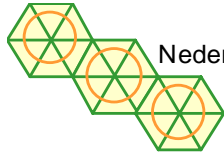


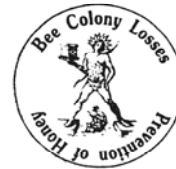


Schweizerische Eidgenossenschaft
Confédération suisse
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Eidgenössisches Volkswirtschaftsdepartement EVD
Research Station Agroscope Liebefeld-Posieux ALP
Swiss Bee Research Centre



Nederlands Centrum Bijenonderzoek



COST Action FA0803
COLOSS
Combined Work Shop
Monitoring and Standardization
The BEE BOOK

Amsterdam, January 18-20, 2010



Dear colleagues

Standardisation of monitoring and research on losses is inevitable to make progress with respect to honeybee colony losses and therefore right at the core of our network. The BEE BOOK idea emerging from stimulating joint discussions with Maria Navajas and Jay Evans at the New Molecular Tools work shop in Bern has a great potential to become a very valuable tool not only for getting our COLOSS standardisation done properly and timely, but may also have much wider implications beyond our network. I am therefore delighted that we will meet and discuss this matter in detail in Amsterdam. Financial support is granted by COST via the Action FA0803 COLOSS. I am very much looking forward meeting all of you, and hope you will enjoy this work shop.

A handwritten signature in black ink that reads "Peter Neumann". The signature is written in a cursive, slightly slanted style. The first name "Peter" is written in a larger, more prominent script, and "Neumann" follows in a similar but slightly smaller script. There is a horizontal line above the "N" in Neumann.

Peter Neumann, Action Chair

Bern, Switzerland, Monday, 15 February 2010

Local Organizer

Netherlands Centre for Bee Research: Romée Van der Zee
Workshop Administration: Lennard Pisa

Session Chairs:

Bee Book: Peter Neumann

Monitoring: Romée van der Zee

Technical support: Bernd Kulawik

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Agenda and Hotel information

TIME	PROVISIONAL PROGRAM
18.01.2010 (Monday) – Hotel Tulip Inn Amsterdam Riverside	
Arrival and informal social gathering in the evening	
20:00	Dinner in Tulip Inn
19.01.2010 (Tuesday) – Hotel Tulip Inn Amsterdam Riverside	
08:00 – 08:40	Registration and Coffee
08:40– 08:45	Welcome by Romée van der Zee and organizational matters
08:45 – 09:00	Introduction talk by Peter Neumann. In his talk, Peter will give a basic reasoning and framework for the BEE BOOK and its contents
09:00 – 09:20	Plenary talk by Vladimir Kartsev: monitoring in Russia
09:20 - 09:40	Plenary talk by Romée van der Zee: monitoring in Europe
09:40 - 10:00	Plenary talk by Dennis van Engelsdorp: monitoring in the USA
10:00 – 10.20	Plenary talk by Stephen Pernal: monitoring in Canada
10:20 – 11:00	Plenary talk by Robin FA Moritz: European research strategies. An update on the research goals of the BEE DOC network, relating to all WGs in Coloss.
11:00 – 11:20	Coffee break
11:20 – 12:20	Separate discussion rounds for each COLOSS WG
12:30 – 13:30	Lunch
13:30 – 14:30	Separate discussion rounds for each COLOSS WG
14:30 – 15:00	Open general discussion on Monitoring and Research standards
15:00 – 15:30	Energy break
17:00 – 18:00	Open general discussion on the BEE BOOK: how to practically realize it?
20:00 – open	Social dinner in the old town of Amsterdam
20.01.2010 (Wednesday) - Hotel Tulip Inn Amsterdam Riverside	
09:00 – 10:00	Separate discussion rounds for each COLOSS WG
10:00 – 11:00	Open general discussion on Monitoring and Research standards
11:00 - 11.30	Coffee break
11:30 – 13:00	Open discussion on next steps for the BEE BOOK
13:00– 14:30	Lunch, end of workshop meeting

Hotel and Program information.

For all correspondence use email:
COLOSS.ws.amsterdam@beemonitoring.org

Dear colleagues

You have registered for the combined workshop in Amsterdam on monitoring and standardization. Last week we informed you about the disappointing COLOSS budget development and how it affected the Amsterdam workshop. Wednesday December 9, the COLOSS MC has approved a new Action budget for the running year. An important new element is the reduction of the originally anticipated workshop budgets with 50%. As a consequence the reimbursement possibilities within the new workshop budgets are limited. For the Amsterdam workshop one person per country will receive reimbursement and next to that reimbursement will be available for invited experts and plenary speakers (never two persons from the same institute). The reimbursement will be limited to only travel expenses up to a maximum of €500 and neither for meals nor accommodation. We expect the COST ACTION office to send an invitation next week in the event that you will be reimbursed.

Hotel and registration

We have made an attractive arrangement for your stay in Hotel Tulip Inn Amsterdam Riverside. The workshop is organized in this hotel too. Public transportation (train/metro) brings you in about an hour from Schiphol Airport to 500 meters from the hotel. You will receive detailed information about transportation later. Taxi is very expensive in Amsterdam, and can, especially in rush hours, take quite some time. Taxi expenses will not be reimbursed since public transportation is the more affordable alternative. We can pick you up from the metro station if necessary. The following arrangements are possible:

- One person arrangement, COSTS €210: Arrival Monday 18, one person room, breakfast, 2 x lunch buffet and dinner at January 18. Every night more will add €53, breakfast included.
- Two workshop participants sharing a room, COSTS €345: Arrival Monday 18, double room, breakfast, 2 x lunch buffet and dinner at January 18. Every night more will add €68, breakfast included.
- One workshop participant + partner, COSTS €240: Arrival Monday 18, double room, breakfast, and only for the workshop participant 2 x lunch, buffet and dinner at January 18. Every night more will add €68, breakfast included.

Facilities (meeting rooms etc.) and coffee breaks are paid from the local organizers budget. Drinks that you personally order are on your own expenses.

Please make your reservation as soon as possible, by sending an email to amsterdam@autogrill.net and mention COLOSS Arrangement in your mail. In the event that you expect to arrive very early at Monday morning you should also mention Early Check In. Don't make your reservations in a different way to avoid paying a higher price. (Hotel information below.)

Workshop registration COSTs are €15 + €35 for the social dinner in Amsterdam at Tuesday 19 January. Registration will be Monday morning before program start.

Workshop Program.

During the workshop we will have plenary and session meetings. In the (attached) workshop participant list (not to be confused with a reimbursement list) you can see in what session you are classified, accordingly to how you filled in your registration form.

