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# BIOGAZDÁLKODÁS A HAZAI MÉHÉSZETEKBEN

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**Összefoglalás**

A konvencionális és a bioméhészetet is számos rendelet szabályozza. Hazánkban az ellenőrzött és tanúsított bioméhészetek a kilencvenes évek közepétől jelentek meg. Az átállt méhészetek száma kb. 1%-a a konvencionálisnak, a méhcsaládok száma az ottani átlagnál kissé nagyobb. Az ökológiai előírások jelentős része vonatkozik az átállásra, amelynél a lépkészlet cseréje kiemelt jelentőségű. A méhlegelőt tekintve a bioméz legfontosabb forrása az akác (*Robinia pseudoacacia*) és az igen elterjedt veszélyes évelő gyom, a selyemkóró (*Asclepias syriaca*). A kártevők és méhbetegségek elleni védekezési lehetőségek jelentős eltéréseket mutatnak a bioméhészetben. A méhlegelő és a klíma változásai kedvezőtlenül befolyásolhatják a méhcsaládok gazdaságos fenntarthatóságát is. A dolgozatban a hazánkban alkalmazott kaptárakat és egyes technológiai változatokat ismertetjük és javaslatokat teszünk a bioméhészet fejlesztésére.
**Kulcsszavak**: méhészet, ökológiai gazdálkodás, átállási idő

## Organic apiculture in Hungary

**Abstract**

Conventional and organic apiculture are regulated with several directives. In Hungary controlled and certified apiaries have started in the mid-nineties. Organic apiaries after the conversion period mean 1% of the conventional ones; however the number of colonies exceeds its average. Significant part of the organic regulations deals with the transition period where the replacement of the combs has outstanding importance. Regarding to the bee pasture the most important sources of organic honey are black locust (*Robinia pseudoacacia*) and the dangerous, wide spread perennial milky weed (*Asclepias syriaca*). There are big differences in the possibilities of pest and disease control in the organic operations. Changes of climatic conditions and bee pasture may have negative influence on economic sustainability of the colonies. In the paper technological versions and hive types of Hungary are dealt with. For the development of organic beekeeping suggestions have been included.
**Keywords:** apiculture, organic farming, conversion period

## Introduction

Beekeeping has a long and successful tradition in Hungary (*Nikovitz*, 1983, *OMME*, 2013). The country is among the largest producers in Europe. The annual honey production varies between 15-25 tons produced by over 18000 Hungarian beekeepers. The European Union regulated the production of organic agriculture to give a common framework through the certification of the environmentally sound production system (*EU*, 1991, *EU*, 2007). In Hungary the number of organic beekeepers stabilised in the last decade as shown on *Table 1*, however their number is around 1% of the conventional producers. The number of organic colonies is about 2% of the total (*Biokontroll*, 2012).

***Table 1:*** **Number of organic beekeepers in Hungary**

| Year | 2001 | 2002 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| Nr. of organic apiaries (1) | 207 | 193 | 200 | 192 | 181 | 181 | 176 |
| Nr. of organic colonies (2) | 15532 | 15337 | 20044 | 20170 | 18622 | 19376 | 19296 |

Source: Biokontroll, 2013

*1. táblázat: Ökológiai méhészek száma Magyarországon*
*(1): bioméhészetek száma (2): a bioméhészetekben élő méhkolóniák száma*

Although honeybees (*Apis mellifera*) have successfully adapted to the environment since millions of years and have good abilities to resist or tolerate many diseases, pests and infections, new parasites and diseases have appeared from the eastern race (*Apis cerana*). Since the varroa mite (*Varroa destructor*) have become common in the colonies beekeepers need regular acaricide treatments to keep mite populations under control. *Bogdanov* (2006) reported that the main danger for bee products originates more from apicultural practices than from the environment. The main contamination risks for the different bee products are as follows: Honey: antibiotics; wax: persistent lipophylic acaricides; propolis: persistent lipophylic acaricides, lead; pollen: pesticides; royal jelly: antibiotics.

