

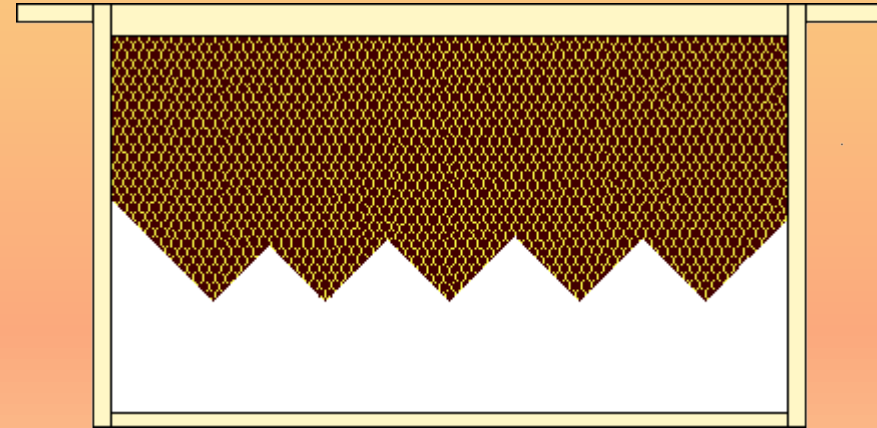
# **Non-Graft Methods**

# Charles C. Miller (1911)



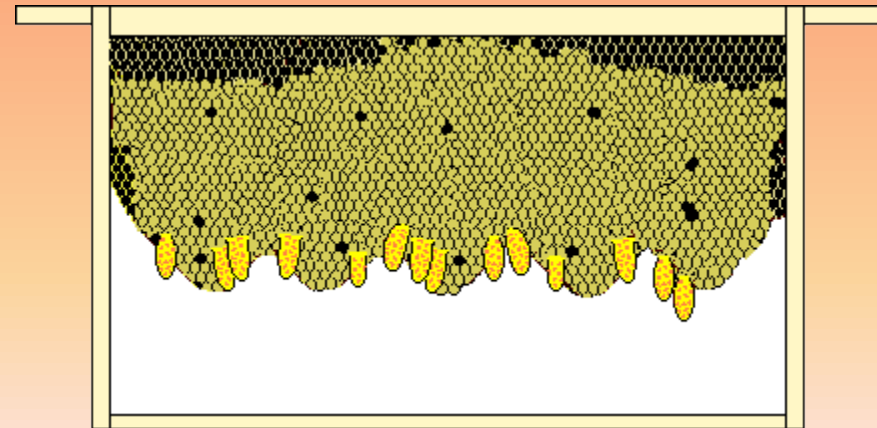
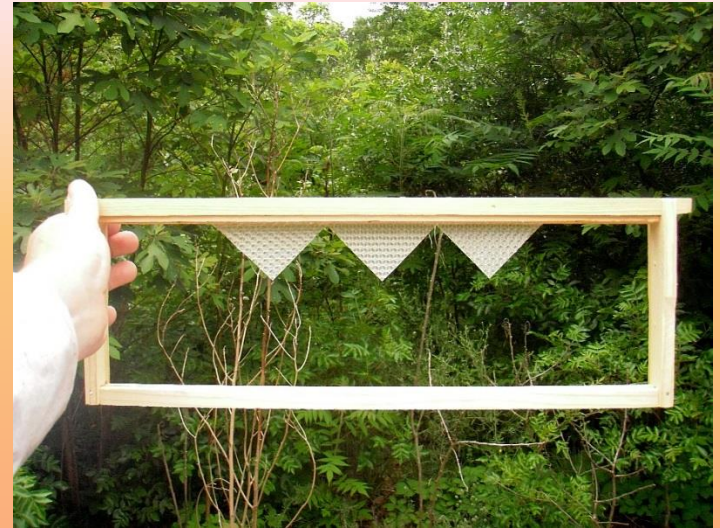
# Miller Method