A workshop requires active participation. So we expect you to adapt to the following:

- **Monitoring Sessions.** In the attached first draft of the COLOSS Questionnaire on winter losses you will find indicators and questions. We ask you to provide an abstract (1) on questions you would like to add to the Coloss Questionnaire and indicate if your questions are considered critical or optional, (2) with suggestions to improve the question set in the COLOSS Questionnaire, (3) with information about how you will implement the questionnaire in your country (survey mode, cooperation with beekeeping associations etc.) in spring 2010 and if a follow up in the coming years can be expected.
- **BEE BOOK Sessions.** The scope of this effort is quite broad, in that it does not just simply cover experimental approaches (e.g. molecular virus diagnosis), but also advice and guidelines for data analysis, reporting, publishing, etc. The final product will be dynamic, an on-line BOOK containing procedures, recipes, primer sequences, guidelines etc. on all factors related to research on honeybee health and the loss of colonies. There are two key components to this standardization effort:
 - A. To provide practical online guidelines for direct use by scientists
 - B. To provide guidelines and criteria for improvements, additions/deletions etc., so that the BOOK will become dynamic, self-correcting and self-improving according to new developments without losing data compatibility. Thus, we will take full advantage of web 2.0, much like Wikipedia, but not quite so open.

To foster the output of this particular work shop, we herewith encourage you to team up with other registered participants or members of the COLOSS network interested in the same WG BEFORE the work shop. For example, Joachim de Miranda, Magali Ribière and Nor Chejanovsky have already teamed up and will together prepare a rough outline for viruses. Similarly, Jochen Pflugfelder, Vincent Dietemann and Peter Neumann will do the same for *Varroa destructor*. This will be the basis for joint discussions on WG specific subjects. Since no-one in our group has any real, live experience with such standardization efforts across international boundaries, suggestions for the general structure will be very welcome, especially because most of us are largely ignorant of the downstream issues, such as quality control, assay failure rates, defaults, cross-platform implementation, compatibility, data harmonization, commercial involvement, intellectual property rights, (de)centralization of task-stages, financial concerns, geo-political issues (they always come up somewhere...), etc. Therefore, your suggestions for the monitoring part (see points 1-3 above) or the BEE BOOK sessions (either in general terms (organization, practical realization, etc.)

or specific for a WG theme (e.g. viruses or varroa) should be on file with Peter Neumann by the 04.01.2010 in form of an abstract following the style and guidelines for the last COLOSS conference. Example: Vincent Dietemann, Jochen Pflugfelder, XYZ and Peter Neumann: “Suggestions for standards on *Varroa destructor* research” (XYZ = colleagues who wish to team with us on this particular subject). The invited speakers are herewith kindly requested to provide a respective abstract. These abstracts will form the basis of the work shop proceedings, which will be the written proof for COST of your active participation. The provisional workshop program may undergo changes in the coming weeks. Please inform us before December 24 if you will join the social dinner at Tuesday 19 January, and if you have special wishes for diet (preference for meat and/or fish). We expect an interesting workshop and hope to welcome you in Amsterdam in January.

Romée van der Zee, Peter Neumann

CONFERENCE LOCATIONS	
Hotel Tulip Inn Riverside	Romée van der Zee
Provincialeweg 38 1108 AB Amsterdam Zuid Oost Tel: +31 (0)20 312 1416 Fax: +31 (0) 20-312 1465	Dutch Centre for Bee Research Phone: +31 515 52 11 07
CONTACT FOR FURTHER INFORMATION	
COLOSS.ws.amsterdam@beemonitoring.org	

Allier et al.: First Draft of the COLOSS Questionnaire for winter losses

Allier, Fabrice; Le Conte, Yves

French survey coordinator : Fabrice ALLIER – fabrice.allier@cnda.asso.fr

Tel: 00 33 140 04 50 25

Institut technique et scientifique de l'apiculture et de la pollinisation – Institut de l'abeille (ITSAP – Institut de l'abeille)

French survey collaborators: Yves LE CONTE : leconte@avignon.inra.fr.

In the attached first draft of the COLOSS Questionnaire on winter losses you will find indicators and questions. We ask you to provide an abstract (1) on questions you would like to add to the Coloss Questionnaire and indicate if your questions are considered critical or optional, (2) with suggestions to improve the question set in the COLOSS Questionnaire, (3) with information about how you will implement the questionnaire in your country (survey mode, cooperation with beekeeping associations etc.) in spring 2010 and if a follow up in the coming years can be expected

(1)

Question 2: How many times were the majority of the colonies moved for either honey production or pollination service. We don't ask this question in our French questionnaire, we just ask about sedentary or migration apiary.

Question 3: What was the average honey yield in kilograms per production colony for 2009? We just ask the estimate of the last honeyharvest – Low, average, good.

Question 5: How many production colonies were lost within two months before wintering in 2009? We don't ask this question. We consider that our questionnaire is pretty hard to fill for professional beekeepers (if they are not used to notice information about their practices it's difficult to get so precise answers)

Question 7: Have you verified if colonies were lost within about 3 months **after** wintering? We should precise the year. It is wintering of 2008/2009 or 2009/2010?

Question 8: How many colonies were lost within 3 months **after** wintering in 2009? Do the "losses" include the diseased, queenless or weakened colonies? Or it is just fordead colonies? For our french questionnaire 2009/2010, we will try to estimate the mortality during the foraging saison (march- September).

Colonies Lost: symptoms Question 10 – 11 – 12 13: We don't ask such questions. We think that asking about mortality causes and colony state is enough for the professional beekeepers. For the moment, it would be too difficult for them to tell us the symptoms of each colony when they are on average 400 colonies on the farm. We know that we have to solve this question with our questionnaire.

(2)

OPTIONAL Suggestions: Add a question as question 20 but for wintering and ask if the apiary is protected from the wind or not (we have demand from beekeepers to work on that).

We will suggest to add question about the estimation of varroa infestation (poor, average, good) and the strength of the colony (low, average, high) at the beginning of wintering.

(3)

Selection of the target population

- From the list of professional beekeepers acceding to the network ITSAP-Institut de l'abeille.
- Stratification by region.
- Poll rate covered 20% in each region with a minimum of 5 farms.

Forecast non-responses to the survey

- Creating a random list of "titular" and "substitute" (rate survey conducted by 40%). Drawing list conducted among 782 farms.
- Replacement of titular who have not responded by substitutes in order of entry on the list.
- The questionnaires are sending by post to the beekeepers.

Using the ITSAP survey program which is nowadays running for 2 years, we will able to obtain data of about 20% of professional beekeepers (150 and more colonies) for all France. We will use the results of our survey of winter 2008/2009, which will be ready for next summer.

