Proceedings COLOSS Monitoring workshop

27 and 28 January 2015
University of Copenhagen, Faculty of Life Sciences, Dyrlægevej, 1870 Frederiksberg C

Alison Gray and Robert Brodschneider

Content

Summary

The main focus of the meeting was review and revision of the COLOSS loss Monitoring questionnaire, although several talks by group members were also presented, chosen for their potential relevance to the questionnaire and data analysis. Romee van der Zee talked about the international data analysis and issues and suggestions arising in relation to the questionnaire. Grazyna Topolska also provided suggestions for improving some questions from experience in Poland. Jean-Daniel Charriere presented recent results of loss monitoring in Switzerland, and introduced a software package that had proved useful in identifying data patterns associated with colony loss. Victoria Soroker presented results from Israel, including summer and winter losses, a topic revisited later. Preben Kristiansen talked about winter losses in Sweden and provided an interesting comparison with Epilobee results.

Some general principles were presented to the meeting for effective design of questionnaires, and approaches to loss monitoring were reviewed, before discussion concerning revision of the 2014 COLOSS loss monitoring questionnaire for implementation in 2015. In particular difficulties had emerged in relation to losses due to unresolvable queen problems. All questions were reviewed. Spirited debate finally resulted in some restructuring, rewording, and cross-referencing of questions to explanations. Additional possible questions concerning signs of disease other than Varroa mite infestation were concerned and one was adopted as an optional question.

Commitments had been undertaken at the COLOSS conference in Murcia in autumn 2014, to design questions addressing summer losses and annual losses, for comparability with other countries where these were especially important, as well as addressing the economic impact of colony losses.

Addressing seasonal and annual losses was a particular challenge. Epidemiological principles were considered and proposals for new questions were put to the meeting for consideration. As questions used several years ago for summer losses, collecting data on numbers of managed increases and decreases in colonies, had been found not to provide robust data, a different approach was adopted to try to collect information directly on the population of colonies at risk of loss for any one beekeeper. Some reservations were expressed about how successful this might be, but it was decided after discussion to test the questions in the 2015 questionnaire. These would be provided as questions in an optional extra section which participating beekeepers would be asked to complete on a voluntary basis. It was recommended that this be limited to online questionnaires and only to be implemented by countries well established in monitoring. The results would be reviewed and a decision made on how to proceed in future.

Alison and Robert would send out the new questionnaire after the workshop, to be finalised after allowing a couple of days for feedback. Romee also requested that national co-ordinators provide GPS data for inclusion in the modelling.

Norman Carreck had been approached concerning estimating the economic value of colony losses, based on his past experience in this area. He was willing to try this, but it was recognised that time would need to be allowed for this. Providing estimates in time for the press release could be difficult. It was felt that a more realistic prospect was to do this for inclusion in a journal paper.

The Epilobee project had provided two years of data overlapping with data from the Monitoring surveys. There was some discussion of the experience of Monitoring group members of how Epilobee had worked in their own countries, as well as consideration of how any collaboration to compare results might best be organised. There was a general feeling that this would be best led by the Monitoring group.

Plans for publicity and publication were reviewed. It was decided that countries returning their loss rate data by 30th June 2015 would be included in the press release in early July. An aim for the coming year was to extend the network of countries returning data. Those using all of the essential questions and returning their data by 30th June 2015 would be included in the corresponding journal paper, to be written by Romee and Alison. Time would be allowed for group members to contribute to the interpretation, discussion and referencing of relevant literature. Preben would again prepare the codebook for return of data, with help from Robert, Flemming Vejsnaes and Ole Kilpinen. Group members were encouraged to continue to use articles in beekeepers' journals, websites and press communications to publicise results to both their beekeepers and the general public.

Programme

Tuesday 27. January

13.00- 13.10	Welcome and Workshop Introduction/Overview: Chairs Alison Gray and Robert Brodschneider
13.10- 13.30	Introduction of participants
13.30- 15.15	Selected presentations, with coffee/tea break
	Romée van der Zee: Monitor 2014 - the explaining model
	Preben Kristiansen: Winter losses in Sweden
	Jean-Daniel Charrière: Colony losses in Switzerland-newest results
	Victoria Soroker: Evaluation of colony losses in Israel 2013-14
15.15- 17.00	Questionnaire session 1
15.15-16.30	Presentations
	Alison Gray & Robert Brodschneider: Key considerations and suggested changes to questions
	Grazyna Topolska: Suggestions to further define the questions in COLOSS questionnaire
	Romée van der Zee: Monitor 2014 - problematic questionnaire questions
16.30 -17.00	Discussion 1: Questions for loss calculation: winter losses and annual/summer losses
18.00	Departure from Hotel by Metro to Christiania
19.00	Dinner at Spiseloppen.

