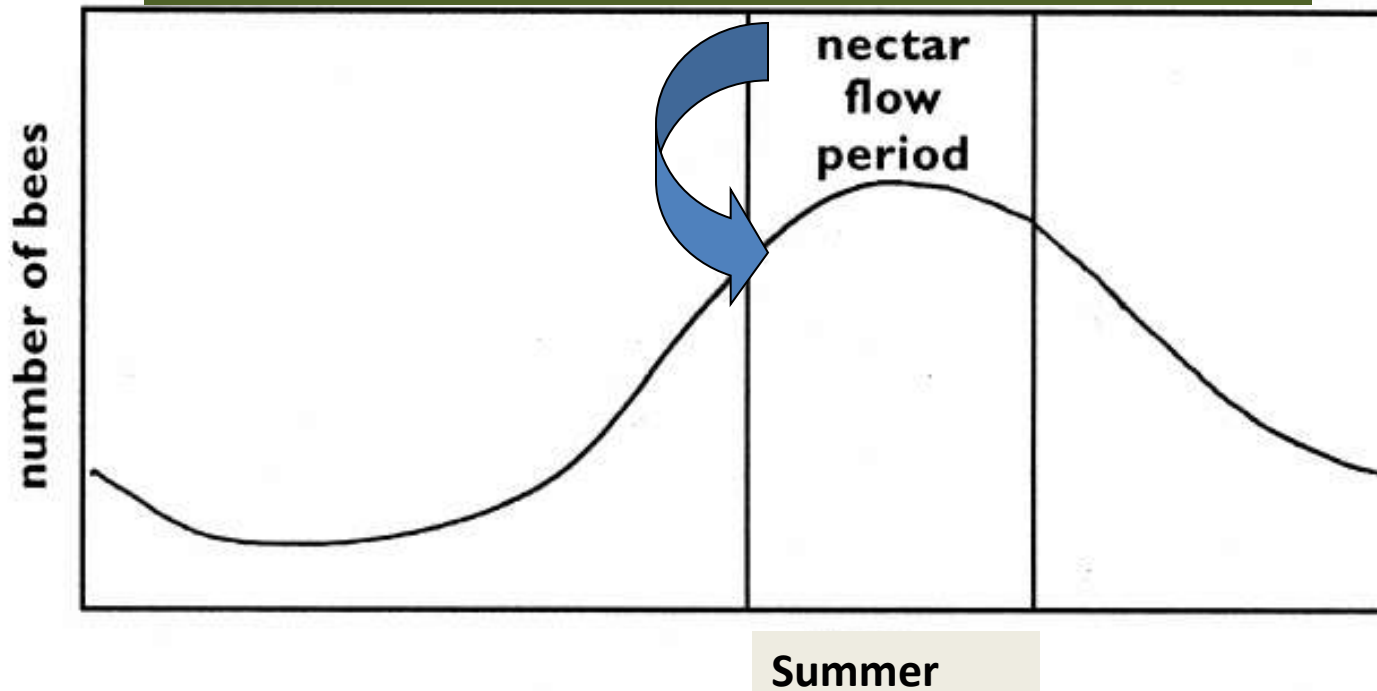
Before



After

Supering

Start supering before the nectar flow



Anticipate...Manage colony population...timing!