For the no professional beekeepers (less than 150 colonies) we have to contact different beekeepers unions, propose them to work with CNDA for the COLOSS beemonitoring. For this point, we have to work on the method with the union to obtain data which represent a good spread geographically of those 2 beekeeper operation scale (0-50 and 51-150 colonies). We have to decide if we send an email to those beekeepers or we use another survey mode.

Brodschneider et al.: General comments on evaluated parameters and statistics of colony losses after two surveyed years in Austria

Robert Brodschneider and Karl Crailsheim*

Department of Zoology, Karl-Franzens-University Graz
email: Robert.Brodschneider@uni-graz.at
phone: 0043 3163805602

Austrian honey bee overwinter colony losses were surveyed for two consecutive years, and were 13.3% in 2007/2008 and 9.3% in 2008/2009 respectively (Brodschneider et al., 2010). Overwinter colony losses are mainly attributed to invertebrate pests, queen loss or starvation, and may be within a range that can easily be compensated.

Data of various regions or differentially treated subgroups are commonly compared using parameters such as average, median or total loss, but authors still use different ways to calculate or statistically compare these parameters. Previous attempts to collect and compare results from different countries (e.g. Crailsheim et al., 2009) demonstrated that there is no standardization of evaluated parameters and sample size also in a dedicated network like COLOSS so far.

We therefore would like to consult participants of the Amsterdam workshop in which ways total loss and 95% confidence intervals (95% CI) should be calculated. Austrian results suggest that overwinter losses follow a poisson distribution, what should be considered when calculating 95% CI (Paoli et al., 2002). Furthermore we suggest not only to compare total loss using χ^2 tests but also comparing median loss (where also individual experiences are incorporated) using Mann-Whitney statistics. In our case study (Brodschneider et al., 2010), comparisons of median losses in contrast to comparisons of total losses resulted in fewer statistical significances and can therefore be used as a more conservative statistic reducing type I errors.

The outcome of the Amsterdam workshop regarding the above questions could be published as a collectively used spreadsheet, 'good monitoring practice' in the bee book or a similar publication.

Brodschneider, Moosbeckhofer, Crailsheim (2010) Surveys as a tool to record winter losses of honey bee colonies: a two year case study in Austria and South Tyrol. *Journal of Apicultural Research* 49 (1): 23-30.

Crailsheim, Brodschneider, Neumann (2009) The COLOSS puzzle: filling in the gaps. In: *Proceedings of the 4th COLOSS Conference Prevention of honeybee Colony LOSSes*, 46-47.

Paoli, Haggard, Shah, (2002) Confidence intervals in public health. Office of Public Health Assessment; Utah Department of Health, USA. 8 pp.

Bruun Jensen: Chalkbrood – a neglected honey beedisease worth standardizing?

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Chalkbrood disease of honey bees has been known since the early 1900s. The causal organism of chalkbrood is the ascomycete fungus *Ascosphaera apis*. Larvae become infected upon ingestion of *A. apis* spores and infected larvae usually die within two days after having been sealed in their cells. First dead infected larvae have a fluffy appearance due to external fungal hyphae and later they desiccate, shrink and turn into hard white to dark mummies. Worker bees can detect chalkbrood mummies under cell caps, allowing them to uncap and remove mummies. By this hygienic behaviour many colonies can cure themselves of early spring disease outbreaks. It is possible to breed for chalkbrood resistance.

The clinical symptom of chalkbrood is easily recognized by the presence of mummies inside the brood cells, at the bottom and/or around the entrances of the hives. Chalkbrood is not a big ‘mystery’ for beekeepers and it is generally not regarded as a problem for beekeeping. Nevertheless, chalkbrood is a world wide disease and does probably affect the honey bee health more than we are aware of.

So far no international standard protocol for diagnostics of chalkbrood is available. I suggest that COLOSS should develop and provide standardized diagnostic techniques as well as guidelines on how to perform experimental infections from colony to individual level. The guidelines should also include recommendation of certain reference strains and quality control measures. Based on such standards and guidelines chalkbrood could be included in a COLOSS ring testing program.

Dietemann et al.: Standards for *Varroa destructor* diagnostics and research

Vincent Dietemann^{1,*}, Jochen Pflugfelder¹, Peter Neumann^{1,2}

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The ectoparasitic mite *Varroa destructor* is the major pest of apiculture and plays a central role for colony losses. However, despite several decades of *V. destructor* research and almost global pest diagnostics by several thousands of beekeepers, no commonly used and widely accepted standards exist. Therefore, *V. destructor* standards are urgently required at both apicultural and research levels to improve accuracy and to enable comparability of results. Here we suggest the most important issues:

- 1) Quantitative diagnostics to estimate colony infestation levels (natural mite fall, ant protection, etc.)
- 2) Number of phoretic mites and mites in brood (method, sample size, extrapolation to colony population, age of affected pupae, etc.)
- 3) Mite fertility and sex ratio
- 4) Qualitative diagnostics to estimate the damage to the colony (colony survival)
- 5) Standardised field experiments (controls, history of the treatment colonies, acaricide residues, mite infestation levels, cross infestation and re-infestation, etc.)
- 6) Standardised laboratory experiments with phoretic mites (cage type, humidity, temperature, feeding status and age of bees and mites)
- 7) Standardised laboratory experiments to investigate mite orientation, reproduction and mortality (bioassays and larval test, etc.)

Clearly, some efficient methods have been developed, but we need to determine, which is best suited to serve as a basis for a commonly accepted standard and whether it can/should be improved. Finally, there is an obvious need to perform ring tests in order to validate the standards. These issues will be further discussed in the working group 2 pests and pathogens.

Granato et al.: Quality assurance in biomolecular techniques applied to honey bee diseases diagnosis

**Anna Granato, Franco Mutinelli*

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According to the expertise matured in the field of molecular biology applied to the diagnosis of animal diseases, we could contribute to the BEE BOOK project considering the procedure required by World Animal Health Organization (OIE) for standardization and validation of diagnostic tests (OIE, 2008) applied to honey bee pest and pathogens. Validation is the evaluation of a process to determine its fitness for a particular use and includes assay optimisation and demonstration of performance characteristics. An assay validated for an infectious disease yields test results that identify the presence of a particular analyte and allows predictions to be made about the status of the test subjects. Assays applied to individuals or populations have many purposes, such as aiding in: documenting freedom from disease in a country or region, preventing spread of disease through trade, eradicating an infection from a region or country, confirming diagnosis of clinical cases, estimating infection prevalence to facilitate risk analysis, identifying infected animals toward implementation of control measures, classifying animals for herd health or immune status post-vaccination, as well as supporting the results obtained in research investigations. Validation and quality control of PCR methods used for the diagnosis of infectious diseases extends the principles outlined here to a direct method of infectious agent detection, the molecular diagnostic assays. Many factors obviously must be addressed before an assay can be considered to be “validated”. Therefore, a working definition of assay validation is offered as a context for the guidelines outlined by OIE. A validated assay consistently provides test results that identify animals as positive or negative for an analyte or process (e.g. antibody, antigen, or induration at skin test site) and, by inference, accurately predicts the infection and/or exposure status of animals with a predetermined degree of statistical certainty. Implicit in this definition is the requirement that the test method was properly developed, optimised, and standardised to achieve performance characteristics that are consistent with the purpose for which the assay is intended.

