THE DOMINATION OF MEDICAL TREATMENTS' BUDGET ON THE HUNGARIAN NATIONAL PROGRAM FOR BEEKEEPING

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ABSTRACT
The Western honey bee, Apis mellifera, is the most important animal pollinator in agriculture worldwide and apiculture provides full or additional family income with a considerable market for bee products used as food, pharmaceutics and medical products. More importantly honeybees are key pollinators native to Europe and have great impact for many agricultural crops and conservation of natural plant diversity. Since we joined the European Union the Hungarian Beekeepers Federation manages the budget of grounded by the 797/04 and 1234/07 EC directives. According to the 47/2010 (XII 31) VM regulation our National Program of beekeeping controls the supporting system for multiple reimbursement applications. In the six year average data of this program between the types of requests occurs a clear dominance for budgets connected to medical treatment which is a symptomatic treatment but no solution to unravel factors which are responsible for increased colony losses.

Keywords: Honey bees, National Program, monitoring system, medical treatment

INTRODUCTION

Honey bees (*Apis mellifera*) are key pollinators in Europe and have great impact for many agricultural crops and for conservation of natural plant diversity. Therefore, the economic value of honey production plays only a minor role compared to the economic value of honey bees as pollinators in agriculture (MORSE AND CALDERONE, 2000). For European crops it was estimated that 84% of crop species depend at least to some extent upon animal pollination, with honey bees being the most important animal pollinator (WILLIAMS, 1994).The direct value of the produced honey is about 140 million EUR, but the total added crops due to pollination services has estimated 14,2 billion EUR in 2005 in the EU. In light of the decline of wild insect pollinators the importance of managed beekeeping is greater today than ever. In the last years extensive colony losses have been observed in many parts of the world. Concerning the role of pathogens, there is no question that the global health of honey bees is at risk, threatened by parasitic mites (Varroa destructor, Acarapis woodi, Tropilaelaps spec.), fungi (Nosema spec., Ascosphaera apis), bacteria (Paenibacillus larvae, Melissococcus plutonius), viruses. "Disappeared" colony phenomenon has got the name of Colony Collapse Disorder (CCD) which resulted in huge honey bee losses in the USA and elsewhere (COX--FOSTER ET AL., 2007; OLDROYD, 2007; VAN ENGELSDORP ET AL., 2007), as well as massive colony losses in Spain since 2006 attributed to Nosema ceranae (HIGES ET AL., 2006; HIGES ET AL., 2008) and has been extensively analyzed since. However, winter losses of honeybees seemed to be increasing everywhere, and resulted in decline of managed honeybee population. The losses are thought to be multifactorial and the different sampling systems used. Nosemosis being present in bee colonies worldwide may have many negative effects on the colony and cause heavy economic losses in apicultures.

MATERIAL AND METHOD

Honeybee experts in the USA and Europe formed networks to collect more exact data to identify factors that seem to be not only multifactorial, but interact with individual situations by countries. The European concerted action was designed in 2008 as a COST action FAO 803 by the name of „Prevention of honeybee COlony LOSses" (COLOSS). The Working Group 1 (WG1) of the COLOSS epidemiological unit developed a detailed self-administrated questionnaire to collect exact data on losses. The first results were published recently (VAN DER ZEE ET AL., 2012) with the analyzed information from 12 countries in 2009 and 24 countries in 2010. According to the survey the mean losses varied between 7-22 % in 2009 and 7-30 % in 2010 winter. An important finding was that for all countries which participated in 2009, winter losses were found to be substantially higher in 2010. Beekeepers in the majority of the countries who reported disappeared colonies experienced higher winter losses compared with beekeepers that experienced winter losses but not reported disappeared colonies. The same was noticed in the USA where survey responders had lost an average 38.4 % of their colonies in 2011 (VAN ENGELSDORP ET AL., 2012). According to Hungarian Beekeepers Federation (OMME) but accounts for 10% of Europe's total annual honey production and 60% of total annual locust honey however Hungary covers only 0.9 % of the territory the continent. Information flow in this sector on national level is closed in a triangle with the regional associations, the national consultant network and the national sanitary network. Hungary has one of the most developed sanitary network with more than 900 inspectors. 80% of the Hungarian beekeepers are members of the Hungarian Beekeepers Federation, which is coordinating the national consultant network, where each county is supported by its own consultant. Besides, more than 100 regional developed local associations have monthly meetings. Since we joined the European Union the Hungarian Beekeepers Federation manages the budget of grounded by the 797/04 and 1234/07 EC directives. According to the 47/2010 (XII 31) VM regulation our National Program of beekeeping controls the multiple types of opportunities grant application.