Follow the 70% Rule*

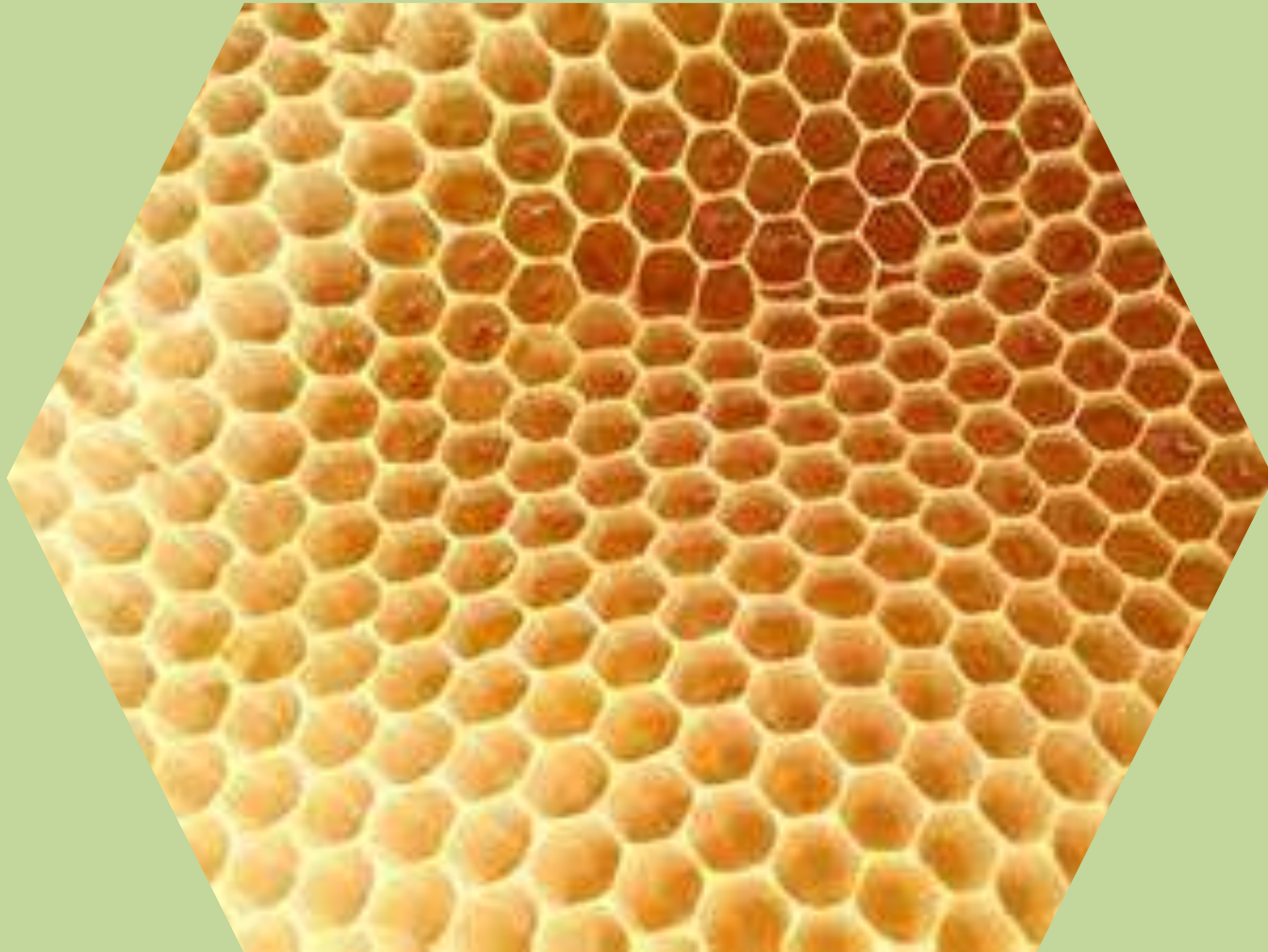
When 1st brood box reaches 70%, add a second brood box