Higes et al.: Nosema disease: development of research standards

Mariano Higes, Aránzazu Meana, Raquel Martín-Hernández*

Centro Apícola Regional (CAR), Camino de San Martín s/n, 19180 Marchamalo, Spain.

During the workshop developed on October of 2009, about Nosema disease inside the COLOSS group, it was unanimously agreed the importance of standardize same aspects for researching in order to minimize or even eliminate the influence of variations because of the different ways to perform the same study work by the different research groups.

In this workshop two different working groups were launched to develop standard protocols: one for experimental infection (constituted by Marie Pierre Chauzat (Head), Violeta Santrac, Zachary Huang, Asli Özkirim, Raquel Martín-Hernández, Ulrike Hartmann, Claudia Dussabaut, Frederic Delbac and Antonio Nanetti) and a second one for sampling and diagnosis (formed by Antonio Nanetti, Zachary Huang, Giovanni Formato, Mariano Higes, Anna Gajda, Marie-Pierre Chauzat, Asli Özkirim and Martin Kamler). Both groups are currently working in order to elaborate protocols that will be provided to those researchers interested.

Kartsev et al.: Monitoring Bee Colony Losses in Russia

Yuri Batuev¹, Vladimir Kartsev^{2*}, Mikhail Berezin³

¹All Russia Ya.R. Kovalenko Research Institute for Veterinary Medicine, Moscow, Russia

^{2*}Lomonosov Moscow State University, Moscow, Russia

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Varroaosis is considered to be one of the most important causes of bee colony losses in Russia. This disease was first registered in Russia in 1964 (earlier than in other European countries) and in 1970 – 1980-th it spread all over the country. As a result the number of honeybee colonies fell by more than 2 million. The fall presumably continued till early 1990-th, then some growth in number occurred due to availability of effective anti-Varroa agents. In 2006 the All-Russian agricultural census revealed 3,728 million bee colonies.

According to the Centrum of Veterinary Medicine estimations, 50% mortality is concerned with varroaosis, 40% with *Nosema* disease and 10% with chalk brood, European and American foul brood, acarapidosis and others. No discrimination between *Nosema apis* and *N. ceranae* was carried out. However there is some indirect evidence that *N. ceranae* is present in Russia too.

Colony collapse disorder is registered in Russia as well. As early as in 1979 we observed collapse-like events in colonies infected by acute paralysis virus and *Varroa destructor*; the mites acting as virus vectors. More obvious collapse effect was caused by combined infection by deformed wing virus and *Varroa*. In our experiments, we were able to provoke collapse by stopping anti-Varroa treatments for one – two years. At present time, PCR investigations of bee viruses have started in Russia.

We questioned beekeepers in Moscow suburb; 10% of them had observed events resembling colony collapse disorder. Nevertheless during next summer beekeepers always restored the number of their colonies.

Kence et al.: Progress on the satellite experiment in Turkey within the framework of the honey bee Genotype-Environment Interactions Research across Europe

Meral Kence, Aykut Kence*

Middle East Technical University

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We have started a total of 90 colonies in three locations representing three different climates according to the Köppen-Geiger Climate Classification. In Ankara (Semi Arid Climate Zone) 10 colony from each of three races, *carnica* from Kırklareli (Thrace), *caucasica* from Rize (Black Sea), the local one is being *anatoliaca*. In Kırklareli (Mediterranean Climate Zone) 10 colony from each of three races, *caucasica* from Rize (Black Sea), *anatoliaca* from Ankara, and the local race, *carnica*.

In Rize (Humid Subtropical climate zone), 10 colonies from each of three races, *anatoliaca* from Ankara, *carnica* from Kırklareli, and the local race, *caucasica*. All colonies were treated with Perizin against Varroa at the beginning of November. Infestation levels were determined by counting the Varroa dropped on the sticky papers over the pull bottom tray under the hives. Treatment repeated twice with 2 week interval. Standardized methods will be applied for the management and evaluation of the colonies in terms of breeding, Varroa infestation levels, resistance against biotic and abiotic stressors, and vitality. The result of this experiment will test the hypothesis that local races are more resistant to Varroa in their own localities than those from different localities.

Kence/Giray: Monitoring colony losses in four different races in Turkey

Aykut Kence^{1}, Meral Kence¹, Tugrul Giray²*

¹Department of Biology, Middle East Technical University 06531 Ankara

²University of Puerto Rico, Natural Sciences, Department of Biology, San Juan PR 00936-8377

We plan to monitor the colony losses in four different races of honey bees in five different regions in Turkey in the cost project which started on November, 2009 for a period of three years. Our basic hypothesis is that 10 to 15 % of the the beekeepers in Turkey are sedentary beekeepers who have sufficiently isolated races which should show diferences in their resistance to diseases. This diversity should prove to be useful in fighting against new pathogens and siseases in the future. The study involves comparisons of different races for susceptibility to *Varroa*, *N. cerenae*, viruses, and chemical factors and surveys throughout the study area to determine the colony losses with collaboration with the beekeeper associations in different regions as well as with the central beekeepers association of Turkey. We are starting to carry out surveys by interviewing the 10% of the beekeepers in the study, and by sending the survey forms to the rest. This way we will be able to test whether the results of the surveys done directly by interviewing the beekeepers where we sample the apiary match with the surveys done by asking them to fill the survey form without visiting the apiary. We have prepared a different questionnaire from the earlier one for the survey in the next spring in the light of criticism to the earlier questionnaire, results of which has recently been published. The new questionnaire will be presented and reasons for the changes will be discussed. Before applying the survey, we hope to standardize it by comparing different questionnaires at the combined COLOSS workshop.to be held in Amsterdam.

Kristiansen: Some comments on COLOSS basic questionnaire 2009/2010 draft version 2.2

Preben Kristiansen

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- 1) At the moment I don't have any suggestions on questions to add to the questionnaire.
- 2) In my opinion the number of questions could be reduced, to keep it more basic. For example could questions 3 and 4 be left out; and questions 14 and 15 could be made into one: failing queens.

Instead of suggesting more questions to leave out or to change I suggest to look at the questionnaire proposed by Flemming Vejsnaes at the meeting in Montpellier, and to use that as base for the discussions
- 3) The plan in Sweden is to carry out a web-based survey in May 2010 as the one we did in 2009.

