Swarming in Honey Bees

Part IV
Advanced Swarm Control Measures

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In this concluding Part IV of swarming in honey bess, we examine less conventional control measures that, once mastered, present opportunities to further turn the swarming impulse to good advantage. We start here where we left off in Part III with the Demaree Plan, then examine the many merits of shook swarming. We finish where we started, seeing swarming from a honey bee perspective.

Advanced Demaree Plan

In the previous article examining basic swarm control measures, we were introduced to the Demaree Plan. We discovered that the simple measure of separating the queen from all but a single frame of her brood simulates a near brood-free condition where the queen and her retinue face conditions not dissimilar to those of a recently swarmed colony. Wedmore[1] provides a more detailed approach to application of the Demaree Plan especially in respect of its repeated use.

In a further variant of the Demaree Plan, the top unit in the strong Demareed double (Figure 4a) is offset to a separate bottom board as soon as queen cells are built and sealed, in practice ten days later. A queen in this offset colony will mate (Figure 4b) and tear down rival sister queens and becomes the new queen (NQ). This obviates any need to locate and destroy queen cells, removes any chance of swarming – timing is critical – and keeps the old queen laying uninterrupted. The original colony with the old queen (OQ), depleted of brood and supered will freely expand once brood begins to emerge as will the split off unit (Figure 4c). Again conditions are created where swarming is avoided, and for the very simplest of reasons, the bees are kept in the early season brood expansion mode, but now with the immediate prospect of a honey flow.

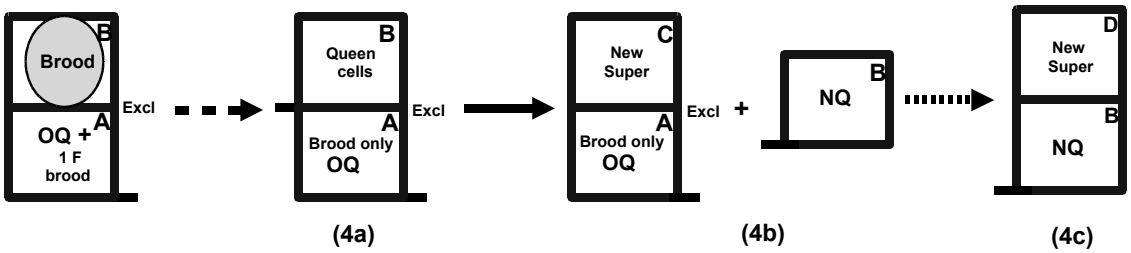

Figure 4 Advanced Demaree Plan

In a very elegant advanced Demaree system, the 'Lavender Hill Plan' described by Hogg[2], this new queen offset can be papered onto the old bottom queen brood box forming a consolidated brood nest headed by two queens. In detail, the new queen in the stand alone new queen colony (super B) is papered on above the old queen (super A) and the original honey super (C) is further papered over a second excluder (Figure 5a). The resultant system is a very powerful colony that can be supered freely (Figure 5b). Two-queen colonies, stable during a honey flow, benefit from two lots of queen

pheromone, will rarely swarm and will produce a large honey crop provided the season is good.

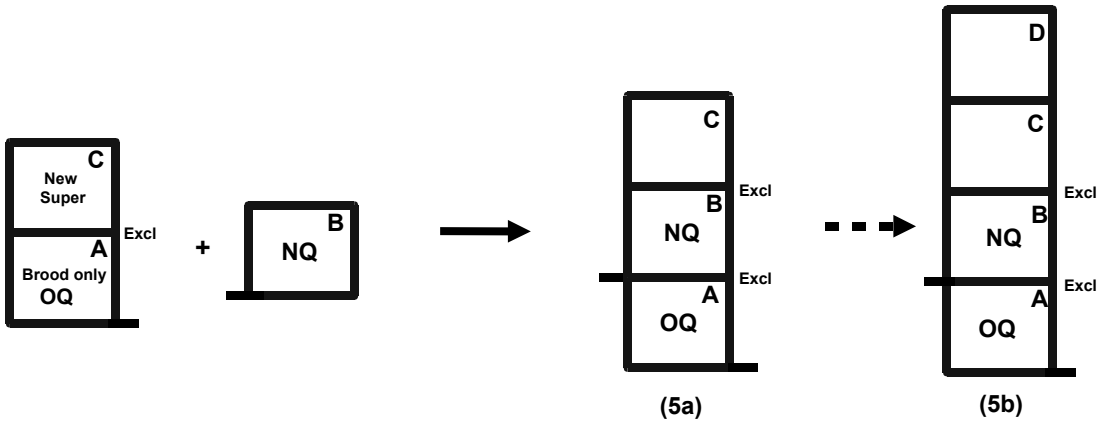

Figure 5 Advanced Demaree Plan – with a two-queen setup

Case e – Shook Swarming

Shook swarming involves shaking all bees from a strong colony preparing to swarm into new gear. This system is a distinctive alternative to hive splitting (where the colony is physically divided) and to the Demaree plan (where the bees are kept together but where queen is separated from her brood). The bees including the queen are simply pushed out the front door and housed elsewhere in much the same manner one would observe bees swarming naturally.