Wednesday 28. January

6.30 –	Breakfast at hotel
9.00 – 12.00	Questionnaire session 2, with coffee/tea break
	Discussion 2: Questions for loss calculation - winter losses and annual/summer losses
12.00-13.00	Lunch at venue
13.00- 15.30	Questionnaire session 3, with coffee/tea break
13.00- 14.00	Discussion 3: Other questions to revise
14.00- 15.35	Discussion 4: Questions enabling assessment of further risk factors and any others to add
15.35-16.10	Organisational matters: deadlines, press release, publications, any other matters arising
16.10-17.00	Outcomes of the workshop
17.00	Close of workshop
19.00	Dinner at WagaMama

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Abstracts

The COLOSS Workshop on "monitoring beelosses"
Copenhagen, 27. - 28 Januar 2015

Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Developments and plans for the colony loss monitoring

Authors and Affiliations (Arial 12 pt. bold)
For the contact author only (typically the senior author), include email address, mail address and phone number. Denote contact author with an asterisk.

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Text of Abstract (between 250 and 400 words)

This year has seen expansion of our monitoring network and renewed involvement of some countries which have not, for various reasons, been able to participate in the past few years. For example, Turkey and France propose once again to do monitoring, and we may have involvement from England and Wales. We also have contact with New Zealand and Argentina in the southern hemisphere where environmental conditions, weather conditions and beekeeping practices may be very different from the northern hemisphere countries which form the biggest part of our network at present.

New challenges for our network include modifying the standard COLOSS questionnaire for monitoring to include questions that can address annual losses as robustly as possible. This will enable comparison with loss rates in countries where annual losses, not just winter losses, are important. However devising appropriate questions and robust estimation is a challenge requiring careful consideration. We must also continue to estimate winter losses, for comparison with our previous years' results, and these are of main interest for the northern countries.

We also require to estimate the economic impact of estimated colony losses. This is especially important for the southern countries with high agricultural output.

Concerning the data analysis, the plan for our annual publications is to develop the methodology used with each article, to make best use of the available data and the analytical techniques available. The mixed effects modelling used most recently will gradually be developed to include longitudinal and spatial analysis, data permitting, and to include suitable environmental data where this can be obtained. We will continue working with Romee van der Zee on the data analysis. She has led the drive to use more advanced modelling and to include additional data sources.

Colony loss monitoring is a core project of COLOSS.

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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Monitor 2014: the explaining model

Authors and Affiliations (Arial 12 pt. bold)
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Romée van der Zee, Nederlands Centrum Bijenonderzoek.

Text of Abstract (between 250 and 400 words)

Analysis of the 2014 international COLOSS monitoring data, demonstrating which factors were explaining the (very low) losses. Also what could not be explained by questionnaire data.

The COLOSS Workshop on “monitoring beelosses”
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Winter losses in Sweden

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

The survey on winter losses that was done in May 2014 with the COLOSS questionnaire and in cooperation with Denmark, Norway, Finland, Estonia and Latvia showed the lowest losses since a number of years. In Sweden the survey included 1604 beekeepers who wintered a total of 20700 colonies and almost 60% of them had no losses at all. This is a higher proportion than the winter 2012/2013, when only around one third of the respondents had no losses. There were no differences in the losses between beekeepers whose colonies foraged on oilseed rape and the ones that didn’t. Some of the factors that the survey show can play a role for losses, apart from varroa and inadequate varroa control, are lower honey yield and more queen problems than usual. The amount of winter feed is also an important factor, and the survey in 2014 confirmed the results from earlier studies in Sweden that colonies who get less than 15 kg of sugar (dry matter) run a higher risk to die during the winter compared to colonies that get more. Results from the Swedish study with the COLOSS questionnaire will be presented and even compared with the results from the Epilobee project as well as data from the reports that beekeepers send to the Swedish Beekeepers Association.