Kryger: Standards of genetic data storage.

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Methods of data processing for large scale projects will be discussed. There are various ways of obtaining genetic data from honey bees. I have dealt with microsatellite data from Denmark and other locations. Sampling took place over several years, from more than 10000 bees, and 26 loci were scored. That demands for effective data handling for the various software packages to be used for questions of population differentiation, assignment test, landscape genetic and paternity testing. I will describe the method used, including the GENALEX software. GENALEX allows for some data analysis of various data types, for both haploid and diploid data, and in addition for the export of data in a wide range of formats. The establishment of a standard in this area will allow for more effective exchange of data between labs. GENALEX is using EXCEL of the Office package, which has both advantages and drawbacks, some of which I will demonstrate.

Martín-Hernández et al.: Surveillance program on honeybee health in Spain

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A monitoring program on honeybee health is currently being developed in Spain. By means of an active and a passive surveillance, this program includes a system to monitorizing honeybee infectious and parasitic diseases to detect either the entry of new pathogens in Spain and / or the change in tendency (prevalence, seasonality...) of pathologies previously present.

On the other hand, the study of agro-toxics and chemotherapeutic in pollen and wax samples is also included in this program in order to provide data about the contamination levels of both structures from agricultural pesticides and from substances used by beekeepers to treat hives. This information could also be used as a measure of environmental contamination as has been recently proposed in other European countries.

The passive surveillance is carrying out with pathological samples received in CAR and the active survey to get samples around the national territory will be launched during the next month.

The development of new detection techniques for some contaminants and the development of quick detection method for pathogens will be also raise during this research project.

This project is funded by INIA- European Social Funds (RTA2008-00020-C02-01).

Meixner et. al. – Towards the development of international standard recommendations for breeding honey bees including characters of colony vitality

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Our experimental approach consists of a common experiment to reveal interactions between the genetic origin of the bees, the environment and pathogens. To this end, a total of 670 colonies from 17 different genetic origins have been set up in 16 locations across Europe, where each location contains the local strain of bees together with two “foreign” origins. The colonies have uniformly been set up in the summer of 2009 and will be managed and evaluated according to a protocol that has been agreed upon by all participants. Standard methods to assess the colony strength and the level of Varroa infestation within the experiment have been suggested and discussed. One of the aims of the experiment is to adapt and validate the methods in the respective local conditions of each participant. International breeding recommendations including characters related to colony vitality will be designed, consisting of both the theoretical framework and technical and methodological aspects.

The existing subspecies and ecotypes of honey bees in Europe represent an important resource for breeding of disease and stress resistant strains. Anecdotal evidence suggests that locally adapted strains of bees suffer less from colony losses than non native bees. Several methods are being used to characterize European honey bee populations and much information has been collected over the years. One of our aims is to create a published and accessible reference data base that will be of use to scientists and apiculturalist wishing to study and conserve European honey bee biodiversity.

Miranda et al.: COLOSS Bee Book: Standardization of molecular diagnosis and data analysis for honeybee virus research and surveys

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COLOSS is an organisation dedicated to co-ordinating honeybee research, surveying and information flow across Europe, with specific emphasis on factors relating to honeybee colony losses. This co-ordination requires standardisation of a range of procedures, so as to make the data from different countries and laboratories comparable. Our aim is to provide such standardisation for the identification and monitoring of the viruses of honeybees. There are two key components to this standardisation effort:

1. To provide practical protocols and guidelines for direct use.
2. To set the criteria for adding new protocols or improving existing ones without losing data compatibility, thereby allowing the standardisation to become dynamic, flexible, self-correcting and self-improving.

The scope of this effort is quite broad, covering not only (molecular) virus diagnosis, but also guidelines for questionnaires, surveys, experimentation, data transformation-analysis and reporting-publishing. We expect the final product to be a dynamic, on-line resource containing protocols, guidelines and data on all factors related to honeybee colony losses.

Moritz: Bees in Europe and the Decline Of Honeybee Colonies (BEE DOC)

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The BEE DOC comprises a network of eleven partners from honeybee pathology, chemistry, genetics and apicultural extension aiming to improve colony health of honeybees. The BEE DOC will empirically and experimentally fill knowledge gaps in honeybee pests and diseases, including the 'colony collapse disorder' and quantify the impact of interactions between parasites, pathogens and pesticides on honeybee mortality. Specifically BEE DOC will show for two model parasites (*Nosema* and *Varroa* mites), three model viruses (Deformed Wing Virus, Black Queen Cell Virus, Israel Acute Paralysis Virus) and two model pesticides (thiacloprid, τ -fluvalinate) how interactions affect individual bees and colonies in different European areas. The BEE DOC will use transcriptome analyses to explore host-pathogen-pesticide interactions and identify novel genes for disease resistance. The BEE DOC will specifically address sublethal and chronic exposure to pesticides and screen how apicultural practices affect colony health. The BEE DOC will develop novel diagnostic screening methods and develop sustainable concepts for disease prevention using novel treatments and selection tools for resistant stock. The BEE DOC will be linked to various national and international ongoing European, North- and South-American colony health monitoring and research programs, which will not only ensure pan-European but also global visibility and the transfer of results to apicultural practice in the world community of beekeepers.

Mutinelli: Implementation of COLOSS basic questionnaire 2009/2010 on winter losses in Italy

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After reviewing the COLOSS Basic Questionnaire on winter losses draft version 2.2, I agreed on the general approach and made some considerations as indicated below.

(1) I consider the questions listed in the Coloss Questionnaire exhaustive enough to cover the field of information we would like to collect about winter losses; the questionnaire is longer and more difficult (21 questions as a total) than that proposed for winter losses in 2008/09. This could raise complaints from beekeepers and more attention has to be paid to its filling in when administered to beekeepers.

(2) No further questions need to be added.

Concerning the variables listed, I considered variable n. 1, 5-6, 8-13, 15-16, as essential as stated in the document; I also considered essential variables n. 3, 17 and 19, which were classified as undecided; I did not consider relevant variables 2, 4, 7 and 14, which were also classified as undecided; concerning variable n. 18, the degree of sunshine in summer apiary could be useful to evaluate the degree of varroa transmission and colony losses (Otten, 2008), however, it seems difficult for beekeepers providing such an information, since they always try to choose the best location, also in terms of sun exposure, for their apiaries.

I suggest not to consider colonies bought from third parties in order to repopulate an apiary (variable n. 16).

Indicators given in the document are clear and easily understood.

(3) It is our intention to implement the COLOSS basic questionnaire 2009/2010 on winter losses in Italy mainly in cooperation with beekeeping associations and to work in order to create the conditions for a follow up in the coming years.

