

**Location:** Webconference

**Attendees:**

- Working Group Members:  
James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:  
Hans-Hermann Thulke
- European Commission and/or Member States representatives:
- EFSA:  
MESE : Yannick Spill  
PLANTS: Agnes Rortais (chair), Csaba Szentes
- Others:

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting and the preparatory meetings listed under agenda item "Preparatory meetings". No Conflicts of Interest related to the issues discussed in these meetings have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 23<sup>rd</sup> Working Group meeting held on 25 February 2025, via web-conference**

The Minutes of the 23<sup>rd</sup> Working Group Meeting were agreed by written procedure on 04 March 2025.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Post model development validation<sup>4</sup>

This meeting was the opportunity to finalise the revision of the technical report on the evaluation of the model *ApisRAM.03*. This was also the last WG meeting and therefore marking its closure.

## VI. Next meeting

Not applicable.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:  
Hans-Hermann Thulke
- European Commission and/or Member States representatives:
- EFSA:  
MESE : Yannick Spill  
PLANTS: Agnes Rortais (chair)
- Others:

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting and the preparatory meetings listed under agenda item "Preparatory meetings". No Conflicts of Interest related to the issues discussed in these meetings have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 22<sup>nd</sup> Working Group meeting held on 07 February 2025, via web-conference**

The Minutes of the 22<sup>nd</sup> Working Group Meeting were agreed by written procedure on 14 February 2025.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **Post model development validation<sup>4</sup>**

This meeting was the opportunity to clarify with the ISA expert some sections of the report, both on the structure and content, for further revisions by the WG members. A consolidated version of the report will be circulated to the Experts for further amendments to be done by the next WG meeting.

## VI. Next meetings

The next WG meeting will be held on 20 March 2025.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:
- European Commission and/or Member States representatives:
- EFSA:  
MESE : Yannick Spill  
PLANTS: Agnes Rortais (chair), Csaba Szentos
- Others:

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting and the preparatory meetings listed under agenda item "Preparatory meetings". No Conflicts of Interest related to the issues discussed in these meetings have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 21<sup>st</sup> Working Group meeting held on 09 January 2025, via web-conference**

The Minutes of the 21<sup>st</sup> Working Group Meeting were agreed by written procedure on 16 January 2025.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **Post model development validation<sup>4</sup>**

This meeting was the opportunity for the WG members to review the structure and content of the draft EFSA technical report which was prepared based on the outcome of the evaluation of ApisRAM. Experts were assigned sections of the report to be reviewed or drafted and the conclusion and recommendation sections were thoroughly discussed and revised during the meeting.

## VI. Next meetings

The next WG meeting will be held on 25 February 2025.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:
- European Commission and/or Member States representatives:  
Sofie Hofkens
- EFSA:  
MESE : Yannick Spill  
PLANTS: Agnes Rortais (chair), Csaba Szentos
- Others:  
Observers: Xiaodong Duan participated as contractor (ref., GP/EFSA/SCER/2021/02), Martin Lange and Hans-Hermann Thulke participated as ISA (Individual Scientific Advisor) for agenda items 3-4, via web conference.

## I. Welcome and apologies for absence

The Chair welcomed the participants.

## II. Adoption of agenda

The agenda was adopted without changes.

## III. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting and the preparatory meetings listed under agenda item "Preparatory meeting/s". No Conflicts of Interest related to the issues discussed in these meetings have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## IV. Agreement of the minutes of the 20<sup>th</sup> Working Group meeting held on 25 November 2024, via web-conference

The Minutes of the 20<sup>th</sup> Working Group Meeting were agreed by written procedure on 4 December 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## **V. Scientific topic for discussion**

### **Post model development validation<sup>4</sup>**

This meeting was the opportunity for the ISA experts to present the outcome of the sensitivity and uncertainty analyses and to highlight the lack of reliable set of simulation data accessible for analysis to complete the analysis in due time. The software developer took action and will provide new figures, but time-wise, the ISA experts will not have the capacity to re-run analyses. Therefore and accordingly, the WG discussed the content of the second part of the report related to these analyses. The next WG meeting will be the opportunity to finalise this second part and the conclusions and recommendations for future analyses/evaluation of the model.

## **VI. Next meetings**

The next WG meeting will be held on 7 February 2025.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>



**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:
- European Commission and/or Member States representatives:  
Sofie Hofkens
- EFSA:  
○ MESE : Yannick Spill  
PLANTS: Agnes Rortais (chair), Csaba Szentos
- Others:  
Observers: Xiaodong Duan, Hans-Hermann Thulke

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 20<sup>th</sup> Working Group meeting held on 25 November 2024, via web-conference**

The Minutes of the 20<sup>th</sup> Working Group Meeting were agreed by written procedure on 4 December 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Post model development validation<sup>4</sup>

The ISA expert presented to the WG the preliminary outcomes of the sensitivity analysis conducted on the honey bee population (adult and brood: egg, larvae pupae) for the baseline scenario with the agreed protocols (in terms of number of sites, years, repetitions). The results obtained and variability was thoroughly discussed, in particular, the extreme generation cycle with strict up-and-down between zero and maximum egg numbers. The patterns are created in the model by the fast saturation of egg cells by the egg laying capacity of the queen and the necessary waiting period of egg development. Further expert knowledge input is sought to check whether such cyclic dynamics are evident from field practice. It was acknowledged that the 2<sup>nd</sup> year of the 3<sup>rd</sup> year simulations should be selected as the starting point for the assessment (the 1<sup>st</sup> year is used for model burn-in). Results on pollen/beebread and nectar/honey production showed a good stability against hive location in the landscape with expected level of response to high vs low natural flower resource landscape scenarios. However, with the medium exposure scenarios (drift from non-flowering crop with seasonal pesticide treatment protocol of winter rape) chosen to test the model response, pollen and nectar output became highly sensitive to hive location (i.e. nearness to the treated crop) and increasing with shrinking natural resources in the landscape. Simulation results of the adult population under varying flower resources and pesticide exposure were presented. Finally, results on cumulative pesticide burden in individual bees were presented over the days of one year by colour-coding the frequency of doses per day among the population and varied by different exposure routes (drift-only when crop is non-flowering vs, drift-and-direct if crop is flowering). The visualisation mode was further commented by the WG for improvement.

## VI. Next meetings

The next WG meetings will be held on 09 January 2025.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Martin Lange, Hans-Hermann Thulke & Liyan Xie
- European Commission and/or Member States representatives:
- EFSA:  
PLANTS: Agnes Rortais (chair)
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Sofie Hofkens.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 18<sup>th</sup> Working Group meeting held on 16 September 2024, via web-conference**

The Minutes of the 18<sup>th</sup> Working Group Meeting were agreed by written procedure on 26 September 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

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<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Post model development validation<sup>4</sup>

The WG went through the draft technical report (TR) prepared by the ISA experts and reviewed the comments made by the WG members and EFSA. In particular, the WG discussed the outcome of Part I of the evaluation on the alignment of the conceptual model with the formal and computer model and the decisions made for Part II of the evaluation focused on the sensitivity and uncertainty analyses on specific endpoints. For the Part I, it was acknowledged that the latest version (deliverable 4, as specified in minutes WG17) used by the ISA experts to finalise their assessment should be noted in the report. A discussion on the last steps of the model cycle regarding i) the need to have, prior to actual use in risk assessment, the regulatory model evaluated for relevance to the specific protection goals (SPGs) and ii) on the need for feedback from risk assessors with possible recommendations for model improvement was held. It was proposed that i) is addressed in a specific section of the TR based on the available information on the SPG definition for honey bees. As for the ii), it should be clarified in the TR that it will not be covered under this work, but in a next step when the model is in production mode and can be tested by users. The WG agreed on the conclusions made on Part I and the ISA acknowledged that this is still under work progress. Regarding part II, the WG re-discussed the methodologies, in particular the definition of the scenarios to be used for the sensitivity/uncertainty analyses and it was agreed to have a fourth scenario with "crop flowering and no pesticide". For endpoints, it was clarified by Aarhus that sublethal effect is not included in the model in terms of behavioural impairment (e.g. foraging cognitive impairment resulting in inefficient flights/foraging), but in terms of mortality (a forager unable to return to the hive because of cognitive impairment will ultimately die). It was highlighted that an assessment of the robustness of the modelling of the transfer of pesticides between matrices would increase trust in the model. The ISA experts agreed to test this part of the model by assessing the impacts from varying pesticides exposure levels on internal exposure and effects. Regarding the scenarios with exposure to biological agents, Aarhus will send to the ISA experts the values which were defined as starting conditions on pest prevalence and viral infection levels. These values will be included for the assessment of the vitality index.

## VI. Next meetings

The next WG meetings will be held on 25 November 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Martin Lange, Hans-Hermann Thulke & Liyan Xie
- European Commission and/or Member States representatives:  
Sofie Hofkens
- EFSA:  
PLANTS: Agnes Rortais (chair), Csaba Szentos
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 17<sup>th</sup> Working Group meeting held on 27 June 2024, via web-conference**

The Minutes of the 17<sup>th</sup> Working Group Meeting were agreed by written procedure on 04 July 2024.

## **V. Scientific topic for discussion**

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



### **Post model development validation<sup>4</sup>**

The WG went through a thorough discussion on the selection of environmental scenarios for the testing of the model *ApisRAM* performance. The ALMaSS landscapes on which *ApisRAM* is run generates maps of 10 km X 10 km. Since the location (and environmental context) of the honey bee colony to be simulated is key, it was proposed in these landscapes to draw a grid of 100 cells (1 km x 1 km) and locate the colonies in the centre of each of these cells. In total, the WG proposed to run test simulations on 100 colony locations X 10 replicates X 3 years = 3000 runs. It was also suggested to repeat these simulations 3 times (representing a 9-years period) to include more weather conditions since each year's weather is different for these 9-years period. Then, it was suggested to define 2 types of landscapes (low *versus* high resource availability), based on the ratio of natural habitat *versus* farm habitats. The low resource availability landscape was defined by a 21.47% natural habitat and the high resource availability landscape was defined by a 41.3% natural habitat. To test *ApisRAM*, it was proposed to vary the flower resource availability in both landscapes (reducing by half and increasing by 2 times the flower resource generated by the natural habitat) and to vary the landscape structure (i.e. reducing the amount of natural habitat with flower resources from 21.47% to 9.99% in the first landscape and from 41.3% to 19.9975% in the second landscape). In addition, it was suggested that the farm habitat in both landscape types (i.e. 73.17% and 52% for the first and second landscapes, respectively) are made of mono-crop (winter rape) and that effects from pesticides exposure is tested under 3 settings: i) flower resource + pesticides application, ii) flower resource + no pesticides application and iii) no flower resource + pesticides application. The team developing *ApisRAM* will generate these landscapes shortly in order for the experts (Hans Hermann Thulke and Martin Lange) to conduct the sensitivity/uncertainty analysis on the model performance.

## **VI. Next meetings**

The next WG meetings will be held on 16 October and 15 November 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Martin Lange, Hans-Hermann Thulke & Liyan Xie
- European Commission and/or Member States representatives:  
Sofie Hofkens
- EFSA:  
PLANTS: Agnes Rortais (chair), Csaba Szentes and Elena Zioga  
MESE: Yannick Spill
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Trine Poulsen.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 16<sup>th</sup> Working Group meeting held on 17 April 2024, via web-conference**

The Minutes of the 16<sup>th</sup> Working Group Meeting were agreed by written procedure on 25 April 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Post model development validation<sup>4</sup>

The first part of the meeting was dedicated to the presentation of the work progress made by the ISA experts (Hans Hermann Thulke and Martin Lange) on the evaluation of ApisRAM (i.e. on the alignment between the conceptual and formal model) to the WG. This information was consigned in a draft note that was shared with the WG, prior to the WG meeting, for review. The comments made by the experts on this draft note were discussed and clarified in that meeting. Accordingly, the ISA experts will amend the draft note, including the input from the WG, the latest update provided by Aarhus team (on the formal model) and the outcome of the alignment between the formal model and computer model for the three endpoints selected by the WG (colony size, brood development and foraging) by 31 July 2024. In addition, further discussion will be made in written, between the ISA experts and the WG, to decide on the approach to be taken for the second part of the evaluation (i.e. endpoints selected a priori by expert knowledge or a posteriori with sensitivity analyses). The second part of the meeting was dedicated to the presentation of the work progress made by Aarhus Team (Xiaodong Duan and Lyan Xie) on ApisRAM's implementation, in particular on deliverable D4 and the list of issues raised by the WG on the previous deliverables D1-D3. These deliverables were also shared with the WG experts prior to the meeting for review. The major comments made by the experts on D4 were clarified in this meeting, while the other comments of editorial nature were left to be addressed later and directly by Aarhus team when consolidating the final report (with input from EFSA on the final structure of the report). Finally, the next steps (WG meetings, deliverables from the ISA experts, Aarhus Team and WG) were presented by EFSA to the WG.

## VI. Next meetings

The next WG meetings will be held on 16 September, 16 October and 15 November 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>



**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Martin Lange, Hans-Hermann Thulke & Liyan Xie
- European Commission and/or Member States representatives:  
Sofie Hofkens
- EFSA:  
PLANTS Unit: Agnes Rortais (chair), Elena Zioga (PLANTS), Csaba Szentes (PLANTS),  
Yannick Spill (MESE) and Manola Sulollari (TS)
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Trine Poulsen.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 15<sup>th</sup> Working Group meeting held on 15 February 2024, via web-conference**

The Minutes of the 15<sup>th</sup> Working Group Meeting were agreed by written procedure on 22 February 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Post model development validation<sup>4</sup>

The WG was presented a business analysis plan that EFSA will carry in 2024, interviewing members of the WG, along with other stakeholders (e.g. risk assessors from Member States National Authorities and researchers in the field of environmental risk assessment). This project is to support EFSA in identifying the needs and requirements for the design of the graphical interface of ApisRAM. The ISA (Individual Scientific Advisors) experts involved in the testing of ApisRAM (Hans Hermann Thulke and Martin Lange) confirmed with the WG the endpoints to be used in subsequent analyses (sensitivity/uncertainty) and also raised some issues related to the protocols (i.e. analytical and computational-wise) for the testing of ApisRAM. For the latter, further technical discussions with EFSA and Aarhus Team are needed and will be organised. The meeting was also the opportunity for Aarhus Team to present updates on the formal model since its publication in 2022. The WG clarified some aspects related to the flower resource model, the foraging strategy, the pesticides engine and the vitality which will need to be further expanded/detailed. The next deliverable on ApisRAM is due on 23 May and will be circulated to the WG members for their review and reporting at the next WG meeting. At this next WG meeting, it will also be the opportunity for the ISA experts to report back the results of their critical assessment on the alignment of the conceptual model (as defined by WG) with the formal model ApisRAM version 3 (as defined by Aarhus Team) and also with the computer model.

## VI. Next meeting

The next WG meeting will be held on 27 June 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00755>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Martin Lange , Trine Poulsen, Hans-Hermann Thulke
- European Commission and/or Member States representatives:
- EFSA:  
PLANTS Unit: Agnes Rortais (chair), Elena Zioga (PLANTS) & Yannick Spill (MESE)
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Sofie Hofkens and Csaba Szentes.

## **II. Adoption of agenda**

The agenda was adopted without changes. Apologies were received from Sofie Hofkens and Csaba Szentes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 14<sup>th</sup> Working Group meeting held on 31 January 2024, via web-conference**

The Minutes of the 14<sup>th</sup> Working Group Meeting were agreed by written procedure on 8 February 2024.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Scenarios for ApisRAM honey bee colony model<sup>4</sup>

The meeting was divided in two parts. The first part (15-18h) was the opportunity for the new experts recently appointed by EFSA under the Individual Scientific Advisor (ISA) scheme (i.e. Hans-Hermann Thulke and Martin Lange) to get introduced to the MUST-B WG members, the contractor developing the model ApisRAM from Aarhus University (i.e. Xiaodong Duan and Trine Poulsen) and the EFSA staff involved in the project. In this first part of the meeting, the ISA experts presented the first evaluation they made from the preliminary documentation they received by EFSA. This assessment was focused on the available documentation related to the conceptual and formal models. The experts from Aarhus University clarified that the deliverables describing the pesticides and biological agents modules will be amended by the end of February and the flowcharts on the amendments made on the conceptual model by the end of March. Further the expert from Aarhus University agreed to submit an accessible code of the ApisRAM software and provide a library to run trial-simulations with the functioning ApisRAM and backbone. The ISA experts discussed extensively with all experts the endpoints to be selected for conducting sensitivity and uncertainty analysis on ApisRAM. The second part of the meeting (18-19h) was restricted to two members of the WG (i.e. Andreas Focks and James Crall) to discuss with the experts from Aarhus University on the implementation of the vitality concept with the GUTS modelling approach as well as calibration aspects, including sensitivity and uncertainty analyses, related to the 10d chronic adult risk assessment. This work will be included in the amendment to be made by Aarhus on the deliverables to be sent to EFSA by the end of February.

