

# Studies Concerning the Wintering of Bees

Monica Parvu, Ioana Cristina Andronie, Adriana Amfim, Violeta Elena Simion

Spiru Haret University, Faculty of Veterinary Medicine: 032091 Bucharest, Bdul Energeticienilor nr.11, Romania

---

## Abstract

The study was conducted in a private apiary, in order to determine the most efficient method of wintering in Brasov County. The biological material was *Apis mellifera carpathica Foti* honey bees maintained in multi-storey hives. Ten hives were housed outdoor and ten in shelter. The parameters were monitored between October 2013 and March 2014. The monthly average temperatures were 9°C in October; 7°C in November; -8°C in December; -6°C in January; 2°C in February and 4°C in March. In the colonies housed in shelter, the consumption of honey during the winter was less than 34% and the mortality was less than 63.3%. The results were very significant ( $p \leq 0.01$ ). The diarrhea was moderate compared to wintering hives outdoor. The laying of queen bees has resumed in late February, in both methods. It was observed that the colonies housed in shelter have refused to leave the hives and the intervention of beekeepers was required. This method is recommended in the regions with cold winters, even if it requires more effort to transport the hives.

**Keywords:** bees, wintering methods

---

## 1. Introduction

The wintering methods have a major influence on bee's colonies and honey production of the next year beekeeping.

The objective of any beekeeper is to minimize the bee colony losses during the winter. By instinct, the bees prepare for winter on their own, but they may need the assistance of a beekeeper to ensure survival through winters in extremely cold climates. The preparation of the colony for winter must begin in late summer, usually in August/September, depending on the location [1]. During the winter, the bees develop conservation behaviour by forming the "winter cluster". In order to produce body heat and stay alive, the bees must rely on honey for energy. Some studies have found that the colony will consume up to 13 kg stored honey over the winter period, depending on colony strength [2,3].

In Romania three methods of wintering are being applied: outdoor, in shelter and by packing.

The aim of the experiment was to determine which of the methods (outdoor and in shelter) are the most efficient in Brasov County.

## 2. Materials and methods

The study was conducted in a private apiary from Sambata de Sus, in order to determine the most efficient method of wintering, to lower the percentage of mortality.

The biological material was *Apis mellifera carpathica Foti* honey bees maintained in multi-storey hives. Ten hives were housed outdoor (G1) and ten in shelter (G2).

The following parameters were monitored: the bee's mortality during the winter, consumption of honey during the winter, the general status of the family (the presence or absence of diarrhoea stain and moisture from the hive), restart of egg laying in spring. The parameters were monitored between October 2013 and March 2014. The monthly average temperatures were 9°C in October; 7°C in

---

\* Corresponding author: Monica Pavu, Email [monica.parvu@gmail.com](mailto:monica.parvu@gmail.com)

November; -8°C in December; -6°C in January; 2°C in February and 4°C in March.

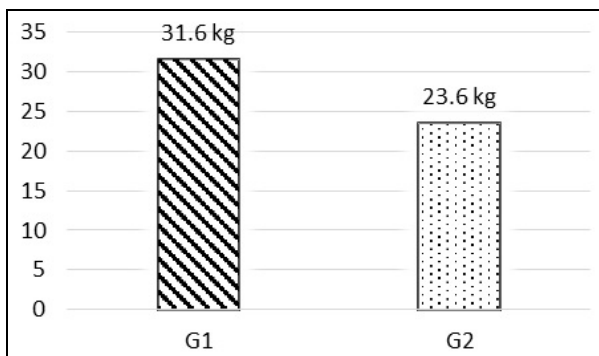
The performance data were processed statistically by T-test.

### 3. Results and discussion

The data concerning the consumption of honey during the winter are present in Table 1 and Figure 1.

