Bee farming: maintaining productive stock

R.S. Coleman

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Maintaining Productive Stock

By R. S. Coleman, Officer-in-Charge, Apiculture Section

Every bee hive must be a productive unit, headed by a young vigorous queen, to make sure of the greatest possible return from capital invested in the commercial apiary.

Every hive that does not produce to its maximum is a passenger on the rest of the apiary. A poor hive costs just as much to maintain and transport as a good one.

To keep these hives in full production and in good condition, it is necessary to replace at least half the queens every year with young vigorous queens of a productive strain. There are two approaches to the problem of maintaining young productive queens in the apiary—requeening at fixed intervals, or requeening according to hive performance.

A.—Requeening at Fixed Intervals

This means replacing half the queens each year. It is effected by killing the old queen and replacing her with a new one, introducing a queen cell into the hive to be requeened, or combining with a nucleus hive.

1.—Killing the old queen and replacing with a young queen.

This method involves searching for the queen through the hive. This can be helped by puffing smoke in one side of the entrance of the hive for two to three minutes before opening the hive. The
queen is then usually found on the second deck on the side opposite to which the smoke was introduced. If the queen is not found by searching and there is no chance of coming back next day, the whole hive is shaken through a queen excluder and the queen found in this manner.

After the old queen is found and destroyed the new mated queen is introduced.

Introducing queens into productive hives can be difficult. If the queens are raised by a queen producer, they will come in a queen cage or queen bank. The queen cage has the queen and about 12 escort bees, together with the instructions on how to release her.

The queen bank has 50 or more queens in a nucleus hive, each queen in a separate cage without escorts; the free roaming worker bees in the nucleus feed and care for all the mated queens. Two dangers of queen banks are that queens are sometimes chilled when a bank is travelling in an exposed position and the bees cluster in the top of the box, and that the bees tend to abscond when released in the apiary. Absconding can be overcome by shaking young bees in front of the hive. These queens are placed in the hive to be requeued, in the same manner as the caged queen with escorts.

The candy blocking the entrance to the cage is exposed to the bees in the hive, to enable them to free the queen by eating it out after she is accepted.

2.—Cell introduction.

The second method is to introduce a queen cell in the top of the hive. When the young queen hatches she usually goes down and kills the old queen.

The cell is placed in the super of honey away from the brood nest, and as the queen seldom leaves the brood in an undisturbed hive the young queen hatches out without interference. The slow moving older queen, hampered with eggs, has little chance of defending herself against the youngster. The fault with this method is that there is a break of 10 to 14 days in egg production, and a subsequent drop in the worker population.

3.—Combining with a nucleus hive.

In the third method, a laying queen is introduced with a nucleus on the top of the hive.

This is done by making up a super containing the frames, bees and queen from the nucleus hive, filling the spare room with empty frames and placing it on the top super of the hive to be requeued. To keep the two lots of bees apart one or more sheets of newspaper are placed between these supers, making sure there is no passage-way for the two groups of bees to meet around or through the sheet of paper.

If a few small nail holes are pierced through the paper, the bees will tear the paper out overnight, and combine peacefully. One of the queens is killed, and 95 per cent. of cases it is the older queen. The hive is then strengthened by young bees and headed by a young queen.

B.—REQUEENING ACCORDING TO HIVE PERFORMANCE

The second system of requeening is to watch for hives that are failing when extracting, then at the end of the extraction round, put a nucleus with a young mated vigorous queen on the top of each failing hive.

This is the most economical way, because the hive remains a producing unit at all times and production does not fall while the young queen mates and starts to lay. Also good queens are not killed unnecessarily and are used as long as they remain productive.

With this method, the highest production is gained at the lowest cost in queens. The only drawback is that nuclei, headed by good young queens, must be carried at all times.

Breeding Stock.

The most common way for the honey producing beekeeper to secure breeding stock is to buy, from the recognised queen breeder, a queen that has been tested as a potential breeder queen.

The other way is to select a breeder queen from the hives in the apiary. This works in well with the nucleus and hive combining method of requeening.