## VI. Next meeting

The next WG meeting will be held on 17 April 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Trine Poulsen
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair), Laura Padovani, Csaba Szentes
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 13<sup>th</sup> Working Group meeting held on 13 December 2023, via web-conference**

The Minutes of the 13<sup>th</sup> Working Group Meeting were agreed by written procedure on 20 December 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **Scenarios for ApisRAM honey bee colony model<sup>4</sup>**

The hearing experts presented to the working group the progress made on the model ApisRAM, in particular on the pesticides module (compartments, pesticide and dust drift) where new calibration results and sensitivity analysis were presented. Deviations from the revised bee guidance were highlighted and discussed. There was also a presentation followed by a discussion with the experts on the concept of vitality for the biological agent module. The hearing experts will include the working group feedback when amending the deliverables.

## VI. Next meeting

The next WG meeting will be held on 15 February 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan, Trine Poulsen
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair), Alberto Linguadoca and Csaba Szentes
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 12<sup>th</sup> Working Group meeting held on 07 December 2023, via web-conference**

The Minutes of the 12<sup>th</sup> Working Group Meeting were agreed by written procedure on 13 December 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Scenarios for ApisRAM honey bee colony model<sup>4</sup>

The working group and the hearing experts from the Aarhus team developing ApisRAM, discussed extensively the list of key issues that was made by the WG on the first two deliverables prepared by the hearing experts (i.e. D1: pesticides module and D2: infectious agents/beekeeping management practices module). This discussion was the opportunity to identify any challenges and find possible way forward for the implementation of ApisRAM. The working group was presented the timeline and workload for 2024 as well as the foreseen interactions between the Aarhus team and two individual scientific advisors (ISA) on the critical assessment of ApisRAM version 3 (i.e. alignment between conceptual, formal and computer models; accuracy checks, sensitivity and uncertainty analyses).

## VI. Next meeting

The next WG meeting will be held on 31 January 2024.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>



**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
No applicable
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 11<sup>th</sup> Working Group meeting held on 15 November 2023, via web-conference**

The Minutes of the 11<sup>th</sup> Working Group Meeting were agreed by written procedure on 22 November 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Scenarios for ApisRAM honey bee colony model<sup>4</sup>

The working group was presented an overview of the feedback received by the EFSA SC and PLH Panels on the work progress that was presented to them in the November plenaries. Then, the WG re-discussed several aspects of the report to close any open or pending issues in order to produce a final draft of the report. In particular, issues related to the definition of the floral resource diversity, the floral resource quality, the environmental scenarios, the time dimension were extensively discussed. The conclusions and recommendations were also reviewed and a timeline was agreed with the experts to endorse the report within the next days for later publication. In the next WG meeting, the contractor will present to the WG experts how to address the key issues listed by the WG made on the first two deliverables related to ApisRAM.

## VI. Next meeting

The next WG meeting will be held on 13 December 2023.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Not applicable
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 10<sup>th</sup> Working Group meeting held on 18 October 2023, via web-conference**

The Minutes of the 10<sup>th</sup> Working Group Meeting were agreed by written procedure on 27 October 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Scenarios for ApisRAM honey bee colony model<sup>4</sup>

The working group reviewed all sections of the technical report on environmental scenarios. The terms of reference were further clarified and sections in the report describing the concept of ecological quality and the definition and levels of floral diversity for baseline scenarios were amended. A thorough discussion was made within the working group on how to tackle floral resource quality for baseline scenarios, taking account of both pollen and nectar resources. For this purpose, an approach was proposed and will be formulated and endorsed at the next working group meeting. This meeting scheduled on 07/12 will be the opportunity to have a discussion on how to include the time dimension in the scenarios and finalise the report. Finally, an overview of the main comments made by the WG and EFSA on the first two interim reports/deliverables (D1 & D2) produced by the contractor developing the model ApisRAM (D1: pesticides module and D2: infectious agents/beekeeping management practices module) was presented to the working group with a timeline for their implementation and finalisation by the contractor. On 13/12, the contractor will present to the WG how they will address the comments and implement the work.

## VI. Next meeting

The next two WG meetings will be held on 07 and 13 December 2023.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Not applicable
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 9<sup>th</sup> Working Group meeting held on 16 October 2023, via web-conference**

The Minutes of the 9<sup>th</sup> Working Group Meeting were agreed by written procedure on 25 October 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### Scenarios for ApisRAM honey bee colony model<sup>4</sup>

The meeting was the opportunity to make progress on the draft technical report defining the environmental scenarios for ApisRAM's use and also to discuss the possible tasks for an external expert to be appointed in 2024 by EFSA to support the work of the WG (3<sup>rd</sup> term of reference, TOR3), in particular on the testing of ApisRAM. As regards the scenarios, the experts expressed the need for further clarification on the interpretation of ToR3, in particular on the need of involving stakeholders when running simulations with the selected scenarios, ensuring they are fit for their purpose and risk assessment. Editorial changes were made to align terminologies. The WG refined the definition of the floral resource diversity, including the Shannon Diversity Index and discussed extensively issues related to the time dimension and the possible colinearity between landscape diversity and quality. These issues will be re-discussed in the next meeting. In respect to the discussion on the tasks of the external expert, the Chair presented an overview of the work of the WG in relation with the work on ApisRAM and the interactions of the expert. In line with the EFSA opinion on good modelling practices, a list of items to be assessed and checked in ApisRAM was presented to the experts. It was proposed that the external expert could support EFSA and the WG in building trust and robustness in the model by undertaking several of the checks/assessment as presented in this list. This will be further discussed within the WG and in presence of the expert when he/she is appointed, early 2024. Finally, the experts were provided feedback on the follow up of the past communications provided before summer to the PPR and SC Panels as well as to SCoPAFF.

## VI. Next meeting

The next meeting will be held on 15 November 2023.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan and Trine Poulsen
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca  
MESE Unit: Yannick Spill
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 8<sup>th</sup> Working Group meeting held on 18 September 2023, via web-conference**

The Minutes of the 8<sup>th</sup> Working Group Meeting were agreed by written procedure on 25 September 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **ApisRAM version 3 for the risk assessment of pesticides<sup>4</sup>**

The WG experts were presented the work progress made by Xiaodong Duan and Trine Poulsen, the contractor developing ApisRAM towards version 3, in order to provide feedback to Aarhus Team. In particular, WG experts were provided an overview of the description of the deliverables as requested by EFSA followed by three detailed presentations on the scientific content of the deliverables. The first presentation provided an overview of the 'pesticide engine' (i.e., pesticide fate) module and simulation framework for spray, granular, seed coating with some preliminary results on (spray/dust) drift simulation. Results of calibration exercises for the simulation of the amounts of residues over time from soil to plant with spray application of a model substance in wheat, barley, potato and cotton were shown. The second presentation was made to describe the processes and parameters linked to pesticides exposure/effects in individual bees: adults after acute contact and oral exposure and larvae after repeated dietary exposure. The toxicity model implementation for oral and contact exposure routes was described. Using two model substances, a calibration exercise of the parameter set using standardised toxicity studies was presented. A comparison of the model predictions to the empirical observation (i.e., the cumulative mortality at increasing doses and multiple time points in adults, larvae and pupae) was performed via least squares method. A local 'one-at-a-time' sensitivity analysis was also presented. The third presentation was focused on the biological agents and beekeeping management practice (BMP) modules. In this presentation, the WG was presented the vitality concept linked to the bee immune system and the processes/equations to determine the vitality of bees when exposed to various stressors (chemicals, nutritional, thermal, biological). Finally, the BMP module comprising the chemical treatment and supplementary feeding practices, was presented. These modules will be implemented and calibrated by January 2024. After the presentations, the WG discussed with the hearing experts the issues of data availability/gap and the way forward.

## VI. Next meeting

The next meeting will be held on 18 October 2023.

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<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00786>



**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Not applicable
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca
- Others:  
Not Applicable

## **I. Welcome and apologies for absence**

The Chair welcomed the participants.

## **II. Adoption of agenda**

The agenda was adopted without changes.

## **III. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## **IV. Agreement of the minutes of the 7<sup>th</sup> Working Group meeting held on 21 June 2023, via web-conference**

The Minutes of the 7<sup>th</sup> Working Group Meeting were agreed by written procedure on 30 June 2023.

## **V. Scientific topic for discussion**

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



### **Scenarios for ApisRAM honey bee colony model<sup>4</sup>**

The WG experts were presented the feedback received on the scenarios from the PPR Panel and the upcoming presentation to be made to other the SC and PLH Panel. Feedback from SCoPAFF, to which a presentation of the scenarios was made early July, is expected by the end of September 2023. Then, the WG experts were presented the key points from the last WG meeting discussion as well as the new issues to be discussed in this meeting. In particular, the WG discussed extensively the definition of the landscape composition and quality in regards to the floral resource diversity and quality found in those landscapes represented by various types of habitats (i.e. focal and non-focal crops, and non-crop elements). Spatial and temporal aspects of the scenarios were also discussed and clarified. Finally, action points were defined for the next WG meeting and the WG experts were presented a workplan to finalise the technical report by the end of 2023.

## **VI. Next meeting**

The next meeting will be held on 16 October 2023.

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**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) – observer
- EFSA:  
PLANTS Unit: Agnes Rortais (chair) and Alberto Linguadoca  
MESE: Olaf Mosbach-Schulz
- Others:  
Not Applicable

## I. Welcome and apologies for absence

The Chair welcomed the participants.

## II. Adoption of agenda

The agenda was adopted without changes.

## III. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## IV. Agreement of the minutes of the 6<sup>th</sup> Working Group meeting held on 21 April 2023, via web-conference

The Minutes of the 6<sup>th</sup> Working Group Meeting were agreed by written procedure on 05 May 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **Expert Knowledge elicitation to define scenarios for ApisRAM honey bee colony model<sup>4</sup>**

The WG experts were presented the key points from the last WG meeting discussion. The WG reviewed thoroughly the draft technical report on the selection of environmental scenarios for ApisRAM version 3 and identified a few sections which needed further work from the WG to be presented at the next WG meeting for endorsement. It was concluded that the EKE foreseen under this WG for the definition of the scenarios would be re-discussed later in the implementation of ApisRAM. As time did not permit the review of the last sections of the report on the classification of the landscape heterogeneity for the baseline scenarios, the case scenarios, the exposure modification factors, the risk matrix and the conclusions, it was agreed to continue this work at the next WG meeting. Finally, the experts were presented the communication plan on the progress of this work to SCoPAFF and the EFSA Panels as well as the new adjustments made on the timeline of the next 2023 WG meetings.

## VI. Next meeting

The next meeting will be held on 18 September 2023.

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21 April 2023

15:00-19:00

MINUTES - Agreed on 05 May 2023

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)
- Hearing Expert<sup>1</sup>:  
Xiaodong Duan
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) - observer
- EFSA:  
PLANTS Unit: Agnes Rortais and Alberto Linguadoca
- Others:  
Not Applicable

## I. Welcome and apologies for absence

The Chair welcomed the participants.

## II. Adoption of agenda

The agenda was adopted without changes.

## III. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## IV. Agreement of the minutes of the 5<sup>th</sup> Working Group meeting held on 31 March 2023, via web-conference

The Minutes of the 5th Working Group Meeting were agreed by written procedure on 10 April 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic for discussion

### **Expert Knowledge elicitation to define scenarios for ApisRAM honey bee colony model<sup>4</sup>**

The WG experts rediscussed aspects related to the definition of scenarios and validated the amendments made in the technical report as requested at the last WG meeting (i.e. on assessment endpoints, beekeeper experience, vitality definition, colony size, infectious agents/viruses thresholds for baseline scenarios, and landscape heterogeneity concept). The WG discussed at length the consideration of the various infectious agents with the available data and also the newly designed scenarios with both landscape configuration (composition) and quality (for foraging). It was agreed that sufficient data was available for the model to include Varroa, but not for its associated viruses (DWV, ABPV and SBV) and Nosema. For those, Aarhus university is exploring ways to fill in the gaps (with the intention of a new dataset) and will conclude with EFSA whether an expert knowledge elicitation is still needed for those infectious agents. Regarding the discussion on the landscape heterogeneity, it was agreed that spatial arrangement would not be considered as it would be too complex to categorise. To overcome this, multiple simulations with varying positioning of the colonies in the landscapes (but always at the edge of the field/treated crop) could be conducted. In the technical report, clarification will be made on the discrimination between focal and non-focal crop (and crop vs non-crop habitat in terms of management decisions made) and also to guide end-users and align with the risk assessment requirements when selecting realistic landscapes for the scenarios and simulations. The technical report will be amended following these action points.

## VI. Next meeting

The next meeting will be held on 21 June 2023.

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31 March 2023

15:00-19:00

MINUTES - Agreed on 10 April 2023

**Location:** Webconference

**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)
- Hearing Experts<sup>1</sup>:  
Xiaodong Duan and Chris Topping
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) - observer
- EFSA:  
MESE Unit: Olaf Mosbach-Schulz and Agnes Rortais,  
PREV Unit: Alberto Linguadoca
- Others:  
Not Applicable

## I. Welcome and apologies for absence

The Chair welcomed the participants.

## II. Adoption of agenda

The agenda was adopted without changes.

## III. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## IV. Agreement of the minutes of the 4<sup>th</sup> Working Group meeting held on 08 February 2023, via web-conference

The [Minutes of the 4th Working Group Meeting](#) were agreed by written procedure on 20 February 2023.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic(s) for discussion

### **Expert Knowledge elicitation to define scenarios for ApisRAM honeybee colony model<sup>4</sup>**

The WG experts discussed aspects related to the scenarios definition (i.e. assessment endpoints, beekeeping management practices, vitality/viability concepts, colony size and infectious agents/viruses thresholds for baseline scenarios, and landscape heterogeneity concept) and the calibration/validation process conducted by Aarhus University. A clarification was requested to be made on the list of assessment endpoints to determine those which comply with the specific protection goals (SPGs) and those which go beyond the EU legislation 1107/2009. Regarding the beekeeping practices, it was noted that good management practices are assumed when conducting pesticides risk assessment, but ApisRAM could still have the option to simulate the influence of the beekeepers' experience (as an input parameter, being set as 1 for experienced and 0 for unexperienced). The vitality/viability concepts were judged as key, in particular for the simulation of the influence of infectious agents/viruses on resilience to stress, but it was agreed to delay this discussion, after the scenarios are finalised, and when Aarhus University has made further progress on these concepts. Threshold values were obtained for colony size (in spring/fall/winter) and infectious agents/viruses for baseline scenarios. The values obtained for colony size were in the range of the available data published by EFSA in 2021 on the background variability of honey bee colony size (to be included in the report). While thresholds could be obtained (from individual to colony levels) for Varroa, the situation for infectious agents (DWV, ABPV and SBV) and Nosema was more challenging. Further discussion was made on whether semi-quantitative data or expert knowledge could be derived to obtain the missing data. Further exploration is needed before a decision can be made on whether viruses and Nosema could be included in version 3 or later, when more information is gathered and show that those agents are key for simulation purpose (some sensitivity analyses could support on such future decisions). In light of the new information provided regarding the landscape heterogeneity concept and risk envelope (containing, as an example, three landscape heterogeneity levels and four exposure modification factors), the WG agreed to derive additional landscape heterogeneity classes, based on landscape composition/configuration in light of foraging capacities (crops attractiveness/production/availability). Finally, the WG was provided an update of the progress made by Aarhus University on the calibration and validation process for ApisRAM version 3 and key action points were made. The technical report will be amended following these action points.

## VI. Next meeting

The next meeting will be held on 21 April in Parma.

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08 February 2023

15:00-19:00

MINUTES - Agreed on 20 February 2023  
2023**Location:** Webconference**Attendees:**

- Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)
- Hearing Experts<sup>1</sup>:  
Xiaodong Duan and Chris Topping
- European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) - observer
- EFSA:  
Alberto Linguadoca, Agnes Rortais
- Others:  
Not Applicable

## I. Welcome and apologies for absence

The Chair welcomed the participants.

## II. Adoption of agenda

The agenda was adopted without changes.

## III. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## IV. Agreement of the minutes of the 3<sup>rd</sup> Working Group meeting held on 05 December 2022, via web-conference

The [Minutes of the 3rd Working Group Meeting](#) were agreed by written procedure on 14 December 2022.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## V. Scientific topic(s) for discussion

### a. Key points from WG3

The WG got an overview of the key points made from the last WG meeting (No 3) regarding the definition of baseline scenarios and their use in the context of the Good Agricultural Practices (GAP) and the agreed Specific Protection Goals (SPGs) for honey bee colonies. In addition, other aspects discussed at the last meeting which need further discussion, relating to foraging (e.g. crop attractiveness), body burden, colony vitality and Expert Knowledge Elicitation (EKE), were brought to the attention of the WG.