The COLOSS Workshop on "monitoring beelosses"
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Colony losses in Switzerland: newest results

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

During the 2007/08 winter, we started close collaborations between the Swiss Bee Research Centre and the Swiss Beekeeping Association. A representative panel of 472 beekeepers (2.6% of the CH-beekeepers), distributed overall Switzerland and managing 8200 colonies, were invited via e-mail to provide data about their winter losses on a website. We got so the first results from the newly established national monitoring system which was implemented. Since this first monitoring, we looked to increase beekeeper participation in the COLOSS questionnaire. For the 2013/14 winter, via the Swiss beekeeping journals, The participating beekeepers were distributed throughout Switzerland and increased from 472 beekeepers in 2008 to more than 960 (5.5% of all Swiss Beekeepers), managing 17'400 colonies in 1244 apiaries.
From 1st October 2013 to 1st April 2014, mean colony losses in Switzerland were 12.1% (ranging from 7 - 25% depending on the Canton) and 7.4% of all Swiss colonies surveyed were too weak in spring to develop to a productive colony. With 12.1% losses, this winter is one of the winter with the lowest losses since 2007. The most frequently (43%) cited causes by beekeepers for winter losses was "queen problem".
The altitude of the apiaries, the bee race and the age of the beekeepers had no influence on colony losses. The drone brood removal and the frequency of this removal seem to reduce the winter losses. For the summer treatment, the formic acid gave better results than the thymol-products and the best time to perform the winter treatment was in December.
Our institute, the University of Bern and a private company try at present a new data analysis technology (HyperCube®) with the data of the Swiss monitoring system to identify the combinations of variables that give the optimal prediction of the winter losses. The first results are promising.

Evaluation of colony losses in Israel 2013-14

Victoria Soroker[1], Joseph Kamer[1], Ilya Zeidman[1], Amotz Hezron[2], Hillary Voet[3]
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We have started monitoring colony losses in 2009. For the last two years we conduct colony losses surveys among beekeepers mainly using an internet questionnaire. The questionnaire devoted to winter losses was based on the one developed by a Coloss working group one and was translated to Hebrew. However, as in our climatic conditions losses during the summer can be more severe than during winter we have extended the same questionnaire to the summer season as well. The invitation to participate in the questionnaire was sent to 179 beekeepers by email.
This year the number of responding beekeepers was 47 (about 10% of total beekeepers that represent 33696 colonies (about 34% of a total number of colonies). Data regarding loses during the last year (summer and winter) will be discussed.

The COLOSS Workshop on “monitoring beelosses”
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Suggestions to further define the questions in COLOSS questionnaire

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

After the winter of 2013-2014, in Poland monitoring of honey bee colony losses was based on stratified randomized sampling. Together with the questionnaire, each beekeeper received one small sheet of paper to fill in if he did not want to participate in the survey, with the request to state the reason.

Although a huge effort was made to formulate the questions in the COLOSS questionnaire clearly, the answers given by Polish beekeepers suggest that not everything was yet obvious to them. We conclude this on the basis of the following facts:

1. Some beekeepers explained that they did not take part in the survey since they are only hobbyist beekeepers and their colonies do not produce honey for sale (consequence of the term “production colonies”).

2. Sometimes, answers to the question about the number of lost colonies during the winter of 2013-2014 were in disagreement with subsequent answers about the number of lost colonies with queen problems, dead workers in the cells, etc.

3. Some beekeepers claimed that they did not treat their bees against Varroa in the relevant period of time but later they ticked the boxes with months when they started a particular Varroa treatment.

During this workshop we will suggest a solution to these problems.

The COLOSS Workshop on “monitoring beelosses”
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Monitor 2014; problematic questionnaire questions

Authors and Affiliations (Arial 12 pt. bold)
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Romée van der Zee, Nederlands Centrum Bijenonderzoek

Text of Abstract (between 250 and 400 words)

Bias will be the result if a question is too complex or not well worded. Some examples from the 2014 questionnaire and earlier will be shown and improvements suggested.

The COLOSS Workshop on "monitoring beelosses"
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Monitoring of honey bee colony losses in Republic of Macedonia

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

Based on designed common COLOSS Basic Questionnaire for the colony losses, in the spring 2012 a translated version was sent to the local beekeeping associations in the Republic of Macedonia. We received 274 fulfilled questionnaires back from the same number of beekeepers. The total number of colonies of the assessed beekeepers was 18.259, representing 16.8% of the total population of honey bee colonies in the country.

From the analyzed data, we can conclude that the average colonies' losses during the winter 2011/2012 was 30.9% and was significantly higher than the losses level from the 2007/2008 and 2009/2010 winter seasons with 20% and 6.8%, respectively.

Having on mind that the monitoring was not conduced on regular basis in the country, we are planning to establish an online data base and organize regular annual screening schemes based on the questionnaire developed from the COLOSS colony losses monitoring group.

