

Swarm Prevention and Control

Swarming (revision)

- Swarms are how colonies of honey bees multiply and occupy new sites
- Worked fine for bees for millions of years
- BUT – not convenient for the beekeeper or neighbours
- Loses the beekeeper half the colony and honey production
- Worries neighbours and expense removing from chimneys and wall cavities

How to Reduce Chance of Swarms

- Replace queens every year (or two), pheromones reduce with age
- Add supers and brood space in good time to give expansion room
- Multiple brood boxes can add brood space over the colony
- Reduce strength of strongest colonies by making nucs
- Keep them busy, replace brood frames of stores with fresh foundation
- Avoid breeding from prolific swarmers
- Inspect regularly, weekly is ideal. Swarms are most likely May-June but could be any time March to October
- Strategies before queen cells appear, e.g. Demaree, Shook swarm
- Clipping wings delays but **does not** prevent. A non-flying queen is often driven to swarm but the swarm ends up on the grass or on the hive stand

What happens ?

- The workers decide when to swarm
- Queen slimmed, reduces egg laying
- Scout bees begin investigating potential homes
- Swarm queen cells are made, 12-20 sculpted cells hanging down around edge of frames
- Around the time the first swarm cells are sealed (after 3 days as egg, 5 open larva) the queen leaves with about half the adult bees who will be well fed to start making wax (a “prime” swarm).
- Usually late morning to early afternoon; they delay for bad weather but don't rely on it
- New queens are sealed in cells for 7-8 days. First out can kill the rivals in their cells (the only time queens sting) OR the new queen leaves with half the rest of the adult bees as a virgin in a secondary or “cast” swarm – after several casts the hive is near empty



Signs to look for

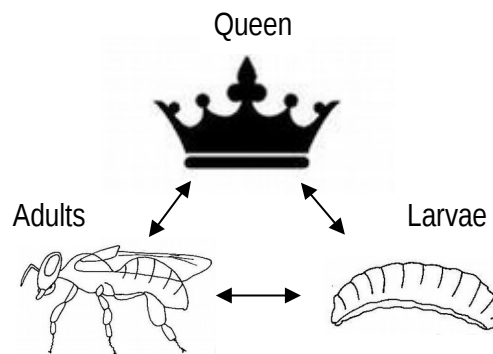
- Plenty of eggs means the queen is still laying strongly, probably not swarming
- Shallow queen cups facing down or “play cups” are common. If they are all empty, they may never be used but proceed with caution
- Even an egg in a cup is not definite to proceed, **but** think about the space they have, inspect more frequently, prepare other strategies and equipment
- A cup with eggs in jelly is a definite cue for action, the colony can go from hatched egg to sealed cell and old queen gone in 5 days.

Swarm cells?

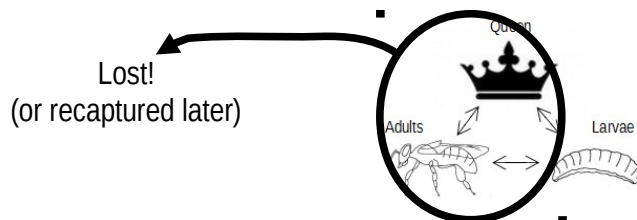
- Check all brood frames, queen still there? Marking before helps, maybe hiding or already gone. Are bees missing? Half are foraging in good weather anyway.
- **DO NOT** just tear down all queen cells - a determined colony can convert 3 day worker larvae to emergency queen cells, they could still swarm tomorrow and have sealed queen cells 2 or 3 days later!
- Queen excluder under brood and patent devices might delay, but not a cure

Artificial Swarm

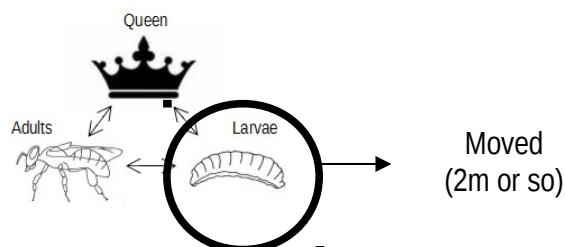
- AS will stop most colonies actually swarming. There are many variations but virtually all control methods are based on a swarming hive needing three things, a **queen**, flying **adult** bees and **larvae** including a potential new queen



- In a **Natural Swarm** the queen leaves with half the adults, mostly those just able to fly at around 2-4 weeks and well fed to build comb. The brood are left with several queen cells nearly sealed (or just sealed) and the rest of the adult bees.