Nanetti et al.: A forthcoming workshop on standardisation of honey bee rearing in hoarding cages

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Notwithstanding the experimental setup of *in vivo* trials conducted in the laboratory and in the field by different researchers may be relatively constant, the practical implementation may badly diverge according to the current individual experience and knowledge.

For instance, the authors belong to the same Institute and mainly research in different areas. However, while conducting independent experiments on similar subjects, they often make different choices about critical experimental aspects, like honey bee rearing conditions (hoarding cage type, temperature, quality and amount of food provided etc), infection/infestation procedure (storage of the pathologic material, method of inoculation, honey bee age etc.) and data recording (post-infection/post-infestation age, examined organs, behavioural observations, longevity assessment etc.).

The above diversity may be even more pronounced in case of researchers working in different countries.

Even though the above differences are not sufficient to invalidate some of the trials, obvious problems show up when attempts to compare the inter-experiment results are made. This points out that efforts to standardise the working procedures are badly needed.

Past successful attempts in this direction had already been made, like the efforts of the European Group for the Integrated Varroa Control, that resulted in the “Technical guidelines for the evaluation of treatments for control of varroa mites in honey bee colonies” being compiled.

It is strongly desirable that similar efforts are extended to other research areas, starting from the rearing methods of the honey bees in laboratory conditions, that are the common background to perform experiments in many other areas.

To start covering the above aspects, the organisation of a CoLoss workshop on the rearing methods in the hoarding cages is in the pipeline. The meeting will be held by the CRA-API of Bologna.

Nguyen et al.: A Survey of Honey Bee Colony Losses in Belgium, fall/spring 2008/2009

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According to Belgian beekeepers, the apicultural season 2008 – 2009 was relatively good. It was probably because the honey production was high because contrary to what had been said honey bee mortality rate in Belgium was high. Indeed, the first questionnaire (Level 1) proposed by the Working Group 1 was tested in some countries of the COLOSS network and the data collected in Belgium have highlighted a mortality rate of $19.44\% \pm 2.06$ (average mortality rate per apiary \pm SE). A total of 2220 beekeepers were officially registered in Belgium and 174 beekeepers (~ 8%) were randomly selected and were visited. Belgium is divided into ten provinces and the mortality rate in these provinces ranged between $9.259\% \pm 9.064$ (average mortality rate \pm SE) and $29.644\% \pm 5.333$ (average mortality rate \pm SE) respectively in the provinces of Luxembourg and East Flanders. These results show the need to collect reliable scientific data to get a clear view of the honey bee health status in EU and worldwide. The next steps are to compare the results obtained in countries that have tested the basic questionnaire, to extend his use to other countries and to test the level 2 questionnaire.

Orozumbekov et al.: Insect-Plant Interactions: Honey bee management in Kyrgyzstan, Central Asia

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Pollination is the most important contribution bees make to human economies in Kyrgyzstan. Land use intensity and isolation of agriculture from natural habitats is causing declines in the availability of pollinators (Klein et al. 2007, Ricketts et al. 2008). After the collapse of the Soviet Union, land use intensity by local human populations in Kyrgyzstan increased with high magnitude. Currently, there are about 180 thousand bee colonies producing up to 2.5 thousand tons of honey, which accounts for only 65.9% of the forecasted level of honey production (Centre of beekeeper, Bishkek 2007). Changes agriculture management and landscape scales have affected pollinator communities in various habitats. The increase in utilization pressure on the limited natural resources results in unsustainable land use, which again has negative repercussions on socio-economic conditions. Understanding the role of bee diversity and abundance for fruit tree pollination and the bee's habitat requirements and use of different habitat types will help to establish knowledge of how pollinators can be promoted, restored or managed in Kyrgyzstan. Studying the colony growths and health (*Varroa jacobsoni*, *Acaripis woodi*, *Pyemotes nerfsi*, *Acaris ciro*, *Tyrophagus putrescentiae*, *Glycyphagus domesticus*) and management of honey bees as well as the colony-specific honey yield in the adjacent agriculture landscapes and isolated natural habitats may indicate that honey bees need flower resources for optimal development and honey production.

Keyword: pollination ecology, bee's diseases, land use, bee diversity, management

Özkırım: The First Results of COLOSS Questionnaire Application in Turkey

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According to the action of WG1 in Coloss group, the previous version of Coloss questionnaire level 1 was applied to Turkish Beekeepers in Rize as a pilot study. Rize Beekeepers' Association has 1837 members and all of them joined this programme in 2008-2009 season. Different methods were used for collecting results: Paper work, computer data but not using web page and interviewing with beekeepers by face to face. All results are summarized in Tables. Except some small problems, the big problem about the application of the questionnaire was migratory beekeeping in Turkey. It was very difficult to determine colonies location, beekeeper's address, the background of colonies etc. Especially for Professional beekeepers who has 350-500 colonies. In conclusion, it is thought that the Coloss questionnaire level 1 is applicable among the Turkish Beekeepers but it still needs to be covered to final version for the highest productive results.

Pernal: Honey Bee Losses and Monitoring in Canada

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Canada is a large country with approximately 600,000 colonies of honey bees, across nine of its ten provinces. The industry contributes approximately 2 billion dollars per year to the Canadian agricultural sector through the sales of honey, hive products and through pollination services. Compared with Europe, beekeeping operations are large with commercial beekeepers managing an average of 2,000 colonies. Responsibilities for bee extension, regulatory and health services are administered by provincial governments. *Varroa destructor* was introduced to Canada in 1989, and since the development of acaricide resistance to fluvalinate, colony winter losses have been annually surveyed by Provincial Apiarists since 2002-03. Colony winter mortality varied considerably in different regions of the country over years, however normal variation was found to range between 5 to 15%. Following the winter of 2006-07, losses in Canada more than doubled with the national average being 36% for that year. Losses in 2007-08 and 2008-09 continued to be high at 35% and 34% respectively. Based on data from surveys and targeted analysis of samples from beekeeping operations that were most severely affected, several factors became evident. First, similar to Colony Collapse Disorder (CCD) in the U.S., no single cause appeared to be responsible for this dramatic increase in mortality. Secondly, symptoms of CCD, as defined by U.S. researchers, were not readily apparent in Canada. Instead, losses were principally observed as dead or weakened colonies in the early spring of the year. Thirdly, *Nosema ceranae* was detected in every region in Canada however, unlike warmer latitudes, its distribution was discontinuous and similar in abundance to *Nosema apis*. Increased rates of winter colony losses in Canada have been attributed to the interaction of the following factors: 1) Inadequate control of *V. destructor*; 2) Lack of *Nosema* detection and management; 3) Unusual weather that affected forage availability, changed patterns of bee and mite population growth, prolonged winter confinement and created cool, wet spring conditions; 4) Inadequate fall feeding; 5) Higher rates of queen failure. Though these and other interacting stressors affected colony survival, the direct and indirect effects associated with acaricide resistance and the failure to control *V. destructor* mites are believed to be the most important factors related to colony loss in Canada over the last three winters. National monitoring of colony losses in Canada based on collation of data from provincial agencies has highlighted the need to harmonize data collection across the country so that accurate and meaningful comparisons of losses and their associated causes can be made. Though the majority of colonies in the country have been captured in annual loss reporting, the need to standardize definitions between regions was identified. These concepts included the timing of losses, type of wintering management used, measurement of pathogen levels and definition of commercially unproductive colonies. Furthermore, implementation of standardized surveillance across regions would allow meaningful epidemiological modelling to take place and causalities to be better explored. Harmonization of interprovincial surveys within Canada is proposed for 2010-11.