### b. Vitality

The terminology for vitality (i.e. at individual level) and viability (i.e. at colony level), both used to quantify health status, were clarified. The WG was presented with an overview of a list of possible factors influencing vitality and viability (numeric value ranging from 0, if colony is dead, to 1 if colony is in optimal health). The WG was provided the opportunity to discuss the list and to expand it, after this meeting, in writing. Finally, the WG discussed the updated conceptual diagram of the factors influencing colony vitality (i.e. now including new infectious agents, thermoregulation capacity and updated interactions). The WG also discussed the relationship between colony viability (which relates to number of worker bees, brood development and queen) and colony strength/size (which relates to number of worker bees as set in the SPGs). It was noted that ApisRAM's output (viability) should be linked to the SPGs, but also goes beyond this (i.e. considering other endpoints such as brood abundance and queen survival and considering longer-term assessments, with their associated uncertainties, by running simulations over multiple years). Finally, it was clarified to the WG that the viability is not a summary measure of individual vitalities, and needs suggestions on which stressors to consider, how to combine them and how to parameterize vitality in ApisRAM.

### c. Baseline scenarios

The WG was given a high-level presentation (draft note and diagram) on a possible way forward to define the scenarios, taking into account the initial colony vitality, the beekeeping practices and the landscape heterogeneity, with the potential to also incorporate exposure modification factors. The landscape heterogeneity concept was extensively discussed within the WG and it was acknowledged that a large number of scenarios (with high computer processing needs) could be derived given the number of parameters to be factored in, but that a more pragmatic approach, with a small number of realistic scenarios, could be taken for the implementation of ApisRAM version 3. It was agreed that the risk envelope, defining the range of possible impacts that could be used by risk managers to inform decision-making, should contain realistic scenarios.

It was suggested that algorithms may be developed to categorise landscape heterogeneity. Starting from the problem formulation (i.e., relative to the spatial and temporal elements of representative GAP uses under evaluation), scenarios could be selected across a gradient of landscape heterogeneity, based on landscape structure, landscape diversity and representative GAP uses, starting from monoculture to rotation-based crops to full landscape diversity (with a variety of crops and non-crops landscapes).

### d. Structure of technical report

The WG was presented with an overview of the table of contents of the technical report that needs to be prepared and finalised by the WG by the end of 2023. The table of contents contained the existing framework that was prepared in the first 3 WG meetings on the background information related to the terms of reference of the WG, comprising the problem formulation and definitions of baseline and case scenarios. At this 4<sup>th</sup> meeting, an updated table of content was presented, comprising the new information presented under agenda item

6 on baseline scenarios (see above). New sections on the definition of the exposure



modification factors, the risk envelope and the data needs for the testing of the model were added and will need to be further discussed in the following meetings.

**e. Communication and workplan ([EFSA-Q-2022-00753](#))**

The WG was presented with an overview of the communication and workplan of the work to be conducted under this WG. This included a brief feedback to the WG on the first communication provided to the Standing Committee on Plants, Animals, Food and Feed (ScoPAFF) in December 2022 on the ongoing work of the WG. The next 2 ScoPAFF communications will be made in May and July 2023 to report the results of the WG on the definition of the scenarios and provide Member States with the opportunity to give feedback. The WG was then provided an update of the timing of the EKE exercise, which will be postponed from May to October 2023. Finally, the WG was provided an overview of when its input will be required for the review of the implementation and finalisation of ApisRAM version 3.

**f. Wrap up, action points & next steps**

The WG was presented with an overview on the next steps. EFSA will send a consolidated technical report to the WG comprising track changes and specific comments to dedicated from the experts will be further discussed in the next WG meeting in March. Outstanding discussion threads will be highlighted so that they are addressed and resolved at the next WG meetings.

## **VI. Any Other Business**

No applicable

## **VII. Next meeting**

The next meeting will be held on 31 March 2023, via web conference.



## METHODOLOGY AND SCIENTIFIC SUPPORT UNIT

### MINUTES OF THE 3<sup>rd</sup> MEETING OF THE WORKING GROUP ON MUST-B 2

TELE-conference, 5 December 2022

(Agreed on 14 December 2022)

#### Participants

- n Working Group Members:  
Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)
- n Hearing Experts<sup>1</sup>:  
Xiaodong Duan and Chris Topping
- n European Commission and/or Member States representatives:  
Sofie Hofkens (DG Santé) - observer
- n EFSA:  
MESE Unit: Olaf Mosbach-Schulz and Agnes Rortais,  
PREV Unit: Alberto Linguadoca  
ENREL: Steve Pagani
- n Others:  
Not Applicable

#### 1. Welcome and apologies for absence

The Chair welcomed the participants.

#### 2. Adoption of agenda

The agenda was adopted without changes.

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<sup>1</sup> As defined in Article 15 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/expertselection.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/expertselection.pdf)

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

### 4. Hearing Experts

Dr DUAN and Prof. TOPPING were invited to discuss the setting of baseline and case scenarios for ApisRAM version 3.

### 5. Scientific topics for discussion

#### 5.1. Expert Knowledge elicitation to define scenarios for ApisRAM honey bee colony model<sup>4</sup>

In line with the conclusions reached in the second WG meeting, a draft framework on the setting of environmental scenarios for ApisRAM version 3 was prepared by EFSA, reviewed by the experts and thoroughly discussed in this meeting with the WG. The application of the model for regulatory purposes will be defined in terms of baseline scenarios (in the absence of the active substance) and case scenarios (with the active substance included). The WG acknowledged that "landscape heterogeneity", captured in the 10 x 10 km landscapes in ALMaSS (essentially a series of "ALMaSS windows") will be an important source of variability to be considered when conducting assessments. These ALMaSS windows will comprise different landscape structure and compositions (e.g. from natural, semi-natural to extensive cropping habitats), including the crop of interest from a given GAP and with the realism of a "healthy colony". They will represent a full range of realistic conditions and scenarios, from least to most favourable for honey bee foraging and colony development. This approach was defined by the WG as the "risk envelope". The WG suggested that in case scenarios, where risks from exposure of a pesticide on honey bee colonies are assessed, this "risk envelope" could include different exposure modification factors to account for the exposure variability and uncertainties and for risk managers to make informed decisions. Regarding the colony attributes, comprising the vitality index and infection levels, the WG concluded that further development was needed for further discussion at the next WG meeting. Finally, it was noted that within the timeframe of the implementation of ApisRAM version 3, data availability for model calibration, could be an issue for model acceptance. Therefore, it was proposed that the most important issues/aspects to be considered for model validation would be presented and discussed at the next WG meeting.

### 6. Any Other Business

#### 6.1. Not Applicable

### 7. Next meetings

**2023:** 16 January (WG4), 8 February (WG5), 21 April (WG6), 21 June (WG7), 18 September (WG8), 18 October (WG9), 15 November (WG10), 15 December (WG11)

**2024:** 17 January (WG12), 15 February (WG13), 17 April (WG14), 19 June (WG15)

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<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>



# METHODOLOGY AND SCIENTIFIC SUPPORT UNIT

## MINUTES OF THE 2<sup>nd</sup> MEETING OF THE WORKING GROUP ON MUST-B 2

TELE-conference, 14 November 2022

(Agreed on 21 November 2022)

### Participants

Working Group Members:

Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)

Hearing Experts<sup>1</sup>:

Xiaodong Duan and Chris Topping

European Commission and/or Member States representatives:

Sofie Hofkens (DG Santé)

EFSA:

MESE Unit: Olaf Mosbach-Schulz and Agnes Rortais,

PREV Unit: Alberto Linguadoca

Others:

Not Applicable

### 1. Welcome and apologies for absence

The Chair welcomed the participants.

### 2. Adoption of agenda

The agenda was adopted without changes.

<sup>1</sup> As defined in Article 15 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/expertselection.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/expertselection.pdf)

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

### 4. Hearing Experts

Dr DUAN and Prof. TOPPING were invited to describe several aspects related to ApisRAM: the biological agent module, the use of landscape data and the prioritisation of the scenarios/parameters.

### 5. Scientific topics for discussion

#### 5.1. Expert Knowledge elicitation to define scenarios for ApisRAM honey bee colony model<sup>4</sup>

In line with the conclusions reached in the first WG meeting, the WG discussed two main issues: the honey bee colony healthy concept and the methodologies to derive scenarios for ApisRAM. On the first issue, the WG was presented an overview on both the data requirements (for higher tier risk assessment and modelling purposes) and the data availability in respect to disease prevalence, as implemented in ApisRAM (i.e. for Varroa, the Deformed Wing Virus (DWV), the Acute Bee Paralysis Virus (ABPV) and Nosema). The WG agreed that for the testing of the effects of pesticides in bees, the use of a healthy colony, exempt from any clinical symptoms of disease, does not imply the absence of the infectious agent which can still be present at the start of the test, but at a threshold which does not induce clinical symptoms. In addition, to consider the various infectious agents to which a colony can be exposed in the natural conditions, the WG suggested to use the vitality index that is currently implemented in ApisRAM version 1. On the second issue, the WG was presented the key methodological aspects to be considered when defining environmental scenarios for simulating pesticides risk assessment in a regulatory context. In addition, Aarhus University presented a demo on the use of the landscape data for ApisRAM, as simulated under ALMaSS, as well as the scenario categories (baseline and test) and scenario setting (i.e. landscape, colony initialisation, endpoints) to be considered for the model. For the next meeting, it was proposed to elaborate a framework that integrates the information presented in this meeting, on the scenarios, integrating new information from the revised Bee Guidance Document and the framework partnership agreement signed between EFSA and Aarhus University on the implementation of ApisRAM towards version 3. The next WG meeting will discuss this framework as well as the selection of appropriate endpoints for ApisRAM, including colony survival *versus* colony strength.

### 6. Any Other Business

#### 6.1. Not Applicable

### 7. Next meetings

2022: 5 December (WG3)

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<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>



**2023:** 16 January (WG4), 8 February (WG5), 21 April (WG6), 21 June (WG7), 18 September (WG8), 18 October (WG9), 15 November (WG10), 15 December (WG11)

**2024:** 17 January (WG12), 15 February (WG13), 17 April (WG14), 19 June (WG15),



## METHODOLOGY AND SCIENTIFIC SUPPORT UNIT

### MINUTES OF THE 1<sup>st</sup> MEETING OF THE WORKING GROUP ON MUST-B 2

TELE-conference, 24 October 2022

(Agreed on 31 October 2022)

#### Participants

Working Group Members:

Cédric Alaux, James Crall, Andreas Focks and Simon More (Chair)

Hearing Experts<sup>1</sup>:

Xiaodong Duan and Chris Topping

European Commission and/or Member States representatives:

Sofie Hofkens (DG Santé)

EFSA:

MESE Unit: Olaf Mosbach-Schulz and Agnes Rortais

PREV Unit: Alberto Linguadoca

ENREL: Steve Pagani

Others:

Not Applicable

#### 1. Welcome and apologies for absence

The Chair welcomed the participants.

#### 2. Adoption of agenda

The agenda was adopted without changes.

<sup>1</sup> As defined in Article 15 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/expertselection.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/expertselection.pdf)

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

### 4. Hearing Experts

Dr DUAN and Prof. TOPPING were invited to present their views on the implementation of the model ApisRAM and the selection of appropriate scenarios for ApisRAM simulations of the present meeting.

### 5. Scientific topics for discussion

#### 5.1. Expert Knowledge elicitation to define scenarios for ApisRAM honey bee colony model (EFSA-Q-2022-00753)<sup>4</sup>

The first part of the meeting was dedicated to presentations to the MUST-B WG on the work to be achieved within the new (self-task) mandate given to the MESE Unit. This background information included an overview on how the pesticides risk assessment scheme is conducted in EU, on the vision of MUST-B since its establishment in 2015, and the new tasks to be conducted by the WG within the next 2 years (terms of reference, timeline, deliverables). These tasks will be on the definition of scenarios for ApisRAM and on the review and support provided for the implementation of ApisRAM version 3, a model for the regulatory risk assessment of pesticides on honey bee colonies. To this end, the contractor from Aarhus University (Xiaodong Duan and Chris Topping) presented a detailed description of the design and implementation of ApisRAM to the WG. The second part of the meeting was dedicated to a discussion on the selection of scenarios for ApisRAM, in particular on the intended use of ApisRAM by risk managers, risk assessors, scientists and field practitioners, on the use of the modelling in regulatory risk assessment while acknowledging the need for a transition for more context-dependent risk assessments and finally on a proper definition of a healthy bee colony with various levels of infection for both risk assessment and simulation purposes. Towards the end of the meeting, the WG was provided with an overview on the expert knowledge elicitation protocol and methodology to be developed by the WG in the next meetings in assist in the definition of scenarios for ApisRAM. It was proposed that the next WG meeting would be the opportunity to discuss further this topic with the WG experts and the contractor, identifying opportunities (e.g. structured approach with specific criteria/requirements for the definition of environmental risk assessment scenarios and collaboration with ongoing EU research projects on the definition of scenarios) and priorities (in terms of ApisRAM's parameters which need further input from EKE).

### 6. Any Other Business

Not Applicable

### 7. Next meetings

2022: 14 November (WG2), 5 December (WG3)

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<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2022-00753>



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SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

# SCIENTIFIC COMMITTEE/ SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## MINUTES OF THE 50<sup>TH</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 30 November 2021

(Agreed on 14 December 2021)

### Participants

#### Working Group Members:

Simon More

Gérard Arnold

#### Hearing Experts:

Chris Topping, Aarhus University

Xiaodong Duan, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter"

#### European Commission and/or Member States representatives:

Not applicable

#### EFSA:

SCER Unit: Agnès Rortais, Angelo Maggiore

AMU Unit: Federica Barrucci, Yannick Spill

DATA Unit: Alexandra Papanikolaou

PREV Unit: Csaba Szentes, Domenica Auteri

#### Others:

Not applicable

## 1. Welcome and apologies for absence

The Chair welcomed the participants. No apologies were received.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>1</sup> and the Decision of the Executive Director on Competing Interest Management<sup>2</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## 4. Agreement of the minutes of the 49<sup>th</sup> Working Group meeting held on 23 March 2021, TELE-conference.

The minutes of the 49<sup>th</sup> Working Group meeting held on 23 March 2021 were agreed by written procedure on 25 March 2021.<sup>3</sup>

## 5. Hearing Expert

Prof Chris Topping, Dr Xiaodong Duan and Dr Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; Xiaodong Duan is involved in the development of the formal model; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

## 6. Scientific topic for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)<sup>4</sup>

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the progress in the development of the formal model for the risk assessment of pesticides in honey bee colonies under different environmental scenarios.

The discussion focused on the different modules in ApisRAM, specifically: development, pesticides, thermal, biological agents, activities and beekeeping management practices. The bee 'vitality' index, linking effects of biological agents, pesticides, body temperature and quality/quantity of food resources to individual bee performance and lifespan, was discussed. At the moment the model supports two types of pesticides and is able of simulating drift for pesticide spray applications. For each pesticide,

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<sup>1</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>3</sup> <https://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf>

<sup>4</sup> <https://open.efsa.europa.eu/questions/EFSA-Q-2016-00558>

concentrations are calculated in soil, plant surface, inner plant, seed coats, nectar and pollen. Pesticides are tracked, for each hive cell, in pollen, nectar, honey and wax.

Bees are exposed to pesticides through overspray, contact when they forage or scout and intake. Pesticide stress is then calculated on the basis of the resulting pesticide body burden. Both lethal and sublethal effects (Reproductive performance of the queen, Hypopharyngeal gland development, Homing ability of foragers) are considered.

The GUI and command line interfaces of the computer programme were also illustrated. The updates on the literature search were indicated and possible synergies with the revision of the Guidance on the risk assessment of plant protection products on bees were considered.

Currently, the model has been calibrated in its colony and in-hive products module, on the basis of data from Denmark and Portugal. In the second half of the meeting, the required actions for calibration and validation of the full model (including biological agents and thermal modules, additional landscapes, multiple stressors interactions, mixtures and effects from invasive species) for the risk assessment of honey bees were debated.

The report describing the formal model and accompanying documentation will be published in the first quarter of 2022.

## 7. Any Other Business

Not applicable.

## 8. Next meeting

Not applicable.



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 49<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 23 March 2021

(Agreed on 25 March 2021)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais

Pesticides Unit: Csaba Szentes

Others:

NA

#### 1. Welcome and apologies for absence

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 48<sup>th</sup> Working Group meeting held on 9-10 March 2021, Parma

The minutes of the 48<sup>th</sup> Working Group meeting were agreed by written procedure on 16 March 2021.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the answers to be provided by the working group on the comments made to the scientific opinion related to ApisRAM.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)

This meeting was dedicated to the revision of the draft scientific opinion following the public consultation that was launched on 7 January 2021 until 4 March 2021, by means of an electronic comment submission tool together with explanatory text on the EFSA website. This meeting was the opportunity to further progress on the revision of the opinion addressing the comments from the public consultation. The experts will make a final check to the list of comments and replies provided to ensure consistency by 28 March. The revised draft opinion will be presented at the next SC Plenary, scheduled on 14-15 April 2021, for possible adoption.