Queens selected for breeding replacements must be high producing queens that consistently produce daughter queens which are also high producers.
Selecting the Breeder Queen.

Easy recognition is essential when testing queens as potential breeders. It is very simple to place a dob of paint on the thorax of the mated queen bee, using one of the modern water-resisting poster paints. The queen, held by one wing, will pivot on her six legs and try to pull the wing away. While she is doing this she presents an easy target for a fine paint brush to place a small dob of paint in the middle of her thorax. It is necessary to hold the queen away from the hive for about 10 minutes until the paint has dried. She can then be returned to the hive, and the paint should remain on her back for up to four years.

If a different coloured paint is used for each year, the age of a queen can be seen at a glance when the hives are examined. A queen that is still producing well after two years and whose daughter workers show uniform colouring, can be considered as a possible breeder queen. Docility and good comb-building in the daughter workers are also attributes to consider.

If 10 daughter queens are bred from this queen and prove to be high producers over the next year, and if the potential breeder still remains a high producer in the third year, she can be used with relative safety as a mother of replacement queens.

QUEEN RAISING METHODS

There are two main methods of raising queens, and these have one point in common: the need for a vigorous hive to feed the young queen larvae. This can be produced by upsetting the balance of the normal hive, in other words duplicating the spring condition.

The methods used to do this vary with each beekeeper, but the most popular is to introduce young bees in to a queenless hive at a constant rate. The young bees at the age of from three to twenty days are the main suppliers of royal jelly, the “milk” of the bees secreted from glands on the forehead of the worker bee. This group of bees has a physiological urge to feed larvae and where a hive has a high proportion of this group the queen cells are large and full of royal jelly. This makes sure that young queens have the best of food during their larvae life so they will be as good as their genetic makeup will allow.
THE DOOLITTLE METHOD

There are many modifications to the method originated by G. M. Doolittle, about 80 years ago.

The original method is as good as any of the modifications, which only serve to meet variations in the working methods of different beekeepers. The method described below follows closely, but not exactly, the original recommendation of Doolittle in the 19th century.

Equipment Needed

Grafting tools.—There are a variety of types including the flattened end of frame wire, specially made grafting tools, a 000 paint brush, a sharpened match, and a sliver of bamboo.

Cell frames.—These are frames fitted to take cell bars.

Cell bars made from bottom bars.

Clean wax.

A one-inch paint brush to put on the wax.

Three queen excluders. These should be enough for one run, i.e., one batch of 40 cells every five days.

Boardman feeders, four for one run.

Twelve strong hives to supply the bees.

A number of nuclei stocked with bees according to the number of cells needed, or if the queens are placed out or sold as soon as they are laying the number of nuclei needed to take the cells produced in three weeks.

PREPARATION OF HIVES FOR QUEEN RAISING

The secret of queen raising after the breeding stock is selected is abundant food of the right type for the larvae. This is the one aim in preparing the hives.

For a successful queen raising project, a number of special hives should be selected and prepared. Each has is own part in the programme.

The Queen-Breeder Hive

The queen in this hive is the mother of the queens you are going to produce. From it are taken the larvae which are grafted into queen cell cups.

The larvae produced for grafting should have two characteristics:

- They should be well fed, floating in a relatively large drop of royal jelly to make the grafting easy and protect the very small larvae.
- They should be between 24 and 48 hours old.

Points to Follow:

(a) Keep the breeder queen in a single deck.

(b) Feed the hive at all times with a Boardman feeder.

(c) Have honey combs on the outside with the brood in the middle.

(d) Use dark combs for the queen to lay in so that the larvae can be easily seen.

(e) Remove the centre frame of brood and replace it with the dark drawn comb. On the morning of the seventh day, the larvae should be ready to graft, with average age of about 40 hours. The maximum age is then 60 hours and the minimum age 32 hours.

(f) It is wise to make sure of the age of larvae by lifting freshly laid eggs out after the frame has been in for 24 hours, and placing it over a queen excluder, with milky brood on each side of the eggs in a very strong hive.

