



Simple Queen Rearing

Growing your apiary exponentially AND lessening your dependence on southern package bee sellers by raising your own queens without the use of special equipment or learning how to graft.

Who is the crazy person
in the front of the room?

Fred Boucher

Beekeeping: 2 Years

Managing: Currently 10 Colonies

Approach: Natural/Small Cell, Treatment
& Chemical Free





Why rear your own queens?

- Cost
- Time
- Availability
- Mite and Disease Resistance
- AHB
- Acclimatized Bees
- Quality



Cost

- A typical queen costs about \$20 counting shipping and may cost considerably more.



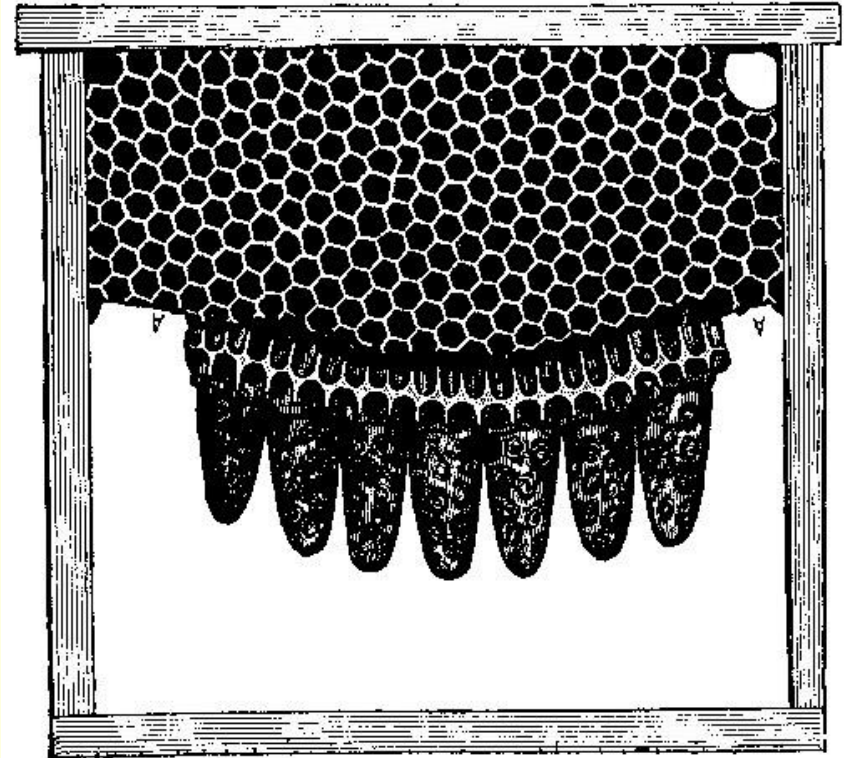
Time



- In an emergency you order a queen and it takes several days just to make the necessary arrangements.
- Often you need a queen yesterday.
- Losing a week of laying can be the loss of up to 14,000 bees that season.
- If you have some queens on hand, in mating nucs, there is no emergency at all.