- Choose strong parent colony with desired traits
- Insert frame with foundation triangles into center of nest
- Check every 2 days to see if bees draw comb
- Look for appearance of eggs in new comb



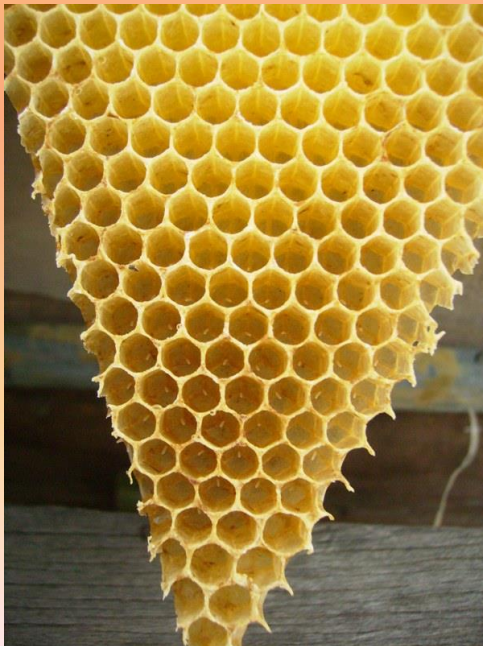
# Miller Method

- Prepare CELL STARTER about 24 hours before eggs should hatch
- Remove drawn frame from parent colony and cut drone comb back to original shape of foundation
- Some people will also kill worker larvae to leave space for queen cell construction

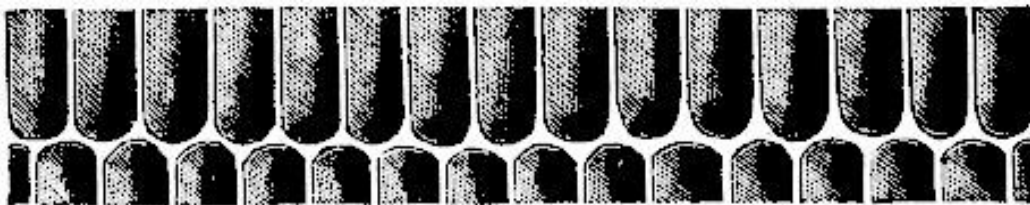
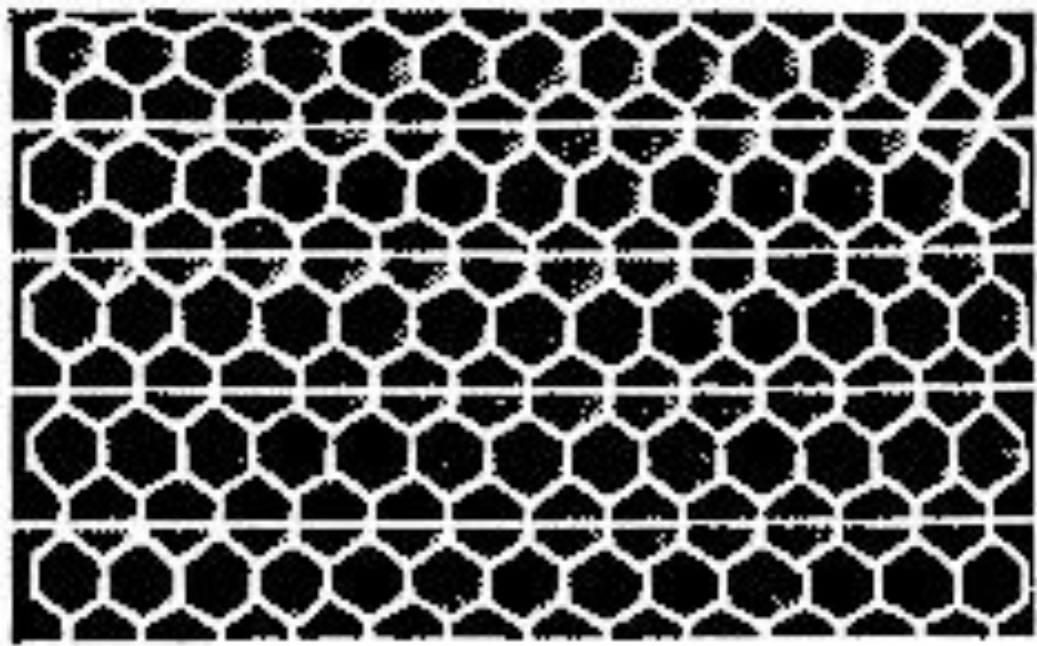




