



Eva Crane Trust

ECTD_079

TITLE: Beekeeping techniques: Queen rearing without dequeening

SOURCE: *Bee World* 55(3) 95 - 96

DATE: 1974



Beekeeping techniques

Queen rearing without dequeening

A queenless colony of honeybees will rear a new queen, provided it has female eggs or larvae that are young enough. This fact has tended to overshadow the fact that a queenright colony can be made to rear one or many queens, yet queen rearing without having to remove (or even find) the queen has various advantages³.

Research has been done recently in both New Zealand and Israel to provide a basis for queen rearing by commercial beekeepers, and the results will be useful to beekeepers elsewhere, whether they operate on a large or small scale.

Requeening individual colonies

W. Forster's experiments in New Zealand² were designed to find the most expeditious way of requeening honey-producing colonies, using a ripe queen cell for each, and without removing the old queen. In each hive the brood nest extended to two storeys, or hive boxes. His method A is one that is widely used and recommended. In spring (October in New Zealand) the queen was found, and placed in the bottom box together with a third of the bees, half the brood, and adequate stores. The second box was put above, separated from the lower box by a division board, and provided with its own entrance, which was however closed temporarily to reduce robbing and drifting of bees in the upper box to that containing the queen. In method B the entire brood nest—containing the queen, which therefore need not be located—was raised above the division board, and its entrance was opened straight away. The bottom box received young bees from the combs of both boxes that were outside the brood nest, adequate stores, empty combs, plus a single frame of brood from which the bees had been shaken. Some bees flying from the upper box would return to the lower one, and thus increase its population.

Two days after these operations, a ripe queen cell was introduced into the queenless box of each colony (86 dealt with by method A, and 86 by method B). The queens heading these colonies were in their first, second or third year (70, 48 and 54 respectively). The cells introduced contained sister queens reared by a commercial beekeeper. The two boxes of each hive were united with newspaper early in December, and in late December the results were assessed. All queens "hatched" from their cells; about 80% successfully mated, and 95% of these queens survived after uniting. Results from both methods were considered satisfactory, and both methods were completed without locating the old queen before uniting. The two methods gave similar results in all respects, including honey production. The one factor that reduced honey production with either method, was the survival of the *old queen* instead of the young one after uniting.

The significant difference between the methods was that method B took only 40% as much time as A, required less skill, and could be carried out in poor weather. It is herefore recommended.

Rearing queens in queenright colonies

Dr. Y. Lensky's experiments in Israel⁴ were concerned with the actual rearing of

queens in queenright colonies. A colony with an adequate queen is normally prevented from rearing new queens, by pheromones produced by the existing queen¹. What these pheromones specifically prevent is, however, *not queen rearing as such, but its initial phase*, the construction of queen cells^{5,6}. Dr. Lensky grafted larvae 24 hours old into queen cells, and introduced them thirty at a time into the upper box (super) of 6 colonies, two groups of 3. In the one group the queen was confined to the brood chamber by a queen excluder; in the second group the queen excluder had been removed a week before queen rearing started, so that she had free access to the introduced grafted larvae. The introductions were made five times during July and August, after the swarming season. Out of the 450 (5 × 3 × 30) larvae introduced into colonies where the queen had no access to them, 284 were accepted (63%); out of the 450 larvae to which the queen had unrestricted access, 270 were accepted (60%). There was no need to renew nurse bees or brood in either group of colonies, since the queens were laying continuously.

The presence of the queen therefore does not suppress the rearing of large numbers of other queens in the same colony, provided the larvae are more than 24 hours old (or possibly less—further experiments are needed). There is an interesting parallel in the rearing of diploid drones. These are not normally reared in a colony whose queen lays diploid male eggs, because the workers eat the newly hatched larvae⁷, but if these larvae are reared outside the colony until they are 24 hours old, they can then be returned safely to the colony for the rest of the rearing. The queen cells must be removed again before they are sealed, or the queen heading the colony is likely to destroy them; there is no such need to remove diploid drone cells.

The results of Dr. Lensky's research have been put into practice in commercial queen rearing in Israel, and this will doubtless also be done elsewhere.

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