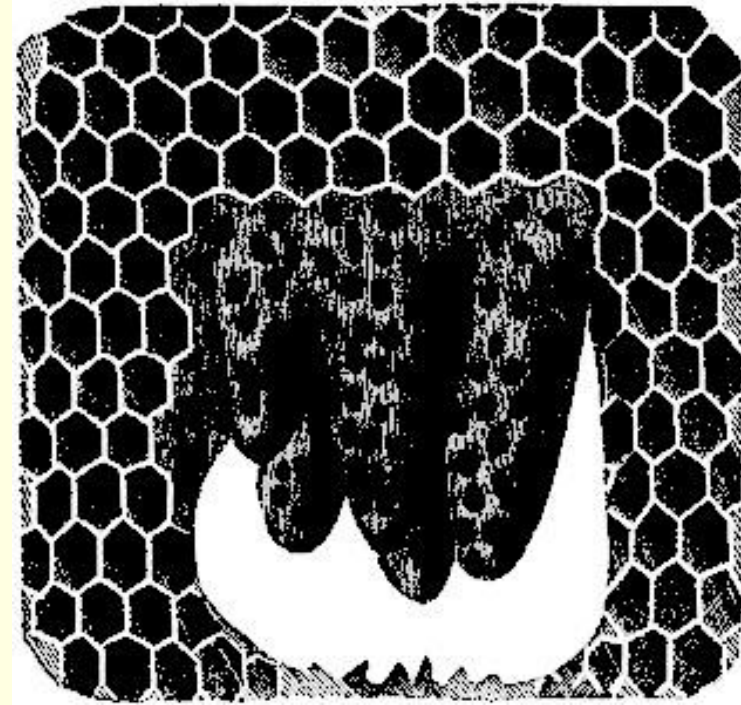
Availability

- Often when you need a queen there are none available from suppliers.



Africanized Honey Bees

- Southern raised queens are more and more from Africanized Honey Bee areas.
- In order to keep AHB out of the North we should stop importing queens from those areas.



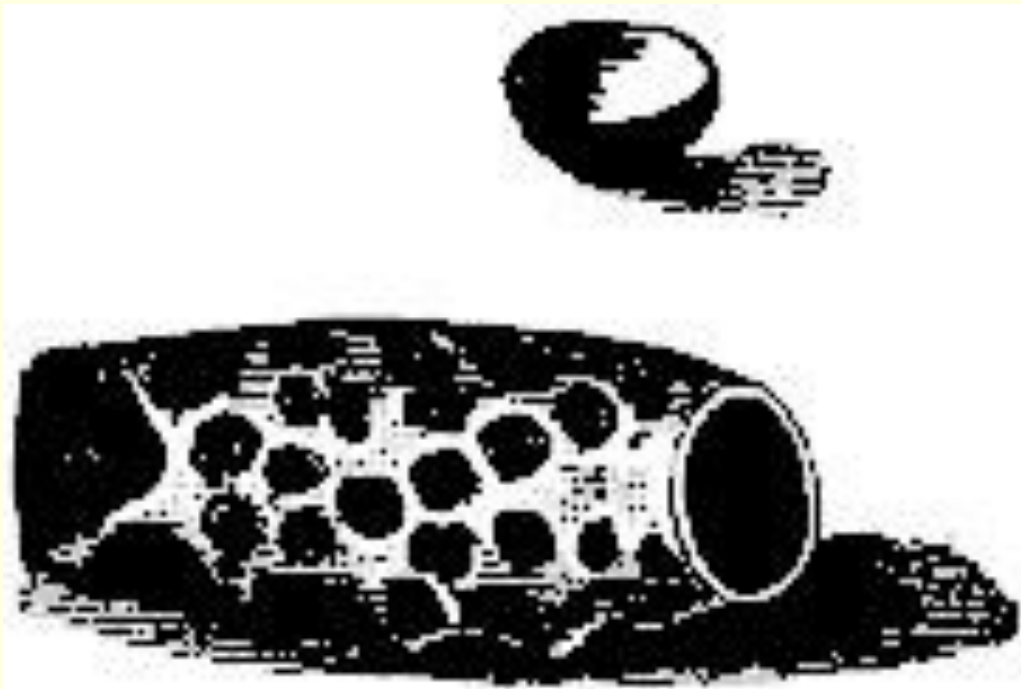
Mite and Disease Resistance

- Tracheal mite resistance is an easy trait to breed for.
- Hygienic behaviour, is not difficult to breed for.
- Hardly any queen breeders are breeding for these traits.
- The genetics of our queens is far too important to be left to people who don't have a stake in their success.