- In most **Artificial Swarm** methods, the queen and adult foragers remain on the original stand. Most of the brood with 1 or 2 queen cells and younger worker bees are moved a few metres to the side.
- Artificial Swarm ideas were developed from an 1868 book by James Pagden, a beekeeper and writer near Eastbourne, Sussex.
- The idea that “they think they have swarmed” is not entirely true, e.g. age mix differs. They take a couple of weeks to adjust, but mostly can sort it out



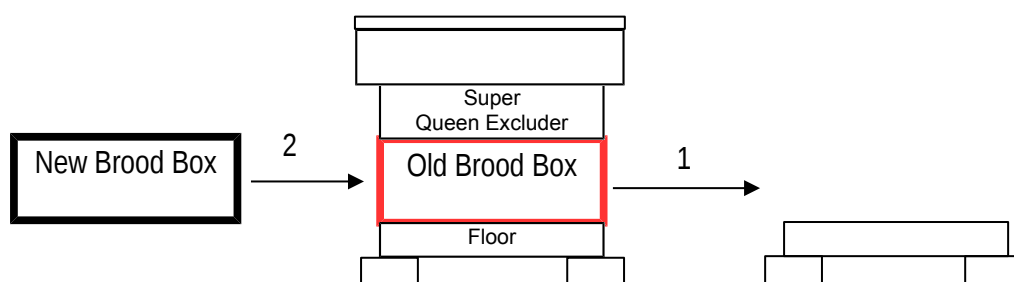
The Basic “Pagden” Artificial Swarm

Preparation is to have spare clean equipment available – and a diary!

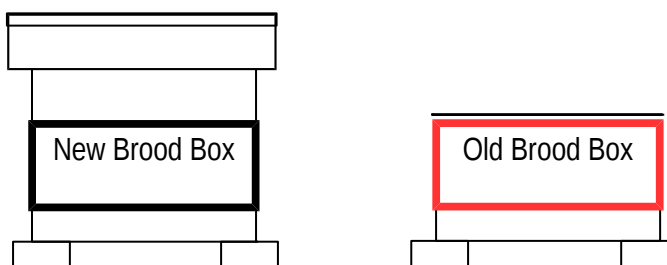
- New brood box (or cleaned one) full of comb or foundation frames
- Plus new Stand, Roof and Floor and a Crown Board (or two)
- Frames of honey or a feeder with syrup and empty super
- Have a cage and paint pen for marking the queen and drawing pins to mark frames

You find a brood box with swarm cells. Don't panic, but don't waste time. If you have to fetch spare kit, close the hive again. If you see the queen and can cage her it saves time later. A queen preparing to swarm can fly, and some will, so carefully and soon as you can:

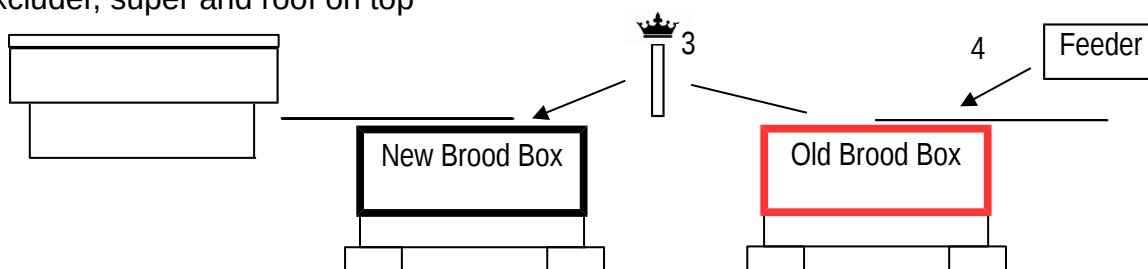
1. Place the new stand and floor 1-3m to the side. Take off the old roof and super plus queen excluder. Then move the Old Brood Box with queen, house bees and swarm cells to the new floor with at least a crown board on top to cover.



