

How to deal with a colony that is re-queening itself

(By Wally Shaw, Anglsesey Beekeepers` Association)

There are all sorts of situations where a colony is in the process of re-queening. The two most common are during and after swarming or when a colony has been split to make increase. In most cases, a colony will successfully develop a new laying queen without input from you. But if this does not happen – and the most usual cause is poor weather during the period when the new queen is trying to make mating flights – then the beekeeper must know about this and take the necessary actions to (hopefully) recover the situation. Time is of the essence because every day the bees in the queenless colony are getting older and the likelihood of successful re-queening at a second attempt is rapidly diminishing. A week in your life is not a long time but it is about 20% of the life of a worker bee in summer! Developments within a colony follow quite a logical sequence and adhere to quite a strict time table. It is important to know when various things happened and, unless you have much better time recall than I do, a written record is essential. The following is a series of logical steps describing the calculations, observations and beekeeping actions that cover all eventualities of the re-queening process.

1. As with a pregnancy, the first thing to do is **to calculate a due date for a new queen to hatch**. The development time for a queen is 16 days from a newly laid egg to emergence. It is very rare to see an egg in a queen cell and know that the bees will carry through with the queen-making process. The decision to raise a queen starts with nurse bees feeding a newly-hatched larva with royal jelly, whilst simultaneously extending the walls of the cell. If a new queen is to develop properly this decision must be taken on day 3 or very soon thereafter. If you see a cup with a very young larva in a pool of royal jelly then the decision has been taken and, unless the bees decide otherwise, will become a queen in 13 days. There are 5 days of feeding only for a queen larva and the queen cell is sealed on day 8 (worker cells are sealed on day 9 and drones on day 10). So if you see an open queen cell it is between 8 and 13 days from hatching. With a little experience, you can guess from the size and development of the cell roughly at what stage (which day) it is at. Once the queen cell is sealed it is more difficult to tell how old it is. You could sacrifice a surplus queen cell, breaking it open to see if it is still a larva (days 8-9 old), a mush (days 10-11) or a recognisable queen (day 12 on). This will not necessarily give an accurate prediction because other queen cells may be of different ages – but you only need a rough estimate anyway. If it is an emergency re-queening situation, as when you make a split or due to death of the queen, the bees will usually start some queen cells using young larvae (not eggs) and these will be the first to hatch in about 13 days time.

2. A commonly occurring situation is for the beekeeper to open a colony and find that it has already swarmed. You will be able to identify this condition by an obvious lack of bees (supers that were full of bees are now empty); there are no newly laid eggs and no queen, of course. You can identify the approximate date of swarming from the brood that is left behind. If the swarm took off less than 9 days ago the youngest unsealed brood will tell you on which day the swarm occurred. If you assume swarming took place when the first queen cells were sealed, then 8 days minus the number of days since the swarm will give you a due date for the first queen hatching. **Urgent action is now required if you are to avoid cast swarming in a few day's time. You need to carefully search all the frames for queen cells and reduce their number to one (1 queen cell).** You can play safe (or safer) and leave two queen cells if you are confident that they are of approximately the same age. Two queen cells side-by-side are usually the same age. **Frames that have a lot of bees on them must be gently shaken to ensure you do not miss any queen cells and do not forget to look in those hidden corners down the sidebars.**

3. If there is no unsealed worker brood in the hive then you are in deep trouble and the colony may already have cast swarmed or be about to do so. In this situation, you are likely to see hatched and unhatched queen cells, so what do you do – there may already be a virgin queen (or queens) running round the hive? Is she there or isn't she? Unless, by good luck, you happen to see a virgin queen, **all you can do is thin the remaining queen cells to 1 and pray!** At least you know when to look for a new queen starting to lay, which is about 14 days from now. In this situation you may find that several queen cells hatch whilst you are looking through the colony and deciding what to do. This is because your blunderings have distracted the guards that were keeping them in their cell for later use. You now may have several virgin queens wandering around in the hive. This is not as bad as it sounds because at least you know there is a queen (or queens) in the hive. **What you do now is to destroy all remaining queen cells and close up the hive.** These newly hatched queens will not be able to fly with a swarm for at least 24 hours by which time the bees will have discovered they have no back-up queen cells. The colony will choose from the available virgin queens and select one to go on to make mating flights and stability will be restored. Again you will be expecting a new laying queen in about 14 days.

