

Swarms and Hive Management



How many of you have witnessed a swarm? Awesome to witness, the noise level quite loud, and distressing for the beekeeper (due to the loss of half of his honey bees and honey crop).

Some people can be quite frightened and nervous of swarms, but the bees are very docile in a swarm

Benefits To Swarming

- **Getting free bees**
- **New young queen, genetic diversity. Old queen leaves with the swarm**
- **Breaks the brood cycle (method of Varroa control)**

Downsides to Swarming

- **Loss of over half the hive population**
- **Less honey production, less pollination**
- **Late season swarms result in low hive population, and less a weaker hive going into winter**

Swarming is Normal for Bees

- **Hive reproduces itself by swarming**
- **Normal instincts are difficult to stop**
- **Beekeepers can prevent or delay this process with advanced planning and clever tactics**

Swarms usually begin in our area in April and go through June, however they can occur later in the season. This year swarms are happening right now.

Tonight's Objectives

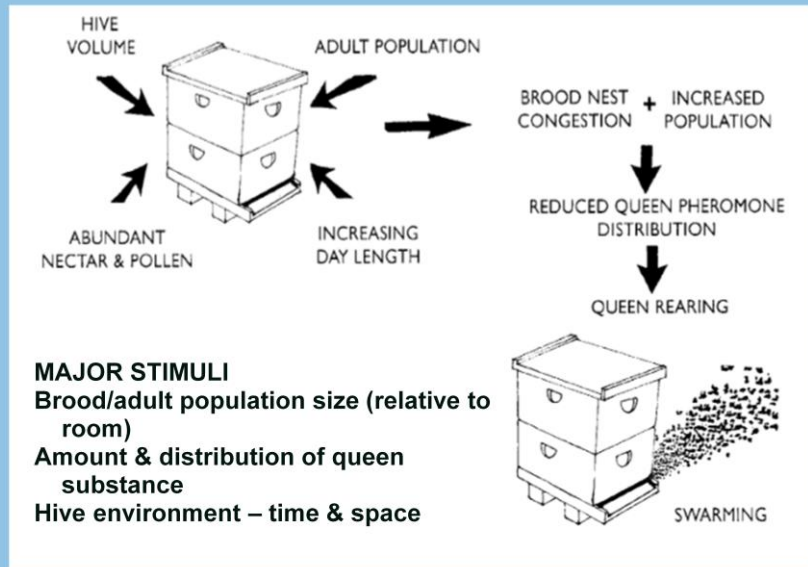
- **Conditions that Encourage Swarming**
- **Signs of Swarming Impulse**
- **Planning and Preventing Tactics**
- **What to do if your Hive Swarms**

Why Bees Swarm?

- **Overcrowding in hive**
- **Colony gets too large for space**
- **Natural reproduction behavior**
- **Weak queen**

The main reasons are overcrowding and the colony wants to reproduce.

Why Bees Swarm?



30% to 70% of bee hives colonies have the conditions that are optimum for swarming, But not all colonies that start their swarm preparations actually DO SWARM.

In the spring the colony population is rapidly expanding due to the increasing day length and the availability of more abundant nectar.

The weather is more suitable for foragers to leave the hive to collect the nectar and pollen. More fresh pollen enables the workers to rear more brood and the queen then begins heavy egg laying.

The increased number of workers means that the pheromones produced by the queen, particularly the **queen mandibular pheromone**, are effectively diluted. Studies have shown that there is a relationship between this pheromone and colony congestion. The mandibular pheromone is an inhibitor of queen cell production. The study concluded that overcrowding inhibits the transmission of this pheromone. This reduction then promotes bees to start making queen cells.

Signs of an Impending Swarm

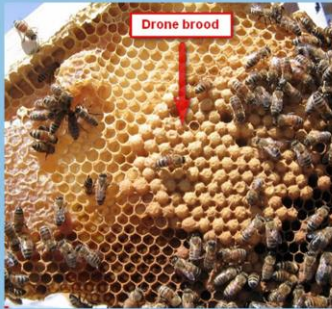
- **High Drone Production**
- **Queen Cups**
- **White Wax (burr comb) on Top of Frames**
- **Back filling in Brood Nest with Nectar**
- **Bearding on front of Hive**

These are some signs of that your bees are planning to swarm

As swarm day approaches, the queen must drop 25% of body weight in order to fly and foragers become lethargic. Foragers take about a week's worth of nectar supply with them when they swarm. 66% on average of the bees will leave, and the old queen will go too, leaving the new queen.

The queen can't fly long or far, so initially the swarm will find a spot to rest while they send out scouts for a new good hive location. A good book to read is "Honey Bee Democracy" by Tom Seeley.

First Signs of Swarm Preparation



**Drone production
increasing**



Adult drones

**Hive naturally wants adult drones nearby when
Virgin Queens emerge**

Drone population increases 4 to 6 weeks before swarm season.

Note Bullet shape of drone cells. A lot of adult drones need to be produced by the time the virgin queens emerge in order for her to mate. She only mates with drones from other hives.