## 7. Any Other Business

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)





None

## 8. Next meeting

Not applicable



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 48<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 9-10 March 2021

(Agreed on 16 March 2021)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais, Jean-Lou Dorne & Angelo Maggiore

Pesticides Unit: Csaba Szentes

COM Unit: Simon Terry, Domagoj Vrbos & Giorgia Zamariola

Others:

NA

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work :  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 47<sup>th</sup> Working Group meeting held on 15 February 2021, Parma

The minutes of the 47<sup>th</sup> Working Group meeting were agreed by written procedure on 19 February 2021.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the answers to be provided by the working group on the comments made to the scientific opinion related to ApisRAM.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)

This meeting was dedicated to the revision of the draft scientific opinion following the public consultation that was launched on 7 January 2021 until 4 March 2021, by means of an electronic comment submission tool together with explanatory text on the EFSA website. A total of 65 comments were received from 16 interested parties from 8 countries. The first half day of the WG meeting was dedicated to address the general issues and the 2nd half-day and 2<sup>nd</sup> day to the specific comments that were assigned to individual experts. Extensive exchange of views took place among the experts and the majority of the comments were addressed and agreed during the meeting. The remaining comments that could not be addressed in this meeting will be discussed in the next meeting in order

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



to finalise the revision of the opinion and present it at the next SC Plenary, scheduled on 14-15 April 2021, for possible adoption.

## 7. Any Other Business

None

## 8. Next meeting

23 March, 9-12h, CET (via TC)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>5</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## SCIENTIFIC COMMITTEE/ SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 47<sup>TH</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 15 February 2021

(Agreed on 19 February 2021)

#### Participants

**n** Working Group Members:

Simon More

Gérard Arnold

**n** Hearing Experts<sup>1</sup>:

Chris Topping, Aarhus University

Xiaodong Duan, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter"

**n** European Commission and/or Member States representatives:

Not Applicable

**n** EFSA:

SCER Unit: Agnès Rortais, Angelo Maggiore

AMU Unit: Federica Barrucci

DATA Unit: Alexandra Papanikolaou

PREV Unit: Csaba Szentes, Domenica Auteri

COMM Unit: Simon Terry

ENCO Unit: Flavio Fergnani

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<sup>1</sup> As defined in Article 15 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/expertselection.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/expertselection.pdf)

- n Others:  
Not applicable

## 1. Welcome and apologies for absence

The Chair welcomed the participants. No apologies were received.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## 4. Agreement of the minutes of the 46<sup>th</sup> Working Group meeting held on 11 February 2021, TELE-conference.

The minutes of the 46<sup>th</sup> Working Group meeting held on 11 February 2021 were agreed by written procedure on 18 February 2021.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping, Dr. Xiaodong Duan and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; Xiaodong Duan is involved in the development of the formal model; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

## 6. Scientific topic for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the progress in the development of the formal model for the risk assessment of pesticides in honey bee colonies under different environmental scenarios. The discussion focused on the simulation of temperature distribution within the hive, beekeeping management practices, biological agents, food requirements and activity priorities for worker bees. Regarding the pesticides module, at the moment, the model supports two types of pesticides. Drift is included for pesticide spray application. Pesticides concentrations are predicted in

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf>



the following matrices: soil, plant surface, in the plant, nectar and pollen. They are tracked also in each hive cell (nectar, honey and pollen). The exposure pathways for bees implemented in the model are overspray, contact (when the bees forage or scout) and intake. A range of sublethal effects are being considered by the model. They include reproductive performance of queens, hypo-pharyngeal gland development and effects on homing ability. The opportunity of adding effects of pesticides on egg mortality, related to viability of sperm, was also debated.

A bee 'vitality' index linking effects of biological agents, pesticides, temperature and quality/quantity of food resources to individual bee performance and lifespan was presented. By combining these stressors through the vitality parameter, the feedback between stressors can be mechanistically modelled.

Due to the huge dimensional space of the ApisRAM model parameters and the complex nonlinear relationship between the model parameters and model output, the contractor has proposed to use a neural network to search for the optimal parameter settings. This methodology can be used to conduct calibration and sensitivity analysis.

Synergy with the working group involved in the revision of the Guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees) was recognised and alignment was recommended, in particular for food requirements.

The second part of the meeting was devoted to an initial delineation of a plausible timeline for model development, considering different purposes: 1. Analysis of background variability of honey bee colony size; 2. Tool for regulatory risk assessment and 3. systems-based approach to the environmental risk assessment of multiple stressors in honey bees. The discussion will be concluded in *ad-hoc* follow-up meetings.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

MUST-B WG: 9-10 March 2021



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE/ SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 46<sup>TH</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 11 February 2021

(Agreed on 18 February 2021)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnès Rortais

DATA Unit: Alexandra Papanikolaou

PREV Unit: Csaba Szentes (for agenda items 1-3)

Others:

Aarhus University, Denmark: Yoko Dupont, Marianne Bruus (for agenda item 3), Peter Borgen Sorensen (for agenda item 3), Per Kryger and Xiadong Duan

University of Coimbra, Portugal: José Paulo Sousa, Nuno Capela and António Silva Instituto

Politécnico de Bragança, Bragança, Portugal: Alice Pinto (agenda items 1-3)

<sup>1</sup> As defined in Article 15 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/expertselection.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/expertselection.pdf)

## 1. Welcome and apologies for absence

The Chair welcomed the participants.

Apologies were received from Jørgen Axelsen and Angelo Maggiore.

Csaba Szentes, Marianne Bruus, Peter Borgen Sorensen and Alice Pinto did not participate in agenda points 4 and 5<sup>2</sup>.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>3</sup> and the Decision of the Executive Director on Competing Interest Management<sup>4</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## 4. Agreement of the minutes of the 45<sup>th</sup> Working Group meeting held on 29-30 September 2020, TELE-conference.

The minutes of the 45<sup>th</sup> Working Group meeting held on 29-30 September 2020 were agreed by written procedure on 08 October 2020.<sup>5</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the data requirements and flows for the calibration of the model ApisRAM.

## 6. Scientific topic for discussion

### 6.1. Field data collection to calibrate and validate ApisRAM model (EFSA-Q-2016-00557)

The chair provided an overview of the progress made and the various meetings organised between EFSA and the contractor since the last meeting of the Steering Committee in December 2019 in the years 2020/21, in particular on specific mitigation measures that were taken by the contractor in agreement with EFSA, in April 2020, to reduce impacts from the restrictions imposed by COVID-19. The chair also provided an overview on the next steps of the project which are the sending of the completed and final tables containing all the data collected in the last months and the final external scientific report containing all the work achieved through the 3-years project. The contractor presented the work progress for the 2<sup>nd</sup> year of data collection, i.e. all sub-work packages WP2 (2.1 Agricultural practices and land use, cover and structure; 2.2 Local weather and in-hive conditions; 2.3 Hive management and colony observations; 2.4 Identification and prevalence of infectious agents; 2.5

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<sup>2</sup> Optional: to be used when a participant, in exceptional circumstances, cannot attend to a specific agenda item for any reason other than a Conflict of Interest.

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>4</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>5</sup> <https://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/smustb.pdf>

Experimental insecticide spraying and quantification of chemical residues in crops, bees and hives and 2.7 on the data submission to EFSA DCF (XML files) and the database). The results on WP 2.6 on Sugar concentration in nectar and floral origin of pollen were omitted from the presentation of the contractor, but they will be included in the final report like the results from all sub-work packages. The results from the additional work made by the contractor on the training of the image analysis software DeepBee® to increase its accuracy in the level of detection of the comb cells (brood demographics and food stores) between different regions (Portugal and Denmark) paid off with a greater detection level. The contractor will focus the next developments of the software on improving the recognition of drone cells and the dynamics of the cell content (changes in time); this will not be done under this contract but rather by joint efforts between the software developers and the research teams involved in the project. During this presentation, technical issues (e.g. data cleaning, overcome of missing data, protocol fine-tuning and finding of alternatives) were discussed extensively with the Steering Committee and EFSA. In the afternoon, the members of the steering committee congratulate the contractor and all the team working on the project for the good work delivered and provided feedback to improve the quality of the final output. The Steering Committee recommended the inclusion of detailed results with graphs/tables/figures, a discussion on the biological understanding of the obtained patterns and a section on the lessons learnt from this project. In particular, it was proposed to highlight the key aspects of field data collection (e.g. what worked, what could be collected with accuracy and reliability, what could be collected using (semi-)automated measures, what remains to be further developed in terms of protocols and data reliability). This would allow an assessment of each variable against a range of criteria, to determine those data that can be collected with a high level of confidence and the data that contain still too many uncertainties and would need further development/research before being used for the model calibration. In terms of timeline, the contractor confirmed that the final data would be transmitted to the modelling team by the end of February to be further processed for the model calibration. The modelling team acknowledged that there was no issue in data transfers, but that the integration of all this information was very intensive and required a lot of work which will span over several months. Since model testing and calibration is an iterative process, the ApisRAM team cannot guarantee all datasets will be integrated into the model by the deadline of the EFSA procurement on the model development. Towards the end of the meeting, publication of the work was discussed briefly. The contractor listed some topics related to some technical aspects of the project (waggle dance and bee counters, protocols fine-tuning, population assessments) relevant for scientific publications. The Steering Committee offered support (bee counters) and EFSA proposed the drafting of a more conceptual paper linking all MUST-B activities when the project is finalised. This will first be further discussed within the next MUST-B WG.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

MUST-B WG: 9-10 March 2021



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 45<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 29-30 September 2020

(Agreed on 08 October 2020)

#### Participants

**n Working Group Members:**

Simon More  
Gérard Arnold  
Simone Tosi

**n Hearing Experts<sup>1</sup>:**

Chris Topping

**n European Commission and/or Member States representatives:**

Not Applicable

**n EFSA:**

SCER Unit: Agnes Rortais and Jean-Lou Dorne (for agenda items 8-9)  
Pesticides Unit: Csaba Szentes and Domenica Auteri (for agenda item 8)  
ENCO Unit: Stephen Pagani  
COM Unit: Giorgia Zamariola (for agenda item 4)

**n Others:**

NA

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 44<sup>th</sup> Working Group meeting held on 13-14 July 2020, Parma

The minutes of the 44<sup>th</sup> Working Group meeting were agreed by written procedure on 24 July 2020.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

This meeting was dedicated to the revision of the scientific opinion following the comments made by the Scientific Committee, the PPR Panel experts and EFSA staff from SCER and PREV units. A summary table was made to aggregate all issues and comments. On the first day, the working group went through this table discussing all issues raised and the way forward. Action points were identified for each expert of the working group. On the second day a discussion was organised with two EFSA staff from the PREV unit to revise section 2 of the opinion as agreed with the Scientific Committee upon their first reading of the opinion, on the current risk assessment of single plant protection products in the context of the revision of the bee Guidance Document. The working group discussed further the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



pending issues from the table that were not discussed on the first day and on terminologies. Some additional definitions were provided (e.g. on cumulative vs. combined exposures) and a new section was included on the multiple routes of exposure through which bees might be exposed. Finally, the structure of the opinion was extensively revised, merging some sections where information was repeated in several sections of the document (e.g. on chemical mixtures). A new version of the opinion will be sent to the Scientific Committee by the end of October for endorsement for public consultation (December 2020 until January 2021) at the next Plenary meeting in November 2020.

## 7. Any Other Business

None.

## 8. Next meeting

9 (9-18h, CET) and 10 (9-18h, CET) March 2021



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)





SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 44<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 13-14 July 2020  
(Agreed on 24 July 2020)

#### Participants

Working Group Members:

Simon MORE

Gérard ARNOLD

Simone TOSI

Hearing Experts<sup>1</sup>:

Chris TOPPING

EFSA:

SCER Unit: Agnes RORTAIS and Jean-Lou Dorne

COM Unit : Domagoj VRBOS and Giorgia ZAMARIOLA

PREV : Csaba Szentes

ENCO Unit : Stephen Pagani

#### 1. Welcome and apologies for absence

The Chair welcomed the participants.

#### 2. Adoption of agenda

The agenda was adopted without changes.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the MUST B and Bee Guidance revision Working Group members.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

### 4. Agreement of the minutes of the 43<sup>rd</sup> Working Group meeting held on 19 June 2020, Parma

The minutes of the 43<sup>rd</sup> Working Group meeting were agreed on 26 June April 2020.<sup>4</sup>

### 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

### 6. Scientific topics for discussion

On the first day, the working group reviewed the sections of the scientific opinion on the social science research, the applications of the systems-based approach, the end-users, the gaps and implementations, the conclusion and recommendations. On the second day, discussions were made on gaps and implementation in the area of data collection and sharing among stakeholders. Then, the first sections of the scientific opinion, including the abstract, summary, introduction, the current application of the environmental risk assessment of PPPs, the challenges and the systems-based approach including its core components were reviewed and validated. Last amendments on the summary and the section on the data collection and sharing will be made before the scientific opinion is sent to the scientific committee for a first reading in the September Plenary. The plan is to have the scientific opinion adopted by the Scientific Committee in the November Plenary to go for public consultation in December 2020 and January 2021.

### 7. Any Other Business

None.

### 8. Next meeting

MUSTB WG 45: 29-30 September 2020 (9-18h and 9-13h, CET)

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)  
[http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 43<sup>rd</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 19 June 2020

(Agreed on 26 June 2020)

#### Participants

- n Working Group Members:  
Simon MORE  
Gérard ARNOLD  
Simone TOSI
- n Hearing Experts<sup>1</sup>:  
Chris TOPPING
- n European Commission representatives:  
Not applicable
- n EFSA:  
SCER Unit: Agnes RORTAIS and Angelo MAGGIORE  
COM Unit : Domagoj VRBOS and Giorgia ZAMARIOLA
- n Others:  
Silvia Pieper and Annette Aldrich (PPR Panel)

#### 1. Welcome and apologies for absence

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



The Chair welcomed the participants. Apologies were received from Stephen PAGANI.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the MUST B and Bee Guidance revision Working Group members.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 42<sup>nd</sup> Working Group meeting held on 18 June 2020, Parma

The minutes of the 42<sup>nd</sup> Working Group meeting were agreed on 25 June April 2020.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

This meeting was the occasion to discuss with two invited experts from the PPR Panel the usefulness and implementations needed on the approach developed in the scientific opinion. A set of questions prepared ahead of the meeting by MUST-B WG was sent to the experts with a background note providing information on the MUST-B project and approach developed in the scientific opinion. The experts were interviewed separately for 1h to share their view with the WG on the strengths, weaknesses, gaps and usefulness of the approach for all relevant stakeholders and for risk assessment purposes. The feedback from the 2 experts will be incorporated in the scientific opinion, in particular to fine tune the sections related to the application of the approach and its interactions with stakeholders.

## 7. Any Other Business

None.

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<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



## 8. Next meeting

MUSTB WG 44: 13-14 July 2020 (9-18h and 9-13h, CET)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>5</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 42<sup>nd</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 18 June 2020

(Agreed on 25 June 2020)

#### Participants

**n** Working Group Members:

Simon MORE

Gérard ARNOLD

Simone TOSI

**n** Hearing Experts<sup>1</sup>:

Chris TOPPING

**n** European Commission representatives:

Not applicable

**n** EFSA:

SCER Unit: Agnes RORTAIS

PREV Unit : Csaba SZENTES

ENCO Unit : Stephen PAGANI

COM Unit : Domagoj VRBOS and Giorgia ZAMARIOLA (for agenda item 6)

**n** Others:

EFSA "Social Research Methods and Advice" WG: Laura MAXIM (for agenda item 6)

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.





## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the MUST B and Bee Guidance revision Working Group members.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 41<sup>st</sup> Working Group meeting held on 9 June 2019, Parma

The minutes of the 41<sup>st</sup> Working Group meeting were agreed on 18 June April 2020.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

As a follow up of the joint meeting with the Bee GD Revision WG on 9 June, the working group agreed on the inclusion of additional description in the scientific opinion to make cross-references to the work of the Bee GD, highlighting the distinctions and complementarities of the two activities. The COM Unit and one expert from the "Social Research Methods and Advice (SRMA)" WG reported back to MUSTB WG the final results of the interviews made with members of the EU Bee Partnership and the results of the focus group research conducted with beekeepers in EU. This work will be further discussed and validated with the SRMA WG on 25 June, reported in the scientific opinion for final discussion with the MUSTB WG on 13-14 July, and presented to the SC Plenary in September. The working group acknowledged the usefulness of these results coming from the beekeeping sector, which will need to be well reflected in the opinion (i.e. on data standards/access/openness, stakeholder's engagement, surveillance/alert system, etc.). The remaining time of the meeting was dedicated to the revision of the first chapters of the scientific opinion (sections 1 to 4) with clarifications made on some terminologies (e.g. monitoring vs. surveillance). The remaining revisions in sections 5-7 will be made

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



by the next WG meeting and validated by the WG during this next meeting as well as the finalisation of the opinion to be sent to the SC in August for a first reading in September.

## 7. Any Other Business

None.

