

# Swarm Control Achieved Through Vertically Splitting a Colony

by Ken Basterfield, NDB

*You may be wondering why we are looking at swarm control in November, but to achieve a maximum honey crop while keeping strong, healthy colonies it is worth planning ahead, as Ken Basterfield explains. Over the next few months, different methods of swarm control and queen rearing will be discussed, giving you time to consider which is right for your beekeeping.*

## Introduction

Swarming is a bit like puberty, it is rather painful, but we all have to go through it! The objective then should be to pass this stage with as little disruption as possible and without, as far as possible, diminishing the colony's ability to produce a good honey crop.

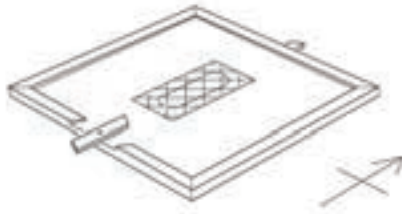
There are numerous approaches to swarm control from the complicated and time consuming systems at one extreme to the 'couldn't care less; let it go' at the other. Both have their costs and benefits. I have, in my time, tried most swarm control systems and, unless expansion is required, the colony should be kept together. I have no faith in cutting out queen cells; it may keep the colony intact, but it becomes so demoralised that the bees fail to forage and become unproductive. If you seek discussion and analysis of competing swarm prevention and control philosophies then you will need to look elsewhere; what follows is what I do and why it suits me.

## Background

We have had an active stock selection programme for many years, breeding from our best performers with queens mated in Apideas. Swarm control is an integrated part of replacement colony provision. With our size of operation, normally about 150 colonies, there is a need for a simple and efficient method of swarm control, so let me explain what my son Daniel and I do. The early influence on my swarm control system development was Snelgrove, from his book *Swarming, its control and prevention*. It is worthy of a brief revue, but what is of value to me here is his division board.

## The Snelgrove system

In the 1930s, the thinking behind Snelgrove's system was based on the Gerstung theorem that an excess of nurse bees stimulates the swarming impulse. Snelgrove's response was to devise a complex division board, which allowed him



*Figure 1. A simpler derivative of Snelgrove's swarm board forms Ken's vertical split board. Notice it has two closable entrances on opposite surfaces and sides to each other.*

to remove brood into an upper brood chamber away from the queen. The effect was to create an artificial swarm (with a minimum of extra equipment) directly above the main colony with his division board acting to separate the two parts. The clever bit was the multiple entrances in the division board. Flying bees from the top brood chamber which became accustomed to one entrance of the division board could be redirected into the bottom brood chamber to reinforce that (and vice versa). Very effective population control!

Following Gerstung, Snelgrove had a quite rigid system of timing for changing of entrances so that only when that brood had emerged and developed beyond the 'nursing age' and into foragers was it allowed back into the lower and queenright brood box by means of the selectable entrance doors in the board. We now know that there is no such rigid relationship between the age of a bee and its function in the hive. Nevertheless, whatever flaws there may have been in the underlying theory for Snelgrove, we should all be thankful for his division board. It allows us to control the population of a swarming colony without the catastrophic population reduction that the loss of a swarm causes.

## Current thinking

A colony that is preparing to swarm can normally be deterred from doing so by temporarily removing much of the brood

and most of the flying bees. Depopulation, sounds obvious! The effect is not just transient, however. It appears to change the colony's 'mind' about swarming, in a manner similar to the way that the onset of a strong nectar flow can. Hence adoption of the common current practices of shook and artificial swarming along with the abstraction of nucs. So swarm control with only a board and an extra brood box makes for efficient beekeeping for many beekeepers.

## My swarm control system

A simpler derivative of Snelgrove's board is the basis of my swarm control methods. It is shown in figure 1. Notice that it has only two closable entrances on opposite surfaces and sides to each other. It is very easily made from an ordinary crownboard.

Using the board requires the temporary separating of the colony into a queenright portion at the bottom with a queenless portion above. The queenless portion will, in due course, raise its own new queen and the whole lot can then be re-united or split if expansion is required.

## Timing

It takes about four weeks to get a laying queen from the date of the division. I use the board only on colonies that show definite signs of swarm preparation during the normal course of hive inspections. As I clip queens this gives me plenty of time before a swarm departs. The timing is therefore determined by the bees and we have to judge whether there is time to re-unite them before the target flow or whether to use it for expansion or replacement. As an example, a colony swarming as late as the third week of May can be reunited well before a main flow in early July. However, the technique is equally applicable to large colonies that you think might try to swarm even though they may not currently be attempting to do this. In this case you may both deter swarming and re-unite with a young queen at your leisure.