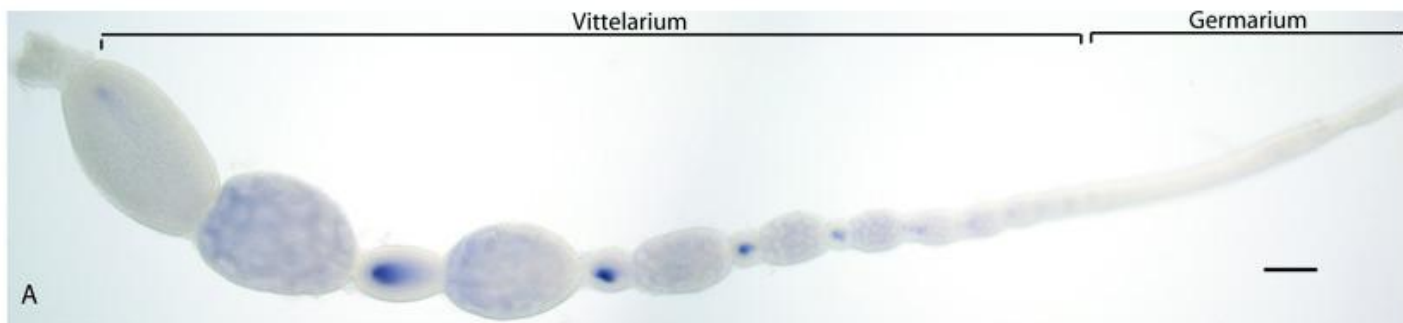
Acclimatized Bees

- It's unreasonable to expect bees bred in the deep South to winter well in the far North.
- Local feral stock is acclimatized to the local climate.
- Even breeding from commercial stock, you can breed from the ones that winter well in your location.



Quality

- The quality of your queens can often surpass that of a queen breeder.
- Dr. David Tarpy of the Department of Entomology at NC State University: “A properly mated queen is fertilized with between 5 to 7 million sperm.”
- Tarpy: “81% of commercially raised queens are fertilized with less than 5 million sperm, and 19% are fertilized with less than 3 million.”



Quality (cont.)

- Research has shown that a queen that is allowed to lay up until it's 21 days old will be a better queen with better developed ovarioles than one that is banked sooner.



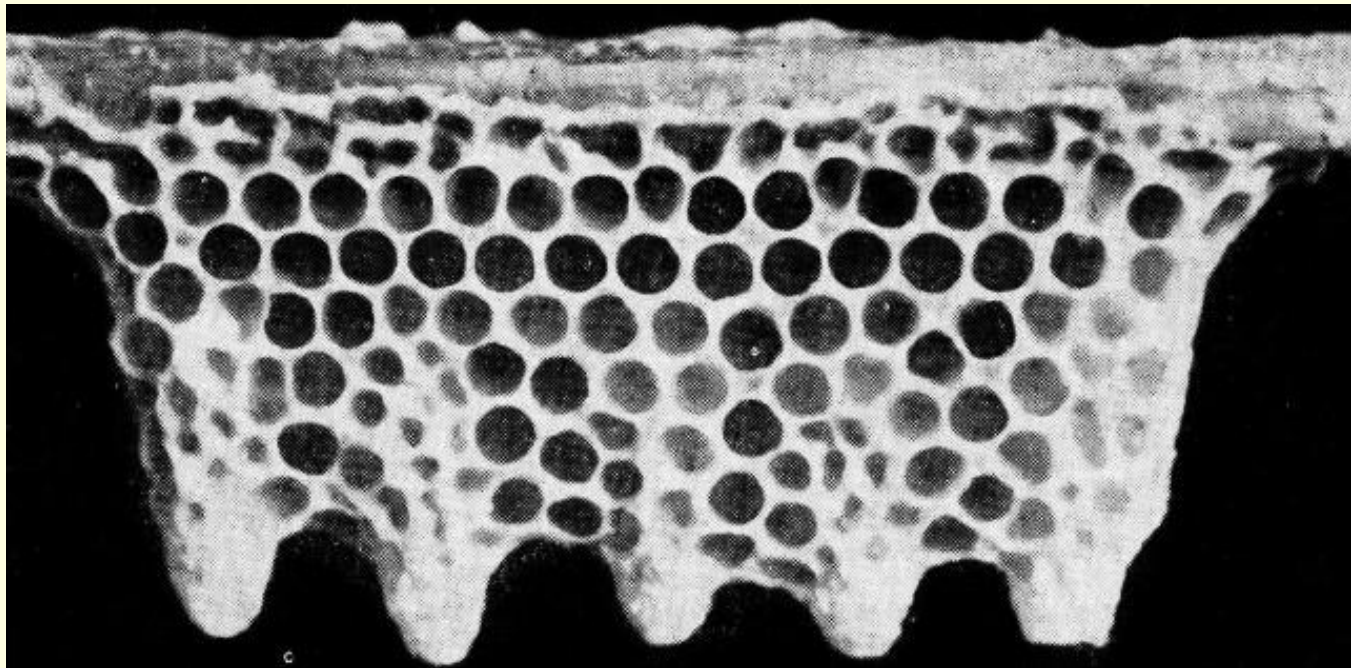
- A commercial queen producer typically looks for eggs at two weeks and if eggs are present, the queen is banked and eventually shipped.