When the second brood box reaches 70%, add a honey super, etc

***60% rule
for
Russians**



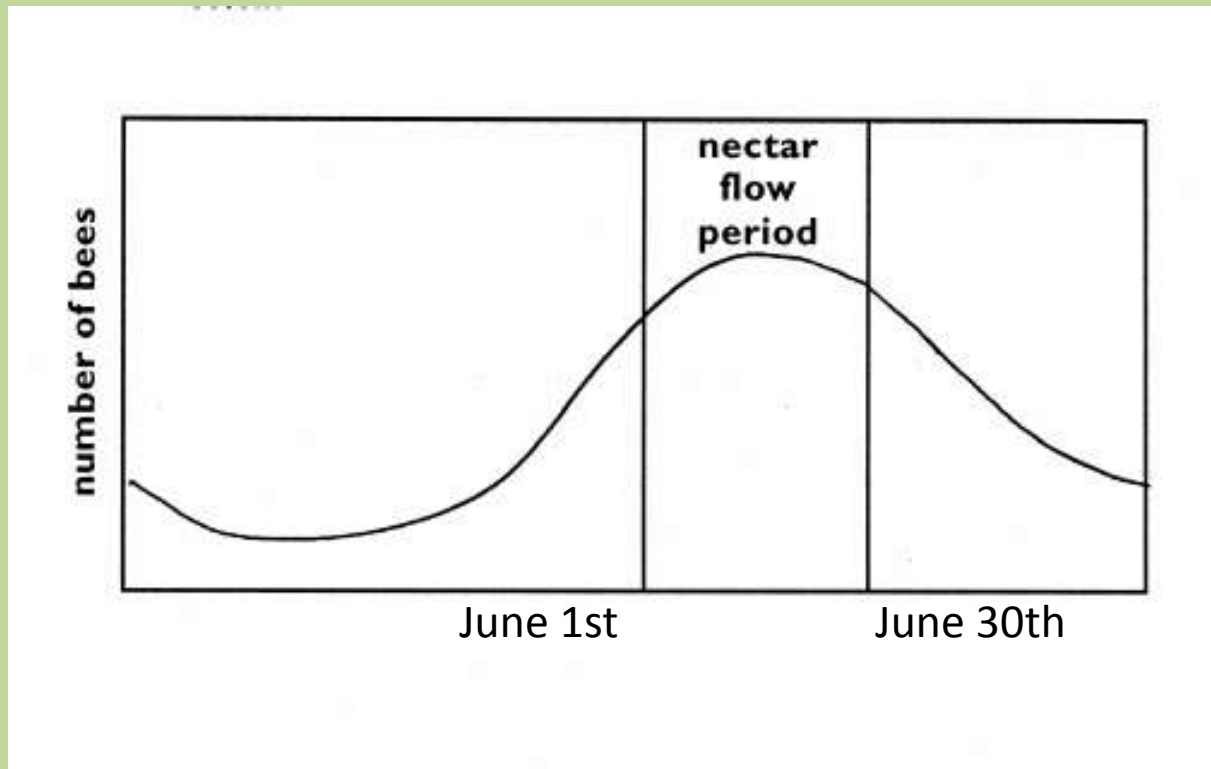
Drawn comb: worth its weight in gold



When you see the Blackberry blossom in early June, the nectar flow has started!



Nectar flow in Willamette Valley



A Seasonal Approach

- Summer
 - Don't BUG
 - Checker boarding
 - Tools of the trade
 - Supering
 - Extract

Summer Don't BUG Us



When is too much honey not a good thing?



The idea behind **checker boarding** is to perforate the barrier of honey in the super above the brood area

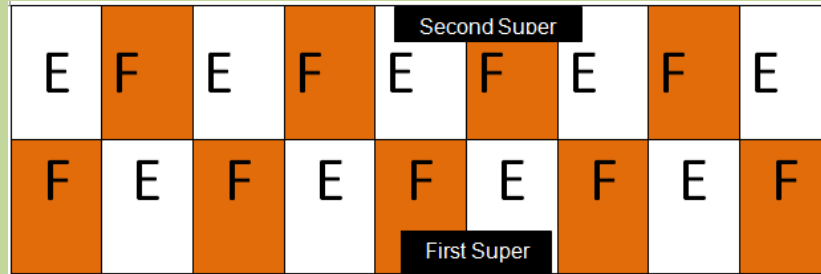
Checker Boarding

- Manages placement of stored honey
- Relieves congestion
- Helps control swarming
- Contributes to increased honey production