Cell building hives:

Two methods are commonly used to start and finish the cells. In the first, the cells are started in one hive and finished in another; in the second both processes take place in one queenless hive.

1. A closed swarm box or an open cell starting hive accepts and starts the cells, then the cells are finished in a queen-right hive, specially strengthened with bees.

(a) A swarm box (or closed starter) is an enclosed box with provision for five frames, with an air space of 6 in. under the frames. The space has flywire on each side to allow free movement of air.
The box is stocked with about 3 lb. of bees or the bees that had been covering 10 frames of milky brood. In the box the frames are arranged with a frame of water on one side and a frame of honey on the other side. A centre space is left for the cell frame, and on each side of the space are frames of brood. Make sure that none of the brood is less than 3½ days old by taking the frames from a deck of brood placed above a queen excluder eight days before.

On the top of the lid of the box is provision for a bottle to feed the bees while they are confined. The lid of the bottle has some twenty holes made by a frame nail and is filled with a mixture made from ½ gal. of hot water and 6 lb. of sugar.

Just before the cells are introduced, the closed starter is dropped on one corner; this bounces the bees into one corner of the box and stops them flying out when the grafted bars are introduced. The box should be kept in a cool place and the bees should not be used more than twice before they are tipped out in front of a cell finishing hive and the box recharged with fresh bees.

(b) The open free-flying cell starting hive is better than the closed hive, as it is more quickly prepared and does not need specialised equipment. A strong hive has all the brood except one frame of milky brood on which is the queen, brought up above a queen excluder, and this hive is fed from this time on. Seven days later, the queen with enough bees to care for her, is removed in a nucleus hive. The nucleus hive is removed from the apiary altogether or is kept shut for two days before the bees are released. This ensures the queen retains enough bees to look after her.

The eggs and young larvae left over are placed on the top of another strong hive so that they may be cared for while the starting hive is being used. The remaining bees, together with the older brood, are left on the old site in a single deck hive, a space being left in the middle of the frames to take the cell frame.

This open starter should not be used for more than five days, after which it should be recombined with paper with the young brood and queen, or strengthened with a deck of brood and young bees.

The queen-right finishing hive is a strong hive that has had added to it, over a queen excluder, a full deck of brood and bees, by the paper combining method, to give it the needed over abundance of young nurse bees to finish the cells after they are placed in the deck above the queen excluder.

All hives used in queen raising should be fed freely; this one should be fed for at least three days before it is used.

2. In the queen-less cell-raising hive method, the cells are placed in a queen-less hive after they are grafted and not
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removed until they are ready to be placed in the nuclei.

The hive is built up the same way as the open cell starter with added bees and old brood, i.e., all larvae over four days old. If the hive is used consistently for complete cell building, a box of bees and old brood is added every five days as a batch of cells is removed.

There is a danger of laying workers appearing if the hive is used for more than three weeks, therefore only four batches of cells should be put through before the hive is given a queen. Do not give the hive a good queen, as they very often kill her.

When using queenless starter hives or queenless cell-building hives, make sure that queens flying in the area are not called into the hive by the bees, by protecting the entrance with a queen excluder. If queens do fly in, all the cells could be destroyed.

**CELL CUP EQUIPMENT**

Cell cups are cast wax cups, the right size for the bees to accept as their own manufacture.

**Making Cell Cups**

A vessel containing absolutely clean wax and rain water is heated until all the wax is melted. If a water jacketed vessel can be used, this gives better protection against the wax boiling over and starting a serious fire.

Do not have this wax too hot or cold. The aim is to get a good even cover of wax each time the cell stick is put into the wax. Experience will soon teach you the right heat.

A cell stick, usually 3/8 in. dowel, is tapered from about 1/2 in. from the end to finish with a rounded base. If the beekeeper who produces his own queens wishes to make his own queen cells a single stick is all that is needed.

The art of coating the wax cups is to first wash the stick in hot soapy water, followed by rinsing the shaped end in boiling water and then placing this end of the stick in iced water. The iced water goes into the grain of the wood, making it waterlogged.

