THE MANY USES OF A SNELGROVE BOARD

PART 1 – AN INTRODUCTION TO L. E. SNELGOVE AND HIS BOARD

(by M.W. Shaw, Anglesey Beekeepers' Association)

The Man Himself

Leonard E. Snelgrove was an eminent beekeeper in the 1930`s and was active up until sometime in the mid-1950`s. He lived in Weston-super-Mare, Somerset and was a fellow of the Royal Entomological Society. Amongst his many achievements he was President of Somerset BKA, Hon. Life Member of BBKA, Expert and Honours Lecturer BBKA and a Past President of the BBKA. What is even more important, he was obviously a very thorough and intelligent observer of bees. ***Swarming – Its Control and Prevention***, which introduced the Snelgrove board, was first published in 1934 and has been re-printed by BBNO (15th Edition 1998). Snelgrove also wrote important books on Queen Rearing and Queen Introduction.

Introduction

It is surprising how many beekeepers have a Snelgrove board amongst their collection of beekeeping equipment. Mostly it languishes in the shed unused simply because they do not know what to do with it and, if it does occasionally see the light of day, it is usually as an emergency cover board. This is partly the fault of the beekeeper, not bothering to find out about its use, but not helped by Snelgrove`s book which, in modern terminology, is not very user-friendly. The description of his methods tends to be rather prescriptive and, apparently, inflexible – that is, until you read on into the discussion. He clearly felt that most beekeepers needed detailed recipes. Another problem is that Snelgrove obviously kept a fairly prolific strain of bee because most of the instructions for his methods involve hives on double or even triple brood chambers (ie. 2-3 deep boxes below the queen excluder). Simply following Snelgrove`s instructions it is difficult to see how his methods can be applied to a hive on a brood and a half (one deep and one shallow box). The book also gives the impression that you have to do all the manipulations exactly as he describes on the precise day stated or the outcome may be compromised. It all sounds very difficult and fussy and this puts people off. Later in the book he lets his hair down a bit (not that he had very much to let down judging from contemporary photographs) and talks about all sorts of variations to meet different circumstances, but most readers have lost the plot before they get to this point. The other thing that puts beekeepers off is that for most of his methods (and most other methods of swarm control) you have to find the queen. Well, actually, you do not have to find the queen! Snelgrove recognised this difficulty and gives alternative instructions as to how to do the job without finding the queen - but, again, most people do not read this far.

Snelgrove developed his board mainly for swarm prevention by pre-emptive splitting. Again there is nothing new in this idea which has been used in various guises by beekeepers starting soon after the movable frame hive came into use in the mid-19th century. The aim of this method of swarm prevention is to judge when the colony is fully developed and on the point of swarming (but has not actually started making queen cells) and then split it. Splitting has also been widely used to make increase and, in this case, swarm prevention is an added bonus. It has also been used strategically to prepare colonies for a particular nectar flow, eg. heather; recombining the splits to make a powerful colony with a full brood box and a large head of foraging bees.

Snelgrove based his method on the Gerstung theory of swarming, which claims that swarming is the result of a colony having an excess of nurse bees producing brood food compared with the number of larvae that need to be fed. Snelgrove knew the theory had its detractors and retained an open-mind but still regarded it as a useful way to think about swarming. Pre-emptive splitting effectively removes a lot of nurse bees from the presence of the queen and brood. The Gerstung theory was finally disproved as a result of work by Butler and Simpson at Rothampstead in the 1950`s but, theory or no theory., Snelgrove`s methods still works.

A half-way house to fully splitting a colony is the much older Demaree Method (1892), where brood combs are put to the top of the hive (on top of the top super) but not on a separate floor, i.e. they remain in continuity with the rest of the hive. This method removes nurse bees from the main brood area and it also relieves congestion. It gives less control than a Snelgrove board (or other split floors) and an initial check has to be made that queen cells have not been started at the top of the hive where the bees may be isolated enough to regard themselves as queen-less. The more supers there are between the main brood area and the brood on top of the hive at the time of the manipulation the more likely it is that queen cells will be produced. All that is necessary is to destroy these queen cells (once) and there will be no young brood from which the bees can make further cells. The Demaree Method also suffers problems with drone brood hatching out above the queen excluder, the poor dears can not get out and perish on the queen excluder.

The Snelgrove Board

Snelgrove`s design of board was not entirely original. There had been `swarm-boards` or `split-boards`, as they are often called, around since before 1900. A design of a very similar board (by JE Chambers) appeared in the American journal, Bee Culture, in 1906 and there are several more recent boards, such as the Wilson, Cloake and Horsley boards. As I have not used any of these other boards, I am not sure what they offer but I doubt any are as flexible in use as the Snelgrove design. Basically a Snelgrove board is an intermediate floor but instead of one entrance it has eight! This seems a bit excessive until you understand their use. The board is constructed like a cover board with bee-space on both sides. For the doors to work well and provide good access it is better to increase the bee-space on either side of the board from the normal 6-7mm to 9mm. Most of my boards have 9mm bee-space on the underside and 12mm on top. The extra space on top aids ventilation to the upper colony. Paired doors are located in the middle of the three (or four) sides; the upper doors connect to the topside of the board and the lower doors to the underside. In the middle of the board there is a hole which, in normal use, is covered with mesh. Figure 1 shows the general layout of the board (detailed plans for the construction of a Snelgrove board will be published later).

The paired doors provide the means of controlling the number of bees that are in the colony on the top of the split board. When a split (of any type) is initially put on the board, one top door (usually one at the side or back) is opened to allow the bees to fly. Bees that have flown before will exit from this door but return to the entrance at the front of the main hive from which they have learned to fly. Over the next few days (how quickly depends on the weather) the colony on the Snelgrove board will lose all its (previously experienced) flying bees. During this period, non-flying bees will be `promoted` to flying duties and they will regard the open door on the Snelgrove board as the entrance to their home. Meanwhile brood will be hatching out from the combs in the top colony and, after the initial loss of flying bees, the number of bees will be on the increase. After about five days there will again be a good number of bees flying from the board entrance and the beekeeper can decide whether to keep these bees with the top colony or transfer them to the colony below. Usually the bottom colony is the honey making part of the hive so the aim is to transfer as many flying bees there (to boost the number of foragers) without jeopardising the colony on the top. The colony at the top needs to be able to feed itself, guard itself and if it is making queen cells - which in most uses of a Snelgrove board it is - it needs to have enough bees and food (pollen and nectar) to make a good job of this important task. The transfer of bees into the bottom part of the hive is accomplished by closing the door through which the bees are currently flying and opening the door immediately under it. Another different door on the upper side of the board is now opened from which the bees in the top colony fly (it can be at 90^o or 180^o to the original entrance – is does not really matter). Flying bees will now exit the top colony through the new door but return to the position of the previous entrance and (usually after a slight hesitation) go down and join the bottom colony. Again the top colony will `promote` bees to flying duties to replace the loss but, of course, this will be at the expense of house bees.