4. Once a new queen has emerged she will take 2-4 days to start on her mating flights, assuming the weather is favourable. **This is the time to NOT mess around with the hive unless absolutely essential.** If you really must open the hive (and I find it is difficult to think of a sensible reason) it should be outside business (mating) hours, 9.00am-18.00, and certainly not when drones are on the wing. After mating, which may take several days, depending on the weather, the queen needs time to set up her sperm bank and commence egg

production. **The minimum time from emergence to commencement of egg laying is about 10 days but it is normally not less than a fortnight (14 days).**

5. So 14 days after the estimated time of queen emergence you can start to look at the hive entrance for a sharp increase in the amount of pollen going into the hive – this is a pretty sure sign that all is well on the home-front. It is now safe to take a careful look in the colony to see if you can see signs of laying. If you can see the start of brood then the bees have probably got an effective new queen – but not necessarily (see para. 8).
6. If at 14 days after emergence there is not a laying queen, don't panic! What is the demeanour of the colony? Does it seem settled and calm? Does it have arcs of cells, cleaned out and shiny ready for a queen to lay? These are promising, but not infallible, signs so **go to para. 7**. No laying arcs, agitated bees and `roaring` - a very loud buzz caused by many bees fanning – are a bad signs so **go straight to the action part of para. 7**.
7. If there is no laying queen, but the signs are good, give them a bit longer. Wait 5-7 days and take another look. If there is still no laying queen after 3 weeks all may not be lost but, nevertheless, it is time to take action. **The action you need to take is to obtain a test frame of brood – which must include some eggs** - from other colony. If you cannot provide this from your own colonies you will need help from another beekeeper. **Remove a frame from the colony whose queen status is in doubt (shaking off the bees) and place the test frame in the centre of the brood box. Mark it with a drawing pin so that you can easily recognise it later.** If the colony is genuinely queenless the bees will immediately start queen cells on the test frame and in 3-4 days you need to look again to see if this has happened. If no queen cells are produced then the colony thinks it has got a queen and the brood on the test frame will be raised as its own and join the colony. If queen cells are found then you are back at the beginning of the process and it will be about another 13-16 days (from when you put the frame in) before a new queen is hatched.
8. When the brood from a new queen has reached the sealed stage you need to look at it carefully. Is it normal worker brood with more or less flush cappings? **If there are raised (domed) cappings on brood in worker sized cells then you have got a drone layer – a queen who, for whatever reason, is not laying fertilized eggs. This queen and the colony she is in have no future!** Just to complicate matters, there is another possibility. If the area of drone brood in worker cells is quite small and the laying is very patchy with lots

of gaps, then you may have a laying worker or workers. Another clue to this condition is that eggs are being laid in the wall of the cell (not the bottom) and there may be more than one egg per cell.

9. What do you do if a colony has a drone-laying queen? **Well, you cannot do anything until you have got rid of her. So first go through the colony and try to find and kill her.** If this fails, take the hive about 20m away and shake all the bees from the frames onto the ground – or a white sheet if you want visual confirmation there was a queen present. Quickly put the hive back on its stand and all the worker bees (who will all flown by now) will return there minus the queen. If there are enough bees left you can try to re-queen it by introducing a frame with a sealed queen cell on it. At this late stage it is unlikely they will be able to make a good queen from scratch so introducing a frame with eggs is not advisable. Or you could introduce a new queen directly to the colony - if you think this bunch of OAP`s are worth the bother! If you decide to try and recover the colony, a donation of some ready to hatch worker brood would help it on its way.

10. What about laying workers? Well despite what the books say, I have never had any problem with introducing a frame with a queen cell on it. It may not have been successful in the end but at least the queen cell has hatched and not been torn down by the bees.

11. Finally, you know what they say about throwing good money after bad? By the time about 6 weeks has elapsed since a colony had a laying queen it may not be worth the effort. All the surviving bees will be old and not even worth the effort of uniting them to another colony. If this is the decision, shake the bees onto the ground and remove the hive. This is not cruel because the now homeless bees will quickly join other colonies.

Do not be put off by paras. 7-11, most re-queenings succeed without any of these problems. There is one very rare problem that I have not yet mentioned and that is a colony with a queen who does not (cannot) lay at all. She will produce pheromone that tells the colony it is queen-right and a test frame with eggs will be ignored. We met this problem in our second year of beekeeping (and have had it again twice since). Like the drone-laying queen, you have to find and kill this non-laying queen before you can do anything to recover the situation. This type of queen can be very difficult to find, believe me. We had a mentor who came and helped us out and, yes, there was a happy ending.