After the stick has been shaken to remove drops of water, immerse in the wax for 1/4 in.; cool the wax-covered tip in iced water and dip in the wax again for 1/4 in.; remove, cool in the iced water again, dry off all water and dip a third time for 1/4 in., then cool it for the last time in the iced water. The cell cup is then removed by gently twisting it off the stick.

The cell cups are fastened to the cell bar with wax, using a 1 in. pastry brush on the cell bar. Twelve to 18 cups should be evenly spaced along the bar.

**Cell Bars**

The cell bars are made from frame bottom bars. One layer of molten wax is brushed on to the surface of the bar and then allowed to become absolutely cold; a second layer is then brushed on, at least 1/4 in. thick, and it is on this layer the cell cups are fastened.

When the ripe cells are removed, a 1 in. square of wax 1/4 in. thick comes off easily. This square protects the cells, and gives a firm base that can be pushed into the comb of the nucleus hive when the cell is introduced. The wax square becomes part of the comb and does not have to be removed for extracting the honey.

The day before the cells are grafted, the frame containing the cell cups should be placed into a hive for the bees to tidy up. This is usually called "warming up" the queen cups.

**GRAFTING**

Grafting is an art that comes only after many failures. Before attempting to graft into the queen cells, it pays to experiment...
by lifting out drone larvae with the grafting tools until you have the knack of lifting the larvae without damage.

**How to do it:**

The first essential is to make sure the larvae are floating in a reasonable amount of milk, then take the frame to a position where you have ample light over your left shoulder (if you are right handed), hold the bar of the queen cups with your left hand, using the frame and brood in such a position that while it is not in the way, the larvae can be placed comfortably in the cell without moving the comb.

When you are comfortable, take the grafting tool and slip it down the side of the cell. Slip the end of the grafting tool underneath the larva and you will find that it can be lifted up with its two ends dangling from each side of the grafting tool. The larva is gently lowered onto the surface of the queen cell cup.

The newly-grafted larvae must be placed in the starter hive or building hive, as soon as possible. Cold does not kill the larvae but dryness, heat and sunlight do. It is important to keep the larvae in the shade and out of the wind.

**Priming the cells:**

Some beekeepers prime their cells with royal jelly, others with honey and others do not prime at all. Each method is well supported by numbers of beekeepers.

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**INTRODUCTION OF CELLS**

The completed cells should be introduced into mating nuclei with as little exposure to heat and cold conditions as possible.

Normally no more than 80 cells are introduced during one day; this is equivalent to five bars of cells. If these are firmly fixed on to the cell bar, they should be cut off beforehand and placed in specially made frames and placed over a queen right colony over a queen excluder, for the bees to care for them.

On the day on which they are introduced into the nuclei the frames are carried from nucleus to hive in a small carrying box. Do not attempt to shake the bees off the frames, but rather put them all into the carrying box. These bees will try to keep the hive temperature within the box and the cells suffer less from the cold.

**NOTE:** It is most important that at no time should the cells be tipped more than horizontal; if they are tipped more than horizontal they may as well be discarded because the wings of the pupae will probably be damaged so that when the queens emerge they may not be able to fly, and thus become drone layers. It is also for this reason that the frames must not be bounced or dropped.