Our aim was to study the main characteristics of the Hungarian organic apiaries.

## Material and methods

Our survey was based on the organic apiaries, which are under control by Biokontroll Hungária Nonprofit Ltd. in Hungary. Organic (certified) beekeepers were selected from three areas that are different in terms of agro-ecological conditions:

- Zone 1 – north part of Hungary hilly region
- Zone 2 – north-east part of Hungary relatively flat area along the river Tisza
- Zone 3 – south-east part of Hungary definitely flat area

The database of the selected beekeepers consists of 62 apiaries with 5164 colonies.
--Origin of the colonies was determined (transition from conventional or purchase of organic ones).
--Source of wax or comb foundation for the conversion period was observed.
--Management, preparation of conversion was monitored.
Beekeepers from the three zones were interviewed and data were recorded. An evaluation was prepared based on the three zones. The comparison and the evaluation were based on the regulation of the organic production according to EU 834/2007. The present regulation 834/2007

of the European Union and its implementation 889/2008 came into force in 2009 (*EU*, 2007, *EU*, 2008).

## Results and discussion

The survey was carried out in the most significant regions in Hungary regarding the numbers of organic beekeepers. The studied apiaries and the number of the colonies in the three regions are shown on *Table 2*.

***Table 2:*** **Number and size of the studied apiaries**

| Zone (1) | Number of apiaries (2) | Number of colonies (3) | Average size of the apiary (hives/apiary) (4) |
|---|---|---|---|
| 1 | 26 | 1900 | 73 |
| 2 | 13 | 1444 | 111 |
| 3 | 23 | 1820 | 79 |
| Total | 62 | 5164 | 88 |

*2. táblázat: A vizsgált méhészetek mérete és száma*
*(1): régió (2): méhészetek száma (3): kolóniák száma (4): a méhészet átlagos mérete (kaptár/méhészet)*

There are three main types of hives in the Zones. The one time traditional horizontal 'NB' (frame size: 42x36cm), the half height of '½NB' with supers of 42x18cm and the 'Hunor' supers (42x27cm). *Table 3.* indicates the shares of the hive types in the studied apiaries.

***Table 3:*** **Hive types of the in the studied apiaries**

| Hive type | Percent of the beekeepers in (1) | | |
|---|---|---|---|
| | Zone 1 | Zone 2 | Zone 3 |
| NB (horizontal) | 47 | 92 | 61 |
| Hunor | 15 | - | 26 |
| ½NB | 38 | 8 | 13 |

*3. táblázat: A vizsgált méhészetek kaptártípusai*
*(1): a méhészek százalékos aránya (régiónként: oszlopok, kaptártípusonként: sorok)*

The effect of local conditions can be followed on the development of the regional beekeeping and methods of production as well. The flat areas (Hungarian Great Plain) were among the first areas where migratory beekeeping was introduced. It was often linked with the greater frame/comb size which were used in larger hives as well (*Nikovitz,* 1983). The number of migration is shown on *Table 4.*

***Table 4:*** **Frequency of migrations in the apiaries**

| Number of migration | Percent of beekeepers in | | |
|---|---|---|---|
| | Zone 1 | Zone 2 | Zone 3 |
| 0 | 11,5 | 7,5 | - |
| 1 | 19,2 | 85 | 4 |
| 2 | 34,6 | 7,5 | 13 |
| 3 | 11,5 | - | 17 |
| 4 | 19,2 | - | 66 |
| 5 | 3,8 | - | - |

*4. táblázat: A vándorlások gyakorisága a méhészetekben*
*(1): a vándorlások száma (2): a méhészek százalékos aránya*

The total areas of Black locust (*Robinia pseudoacacia*) forests are around 400 thousand hectares (*ÁESZ*, 2005). Sunflower has got a high value in the beekeeping sector because of the significant sowing area as well, however it cannot be certified as organic honey and it represents a different commercial category. Since the Black locust forests are not treated with plant protection products and can be considered as "natural" vegetation is territorial distribution ensures that it can be the main source for organic honey as it is reflected on *Table 5*. Milkweed (*Asclepias syriaca*) has become widespread in many abandoned areas as unwanted vegetation and provides good source of nectar for organic honey as well (*Szalai és mtsai*, 2008).