## 8. Next meeting

MUSTB WG 43: 19 June 2020 (14-17h, CET)

MUSTB WG 44: 13-14 July 2020 (9-18h and 9-13h, CET)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>5</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 41<sup>st</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 9 June 2020

(Agreed on 18 June 2020)

#### Participants

**n Working Group Members:**

Simon MORE

Gérard ARNOLD

Simone TOSI

**n Hearing Experts<sup>1</sup>:**

Chris TOPPING

**n European Commission representatives:**

Sofie HOFKENS and Claudia KOREIMANN OZKAN

**n EFSA:**

SCER Unit: Agnes Rortais

PREV Unit : Domenica AUTERI (Chair), Alessio IPPOLITO, Csaba SZENTES, Monica DEL AGUILA, Marco MARCHESI, Laura PADOVANI, Franco FERILLI, Jacoba WASSENBERG

AMU Unit: Irene MUNOZ GUAJARDO and Franco Maria NERI

ENCO Unit : Stephen Pagani

COM Unit : Simon Terry

**n Others:**

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



ECHA representatives (observers): Simon GUTIERREZ, Adriana LIPKOVA

Bee Guidance Revision WG (invited for this joint meeting): Paulien ADRIAANSE, Andres ARCE, Brecht INGELS (hearing), Daniela JOLLI, Sebastien LAMBIN, Maj RUNDOLF, Dirk SUESSENBACH

## 1. Welcome and apologies for absence

The Chair welcomed the participants, the participants briefly introduced themselves. Angelo Maggiore did not participate in the meeting.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the MUST B and Bee Guidance revision Working Group members.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

Oral Declaration(s) of Interest were asked at the beginning of the meeting and no additional interest was declared.

## 4. Agreement of the minutes of the 40<sup>th</sup> Working Group meeting held on 15-16 April 2019, Parma

The minutes of the 40<sup>th</sup> Working Group meeting were agreed by written procedure on 28 April 2020.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

The two working groups informed each other on their activities. Some overlapping issues, but also major differences were identified. The collaboration of these two working groups is beneficial to maximize the synergism between the two projects and align communication. The EC mandate on the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



revision of the Bee GD falls under the 1107/2009 regulatory framework and focuses on the premarketing of pesticides (one-by-one assessments) and assessments in the three bee types, while the EP mandate on the MUST-B scientific opinion focuses on multiple stressors in honey bees. Potential common areas are sublethal effects and population models. As regards the opportunities to maximise long-term impacts of the two projects, it was agreed that there could be further discussions with DG-Santé when both projects are finalised.

## 7. Any Other Business

None.

## 8. Next meeting

MUSTB WG 42: 18 June 2020 (13-17h, CET)

MUSTB WG 43: 19 June 2020 (14-17h, CET)

MUSTB WG 44: 13-14 July 2020 (9-18h and 9-13h, CET)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

In the Annual Declaration of Interest submitted by Dr Brecht Ingels, the following interest has been declared: membership of the ICPPR Bee Protection Group, CANADA, Guelph. In accordance with EFSA's Policy on Independence<sup>5</sup> and the Decision of the Executive Director on Competing Interest Management<sup>6</sup>, and taking into account the specific matters discussed at the meeting in question, the interest above was deemed to represent a Conflict of Interest.

Therefore, his participation in the meeting was limited to providing testimony, without the possibility to take on any role undertaken by members of the Working Group (i.e. not possible to draft or be involved in the discussion or the adoption of a scientific output).

<sup>5</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 40<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

Teleconference held on 17<sup>th</sup> April 2020  
(Agreed on 28 April 2020)

#### Participants

§ Working Group Members:

Simon More

Gérard Arnold

§ Hearing Experts<sup>1</sup>:

Chris Topping, Aarhus University

Xiadong Duan, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter"

§ European Commission and/or Member States representatives:

Not Applicable

§ EFSA:

SCER Unit: Angelo Maggiore and Agnès Rortais

PRAS Unit: Csaba Szentes

AMU Unit: Federica Barrucci

§ Others:

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.





Not applicable

## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 39<sup>th</sup> Working Group meeting held on 15-16 April 2020, Parma.**

The minutes of the 39<sup>th</sup> Working Group meeting held on 15-16 April 2020 were agreed by written procedure on 28 April 2020.<sup>4</sup>

## **5. Hearing experts**

Prof. Chris Topping, Dr. Xiadong Duan and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; Xiadong Duan is involved in the development of the formal model; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>



## 6. Scientific topics for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the progress in the development of the formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios.

The status of the code implementation for each of the model modules and the work to be done prior to project end were described.

In particular, the discussion was focused on the modelling of water consumption/use by the bees. Synergy with the working group involved in the revision of the Guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees) was recognised and alignment was recommended.

One of the aspects to consider when modelling foraging for pollen is pollen quality. However, criteria for defining quality for pollen are still controversial and need to be further investigated.

A range of sublethal effects are being considered by the model. They include reproductive performance of queens, hypo-pharyngeal gland development and effects on homing ability.

It was agreed to include a representation of the spray drift process, applied to a mixture of two pesticides.

New approaches for the modelling of bee dance communication of quality and quantity of pollen/nectar resources in the landscape was described.

A bee 'vitality' index linking effects of biological agents, pesticides, temperature and quality/quantity of food resources to individual bee performance and lifespan was presented. By combining these stressors through the vitality parameter, the feedback between stressors can be mechanistically modelled.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

§ MUSTB WG 10: 18 (13-17h, CET) June 2020, TC



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 39<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 15-16 April 2020

(Agreed on 28 April 2020)

#### Participants

**n** Working Group Members:

Simon More

Gérard Arnold

Simone Tosi

**n** Hearing Experts<sup>1</sup>:

Chris Topping

**n** European Commission and/or Member States representatives:

Not Applicable

**n** EFSA:

SCER Unit: Agnes Rortais, Jean-Lou Dorne, Angelo Maggiore

Pesticides Unit : Csaba Szentes

COM Unit : Domagoj Vrbos, Stephen Pagani, Simon Terry (for Day 2, agenda item 9)

**n** Others:

NA

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 38<sup>th</sup> Working Group meeting held on 17-18 February 2019, Parma

The minutes of the 38<sup>th</sup> Working Group meeting were agreed by written procedure on 28 February 2020.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

The progress made by the working group on the scientific opinion, in particular the presentation of the challenges faced, and the approach taken to assess multiple stressors in bees, was reported to the 97<sup>th</sup> SC Plenary (17-19 February 2020). The chair provided to the working group an overview of the feedback received by the SC. The chair also clarified that the scientific opinion under development is a reflection paper, meaning that it is not a prescriptive document since there are still unresolved issues. It is a proposal to move forward in the near future with an approach and methodology to address the challenges in a more holistic and integrated manner. This was clarified in the interpretation

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



of the terms of reference of the opinion. It was also highlighted that unresolved issues should be clearly defined in the opinion.

EFSA re-clarified the timeline and discussed with the working group on the possibility of launching a consultation with risk assessors (RA) and risk managers (RM) before the scientific opinion is adopted by the SC for public consultation. The working group concluded that such a consultation (with RA and RM) would not be feasible given the limited time, but better placed for after endorsement by the SC for publication, i.e. beyond June 2021. However, for the purpose of this opinion, the working group still expressed the need for a quality check with RA on the scientific approach developed to assess multiple stressors. Therefore, EFSA proposed to invite two RA experts from the ESFA PPR Panel, with knowledge in environmental risk assessment, to discuss with the working group the approach taken. EFSA will proceed with the organisation of such a discussion in June 2020.

After this introductory overview, the working group revised the structure of the opinion to better reflect on the core components (monitoring-modelling) of the system approach from application (how the monitoring-modelling may be used) and interacting components (users and data/information flows). In the description of the core components, the working group mentioned the key role of quality control for the monitoring system. The working group also discussed extensively the integration of the MIXTOX framework for the risk assessment of chemical mixtures in the system approach and the still need for a common currency to address multiple stressors other than chemicals (e.g. biological agents, nutrition, etc.). It was highlighted that sublethal effects that are currently implemented in ApisRAM with some specific endpoints could be further expanded in this opinion to fully address ToR2.

On the second day, the working group discussed in detail the interacting components, i.e. the various applications and users of the system approach (e.g. for EU Bee Partnership, EU MS, RA, EP, EC, RM, policy makers and researchers). The Social Research Methods and Advice working group provided an overview of the progress made both on the focus group research with beekeepers and the interviews with the EU Bee Partnership members. The preliminary results show beekeepers perceptions on the ambition of the approach developed by MUSTB and their involvement in the EU research agenda, among others. The summary results from social research results will be included in the opinion and presented to the SC in September. The working group acknowledged the added value of this work in the opinion. The next working group meeting will be the opportunity to use the feedback from the beekeepers and the EUBP to complete the description of the interacting components of the system approach and make conclusions and recommendations on the proposed approach.

## 7. Any Other Business

None.

## 8. Next meeting

MUSTB WG 10: 9 June 2020, TC (time tbc)



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 38<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

Held on 17-18 February 2020, Parma

(Agreed on 28 February 2020)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais, Jean-Lou Dorne, Angelo Maggiore

Pesticides Unit : Csaba Szentes

COM Unit : Domagoj Vrbos

Others:

NA

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 37<sup>th</sup> Working Group meeting held on 18 December 2019, Parma

The minutes of the 37<sup>th</sup> Working Group meeting were agreed by written procedure on 20 December 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the systems approach developed, in particular, in relation to the ApisRAM modelling and monitoring components of the system.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

The working group was informed about the inclusion of a public consultation on the draft scientific opinion towards the end of the year 2020 and the need for a re-arrangement of the workplan in 2020/2021. New meeting dates in 2020, for both the work of the working group and the reporting to the scientific committee (SC), were agreed. The workplan for 2021 will be refined when the dates of the SC meetings are communicated. Then, the first impressions from the social research conducted in 8 EU Member States were presented by COM Unit, with the objective of receiving the views of the beekeepers on the holistic approach developed under MUSTB. Also, an overview of the timeline of the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>





delivery of this work to both the MUSTB working group and the SC, as well as the work to be conducted with the EU Bee Partnership, EUBP (i.e. interviews with members of the EUBP to enhance harmonised data sharing processes) was provided. The results of work will be included in the scientific opinion, the table of content was updated accordingly. In addition, the sections related to the challenges was simplified into two main subsections (i.e. complexity of the environment and complexity of the honey bee colony). All previous information (landscape, genetics, multiple stressors, colony dynamics, sublethal effects, etc.) was merged under these 2 subsections. A way forward on the risk assessment of multiple chemicals was suggested to support the development of the chemical module developed under the ApisRAM model that needs to consider exposure of a honey bee colony to a minimum of 2 chemicals. Then, the working group reviewed and amended the scientific opinion, in particular the section related to the introduction, the terms of reference and the clarification on the terms of reference (section 1); the section related to the vision (section 2 becoming section 3) was moved after the section related to the challenges (section 3 becoming section 2); the heading “Vision” was changed into “Proposal for a holistic risk assessment approach of multiple stressors in honey bee colonies”. The figure illustrating the holistic approach was re-discussed and it was agreed that more discussion with risk assessors and risk managers would be needed to come up with a better defined process of the systems approach. It was agreed to organise a discussion with those end-users to ensure that the method developed by the working group is fit for purpose. The working group will refine the holistic risk assessment approach *per se* at the next working group meeting in April.

## 7. Any Other Business

None.

## 8. Next meeting

MUSTB WG 8: 15 (9-18h, CET) and 16 (9-18h, CET) April 2020, Parma



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)  
<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

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## Scientific Committee

### Minutes of the 37<sup>th</sup> meeting of the Working Group on MUST-B

Teleconference held on 18<sup>th</sup> December 2019, Parma  
(Agreed on 20 December 2019)

#### Participants

- **Working Group Members:**

Simon More (chair)

Gérard Arnold

- **Hearing Experts<sup>1</sup>:**

Chris Topping, Aarhus University

Flemming Skov, Aarhus University

Xiadong Duan, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter"

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais

PRAS Unit: Csaba Szentes

- **Others:**

Not applicable

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 36<sup>th</sup> Working Group meeting held on 16 December 2019, Parma.**

The minutes of the 36<sup>th</sup> Working Group meeting held on 16 December 2019 were agreed by written procedure on XX December 2019.<sup>4</sup>

## **5. Hearing experts**

Prof. Chris Topping, Dr. Xiadong Duan, Dr. Flemming Skov and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; Xiadong Duan is involved in the development of the formal model; Flemming Skov in the development of a GIS for spatially explicit modelling; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

## 6. Scientific topics for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the progress in the development of the formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios.

The attention was focused on the status of the code implementation for each of the model modules and the work to be done prior to project end, including timelines for having a first complete model to run.

The ApisRAM project was put in the context of the other EFSA activities on bee health, in particular: the Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*) and the research project on field data collection for honey bee colony model evaluation (OC/EFSA/SCER/2017/02).

A new approach for the mathematical modelling of the temperature distribution in the hive, based on convolutional operations, was explained.

The methodology to translate a time-variant pesticides body burden per individual bee into effects was described. The approach consists in attributing to each bee a basic mortality probability according to its age. This is increased by the amount of stress each bee experiences, due to high or low temperatures, food shortages, parasites, infections, pesticides, movement in long distances, and beekeeping practices (e.g. treatments). A random component is added conferring "stochasticity" to the process.

Regarding the Pesticides module, dynamic concentration maps are generated at the landscape level for soil, vegetation and seeds. User defined parameters are used to convert the pesticide concentration in the vegetations and seeds to nectar and pollen. EFSA will support the contractor in choosing an optimal modelling scheme for pesticides uptake from soil to plants. A Toxicokinetic-Toxicodynamic (TKTD) model for pesticides effects (lethal and sublethal effects) is also developed. A mixture of two pesticides is going to be initially considered. Their effects are assumed to be additive.

The model landscape generation relative to Denmark, Poland and Portugal has been finalised.

It was highlighted that ApisRAM is intended to predict the impacts of multiple stressors with the accuracy required for regulatory use. However,

reaching the required accuracy implies validating and revising the model using appropriate data. This is a lengthy and resource-intensive process.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

- 17 (9-18h, CET) and 18 (9-13h, CET) February 2020, Parma



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 36<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

TELE-conference, 16 December 2019

(Agreed on 7 January 2020)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Hearing Expert<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais

Pesticides Unit : Csaba Szentes

Others:

Marianne Bruus, Aarhus University, Denmark

Yoko Dupont, Aarhus University, Denmark

Per Kryger, Aarhus University, Denmark

Peter Borgen Sorensen, Aarhus University, Denmark

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.





Alice Pinto, Instituto Politécnico de Bragança, Portugal

José Paulo Sousa, University of Coimbra, Portugal

Nuno Capela, University of Coimbra, Portugal

## 1. Welcome and apologies for absence

The Chair welcomed the participants. Apologies were received from Silvia Castro and Beate Strandberg.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## 4. Agreement of the minutes of the 35<sup>th</sup> Working Group meeting held on 10-11 December 2019, Paris

The minutes of the 35<sup>th</sup> Working Group meeting were agreed by written procedure on 18 December 2019.<sup>4</sup>

## 5. Hearing Expert

Chris Topping was invited as the coordinator of the project on the "development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors" (ref. OC/EFSA/SCER/2016/03). The data collected under the procurement OC/EFSA/SCER/2017/02 is for the calibration and evaluation of the Apis-RAM model developed by C Topping. To ensure that the data collected is fit for purpose, C Topping's participation in the follow up of this project is key.