The door changing process can be repeated in about 5 days time, and more bees will be transferred to the bottom colony, but only rarely is this necessary or desirable. Rather than following any fixed rule about the transfer of flying bees to the bottom colony, it is better to base the decision on what you can see. Lift the cover board on the top colony and, if necessary, look at a few frames. How many bees are in the top colony? How much brood it there still to feed and to hatch and are there enough bees to look after it? Are the queen cells in the top colony sealed, ie. is feeding of these potential new queens complete? Another factor that may affect your decision is the time in the season in relation to a possible nectar flow. Is the split primarily for swarm prevention you? Are you trying to make a new queen for the colony or are you trying to make multiple queens by distributing queen cells to nucs? The decision over changing doors is not critical and the worst that will happen by not doing it is that may end up with so many bees on top of the board that you have to add an extra box of comb to accommodate them. It is better to err on the side of caution because having too many bees in the top colony is preferable to having too few and getting it robbed-out. The only rule is that any door changing must cease when there is likely to be a virgin queen in the top colony wanting to fly and get mated. Having her return, be confused over entrances and go down into the bottom colony would be seriously counter-productive. Even after a new queen has started to lay in the top colony, it is unwise to do any door changes for about 5 weeks. This is because, by the time the new queen starts to lay virtually all the bees in the top colony will have had flying experience and changing the doors would transfer majority downstairs. A few would stay behind to tend the brood but this would render the colony wide open to robbers. It is only after about 5 weeks of the new queen raising her own bees that there will again be a fairly normal age structure in the colony. I usually find it better to leave the top colony alone with its new queen and, if it builds up sufficiently while there is still a nectar flow, add a queen excluder and super(s). The other time to avoid changing doors is if a robbing spree is in progress – wait until the evening or another day when things have quietened down.

One of the big advantages of a Snelgrove board it that it enables you to do a whole range of operations under one roof. This economises on equipment – one stand, one floor, one cover board, one roof. All sorts of options are open for the colony on the Snelgrove board; it can be re-united with the colony below; it can be moved away and given its independence, it can be united to a queen-less colony. If for some reason the colony on the Snelgrove board fails to produce a new queen the board can simply be removed and the two colonies united. The mesh covered hole in the board means that upper and lower colonies have a similar hive smell and they can usually be united without the use of paper. Again, if robbing is in progress, a more cautious approach should be adopted. The only extra equipment required is extra boxes and frames and the Snelgrove board itself. Because Snelgrove boards are not an everyday item of beekeeping equipment, they do not come cheap if you want to buy one but are really quite easy to make – no fancy joints just accurate cutting, nailing and gluing. Do not be tempted to cut entrances in a standard cover board (as is sometimes advised) as this will not result in a satisfactory board.

Uses of the Snelgrove Board

Having discussed the origins of the Snelgrove board and the principles of its use, we come to allimportant question, what can you do with it? The following is a list of the main uses which will be dealt with in detail in later articles in this series.

1) Pre-emptive swarm prevention (the original use of the board and described above) – for use when no queen cells are present in the colony.
2) Swarm control – for use when queen cells are present in the colony. Snelgrove describes two methods (well three actually, but I have not tried the third).
    a) Method I (as he calls it) which is simply a vertical (all under one roof) artificial swarm which is the same in principle as the Pagdon method.
    b) Method II for, which there is no name, consists of putting all the brood plus queen cells and the queen on a Snelgrove board on top of the hive. The queen cells are torn down, the queen starts to lay again and about 10 days later a second round of manipulation brings the queen back down to rejoin the flying bees at the bottom of the hive. At first sight this seems counter-intuitive but it does work and there is a logical explanation.
3) Making increase and queen rearing – the latter on a small scale (which is what we should be doing anyway to maintain genetic diversity). Raising new queens and the potential to establish new colonies (or uniting colonies easily if increase is not required) are all by-products of the above methods of swarm prevention and control.
4) There are some other rather sneaky uses that I doubt Snelgrove had in mind but, nevertheless, come in handy to solve specific problems.

PART 2 – METHOD I: FOR USE WITH COLONIES THAT HAVE NOT YET ATTEMPTED TO SWARM (CONTAIN NO QUEEN CELLS)

Background

I can really do no better than let Snelgrove speak for himself by reproducing the opening paragraph from the preface to the First Edition of his book (***Swarming – its Control and Prevention***) published in 1934 - which says it all. `The problem of controlling and preventing swarming of bees has exercised men`s minds ever since bees were first kept in hives. The invention of moveable combs, which greatly increased the possibility of control, in some respects intensified the problem. Most beekeepers of today have little difficulty in managing bees successfully during 10 months of the year (**Note** - this was nearly 60 years before Varroa came on the scene) but when the swarming months come, and they are anticipating a good yield of honey as the reward of their labour and care, they are dismayed and often reduced to a state of despair by the frequent disappearance of swarms from their best stocks. Indeed, apart from bee diseases, the difficulty of swarm control still remains the greatest obstacle to successful beekeeping. Many methods of swarm prevention have been devised but have not been widely adopted; some because they involve difficult, frequent, or unpleasant manipulations; and others because they interfere with the main purpose of keeping bees – that of honey production`. Not much has changed since those words were written. I will return to this important question of the effect of swarm control and prevention on honey production in Part 4, after I have described the various options.

At the start of Chapter 1 Snelgrove also has another telling sentence which showed how well he understood the problems of practical beekeeping. `In our part of the world (he lived in Weston-super-Mare – the Atlantic coast of Britain) the vagaries of the weather present unexpected problems to the apiarist which tax to the utmost his patience and resourcefulness`. How very true! Most beekeeping books make no mention of the effect poor weather has on swarming. Experience shows that when large colonies of bees are confined to the hive for several days this frequently coincides with the start of preparation for swarming. The exact mechanism that triggers swarming is not known but presumably prolonged congestion is involved. The one thing over which we beekeepers an exercise no control is the weather – all we can do is hope for the best but assume the worst!