RESULTS

Note that more than 50% of the budget is devoted for medical defense against Varroa mites, and the requests are always higher than the available financial framework. This trend of over requesting can also be observed about the applications for maintaining the number of colonies, the population size per operations, which is shown in a 6 year average. This was practically used for a financial support for requening (purchase for mated/unmated queens and queen cells) *(Table 1)*. The major impact on the distribution process is that colony health problem is notified by the beekeepers and losses are reported systematically. There is a tendency that the losses are replaced with intensive breeding, multiple hive splits colonies originating from the same apiary, preferably with nuclei made from the lost or purchased stock from other operations. Therefore the number of hives is increasing despite of the number lost hives (i.e. dead, queen less ore collapsing stage) *(Figure 1)*. In response to these losses the National Program created a monitoring study on general bee health and environmental exposures. The aim of this project was to unravel factors which are responsible for increased colony losses. The overall idea was to collect in advance colony data and samples of bees and hive products from colonies and chemical materials accruing in the vicinity of the apiaries in order to use them later for a retrospective explanation of colony mortality. Part of this program is to inform the member beekeepers of the OMME through yearly issues. The budget for this program is utilized for 100% *(Table 1)*. Only one year out of six year period was containing in practice to monitor the occurrence of nosemosis in Hungary. Two types of microsporidian parasites *Nosema apis* (ZANDER, 1909) and *Nosema ceranae* (HIGES ET. AL., 2006) are causing nosemosis disease in honey bees. Ever since the technique for the measurement of the level of nosema disease is always a question for qualitative and quantitative diagnostic methods. Infection of live honey bees can only be diagnosed through the detection of parasites in the ventriculus. The traditional methods for detecting Nosema spp. infections in honey bees still needs standardized methods for measurement and evaluation for the colony health (MEANA ET. AL, 2010). Since the presence of *N. ceranae* in Hungarian colonies was proved in 2008 (TAPASZI ET AL. 2009) nosemosis may appear in all four seasons (14) in Hungary as well. However there was always a need for not just to detect but to measure the incidence of Nosema disease. To examine the infection level of nosemosis there are two main types of sample processing system. Composite samples of bees (usually 25 bees) from each selected colonies are examined for an average spore number (MOELLER, 1956; CANTWELL, 1970), while the more laborious individual examination is indicating the percentage of infected bees (BAILEY, 1953;). Since any intervention in a colony’s life may cause stress for a certain period, we have to consider whether it was justified and it was worth. Decision would be easy in aware of the level of infection in colony level, and use this parameter has been used to evaluate the need for treatment.

Table 1. The average budget structure of the six year operation of the Hungarian National Program for Beekeeping

Source: OMME (2006-2011)

Type of support	Reimbursement	Utility	Over requesting
Operation of the Advisors' Network	12%	87%	
Coordination for beekeeping academics	2%	81%	
Disseminations of theoretical knowledge and events	5%	73%	
Social visits at demonstration apiaries and operations	1%	70%	
Medical treatment against Varroa mites	58%	100%	113%
Alternative treatment against Varroa mites	2%	70%	
Identification systems for hives and beekeeping equipments	3%	79%	
Instruments and other devices for migration	10%	94%	
Chemical and physical analization of honeys	2%	80%	
Maintaining the number of colonies, the population size per operations	6%	100%	108%
Research on Nosema pathology and opportunities for treatments	0,19%	39%	
Setup and operation of phenological and meteorological monitoring network for honey flows	1%	49%	
Monitoring study on general bee health and environmental exposures	1%	93%	
Instruments and other devices for harvesting honey	3%	85%	
Uniform jars and packing	0,47%	83%	
SUM		93%	

