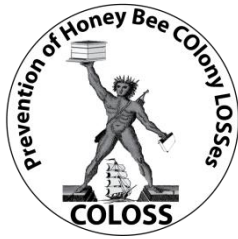


KARL-FRANZENS-UNIVERSITÄT GRAZ  
UNIVERSITY OF GRAZ



Österreichische  
Forschungsgemeinschaft

Naturwissenschaftliche Fakultät  
der Karl-Franzens-Universität Graz

# Estimation of honey bee colony losses - Continuity and visibility

Proceedings of  
the workshop in Graz, 4.-5. February 2014

**Dear colleagues,**

On behalf of the local organizing team, it is my personal pleasure to welcome you to the workshop "Estimation of honey bee colony losses - Continuity and visibility" in Graz, Austria.

I would like to thank all the people who have helped to organize and conduct this meeting and of course all contributors for submitting their abstracts, which I hope will stimulate rewarding discussions on the method standardization and progress in further developing the internationally standardized research on winter colony losses of honey bees.

Financial support is granted by COLOSS, University of Graz, the Dean of the faculty of Science, and the Austrian Research Association.

I am looking forward meeting all of you, and hope you will enjoy this workshop in Graz.



Robert Brodschneider

Graz, Austria, February 2014

**The local organiser for the workshop and editor of these proceedings:**

Robert Brodschneider, Department of Zoology, Karl-Franzens-University Graz

**International coordinator:** Romée van der Zee,  
**Dean of the faculty of Science, University of Graz:** Karl Crailsheim

## Table of contents

- 2 ... Welcome
- 3 ... Table of contents
- 4 ... Program
- 5 ... Abstracts
  - 5 ... **Brodschneider & Raggam**: Website Bienenstand.at helps to collect and disseminate epidemiologic data on honey bee colony losses
  - 6 ... **Coffey & Breen**: Monitoring colony losses in Ireland.
  - 7 ... **Dahle**: Low cost collection of data on honeybee colony losses in Norway.
  - 8 ... **Danihlík et al.**: Insight into current situation of beekeeping and honey bee colony losses in the Czech Republic.
  - 9 ... **Drazic et al.**: Five seasons of colony losses monitoring in Croatia.
  - 10 ... **Gray & Peterson**: Results of the colony loss monitoring survey in Scotland for winter 2012-2013.
  - 11 ... **Kristiansen**: Relation between weather and winter losses in Sweden.
  - 12 ... **Martín-Hernández et al.**: Monitoring colony losses in Spain.
  - 13 ... **Köglberger et al.**: Losses of Honey Bee Colonies During Hibernation or in Supposed Cases of Intentional Bee Poisoning - What Were the Reasons?
  - 14 ... **Mutinelli & Barzon**: COLOSS questionnaire and privacy policy.
  - 15 ... **Soroker et al.**: Evaluation of colony losses in Israel.
  - 16 ... **Topolska**: Towards improved harmonization of surveys on honey bee colony losses.
  - 17 ... **Van der Zee**: Model factors at beekeeper- and areal level.
  - 18 ... **Vejsnæs**: Sample size. Predicting winter losses using internet questionnaire in Denmark.
- 19 ... Outcome of the work shop
- 20 ... List of participants and email addresses

## Program:

### Monday, 3<sup>rd</sup> of February

Arrival

Informal meeting (19:00 in the hotel lobby) and optional dinner in the old town

### Tuesday, 4<sup>th</sup> of February

9:00 -9:15: Registration

9:15-9:30: Welcome and organizational matters

9:30-12:00: Talks by

1. **van der Zee**

2. **Köglberger** et al.

Coffe break

3. **Danihík** et al.

4. **Drazic** et al.

5. **Brodtschneider & Raggam**

Lunch break

13:30-15:00: Approval of the 2014 questionnaire

Coffee break

15:30-17:00: Open discussion on scientific publication, dissemination, press release etc.

