

## SCIENTIFIC REPORT

### WG1:

1) Working group 1 finalized a standardized questionnaire to collect comparable data on honeybee mortality 2009-10. This questionnaire is adapted and will be implemented in 2010 by most of Europe, Russia, USA, Canada, China, Kyrgyzstan and Chile. This is the first global approach in a concerted action and fulfils one of the major aims of COLOSS.

2) The working group was sensitive in recognizing and addressing biases in survey data. Further development of standardized methods to distribute the questionnaire ([www.beemonitoring.com](http://www.beemonitoring.com)) will reduce these biases and enhance comparability.

3) The working group reached provisional consensus on the use of statistical methods to calculate and compare bee mortality. The Chi Square test with Yates correction is applicable to detect differences in mortality in big data sets, with the Fisher Proportional Exact test being applicable to detect differences in small data sets. To compare differences in mortality between beekeepers the Mann-Whitney test can be used, after a proper classification of the data set (for example, removal of bias like the effect of beekeepers with small numbers of colonies). This item is considered to be reviewed by statistical experts.

### WG4:

#### A) what must be standardised?

1) Standard methods to assess the status of colonies, including their health condition will be developed. This includes parameters of colony strength, brood area and food status, and especially the level of infestation with *Varroa destructor* and other relevant diseases. Methods will be adapted and validated according to regional conditions of climate and environment in Europe.

2) International breeding recommendations including characters related to colony vitality, behavioural traits and other quality characteristics (e.g. such as the queen quality characteristics) will be designed, consisting of both the theoretical framework and technical and methodological aspects.

3) Characterization of breeding populations and ecotypes based on a) discriminating tools for inter and intra population differences (e.g. molecular tools)

An accessible reference data base will be created that will be of use to scientists and apiculturists for the study and conservation of European honey bee biodiversity.

#### B) Who will actually do it?

Open COLOSS call for authorships & on invitation. A discussion has been initiated for the members who offered to serve as candidates for the BBB editorial board

### WG 2 & 3 and general BEE BOOK conclusions:

#### A) what must be standardised?

Open frame work, first list here, later online additions with certain amount of flexibility (e.g PCR protocols for viruses)

Standards (grouped by organisms):

1. Qualitative detection
2. Quantitative detection
3. Bioassays
4. Quality control (validation, ring tests, etc. )
5. Host

#### B) Who will actually do it?

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Viruses: de Miranda, Ribière, Chejanovsky et al.

Nosema: Chauzat et al., Nanetti et al., Higes et al.

Varroa: Dietemann, Pflugfelder et al.

AFB: de Graaf et al.

EFB: Forsgren, Santrac et al.

Fungi: Jensen et al.

Pesticides: Medrzycki et al.

The Endosymbionts of Honeybees: Ozkirim et al., Olofsson et al

### **C) how to do it?**

1. Multi-authored (number potentially unlimited) online tools and papers on [www.coloss.org](http://www.coloss.org)
2. Later multiple-authored annual review papers for JAR on global honeybee health (monitoring results) and special issues of JAR (~12 to 18-months-window) g. on GAP (Good Apicultural Practice), GLP, SOP (Standard Operational Procedure), statistics and sampling, experimental design and organism groups (e.g. Nosema, host, Varroa, viruses). The discussion remained open on questions such as the final format, copyright issues and cite ability and indexing. Negotiations are currently conducted with IBRA on the special issues.
3. <http://www.coloss.org/> umbrella = will be the ultimate BEE BOOK
5. Copy & paste from Red Book may help and will be inquired
6. Links to related websites will be installed (IBRA, EurBee, Apimondia, etc.)
4. OIE standards will form the basis for detection (avoid conflict between OIE and COLOSS & instead foster mutual enrichment; OIE authors will be invited to contribute)
7. Video conferences for sub grouping: Skype accounts maybe helpful for 3-way conferencing, as well as the Italian set-up for multi-user webinars. A respective request will be sent out using existing e-mail lists.
8. Downstream issues:
  - a. decentralization of tasks: BBB (BEE BOOK BOARD) editorial board, multiple authors
  - b. quality control (assay failure rates, user defaults):
    - Performance indicator: online feed back using a specific format
    - Any additions must be approved by BBB member, who will use peer-review system to evaluate contributions
    - Approved contributions will be published online
    - BEE BOOK changes must be traceable
    - Limited number of people BEE BOOK BOARD (20) rotation system two years period but overlap with focus on quality control and providing template (instructions for authors)
    - Online BEE BOOK citations must be highly specific
  - c. cross-platform implementation: will require coordination by BBB e.g. with OIE
  - d. data harmonization and compatibility: performance indicators
  - e. intellectual property rights: case dependent, institute awareness
  - f. financial concerns and commercial involvement: case dependent