Key words: *colony losses, winter, questionnaire, Republic of Macedonia*

The COLOSS Workshop on "monitoring bee losses"
Copenhagen, 27. - 28 January 2015

Abstract form

Title (within 150 characters, Arial 12 pt. bold)

First colony losses monitoring in the Czech Republic

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

The colony losses monitoring project has been running in Europe and in other non-European countries since 2007 but the Czech data were missing in this complex study. The first colony losses monitoring was performed in the spring 2015 in the Czech Republic. The Czech Republic has about 47 000 beekeepers, who are in general hobby beekeepers and maintain about 540 000 colonies. The density is approx. 6.9 colonies per km^2 which is very high compared to other European countries.
The translated international COLOSS questionnaire was used for the survey. Beekeepers were invited to the study per direct mailing, beekeeper forums, several articles in a magazine "Modern Beekeeper" and also at events, lectures and seminars. The data were collected on-line by Lime-survey software thanks to close cooperation with Karl-Franzens University Graz. Beekeepers could also send a paper version of filled questionnaire. All collected data were cleared from double entries and non-sense answers.

Winter loss rate was 6.5 % (95% CI: 5.5-7.6), the response rate was 1.2 % (556 participants) in the Czech Republic; i.e. the last season loss was one of the lowest in Europe. We were not able to identify any significant risk factor from obtained data set, which could increase the loss rate. On the other hand the last winter loss rate was very low and thus no rick factor could be shown very clearly. However, we can compare Czech and Austrian results in details and it is evident that natural treatment (formic and oxalic acid, thymol etc.) is more familiar in Austria. Synthetic treatment with amitraz is mandatory in the Czech Republic during autumn (except organic beekeepers).

The follow up study was performed after the summer in Austria and also in the Czech Republic. This survey was aimed at beekeepers who participated in the winter survey. Respondents were queried about colony renewal and their beekeeping or breeding practice. 341 of totally asked beekeepers (78.9 %; 432) answered the questionnaire in the Czech Republic, answers were also collected by our partner Karl-Franzens University Graz. The detailed results have been processed.

We will participate in COLOSS loss rate monitoring also in the winter 2014-15. The data will be sent to the international team to analyse risk factor on the European level.

The Czech survey was supported by AKTION, project 69p11 in the year 2014. The AKTION also supports the further monitoring in 2015 (project 71p6).

The COLOSS Workshop on “monitoring beelosses”
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

The occurrence of Acarapis externus mite in honey bee colonies in an apiary in Iran

Authors and Affiliations (Arial 12 pt. bold)
For the contact author only (typically the senior author), include email address, mail address and phone number. Denote contact author with an asterisk.

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Text of Abstract (between 250 and 400 words)

In April 2013, in Gorgan region at the North of Iran near the Caspian Sea a beekeeper reported the losses of more than 30 percent of the colonies in his apiary. The samples were observed by stereo microscope. High level of external Acarapis infestation on the body of adult bees was detected. To determine the species the samples were sent to veterinary faculty of Tehran University and the A. externus was detected. Acarapis.externus Morgenthaler is found on the cervix (the neck region) and A.dorsalis Morgenthaler is found on the dorsal groove of the thorax (Ibay and Burgett, 1989). Morphologically they are difficult to differentiate from one another and from A. woodi, even at high magnification. The parasites were seen at different stages of eggs, larvae and adult. The adult acarapis were moving about on the body of dead bees. The video is available.

The COLOSS Workshop on “monitoring beelosses”
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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Effect of summer feeding on the ascorbate peroxidase activity of honey bees (*Apis mellifera L.*)

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

In the recent years, the number of colonies of honey bee has been decreased worldwide as a result of a combined action of several negative factors such as pesticides, bee infestation by mites, bacteria, fungi or viruses and prevalence of monocultures in the agriculture. It has been supposed that the cause of death of bees is a decrease in their immunity. An important component of humoral immunity of honeybee is the antioxidant system, which embrace numerous enzymes including ascorbate peroxidase (APX). The aim of our study was to evaluate the effect of summer feeding of bees on the activity of APX of the local bee population in the conditions of not sufficient amount of food in nature (mid-summer). We determined the activity of APX of forage bees of two groups: the control group (without summer feeding) and experimental group (with summer feeding). The experimental colonies obtained additional feeding with 60% sucrose solution for 3 days. For each group we determined APX activity three times: before the experiment (day zero), at the 4th day and at 11-th day of the experiment.
The enzyme activity was determined in tissues of (i) guts, (ii) head and (iii) thorax. The body parts of ten bees were combined to prepare one extract. APX activity was measured by the method of Asada. The protein content was assayed according to the method proposed by Bradford. Statistical analysis was performed using the Wilcoxon test.
APX activity significantly increased on the 4th day of the experiment in the experimental group, whereas in the control one it remained the same in all studied body parts. At the same time, the highest increase in enzyme activity was observed in the tissues of the head, and the lowest one in the tissues of the thorax in the experimental group compared to the control group. Smaller increase of enzyme activity in the thorax tissue may be due to adverse weather conditions for the flight activity. Enzyme activity returned to baseline levels within a week after termination of summer feeding. The data indicate that APX may play an important role in cell protection in bees.