Optional old town walk, social dinner at <http://www.der-steirer.at/>  
(included in registration fee)

### Wednesday, 5<sup>th</sup> of February

9:15 Talks by

1. **Gray & Peterson**

2. **Vejsnæs**

3. **Mutinelli**

4. **Kristiansen**

5. **Gobiet**

Coffee break

Discussion - open slot

Lunch break

13:30-15:00: Discussion - open slot

Coffee break

15:30-17:00: Outcome of the workshop, future workshop, deadlines for 2014

End of workshop – or –

Mixer with C.S.I. Pollen workshop participants (19:00 in the hotel lobby) and optional dinner in the old town

## **Website Bienenstand.at helps to collect and disseminate epidemiologic data on honey bee colony losses**

Robert Brodschneider\*, Johannes Raggam

\* Department of Zoology, Karl-Franzens-University Graz, Universitätsplatz 2, A-8010 Graz, Austria.

We monitor winter losses of honey bee colonies in Austria now for the sixth year in a row. Loss rates of these winters did range between 9.3 and 25.9%. In total we received more than 4000 datasets from beekeeping operations in the last six years. Next to visiting beekeepers meetings and advertising the study in a beekeeping magazine, we established a German language website in 2013 to collect honey bee colony loss data. We also use this website for dissemination of epidemiological results. On <http://bienenstand.at> visitors can browse previously published documents on winter mortality, participate in our annual survey and explore data on their own. For the latter, we created a web based database application utilizing the R script of van der Zee et al., 2013. The CSV survey data is transformed in several ways to fit the projects requirements and stored in a server database. Different web form input widgets for building query statements are automatically generated from the available data. Users of the application can submit individual queries which are calculated by the R script on the server and returned to the browser client, where it is displayed in a result graph. Queries can be stored and reloaded for demo purposes and review. Technologies used in this project are on the server side: Python (programming language), Pyramid (web application framework), RPy2 (Python bindings to R environment), MongoDB (NoSQL database), PyMongo (Python database driver), Buildout (Python build environment), Grunt (Javascript build environment), Bower (Javascript package management), tox (Python test runner), less (CSS preprocessor). On the client side: HTML5, SVG, CSS, Javascript (standard web technologies), JQuery (DOM manipulation), handlebars (Javascript templating), D3.js (graphing library), Bootstrap 3 (base Javascript and CSS), bootstrap-slider (numeric slider widget). To meet the requirements, the application is built in a way where it can be easily updated for new data from other surveys with a different question set. The application is also extensible to meet different or more complex requirements. It might be used as a generic framework for data analysis, also in different scientific disciplines. The software will be released as free software under an open source license later this year.

## Monitoring colony losses in Ireland

Mary F Coffey\*, John Breen

\*University of Limerick, Plassey, Limerick

Beekeeping in Ireland is coordinated by the Federation of Irish Beekeeping Association (FIBKA) with approximately 50 local associations distributed throughout the country. In 2012, a total of 2890 beekeepers were affiliated to FIBKA and based on a recent census carried by Department of Agriculture Food and the Marine, to which 62% of affiliated members responded, 13% of members had no colonies, 61% had 1-5 colonies, 12% has 6-12 colonies, 8% had 11-20 colonies, 4% had 21-50 colonies and 2% had greater than 50 colonies, hence beekeeping in Ireland is predominantly practiced as a hobby. In 2010, resistance to Bayvarol was documented, but its prevalence and distribution is not known. Acceptable winter losses in Ireland among beekeepers is approximately 15%, however data collected from annual surveys over the past five years clearly indicates that during most winters this acceptable level is exceeded. In 2008/2009, the estimated national average winter colony losses were 22%, increasing to 24% in 2009/2010, followed by a decrease in losses to 17% and 13% in 2010/2011 and 2011/2012 respectively. However, in 2012/2013 severe losses were again experienced with the national average estimated at 37%. Many beekeepers attributed this to the poor weather in Spring, which subsequently delayed brood rearing until late April/early May, resulting in the weaker colonies dwindling and inevitably dying out. The insufficient control of Varroa as a result of the spread resistance may also have contributed to colony weakening. During the past number of years the survey has been disseminated in collaboration with the secretaries of the local associations who have predominantly used email and meetings to disseminate the questionnaire at local level. The FIBKA webpage and more importantly the FIBKA magazine, which is received by each affiliated member on a monthly basis have also be used as invaluable methods of dissemination. However, this year based on the recommendations of the Monitoring Group, it is hoped to adopt a stratified random sampling method and use software packages such as Survey Monkey and Lime Survey. This approach should greatly ease the collection and accumulation of data from survey respondents and once suitable strata for the Irish beekeeping community have been devised and a suitable method selected for taking a random sample from within each group, the dataset should provide the most accurate estimate of the overall winter colony loss rate in Ireland.