Concepts of Queen Rearing



Bees rear queens because of one of three conditions:

- Emergency
- Supersedure
- Swarming (Reproductive or Overcrowding)



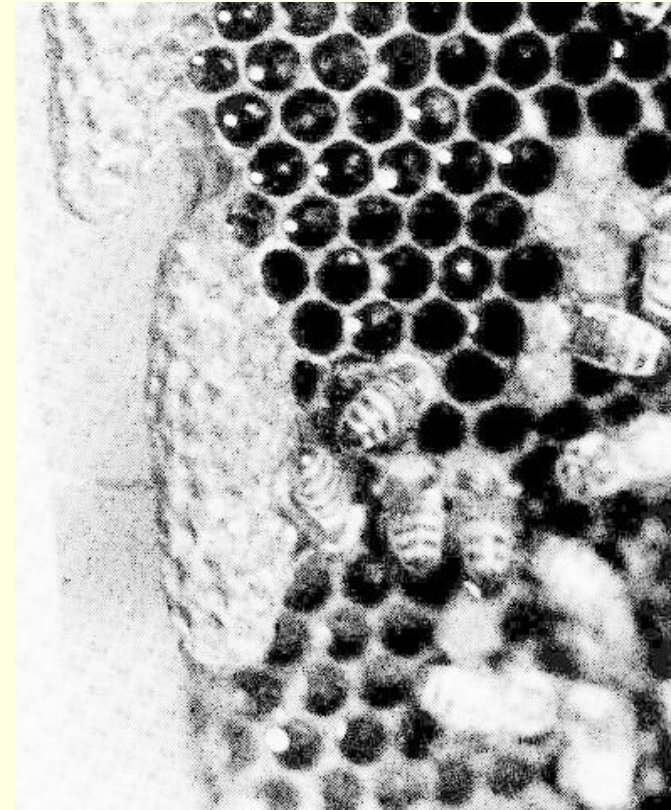
Bees rear queens because of one of three conditions:



- Emergency
 - There is suddenly no queen.
- Supersedure
 - The bees perceive the queen to be failing.
- Swarming
 - Reproductive – A colony with ample stores, bees, and resources flowing in will swarm because that is what bees do and the reason why they are still around today – an instinctual response to normal, strong, healthy, conditions to propagate the species.
 - Overcrowding – When there are too many bees and not enough room or not enough stores to continue under the current conditions.

Highest Quality Queens

We get the most cells and the best feeding of queens if we simulate both Swarming due to Overcrowding and Emergency.



Why Queen Rearing?

- We can easily get a queen simply by making a queenless split with the appropriate aged larvae.
- So why would we want to do queen rearing?



The Most for the Least

The underlying concept of queen rearing is to get the greatest number of highest quality queens from the least resources.



To illustrate, let's examine the extremes.

- If we make a strong hive queenless. They could have, during that 24 days of having no laying queen, reared a full turnover of brood.
- The queen could have been laying several thousand eggs a day and a strong hive could easily rear those several thousand brood.
- We have lost the potential for about 30,000 or more workers by making this hive queenless and resulted in only one queen.
- This hive made many queen cells, but they were all destroyed by the first queen out.

To illustrate, let's examine the extremes.

- If we made a small queenless nuc we would only have a couple of thousand queenless bees rearing several queen cells and those couple of thousand bees could only have reared a few hundred workers in that time.
- But again they made several queen cells and the results were only one queen.