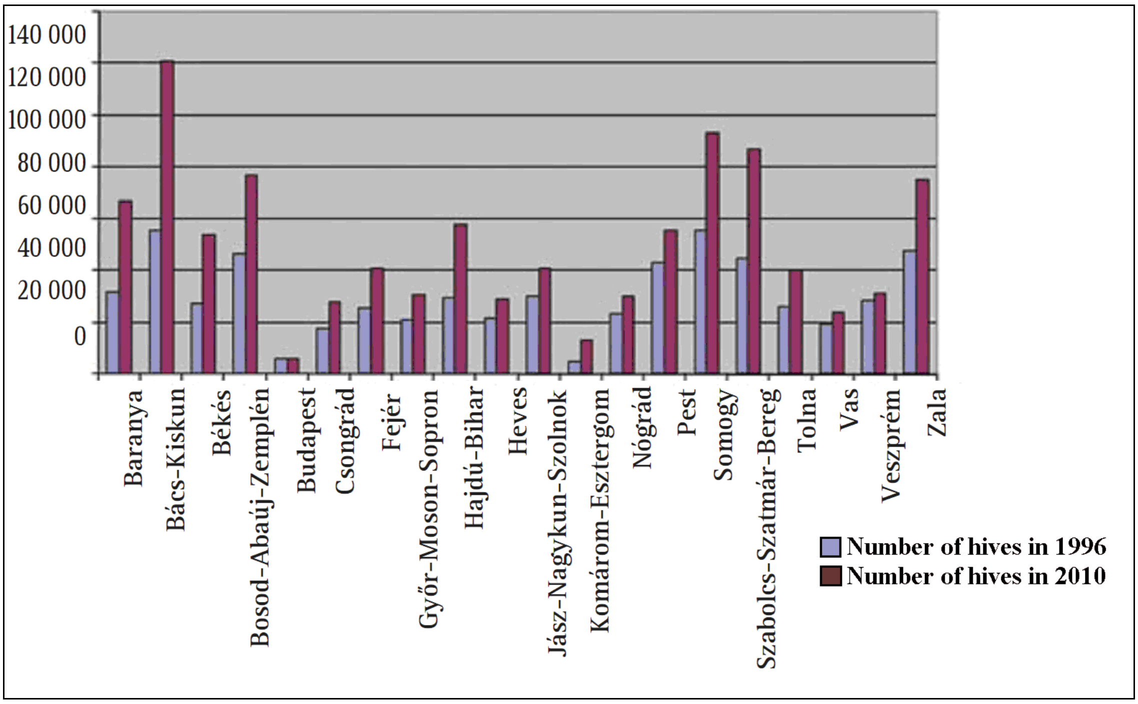

Figure 1. Changes in the number of hives in the counties between 1996 and 2010
Source: OMME MONITORING STUDY ON GENERAL BEE HEALTH AND ENVIRONMENTAL EXPOSURESS (2010)

CONCLUSIONS

According to numerous literatures there is a clear need for practical and financial effort for identification of the key agents in the background of the colony collapses. In the six year average data of the National Program shows that the budgets connected to medical treatment are dominating. Only 1% of the total budget is offered for health studies and especially Nosema studies is more under the supporting level compare to its' importance. Most of the studies are adapting sample collection protocols without clear reliability however the qualitative results are very much influenced by the sampling techniques. The sole presence of the agents in the bees does not necessarily mean that they cause significant health problems. Therefore there is a clear need to investigate the quantitative connections between the presence of the agents in bees both in individual and on colony level.

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