Santrac: Data collection based on the basic COLOSS question for 2010

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Questioner proposed for 2010, in the form that Romee created, seems me very well oriented and can be a new good tool for receiving meritorious data. The collected data will enable future epidemiological analysis on a large geographic scale and different beekeeping management.

Can be only one dilemma that from our experience from 2009 some beekeepers are not too much academic auditorium and maybe 21 questions will be to demanding from them. They were familiar with much simplest way of questioning.

We hope that Final Initiative of COLOSS Q 2010 will bring together representative survey data in COLOSS for the entire international databank analysis.

We will tray to do our best from BIH which will be challenge also.

New 2010 official questioner will be processed to local internet site, newspaper information, special beekeeping magazine, and general assembly of beekeeping association and promoted on other media as TV, radio. We will tray to find financial resources to bay or create our own software program to establish data basis.

Soroker et al.: Monitoring colony losses in Israel

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The number of bee hives in Israel is estimated to be 100,000, which are operated by 450 beekeepers, with annual honey production of about 3200 metric tones (value of 12 million USD) and 60,000 cycles of pollination services to different crops, which produce an additional income of 250 million USD . Apiary migration is common following the wild or crop blossom and bee wintering sites. The common bee lines are *Apis mellifera ligustica*, *Apis mellifera caucasica* and Buckfast.

A colony loss monitoring project was launched in 2008 aiming to characterize the distribution and extent of the losses, and to evaluate the correlation of loss with, pesticide uses, presence of bee pathogens, pests and management practices. One of the main approaches of the project was to implement a survey using a questionnaire. A specific, detailed questionnaire was developed. The survey was conducted twice, in September 2008 and during September-December 2009 using mail, phone and electronic mail. It was distributed among the 100 major registered growers. In addition about 100 hives in ten sites were monitored and sampled for presence of pathogens and pest along the year 2009.

In 2008 out of the responding beekeepers, 38% indicated (over 20%) losses and 9% sever losses above 40%. The survey of 2009 indicates that overall the majority of beekeepers suffered losses below 20%. Hive monitoring for the presence of pathogens revealed that although most hives appeared healthy about 95% of them carried pathogens. The most common pathogens were *Nosema ceranae*, Black Queen cell virus, Deformed wing virus and Israeli acute paralysis virus. Multiple pathogen infections were common as well. Presently, the study is being extended to gain a deeper insight into the significance of these findings to colony survival.

Steen: Aspects of sampling honeybee colonies

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For honey bee studies, focused on physiology, diagnosis of diseases or for bioindication purposes, bees are sampled from the colony. Reliable samples are necessary for reproducible biological research. The number of bees and the sampling technique for a representative sample depends on number of sick or parasitized bees, what age cohort of bees are parasitized and distribution of age cohort in a colony. Considerations on these aspects will be presented and discussed.

Topolska et al.: The implementation of the COLOSS questionnaire in Poland

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In Poland a survey on colony losses with the use of the COLOSS questionnaire was already carried out in 2009. During this survey we found that many beekeepers were disappointed that the questionnaire did not include questions on summer bee mortality and colony losses. This discouraged some of them from participation in the survey. Also the EFSA report notes the lack of such information from most EU countries. Besides, there could be a connection between summer bee mortality (or colony losses) and winter losses. We think that it is time to introduce such questions (one or two) to the questionnaire (as critical). In our country it would also be worthwhile to give beekeepers the possibility of completing the questionnaire anonymously.

During the survey performed in 2009 beekeepers' participation was unsatisfactory. An especially small number of beekeepers filled in the questionnaire using the monitoring web page (www.beemonitoring.org). Nevertheless, this year we would like to continue (if possible) this form of survey, though our main efforts will concentrate on the survey using the COLOSS questionnaire to be published in the most popular Polish beekeeping journal "Pszczelarstwo" and by questionnaires distributed during beekeepers meetings. We will also send questionnaires to regional beekeeping associations. We plan to continue the survey in the following years.

Van der Zee: Development and Implementation of the COLOSS questionnaire on overwintering Colony Losses in Europe and results for 2008-09.

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The COLOSS Cost action program expresses the need to achieve “reliable and internationally standardized data on colony losses, which can be compared between countries and years” (Cost Action FA0803 Proposal 2008). At the Zagreb conference (March 2009) a draft of the first COLOSS basic questionnaire was presented. As a result of discussions during the WG1 meeting an improved version was developed. This version was finalized in March 2009 and sent to the COLOSS network. Some European countries were able to implement the questionnaire in time and collect overwintering data 2008-09. An analysis of these data, complemented with data extracted from similar questionnaires from other countries will be presented during workshop plenary session.

A draft for the second edition of the standardized questionnaire has been developed and presented to the COLOSS network in September 2009. New elements, proposed during the Amsterdam COLOSS workshop on Monitoring in May 2009 have been incorporated such as: (1) the value of ‘queen problems’, since these might be related to colony losses, (2) the value of lost colonies with dead bees found at the front of the hive or within the beeyard, (3) more distinction between pre winter losses and winter losses, (4) apiary characteristics and (5) basic information about migration.

Furthermore the concepts of honey production and pollination services during the foraging season have been worked-out to obtain better insight in the production dynamics over the years.

The draft of the second edition of the COLOSS questionnaire will be discussed in the monitoring sessions to establish a final version to obtain data on overwintering colony losses 2009-10.

vanEngelsdorp and Pettis: Overwintering colony losses in the US

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Honey bee colonies over wintering in the USA have experienced high mortality rates (29% or more) for 3 consecutive years. By discussing methods for obtaining and presenting loss data we will compare US loss data with data from other nations, and in so doing propose a unified approach to loss data presentation. Further we will explore the plethora of theories proposed to explain the causes of elevated losses. Fairly consistently beekeepers have self identified queen failure, starvation, and poor climatic conditions as the chief reasons for their losses in the US. By exploring the evidence that supports and/or refutes these claims, we will explore and propose methods for quantifying and assessing risk.