***Table 5: Main bee-pastures of the studied apiaries***

| Bee pasture (1) | Number of apiaries in (2) | | |
|---|---|---|---|
| | Zone 1 | Zone 2 | Zone 3 |
| Black locust (3) | 26 | 13 | 23 |
| Sunflower (4) | 8 | - | 18 |
| Milkweed (5) | 6 | - | - |
| Rape (6) | 2 | - | 13 |
| Wild flowers (7) | 2 | 2 | 1 |
| Pumpkin (8) | 1 | - | - |
| Mustard (9) | 1 | - | - |
| Willow (10) | - | 1 | - |

*5. táblázat: A vizsgált méhészetek főbb méhlegelői*
*(1): méhlegelő (2): a méhészek százalékos aránya (3): akác (4): napraforgó (5): selyemkóró (6): repce (7): vadvirágokn 8: tök 9: mustár (10): szomorúfűz*

The origin of organic colonies/apiaries was mostly the transition of the conventional apiaries, (92%) however from 2010 the purchase of organic colonies could be followed in higher rate/year (8-20 %) due to national programmes for young farmers. In the transition process the main task is the replacement of wax, which means the combs of the colonies. The EU regulation accepts the use of virgin wax/comb built under the transition period in the given apiary. In our survey this type of wax production varied between 21-33%. The other source was the purchase of certified organic wax or comb foundation. We found 71% and 29%, respectively. The origin of the wax or comb foundation was in 99% from certified organic beekeepers in Hungary.

Unfortunately, organic wax or comb foundation is not a regular product in the Hungarian market. The 1% exception means certified purchase from abroad.

In the management practice in establishing/converting new apiaries the effect of weather conditions influencing nectar and pollen sources was significant. Summer drought in zones 2 and 3 caused shortage of nectar in the bee pastures and in 21-42% reduced honey yield too. The amount of new combs and colony population was significantly higher in good years (24-95%). However, migration in most sites helped the progress in conversion but generated higher costs as well.

Feeding of organic colonies is possible with their own honeycombs. The use of conventional sugar is not allowed since 2002, thus the application means non-conformity against the regulations. Organic sugar is available in the market but the extra costs are high for general use.

## Conclusions

During in-conversion the full compliance with the regulation is needed. The selection of the proper bee pastures was not considered as a difficult request. However, the replacement of the combs is often needs extra attention and monitoring. The contamination risk might be lower in the honey supers than in the brood combs (*Bogdanov és mtsai,* 1998).

In the case of the hive types comparing their ratio to the national average, the horizontal NB hive is very different from the 47% or 61%. This traditional big frame and technology may cause difficulties in mite control and in further development as well. In Zone 2 the big (NB) hive type was 92%, which reflects the traditional honey production. There was only 1 or 2 migrations with the horizontal type hives (‘NB’ - 92%), while 4-5 migrations/year were done by hives having different supers (‘½NB’ - 53%, ‘Hunor’ - 39%).

At the same time the local conditions of these sites influenced the migrations as well. In Zone 1 seven pastures were attended, sometimes in 5 migrations. The group of the beekeepers from Zone 2 transport the colonies almost exclusively to Robinia pseudoacacia pasture. In Zone 3 the visit of arable crops was almost as frequent as acacia. Technologies contributing to sound colony management (migration, mite control, honey harvest, etc.) with improved knowledge in organic apicultural operations may lower the risk of production. The findings are complementary to studies on land use change and organic beekeeping and the different treatments used in organic beekeeping (*Szalai et al,* 2008, *Skubida et al,* 2006) respectively.

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