# Miller Method



# Henry Alley(1883)





# Isaac Hopkins (1886)





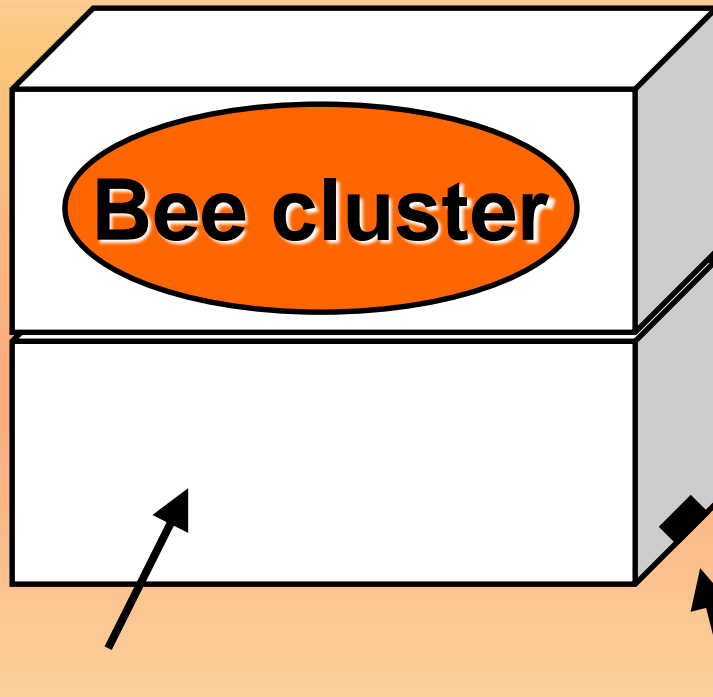
A ventilated swarm box.



# Swarm Box

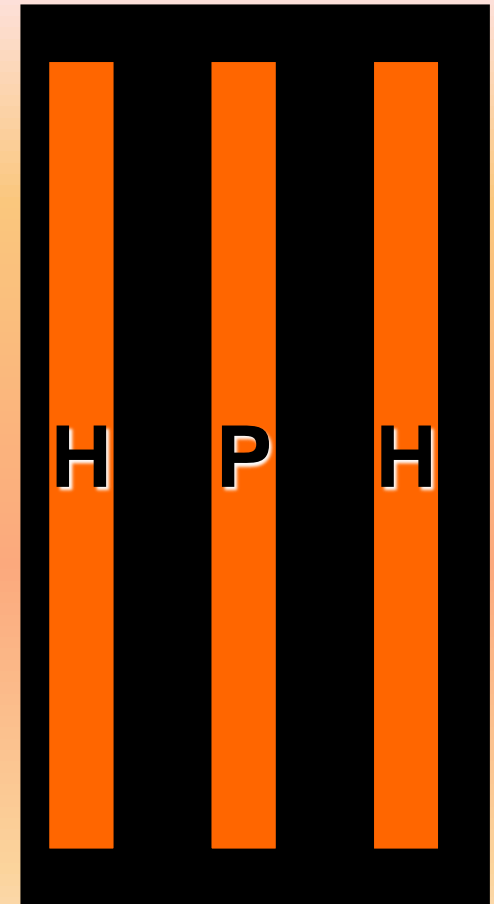
- Collect 2-3 lbs. of bees into a deep 5-frame nuc box a few hours before the graft (without a queen)
- Fit the nuc with either an empty rim, or a screened chamber (for cluster expansion)
- Provide honey and pollen combs; water on a clean sponge inside box; also feed syrup
- Do not allow bees to fly freely