The bees, being artificially swarmed, are deprived of brood, stores and combs but will start again and do so with remarkable comb building and brood development vigour. There are, however, many variants[3] to shook swarming both in terms of timing and the way in which it is performed. In practice the new colony may be fed or supplied with drawn and undrawn combs and stores to accelerate its reestablishment. In any event the colony gets a new start and bees are too intent on rebuilding the colony to swarm.

Planning the fate of the brood left behind as a result of shook swarming depends entirely on the condition of the parent colony. The remaining brood chamber may be left in place to receive returning field bees and the colony will produce its own emergency queen in much the same way as a split colony operates. More often, healthy brood from a strong shook hive can be distributed to weak colonies and a weak colony can be located on the old stand and will be strengthened by the strong force of returning field bees. Suspect or diseased brood must be handled very differently as we shall now explore.

The process of shaking bees out of a colony is extremely valuable for purposes other than swarm control. Firstly there are very good reasons to shake bees where the colony has become hopelessly queenless. Such a hive is virtually impossible to requeen[4] and for one simple reason, laying workers – gynaecoid queens – ensure that they or their workers will ball and destroy a 'foreign' introduced queen. The bees, mainly drones and aged workers, are of little or no value and can be simply shaken off frames well away from hive entrances and left to fend for themselves. Additionally, a drone laying queen, if present, or laying workers will be unable to fly and so will not re-enter the colony. The frames and gear can then either be stored, if needed treated, or more simply added to other colonies once a check is made to ensure the parent colony is disease free.

Secondly, shook swarming can be employed to help resolve some but not all bee disease problems. It can be used to help regenerate hives badly affected by European Brood Disease, Small Hive

Beetle, *Nosema*, chalk brood and even sac brood but *not* American Brood Disease[5]. Here shaking bees from a colony provides a means of separating heavily infected brood, stores and gear from largely healthy bees. Infected hive gear can be disposed of or separately irradiated. Meanwhile the bees can be reestablished in clean gear and fed with a much better prospect of overcoming disease burden, especially if requeened.

It seems almost inevitable that shook swarming will come into vogue with the arrival of the parasitic *Acarapis, Tropilaelaps* or *Varroa* mites. Separating bees from the parent colony forces a break in the brood cycle of parasites and is already a key strategy for controlling, though never eliminating, *Varroa*. Breaking the brood cycle can be an effective means of eliminating *Tropilaelaps* at the apiary level but does not prevent re-infestation from feral colonies or from other apiaries. Swarming and drifting bees will always spread mites.

Swarm control in perspective

It is worth noting that many plans, involving simulation of the pre and post swarming condition, such as caging a queen to force a period of broodlessness, have a major downside. There is a loss in population attendant to the lack of a laying queen or brood and to the removal of bees. This reduces the rate of colony buildup and hence the capacity of colonies to take full advantage of every and any honey flow.

In the absence of disease, the brood cycle break problem has been averted in a number of ways. Not least amongst these is the practice of introducing a new queen to the initially queenless split colony unit or even introducing new queens to both splits. The alternative of using overly strong colonies to make up nuclei to introduce queens and then use these nucs to requeen hives in an apiary is a very practical swarm control measure and averts brood cycle interruption. Requeening an apiary using nucs involves extra work but improves queen acceptance, definitively replaces old queen stock prone to swarming and ensures continuous brood production.

Even with the simple colony split, performed 5-6 weeks before the main flow, the brood nests can be reunited at the beginning of the honey flow after almost all chance of swarming has disappeared. The result is a very powerful honey producing or pollinating unit.

Despite a great deal of evidence that sound management practice should avert swarming, it is important to realise that the natural tendency of bees to swarm and to replace queens means that swarming will still sometimes occur and often unpredictably. Swarm control measures simply improve the odds for colonies to successfully build up to full strength to coincide with major honey flows.

All this stated, it would be an oversight not to emphasise the importance of regular requeening to minimise the risk of swarming, in my experience best conducted every 12-18 months. Queen age is a critical factor in determining the propensity of bees to swarm. Colonies headed by queens two years of age are three times more likely to swarm than with queens less than one year old whereas swarming was reported to occur in 10-40% of unmanaged colonies with young queens[6]. While queen breeders have been able to progress selection for strains of bees with a lower propensity to swarm, the take home message is that if you want to control swarming, make every effort to do so.

Young queens have a higher fecundity – that is, they lay more eggs – and produce more queen pheromone. As we saw in Part I, young queens produce more 'queen substance' than do older queens. This arrests queen cell construction reducing the likelihood of swarms issuing.

The widely advocated practice of autumn requeening is of particular value. Because queens suffer little breeding stress over winter, healthy colonies headed by young queens introduced in autumn, and with good supplies of honey and pollen, will commence laying in mid-to-late winter, come away earlier and have a less than average chance of early spring swarming.

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