Method 1

This is what Snelgrove originally invented his board to do. He soon found that it could be used for other things (eg. his Method II – subject of Part 3 of this article) and, with a little imagination, further uses can be devised. It had long been known that splitting a colony as it was nearing its peak size, and before any queen cells had been produced, would usually prevent swarming. However, all methods of splitting result in a (potential) doubling of the number of colonies. In addition to a new box of combs in which to install the split, most previous methods also require a new hive stand, floor, cover board, roof and a new place in the apiary to stand the split. This is fine if you want to increase your number of colonies. If not, then you are faced with some tricky logistical problems in re-uniting colonies to get back to square one at the end of the season. Doing a vertical split does away with most of these problems and economises on equipment – everything is on one stand under one roof. Also, as explained in Part 1, by use of the paired doors on the Snelgrove Board (hereafter referred to as SB) the number of bees going to the two halves of the split can readily be adjusted. Within reason, a substantial number of bees can be progressively diverted to the colony at the bottom of the split (the part containing the old queen), which is the main honey producing unit. The only downside of a vertical split is, that in order to look at the bottom colony, you first have to lift off the top colony. But as the whole purpose of the split is to prevent swarming, after the split has been made the bottom colony is extremely unlikely to swarm. Routine inspection of the brood area for queen cells is no longer necessary and, as long as the bottom colony has adequate space to store honey - it should be generously supered at the time of the split - it can be largely ignored for the rest of the season. In the absence of a queen, the top colony will make emergency queen cells and will on no account attempt to swarm. If all goes well, in 4-5 weeks the top colony should have a new laying queen but, if this does not happen, the two parts can simply be re-united. Re-uniting is a very easy manipulation because the mesh covered hole in the middle of the SB ensures that top and bottom colonies have a similar (if not identical) hive smell. The process of uniting can be done gradually; first the mesh panel should be removed so the bees can mingle and the doors on the SB changed so that bees in the top colony can only exit through a door at the front of the hive. After a few days the SB can be removed and the bees will quickly adapt to the normal entrance at the bottom of the hive. The only time to be careful about uniting is if a robbing spree is in progress. Under these circumstances, it is better to wait a day or two or do the uniting as it is just getting dark.

Hive Configurations for Method 1

Snelgrove describes the necessary manipulations in great detail as applying to a colony that is on a double (deep) brood. When we first tried to use Snelgrove`s methods, we converted several hives to double brood but quickly realised that this was unnecessary and that adaptation to our usual hive configuration of brood and a half (one deep and one shallow brood box) was quite straightforward. We found that two deep boxes gave too much space for most colonies of black (or near black bees) unless the number of frames was reduced by using dummy boards. For a more prolific type of bee (which is presumably what Snelgrove kept because he mentions having 3 deep boxes on some hives!), two deep brood boxes would be fine. For those who keep their bees on a single deep brood system, this too can easily be accommodated. However, if you keep bees in a single extra-deep hive (12 x 14 or Commercial) then I think Snelgrove`s methods are of limited application – an extra-deep at the bottom and another on the SB would be too much space for anything but the most prolific type of bee.

Simplification of Snelgove`s Instructions

Because Snelgrove`s Method I was based on the Gerstung theory of swarming (discussed in Part 1), some of the manipulations he describes can be ignored. They were designed to ensure that the maximum number of nurse bees were removed from the bottom part of the split (with the old queen in it) and consigned to the sub-colony at the top. The Gerstung theory was under question at the time Snelgrove published his book but it took until Simpson`s experiments at Rothamptead in the late 1950`s for it to be finally laid to rest. On this basis – and born out by practical experience – it is not necessary to do several of the manipulations described, such as not installing the SB for 48 hours after the split or leaving the mesh panel out of the board to allow the maximum number of nurse bees to move up into the top. As long as the frames of brood placed on the SB get there with their cover of nurse bees intact that is sufficient. There will be enough nurse bees to look after the brood and more will come on stream as the brood hatches out and, of course, there will be no more laying as this part of the hive has no queen for the time being. If for some reason you do disturb the bees too much the situation can be recovered by going through steps 7-10 of Plan B (below – for when you can not find the queen).

The Manipulation

The general features of the manipulations are now described as a number of steps. In step 1 you have to find the queen and this is made easier if she is already marked. The best time to mark queens is in late April or early May, before the colony has got too big and when she can usually be found hard at work on a frame that has got laying space:-

1) Open the hive; get below the queen excluder to the brood and, using as little smoke as possible, find the queen – this is Plan A! I know this instruction strikes fear in the heart of many beekeepers but there is a Plan B (below) which avoids actually finding the queen. However, my advice is try Plan A first; it is much less disruptive for the bees, it takes less time and is more satisfying for the beekeeper (that`s you). If after having conducted a careful queen search for say 10 minutes, and you have not found her, then, and only then, resort to Plan B. We followed this approach over several years and gradually got better at finding queens and now are rather disappointed if we have to resort to Plan B – but it does happen from time to time.

2) Having found the queen put her in a safe place; in a cage (the type of marking cage with a foam plunger is good) or place her on the frame she is on in a secure (entrance blocked) nuc box and cover over. You are now free to examine and split the frames without risk to the queen.

3) The next task is to split the frames of brood (and stores) and decide which will stay at the bottom of the hive with queen and which will go to the top of the hive on the SB. What you do at this point is very flexible – within limits! I know this sounds vague, but how you split the frames depends on what you want to achieve and I will discuss this below with some worked examples – but basically a substantial proportion of the brood goes to the top on the SB and the queen remains at the bottom with what is left of the brood..

4) Re-assemble the hive with the box (or boxes) of frames that are go to the bottom on the floor - **NOT** forgetting to re-introduce the queen to them.

5) Install the queen excluder and what you consider to be an adequate number of supers above – it is not the end of the world if you get this wrong. If the honey flow exceeds your expectations you will probably not resent the extra task of adding more supers!

6) Next put the SB on (where the cover board would normally go) and put the box of combs you have selected to go to the top of the hive on it. Add the cover board and roof.

7) Finally, **DO NOT** forget to open a door communicating with the top side of the SB so that the bees can fly from it – if you forget they will be locked in and will die if left like this for any length of time. A door at one side is usually the best choice.