Queen Cups



Queen Cups will appear at bottom edge of frames. (Cups are normal spring – early fall)

**This hive is committed to swarming!
Queen cell populated**



**Queen
larvae**

Note larvae in queen cells. This hive is committed to swarming.

Capped Queen Cells! Now We're In Trouble!



Capped queen cells



Waited too long
Emerged Queen cells

If capped cells are open at the bottom it's too late to stop swarming. This is how the hive propagates new queens.

Emerging Virgin Queen



First year queens are less likely to swarm. Young queens produce **more pheromones** than aging queens. Therefore, all other things being equal, the inhibitory effects of queen mandibular and footprint pheromones will be stronger in a colony headed by a young queen. This is why colonies are less likely to swarm in their first full season.

Other Signs of Swarming



**White Wax on Top
of the Frames**

White wax on top of frames means there is no room is available for the bees to build.

Really Serious! Back filling in brood nest



Photo: Shady Grove Farm

Backfilling takes place when **foraging bees run out of empty comb in which to store nectar**. They will first look to fill the area above the brood nest, but if they find it full they will store nectar in the brood nest. This area should normally be full of eggs, larva and capped brood, not nectar.

The queen has no more space to lay eggs. There are larger numbers of unemployed young bees now. Unemployed because there are reduced amounts of brood to rear because the queen has run out of space. The bees need more room.

Bearding of bees in front of the hive



Sign of bees preparing to swarm

There is a difference between bees clustering in front of the hive because they are overcrowded versus bees clustering in front of the hive because they are too hot. How do we tell the difference?

In the morning when it is cool if the bees are clustering in front of the hive, this is an indicator they are over crowded. They need more room.

If clustered in front of the hive in the afternoon and the temp is below 80 degrees that also indicates overcrowding. Need more room or space. But if the temperature is over 80 degrees it could be they are just too hot. Be sure to provide late afternoon shade and water.

Basic Swarm Prevention

- Reduce congestion in brood box
- Add Supers ahead of normal conditions
- Provide good ventilation and shade
- Separate queen from young brood by splitting the hive – most effective method
- Cut out queen cells – least effective method
- Re-Queening (use young queen if available)

Reduce Congestion

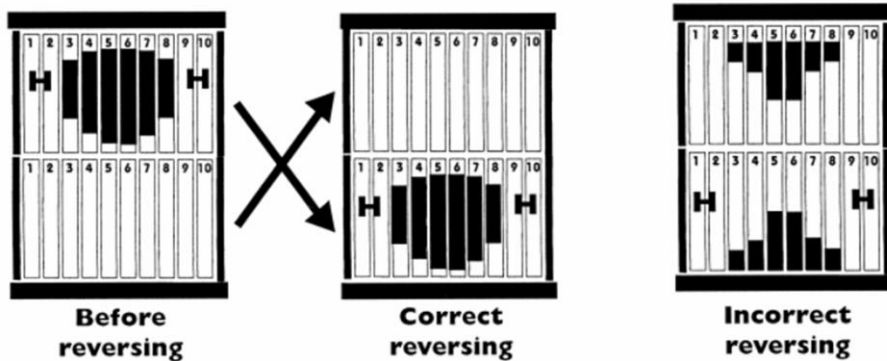
Give them more room
for Brood and Nectar



First is to reduce congestion by giving them more room. The left frame shows expansion of brood from older brood in center to younger brood outside and frame on right shows earlier capped brood – sphere expands as the conditions permit.

Expand the Brood Nest

Expand only healthy, established Hive
Reverse brood boxes if necessary



Check the brood box. Have the bees move up? If so reverse the brood boxes. Reversing boxes keeps the brood nest lower in the hive and provides room above to store honey above.

Do not split the brood as it will split the chamber. The bees cannot keep 2 separate areas warm.

Established Hive

Add a Honey Super



Queen
Excluder




New Box


Bee's
Honey

Brood

Add a honey super to give the bees more room in an established hive.

Ideal spring colony: Picture on right shows an ideal spring colony, it has 3 westerns for brood or you can have 2 deeps (picture on left) with both having honey supers on top. 

Brood boxes: 2 deeps = 3 westerns

 Bees want to move up - be sure to have adequate room for them to do that.

New Spring Hives

Add second brood box



Photo by Morris Ostrofsky

New spring hives: Add a second brood box when the bees are working 70% of the frames. If using westerns you will also want to add a third box when 70% of the second box is being worked.

Provide Good Ventilation & Shade

Improve Ventilation with

- **Screen bottom board**
- **Adding Upper entrance**
- **Place Twigs between boxes**
- **Slatted Rack**



Screen bottom board provides ventilation and prevents groomed mites returning to the colony.

Upper entrance improves ventilation and decreases congestion at the lower entrance. If Yellow Jackets are pestering your hive this upper entrance will need to be plugged up.

Using a twig between (thickness of an ice cream stick) every 2 boxes provides extra ventilation.

Using slatted racks give bees more room to cluster in the brood nest.

If temperatures reach into the 90's, It's important to provide some shade. Add some shade just by putting a white political sign on top of your top cover held down with a weight. White is best to reflect the sun.