## **Low cost collection of data on honeybee colony losses in Norway**

Bjørn Dahle\*

\*Norwegian Beekeepers Association, Dyrskuev. 20, 2040 Kløfta, Norway

Data for estimating honeybee colony winter losses can be collected in different ways. In Norway we have collected data through annual internet surveys where all members of the Norwegian Beekeepers Association are invited to participate. This survey method is probably biased towards younger beekeepers, although the majority of Norwegian Beekeepers have access to internet. However, this is a low cost option that eliminates the need for punching of data, and we think it is suitable for detecting differences in loss rate between years.

## **Insight into current situation of beekeeping and honey bee colony losses in the Czech Republic**

Jiří Danihlík\*, Zdeněk Klíma, Zdenko Tichý, Radek Kobza

\* Czech Beekeepers Association, Staroměstská 2362/A, 370 04 České Budějovice, Czech Republic

Beekeeping is common activity in the Czech Republic with a tradition ranging to the early medieval times. In 2012, 540 705 bee colonies were registered here and managed by 48 132 beekeepers. Majority of hobby beekeepers have 10 colonies on average. Professional Czech beekeeping industry is represented by 110 semi- and professional farmers who take care about 28 073 colonies (255 on average). The average density of colonies is one of the highest in Europe (6.8 colonies per km<sup>2</sup>). Most of these are distributed throughout the countryside. In the past few years, we can observe a growing trend of both urban and organic beekeeping. In 2008, a lot of colonies died due to Varroa and follow up virus diseases. There is no survey monitoring winter losses in the Czech Republic. As all beekeepers have a legal duty to register in the national database of the breeders and to report number of their colonies up to 1st of September each year, we can estimate, that there was major loss of bee colonies, and despite a renewal of honey bee livestock during the summer, we were still missing about 12% of the colonies at the September 2008. Since these collapses, some Czech beekeepers have been looking for alternative ways of treatment. However, using synthetic acaricides (based on amitraz and/or tau-fluvalinate, achrinathrine) is the most popular and also directed varroa treatment in autumn and spring. Only some approved organic beekeepers can legally use formic acid and thymol, they are limited only to authorised preparations. The Czech Beekeepers Association promotes, among other topics, using organic acids (mostly formic and oxalic) without a need of specially approved preparations. Local beekeeping clubs can gain a rough data about colony loses every year but this information is not more evaluated except, together with data from national registration, as an argument to lobby for more funding from government. For the future development of the beekeeping industry, it is essential to collect and evaluate data about winter colony loses and summer renewal of honey bee stock. Standardized methodology and exact evaluation can lead us to identify risk factors and gain more additional information valued for developing beekeeping in the Czech Republic.



## Five seasons of colony losses monitoring in Croatia

Marica Maja Drazic<sup>1</sup>, Janja Filipi, Nikola Kezic<sup>2</sup>

<sup>1</sup> Croatian Agricultural Agency

<sup>2</sup> Faculty of Agriculture, University of Zagreb

Five years ago (season 2008/09) the response of beekeepers was the highest (1903 beekeepers). However, it was mostly due to direct contacts with beekeepers, which continued in following two seasons (1871 and 1485 beekeepers). During last two seasons (2011/12 and 2012/13), we are disseminating questionnaire using internet on the most popular beekeepers web pages, as well as during various meetings. We faced low response rate (134 and 180 returned questionnaires). Our question is a timeframe for the survey. Over the past five years, majority of the colony losses occurred during February (25.14%) and March (26.75%). If we want to include data from March, than we have short period when beekeepers respond. With the beginning of the activities on the apiaries, usually from mid-March, it is not likely to gather beekeepers on meetings or to encourage them to take time for the survey.