Honey Super

F = full frame

E = empty frame



Honey & Brood

Less Honey & Brood

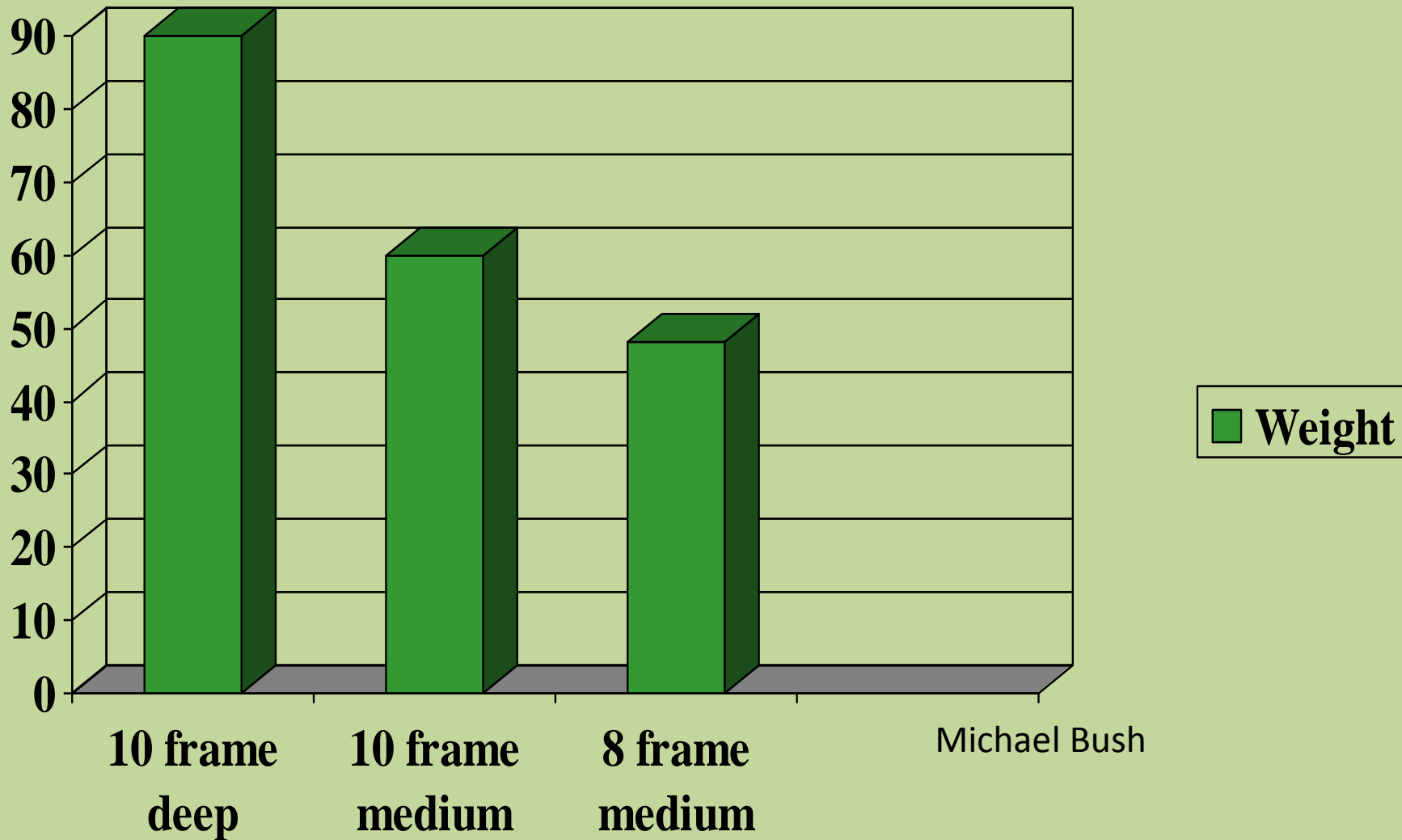
Brood

Brood

Before Checker Boarding

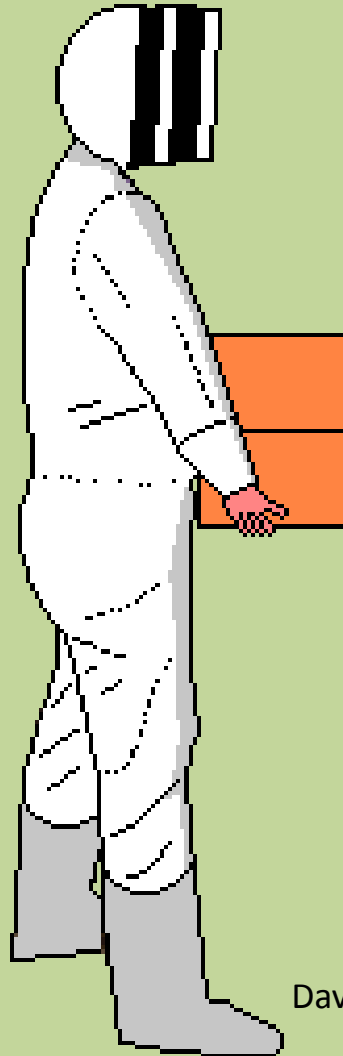
After Checker Boarding

Comparative weight of full boxes



“Friends don’t let friends lift heavy supers”

Jim Fischer



Dave Cushman

Tools of the Honey Trade: Imerie Shim

Western



Dado Cut



Imerie Shim

Why the Imerie Shim?