**Table 1.** Monthly consumption of honey during the winter (kg)

Month	G1	G2
October	2.625	3.068
November	2.722	3.304
December	7.001	4.012
January	7.584	4.358
February	7.390	4.138
March	4.278	4.720



**Figure 1.** Consumption of honey during the winter

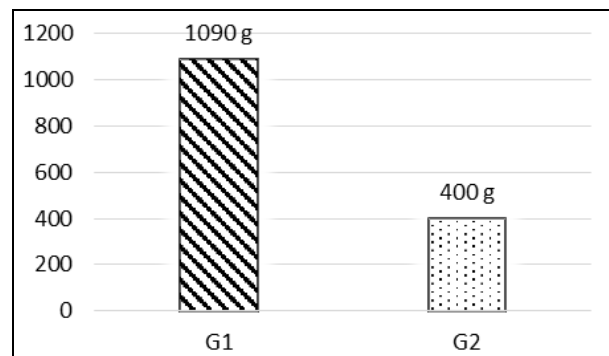
At G1 (housed outdoor) the consumption of honey was 8.3% in October, 8.6% in November, 22.2% in December, 24% in January, 23.4% in February and 13.5% in March.

At G2 (housed in shelter) the consumption of honey was 13% in October, 14% in November, 17% in December, 18.5% in January, 17.5% in February and 20% in March.

It was found that at the colonies housed in shelter, the consumption of honey was lower with 34%. But, in March the consumption was higher with 10.3% even if in this period began the collect of nectar and pollen.

In the literature, it was mentioned that the consumption of honey during October – April was 29.6 kg at colonies housed outdoor and 21.4 kg indoor [4].

The results concerning the mortality during the winter are presented in Figure 2.



**Figure 2.** Mortality during the winter

The initial amount of bees was 10240 g (G1) and respectively, 9200 g (G2). The mortality during the winter was 10.6% at G1 and 4.3% at G2. In the literature, it has been reported that the losses during the winter was between 4 - 15% [2,5].

At the honey bee colonies housed in shelter, the mortality during the winter was with 63.3% lower, the differences being very significant ( $p \leq 0.01$ ). Also, the diarrhoea was moderate compared to wintering hives outdoor.

The queen has started laying eggs again at the end of February. After a month of laying in each hive there was one frame with young bees at G1 and ½ frame at G2. It was observed that the colonies housed in shelter have refused to leave the hives and the intervention of beekeepers was required.

### 4. Conclusions

The consumption of honey during the winter was 34% lower in the colonies housed in shelter, although in March the parameter was 10.3% higher.

The mortality during the winter was 63.3% lower at the colonies housed in shelter, the differences being very significant ( $p \leq 0.01$ ).

After a month resumption laying the frames with young bees were 50% lower at G2.

The colonies housed in shelter have refused to leave the hives and the intervention of beekeepers was required.

This method is recommended in the regions with colds winters, even if it requires more effort to transport the hives.

## References

1. Ellis J. and Hammons Katherine, Overwintering Honey Bee Colonies in Northern Climates, UF/IFAS Extension, University of Florida, September 2013. Home page address: <http://edis.ifas.ufl.edu/in1006>
2. Genersch Elke, Werner von der Ohe, Hannes Kaatz, Annette Schroeder, Christoph Otten, Ralph Buchler, Stefan Berg, Wolfgang Ritter, Werner Muhlen, Sebastian Gisder, Marina Meixner, Gerhard Liebig, Peter Rosenkranz, The German bee monitoring project: a long term study to understand periodically high winter losses of honey bee colonies, *Apidologie*, 2010, 41, 332–352, INRA/DIB-AGIB/EDP Sciences. Home page address: <http://www.apidologie.org>
3. Owens C.D., The Terminology of Wintering Honey Bee Colonies, *Bee Source*, 2015. Home page address: <http://www.beesource.com>
4. Moeler F.D. 1978, Overwintering of honey bee colonies, cited by *Bee Source* 2015. Home page address: <http://www.beesource.com>
5. Van Engelsdorp D., Underwood R., Caron D., Hayes J., An estimate of managed colony losses in the winter of 2006-2007, 2008. Home page address: <http://journals.plos.org>.