## Results of the colony loss monitoring survey in Scotland for winter 2012-2013

Alison Gray<sup>1</sup>, Magnus Peterson<sup>2</sup>

<sup>1</sup> Department of Mathematics and Statistics, University of Strathclyde, Glasgow G1 1XH, Scotland, UK

<sup>2</sup> University of Strathclyde, 26 Richmond Street, Glasgow G1 1XH, Scotland

In Scotland we have carried out surveys of beekeepers since 2006. Since 2008 these surveys have used random sampling of the Scottish Beekeepers' Association membership records. In 2013 for the first time our survey was mostly run online using the LimeSurvey software (<http://www.limesurvey.org/>). Previous surveys were wholly postal. A sample of 300 participants was selected from 1094 possible participants. Of these 300, 218 (73%) had email contact details. A posted questionnaire was used only for beekeepers who were selected but lacked email contact, or whose email failed and could not be corrected, or (in a few cases) those contacted by email who experienced technical problems in accessing the survey. This resulted in 94 questionnaires being posted and 3 sent electronically for postal return, the rest being online. The overall response rate was higher than in most of the previous surveys and data processing much faster, and for the 2014 survey we will use the same online approach. Based on 108 usable responses from beekeepers, 61 (56.5%) experienced colony losses over winter 2012/13, and the winter colony loss rate was 31.6%, estimated using the overall proportional loss rate [1]. This represents 158 colonies lost out of 500 colonies in total being managed at the start of winter in October 2012. This is an extremely high loss rate compared to the previous winter when 40% of 89 beekeepers reported losses and the overall loss rate was 15.9% (which was low relative to the previous two surveys), and is the highest loss rate found in any of our surveys so far. The next highest was 30.9% over winter 2009-10. Factors investigated for a relationship with loss rates include geographical area (East/West), forage sources, in particular access to oilseed rape, and nature of Varroa treatment. Results of the further analysis will be reported, including a presentation and explanation of model fitting using generalised linear mixed effects models.

[1] van der Zee, R., Gray, A., Holzmann, C., Pisa, L., Brodschneider, R., Chlebo, R., Coffey, M.F., Kence, A., Kristiansen, P., Mutinelli, F., Nguyen, B.K., Adjlane, N., Peterson, M., Soroker, V., Topolska, G., Vejsnaes, F., Wilkins, S. (2013). Standard survey methods for estimating colony losses and explanatory risk factors in *Apis mellifera*. In V. Dietemann, J.D. Ellis, P. Neumann (Eds.), *The COLOSS BEEBOOK, Volume I: Standard methods for *Apis mellifera* research*, Journal of Apicultural Research 52(4).

## Relation between weather and winter losses in Sweden

Preben Kristiansen\*

\* Swedish Beekeepers Association, Trumpetarev. 5, 59019 Mantorp, Sweden

Since 2009 we have carried out web based surveys on winter losses with the help of the questionnaires developed by WG1 within the COLOSS network. Results have been presented at various workshops and conferences, and even published in articles together with results from a number of other countries. Apart from the data collected with the help of the COLOSS-questionnaire we have data on colony losses based on reports to the Swedish Beekeepers Association. Each year since 1920 beekeepers have sent in reports about their beekeeping to the association, and these reports include information about e.g. the number of hives, honey yield and winter losses. According to these reports the average yearly losses 1920-2012 was around 12,9 %, varying between 6 and 27 %. The average yearly losses for the latest 10 years period is 16,6 % which is significantly higher than the previous 10 years periods. Inadequate varroa control appears to be one of the main reasons for high colony losses in Sweden. But our data show that even other factors play a role, e.g. the weather. We have recently got access to detailed weather data from the Swedish Meteorological and Hydrological Institute. Between 1920 and 2012 there were 32 winters with average temperatures above minus 4.7 °C (which is the mean for the winters 1961-1990) and 61 winters below that temperature. The average losses were 11,0 % in the milder winters and 16,4 % in the colder winters.