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Title (within 150 characters, Arial 12 pt. bold)

Occurrence of nitrates in bee honey in Chernivtsi region (Ukraine)

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

Honey has the image of being clean and healthy. Yet, in our days bee products are produced in an environment, polluted by heavy metals, pesticides, nitrites, nitrates and other from different contamination sources. A trend towards increased nitrate pollution of an environment (groundwater, plants) can be observed worldwide. Honey bees have been used to assess atmospheric and other types of pollution (Bogdanov, 2006). As far as honey is the result of bio-accumulative process useful for collecting information about the environment within the bee’s forage area we decided to try honey to assess nitrate pollution in Chernivtsi region (Western part of Ukraine). We investigated honey obtained from private beekeepers living in areas with different levels of urbanization and agriculture in Chernivtsi region. We studied different kinds of honey collected from various plants: sunflowers, buckwheat, and motley grass. Nitrates were evaluated potentiometrically using Portable Nitrate sensor H-401. The content of nitrates in different types of honey from all investigated localities ranged from 5.4 to 11.6 mg /kg. The maximum nitrate levels were found in honey collected in Kitsman area, characterized by the greatest development of agriculture in comparison with other investigated localities. It is known that intensive agricultural activity is one of the factors leading to nitrate pollution. Among studied kinds of honey the buckwheat honey was found to have higher nitrate concentration, while the sunflower honey is characterized by the lowest content of nitrates. The present study led us to the conclusion that bee honey can be considered as a good marker for monitoring of environmental pollution with nitrates.

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Title (within 150 characters, Arial 12 pt. bold)

Honey bee health monitoring and reporting network in Italy: an up to date

Authors and Affiliations (Arial 12 pt. bold)
For the contact author only (typically the senior author), include email address, mail address and phone number. Denote contact author with an asterisk.

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Text of Abstract (between 250 and 400 words)

In Italy a National monitoring network on honey bee health is active since 2009, in the framework of ApeNet (2009-2011) and BeeNet project (since 2011) funded by the Italian Ministry of Agriculture. From about 1,350 recruited hives in 2009 there are now approximately 3,000 covering all the Italian regions. Visits are schedules four times per year: 1) end of winter; 2) spring-summer; 3) end of summer-beginning of autumn; 4) before wintering. At each visit, environmental and beehive data are recorded, while at visits 1) and 3), samples of beehive matrices are collected (beebread and alive honey bees). The percentage of positive samples and the level of *Nosema ceranae*, *Nosema apis*, DWV, ABPV and CBPV infections are investigated in alive collected bees. Raw proteins of beebread as estimation of the nutritional value and residues of pesticides (only in the first visit) were analysed. Varroa infestation was assessed in each colony by "powdered sugar" method in the third visit. The results of the monitoring network in 2012 and 2013 indicate a high pesticide load in beebread (50.4% of positive samples in 2012 and 42.1% in 2013). Seven and 0% of *N. ceranae* highly infected samples in 2012 and 2013 were identified, respectively. *N. apis/N. ceranae* coinfection was detected only in one apiary of Bolzano province (northern Italy). The level of DWV infection was greater (30.6% of highly infected samples in 2012 and 33% in 2013), compared to ABPV (2.1% in 2012 and 2.5% in 2013) and CBPV (1.9% in 2012 and 4.1% in 2013). Overall, colony losses were slightly higher in 2012 (13.7%) than in 2013 (10.8%). The monitoring network is supported by BEST (Bee Emergency Service Team), which permits to record honey bee mortality and colony losses events from the whole Italian territory, in collaboration with local veterinary services, beekeepers associations and regional extension services. The aims of this service are a) to complete the data collected through the BeeNet monitoring network, b) to create a database of the events of bee mortality and colony losses in Italy and c) to investigate the event in real time. On-call intervention and direct inspection of the affected apiaries are strategic. Since 2012, 219 records of honey bee mortality have been received. Pesticides were the main cause of honey bee mortality. 57 different active ingredients were found and multi-residual contamination was demonstrated in most cases. In approx. 10% of cases honey bee diseases were involved.