There now follow some examples to illustrate how to approach splitting the combs. They are also illustrated in the accompanying diagrams showing comb splits and typical hive configuration:-

Example 1 – it is late May, the spring flow is at an end and the next good flow is not expected until the end of June and possibly extending to the 3rd week in July. The hive is on brood and a half; the deep box (on the bottom) is more or less full of brood wall to wall and the shallow box (on top) is 50/50 brood and sealed and unsealed honey. The main aim is to keep the colony from swarming before the next flow starts in 3-4 weeks time and a new queen would be a useful by-product. Assuming 12 (Hoffmann) frames to a box (we normally have 11 and a dummy board), I would select 8-9 frames from the deep box to go to the top. Because this colony is going to be short on foraging bees for a while, I would include some frames that have some stores in them but this can be ignored if the frames used to make up the box contain stores. The bottom (deep) box would be made up with 8-9 drawn frames (or a mix of drawn and foundation) and the box to go the SB with 3-4 drawn frames (preferably containing some stores). In this example I would anticipate making two changes of doors on the SB to transfer bees to the bottom colony; probably on days 5-7 and 10-12 but would check the number of bees present before I did the second change. No door changes would be made after day 12 when it is possible for a virgin queen to be in the top colony (a queen raised from 1 day old larva emerges on day 12). This split is designed to inflict a moderate setback to the colony at the bottom of the hive so, that by the time the brood nest had been fully re-established, there will be a nectar flow on - and it would be nearing the end of the swarming season anyway. The number of combs transferred to the box that is put on the SB can be varied up or down to suit the situation. A sensible minimum (to make a viable colony on the SB) is probably about 5 frames of brood and bees and the maximum is all 12 frames. You can tailor the split according to the perceived situation; depending on the size of the colony, the age of the queen, the time of year, anticipated flows and the likelihood of swarming.

Example 2 - it is early May, the colony has an old queen who, although she is laying quite well, needs replacing as soon as possible – so swarm control is not the main issue here. If the shallow brood box contains at least 50% brood, including eggs and young larvae, that is what I would put to the top of the hive on the SB - as it stands and without any comb changes. If there were not enough eggs in the shallow brood I would introduce a couple of empty drawn frames in the middle and delay 2-3 days until the queen had laid in them. The bottom part of the hive would be the existing deep brood – plus the queen, of course - also without any changes. Whether I replaced the shallow brood at the bottom of the hive (with a new empty box of drawn frames) at this time would depend on how well the old queen was laying. Another option as this point in the process would be to decide if you wanted to change the strain of bee. If the old queen was considered to be desirable then I would accept her daughter as the new queen. If not, I would wait 5-6 days, destroy **all** queen cells on the SB and introduce a shallow frame with eggs and young larvae from a colony that was desirable. For the duration of the split, I would make no door changes with the aim of retaining the full complement of bees on the SB – that is after any flying bees had departed. When a new queen was established and laying well on the SB, I would dispose of the old queen in the bottom of the hive and re-unite by moving the shallow brood plus new queen down – an easy way of providing a colony with new queen whilst retaining the old queen and her laying power until the new one is ready to take over.

Example 3 – this is really just a variant of Example 2 for use when you want to raise some new queens from a desirable queen but without seriously impairing the honey producing potential of the hive. Again, I would put the shallow brood on the SB but would introduce a new, empty shallow brood to the bottom of the hive into which my desirable queen could expand her laying again. After 8-9 days I would look at the box on the SB to see how many frames had good (now sealed) queen cells on them. I would make up some nucs (one less than the number of frames with queen cells) containing bees, brood and food frames from some other colony or colonies (this could be part of their swarm control) and then, after about 24 hours to let them settle down, distribute the frames with queen cells to them. Note that the frames with queen cells **MUST** be harvested before about day 10 or the bees will start to cull the ones they do not want. Left to their own devices the bees will reduce the queen cells to just one that will be allowed to hatch and there will be no attempt to swarm. One frame with queen cells would be left on the SB to raise a new queen there and the removed frames (the ones that went to the nucs) replaced with drawn frames. This example is multi-purpose and has achieved several different outcomes; it has given a measure of swarm control to the hive from which the queens were raised; it has raised several queens in nucs plus one on the SB; and it has also provided a measure of swarm control for the colony (or colonies) that were used to populate the nucs.

I hope these examples have served to demonstrate just how flexible Snelgrove`s Method I (pre-emptive splitting of the colony) can be. Once you have got your head round it, you can easily dream up other variations to suit your or the bee`s needs. What you can do with the new colony that is produced on the SB (if the queen is successful) I will leave to Part 3.

Plan B – for when you can not find the queen.

This is what some of you have been waiting for and it is quite simply a form of shook swarm. It is a rather messy operation but the messiness and the risk of losing or damaging the queen can be reduced by good organisation. You should have an empty box (or boxes) of the type from which you are going to shake the bees available into which to place the frames after they have been shaken. The numbered steps for the manipulation go like this:-

1) You have already got the hive open, have looked for the queen (I hope) and failed – it happens to us all!

2) The first step is to decide what frames are going to go to the top on the SB and carefully assemble them in a box – a spare box may help.

3) Put the box or boxes that are to form the bottom of the hive on the floor and make a space in the middle into which bees from frames can be shaken.

4) The queen could now be in either set of frames – those on the bottom or those going to the top.

5) To ensure the queen is at the bottom, all you now have to do is to shake the frames from the box destined for the top into the bottom, placing them in the spare box as you proceed. Having shaken all the combs from a box, carefully brush any bees that are adhering to the walls (the queen might be amongst them) into the receiving box.

6) When this has been completed – unless you have been careless – the queen will be in the bottom of the hive. The box (or boxes) of frames containing brood destined to go on the SB do not have the queen in it but neither do they have any bees – they need to be re-populated.

7) Put a queen excluder on the bottom box (or boxes) and place the shaken box (or boxes) - with brood but no bees - on top of it and temporarily re-assemble the hive (ie. add the supers and roof to keep everybody happy).

8) Leave the hive like this for about 1 hour, by which time the nurse bees will have moved up to cover the brood but the queen will still be in the bottom.

9) The hive can now be re-assembled in it final configuration, with the re-populated box (or boxes) of brood on the SB.

10) After all these manipulations – which are simple enough but take time - do NOT forget to open a door on the SB from which the bees can fly.