2. Place the New Brood Box on the old stand, take out a central frame. Put the super and roof back leave it 30 minutes. Foragers will return to the New Brood Box on the old stand, that leaves fewer bees in the Old Brood Box



3. Go through the Old Brood Box. You need the queen on a frame with young brood but **no queen cells**, the frame the queen is found on is often used. Remove any queen cells from your frame, but leave **at least one QC on another frame** in the Old Brood Box. Put the frame with the queen in the New Brood Box, then the queen excluder, super and roof on top



4. In the Old Brood Box remove all but one well developed queen larva in an open cell. Mark that frame with a drawing pin. Add the spare new frame, put the crown and roof on. With no foragers they need frames of honey or a feeder and syrup

Precautions, Variations and Additions

- Recent books suggest one open queen cell is left in the Old Brood Box. Open cell because you know it's alive and the age. Some leave two close together in case one fails. Some leave a plump sealed cell (or two), they emerge sooner and the queen larva was fed without interruption
- For "insurance" or a queen for later use, sealed queen cells can be cut out to mini mating nucs or a whole frame with QC moved to a full frame nuc.
- The AS can be used to reduce varroa mites. Transfer the queen without brood or use the first frame to trap varroa and discard. If brood are present the queen usually stays. If no brood, a queen excluder under the brood box for a couple of days prevents the queen leaving with the whole colony. When brood has emerged in the Old Brood Box, varroa treatment can be used in the now broodless colony

Next Moves

- After 3 or 4 days go through the Old Brood Box and **carefully** check the marked frame queen cell is OK. Remove any more queen cells that have been started since or you missed first time. Check the old queen is laying in the New Brood Box, over the next week or two she should re-establish the colony
- An optional addition is that 7 days after AS (before the new queen emerges) move the whole colony in the Old Brood Box to the other side (Heddon variation). Foragers migrate to the New Brood Box and reduce the chance of a cast swarm
- A virgin queen emerges in the Old Brood Box 7-8 days after the cell is sealed. A few days to 3 weeks after emerging, given clear sunny days, no wind and some luck the virgin will go on a mating flight and return to start laying
- Don't disturb the new queen for at least 10 days after emerging, 14 is better. Then check for eggs periodically up to 4 weeks. After 4 weeks queens find it harder to mate, a spare mated queen in a nuc is a useful precaution
- If an increase in colonies is not needed and the new queen is laying well think about removing the old queen and uniting the colonies

Alternative AS Strategies

A "Vertical" AS is a division or split. The Pagden AS with extra stand, floor and roof takes a lot of equipment. A "division board" (or "split board") makes another floor with it's own entrance facing a different direction

- Put the New Brood Box and supers on the old floor. Then a division board which forms another hive floor then the Old Brood Box, crown and the roof
- A division board can be easily adapted from a spare crown board by cutting a side rail and covering the escape/feeding holes
- A vertical AS may be a little less efficient in stopping a swarm. They always need more lifting to operate but work well where space and spare equipment is limited

Other boards are developments of the basic division board. They can be used for swarm control as a vertical AS but were principally designed for queen rearing

- A "Snelgrove Board" has a mesh panel and entrances on three sides, above and below the division, these are opened and closed in sequence
- A "Horsley Board" has a mesh panel plus a linked queen excluder panel and entrance that can be opened alternately
- A "Cloake Board" is a queen excluder with a slide to cover it plus an entrance.

Can't find the Queen?