The COLOSS Workshop on "monitoring beelosses" Copenhagen, 27. - 28 Januar 2015 Abstract form
Title (within 150 characters, Arial 12 pt. bold)
Update on bee colony losses and health status in Slovakia
Authors and Affiliations (Arial 12 pt. bold) For the contact author only (typically the senior author), include email address, mail address and phone number. Denote contact author with an asterisk.
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Text of Abstract (between 250 and 400 words)
On the territory of Slovakia, around 260 000 honey bee colonies mainly of the Carniolan race of Carpathian and Alpine ecotypes are kept by more than 16 300 beekeepers (year 2014). Honeybee colonies winter losses during last 3 years were relatively small, up to 9% (8,8% in winter season 2013/2014), no CCD symptomes has occured. The main reasons of these losses are Varroa overpopulation or colony starvation, influence of other pathogens is monitored. Few losses of overwintered colonies are caused by pesticides or bears. For Varroa control administration of formic acid, oxalic acid (BeeVital HiveClean), thymol products (Apiguard, Apilife Var, Thymovar) has been method used during honey-flowing season. The other treatment methods used after last honey harvest include fumigation (amitraz – Avartin 01-B90, Varidol) or contact applications (fluvalinate – Gabon PF90, flumethrin - Bayvarol). Aerosol winter treatment of colonies is promoted among beekeepers to eliminate Varroa in broodless colonies which seems to be very efficient measure to eliminate winter colony losses. Aerosol applicators are used to apply amitraz into hives when outside temperatures reaches from +10 to -5°C. Annually several outbreaks of American foulbrood appears (52 apiaries in october 2014), chalkbrood, nosematosis (Nosema ceranae has been detected as well) and viral diseases (sacbrood, DWV, ABPV, SBV, KBV) causing also problems to some beekeepers. Main bee predators are wax moth, ants, mouse and bears. Breeding of Carnica queens is actually performed in 5 breeding and in 52 reproduction stations (apiaries). Morphometrics methods are used to verify subspecies purity, molecular and genetic methods for discrimination of ecotypes have recently begun to be used.

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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Survey on honeybee colony losses in Croatia during winter 2013 /14

Authors and Affiliations (Arial 12 pt. bold)
For the contact author only (typically the senior author), include email address, mail address and phone number. Denote contact author with an asterisk.

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Text of Abstract (between 250 and 400 words)

Weather conditions during winter 2013/2014 have been described as extremely warm with the exception of some areas in North-western and Central Croatia which were very warm (Source: Meteorological and hydrological institute of Croatia). In such conditions beekeepers were able to open and control colonies most of the time. Data collection on colony losses was initiated by beekeepers in early January 2014, induced by losses at some apiaries. For this purpose beekeepers used questionnaire from previous year. Second collection of data continued during March and April, after translation of the questionnaire for 2014. Beekeepers were approached using beekeepers journal, web portals and meetings. In total, we collected 545 responses from hobby to professional beekeepers (wintered from 3 to 800 colonies). From surveyed, 25.32% beekeepers did not report losses. During January majority of losses was reported on apiaries up to 60 colonies, while in April losses increased on apiaries with 60 – 150 colonies. On average, professional beekeepers (>150 colonies) had lowest losses.

Colony Losses in Turkey and the new structure of Turkish Beekeeping

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In Turkey, Beekeeping industry has a big potential for Turkish economy. Between 2006-2007, there were some problems with colonies . Colony losses were observed in different regions of Turkey and this event occured sometimes gradually, sometimes suddenly. From 2006 onwards, lots of research have been done by collaboration with Hacettepe University, Hatay University, Turkish Agriculture Ministry and Turkish Beekeepers' Association. Though colony losses rates were15-20% in 2006, 8-10 % in 2007, the data of 2008 were very different from the last two years. In 2008, this rate was 1.8% surprisingly. If you think that Turkey has 6 million colony, it is still huge number regarding as any other country, but we evaluate this situtation as a normal winter losses. After the field studies and laboratory research, we found different causes of losses especially between 2006-2007. Generally, Varroa destructor was the biggest problem in Turkey. So, we got suspicious about viral infections. We detected 5 different virus in Hatay region. At the same time, the results of our research in the same area showed that there were N. cerena infection. In addition to viruses and Nosema infections, there were a lot of causes we found; pesticides, starvation, incorrect application for treatment of honeybee diseases, old Queen, the quality of comb foundation, climatic or seasonal changes and etc. On the other hand, since the decrease of colony losses rate in 2008 and huge number of honey production, we have focused on climatic changes in season. We observed that there had been still a lot of causes in 2008, but we also observed that climatic condition could cover or give rise to increase the effect of all negative causes. In 2014, colony losses rate is 0.7% for now.