Most Queens for Least Resource Cost

- An efficient approach to queen rearing involves making the least proportionate number of bees queenless for the least amount of time and resulting in the most number of laying queens when we are done while maximizing the quality of the care of the queen candidates.
- In my experience, I gave up the seasonal honey production of 1 colony of bees and raised 6 queens.



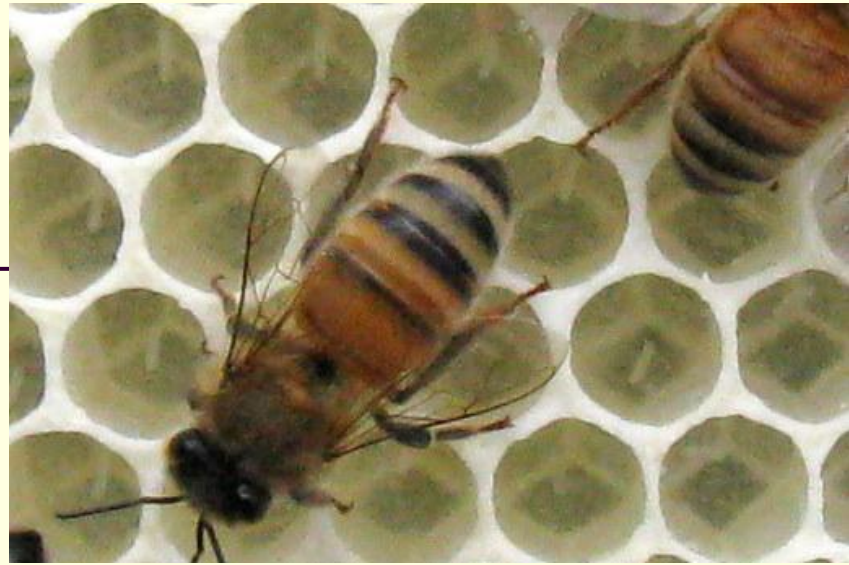
Queens from selected stock

- By using queen rearing techniques we can choose the mother of a large number of queens with an eye on improving our stock.



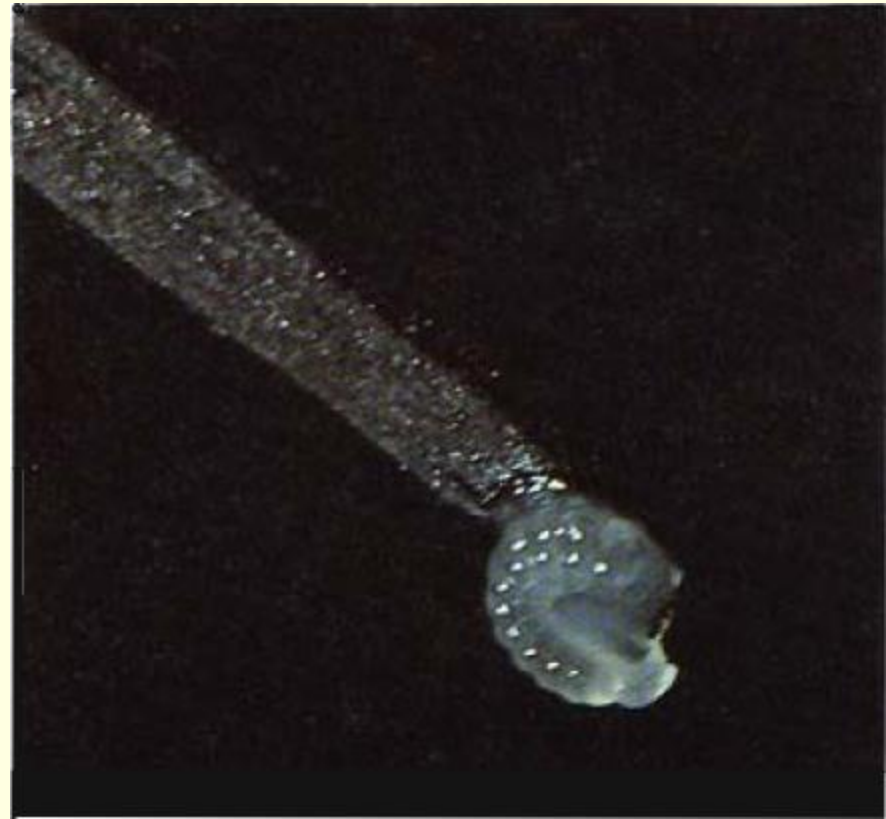
Where queens come from.

