QUEEN PRODUCTION BY USING QUEENRIGHT AND QUEENLESS NURSE COLONIES

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It is well known that the queen bee is the most important individual in the colony. When a colony is deprived of its queen, the bees set to work and raise another queen to replace the lost one. Rearing queens especially at a large scale, needs skill as well as considerable time and equipment. For rearing queens, first one must select the best queens. Second, young worker larvae are necessary, from which the bees raise the queens.

Bees start to build queen cells under three conditions : queenlessness, swarming, and supersedure impulse. In the last two cases the bees already have a queen. So that, conditions similar to the natural ones should be provided for production of queen cells. Laidlaw and Eckert (1950) indicated that the best queens are reared under the swarming impulse.

In our experiment we used the Doolittle method, and queen rearing was done under two conditions, namely in queenless and queenright nurse colonies.

MATERIAL AND METHODS

Queens were reared by using the grafting method. The wax cups were fixed on a 2-bar frame, containing 24 queen cell cups. 12—36-hour old larvae were transferred to these cups.

Two types of nurse colonies were used. The queenright colonies in 2-storey hives were found to be the most suitable. The queen was left in the lower hive body, with emerging and sealed brood combs, while the unsealed brood combs were put in the upper body to encourage nurse bees to the upper chamber. The two chambers were separated by an excluder. 24 hours later the queen cell frames were transferred to the hive and placed in the middle among the combs. On the 10th day, queen cells were caged in emerging cages.

Queenless colonies were also used. The same procedure was applied, except the fact that the original queen was removed from the nurse colony.

66% sugar syrup was given to the nurse colonies at intervals. Queen rearing was repeated seven times during the season, each in two replications. Number of developed queens, percent of emergence and honey production were estimated as measures of comparison.

RESULTS AND DISCUSSION

The results obtained in these studies are summarized and tabulated in Tables 1 and 2. They indicate that rearing queen by using either method does not differ greatly in terms of the number and percent of developed queens per nurse colony, since the figures are almost the same.

In queenless nurse colonies it was noticed that natural queen cells were developed, while this fact was not obvious in the queenright nurse colonies.

The coefficient of variation values are 20% and 14% for the queenless and queenright colonies, respectively. This difference may be due to the tendency of building up natural queen cells and to that of raising queens in the first case especially those developed by the grafting method in spring (swarming time) as it is shown in Table 1. No such experimental evidence exists for the queenright nurse colonies ; also this may be the reason for the stability in number of the queens developed under the queenright condition.

The honey yield of the colonies used for rearing queens under the two systems is greatly different from one another. The average honey yield per colony used for rearing queens under the queenless system is much smaller than of the queenright colonies, bearing in mind that each colony is used for rearing one series and this means that the colony is deprived of its queen for about 2 weeks. The average honey yield per colony for rearing one batch is 8,200 and 16,100 kg. under the queenless and queenright condition, respectively. This significant difference in honey yield may be attributed to some factors. First, depriving the colony of its queen for about 2 weeks greatly affects its population, and also the bees are busy to build queen cells to replace the lost one. Second, the bees lose temper due to the loss of the queen. These two factors greatly affect nectar gathering and honey yield.

So, we can conclude that both queen rearing methods do not differ greatly in percentage of developed queens, but the queenless nurse colonies give less honey yield

Table 1

AVERAGE NUMBER OF DEVELOPED QUEENS/COLONY REARED IN THE TWO TYPES OF NURSE COLONIES

Date	Queenless nurse colony		Queenright nurse colony	
	Artificial queens	Natural queens	Artificial queens	Natural queens
April 23rd	13.0	26.0	13.5	0
May 9th	10.5	15.0	14.0	0
July 7th	12.5	4.0	10.0	0
July 22nd	11.0	5.0	12.0	0
August 5th	16.0	2.5	13.0	0
August 18th	18.0	4.5	10.0	0
Sept. 10th	15.5	1.0	14.0	0
Total average	13.0 ± 1.05	8.3 ± 3.45	12.4 ± 0.65	0
Variation coefficient	20%	100%	14%	

Table 2

AVERAGE HONEY YIELD OF COLONIES USED FOR QUEEN REARING DURING CLOVER SEASON

Number of colony	Honey yield/colony in Kg	
	Queenless nurse colony	Queenright nurse colony
1	10.600	22.100
2	5.400	14.800
3	6.800	13.800
4	10.100	12.400
5	4.400	20.800
6	11.900	12.700
Average	8.200	16.100

than the queenright colonies. Hence, it is preferable to start the cells and finish them in queenright colonies. Some beekeepers prefer to start the cells in one colony and finish them in others, and starting may be done in the queenless or queenright colonies, after which they are given to a queenright colony to complete the process, while most beekeepers prefer to start and finish queen cells in one and the same colony, and this is widely used. The 2-storey queenright starter colony is suitable to be used in commercial queen production and is also recommended where few queens are to be produced by the grafting method.

The location of the cells in the second storey, of a 2-storey colony will assure a more even temperature and a greater number of young bees. The response of both the queenright and the queenless colonies to build queen cells will be continued as long as the ratios between food and colony population of suitable age are maintained.

REFERENCES

LAIDLAW, M. and ECKERT J. (1950). Queen Rearing. Dadant and Sons, Inc. USA