Vejsnæs: Comments to the Basic questionnaire 2009/10 version 2.2

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It is important that we keep to our own definitions that are defined in WG1 (Nguyen B.K et al. Coloss Working Group 1: Monitoring and Diagnosis (accepted November 2009, Journal of Apicultural Research). We work with questionnaires in 4 levels. Here we define it as Bee monitoring questionnaire level 1. Is this the same as the Basic questionnaire?

Collecting information on winter losses from beekeepers is a challenge. The beekeepers have to see the positive use of giving information and using time on it. Therefore the questionnaire has to be simple and fast to fill out. We have to stick to the “keep it simple” strategy. We should even go further and “keep it even more simpler”. In the new version of the questionnaire we tend to be too academic from the beekeepers point of view. Therefore the motivation to give reliable answers/data might become too low.

“Bee monitoring questionnaire level one” should not deal on apiary level. The “basic” questionnaire should only deal with the average situation. If there are major problems or special research needs, it may be relevant to go further on to single apiaries which are the “Bee monitoring questionnaire level 2”. Do we deal with larger beekeeping operations – having colonies spread over larger areas – it should be possible for these beekeepers to fill out several questionnaires – representing several areas – but still not on apiary level.

Beekeeper information

Too many information are asked. From Denmark we will only supply the Coloss database with information regarding the beekeepers “country code” and “zip-code” due to promised anonymity of the beekeepers taking part in the Danish questionnaire.

Colonies Lost: Before and during winter 2009/2010

Very relevant is question no. 6: “How many production colonies were wintered in 2009” and also very relevant is question no. 9: “How many production colonies were lost in total during winter 2009/2010”. Question 5, 7 and 8 are getting too complicated and should just be reduced to the original question: “How many colonies lost during late summer/fall 2009”. The term “Wintering” is well understood by beekeepers (Pers. Com. Romée van der Zee), but wintering happens at very different times of the year. In Denmark starting wintering ranges from July to November. That means that beekeepers starting the wintering very early are not able to define colony losses before or after wintering.

Colonies lost: Symptoms

Questions are getting very complicated (10-13). It has to be discussed if this is of relevance in a level 1 questionnaire. Question no. 12 might be the only really relevant one.

Colonies living after winter

Question 14-17 are all very relevant and do take potential queen problems into account. These seem to be an increasing problem worldwide. Question 17: “How many productive colonies did you have in spring 2010” is extremely important. I suggest that this question is moved up in the front of the questionnaire together with questions about “Colonies wintered”.

Apiary Characteristics

Relevant questions but belongs in the level 2 questionnaire.

General comments.

A few comments to the word “production unit” and “pollination unit”. Denmark is the world largest clover seed producer. The pollination need is in the end of June. The official contract between seed producers and beekeepers define a pollination unit as having one egg laying queen and 10 frames of bees. This means that overwintered nucs do build up to satisfying pollination units when clover is blooming. Does this give conflict with question 6: “How many production colonies were wintered in 2009?”

I better like the word: “productive”, which will include wintered nucs on 3 frames. Mary Coffey, Ireland has earlier suggested the word: “Potential productive colonies”. The “Agricultural Pollination Rate 2009” is a calculation for the supply of pollination services that the beekeeping industry does supply to agriculture. This is “active pollination”. In Denmark we have a very high degree of “passive pollination” due to a high density of non-migratory beekeeping in agricultural areas. The beekeeping-pollination services in Denmark are much higher than the “agricultural pollination rate”.

Additional questions

From the questionnaire (find developing-questions-montpellier-2009-flemming vejsnaes.pdf on www.coloss.org) presented to WG1 at the Montpellier meeting there are plenty of suggestions for additional questions that are relevant for Bee Monitoring questionnaire level 1 and 2.

Age?, Beekeeper age?, How many apiaries do you have ?, How many people are running the beekeeping operation?, Regular comb replacement?, Type of winterfeed?, Food/pollen supply during the season?, Replacement of queens?, Origin of queens?, Swarming?, Population development?, Varroa-treatment – how, when.....?, Monitoring varroa?, General diseases level?

Bee monitoring questionnaire level 1 in Denmark 2010.

We will continue to use the Coloss Bee monitoring questionnaire level 1 as we did in 2009. We will do it online with the questionnaire internet system www.trictrac.com. We continue to increase the awareness of the beekeepers to supply us with data. We are well above the 5 % level, but we are aiming for an even higher percentage.

Wei et al.: Monitoring honeybee losses in China

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2. Apiculture Society of China, Beijing China
A monitoring net work of honeybee loss was established in 2008 by the Apiculture Society of China and the bee institute of Chinese Academy of Agricultural Sciences.

276 beekeepers from 4 provinces (Jilin, Shanxi, Jiangshu and Guangdong) with total of 12,371 *Apis mellifera* colonies and 29,886 *Apis cerana* colonies were questioned. In general, the colony losses of *Apis mellifera* colonies in Jilin province during the 2008/2009 winter was 8%, and in Shanxi province, it was around 2%, about 5% in Jiangshu province. 23 out of 104 beekeepers in Guangdong province, who has *Apis cerana* colonies reported there was a big loss of honeybee in 2009 spring, 37% of beekeepers found Sacbrood symptom in their *cerana* colonies.

Wilkins: COLOSS Basic Questionnaire 2010: Honey bee monitoring and surveys in England and Wales

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In England and Wales a statistically based apiary and colony survey is underway. This is a two year project, now moving to its second year of sample collection. Samples are being taken from up to 25000 colonies in 5000 apiary sites. These samples are being analysed for a whole range of honey bee pests and diseases using molecular diagnostics. The evidence gathered and a robust analysis of the risks will be used to direct the future bee health plan in England and Wales. In addition to this in 2009 the NBU launched an extensive bee husbandry survey to obtain information on current honey bee husbandry practices. The information from this survey is being gathered by means of a questionnaire, available both on-line via BeeBase or hard copies circulated to beekeepers through the bee health inspection service at association meetings and training events. It is intended to gather this data regularly and use it monitor trends in UK beekeeping and to assist with beekeeper training. This is the most comprehensive survey of beekeeping practices ever completed in the UK. Although there is no direct funding available to feed into the CoLoss project the work of the group has been publicised via articles in UK beekeeping journals and press. Once the basic CoLoss questionnaire has been finalised the basic level questions will be included in the next UK husbandry survey to allow compatibility and comparison of data collected - although the survey will be anonymous in the UK. Beekeepers will also be encouraged to take part in the CoLoss Basic questionnaire. Information collected on the current status of bees and beekeeping in England and Wales through the bee health programme will be reported back to the CoLoss working group.

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