# Swarm Box



Empty box

Entrance closed



(view from top)

# Bee Density





# Swarm Induction

- Pick strong colony with desired genetics
- Be sure the queen is clipped and marked
- Allow colony to become crowded (do not super)
- Monitor daily until it swarms (queen will fall to ground)
- Harvest cells with a pocket knife

# Alternative Swarm Induction

- You have discovered a colony that has prepared queen cells for swarming
- Locate and verify queen (some people isolate in a nuc)
- Harvest all frames with queen cells into nucs (with adhering bees)
- Allow queens to emerge and mate
- Retain queens as emergency replacements

# **Mating the Queen**



# Queens





# Drones



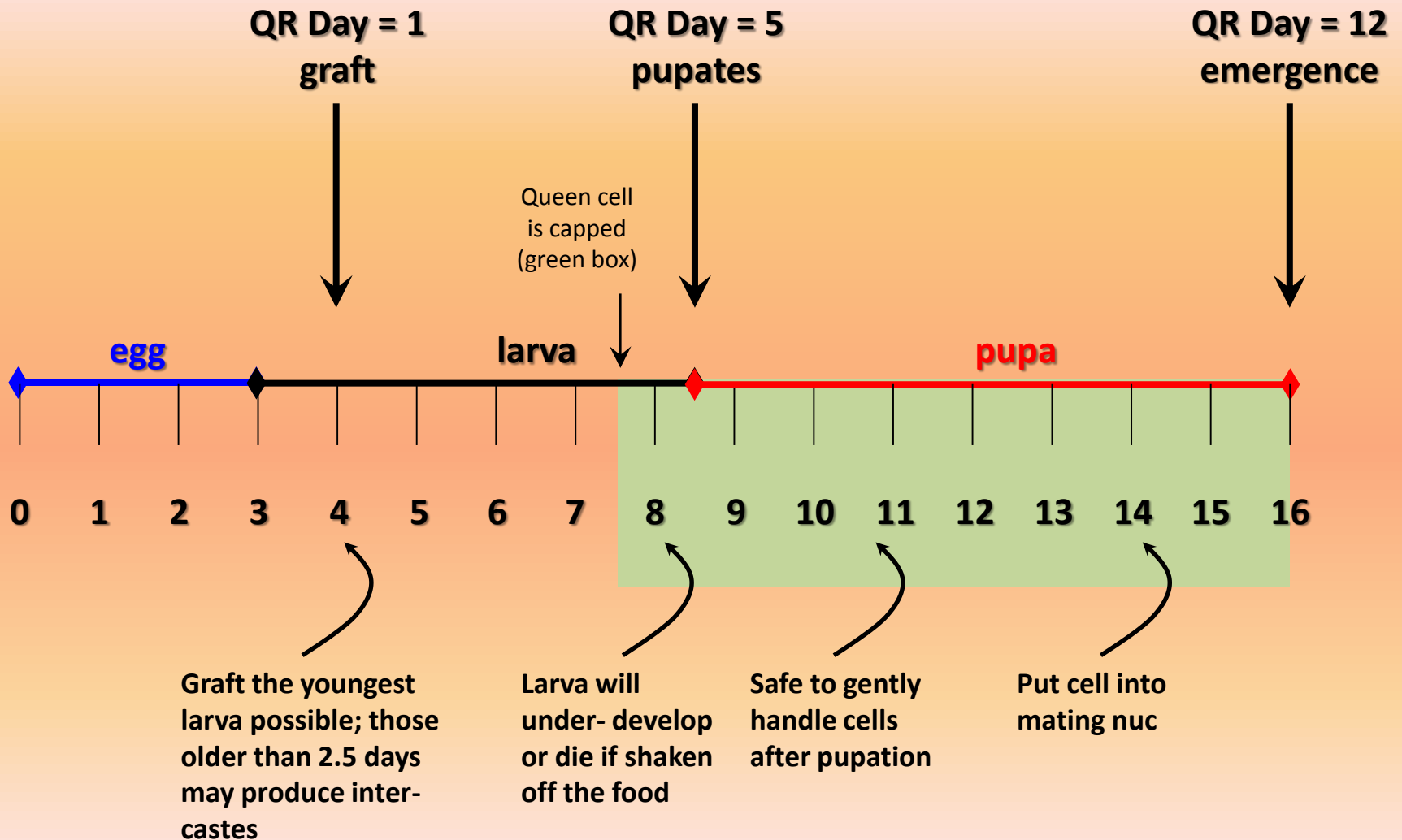
# Natural Mating



- High in the air at DCAs
- Drones fly to DCAs close to home
- Drones only mate with queens in DCAs
- Queens tend to visit DCAs farther from home



# Important Timing During Queen Rearing



Whatever Method Used,

**REMOVE THE CELLS ON THE  
9<sup>TH</sup> – 10<sup>TH</sup> DAY AFTER GRAFTING!**





# Mating Yard

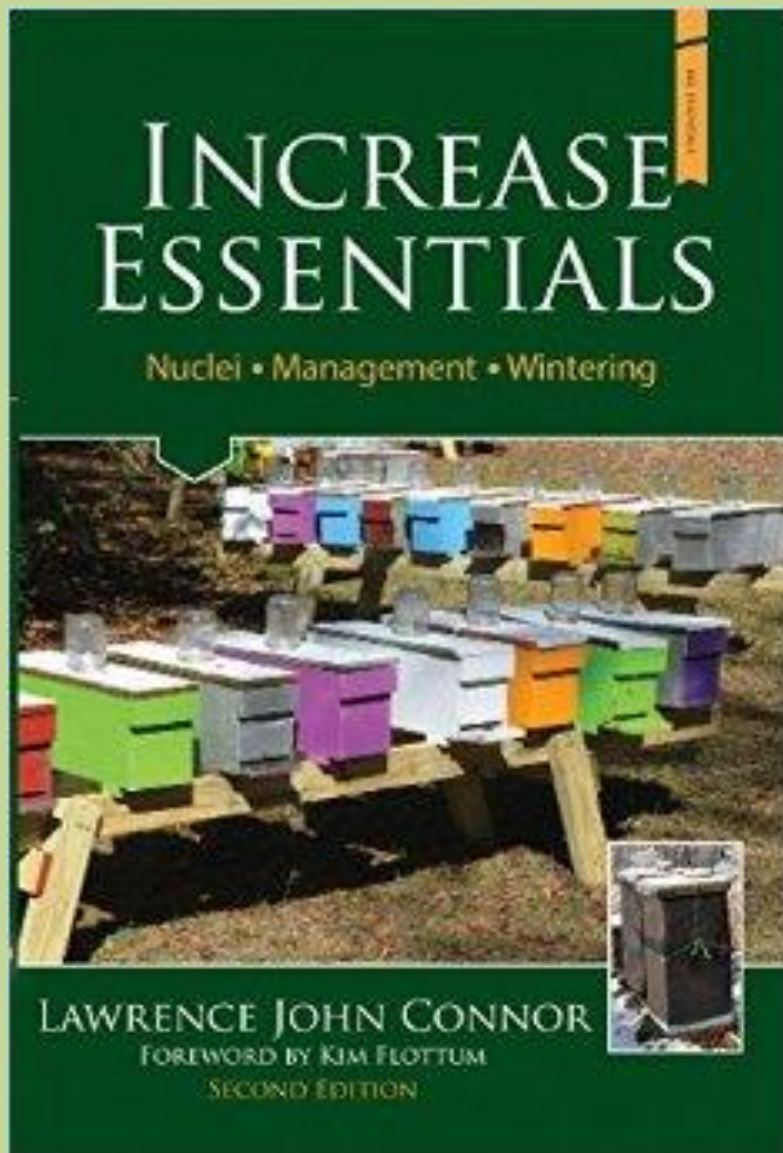


- Install bees and queen cells and do not bother for 3 days
- Check Only to see if Queens emerged
- Wait 21 days to catch and cage queens