## Monitoring colony losses in Spain

R. Martín-Hernández\*; A. Meana; M. Higes

\* Centro Apicola Marchamalo, Camino De San Martin SN, 19180 Marchamalo, Spain

Spain has participated in COLOSS Monitoring from 2010 to 2012. The beekeeping centre of Marchamalo (CAR) coordinated the participation. The dissemination of the COLOSS Questionnaires was made by asking collaboration through beekeepers associations, disseminating questionnaires during meetings or asking directly to the beekeepers (meetings, during the visit to our lab, etc.), although the more frequently, the beekeeper filled out the questionnaires by themselves. We tried different journals to contribute for dissemination, however we had not success. Level 1 of questionnaire was also included in a survey for monitoring infectious and parasitic honeybee diseases and contaminants in pollen. All the studied years, the participation was not very satisfactory and according to the number of beekeepers and the census of colonies in Spain the level of response was very low. Nowadays, Spain is participating in the monitoring surveillance launched by OIE Reference Laboratory. This surveillance is being developed by the Spanish Ministry of Agriculture, and CAR laboratory is contributing by the analysis of the samples collected in the Castilla –La Mancha region.

## Losses of Honey Bee Colonies During Hibernation or in Supposed Cases of Intentional Bee Poisoning - What Were the Reasons?

Hemma Köglberger\*, Josef Mayr\*, Irmgard Derakhshifar\*, Lisa Stadlmüller\*\*, Michael Schwarz\*\*, Rudolf Moosbeckhofer\*

AGES, \* Dep. of Apiculture and Bee Protection

\*\* Dep. Data, Statistics and Integrative Risk Assessment

From autumn 2010 to spring 2012 reported cases of honey bee colony winter losses were investigated. Dead bees and brood were examined for *Varroa destructor*, *Nosema apis*, *N. ceranae* and viruses (DWV, ABPV, BQCV, CBPV, SBV, KBV, IAPV). Data collection by beekeepers was supported by a questionnaire. In cases of suspected intentional bee poisoning additional pesticide residue analyses were carried out.

During wintering period 2010/2011 41 beekeepers reported colony losses of 63 % from 48 apiaries. *Varroa* mites were found in 63 % of bee and 91 % of brood samples. *Nosema* spores were microscopically detected in 34 % of the samples, which were predominantly identified as *Nosema ceranae* and very rarely as *N. apis* by PCR. Virus tests of 75 bee samples were negative for IAPV and positive for DWV (80 %), ABPV (27 %), BQCV (40 %), SBV (17 %), CBPV (5 %) and KBV (1 %).

For 2011/2012 66 beekeepers reported colony winter losses of 47 % from 71 apiaries. *Varroa* mites were found in 74 % of bee and 98 % of brood samples. *Nosema* spores were microscopically detected in 29 % of the samples and in most cases again predominantly identified as *Nosema ceranae*. Virus tests of 118 bee samples were negative for IAPV and positive for DWV (69 %), ABPV (55 %), BQCV (29 %), SBV (14 %), CBPV (1 %) and KBV (2 %). The questionnaires revealed that only about 50 % of the beekeepers applied the recommended three-step protocol for varroa control (drone brood removal; first reduction of varroa infestation after honey harvest and second reduction when colonies are out of brood). Preparations most frequently used during the brood period were based on formic acid and thymol, during the broodless period on oxalic acid. Significant statistical effects between different groups of varroa treatment regimes and compounds were found in the period 2010/2011 between oxalic acid trickling and evaporation. As the results indicated, most cases of winter losses reported in this project were caused by high varroa infestation levels, sometimes in combination with or enforced by simultaneous virus (DWV, ABPV) and nosema infestation. Insufficient or inadequate varroa control measures were common.

Three suspected cases of intentional bee poisoning were reported 2010/2011 and seven in 2011/2012. Two cases in 2010/2011 and five in 2011/2012 were tested positive for pesticide residues.

None of the supposed cases of intentional bee poisoning could be confirmed without doubt, but in some cases the spectrum of detected pesticides strongly indicates an exposition to highly toxic insecticides used for plant protection measures; in other cases pests and parasites were most likely the cause of colony losses.