- Provides upper entrance(s) to the hive. This makes it possible for foragers to gain access to the supers without having to cross a queen excluder (if used).
- Upper entrance(s) relieves congestion not only on the landing board but also in the brood area. It provides the field bees a more direct route to the honey area where the nectar is ripened and stored.
- Improved ventilation making it easier for the bees to vent the hive of the moisture produced from ripening honey.



Imerie Shim Placement



WARNING

Do NOT place Imerie
shim directly above
the brood box!

Continue to follow the 70% Rule*
When the second brood box reaches 70%,
add a honey super, and keep it up during
the nectar flow

***60% rule for
the Russians**



**Do NOT disturb
the brood
chamber during
the nectar flow!**

STOP!

Hold that super

**Some medications must
be removed before
adding a honey super to
the hive**

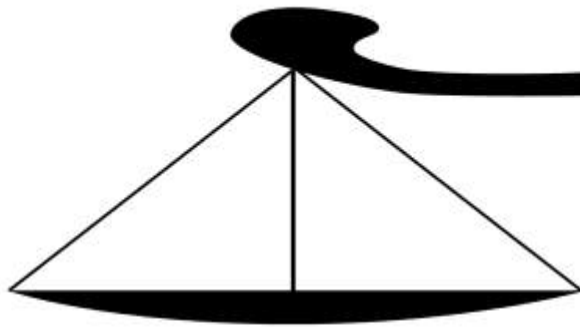
Now this is successful supering!



Extract honey by August 1st

- Remove supers
- Put boxes in hot dry room
- Uncap both sides of frame
- Spin honey out w/ extractor





Surplus for beekeeper

**80 - 100 lbs honey
for bees**

What is honey?

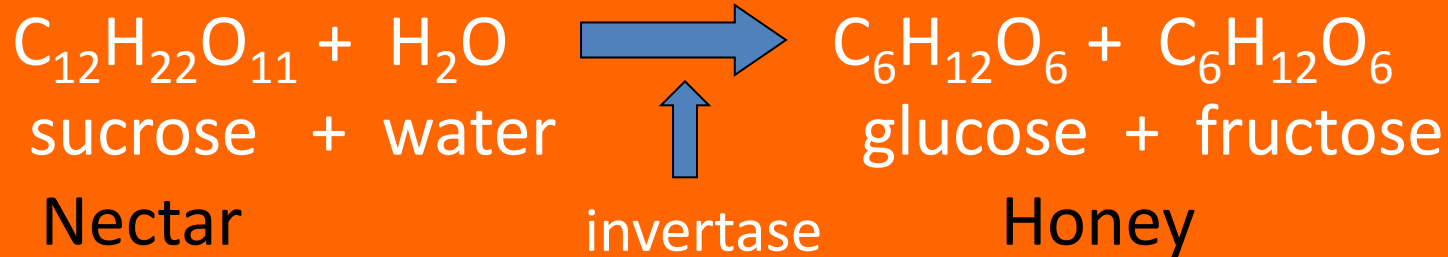




What is honey?

Bees convert nectar....

- chemically into nectar sugars glucose & fructose
- physically into thick consistency with water evaporation