# 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 20-25% loss may be normal**
- **Use increases (splits) to either keep number of colonies stable through time, or to increase the size of your operation**
- **Making queens is important**



# **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**

# Loss of Brood and Queen Replacement

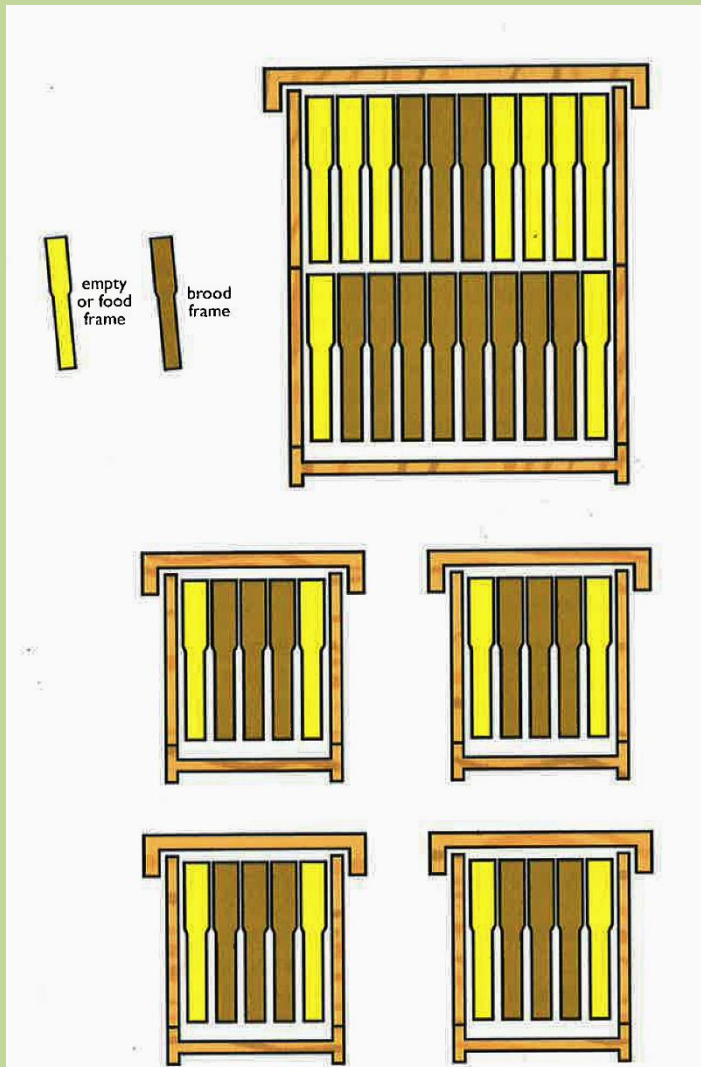
Replacing Unit	Time to New Queen	Time to Mate	Time to Lay Eggs	Total Time until New Brood
Mated Queen	2-5 days	---	3-5 days	5-10 days
Mature Queen Cell	2 days	6-8 days	3-5 days	11-15 days
Eggs	12-16 days	6-8 days	3-5 days	> 21 days

# How to Make Nucs

- I encourage you to make nucs with 3 frames of brood (best chance of surviving)
- Fill out nuc with at least one heavy honey and pollen frame and an empty comb
- Unit should be fed 50:50 syrup and grown into two full sized brood chambers by late spring or early summer
- Alternate: Empty combs and a feeder