## Equipment

To treat a colony, all that is required is an extra brood chamber, frames and a division board. If the colony is very strong and already on two brood chambers this is much easier, requiring only a division board.

## The swarm control technique in practice

It should be noted that the diagrams in figures 1 to 6 are drawn to a constant orientation; to appreciate this will help you understand the manipulations. I have chosen an initial north/south orientation simply to help clarify the explanation; in practice it does not have to be such, merely superimpose the manipulations appropriate to your initial hive orientation. What is important is where the bees are used to finding the entrance to that hive.

Figure 2 shows the hive at the start of manipulations. The floorboard entrance is nominally south. The hive is stripped down to a single brood chamber. This brood chamber and floor board is now rotated through 180° so the entrance now points in the opposite direction, in this case north.



Figure 2. This shows the hive at the beginning of manipulations. The floorboard entrance is facing nominally south.

Half the brood frames are carefully removed with the adhering bees to the spare brood box (later to become the top brood box) leaving the queen behind in the bottom brood box and any queen cells left there are destroyed. The brood frames with stores on are shared out so that the bottom box gets the larger proportion, for they are going to lose the foraging bees (and income) to the top box. The proportion of young to sealed brood in both boxes should be roughly the same. It is not critical.

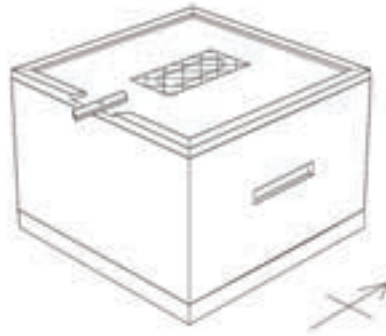


Figure 3. The floorboard has been rotated through 180 degrees with its entrance now facing north. The split board is placed on top of the bottom brood box, closing the lower entrance of this board, and opening the upper entrance to face south.

Only one good, open queen cell should remain in the spare box, a nice fat well provisioned queen larva is what should be left there. Mark the frame with a drawing pin. Young worker brood should be positioned close by.

Both brood boxes are then filled with spare combs. If you started with a two brood box colony the combs are just shared out as above. If you started with a colony that had not yet raised swarm cells, then ensure that there are young larvae in the top box from which the bees can raise emergency queen cells.



Figure 4. The spare brood box is placed on top of the split board and the queen excluder placed on top of that. Existing returning foragers will find their way in through the split board southerly entrance and into the upper part of the vertical split. New foragers from the bottom box will orientate on the northerly entrance.

The division board should have wire gauze on both sides of the Porter escape hole to minimise communication through the hole (although this is not critical and a single gauze will do at a pinch). The division board is placed onto the bottom brood

box, closing the lower entrance of the board and opening the upper entrance with it facing south as in figure 3. The spare brood box is now placed on top of the division board, with the queen excluder on top of that as shown in figure 4. The supers are replaced on top of this queen excluder followed by the crown board and roof as in figure 5.

## Reflection on our work

Now stand back and think what we have got. We have two separate colonies on the same stand. This is a vertical split.

The bottom one with the queen is heavily depopulated and without flying bees. It will give up further swarm preparations and the queen will be brought back into lay. Its entrance now faces north and it will lose its current foraging force which are used to a southerly entrance. As new foragers emerge in subsequent days they will, of course, orientate to this new north entrance.

The top colony has no queen, but does have one good queen cell from which to raise a queen in due course. It also has the flying bees since these bees will have returned to the hive to where they expected the entrance to be, but will not find it. Bees will search much more easily upwards than they ever will sideways round the hive, and in going upwards they enter the top colony to reinforce it. Any income is therefore going into the top and it is on here that we replace the supers, as shown in figure 5. The whole process is a



Figure 5. The supers are placed above the queen excluder and then the crownboard and roof are replaced. The manipulation is now complete.

one-off operation and takes no more than fifteen minutes.

An important point for users of Modified National boxes is to use them the 'warm way', otherwise the end indents and box top rails will act as a barrier to bees searching and travelling upwards. Present them with the flat side where you need them to walk up.

It might be thought that the queenless top colony might still attempt to swarm when its virgin emerges. Indeed emergency queen cells will more than likely be raised in addition to the one swarm cell that was left. My experience is that they normally do not swarm even when left with the emergency queen cells. If it concerns you, go into the hive again five days after the split (and before the seventh day when your chosen queen will be emerging) and knock down any emergency queen cells, being careful not to damage your favourite.