Now you are back where you would have been if you had been able to find the queen but it is over an hour later. During waiting time you can be gainfully employed looking at other colonies - or just go and have a cup of tea. Plan B is not specific to Snelgrove`s Method I but can be used for any situation where you need the queen in a particular part of the hive but are unable to find her, eg. for artificial swarming.

PART 3 – METHODS FOR USE WHEN QUEEN CELLS ARE PRESENT: ARTIFICIAL SWARMING AND METHOD II

Background

In the third part of the series we are moving from pre-emptive methods of swarm control (for use before queen cells are present in a hive) to re-active methods (when queen cells are present). Even the very thorough Leonard Snelgrove did not always get it right with his pre-emptive method of swarm control (Method I – described in Part 2). Like the rest of us, he sometimes opened hives and found that queen cells had already been started. Initially his response to this situation was to do an artificial swam on the colony. As with all methods of artificial swarming, this involves splitting the colony into two; an **artificial swarm**, containing the queen plus the flying bees and just a handful of nurse bees, and the other part, the **parent colony,** comprised of all the brood, the queen cells and most of the non-flying bees. The artificial swam usually stays in its original position and, in a conventional artificial swarm (eg. the Pagden Method), the parent colony is set up in a new position in the same apiary. When the flying bees emerge from the parent colony they return to their previous location and join the artificial swarm.

In the Pagden Method, after the split, the parent colony is stood close to the artificial swarm, first on one side and then, after a few days, it is moved to the other side. After a further few days (but an emerged queen is present) the parent colony is moved to a more distant location in the apiary. In the first position the parent colony looses all its existing flying bees to the artificial swarm. During the stopover, more house bees are promoted to flying duties and, when the parent colony is moved to the other side of the artificial swarm, these new fliers return to the nearest colony they can find, which is the artificial swarm again. The same thing happens for a third time when the parent colony is moved away to a more distant location in the apiary. This series of manipulations is designed to maximise the number bees in the artificial swarm, which is the main honey producing part of the split. At the same time, it removes virtually all the flying bees from the parent colony which no longer attempts to swarm and settles down to choose a queen from those available in the queen cells. All surplus queen cells are torn down and the occupants killed and, in due course, the queen gets mated and starts to lay. Despite what is says in some beekeeping books, **NO thinning of queen cells is required.**

In reality, most beekeepers do not bother with the two extra hive movements and simply put the parent colony in a new position in the apiary and let it get on with it. There is nothing wrong with this practice and, providing the flying bees in the parent colony at the time of the split return to the artificial swarm, no attempt will be made to swarm. The only disadvantage is that the artificial swarm will inevitably have fewer recruits and make less honey. As a point of interest, if the parent colony were to be closed up and immediately moved to another apiary it would almost inevitably swarm! I know this is not a normal beekeeping practice but something like it can happen if a colony is split up and made into several nucleuses for other beekeepers to take home with them. The different outcome reveals much about the underlying mechanism of artificial swarming. Think about it and I will give **my** explanation in Part 4.

The artificial swarm is **supposed** to go off the idea of swarming and settle down to re-build itself. If this happens according to plan, it will contain enough bees to produce a reasonable crop of honey when the next nectar flow occurs. I have deliberately used the words \`supposed\` and \`if\` because it is the artificial swarm part of the split that has the least reliable outcome. The parent colony will be fine so long as it can get the new queen properly mated and laying, but artificial swarms quite often retain the urge to swarm. There are ways to reduce the risk of a renewed attempt to swarm and these are discussed in the next section. However, it seems that there is nothing that can be done to completely eliminate the risk.

Snelgrove\`s Adaptation of the Artificial Swarm

This is simply **a vertical artificial swarm,** where instead of being put on a new stand, **the parent colony** is placed on a Snelgrove board (SB) on top of **the artificial swarm**. The sequence of manipulations is shown in Figure 2:-

a) The hive is completely dismantled and stood in two stacks (a spare roof or empty box is handy) – one stack consisting of the brood boxes and the other the supers.
b) A new deep box of combs is placed on the old floor - drawn frames are preferable but some foundation can be used.
c) The queen is found in the brood stack and transferred to the new box. If she can not be found you can revert to Plan B and use the frame-shake method described in Part 2.
d) This new box, containing the **artificial swarm**, remains in its original position. All the flying bees will congregate in this box with the queen.
e) Unless the attempt to swarm occurs very early, one deep box of comb will usually provide sufficient brood space for the re-building colony until the end of the season.
f) A queen excluder is installed on top of the new box and the supers added.
g) The **parent colony**, comprising the brood, all the queen cells and any bees on the frames, remains in the old brood box (or boxes) which are placed on a SB on top of the suppers.
h) A door on the board is opened (usually on one side). The flying bees emerge from this door but return to the bottom of the hive to join the artificial swarm.
i) After 4-5 days the existing door to parent colony is closed and the door immediately below is opened. Another door on top of the SB (usually at 90º to the previous one) is opened to provide a new entrance for the parent colony. This door change diverts bees from the parent colony to join the artificial swarm below.
j) Another door change can be done in 4-5 days to siphon off more bees.

These door changes are equivalent to the two extra hive movements in the Pagden Method – but without the grunt and groan bit. By now (8-10 days on from the split) there is likely to be a virgin queen ready to emerge in the parent colony and door changing **must cease** to allow her to make her mating flights in peace. Late door changes could result in a queen returning from a mating flight and mistakenly entering a door leading into the artificial swarm, where she might receive a less than welcoming reception. On the other hand, because of the near common hive-smell that is retained by colonies separated by a SB, she might get away with it! But then the beekeeper would be faced with a queen laying in the honey supers!

In Figure 2 you will note that one frame containing brood is shown in the middle of the box containing the artificial swarm. This is a carefully selected frame that contains **no brood young enough to be made into queen cells** – nothing younger than day 6, and older if possible. A frame of all sealed brood is better if you can find one. Bees will not usually abandon brood and this frame is there to prevent them swarming (absconding) in the first few days after the split. Another safety feature is to give the artificial swarm a substantial number of drawn frames. The aim is to get the queen back into lay as quickly as possible as this reduces the chance of renewed swarming. If foundation is used, it should be put to the outside initially. The situation in the artificial swarm can remain `delicate` for up to 3-4 weeks, during which time the colony may decide to produce a new crop of queen cells and have another go a swarming. An explanation for the persistence of the swarming urge will be given in Part 4.