## COLOSS questionnaire and privacy policy

Franco Mutinelli\*, Luciana Barzon

\* Istituto Zooprofilattico Sperimentale delle Venezie, Viale dell'Università, 10 - 35020 Legnaro (PD), Italy

In the European Union this issue is regulated by Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data (Official Journal L 281, 23/11/1995, p. 31-50). The existing EU legislation on personal data protection, Directive 95/46/EC, was adopted in 1995 with two objectives in mind: to protect the fundamental right to data protection and to guarantee the free flow of personal data between Member States. A draft disclaimer has been prepared to be included in the Coloss questionnaire in order to properly manage data collection, storage and processing.

### DISCLAIMER

The undersigned \_\_\_\_\_  
Born in \_\_\_\_\_ on \_\_\_\_\_  
Resident in \_\_\_\_\_  
Street \_\_\_\_\_

### Declares

I hereby authorise the (Institution that administers the questionnaire.....) to use the data collected through the Coloss questionnaire, stored in (Institution that stores the questionnaire and the data .....). I hereby authorise to use the data only in an anonymous form and for research, study and publication purposes as indicated in the following privacy policy note.

Read approved and signed

\_\_\_\_\_, on \_\_\_\_\_ (Signature)

### INFORMATION IN CASES OF COLLECTION OF DATA FROM THE DATA SUBJECT:

With reference to Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, this Institution (name .....) informs that according to article 10 "Information in cases of collection of data from the data subject" of the above mentioned Directive:

- The data collected will be used by the Institution (name .....) for research purposes to investigate the honey bee colony health status and mortality in the framework of the Coloss working group
- The activities that imply data processing are carried out for institutional and research purposes
- Data processing is performed with informatics technologies as well as hardcopies by the Institution
- The controller is the Institution (name .....), legal representative ..... (name) located in .....(address) and the processor is ..... (name, affiliation)
- Every data subject is guaranteed the right to obtain information about data processing from the controller according to article 12 "Right of access" of Directive 95/46/EC contacting the Institution ..... (address)

## Evaluation of Colony losses in Israel

Victoria Soroker\*, Amots Hezroni, Yosef Kamer, Ilya Zaidman

\* Volcani ARO

For the last five years we evaluate and characterize colony losses in Israel by beekeepers' surveys. Beekeepers' survey initially included two types of questionnaires: a detailed local questionnaire, evaluating annual losses distributed among the beekeepers since 2008 and one dedicated to evaluation of winter losses developed by COLOSS working group 1 since 2010. In the last two years the survey is conducted via the internet. Over the years, our survey data represented 23-40% of total colonies, but only 9-15% of the beekeepers, and indicated that the overall level of colony losses was below 20%. However, in the last two years we experience some increase in the percentage of beekeepers experiencing severe losses in particularly above 20%. Most of the losses occurred so far during summer or in autumn rather than during winter. Although most of the colonies are treated against Varroa, from all the evaluated factors Varroa and its associated viruses appear to be the most significant causes of colony loss.

## **Towards improved harmonization of surveys on honey bee colony losses**

Grazyna Topolska\*

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The survey on honey bee colony losses as a part of the activity in the COLOSS COST Action FA0803, conducted using the common Coloss Questionnaire, started in spring 2009. At the time data from 12 countries were submitted for joint analysis. Since the support of COST financing ended, the survey is being continued within COLOSS as a non-profit association and in the last survey 19 countries took part. These five years of research work have resulted not only in publications on the scale of colony losses and their possible risk factors and in the development of the “standardised” COLOSS questionnaire, but also in increased experience concerning the methods and ways of survey suitable for different countries. In the process, three main groups of countries emerged, according to the methods of data collection used; the choice of method was dictated by different financial (money available to the survey) geographical (size of country) and social (development of INTERNET and its utilization by beekeepers) conditions. There are countries, such as the Netherlands (maybe Denmark, Finland, Sweden, Norway), in which census sampling was performed. In others, attempts to perform random sampling were introduced (Scotland, Poland). In many countries non-random sampling was performed. There was no coordination of the survey within groups, apart from using a common questionnaire and keeping to deadlines. The data from all the countries were analysed together. However, maybe it would be worth introducing better harmonization of sampling within particular groups and publishing the results of the analysis performed for these groups, as an addition to the results of a joint analysis of all the data.