- A queen is made from a fertilized egg, exactly the same as a worker.
- The difference is in the nutrition and the size & position of the cell involved.
- Any newly hatched worker egg can be a candidate queen. It simply needs to be fed copious amounts of royal jelly and be raised in a queen cell. Otherwise, it develops into a worker.



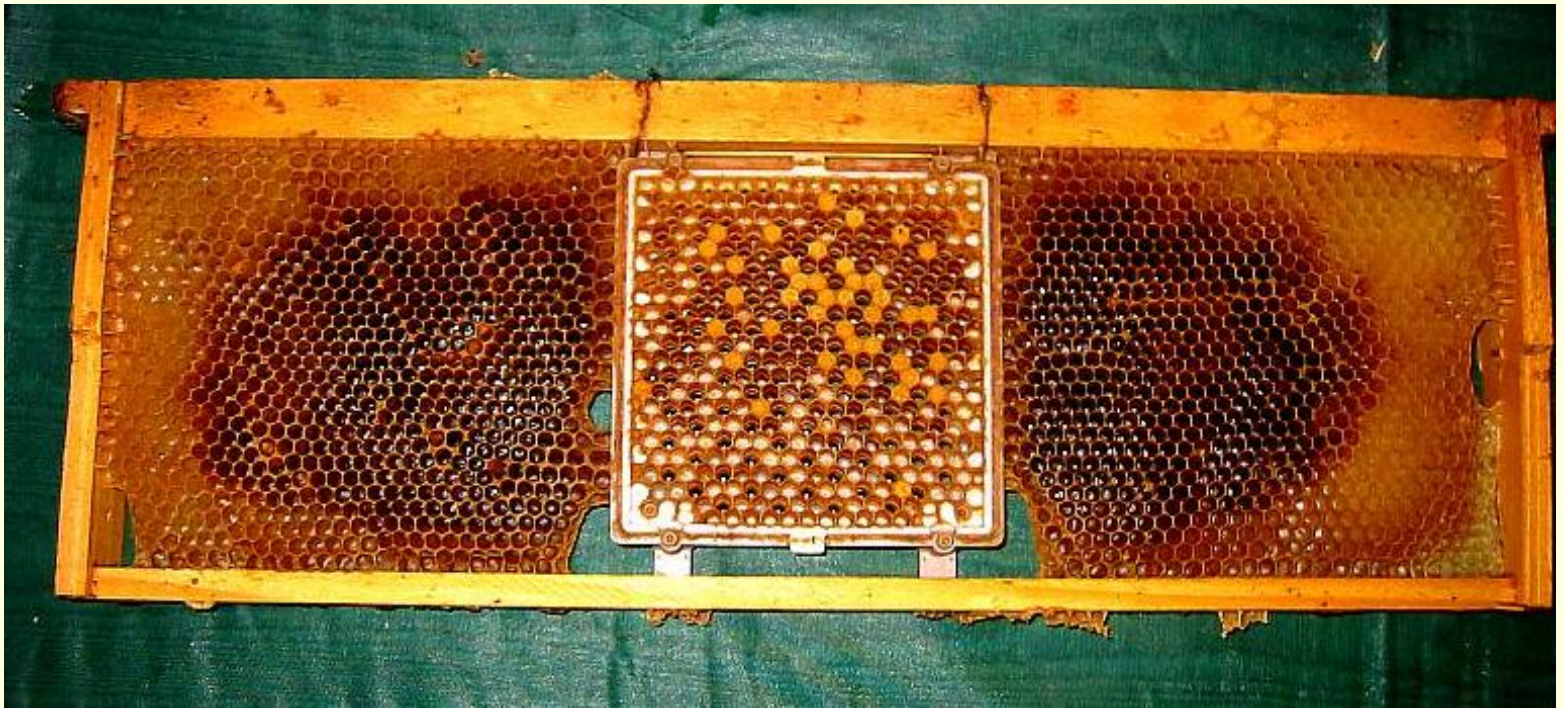
Why Don't More Hobbyist Beekeepers Raise Their Own Queens?