Method II - Original version

Snelgrove discovered this method as the result of an artificial swarming, of the type described above, going wrong. He found that the queens in two hives he had artificially swarmed had managed to squeeze through the queen excluder and rejoin the bees and brood in the box on the SB. Remember that Snelgrove always left the mesh panel on the SB out for 48 hours after the split - and that is how the queens managed to get all the way to the top of the hive. To his great surprise, when he came to inspect them a week later, he found that in both hives all the queen cells had been torn down and that both queens had settled down to lay again. This reveals Snelgrove for what he was; a very observant man. He immediately realised the implications of what he was seeing and that it might form the basis of a method of swam control. So he tried it again, this time deliberately putting the queen and all the brood to the top of the hive on an SB, and, lo and behold, the same thing happened.

So what did he do next? When all the queen cells had been torn down and the queen had started laying again, he found the queen and returned her, on the frame she was on, to the bottom of the hive to rejoin the artificial swarm. They were probably mighty pleased to see her too because, having no means of raising a new queen, they had just about given up hope.

Further experience with the method showed that it had one possible snag because, not uncommonly, the queen-less flying bees at the bottom of the hive discovered that mummy had only moved upstairs to the penthouse apartment and promptly moved up to join her. Initially this produces some rather odd but very obvious behaviour. Bees returning to the entrance at the bottom of the hive, instead of entering, walk up the hive and round to wherever the open door is located. They seem to follow a well-defined route which has obviously been scent marked by the bees. Eventually most of them learn to fly direct from the top of the hive (ignoring the bottom entrance altogether) and the box containing the artificial swarm is virtually abandoned. The return of the flying bees to the parent colony undermines the whole swarm control process; the queen cells are either retained or re-built and the colony resumes its plan to swarm. When he observed this happening, Snelgrove`s solution was to remove the parent colony, on its SB, and place it somewhere else in the apiary – usually on the roof of another hive – where it stayed for a few days. As long as this is done early enough, the artificial swarm loses track of where the old queen is. Any flying bees that have joined the parent colony, come out in their new location but return to the old one where the queen can no longer be found. When the dust has settled, the parent colony can be returned to its original position on top of the artificial swarm. Any bees that have leaned to fly whilst the parent colony is in its temporary location simply join the colony on whose roof they have stood.

When we first tried Method II a few years ago we found that the artificial swarm finding the queen upstairs on the SB happened quite frequently. You had to keep a careful watch on the hive to see this did not happen and, when you saw the signs that they had found her, you had to move the parent colony (and find an extra roof and cover board) as well as the hive lifting and carrying. Basically, it was too much hassle and we reverted to using the more conventional artificial swarm method (described above).

Then we had an idea and asked what would happen if, instead of installing the artificial swarm on all empty combs, you gave them a couple of frames of brood, just to keep them happy? Might not this give them a purpose in life and distract their attention away from finding the old queen? Of course they would make emergency queen cells if brood of a suitable age was present, but this was not necessarily a problem. In fact it could possibly be turned to an advantage! An artificial swarm contains some bees that are still, at least partly, triggered to swarm – which is why the artificial swarm is the unreliable part of the split. Giving them brood from which they can make emergency queen cells might help switch them from swarm to emergency re-queening mode - in which mode swarming is not usually part of the plan. So we made sure that the two frames given to the artificial swarm had cells containing eggs or young larvae.

This proved to be a highly successful modification to Snelgrove`s original Method II. We have used it many times now and on no occasion has the artificial swarm found the queen upstairs - so that problem was eliminated. The artificial swarm has always made queen cells on the two brood frames and has shown a reduced tendency to swarm again at a later date – but it does not totally solve this problem. Overall, we have found the modified Snelgrove Method II to be more reliable than conventional artificial swarming – and it is also easier to do as you will see!

Snelgrove II – Modified version

The sequence of manipulations is shown in Figure 3:-

a) The hive is dismantled as if for an artificial swarm; with the brood and supers in two stacks.
b) A new deep box of combs is placed on the old floor - preferably drawn combs but it can contain some foundation.
c) Two brood frames complete with nurse bees and containing at least some eggs and young larvae are placed in the centre of the new box. **These frames must be carefully checked to see that the queen is not on them. Any existing queen cells on these frames must also be destroyed.**
d) A queen excluder is placed on the new box and the supers added.

e) All the remaining brood (in the original box or boxes) is placed on a SB on top of the hive. This part (the parent colony) contains all but two frames of the brood, all the queen cells and, most importantly, **the queen**. The two missing frames can be replaced with drawn comb or foundation.

f) The only precaution is that no mature queen cells should be present in the parent colony on the SB. Snelgrove actually recommends `no sealed queen cells` but, as long as they are all newly sealed, all will be well. (Logically, unless the weather has been bad for several days, so that swarming has been delayed, there are unlikely to be any mature queen cells present.) However, if in doubt about the maturity of the queen cells, destroy the sealed ones.

g) A door on the SB is opened to let the bees in the parent colony fly and existing fliers will return to the bottom of the hive.

h) After 4-5 days the usual double door change can be done to divert more flying bees to the artificial swarm.

i) After 7-10 days you enter the second phase in the operation. The parent colony on the SB is examined and all queen cells should have been torn down and the queen should have resumed laying.

j) The second phase must not be delayed beyond day 11 or there is a possibility that one of the emergency queen cells may have emerged and there will be a virgin queen on the loose in the artificial swarm at the bottom.

k) Now you have to do a double frame swop; the queen and the frame she is on and one other frame of brood from the top box are transferred to the bottom box (placed in the middle), and the two frames of brood that were put in the bottom during the initial operation – which will now have queen cells on them – are transferred to the middle of the top box.

The bottom box, now re-united with the old queen, should settle down to re-build – and there is a good chance that it will – and the top of the hive on the SB will select an emerging queen, destroy all others and get the chosen one mated. The method is easier than conventional artificial swarming because the queen does not have to be found during the initial split. She only has **NOT** to be on the two frames that go in the bottom box with the artificial swarm. Finding the queen later on the SB is easier because there is a reduced number of bees and she has also resumed laying and will be much less mobile than in a pre-swarming colony – where queens are always more difficult to find.