If the queen is definitely there but cannot be found and swarming is a couple of days off or more **don't panic**. There are some possible ways forward. Proceed as for an AS, move the Old Brood Box, take out one frame with eggs and young larvae but **no queen cells** and place in the New Brood Box as for the AS above. Then either:

- Shake or brush **all** the house bees including the queen into the New Brood Box, put a queen excluder on top, then the Old Brood Box on top of that¹
- Leave overnight and younger nurse and house bees move up to tend the brood. The New Brood Box should have the queen underneath, the Old Brood Box on top will have the brood and house bees. Remove all but one (or two) queen cells from the Old Brood Box and move it sideways or split vertically to make the AS

OR

- Close up the Old Brood Box with crown and roof²
- After 7 days, either:
 - a) The queen is in the New Brood Box, you should have newly laid eggs and young larvae in the New Brood Box. Just as it would be if you found her. In the Old Brood Box one queen *should* emerge and take over when the number of bees is reduced but **this is not infallible**

OR

- b) The queen is in the Old Brood Box, the reduced population of bees *should* recognise they lost the foragers and tear down the queen cell(s). The New Brood Box *should* make emergency cells from the supplied eggs or young larvae, tear down all but one (or two) which you allow to develop.

If you don't find the queen and either delay or get the queen in the wrong box, they may swarm anyway. Always best to know where the queen is, so find her if you can.

Nucleus Colony Swarm Control (not an AS)

Another possibility³ is to just remove the old queen to a nuc box with only enough bees to establish a small colony of her own

- A nuc box is made up with the queen + frame of brood + frame or two of stores + empty comb or foundation + dummy board(s) + some shaken bees and close the entrance
- Remove all but one or two queen cells in the Old Brood Box as for the basic AS
- You can move the nuc box far enough away that the foragers don't all go back (3 miles?). If that's not possible, you will lose foragers, but be careful with the stores and feeding and if you can avoid robbing it usually works anyway
- The queen is a "spare" while the replacement virgin is mated and starts laying in the Old Brood Box
- The new nuc can be grown to another colony, used to mate later queens or reunited

1 Summarised from Woodward "Queen Bee Biology, Rearing and Breeding"

2 Outline of NBU Leaflet "Swarm Control When You Can't Find the Queen"

3 From BBKA Leaflet "Swarm Control for Beginners", Celia Davis books and others

General Note

- There are many, many descriptions with small variations and different terminology that you can read about. The important point is to be confident you understand one method and get familiar with it before experimenting
- Actually, some commercial bee breeders just kill an old queen they find about to swarm if she is not breeding stock. Simple, quick and effective but reduces honey yield.

All the general beekeeping books describe one or more swarm control methods:

- Guide to Bees and Honey (5th. Edition) (2010), Ted Hooper, NBB
- Haynes Bee Manual (2011), A & C Waring. Haynes
- Practical Beekeeping (1997), Clive de Bruyn. Crowood Press
- A Practical Manual of Beekeeping (2008), David Cramp, Spring Hill

BeeCraft and BBKA News articles (back issues of BBKA News are in PDF on the website, selected BeeCraft articles are available online)

- BBKA News March 2012 has an article on Pagden AS
- BBKA News November 2013 has an article on Vertical AS
- bbka.org.uk leaflets include "Swarm Control for Beginners" describing the nuc method
- bee-craft.com/the-horsley-board/ design and use
- bee-craft.com "Essays in Beekeeping History: James and Emma Pagden"

Other free guides

- Welsh Beekeepers Association at www.wbka.com
(website menus not always reliable, try Google to search)
- *There-Are-Queen-Cells-In-My-Hive*
- *The-Many-Uses-Of-A-Snelgrove-Board*
- *Swarm-Control-Wally-Shaw*

National Bee Unit at www.nationalbeeunit.com booklets include

- Swarm Control When You Can't Find the Queen
- Using Artificial Swarming for *Varroa* Control

More detailed guides to Queen Rearing and Swarming

- Queen Bee Biology, Rearing and Breeding, Woodward, NBB
- The Honey Bee Around and About, Celia Davis, Bee Craft