## 6. Scientific topics for discussion

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)



## 6.1. Field data collection to calibrate and validate Apis-RAM model (EFSA-Q-2016-00557)<sup>5</sup>

The contractor presented the work progress for the 1<sup>st</sup> year of data collection, i.e. all sub-work packages WP2 (2.1 Agricultural practices and land use, cover and structure; 2.2 Local weather and in-hive conditions; 2.3 Hive management and colony observations; 2.4 Identification and prevalence of infectious agents; 2.5 Experimental insecticide spraying and quantification of chemical residues in crops, bees and hives and 2.6 Sugar concentration in nectar and floral origin of pollen). WP2.7 on “Data collation and reporting” on the data submission to EFSA DCF (XML files) and the database will be discussed in a separate meeting in January with the project leader, the database developer and DATA Unit. Technical problems identified in the 1<sup>st</sup> data year were raised and discussed with MUSTB WG to identify solutions to be applied in the 2<sup>nd</sup> year. First, the restocking of the apiaries in Denmark (which have lost colonies in year 1) was discussed extensively. It was concluded that 5 colonies would be required at the start of the season for intensive monitoring, preferentially the strongest ones, and 2 additional colonies for less intensive monitoring. It was also decided that whenever this number (7 colonies in total) was not reached, new colonies (with different queen origin, but still closely related) would be added and part of the second set (less intensive monitoring). Some missing values due to the failure of some equipment (e.g. local weather stations and ApisTech scales) over short periods of time could be handled by the modelling team. The modelling team will receive from the contractor the raw data without extreme and aberrant values accompanied with a list of key events that occurred at given time (to enable the data correction). The Danish team will use the software developed by the Portuguese team to conduct automatic downloading of the data collected in the field (digital downloading in Excel files transferred to CSV format), reducing risks of errors due to manual data entering. The GIS expert from the modelling team will provide google maps including names of polygons to the Danish team to allow the mapping of the floral resources according to the ALMASS requirements (this information will allow the update of the maps made in year 1 and guide the data collection/reporting for year 2). Sensors to measure brood temperature were not found to be reliable (as the brood develops, sensors are moved). It was suggested to use several button loggers and to test the use of an infrared camera to measure the temperature (without opening the hive). The image analysis software (DeepBee®) used by the Portuguese team to assess bee population and stored food (eggs, larvae, capped brood, pollen, nectar, honey, empty cells) needs to be trained with images coming from Denmark to increase recognition level (for the moment the software makes 5-8% and 20% errors for pollen and larvae identification). The contractor will report to EFSA the progress made in this area in early 2020. The software developed for the video recording of the forager (in and out fluxes) is very accurate. Some technical issues related to the observation hives were identified (e.g. bees not seen dancing), but the protocol will be maintained in year 2 to provide information on foraging, complementing the pollen analysis. An extensive discussion was made on the spraying experiment. In particular, options were made to reduce the risk of losing (weak) colonies due to sampling (for chemical residue analysis). It was concluded that a decision would be made later, closer to the time of the spraying experiment (in March 2020), depending on the state of the colonies. However, it was agreed that the sampling protocol should remain the same as defined by EFSA (before spraying and 4 times after spraying) and only the number of colonies monitored could be reduced from 5 to 4 or 3 to avoid losing the weak colonies, if any. Towards the end of year 2, data will be provided to the modelling team as soon as they come in for the validation of ApisRAM. Publication and data sharing were discussed, and it was agreed that as a first step, a methodological paper could be drafted in collaboration with the ApisRAM team and EFSA. This item will be re-discussed in early 2020, when the full dataset of the 1<sup>st</sup> year is made available to EFSA.

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00557>



## 7. Any Other Business

Not applicable

## 8. Next meeting

MUST-B WG: 17 (9-18h, CET) and 18 (9-13h, CET) February 2020, Parma

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SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 35<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

Held on 10- 11 December 2019, Paris

(Agreed on 18 December 2019)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais

Others:

NA

#### 1. Welcome and apologies for absence

The Chair welcomed the participants. Apologies were received from James Cresswell.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 34<sup>th</sup> Working Group meeting held on 6-7 November 2019, Parma

The minutes of the 34<sup>th</sup> Working Group meeting were agreed by written procedure on 15 November 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on the risk assessment process foreseen under the MUSTB vision.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

The working group discussed extensively the new drafted sections of the scientific opinion, in particular the sections related to the vision, the potential influence of honey bee genetics on the risk assessment outcome, the description of the agent based model ApisRAM, the addition of a new section to include a framework for the risk assessment of chemical mixtures in honey bee colonies, the data requirements for the model at the landscape and colony levels, the structure of the section related to the monitoring of sentinel hives with digital tools, the support from key stakeholders and the input from science base knowledge, and the benefits of the whole ecotoxicology system approach proposed under MUST-B. Significant amendments and editing were proposed for each of these sections to be addressed by the working group members by the next meeting in February. All meeting dates to be scheduled in 2020 were confirmed by the working group. It was noted that the EFSA communication department will provide support to the working group on the design of some illustrations of the scientific opinion, in particular for the vision and the decision-making system proposed under the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



ecotoxicology systems approach proposed by MUSTB. It is anticipated that the latter is presented for information at the next Scientific Committee Plenary in February 2020.

## 7. Any Other Business

James Cresswell resigned from the MUST-B WG via written procedure.

## 8. Next meeting

TC for OC/EFSA/2017/02: 16 December 2019 (13-16h30, CET), TELE-conference meeting

TC for OC/EFSA/2016/03: 18 December 2019 (14h30-16h30, CET), TELE-conference meeting

MUSTB WG: 17 (9-18h, CET) and 18 (9-13h, CET) February 2020, Parma



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)  
<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



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SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 34<sup>th</sup> MEETING OF THE WORKING GROUP ON MUST-B

Held on 6-7 November 2019, Brussels

(Agreed on 15 November 2019)

#### Participants

**n Working Group Members:**

Simon More  
Gérard Arnold  
James Cresswell  
Simone Tosi

**n Hearing Experts<sup>1</sup>:**

Chris Topping

**n European Commission and/or Member States representatives:**

Not Applicable

**n EFSA:**

SCER Unit: Agnes Rortais, Jean-Lou Dorne and Jose Tarazona and (for agenda items 8-9), Tobin Robinson and Ana Afonso (for agenda item 10)

COM Unit: Domagoj Vrbos (agenda item 10) and Simon Terry (agenda item 10 & 15-16)

**n Others:**

Social Research Methods and Advice WG : Laura Maxim, Mario Mazzocchi, Fabiana Zollo (Members) ; Stephan Van den Broucke (Hearing expert) (for agenda item 10)

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 33<sup>rd</sup> Working Group meeting held on 4-5 September 2019, Parma

The minutes of the 33<sup>rd</sup> Working Group meeting were agreed by written procedure on 12 September 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on agenda item 5 on the "structure of the opinion", on agenda item 6 on the "vision" and on agenda items 13 and 14 on the implementation of the vision by modelling approach and input from scientific knowledge.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

The working group consolidated the table of content of the scientific opinion, in particular, the working group by re-organised the section related to the implementation of the MUSTB vision comprising input from modelling, monitoring, risk assessment, science base and stakeholders. The recommendations

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



section was structured to mirror the structure of the section related to the implementation of the vision. The figures for the illustration of the vision and challenges were refined and will be updated by the next meeting. The work of the SCER Unit on the development of a framework for the risk assessment of chemical mixtures following the EFSA Guidance Document was presented to the working group for implementation and agreement. This work will be published as an EFSA technical report by December 2019 or January 2020 and used as a reference in the scientific opinion to describe the future modelling development foreseen under the MUSTB vision on the integration of multiple chemicals. Further, the working group discussed the drafting of a review paper within the MUSTB WG on bee co-exposure to be also used in the scientific opinion in the section dealing with the challenges faced when assessing the risks posed to honey bee colonies. Towards the end of the first day, a joint session was organised with the “EFSA Social Research Methods and Advice” working group to discuss their input into the scientific opinion, in particular on the societal perspectives from the beekeepers on the proposed vision. Their input was also sought regarding the third term of reference of the mandate on the support to be provided to the EU Bee Partnership to collect and share harmonised data across EU for sustainable bee health and beekeeping. The two working groups exchanged their views on the survey design and questionnaire prepared for beekeepers. Some thorough discussion happened on the role of beekeepers in the prioritisation of research topics which would provide benefits to both bees and beekeepers. The second day was dedicated to further discussion on the section dealing with the implementation of the vision, in particular regarding modelling and monitoring. New action points were allocated for the next meeting and all working group meeting dates (i.e. until the end of the mandate) were confirmed by the members of the working group.

## 7. Any Other Business

### 7.1. Not Applicable

## 8. Next meeting

10 (9-18h) and 1 (9-13h) December 2019, Paris

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## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 33<sup>rd</sup> MEETING OF THE WORKING GROUP ON MUST-B

Held on 4-5 September 2019, Brussels

(Agreed on 12 September 2019)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

James Cresswell

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping (via TC)

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais, Angelo Maggiore and Jean-Lou Dorne (via TC for agenda items 8, 14 & 15)

COM Unit: Domagoj Vrbos (via TC for agenda item 5)

Others:

NA

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 32<sup>nd</sup> Working Group meeting held on 4 July 2019, Parma

The minutes of the 32<sup>nd</sup> Working Group meeting were agreed by written procedure on 12 July 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to share his views on agenda item 8 "IBM pros and cons".

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*)<sup>5</sup>

At the start of the meeting, an overview of the list of action points from the last meeting was provided to check the pending items that need to be addressed by the next WG meeting in November. Thereafter, EFSA COM Unit presented the progress made by the "social research methods and advice" working group (WG) on the inclusion of the beekeepers' perspective (views and perceptions) into the scientific opinion. For this work, focus groups with beekeepers will be set up by EFSA in a few selected EU Member States (maximum of 7-8) to inform a quantitative questionnaire (survey). The MUST-B WG was consulted and agreed on the criteria and selection. The MUST-B WG will prepare background documents for the focus groups that should start in October and the EFSA social science team will provide the results of this survey early 2020 to be further processed by the MUST-B WG. In the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf>

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



remaining time of the first day of the meeting, the WG reviewed the different sections of the scientific opinion as well as the table of content. On the 2nd day, the WG discussed thoroughly (i) the pros and cons of IBM approaches following a SWOT analysis, (ii) the usefulness of the risk assessment approach developed under the EFSA Guidance Document on chemical mixtures and (iii) the inclusion of a review on co-exposures in bees (based on the ANSES report published in 2015). In dialogue with C Topping, the swot analysis was reviewed by the WG and will be included in the scientific opinion whereas the methodology developed for chemical mixtures cannot be full transferred to the multiple stressors (and holistic approach) developed by the WG and therefore need to be carefully considered, i.e. more specifically as a support to the modelling approach at higher tiers. Regarding co-exposures, the WG will prepare an updated review on this topic within the next months. The next meeting on 6-7 November in Parma was confirmed and the following one in December in Paris, back to back with the ANSES conference on bee health, need to be confirmed.

## 7. Any Other Business

### 7.1. Not Applicable

## 8. Next meeting

6 (9-18h) and 7 (9-13h) November 2019, Parma

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## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)





SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 32<sup>nd</sup> MEETING OF THE WORKING GROUP ON MUST-B

Held on 4 July (afternoon), Parma

(Agreed on 12 July 2019)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais

Pesticides Unit: Csaba Szentes

Others:

Marianne Bruus, Aarhus University

Yoko Dupont, Aarhus University

Per Kryger, Aarhus University

Alice Pinto, Instituto Politécnico de Bragança, Portugal

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



José Paulo Sousa, University of Coimbra, Portugal

Nuno Capela, University of Coimbra, Portugal

## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## 4. Agreement of the minutes of the 31<sup>st</sup> Working Group meeting held on 4 July (morning) 2019, Parma

The minutes of the 31<sup>st</sup> Working Group meeting were agreed by written procedure on 11 July 2019.<sup>4</sup>

## 5. Hearing Expert

Chris Topping was invited as the coordinator of the project on the "development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors" (ref. OC/EFSA/SCER/2016/03). The data collected under the procurement OC/EFSA/SCER/2017/02 is for the calibration and evaluation of the Apis-RAM model developed by C Topping. To ensure that the data collected is fit for purpose, C Topping's participation in the follow up of this project is key.

### 5.1. Field data collection to calibrate and validate Apis-RAM model (EFSA-Q-2016-00557)<sup>5</sup>

The contractor presented the progress to date on the second specific contract of the "research project on the field data collection for honey bee colony model evaluation" (OC/EFSA/SCER/2017/02). In particular, critical issues related to work package (WP) 2.3 hive management and colony observations" and WP 2.5 "experimental insecticide spraying and quantification of chemical residues

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf>

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00557>



in crops, bees and hives” were presented to MUST-B and EFSA to seek for advice. In relation to WP 2.3, some colonies in Denmark were lost (and replaced by the backups) due to extreme weather conditions (both before and during wintering 2018/19) and most surviving ones are still weak, possibly due to Sacbrood infections. The plan is to maintain, as long as possible, those colonies alive for the model calibration (to keep collecting data from the same colonies) and replace only those which will not survive until next spring by other colonies (i.e. not sister-queen related). Given the importance of this virus in the colony development, the team developing ApisRAM will look at the possibility of considering the Sacbrood virus in the model. Honey robbing was spotted in one observation hive and preventive measures are used in all apiaries to avoid this behaviour, in particular during the critical period (end of summer). Honey robbing can be identified by the rapid gain/loss of weights of the experimental colonies placed on scales. In Portugal, despite regular checks, a few colonies swarmed (with substituted queens, but still sister-queen related); this is a known tendency in *A. m. iberiensis*. Swarming is not a good beekeeping practice and C Topping confirmed that it is not of interest for ApisRAM. Therefore, the Portuguese team will increase visits and controls during the swarming period to remove queen cells and avoid swarming. The problems linked to the use of the scales (battery, software, timing for measures) were solved, but those resulted in some data gaps. Such technical issues related to the data formatting and database will be discussed with EFSA (DATA Unit), Y Dupont (the leader of the project) and J. Axelsen (the database manager of the project) in another TC scheduled on 9 July 2019. Finally, regarding WP 2.5, spraying with Pirimicarb could only be conducted at the Western sites in Denmark due to inappropriate conditions at the Eastern sites (wet and cold weather; bees not foraging and colonies very weak). The strategy for the spraying experiment in 2020 was discussed extensively with MUSTB (i.e. pesticide to be used, e.g. with lower repellence, pesticides authorisation, manual removal of foragers to mimic foragers’ mortality, frequency and timing of sampling residues in bees). It was concluded that EFSA would re-assess the usefulness of pirimicarb and consider the residue data collected at the Western sites to make a final decision on the design of the spraying experiment for 2020. EFSA will liaise with the contractor on those issues in the coming weeks and another TC meeting will be organised in December (date yet to be confirmed) to report on the progress made in the 1<sup>st</sup> year of data collection.

## 6. Any Other Business

### 6.1. Not Applicable

## 7. Next meeting

(OC/EFSA/SCER/2017/02): 16 Dec. 2019 (14-17h30)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 31st MEETING OF THE WORKING GROUP ON MUST-B

Held on 4 July (morning), Parma

(Agreed on 11 July 2019)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

James Cresswell

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais, Angelo Maggiore (via TC) for agenda item 7

Others:

Pesticides Unit: Csaba Szentes

#### 1. Welcome and apologies for absence

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted with changes (after agenda item 3, an overview of the status of the action points from the previous WG meeting was presented; within agenda item 6 section 3 on risk assessment, a draft figure showing looping effects leading to winter colony mortalities was discussed).

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 30th Working Group meeting held on 17-18 June 2019, Parma

The minutes of the 30<sup>th</sup> Working Group meeting were agreed by written procedure on 26 June 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to present his views on agenda item 4 "List of EU projects selected by experts and recommendations" and on the landscape modelling approach in RA for the purpose of this scientific opinion.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera*)<sup>5</sup>

At the start of the meeting, an overview of the list of action points from the last meeting was provided to check the pending items that need to be addressed by the next WG meeting in September. Thereafter, the working group reviewed the section of the scientific opinion on "harmonised data collection". A selection of EU projects that were relevant for the scientific opinion was made, with a total of 11 H2020 projects comprising 2 feasibility studies. For the moment being, a special focus was

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf>

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



made on some projects (PoshBee, B-GOOD and Ecostack) that are closely monitored by EFSA (which is in the steering committees of these consortium). For the other projects selected by the WG, EFSA will try to get more information and data for further analysis by the WG. The working group re-discussed the section related to the vision which needs further development and to be focused. From the previous meeting, the section on risk assessment was extensively reviewed to include all aspects related to the complexity of the system (i.e. the landscape, the exposure to multiple stressors, the colony behaving like a superorganism, the sublethal effects and the bee genetics) and the knowledge gaps. To illustrate such complexity, a figure was made to show the snowball effect within the colony leading to colony failure (via a series of intoxication/infestation/chilling loops) and discussed with the working group for further implementation. The section related to the modelling approach and the description of ApisRAM was implemented and will be reviewed by all the working group by the next meeting. Finally, the working group suggested the re-structuring of the section on harmonised data collection with a better correspondence with the section on the vision. This will be achieved and re-discussed at the next working group meeting.

## 7. Any Other Business

### 7.1. Not Applicable

## 8. Next meeting

4 (9-18h) and 5 (9-13h) September 2019, Brussels

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## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 30<sup>TH</sup> MEETING OF THE WORKING GROUP ON THE SCIENCE BEHIND THE DEVELOPMENT OF AN INTEGRATED HOLISTIC APPROACH FOR THE RISK ASSESSMENT OF MULTIPLE STRESSORS IN MANAGED HONEY BEES (*Apis mellifera*)

Held on 17-18 June, Parma

(Agreed on 26 June 2019)

#### Participants

##### Working Group Members:

Simon More

Gérard Arnold

James Cresswell

Simone Tosi

##### Hearing Experts<sup>1</sup>:

Chris Topping

##### European Commission and/or Member States representatives:

Not Applicable

##### EFSA:

SCER Unit: Agnes Rortais, Jean-Lou Dorne, Angelo Maggiore

##### Others:

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.





Pesticides Unit: Csaba Szentes

## 1. Welcome and apologies for absence

The Chair welcomed the participants.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest and for conflicts of interest identified therein, please refer to Annex I.