# 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

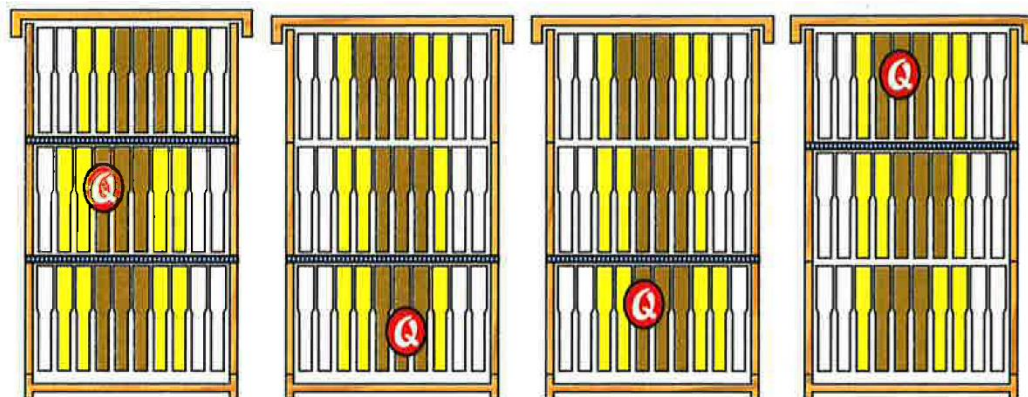
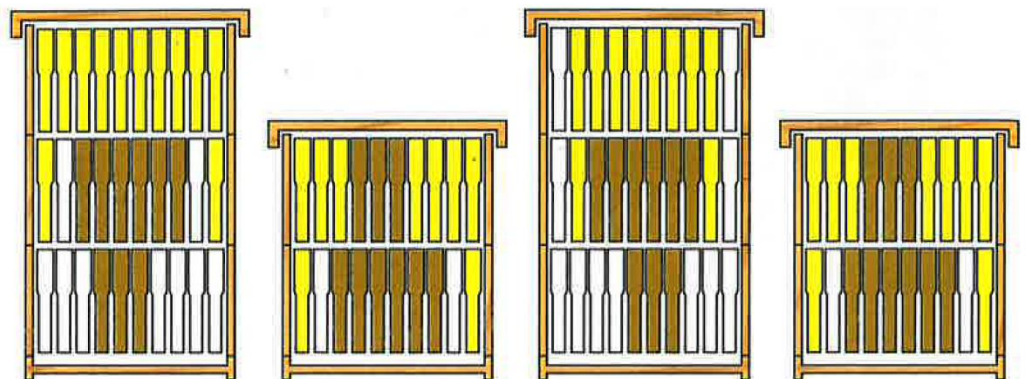
# How to Make Nucs for Sale

- **Add 1 frame of honey**
- **Add 2 frames of brood with adhering bees**
- **Add a frame of foundation and a division board feeder full of syrup**
- **Introduce a queen cell; wait two weeks**