To actually introduce each cell, lift out one of the brood combs and one of the...
<table>
<thead>
<tr>
<th>Day</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Day</td>
<td>In the morning, raise above queen excluders enough brood to make up an open-entrance starter or (alternatively) enough brood to make up a queenless cell starter and finishing hive. In the late afternoon put a dark comb into the middle of the hive containing the breeder, making sure the frame on each side of the empty comb has plenty of milky brood.</td>
</tr>
<tr>
<td>2nd Day</td>
<td>In the afternoon take out the frame of newly laid eggs from the breeder hive and place it above a queen excluder between two frames containing milky brood, in a strong two-deck hive. Make sure the foster hive is fed well, as are all other hives used in the cell building.</td>
</tr>
<tr>
<td>3rd Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>4th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>5th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>6th Day</td>
<td><strong>First day of second run. Other days follow same sequence as first run.</strong> Eggs in foster hive should be hatched, and can be examined when the eggs from the next run are introduced and placed between two milky combs. If the early batch of eggs are not hatched discard them. The starter hive if used should be dequeened and all the milky brood removed except the brood placed above queen excluded on the first day. Another deck of old brood and attached bees should be combined on top with paper. If a queen-less cell-builder is used instead of a starter and queen-right finisher, this should have two decks of old brood combined on top. The cell bars with the attached cell cups should be placed in the cell starter or cell-builder to be warmed up.</td>
</tr>
<tr>
<td>7th Day</td>
<td>The first batch of larvae will be the right age to be grafted in the morning. Graft them and place in the starter or cell building hive. If a Queen right is to be used strengthen it by taking all the bees and half the brood from a strong hive and combine the bees and brood with the queen right finisher with paper. Make sure a milky comb is in the place that will be occupied by the starter cells. Make sure the queen is down in the bottom deck under a queen excluded.</td>
</tr>
<tr>
<td>8th Day</td>
<td>Remove grafted and started cells from the starter hive, if this was used, and place in the queen right cell finishing hive, taking out a comb from between milky frames to make room for it.</td>
</tr>
<tr>
<td>9th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>10th Day</td>
<td><strong>First day of third run. Other days follow same sequence as first run.</strong></td>
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<tr>
<td>11th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>12th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>13th Day</td>
<td>Feed.</td>
</tr>
<tr>
<td>14th Day</td>
<td><strong>First day of fourth run. Other days follow same sequence as first run.</strong></td>
</tr>
<tr>
<td>15th Day</td>
<td>Feed. Prepare nucleus hives for queens.</td>
</tr>
<tr>
<td>16th Day</td>
<td>Cells hatching.</td>
</tr>
</tbody>
</table>
honey combs. Take another brood frame, break down a hollow on the edge of the brood, and fix the cell in this.

The square of wax can be pushed into the comb, leaving the queen cell hanging down in the hollow scraped in the comb. Put the frame containing the cell back in the hive, put in the brood comb and ease it up to the cell, watching to make sure it is not squashed between the frames, then put in the honey comb.

*It is wise to wait at least six hours after taking out the old queen before introducing the cell.*

**PROGRAMME FOR THE DOOLITTLE METHOD**

The chart opposite shows the day-by-day programme for one queen-raising run, which takes 16 days. Most breeders would complete three or four continuous runs, each following the same sequence, once the hives had been set up. The first day of each run is noted on the chart.

It is suggested that the breeder make out a calendar from this chart, outlining the duties for each day of his queen raising project.

The programme should be followed closely; deviations can cause failure of the whole project.

**THE JAY SMITH METHOD**

Jay Smith was a leading queen breeder in the U.S.A. for many years. His method is in itself an adaptation of a much older method, the Alley method.

The procedure outlined does not strictly follow Jay Smith’s method.

The Jay Smith method departs in two ways from the Doolittle method:

1. Strips of comb are cut and very young larvae are used.
2. To be successful it must be continuous. It is a method more suitable for a queen breeder who wants to produce 40 to 80 cells each day of the week.

Its disadvantages compared with the Doolittle method are:

1. The cells are usually webbed together with comb, and the walls of the actual cells are weak.
2. It can only be used continuously.
3. It needs more skill in management of the breeder hive.

For the commercial queen raiser, its advantages are:

1. The larvae are not touched.
2. Younger larvae grow into slightly better queens.
3. The continuous production is an advantage to the commercial queen breeder.

The method of producing the larvae is the essential difference between the two systems.

In the Jay Smith method, the queen is confined in a 10 frame single-deck hive, divided into two compartments by a wire queen excluder. One has room for three frames, and the other for five frames.

The dividing queen excluder should be cut down to fit inside the box from the bottom to level with the top. The wooden rim should make a close fit all round the box, and there must be no way the queen can get into the larger compartment.