## 4. Agreement of the minutes of the 29th Working Group meeting held on 25-26 April 2019, Parma

The minutes of the 29<sup>th</sup> Working Group meeting were agreed by written procedure on 6 May 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to present his views, in particular on item 5 Risk assessment: challenges and holistic approach" and item 10 "Vision" of the present meeting.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera*)<sup>5</sup>

The working group reviewed the list of content of the scientific opinion, the first section on the introduction comprising the background, the terms of reference, the terminology and the clarifications of the terms of reference. The working group discussed extensively the chapter dealing with the vision on which to build the holistic and integrated approach for the risk assessment of multiple stressors in honey bees. In this section, further developments were suggested to include the complexity of the

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>  
<http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00358>



landscape, a review on sublethal effects, the influence of bee genetic diversity and an overview on bee stressors and other factors influencing the colony health. The working group also challenged the risk assessment approach to be developed considering the Guidance Document on chemical mixtures and taking into account the vision developed by the working group. It was agreed that the working group provides input in the drafting of the EFSA scientific report under development by SCER on “towards harmonised methodologies for the risk assessment of multiple stressors in bees” and that report would focus on laboratory data but be wider in scope (i.e. for bees, it would encompass honey bees, bumble bees and solitary bees). This report would be used further by the working group to form a basis for the development of the holistic risk assessment approach to be developed in the scientific opinion. The chapter describing the ApisRAM model was revised. A list of about 50 past and ongoing EU projects funded by the EC and related to bee health was prepared and will be screened by the working group to check their relevance for this mandate. The workplan and meeting dates until the end of the mandate were refined and agreed with members.

## 7. Any Other Business

### 7.1. Not Applicable

## 8. Next meeting

4 July (9-13h) 2019, TC

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## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

## SCIENTIFIC COMMITTEE /SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT

### MINUTES OF THE 29<sup>TH</sup> MEETING OF THE WORKING GROUP ON THE SCIENCE BEHIND THE DEVELOPMENT OF AN INTEGRATED HOLISTIC APPROACH FOR THE RISK ASSESSMENT OF MULTIPLE STRESSORS IN MANAGED HONEY BEES (*Apis mellifera*)

Held on 25-26 April, Brussels

(Agreed on 06 May 2019)

#### Participants

Working Group Members:

Simon More

Gérard Arnold

James Cresswell

Simone Tosi

Hearing Experts<sup>1</sup>:

Chris Topping

European Commission and/or Member States representatives:

Not Applicable

EFSA:

SCER Unit: Agnes Rortais, Jean-Lou Dorne

Others:

ENCO Unit: Stephen Pagani

COM Unit: Domagoj Vrbos

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## 1. Welcome and apologies for absence

The Chair welcomed the participants.

Apologies were received from Csaba Szentes.

## 2. Adoption of agenda

The agenda was adopted with changes (the minutes were not approved during the meeting but via written procedure).

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting.

For further details on the outcome of the screening of the Annual Declarations of Interest, as well as the Oral Declaration of Interest at the beginning of the meeting, and for conflicts of interest identified therein, please refer to Annexes I and II, respectively.

## 4. Agreement of the minutes of the 28th Working Group meeting held on 19 March 2019, Parma

The minutes of the 28th Working Group meeting were agreed by written procedure on 29 March 2019.<sup>4</sup>

## 5. Hearing Expert

Prof. Chris Topping was invited to present his views for item 7 – Landscape in RA of the present meeting.

## 6. Scientific topics for discussion

### 6.1. Scientific Opinion on the Science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera*)<sup>5</sup>

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)

<sup>4</sup> [www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf](http://www.efsa.europa.eu/sites/default/files/wgs/cross-cutting-science/scmustb.pdf)

<sup>5</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00645>



On the first day, background information was provided to the working group on the MUST-B project (objectives, achievements and next steps), the EU Bee Partnership (origin, terms of reference and future developments) and the importance of the context (landscape) in risk assessments. Thereafter, the terms of reference of the mandate were extensively discussed with the experts to reach a common understanding and decide on a structure for the scientific opinion. The working group proposed to address the terms of reference in 4 chapters. The first being dedicated to the introduction comprising the background, the description of the terms of reference, the interpretation of the terms of reference by the working group and clarifications on the terminology used in the mandate. The second chapter provides the vision on which the working group will build the holistic and integrated approach for the risk assessment of multiple stressors in honey bees. In this section, a societal perspective will be provided to examine the views and perceptions of the interested parties on the proposed approach through a targeted social research commissioned by EFSA. The latter will be supported by the Content and Social Science team in the Communication Engagement and Cooperation Department, working with external experts to frame the research. The first 2 terms of reference dealing with the development of a risk assessment methodology on multiple stressors will be described in chapter 3. The approach and knowledge gained from the recent EFSA Guidance Document on chemical mixtures will be used for the development of this chapter, but in accordance with the envisioned holistic and integrated approach described under chapter 2. The structure of this specific chapter will be further discussed in more depth at the next working group meeting in June. The third term of reference on harmonised data collection will be dealt in the context of the EU bee partnership, as specified in the mandate, and again to support the envisioned approach, which will make the work more focused and manageable. In this chapter, input from the social sciences is also envisaged to help collect views from members of the EU Bee Partnership on the factors surrounding the data sharing among stakeholders (motivation, perceived benefits etc.). For each chapter, the working group defined subheadings and assigned drafting tasks to each member of the working group to be finalised and reviewed by all one week before the next working group meeting scheduled on 17 and 18 of June 2019. Working group meeting dates were confirmed for both 2019 and 2020.

## 7. Any Other Business

### 7.1. Not Applicable

## 8. Next meeting

17 June (14-18h) & 18 June (9-18h) 2019, Parma



## Annex I

### Interests and actions resulting from the screening of Annual Declarations of Interest (ADoI)

**CONFLICT OF INTEREST WITH WAIVERS:** In the Annual Declaration of Interest filled by Dr Tosi the following interest has been declared: he has been previously employed with University of California (a non PI) a non-profit research and education university as a postdoctoral researcher; he is also a member of COLOSS (Prevention of honeybee Colony LOSSes, an International, non-profit association headquartered in Switzerland that is focussed on improving the well-being of bees at a global level), and coordinator of the COLOSS NUTRITION Task Force and of APIMONDIA (International Federation of Beekeepers' Association). These activities constitute a Conflict of Interest (CoI) with the mandate of the EFSA Working Group in hand. In accordance with EFSA's Policy on Independence<sup>6</sup> and the Decision of the Executive Director on Competing Interest Management<sup>7</sup>, and taking into account the specific matters discussed at the meeting in question, a waiver was granted in accordance with Article 21 of the Decision of the Executive Director on Competing Interest Management.

Pursuant to Article 21(6) of the above-mentioned Decision, the concerned expert was allowed to take part in the discussion and in the drafting phase of the EFSA Scientific Report on the Science behind the development of an integrated approach for the risk assessment of multiple stressors in managed honeybees (*Apis mellifera* spp.), and has not been allowed to be, or act as, a chairman, a vice-chairman or rapporteur of the Working Group.

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<sup>6</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>7</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)



## Annex II

### Interests and actions resulting from the Oral Declaration of Interest done at the beginning of the meeting

**NO CONFLICT:** With regard to this meeting, Dr Simone Tosi declared the following interest: he has been selected to act as an expert scientist in the “European Innovation Partnership for Agricultural productivity and Sustainability (EIP-AGRI) Focus Group on Bee Health and Sustainable beekeeping” for a duration of 1 year starting in May 2019. In accordance with EFSA’s Policy on Independence<sup>8</sup> and the Decision of the Executive Director on Competing Interest Management<sup>9</sup>, and taking into account the specific matters discussed at the meeting in question, the interest above was not deemed to represent a Conflict of Interest for the expert concerned.

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<sup>8</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>9</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/competing_interest_management_17.pdf)





## SCIENTIFIC COMMITTEE

### MINUTES OF THE 28<sup>TH</sup> MEETING OF THE WORKING GROUP ON MUST-B

**Held on 19<sup>th</sup> March 2019, Parma  
(Agreed on 29 March 2019)**

#### Participants

**n Working Group Members:**

Simon More (chair)

Gérard Arnold has participated via teleconference

**n Hearing Experts<sup>1</sup>:**

Chris Topping, Aarhus University

Flemming Skov, Aarhus University

David Wallis, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter" has participated via teleconference

**n European Commission and/or Member States representatives:**

Not Applicable

**n EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais

PRAS Unit: Csaba Szentes

AMU Unit: Federica Barrucci

**n Others:**

Not Applicable

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director concerning the selection of members of the Scientific Committee, the Scientific Panels, and the selection of external experts to assist EFSA with its scientific work:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## 1. Welcome and apologies for absence

The Chair welcomed the participants. No apologies were received.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence<sup>2</sup> and the Decision of the Executive Director on Competing Interest Management<sup>3</sup>, EFSA screened the Annual Declarations of Interest filled out by the Working Group members invited to the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process, and no interests were declared orally by the members at the beginning of this meeting.

## 4. Agreement of the minutes of the 27th Working Group meeting held on 22 January 2019, Coimbra, Portugal.

The minutes of the 27<sup>th</sup> Working Group meeting held on 22 January 2019 were agreed by written procedure on 11 February 2019.<sup>4</sup>

## 5. Hearing Experts

Prof. Chris Topping, Dr. David Wallis, Dr. Flemming Skov and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; David Wallis is involved in the development of the formal and computer model and Python interface; Flemming Skov in the development of a GIS for spatially explicit modelling; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

## 6. Scientific topics for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios.

<sup>2</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/policy\\_independence.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/policy_independence.pdf)

<sup>3</sup> [http://www.efsa.europa.eu/sites/default/files/corporate\\_publications/files/sites/competing\\_interest\\_management\\_17.pdf](http://www.efsa.europa.eu/sites/default/files/corporate_publications/files/sites/competing_interest_management_17.pdf)

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

The discussion focused first on the aspects related to pesticide exposure and effects and to thermodynamics.

In relation to pesticide exposure, the contractor illustrated the mathematical solution to model the fact that each individual entity is subjected to a continuous and time varying exposure and how to accommodate it to available data.

Two models exist to translate this time-variant exposure into effects: stochastic 'death' and 'individual threshold'. ApisRAM will have the capability to implement both for lethal and non-lethal effects. However, these two models depend on assumptions and data from the user, since there are no standard methods, nor standard data sets available at present for honey bees. The potential of Bayesian-type approaches to address variability in responses was considered.

In relation to thermodynamics, the contractor described the progress with the development of the related module and stressed the importance of a spatially explicit temperature. Heating and cooling are simulated using an electric circuit model.

The contractor also described the components of the C++ computer programme with particular focus on task selection, thermodynamics, colony and in-hive products, and foraging. A Python interface has been developed to run the computer programme.

The progress in the development of model landscapes for Portugal was also documented. Two model landscapes (each 10x10 km) have been generated to cover landscapes with different spatial structure characteristics and with different availability of floral resources for honey bees, both belonging to Central Portugal and with similar climatic characteristics. One is mainly occupied by agricultural areas ("low fitness") and the other one dominated by natural areas of forests and shrublands ("high fitness"). The model landscapes cover the sites where experimental work is being conducted in the MUST-B honey bee data collection project ("Research project on field data collection for honey bee colony model evaluation" - OC/EFSA/SCER/2017/02).

An extensive literature search fully documents variables and parameters for each model module (i.e. the Colony, in-Hive Products, Foraging, Resource Providing Unit, Environmental drivers, Pesticide, Biological Agents and the Beekeeping Management Practice).

The plan for the update of the formal model, the development of computer programme and finalisation of the Geographic Information System (GIS) maps for spatial explicit modelling was agreed.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

Brussels 25-26th April.

## Scientific Committee

### Minutes of the 27<sup>rd</sup> meeting of the Working Group on MUST-B

Held on 22-24<sup>nd</sup> January 2019, Coimbra, Portugal  
(Agreed on 11 February 2019)

#### Participants

- **Working Group Members:**

Simon More (Chair)

Gérard Arnold

- **Hearing Experts<sup>1</sup>:**

Chris Topping

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Agnès Rortais

DATA Unit: Giuseppe Triacchini

PRAS Unit: Csaba Szentes

- **Others:**

Jørgen Axelsen, Aarhus University (via TC)

Yoko Dupont, Aarhus University

Per Kryger, Aarhus University

Alice Pinto, Instituto Politécnico de Bragança, Bragança, Portugal

José Paulo Sousa, University of Coimbra, Portugal

António Silva, University of Coimbra, Portugal

Nuno Capela, University of Coimbra, Portugal

As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

Artur Sarmento, University of Coimbra, Portugal  
Sílvia Castro, University of Coimbra, Portugal  
João Loureiro, University of Coimbra, Portugal  
Caio Domingues, University of Coimbra, Portugal

## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted with the addition of a discussion on the recently received reply by the Danish EPA on the granting of an authorisation for the use of a pesticide spraying experiment in Denmark.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 26<sup>th</sup> Working Group meeting held on 25 October 2018, Parma.**

The minutes of the 26<sup>th</sup> Working Group meeting held on 25 October 2018 were agreed by written procedure on 31 October 2018.<sup>4</sup>

## **5. Hearing Experts**

Chris Topping was invited as the coordinator of the project on the "development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors" (ref. OC/EFSA/SCER/2016/03). The data collected under the procurement OC/EFSA/SCER/2017/02 is for the calibration and evaluation of the Apis-RAM model developed by C Topping. To insure that

<sup>1</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>3</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

the data collected is fit for purpose, C Toppings participation in this meeting was key.

## 6. Scientific topics for discussion

### 6.1. Field data collection to calibrate and validate Apis-RAM model (EFSA-Q-2016-00557)

This 2.5 days meeting was organised in Coimbra (Portugal) with the contractors (from the data collection and the model ApisRAM), the MUST-B experts and EFSA staff to wrap up on the preparatory phase of the project and to visit the Portuguese field sites. The first day was dedicated to the wrap up and the next 1.5 day to the visit of the field sites, Indanha-a-Nova (low fitness landscape, 2.5h South-East from Coimbra) and Lousã (high fitness landscape, 1h south of Coimbra), each of a 10km X 10 km area. During the wrap up, the WG discussed extensively the protocols developed during the preparatory phase (pesticides residues, mapping floral resources, comb analysis, bee counters, hive scales, etc.), in 2018, as well as the pesticide use for the spray experiment to be conducted in Denmark in 2019 and 2020. The contractor will inquire further with EPA the allowed dosage for an experiment with Pirimicarb and liaise with EFSA and MUSTB experts to decide the way forward by March 2019. On 21 January, the contractor sent to EFSA and MUST-B experts an updated version of the database and asked EFSA to validate the business rules and table 6 (SSD2) for the sampling and reporting of infectious agents and pollen diversity. Following the discussion and conclusions made during the meeting, the contractor will send an updated version of the report presenting the protocols and material to be used as well as the database and (lab/field) forms to be used for the field data collection by the end of February 2019, which will lead to the end of the first specific contract of this framework contract OC/EFSA/SCER/2017/02. EFSA and the contractor agreed on timelines for the various deliverables due under the next specific contract that will start in February-March 2019 until January 2020. For this 1<sup>st</sup> year of data collection, EFSA and the contractor need to agree on the best data reporting (with DCF and to the ApisRAM team), in order to avoid duplication of work. Finally, EFSA presented to the MUST-B experts and contractor the ToRs of the mandate received by the European parliament to EFSA to deliver a scientific opinion on the science behind the development of an integrated holistic approach for the risk assessment of multiple stressors in managed honey bees (*Apis mellifera*).

The field visits in the next 1.5 days consisted in going to the sites to check the landscape fitness of the selected sites in terms of PPP input and flower resources for bees, comprising each an area of 10km X 10 km. At the Lousa site, the flowering season extends from March-April to October, with a peak in May. The area is dominated by shrub and forested areas

with very high density of flower resources. The Indanha-a-Nova site is dominated by permanent pastures (44%), temporary pastures (26%), Montados (7%) and cereal crops for fodder (4%). The resources available are mainly located on small patches of woodland areas with shrub species which flowers are used as food resources.

## **7. Any Other Business**

Not Applicable

## **8. Next meeting**

- Meeting for OC/EFSA/SCER/2016/03 on 19 March 2019

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## Scientific Committee

### Minutes of the 26<sup>th</sup> meeting of the Working Group on MUST-B

Teleconference held on 25<sup>th</sup> October 2018, Parma  
(Agreed on 31 October 2018)

#### Participants

- **Working Group Members:**

Simon More (chair)

Gérard Arnold

- **Hearing Experts<sup>1</sup>:**

Chris Topping, Aarhus University

Flemming Skov, Aarhus University

David Wallis, Aarhus University

Fani Hatjina, Hellenic Agricultural Organization "Demeter"

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais

PRAS Unit: Csaba Szentes

AMU Unit: Federica Barrucci

- **Others:**

Not applicable

As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 25<sup>th</sup> Working Group meeting held on 29 June 2018, Parma.**

The minutes of the 25<sup>th</sup> Working Group meeting held on 29 June 2018 were agreed by written procedure on 10 July 2018.<sup>4</sup>

## **5. Hearing experts**

Prof. Chris Topping, Dr. David Wallis, Dr. Flemming Skov and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; David Wallis is involved in the development of the formal model; Flemming Skov in the development of a GIS for spatially explicit modelling; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

<sup>1</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>3</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

## **6. Scientific topics for discussion**

### **6.1. ApisRAM model development (EFSA-Q-2016-00558)**

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization "Demeter" (Greece) the progress in the development of the formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios.