*“ Using my swarm control technique we have two colonies on the same stand. ”*

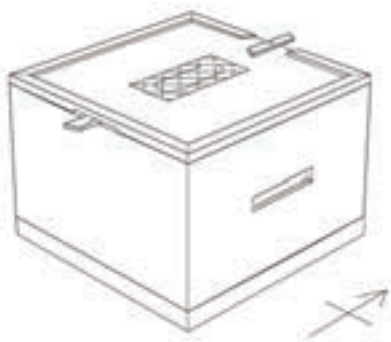
*Ken Basterfield*

The inspection cycle should continue as normal. The main concern with the bottom colony is that they have sufficient stores. If necessary we put a feeder on and lift up the division board and top boxes to accommodate it. The bees walking up from the old southerly entrance will just walk on up a bit higher! Hanging frame feeders are a useful alternative.

Should the bottom colony become unduly weak, flying bees from the top colony can be re-directed below simply by turning the division board round through 180° and opening both entrances of the board as in figure 6 (and rebuilding the hive of course). Look carefully at this diagram and you will see that bees that are used to entering the top colony through the southerly entrance of the division board now go down instead of up. The new entrance for the top colony is then open on the north side.

The hive inspection cycle goes on as normal in the apiary, but during the first couple of inspections the top colony must be disturbed as little as possible when looking into the bottom colony. We always inspect the bottom colony first. Gently removing the roof and supers and stacking these to the side, then lifting off the top colony brood box as a unit with its queen excluder and the division board still

attached. These are put on the stack of supers and not opened yet.



*Figure 6. Look carefully at the different openings in the split board in this diagram. Should the bottom colony become too weak, then the split board can be rotated to divert returning bees downwards to re-inforce the lower box and simultaneously provide a new upper entrance that will face north.*

The bottom colony is then inspected and after this the top colony brood box/ division board/ queen excluder unit is placed back in position above the bottom colony. We can then gently look in the top colony for the emergence of the virgin and on subsequent inspections that she is into lay. By and large, inspecting the boxes in this order avoids mixing the flying bees from the two colonies of the split.

### Reuniting

Once the new queen is well into laying, she is clipped and marked and then they are ready to unite. The quickest method is to replace the division board with a sheet of newspaper and let them sort out for themselves which queen they want to keep; almost always it is the new one. If you feel more cautious, you can remove the old queen prior to uniting. Alternatively, we leave the division board in place, but remove from it one of the pieces of gauze over the Porter escape hole so that the two colonies can get to know each other again without fighting. At the next inspection the division board can be removed to unite them properly.

In either case you will need to decide which orientation the floor board is going to be. The easiest choice is where most of the bees are flying. You can, if you wish, temporarily orientate the floorboard at 90° to both former entrances (i.e. east or west, on the side) and then rotate it to your preferred direction a day later or at the next inspection.

Before the expected flow begins the combs from the brood chambers are rearranged to put all the young brood with the queen in the bottom box beneath the

queen excluder. Combs of stores and surplus mature brood are put into the other box above the queen excluder and they are there to function as an extra super.

### Pollen problems

There is a potential problem with boxes that have contained brood being used as honey supers. It should go without saying, but I must remind you that you do not extract honey until all remaining brood has emerged from the comb. Brood combs used for honey extraction are examined in front of a strong lamp. Those heavy with pollen, which is common in brood frames used for honey, are put aside to boost the stores of weaker colonies. Darker brood combs are difficult to see through and if we extract combs that contain considerable pollen, the risk is that the pollen, now unsealed, will go mouldy and hard, wasting this valuable protein and spoiling the comb. In this case these extracted combs are given directly to less well provisioned colonies by placing them next to the brood nest. Normal hygiene boundary controls should of course apply when transferring combs between colonies.

### Variations and opportunities

Once the fundamental simplicity of the vertical split method is understood, it is possible to appreciate its potential application in situations other than swarm control. The system can be flexible and provide opportunities for multiple uses. For example:

- ❑ Simply split the two boxes off as two colonies.
- ❑ It is possible to extract the old queen to a nuc prior to re-uniting.
- ❑ More than one queen cell can be left in the top brood chamber and when these cells are mature the box can be divided into two or three nucs.
- ❑ Late swarming colonies can be left after the treatment to winter under one roof sharing their combined warmth.
- ❑ The two brood boxes can be united and run as a two queen system.
- ❑ The split can be used as a queenright queen raising colony.
- ❑ Techniques where double brood box working are required.

Look out for my articles on these different applications of the vertical split manipulation in the future. ❀

### BBKA Spring Convention

I will be lecturing on Vertical Split Swarm Control at the 2014 Spring Convention. I do hope some of you can attend; you will be most welcome.