The important development for Turkish Beekeeping is revision of AKS (Beekeeper Registration System). Turkish Agriculture Ministry begin to use barcode system for registration from hive to honey jar. This barcode includes city code-beekeeper's identity number registered by Beekeeping Association-location code-hive number. These data can be used for bee health monitoring system. Moreover, we can follow immigration beekeeper and spread of diseases by means of this system.

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Abstract form

Title (within 150 characters, Arial 12 pt. bold)

Honeybee colony losses in France for winter 2014 : results from the ITSAP survey available for all French beekeepers

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

Since 2008, a survey is realized by the ITSAP (French beekeeping institute) in order to estimate the winter colony losses in France. The questionnaire is available from December to April and can be directly fulfilled on the net ; A paper form is also distributed in one of the main beekeepers magazine. In April 2014, 698 exploitable answers were totalized that represent 83 818 bee hives entering winter 2014. It represents 1.7 % of the French beekeepers or 7.8 % of the bee hives population according to 2010 data (the most recent statistics for French beekeeping). Because French beekeeping considers both professional beekeepers and hobbyists, the Average Loss (AL) was calculated with the method proposed by vanEngelsdorp *et al*. (2012). **The AL is 15.2 % (CI 95% = +/- 0.3 %) for the beekeeper's population who answers the questionnaire**. Two third of the losses (10.5 %) were died colonies at the end of the winter, completed by colonies that were unable to enter a production way (4.7 %). The main reason for colony losses are queen less or drone laying colonies (25.7 % of colony losses), CCD like symptoms (19.5 %) and weak colonies (14.6 %). Diseases represent 5.9 % of the losses. In another hand, the population of colonies treated with Apivar® or Apistan® get 10.3 % of losses when colonies treated with thymol or formic acid raised 29.1 % even if treated again in the brood less period. Colonies treated twice with Apivar® (at the end of the production season and at the end of winter) get the lower loss mean: 7.4 %. In 2014, professional beekeepers who keep more than 150 colonies get a higher AL (18.6 %) than hobbyists (14.1 %). The average losses in France decreases under 20 % from three years: 18.4 % in 2013 and 17.3 % in 2012 while the mean losses was near 25 % between 2008 and 2011.

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Title (within 150 characters, Arial 12 pt. bold)

Colony loss monitoring in Finland

Authors and Affiliations (Arial 12 pt. bold)
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Ari Seppälä

Text of Abstract (between 250 and 400 words)

Colony loss monitoring in Finland
There are 3 surveys: Finnish Beekeepers´association is sending every autumn to 10 % randomly chosen members questionaire about honey yield. Since 1993 the association has included questions about overwintering during previous winter. Retun rate has been about 70 %. In the association responsible for the survey has been Heikki Vartiainen.
Kauko started winter 2007-2008 to ask about overwintering with personal contact. The same beekeepers are interviewed every year. From the 30 beekeepers from the first year still 28 are in the group, which now contains 44 members. They are from all parts of the country the majority however being from south and west.
Seppälä started 2 years ago through internet survey, to which every beekeeper can participate.
In the survey of association the number of bee colonies has been over 2000, in surveys of Kauko and Seppälä in last years over 5000 with some overlapping in these surveys. The number of members of association is about 2200 and number of overwintered colonies about 50000. In spite of different samples of beekeepers the loss rates have been in most years between 15-20 % +- 1 .
In the winter 2008-2009 loss rate in Kauko´s survey was 13,8 % and in survey made by association 18,3 %. In the winter 2013-2014 colonies survived better and all surveys showed losses of about 7 %.
Other results: beekeepers from southern Finland are continously having greater losses than those from northern Finland.
Beekeepers, who lost more than 50 % of colonies during winter tend to need at least 2 years to achieve same amount of colonies that they had before big loss.
Observations of causes of losses are not obtained from all beekeepers and if they are obtained, their accuracy is variable. Generally useful observations is got from about half of the lost colonies. Major causes are same as in other countries: queen failures, varroa, starvation. Smaller am ount of colonies die because of birds, mice, vandalism, storms, bears etc. When bees overwinter well seems the proposition of queen failures be bigger than that of starvation or varroa smaller.