Enzyme invertase chemically converts nectar sugars

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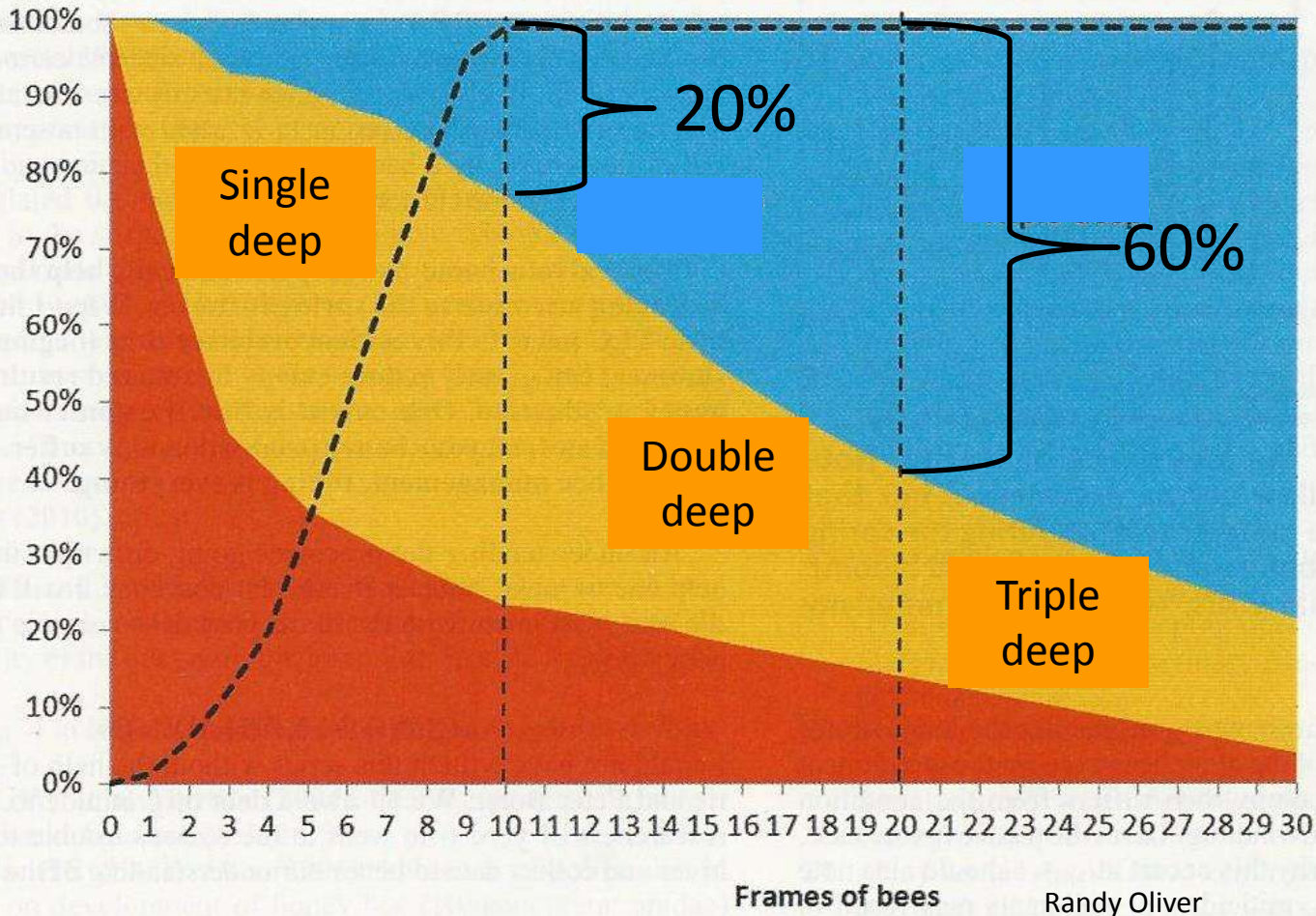
The two queen hive:
a configuration that maximizes honey
production



Why a two queen hive?

- Two queens exist harmoniously in a single colony
- Workers have access to either brood box and honey supers
- If 1 queen dies, second queen remains in colony
- Each box has its own landing board
- MAXIMIZES HONEY PRODUCTION

Hive population and honey production per colony



% of bees making honey

% of bees covering brood

Frames of bees

Randy Oliver

Bottom line: Going from single deep to double deep means triple number of bees available for honey production

“When 2 queens are better than 1”



Setting up a 2 queen hive

- Early May or fall, select a 2 brood box hive to be divided, remove the old queen, make the division and introduce a new queen to each division
- Separate the two brood boxes and place them adjacent to each other on the same footprint of the original hive
- Place a single queen excluder and at least one honey super over the center of the two brood chambers
- Cover the exposed halves of the brood chambers with half sized migratory covers
- Add the second brood box to each existing brood box as the population grows maintaining the queen excluder between the top brood boxes and the honey super(s).
- Add honey super(s) using the 70% rule

Coming full circle back to fall



The result of maximizing honey production



“I have led you to the water now you must
decide whether to drink or not.”

George Imerie



A close-up photograph of two bees on a yellow flower. The flower has a dark red, textured base. The bees are positioned near the center of the flower, one slightly above the other. The background is dark and out of focus.

The End

Photo: Roger Ledbetter

Questions?



(c) Kathy Keatley Garvey