Splitting the Hive

Separating the queen from young brood is the most effective method to help prevent swarming

Make a split by dividing the hive into two

- **Give young brood frames to a weak hive or recent swarm from another hive**
- **Create a Nuc (new colony)**

*****Leave original queen with capped brood and empty drawn frames to replace what you've taken.**

This is done by splitting your hive. It is the most effective way if swarming is imminent.

It is one of the best things you can do. By splitting you are essentially initiating an artificial swarm during which you try to control when and where the bees go. By taking the old queen and some brood and nurses and putting them in a new hive, both parts seem to “think” they have swarmed and, if you're lucky, they will both grow into strong colonies. Both colonies together won't produce as much honey as one big colony, but you were going to lose them anyway, so it doesn't much matter.

Benefits of Splitting a Hive

Splitting hives or making nucleus (nucs) hives will:

- **Reduce swarming impulse**
- **Create a new hive**
- **Equalize brood & nectar**
- **Refocus bees on gathering nectar and tending young**
- **Can recombine after swarm season**



The most effective way is to split or divide your hive.

Morris Ostrofsky gave a presentation on splitting hives at the Feb. 2022 LCBA meeting. His talk is posted on the LCBA website, under the “Talks” tab.

Cut Out Queen Cells

Remove queen cells starting late March until early summer

- **Least effective method *****
- **Very disruptive to hive**

Cutting swarm cells is popular among beekeepers, but it is not a particularly effective way to control swarming. The beekeeper usually loses because if he misses a single cell or cuts a day too late, the bees will swarm anyway.

Worse, if the beekeeper unknowingly cuts the cells from a hive that already swarmed or is just about to swarm, he may leave the old hive queenless.

Also if you keep going into your hive cutting out queens cells it very disruptive to the hive – every time you go in your hive you set it back 3 days.

Remember bees will not swarm if they have either their queen, their field force, or their sealed brood absent or removed. This can be best achieved by splitting the hive. If swarming is imminent, it is one of the best things you can do.

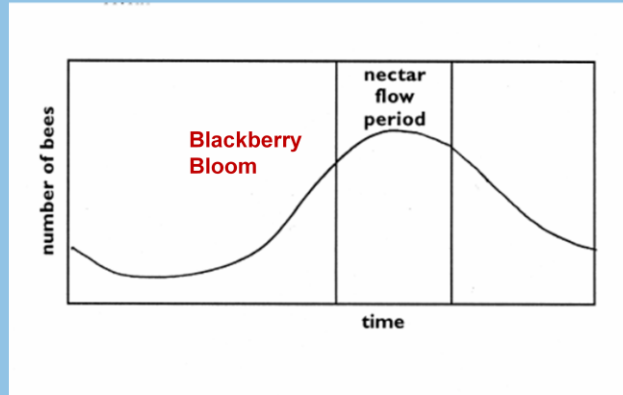
Re-queening

- Young queens tend to produce more pheromones, lay a more eggs, need more open brood
- Strong pheromones may decrease the urge to swarm



Requeening in the early spring can help reduce swarming because young queens tend to produce more pheromones than older queens and tend to lay a lot more eggs making a stronger hive. The queen will then need more open brood area. Be sure there is adequate space.

Prevent Swarms Before Nectar Flow



Want a full, strong hive by the peak of the nectar flow

So the basic idea of spring management is to allow the colony to fully expand in the brood boxes.

Put your supers on for the earliest nectar flow. By building large colony and keeping colony together you are aiming to have a peak population of bees in synch with the nectar flow period of later spring or early summer. You want a strong hive going into the nectar flow.

What If Your Hive Swarmed?

- **Check for eggs in 14 – 21 days**
New queen must mature and mate
Weather must be conducive for mating
- **Must requeen if hive is queenless or if new queen does not get mated**
- **May need to feed the colony, especially if it's a late swarm (May/June)**

If your colony swarmed, you would need to check for eggs to see if the queen is mated. The 14-21 days check is just an estimate. When a hive swarms the new queen, if she has not already emerged, will do so in 1 to 3 days if weather conditions are good. Then it will most likely be 3 days before she takes her first mating flight. She takes an average 3 mating flights and needs to mate with 15 to 20 drones. Once mated it could be another 3 days for her to start laying eggs.

If you do not see eggs you may have to re-queen with new mated queen. You can also add a frame of open brood, one frame per week for three to four weeks to bolster the colony strength. Watch for after swarms.

Reduce the entrance to the hive five to six weeks post-swarm to prevent robbing. Be prepared to feed the colony and treat for mites. Remember the colony will be at its weakest about six weeks after swarming.

In a new swarm hive you will also need to check for eggs and do the same thing. If the swarm you caught came from your own hive you may have to re-combine the hives back together if there is not a viable queen in one of them. There is also a limited time period for the bees to harvest the main nectar flows and boost up their honey supplies for winter.

Summary

- **Monitor strong colonies for swarming signs**
- **Practice prevention methods early**
- **Start the spring with strong queens**
- **Consider splitting your strong hives – temporarily or permanently**
- **Place a swarm trap (empty nuc or hive) nearby to capture the swarm, if all else fails**

Ready For Spring!!



THE END