1. Don't want to buy and learn how to use special equipment when all that is wanted is a few queens.
2. Not comfortable learning how to graft.



Methods – There Are Many

- The vast majority of queen rearing approaches involve getting larvae of the right age from the stock we want into queen cups.
- Here are a few of the techniques.



Most Require Special Equipment, Grafting, or Queen Confinement

Method	Special Equipment	Grafting	Queen Confinement
Doolittle	✓	✓	✓
Jenter	✓		✓
Hopkins	✓		✓
Alley	✓		✓
Miller	✓		✓
Smith	✓		✓
Better Queens	✓		✓

Swarm Induction Method

Easy – Inexpensive

- No Special Equipment
- No Grafting
- No Queen Confinement
- No Cell Starters, Cell Finishers, or any other specialized hive filled with nurse bees, etc.



Swarm Induction Method (cont.)



Requirements

- Need colony containing queen whose genetics you want to propagate
- No honey production from this colony for the season
- Mating Nucs
- Ability to keep a close eye on things

What Happens When Bees Swarm?



- Queen lays profusely
- Fills every cell she can find
- Lays in queen cups (important!)
- In last hours before the swarm is issued, the queen is slimmed down for flight
- Bees will be seen collecting outside the hive sometimes for a few days

What Happened

Sequence of Events



- May 7th: Came out of winter with 3.5 deep frames of bees
- May 30th: Already 7 plus frames of bees so added deep #2
- June 17th: Colony swarmed - Volleyball sized; Captured and hived in another box
- June 26: Transferred frames with swarm cells to 6 Mating Nucs

Mating Nucs



Place in each nuc:

- At least 1 frame with a swarm cell
- Any capped cells should be treated very delicately
- Mark the frame for future reference
- 2-3 frames of brood, honey, pollen, and bees
- In my case with six 5 frame nucs, I filled the balance with remaining frames

Mating Nucs

Important Considerations:

- Orientation
- Ease of Transportation
- Weakness – Robbing
- Standardized Equipment
- Management – Strength & Swarming



Queen Timing

- New queens can be hard to find
- Listen for piping
- Can take 5 days before mating flight
- Can go on numerous mating flights
- Don't always return safely

Process of Queen Rearing

<i>Day</i>	<i>Queen-rearing day</i>	<i>Stage of queen development</i>
0-1		Egg
1-2		Egg
2-3		Egg
3-4	1	Larva in uncapped worker cell
4-5	2	
5-6	3	
6-7	4	
7-8	5	
8-9	6	Larva in capped cell
9-10	7	
10-11	8	Pupa in capped cell
11-12	9	
12-13	10	
13-14	11	
14-15	12	
15-16	13	Adult queen emerges
20-25	18-23	Queen goes on mating flights
25-30	23-28	Queen begins egg laying
30+	28+	

Virgin Queen



Mated Queen



Mating Nucs

- Normally cells should go in the mating nucs on day 14 from when the egg was laid.
- But since the same box is the cell builder, cell finisher, and mating nuc, cells can go in as soon as they are started.
- Once queen is laying, can be used to requeen another colony or nuc allowed to build through the end of the year and overwintered.



Overwintering Nucs Indoors

- Learn from my mistakes – Don't let your nucs get robbed
- When nucs are extremely weak (1 or 2 frames of bees), and you are concerned about the critical mass of the cluster to generate enough heat to survive the winter, overwintering indoors is an option.



Inside Basement – 6 NucS on Shelf



Replaced Basement Window



Cleansing Flights Last Wednesday



Lots of Activity on a Warm Day - 60°



Contact

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