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Title (within 150 characters, Arial 12 pt. bold)

Monitoring Colony Losses in Ireland

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

Beekeeping in Ireland is coordinated by the Federation of Irish Beekeeping Association (FIBKA) with approximately 50 local beekeeping associations distributed throughout the country. In total there are approximately 2700 beekeepers affiliated to FIBKA and based on a recent census carried by Department of Agriculture Food and the Marine, 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. Irrespective of the operation size, winter colony losses are inevitable but since the arrival of Varroa mite to Ireland in the late 1990s the percentage losses acceptable to beekeepers has increased from 10 to 15%. Since 2008, as part of the National Apiculture Programme, winter losses are being monitored on an annual basis using the standardised questionnaire produced by the COLOSS network. In 2008/2009, the estimated national average winter colony losses was 22%, increasing to 24% in 2009/2010, followed by a decrease in losses to 17% and 13% in 2010/2011 and 2011/2012 respectively. In 2012/2013 severe losses were experienced (37%) but last winter, 2013/2014 the estimated losses was 13%. During the past number of years, the response rate has been approximately 15% and 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. Last year we also made the survey available online using Survey Monkey. Although this approach greatly eases the collection and accumulation of data from survey respondents, the overall response rate using this method was disappointing (15%). During 2014/2015 the aim is to develop the online survey method by incorporating more incentives and reminders and also to adopt a stratified random sampling method which should provide the most accurate estimate of the winter colony losses being experienced by Irish beekeepers.

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Title (within 150 characters, Arial 12 pt. bold)

Loss rates from the colony loss monitoring survey in Scotland for winter 2013-2014

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

In Scotland we have carried out surveys of beekeepers since 2006, using random sampling of the Scottish Beekeepers' Association membership records for all except the first survey. In 2014 for the second time our survey was mostly run online via the LimeSurvey electronic questionnaire software (http://www.limesurvey.org/). We selected 350 participants from 1224 possible participants. Of these 350, 273 (78%) had email contact details and 77 did not. Owing to 17 failing emails and one problem with access to the online questionnaire, in fact 95 questionnaires and invitations to participate were posted and the rest processed online.

As in 2013, the overall response rate was higher, at 213 from 350 (61%), than in most of the previous postal surveys. One postal reminder and several electronic reminders were issued. Eleven responses were blank and, of the other 202, 177 were beekeepers and of these 160 had valid loss data concerning colonies kept and colonies lost.

Overall 97 out of 718 colonies kept in October were lost over winter (a 13.5%) loss rate, the lowest since our random sampling began in 2008 (and different questions were asked about losses in the 2006 survey) and 34.4% of beekeepers lost colonies. This contrasts with the highest loss rate of 31.6% found for winter 2012/13 when 56.5% of beekeepers experienced losses.

In the 2013 survey we found a highly significant difference in loss rates between beekeepers responding by postal questionnaire and online, with the loss rate for the postal respondents being much lower. This time, for the 28 postal respondents the winter loss rate was 11.7%, compared to 13.9% for the 132 online respondents, but the difference was non-significant.

Results of further analysis and model fitting will be presented, considering various risk factors including geographical location, forage sources and Varroa treatment.

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Monitoring bee losses in Spain

Authors and Affiliations (Arial 12 pt. bold)
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Text of Abstract (between 250 and 400 words)

COLOSS Questionnaires were disseminated during 2014 to estimate the colony losses in Spain. The dissemination of the questionnaires was made by asking collaboration trough beekeepers associations, during meetings and publishing in different beekeeping journals. In Canary Islands, JA Ruiz, collaborated in the dissemination of the questionnaires.

Despite of all, a low participation was achieved. Only a total of 114 beekeepers answered the questionnaire. This represented just 0.5% of participation according to the number of beekeepers in Spain. The beekeepers declared that 20.8% of colonies were weak after winter and 12.3% were lost. In low percentages were recorded for lost colonies with dead workers in cells and no food or with signs of starvation. However, Beekeepers reported to have a new queen in the 15.5% of the overwintered colonies.

As an important factor under Spanish beekeeping conditions, the 67.9% of the participants, declared transhumance for pollination or honey production. Around the 7% of beekeepers declared to have significan necar flow from oil seed rape and none from the maize.The most of beekeepers reported to treat against varroa since it is compulsory in the Country

New methods to improve the dissemination of the questionnaire should be developed to increase the number of beekeepers collaborating in this survey.