If for any reason you miss the 11 day limit for the second phase and find that queen cells have emerged in the bottom box, you are trapped in that situation – but it is not a complete disaster! If there are still sealed queen cells, open at least one or two and let any mature queens walk out into the hive. When you are satisfied that there is a least one healthy virgin queen in the bottom box, destroy all the remaining queen cells The artificial swarm should now settle down to select a queen, get her mated and should not attempt to swarm. Meanwhile, the colony on the SB will be forging ahead under the old queen and has now become the main honey producing unit. It will soon need a queen excluder and some supers. These can be moved up from the lower part of the hive where the honey producing potential is reduced. If you have really blown it, and not done the second phase until day 16 or later, then there is a good chance that the bottom part of the hive has already swarmed – but it will be difficult to tell for sure. There is not much you can do about this but you can be fairly sure that it will not swarm for a second time. Learn the lesson and resolve to do better next time!

In the fourth and final part of this series, I will discuss the strategic use of the various methods of pre-emptive and re-active artificial swarming to maximise honey production. I will also try to give a convincing explanation of how it all works.

PART 4 – STRATEGIC CONSIDERATIONS AND SOME INOVATIVE USES

Introduction

The previous parts of this series of articles have described the main ways that a Snelgrove board can be deployed in colony management. Some of the uses are determined by the beekeeper having a definite objective in mind, the most common example being the raising of a new queen for a colony because the existing one is nearing the end of her useful life. Another related objective is to change the strain of a colony with undesirable characteristics by making it raise a new queen using eggs or young larvae from a more desirable stock. By using a Snelgrove board this latter operation can be accomplished almost seamlessly, keeping the existing queen in her job until her replacement is up and running, so that little honey production is lost. A Snelgrove board can also be used as a means of small-scale queen raising; isolating part of the brood from the queen thereby causing the split to make emergency queen cells and using frames with cells on them to `seed` nucs that have been populated by bees (surrogate carers) from another hive.

However, the mainstream use of a Snelgrove board is for either swarm prevention (Method I – used to split colonies pre-emptively before swarm cells are produced) or swarm control (conventional artificial swarming or Method II – used when queen cells are present in a colony). The main objective of beekeeping (for most people) is to produce an optimum crop of honey from their hives. The way in which the swarming behaviour is managed is the main determinant of honey production that is under the control of the beekeeper – things like weather are not.

Swarm Control and Honey Production

Virtually all swarm control methods involve some loss of honey production but this must be weighed against the loss that occurs if a colony is just allowed to swarm, the prime swarm makes good its escape and so do any cast swarms. If this entirely natural sequence of events is allowed to proceed unchecked, most of the honey production will be lost. The following management options are listed in order of their increasing impact on honey production.

a) **No swarm control** - the colony goes the whole way through the season without attempting to swarm. This is the option most likely to realise the maximum honey production potential of the hive. The likelihood of a colony **not** attempting to swarm during the season are greatly increased by good comb management; ensuring the queen always has room to lay and there is plenty of space for the storage of honey.

b) **Pre-emptive swarm control** – splitting the colony before any queen cells are produced (eg. Snelgrove`s Method I, described in Part 2) comes next. If this operation is carefully timed in relation to anticipated nectar flows and the **quantitative balance of the split is nicely adjusted***, there will be little loss honey production. There can even be a slight increase if the split is made early in the season and results in two fully functioning colonies by the time of the main flow. Pre-emptive splitting is certainly a good option for bees that are to be taken to the heather or have access to some other late nectar flow. Uniting the splits can be used to produce a large colony with lots of brood and headed by a young queen in anticipation of the flow.

c) **Re-active swarm control** - doing no swarm control until queen cells are produced and then applying some method of artificial swarming (see Part 3 of the series). The two colonies produced by an artificial swarm will inevitably produce less honey than two colonies produced by a pre-emptive split but the **`wait and see what happens`** or **`sitting on the fence`** strategy does allow the beekeeper to get maximum production from those hives that actually go through the whole season without attempting to swarm. This strategy, using re-active swarm control as and when required, is basically gambling on the chance of a colony not attempting to swarm at any time during the season. Like all gambling, you win some and you lose some, but this is not entirely a game of chance. Experienced beekeepers have some idea how likely their colonies are to swarm and there are warning signs in the colonies themselves if you are looking carefully. The only thing the beekeeper can not control is the weather and, in western Britain, this is a major factor in the initiation of swarming.

d) **Waiting until swarms emerge –** hoping to catch and hive them before they disappear into the wild blue yonder. This is a chancy strategy, requiring great vigilance but can be enhanced by the use of catch or bait hives which hopefully attract swarms to hive themselves. If things are not to go from bad to worse, the beekeeper still has to determine which colony has produced the swarm, open the hive and destroy all but one queen cell, if cast swarming is to be avoided.

e) **Doing nothing at all** - apart from adding enough supers and hoping for the best. If the colony does not swarm a good crop of honey will be produced. If it does swarm and then cast swarms then there is little hope of any honey surplus.

Which Strategy is Best?

You are not catching me on that one! If I really knew the answer I would be much too clever and important to be writing articles for you lot. Seriously though, it is a choice (a balancing act) between a) no swarm control but good comb management, b) pre-emptive swarm control by splitting colonies, and, c) re-active swarm control. All three strategies have a place in the beekeeper's management repertoire. I still have plenty to learn about this aspect of beekeeping and I will let you know when I have any firm conclusion – if ever!

* Just to explain what I mean by the phrase the **`quantitative balance of the split is nicely adjusted`.** When a colony is split to prevent initiation of the swarming process you are attempting to revert the existing brood nest to a less mature state. You are doing this by the removal of brood and nurse bees. The existing brood nest (still with the queen in place) now, not only has more room for her to lay, but fewer nurse bees to look after the brood. The result is a brood nest in a state of development similar to that which existed earlier in the season when the colony was still building. The question is how much brood and nurse bee removal is enough to prevent the colony from attempting to swarm for the rest of the season? I do not know the answer and that is where your skill and judgement as a beekeeper comes in. With some colonies the removal of 2-3 frames of brood and bees will be enough whilst other colonies may need the removal of a whole box – and, in some cases, even that may not be enough. The only rule I can give you is, that if you are going to put the removed frames on a Snelgrove board, it has to be a viable number and I would suggest that about 6 deep frames or 8-9 shallow frames is about right. Because by using a Snelgrove board you have warmth coming up from the colony below, you could probably get away with fewer frames but it is best to err on the safe side. Defence may be the critical issue for the split and it is good practice to adjust the degree of opening of the door on the Snelgrove board accordingly. With a small split quite a small opening will suffice until more bees have emerged from the brood and the new colony has got its act together.

