Efficient Methods for Rearing Strong Bee Queens

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Abstract

The aim was to choose the most efficient method to rear genetically strong queens: by overcrowding swarm or by orphaning the bees. The experiment was conducted in a private apiary in Teleorman County, between April and September 2015. The study was conducted on twenty colonies. The bees were housed in multi-story hives. The queens obtained by overcrowding swarm method had higher prolificacy, good organization of brood on frames and higher honey production. This method is indicated in apiaries with many hives, increasing the efficiency and productivity of bee colonies. The queens obtained by orphaning method assured bee families with low swarming predisposition. This method is indicated in small apiaries by reducing the labour intensity.

Keywords: bee queen, rearing method

1. Introduction

For economic reasons, more and more beekeepers prefer to produce their own queen bees, instead of buying them from specialist units. All practices are based on one fact of bee biology, that the nurse bees can produce some queens from young female larvae. By rearing queens the beekeeper can change the blood of his stock and improve his bees.

The most used natural methods are swarming, emergency and supersedure queen [1]. The quality of queens is affected by colonies selection and season rearing [2, 3]. In general, the best time of the year for producing good quality of queens is when nectar and pollen are abundant and there are enough drones available to ensure successful mating.

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2. Materials and methods

The experiment was conducted in a private apiary from Teleorman County, between April and September 2015.

The biological material was *Apis meliffera carpathica.* The honey bees were maintained in multi-story hives.

The new queens were obtained from the colonies selected for queen's prolificacy, gentleness, high honey production, disease resistance, good comb builders and good wintering quality.

Two natural methods of rearing were used: overcrowding swarm and orphaning the bees. The first method was based on the increasing the number of bees in May and building 8-10 queen cells per colony.

The orphaning method was based on the queen's isolation and rearing a new queen from 4-6 enlarged worker cells per colony.

The new queens were introduced in twenty colonies: C1 with queens obtained by first method and C2 with queens obtained by second method. Between June and September, the following parameters were monitored: prolificacy of queens, organization of brood on frames, honey production, swarming predisposition.

The prolificacy of queens was established using Netz frame and the capped brood during the experiment. The honey production was determined by square decimetre method. The swarming predisposition was established in May, based on specific characteristics.
The performance data were processed statistically by T-test.

3. Results and discussion

Figure 1 shows the egg laying during June – September.

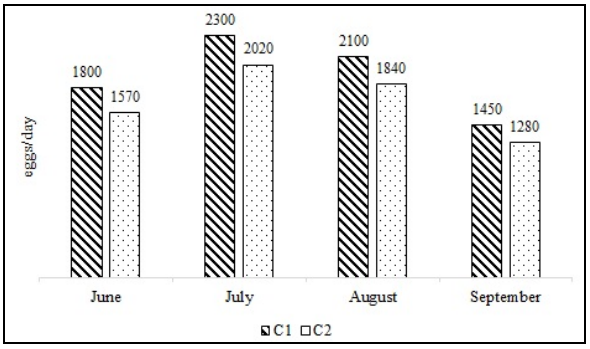

Figure 1. Egg laying

Both groups had a peak in July, with 2300 eggs/day and respectively 1900 eggs/day.
At C1 group the egg laying was higher with 14.6% in June; 13.8% in July; 14.1% in August and 13.2% in September. The differences were significant ($p \leq 0.05$).
The literature data shown that the queens reared by orphaning method were lower quality because they came from older larvae [1,4].
The organization of brood on frames was better at the colonies with queens obtained by overcrowding swarm (Figure 2).

Figure 2. The organization of brood at group C1

Data concerning the honey production are shown in Figure 3.

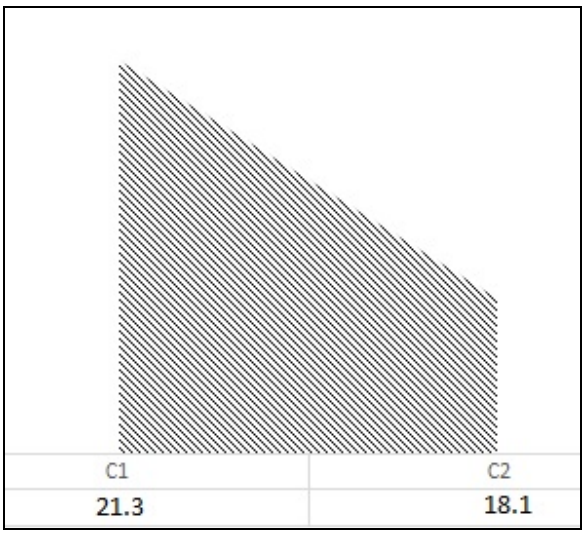

Figure 3. The honey production (kg/colony)

The honey production was 17.6% higher at group C1 ($p \leq 0.05$).
Data concerning the swarming predisposition are shown in Table 1.

Table 1. The swarming predisposition

	C1	C2
Score	3 at 6 colonies 2 at 4 colonies	4

The bees of group C1 were received 2-3 points, because the swarming instinct was present but it could be mastered through specific measures.
At group C2 swarming instinct was 4 points, which means that was absent.

4. Conclusions

4.1. The number of queens achieved by the orphaning method was much lower than the number of queens produced by the overcrowding swarm method.
4.2. The queens produced by the orphaning process were smaller than those obtained by the overcrowding.
4.3. The queens obtained by overcrowding swarm method had higher prolificacy, good organization of brood on frames and higher honey production. This method is indicated in apiaries with many hives, increasing the efficiency and productivity of bee colonies.

4.4. The queens obtained by orphaning method assured bee families with low swarming predisposition. This method is indicated in small apiaries by reducing the labour intensity.

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