# Texas Set-Off Splits

colonies of varying strength  
in the spring time

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



empty  
frame

honey  
frame

brood  
frame

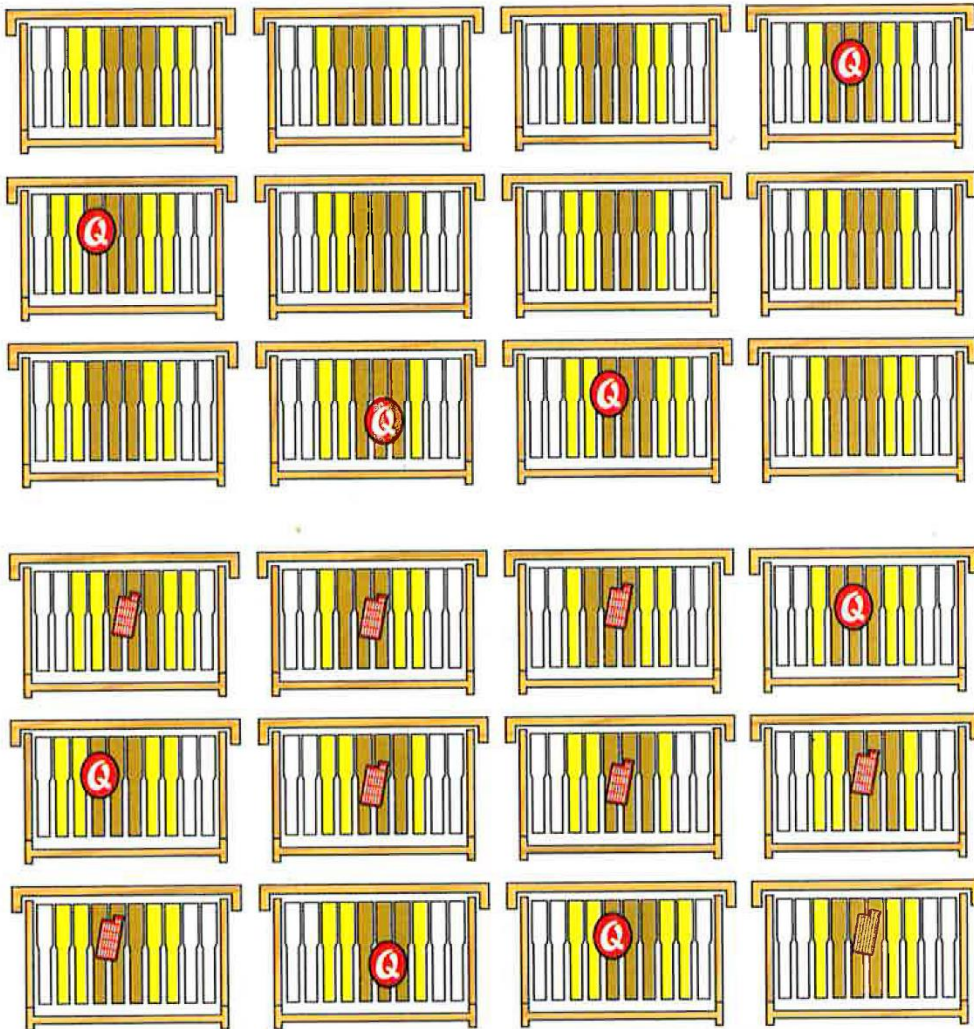
queen  
excluder

caged  
queen

laying  
queen



# Texas Set-Off Splits



**Night after workup: all boxes placed onto bottom boards**

**Next day: caged queens placed into queenless units**

# **Your First Time Making Splits**

- **Consider only doing it in spring just before swarm season**
- **Splits usually respond well to natural flows and can grow to a good size and even produce a surplus honey**
- **Although nucs can be made in the summer, the care is much more involved.**
- **Wintering nucs is possible, but there is a certain finesse to being successful.**
- **Make your first few years of increase during the spring and learn to be good at it; then experiment with other seasons.**

# Seasonal Considerations

<i>Attributes</i>	<i>Early</i>	<i>Swarm</i>	<i>Summer</i>
Colony Strength	Lowest bee and brood levels of season	Excellent bee and brood numbers; Swarm season	Strong, but brood rearing declining
Weather Conditions	May be poor	Usually favorable	Extreme heat possible
Drone Numbers	Unpredictable; Early drones may be scarce	Maximum for season	Reduced number and viability
Mites and Pests	Lowest mite number	Increasing varroa & SHB	Highest varroa; Highest SHB



# Spring Nuc Management

- Usually made during nectar flow (2 frames of brood recommended)
- Spring nucs are ideal for learning how to grow colonies
- Add 2<sup>nd</sup> box, or expand to 10-frame equipment as soon as bee population warrants
- If not sold, given away, or not needed in your operation, it can be overwintered

# Final Suggestions

- NEVER cut queen cells until you verify a queen is present!
- A supersedure queen is better than no queen!
- Get in the habit of always producing a few extra queens from a colony with swarm cells.
- Nothing lost by doing so. Foolproof requeening by transferring an entire nuc into a larger hive.

# Mark and Clip Your Queens



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