The Difference between a Natural Swarm and an Artificial Swarm

Most beekeepers think that natural and artificial swarms are the same thing – they both consist of flying bees don't they? – but this perception could hardly be further from the truth.

An artificial swarm – by the way it is created by the beekeeper's manipulation, contains virtually all of the experienced flying bees (the foragers) from the original colony. However, it only contains a few younger nurse bees; those that were transferred with (and hatch out from) the single frame of brood and bees that it is usual to transfer to the box containing the artificial swarm.

A natural swarm – contrary to popular opinion, a natural swarm contains relatively few dedicated foragers (the oldest bees in a colony) but is rich in younger bees, many of which have little or no previous experience of flying Studies have shown that up to 70% of worker bees under 10 days old depart with the prime swarm.

If you watch a hive in the process of swarming you can see some of this happening. Incoming foragers, ignoring the mayhem that surrounds them, can be seen struggling to get back into the hive against the flow of bees. Similarly, if you look at the newly settled swarm, you will usually see a few foragers with loads of pollen on their hind legs but a few minutes later they will have disappeared – presumably they realise they have no business there and have returned home.

The process by which the colony splits during the formation of a natural swarm – which bees go and which bees stay - is not understood. Presumably it is an instinctive, age-related response to the triggering buzz runs across the comb faces executed by the bees that are organising the swarming process (whoever they are). Some bees are recruited to the swarm and others hold back and provide the garrison for the home colony. The way a colony splits during a cast swarm may be even more complex but, again, virtually nothing is known about this.

When one thinks about the age composition of a natural swarm it makes perfect sense. What use are older bees to a swarm? A foraging bee has probably got only a few days more to live and what the swarm needs is bees that will survive a minimum of 3 weeks (and more typically 4 weeks) until there can be any new recruits. When the swarm settles in its new home it has to re-deploy its labour force to do the most urgent tasks that face it; into wax makers/comb builders and foragers, the latter to keep the wax makers well supplied with nectar. As soon as there is comb available and the queen starts to lay again some nurse bees will have to come on duty.

What does all this matter to the practical beekeeper? Well, I would have thought you had worked that out by now! An artificial swarm and a natural swarm behave very differently. The artificial swarm is slow to recover and start to re-build its numbers - presumably because of the initial shortage of nurse bees. It is also not prepared for large scale wax production and comb building and will be quite reluctant to draw any foundation with which it is presented. By contrast, a natural swarm is all get-up-and-go and full of vigour. It wants to get a set of combs built as soon as possible, it wants to get the queen into lay quickly and it wants to start accumulating stores for the oncoming winter. The very process of swarming may have an invigorating (simulative) effect on the bees.

Because an artificial swarm is what it says on the can – **`artificial`** – the bees have not evolved any instinctive behaviour to deal with this entirely un-natural situation in which you (the beekeeper) have placed them. It is no wonder that initially they struggle but there is not much the beekeeper can do to help. Although we casually say that an artificial swarm **`thinks that it has swarmed`**, I very much doubt this is the case. There are some bees (not all of them) in that artificial swarm that were triggered to organise a swarm and you have frustrated them. Despite the manipulation to which they have been subjected, they often retain the urge to swarm and will do just that given the slightest opportunity. So it is no good introducing some nurse bees into the artificial swarm to help it recover more quickly because that will probably upset the delicate balance that exists during the early days. The safest option is to leave them to recover in their own time.

When one compares the comparative lethargy of an artificial swarm compared with a natural swarm it leads one to think that the old-time practice of beekeepers, assiduously collecting swarms and installing them in their skeps, had something to be said in its favour. Just a thought!

Two Innovative Ways of Using a Snelgrove Board

These are just a couple of things we have tried recently; they are not in the books but they seem to work.

Putting the Queen in Purdah

If you are beekeeping in an area where there is no late nectar flow, by the last week in June the queen will have laid the last eggs that are going to produce bees that will contribute to collecting the honey crop. Most annoyingly, this the moment at which some colonies will decide to swarm and you find the start of queen cells in the hive. What do you do about this? If you do an artificial swarm you will end up with two colonies that will not really be up to the job of producing much honey.

Providing you catch the process in its early stage, one solution is to find and remove the queen. In the past we have taken the queen plus a couple of frames of brood and bees and put them in a nuc – and it worked. Recently, instead of using a nuc, we have put her into the half-brood and placed that at the top of the hive on a Snelgrove board. We have then used door changing to divert surplus bees back into the (honey collecting) colony below. The main colony (now without a queen) will of course make emergency queen cells but will continue to function reasonably well during honey flow – and certainly much better that if it were split or allowed to swarm. When the honey crop has been taken and if the main colony has successfully raised a new queen, a range of options are open. You can unite the colonies, choosing either the new or the old queen, or you can remove the colony on the Snelgrove board and give it its independence (use it to make increase).

If you are going on holiday in July and suspect a colony may attempt to swarm during the time you are away, you can deploy the same manipulation pre-emptively. This will ensure the colony does not swarm and probably cast swarm in your absence.

What to do with a July Swarm

This is the swarm that **`isn't worth a fly`** as the old saying goes. Basically this is a disaster for the honey crop, as neither the swarm nor the parent colony will make much honey on the main flow. Out of the blue (meaning we weren't looking properly) one of our colonies swarmed in early July. Instead of hiving it as an independent colony in the normal way, we chucked it into a box of comb on a Snelgrove board on top of the colony whence it came. A few days later, when it had settled down (which it did, slightly to our surprise), we did a door change to divert bees back into the parent colony below. As most of the bees were active fliers, a substantial number of bees were bled down by this manipulation but enough remained to support the old queen. If there had been a main flow (this was the summer of 2009 don't forget) this colony would have been able to collect quite a good crop. As it happened, the parent colony (at the bottom) did not succeed in raising a new queen so the old queen was retuned to them after the honey had been taken. On the basis of one trial this method seemed to work and we will use it again if the opportunity arises – which it will no doubt.

What I have tried to demonstrate by these last two examples of the use of a Snelgrove board is what a flexible tool it can be for the beekeeper who is prepared to try something new. The only problem is that, when obtained from equipment suppliers, Snelgrove boards tend to be quite expensive. This is why plans for making your own boards accompany this last part of the series. There is nothing really complex about their construction – no fancy joints – just a bit of accurate measurement and cutting and it's just a bit fiddly. Why not band together as a group of beekeepers or an association and make a batch of Snelgrove boards?