Laid across the top so that it falls over the edge of the box by about two inches all round, and nailed to the top of the partition, is a piece of heavy canvas. It helps if a piece of wood or fibre board is fixed to each side of the canvas, to hold it down. To shelter the hive, a lid is placed over the top.

The entrance at the front of the hive, on the side of the smaller compartment, is completely closed, so the bees only have access to the smaller compartment through the queen-excluder.

The entrance at the front of the hive, on the side of the smaller compartment, is completely closed, so the bees only have access to the smaller compartment through the queen-excluder.

In the front a one to two pint Boardman feeder filled with strong syrup is used to keep the queen laying continuously.
STOCKING THE JAY BREEDER

The queen is placed in the three frame compartment about a week before the eggs are needed, with three frames of brood. All the other brood is placed on the other side.

At the time when the eggs should have been laid, a drawn out one-third sheet of foundation is placed in the centre of the queen compartment, and the centre frame removed and placed on the other side.

If the hive is in correct mood, the queen will lay in a solid pattern on each side of the one-third sheet.

At the same time the next day, the one-third sheet of eggs is put in the larger compartment, against the partition. It is replaced in the queen’s compartment with another drawn one-third sheet. This should be done every day; it is wise to put the one-third sheet over even if it contains no eggs.

At the end of four days, the first sheet of eggs will be hatched, and ready to be placed on the cell-bars.

If the queen is marked, it is fairly easy to see her and make sure she is not put over accidently. It pays to see her each day to make sure she is the breeder queen.

The breeder-hive constantly drops in strength, and it is essential to add bees continuously, not only when the queen needs them. A danger sign is the absence of cluster between the side of the box and the frame furthest from the queen in the queenless side. If only a few bees are there, the breeder-hive worker strength is dropping too low.

A frame of brood shaken in front of the breeder each evening, or two if the strength is going down is the best way to help the breeder.

RAISING THE CELLS

It is absolutely necessary to use a queenless hive to start the cells with the strip method.

The best method is the queenless cell-builder, although the open-queenless
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The one-third sheet, when it is withdrawn from the queen right side, is covered with bees and full of eggs.

The cell builder needs to be built up with a deck of brood and bees each time cells are placed in it, and it should be fed constantly. It is the cell builder that draws out the one-third sheets of foundation.

Watch for laying workers in the queen-less cell-builders and make sure there is a queen excluder across the entrance.

Fixing the strips to the cell-bars:

A one-third sheet is taken out of the breeder as the new sheet goes in. At this stage it contains hatching eggs. The bees are brushed off and the sheet laid on newspaper on a hard surface. A hot sharp knife, heated in a tin of briskly boiling water is used to cut the strips.

The sheet is cut into one cell-wide strips. If the knife goes down the middle of the cells each side of the line to be retained, it keeps away from the small larvae in the middle, and kills the larvae in the side cells.

The cell bar is then brushed with molten wax, and before the wax sets the strip is gently pressed onto it. With the brush, more wax is run down each side of the strip to hold it in place.

Some of the larvae are now killed; this is necessary to space the future queen cell. A hot knife is a good implement.

At least two larvae in three should be killed. More space should be left if there is any doubt.

It is not necessary to trim the strip in any other way.

It is wise to put the freshly grafted cells or strips into the cell-builder hive in the evening, so that there is a good cluster to care for the larvae. The cell-builder hive is strengthened with a deck of brood every five days.

PROCEDURE FOR THE JAY SMITH METHOD

1st Day:

Stock the breeder-hive, and start feeding all hives.

Start cell builders. Place above queen-excluders in the hives to be used as cell-builders, all the brood except two frames of brood that are left below with the queen.
In the top deck is placed a new one-third sheet of foundation, approximately square, held in place with wires through the two bottom holes in the frame and waxed thoroughly in the top groove.

Reinforcing Hives: For continuous cell production five cell building hives are needed. To make sure they are strong enough, 10 hives, two for each cell-builder, have all the brood brought above a queen excluder except two frames of brood left with the queen. The rest of this box contains empty frames so that she will continue laying at full capacity. These hives are used to keep the cell-builders at full strength.

