

Lecture notes for a talk at the National Honey Show 2005 by Albert Knight

Practical Aspects of Queen Rearing

The content of this talk covers:-

- Preparing colonies for queen rearing
- Grafting tools and aids
- Use of incubators
- Types of mini-nucs
- Overcoming the limitations of mini-nucs
- Choosing and using mating sites

Preparing colonies for queen rearing

To rear good queens requires a strong colony with an abundance of nurse bees, plenty of pollen and open stores.

Preparing such a colony starts the previous season, for it should go into winter as a double brood box colony without a queen excluder and with a young queen and with an abundance of winter bees, by that I mean bees raised in August to October, for these are the bees that will kick-start the colony next Spring.

In Spring ensure the colony is healthy and the queen is present and in the bottom box and laying and with room to lay. Fit the queen excluder between the two brood boxes.

Once the colony has an abundance of nurse bees (that is newly hatched workers) and plenty of open brood, the colony can be made ready to accept transferred larvae.

The day before the larvae are to be given, go through the colony and rearrange the combs so that all the frames of open brood are in the top box together with frames of pollen and open stores. The queen should be caged while this is being done, or if the queen cannot be found then brush all the bees off the frames that are being transferred from the bottom box to the top box. The nurse bees will quickly move up from the bottom box to cover the open brood.

The bottom brood box should have some frames of drawn comb that the queen can continue to lay in. If there are frames of open brood left in the bottom box that cannot be accommodated in the top box, then the bees should be brushed from these and the frames given to other colonies.

The next day the bottom brood box is set up on its own on a new site facing the opposite direction on a new floor with a cover board and roof.

The top box stays on the original site. If grafts are to be given using cell cups the a frame of cups should be placed in the middle of the box, the cups having been lightly sprayed beforehand with a weak sugar syrup. The next day the frame of cups can be removed and larvae transferred into them. These are left for a minimum of 18 hours, then the two brood boxes are restored to their previous positions, that is the box with the queen in at the bottom, a queen excluder in place and the box with the grafts in on top.

Six days later the cells will be sealed and these can be removed and transferred to an incubator or to a cell finishing colony, or can be left as they are to go on to completion.

If an incubator is not being used then the cells can be used by inserting them into nucs on the 10th day after grafting, or they can be left in the colony by caging the cells and allowing the queens to emerge. It is advisable to use the queens the same day by introducing them into nucs at the same time as the bees.

I've described in detail one method of queen rearing, but there are many variations using the natural forces that trigger bees to raise queens.

The set up may be designed as a one-off queen rearing event in the season if only a few queens are required, or it can be designed as a continuous cycle over several weeks to produce numerous queens.

This year we have used a continuous method we call the 'John Harding' method. This is based on a system similar to one designed by one of our members, John Harding. This uses three units connected together by plastic tubing that allows free passage of workers from one unit to any of the others. Queen excluders are fitted to prevent queens from moving out of the boxes they are in. The centre unit is queenless and the two outer units are queenright.

A special cover board on the centre unit has rows of holes drilled to accept the type of cells being used. Prior to grafting the frames in the units are manipulated so as to give the centre unit frames of open brood and frames of pollen and open stores. The grafted cups are inserted into the holes in the cover board that previously had corks. The tubes are blocked by slides for 48 hrs to induce queenlessness.

Using this system we were able to remove the cups when the cells were sealed, or as we often did, remove them as started cells to give to visiting beekeepers after 24 hours then grafting again for our own use.

There are lots of variations such as the 'Cloake' method that can be used to raise queens but the basic principles are used by all of them.

Grafting tools and aids

There are a variety of tools that can be used for grafting, but fine tipped ones such as the Swiss grafting tool are the best.

A good light makes it easier to see larvae and a magnifier too is useful for aging eyes.

The larvae selected must be very small, not much bigger than an egg, these are actually easier to pick up than older larvae.

Use of incubators

These can be made by a handyman or purchased. An incubator is essentially an insulated box with a heater element controlled by a thermostat and a fan to ensure an even temperature throughout the unit. Water is necessary to give humidity.

These should be run at 34° + or - 1 degree. Humidity should be between 60 - 70%.

The queen cells should be put into individual cages that have slots in the base to hold a small amount of liquid honey. This ensures that when the queens emerge they have access to food immediately.

As queens hatch they should be removed from the incubator as they quickly die in the high temperature. They can be kept for two days without worker attendants if required by placing them in a warm place such as an airing cupboard. Check daily that they still have food available.

Types of mini-nucs

There are the commercial nucs such as Apidea, Kirchhain and Warnholz. Small units can be made by dividing up brood boxes, or small nucs can be made with half frames that can be joined together to make full frames that can be put into standard brood boxes when required.

Overcoming the limitations of mini-nucs

Mini-nucs need certain requirements to ensure they function well. These include:-
The right amount of bees. 300ml for Apideas and 500 ml for Kirchhain and Warnholz.

Suitable food.

Positioning on the mating site near a natural marker such as a tree, bush of some other feature.

Confinement after being made up for three or four days in a cool place.

liberating on the mating site at dusk.

After the first queen is mated removing her leaving queenlees for a few days before inserting a ripe queen cell.

Providing room for the second queen to lay.

Choosing and using mating sites

The aim should be to have a site that gives some degree of isolation.

This is not so difficult as one might imagine. One only has to look at a large scale map to see areas that are sparsely populated, this often means few beekeepers.

Moorlands are typical places that are often suitable as mating sites, that is until the heather is in bloom, but by then one can be finished for the season.

Coastal areas can often be found to have possibilities.

A mating site may be 50 miles away from one's apiary, but can be worthwhile.

Obviously full colonies that have been selected as good breeding stock have to be taken to the site, and the maintenance of these and attention to the nucs mean regular weekly visits.

Such projects become easier if a group of beekeepers work together.

Useful booklets on the use of mini-nucs are:

Ron Brown's book on "Managing Apideas" and the "BIBBA guide to Managing Mini-nucs".

For downloads on bee breeding visit the BIBBA web site at <http://www.bibba.com>

Another useful site is Dave Cushman's at:-

<http://www.dave-cushman.net>