## **Model factors at beekeeper- and areal level**

Romée van der Zee\*

\* NCB Durk Dijkstrastr. 10 9014 cc Tersoal Netherlands

Alison Gray and I report in our analysis that the variation in random intercepts at beekeeper level is large. To a lesser extent this is true for the variation in regional random intercepts. We could identify significant factors at beekeeper level, but no factors at regional level. These remain to be investigated. I will discuss regional factors as precipitation, hours of sunshine and how we could address this in our modelling. Also the differences in size between regions and how this may affect the outcome of our modelling. Suggestions will be given to make a step forwards in this respect.

## Sample size. Predicting winter losses using internet questionnaire in Denmark

Flemming Vejsnæs\*

\* Danish Beekeepers Association, Fulbyvej 15, DK-4280 Sorø, Denmark

Early prediction of losses in Denmark Flemming Vejsnæs, Danish Beekeepers Association  
The main aim of COLOSS WG1 has since 2008 been producing a protocol for questionnaires for beekeepers, analyzing causes and colony losses. The group has been successful. Up to 25 countries are participating and using the WG1 standard questionnaires. As an improvement in 2013 we were able to make a joint press release in the end of July giving a very nice survey of the general losses mainly in Europe. The target for the press release was the press, the public, the decision makers, the beekeeper magazines and finally the beekeepers. There is a demand for getting the first figures of losses out much earlier. The questionnaire is run the questionnaire from 1st May to 1st June (even 16th June) due to regional and geographical reasons. Having a late deadline, because of the many countries involved, it is not possible to make the press release earlier than mid-July. At the same time national press releases have been published and therefor the interest of the press is minor, the beekeepers are focusing on the new honey harvest etc. We need to be able to make the prediction of losses much faster. We need to make some intermediate loss calculation. In the below example from Denmark (spring 2010) we were able to state good figures for the losses. Already 3 days after the questionnaire was released on the internet the figure was 13,00 % and after 6 days we were within the range +/- 1 percent of the final result (394 beekeepers, 8397 colonies, total no of beekeepers 4020, total no of colonies: 80.000). Statements like the above needs an internet survey, but even counties doing internet and paper surveys are able to make preliminary predictions. Preben Kristiansen did in 2013 compare the internet survey with an independent paper survey. There was no significant difference between the two surveys. I suggest that we in the future do make a winter loss prediction after one week.

## **Outcome of the workshop: Estimation of honey bee colony losses - Continuity and visibility**

Robert Brodschneider, Mary F. Coffey, Bjørn Dahle, Jiří Danihlík, Marica Maja Drazic, Alison Gray, Nikola Kezic, Zdenek Klima, Elfriede Kalcher-Sommersguter, Preben Kristiansen, Raquel Martin-Hernandez, Rudolf Moosbeckhofer, Franco Mutinelli, Magnus Peterson, Victoria Soroker, Grazyna Topolska, Flemming Vejsnæs, Romée van der Zee

On 4<sup>th</sup> and 5<sup>th</sup> of February 2014, 18 researchers from 13 countries attended the workshop in Graz, Austria. The workshop was supported by COLOSS, University of Graz, the Dean of the Faculty of Science and the Austrian Research Association. An authorized questionnaire that was drafted before the workshop was finalised during the workshop after necessary extended discussion. The questionnaire will be published on the COLOSS website to make it available to all interested countries. Deadlines and important dates for the 2014 monitoring and submission of data were established. The use of additional databases (meteorological and land use) which could be relevant for better understanding of the past and future loss data collected using the COLOSS questionnaire was explored, with input from specialists from other fields. So far only winter losses have been considered, however in southern countries summer losses appear to be more important. This issue was discussed and a decision was taken to further explore summer losses in specific southern areas ideally using a randomized approach. The general feeling was that the monitoring group currently acts as an European entity which attracts other countries, but which may require to develop a stronger European profile. For COLOSS, it would be a good initiative for similar entities to be developed independently in other continents by honey bee researchers based in those continents. Further exploration of specific requirements and conditions is needed. The issue of compliance with the EU regulations on data protection was discussed for future implementation. A jointly authored publication on winter 2012-2013 colony losses which is in press and soon to appear in the Journal of Apicultural Research was welcomed by the participants of the workshop and would be accompanied by an IBRA press release to publicise this article.

## List of Participants and Email addresses

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