6th Day:
In the afternoon, start the breeder by putting a drawn one-third sheet into the queen-right compartment. Trim this sheet back to the original square shape.

7th Day:
In the afternoon put a newly drawn one-third sheet of foundation into the breeder.

8th Day:
In the afternoon put a newly drawn one-third sheet of foundation into the breeder.

9th Day:
In the afternoon put a newly drawn one-third sheet of foundation into the breeder.

Remove the queen and all the young brood and eggs from one cell-builder.

Place two decks of brood and bees on top of this hive, combining them with paper.

10th Day:
Make the first cell-builder ready to receive the hatching larvae and prepare another. Put a one-third sheet of foundation into the second cell-builder, to be drawn out.

In the afternoon place a drawn one-third sheet of foundation in the breeder, remove the hatching larvae, cut the strips, then place the strips containing larvae on the cell bars and put into the first cell-builder.

When the programme has passed the initial stage the typical day should be as follows:

1. Make up queen cages and check orders.
2. Catch and cage queens and post. If not enough orders place in a queen bank. Make sure that there are enough nucleus hives to take the cells.
3. Raise above a queen excluder, the brood and bees needed to reinforce a cell builder in eight days' time.
4. Remove the ripe cells, and place out in the nucleus hives.
5. Reorganise the cell builder, removing combs not containing brood. Change over the drawn one-third sheet of foundation for a new one, leaving gaps for the new cells, and shift the cells just being capped to one side.
(6) Remove the freshly laid eggs from the breeder queen and place on the other side of the partition, shifting the other frames (containing one-third sheets with eggs) away, after making room by removing the newly hatched young larvae.

(7) Cut the strips of young larvae and mount them on the cell-bars. Kill enough larvae to make sure the cells will be spaced well apart, about 15 to the bar, three bars to the frame and two frames of bars.

(8) Place in the cell-builder.

(9) Combine a deck of brood and bees onto the cell-builder, using paper.

(10) Fill all feed bottles.

NUCLEUS HIVES

NUCLEUS hives are small hives designed to carry enough bees to care for a queen until she is mated, and to act as a storage place for young queens.

They vary in size from a small miniature size which takes three half-length half-depth type frames to a nucleus holding five standard frames.

Stocking the Nuclei

Miniature Nuclei: These can be stocked by the orthodox method of finding the queen in a hive, then confining her above a queen excluder in a standard hive super fitted to take the small (nucleus size) frames. These frames can then be lifted out, giving each baby nucleus one or two frames of brood and one or two frames of honey covered with bees.

There is a danger in confining the queen to the small frames, that the bees will abandon her and raise queen-cells amongst the brood in the full size frames.

A second method is to place the small frames in the miniature hive with a pint of bees. The bees are shaken through a queen excluder and then sprinkled with enough thin syrup so they cannot fly. They can then be ladled into the baby nucleus.

Nucleus Hives Containing Standard Frames:

Methods used are:

(1) Finding the queen in a hive then making up the nucleus with brood and honey from the hive.

(2) Bringing up most of the brood in a hive above a queen excluder. When the brood is covered with bees next day, the nucleus is made up with brood and honey.

(3) The hive to be used is spun around on one corner to face the other way, then opened and the frames selected for the nucleus hive, the bees being shaken off back into the hive. The nucleus hive containing frames of brood and honey, but no bees, is placed with its entrance in the same position as the entrance of the hive before it was shifted. This must be done in the morning and the disturbed bees and the foraging bees will stock the nucleus hive by the next morning.

With any of the methods, to retain the bees in the nucleus hive if it is shifted away from the position the bees know as home, it must be shut up for two days before the bees are allowed to fly, or shifted more than two miles away from the apiary the bees regard as home.

CAGING THE QUEEN

Catching the queen can be done either by running her into a queen catching cage or by holding the hand as a funnel or picking up the queen by her wings and placing her in the cage.

With the queen should be as many workers, taken off a brood comb, as the cage will comfortably hold; the usual number is between eight and 12. These are picked up by their wings as they walk or drink honey on the comb.
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