The attention was focused on the Pesticides module, in particular environmental fate and exposure to pesticides in the landscape (concentration of pesticides in nectar, pollen and water) and conceptual models for pesticides effects (lethal and sublethal effects).

A scientific challenge was identified in how to translate a time-variant body burden per individual bee into effects. Two approaches were proposed: the 'stochastic death' model (as described in the General Unified Threshold model of Survival (GUTS) TK/TD modelling) and the 'individual threshold' approach. The model will have the capability to implement either 'stochastic death' or 'individual threshold' for both lethal and non-lethal effects.

The issues of sensitivity analysis of the parameters, stochasticity and uncertainty of the model were also debated.

In relation to landscape mapping for Poland, two model landscapes have been developed to cover landscapes with different spatial structure characteristics (one characterised by large-scale industrial farming and a second one with more traditional small-scale farming).

The current state and data availability for landscape generation relative to Portugal was also discussed. Field parcels in Portugal are very small and therefore data availability is very limited. The possibility of using remote sensing data and military maps will be explored.

The plan for the update of the formal model, the development of computer programme and Geographic Information System (GIS) maps for spatial explicit modelling was agreed.

## **7. Any Other Business**

Not Applicable

## **8. Next meeting**

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- 22<sup>nd</sup>-24<sup>th</sup> January 2019: Mid-term project review physical meeting for the research project on field data collection for honey bee colony model evaluation (OC/EFSA/SCER/2017/02).

## Scientific Committee

### Minutes of the 25<sup>th</sup> meeting of the Working Group on MUST-B

Teleconference held on 29<sup>th</sup> June 2018  
(Agreed on 10 July 2018)

#### Participants

- **Working Group Members:**  
Simon More  
Gérard Arnold
- **Hearing Experts<sup>1</sup>:**  
Chris Topping (for WP 1.2 on sites selection and to ensure the data collected is appropriate for the model calibration and evaluation)
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Agnès Rortais (Chair) and Angelo Maggiore  
DATA Unit: Giuseppe Antonio Triacchini  
BIOCONTAM Unit: Yves Van der Stede  
PRAS Unit: Csaba Szentés
- **Others:**  
Yoko Dupont, Jørgen Axelsen, Per Kryger, Marianne Bruus, Peter Borgen Sørensen and Beate Strandberg, Aarhus University, Denmark  
Alice Pinto Polytechnic Institute of Bragança, Portugal  
José Paulo Sousa, Nuno Capela and Joana Alves, University of Coimbra, Portugal

As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Jos Boesten.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 24<sup>th</sup> Working Group meeting held on 22 March 2018, Parma.**

The minutes of the 24<sup>th</sup> Working Group meeting held on 22 March 2018 were agreed by written procedure on 13 April 2018.<sup>4</sup>

## **5. Hearing Experts**

Prof. Chris Topping was invited as the coordinator of the project on the "development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors" (ref. OC/EFSA/SCER/2016/03).

<sup>1</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>3</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

## 6. Scientific topics for discussion

### 6.1. Field data collection to calibrate and validate Apis-RAM model (EFSA-Q-2016-00557)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark), the Polytechnic Institute of Bragança and the University of Coimbra (Portugal) on the progress made regarding the site and chemical compound selection, the field protocols and training, the interim database and field/lab forms related to the “Research project on field data collection for honey bee colony model (ApisRAM) evaluation” (OC/EFSA/SCER/2017/02).

A total of six field sites were selected in Denmark and Portugal. In Denmark, two high exposure sites and two low pesticide exposure sites (with different flower resource availability across the flowering season) with typical agricultural landscapes were selected in Western and Eastern Denmark, respectively. In Portugal, two sites with low pesticide exposure and high and low landscape fitness were selected in the Central Region.

The first interim report on the description of the selected sites and the interaction with the modellers for the use of the GIS mapping and the coordination strategy with farmers for field operations and laboratories for analyses was received and reviewed by EFSA. The contractor will send an updated version of this report to EFSA shortly after this meeting.

The contractor sent to EPA a request for the use of Flupyradifurone (1 kg/ha), Formetanate (0.5 kg/ha) and/or Pirimicarb (1 kg/ha) at the high exposure sites in Denmark and received forms from EPA to further process the request. The contractor asked and received support from EFSA to fill in the forms. Now, the forms will be sent to EPA by the contractor.

The field protocol for bee population assessment (in particular pros and cons of automatic *versus* manual methods), in hive measurements, hive scale, bee counters for the recording of forager activity, were also discussed with the aim of agreeing the optimal methods for guaranteeing data accuracy within the established budget. Different options were suggested to reduce workload that will be re-discussed at the end of the trial phase, at the next meeting with the contractor, in particular regarding possible disturbance of colonies and bias of the colony baseline linked to frequent observations.

The need for observation hives, equipped with video-recording (analysis of waggle dance) to assess and validate the bee foraging range and foraged resources, in the low exposure landscapes, was suggested by the contractor and agreed by the WG and EFSA (total of 2 sites in Denmark and 2 sites in Portugal), at least for the first year of data collection.

The contractor described the training courses organised in Denmark in June in order to standardise beekeeping practices, in hive measurement and sampling across field operators. An interim report on field protocols and rearing of sister queens/colonies and tools to be used for the data collections will be sent to EFSA in November 2018.

Finally the contractor presented the database where the collected data is going to be stored. The data model reflects the seven tables of the Appendix A of the specifications provided by the MUST-B working group (see <http://onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2017.EN-1234/pdf>). The need of an automatic link with the GIS maps developed in the context of the ApisRAM bee model development (ref. OC/EFSA/SCER/2016/03) was raised and addressed. The interim report presenting the work progress on the interim database will be sent to EFSA by 13 July 2018. Data submission to EFSA Data Collection Framework (DCF) will be tested by the contractor and EFSA in November 2018.

The timeline of the different work packages, the deliverables and the next project review meeting were agreed.

## **7. Any Other Business**

Not Applicable

## **8. Next meeting**

- **Physical meeting 4 days between 21-25 January 2019 (exact dates to be confirmed).**

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## Scientific Committee

### Minutes of the 24<sup>th</sup> meeting of the Working Group on MUST-B

Held on 22<sup>nd</sup> March 2018, Parma  
(Agreed on 13 April 2018)

#### Participants

- **Working Group Members:**  
Simon More (via teleconference)  
Gérard Arnold  
Jos Boesten
- **Hearing Experts<sup>1</sup>:**  
Chris Topping, Aarhus University  
Flemming Skov, Aarhus University  
David Wallis, Aarhus University  
Fani Hatjina, Hellenic Agricultural Organization "Demeter"
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Angelo Maggiore (chair) and Agnès Rortais  
BIOCONTAM Unit: Yves Van der Stede  
PRAS Unit: Csaba Szentes  
DTS Unit: Filippo Conte
- **Others:**  
Not applicable

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 23<sup>rd</sup> Working Group meeting held on 25 January 2018, Parma.**

The minutes of the 23<sup>rd</sup> Working Group meeting held on 25 January 2018 were agreed by written procedure on 2 February 2018.<sup>4</sup>

## **5. Hearing experts**

Prof. Chris Topping, Dr. David Wallis, Dr. Flemming Skov and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader; David Wallis is involved in the development of the formal model; Flemming Skov in the development of a GIS for spatially explicit modelling; Fani Hatjina in the development of the methodology to perform the search and screening of the scientific literature.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

## 6. Scientific topics for discussion

### 6.1. ApisRAM model development (EFSA-Q-2016-00558)

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Hellenic Agricultural Organization Demeter" (Greece) the formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios. The model is a spatially explicit individual based model (IBM) where each bee in the colony is modelled as an individual entity, characterised by a position, temperature and other properties. The need of a spatially explicit model simulating the temperature of each bee and honeycomb cell in the hive was stressed since many bee processes and decisions depend on temperature. Behaviours emerge from the actions taken by each bee at each time step. The development of the formal model needs to be an iterative process where the model is constantly improved until predefined performance criteria are reached.

An extensive literature search is being conducted to fully document variables and parameters for each model module (i.e. the Colony, in-Hive Products, Foraging, Resource Providing Unit, Environmental drivers, Pesticide, Biological Agents and the Beekeeping Management Practice).

The current state and data availability for landscape generation relative to Denmark, Poland and Portugal were discussed. Four model landscapes have been developed to cover two zones (East- and West Denmark) and a sprayed/non-sprayed scenario for each zone. The model landscapes are 10x10 km and cover the sites where experimental work will be conducted in the MUST-B honey bee data collection project. The resolution of the maps is one meter, which makes it possible to represent the actual structures of the landscape in great detail.

The plan for the update of the formal model, the development of computer programme and Geographic Information System (GIS) maps for spatial explicit modelling was agreed.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

- TC at month 6 after date of signature of the specific contract.

## Scientific Committee

### Minutes of the 23<sup>rd</sup> meeting of the Working Group on MUST-B

Held on 25<sup>th</sup> January 2018, Parma  
(Agreed on 2 February 2018)

#### Participants

- **Working Group Members:**  
Simon More (Chair)  
Gérard Arnold  
Jos Boesten
- **Hearing Experts<sup>1</sup>:**  
Chris Topping (for WP 1.2 on sites selection)
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Agnès Rortais and Angelo Maggiore  
DATA Unit: Jane Richardson  
BIOCONTAM Unit: Yves Van der Stede  
PRAS Unit: Csaba Szentes  
Finance: Donna Lucas and Joanna Swarcewicz
- **Others:**  
Jørgen Axelsen, Aarhus University  
Yoko Dupont, Aarhus University  
Per Kryger, Aarhus University  
Alice Pinto, Polytechnic School of Brangança, Portugal  
José Paulo Sousa, University of Coimbra, Portugal (via TC)

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants. No apologies were received.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were (identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 22<sup>nd</sup> Working Group meeting held on 20 September 2017, Parma.**

The minutes of the 22<sup>nd</sup> Working Group meeting (held on 20 September 2017) were agreed by written procedure on 3 October 2017.<sup>4</sup>

## **5. Hearing Experts**

Prof. Chris Topping was invited as the coordinator of the project on the "development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors" (ref. OC/EFSA/SCER/2016/03).

## **6. Scientific topics for discussion**

### **6.1. Field data collection to calibrate and validate Apis-RAM model (EFSA-Q-2016-00557)**

The MUST-B working group discussed with the contractors from the Aarhus University (Denmark) and the Polytechnic School of Brangança

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

and University of Coimbra (Portugal) the alignment of the research project (OC/EFSA/SCER/2017/02: field data collection for honey bee colony model evaluation) with the specifications provided by the working group (see <http://onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2017.EN-1234/pdf>). The methodologies used for each work package were thoroughly discussed, in particular those related to the measurements of the colony endpoints (colony size, foraging activity, forager mortality and brood structure) that need to be as accurate as possible and unbiased (e.g. use of automatic devices to reduce operators effect; use of high resolution camera and good light). The working group advised the contractor to liaise with the ECOBEE team and WSC Scientific GmbH who are knowledgeable in this domain and developed automated methods. The importance of observation hives for the assessment and validation of the bee foraging range and foraged resources (for the model calibration) was highlighted. The working group and contractor agreed that further investigation is required for the selection of the compound to be tested in Denmark and the specific site for the data collection in Portugal. This was noted as an action point for both EFSA and the contractor. The other deviations suggested by the contractor (use of Buckfast X *Apis mellifera mellifera* colonies instead of pure *Apis mellifera mellifera*; use of distant sites, but confined for experimental testing, in Denmark for the pesticides spraying) were agreed by the working group. The timeline of the different work packages, the deliverables and the next meetings for the 1<sup>st</sup> year were agreed.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

- Teleconference in June 2018 (exact date to be confirmed).

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## Scientific Committee

### Minutes of the 22<sup>nd</sup> meeting of the Working Group on MUST-B

Held by WEB-conference, 20 September 2017  
(Agreed on 3 October 2017)

#### Participants

- **Working Group Members:**

Simon More (Chair)

Gérard Arnold

Jos Boesten

- **Hearing Experts<sup>1</sup>:**

Chris Topping

Gianni Gilioli

Flemming Skov

Fani Hatjina

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais

AMU Unit: Gilles Guillot for the development of a GIS for spatially explicit modelling and formal model

Plant and Animal Health Unit: Ciro Gardi for the development of a GIS for spatially explicit modelling

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

- **Others:**

Not Applicable

## **1. Welcome and apologies for absence**

Since the MUST-B WG chair (Simon More) was remotely connected, the meeting was chaired by EFSA staff. The Chair welcomed the participants.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 21<sup>st</sup> Working Group meeting held on 20-21 March 2017, Parma.**

The minutes of the 21<sup>st</sup> Working Group meeting, held on 20-21 March 2017, were agreed by written procedure.<sup>4</sup>

## **5. Hearing Experts**

Prof. Chris Topping, Prof. Gianni Gilioli, Dr. Flemming Skov and Dr. Fani Hatjina were invited since they are involved in the development of a mechanistic model to assess risks to honeybee colonies from exposure to pesticides under different scenarios of combined stressors and factors (ref. OC/EFSA/SCER/2016/03).

Chris Topping is the project leader, Gianni Gilioli is involved in the development of the formal model, Flemming Skov in the development of a GIS for spatially explicit modelling and Fani Hatjina in the development

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

of the methodology to perform the search and screening of the scientific literature.

## 6. Scientific topics for discussion

### 6.1. ApisRAM model development ([EFSA-Q-2016-00558](#))

The progress of the work package (WP) 1 (Development of a formal model for the risk assessment of pesticides in honeybee colonies under different environmental scenarios) and WP2 (Development of a GIS for spatial explicit modelling) of the procurement on bee model development (ref. OC/EFSA/SCER/2016/03) as reported in interim reports sent to EFSA were presented and discussed.

The MUST-B working group discussed the alignment of the presented methodologies with the conceptual model and modules designed in the honeybee colony model specifications (see <https://www.efsa.europa.eu/en/supporting/pub/en-1069>).

A full documentation of variables and parameters for each model module (i.e. the Colony, in-Hive Products, Foraging, Resource Providing Unit, Environmental drivers, Pesticide, Biological Agents and the Beekeeping Management Practice) is under way. For these variables and parameters, an extensive literature search is needed and the different steps of the literature screening need to be clearly described and justified.

In addition the formalisation of the relations between these variables is also under development.

The GIS methodology for taking into account the influence of the landscape structure (comprising data on land use, land cover, crop, vegetation and soil in Denmark, Poland and Portugal as the three EU regulatory zones (i.e. north, centre and south, respectively) was presented and the data access and availability for the GIS mapping in the 3 selected countries was discussed. Data access in Portugal needs further investigation.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

For the bee model development (OC/EFSA/SCER/2016/03): February 2018 (exact date to be confirmed).



## Scientific Committee

### Minutes of the 21<sup>st</sup> meeting of the Working Group on MUST-B

Held on 20-21 March 2017, Parma (Italy)  
(Agreed on 29 March)

#### Participants

- **Working Group Members:**  
Gérard Arnold  
Jos Boesten  
Simon More (Chair)  
Chris Topping  
Ullrika Sahlin (via teleconference)
- **Hearing Experts<sup>1</sup>:**  
Vincent Bretagnolle (for items 7-9); Magali Chabert (for items 1-9);  
Jean-Francois Odoux (for items 7-9); Magnus Wang (for items 7-9).
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Angelo Maggiore and Agnès Rortais  
AMU Unit: Gilles Guillot  
Pesticides Unit: Csaba Szentes
- **Others:**  
Not Applicable

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 20<sup>th</sup> Working Group meeting held on 15-16 February 2017, Parma.**

The minutes of the 20<sup>th</sup> Working Group meeting held on 15-16 February 2017 were agreed.<sup>4</sup>

## **5. Hearing Experts**

Dr Magali Chabert was invited to present the view of the EURL on honeybee health. Dr Vincent Bretagnolle and Mr Jean-Francois Odoux were invited to present the view of CNRS and INRA for the ECOBEE project; Dr Magnus Wang was invited to present the view of WSC on the development of tools and software to assess colony endpoints.

## **6. Scientific topics for discussion**

### **6.1. MUST-B (EFSA-Q-2016-00359)**

The working group re-discussed the field design (sites, chemical exposure and protocols) within the working group on the first day and with the

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

newly invited hearing experts on the second day. The actual field data collection would take more than 2 years starting in 2018 (with a preparatory phase starting in 2017). The experience and data collected within the framework of "Zone Atelier Plaine & Val de Sèvre" presented by JF Odoux and V Bretagnolle was considered very useful for the project. However, the field design proposed by the WG (matrix of 4 sites separated by 10 km maximum with high *versus* low landscape fitness and high *versus* low pesticides exposures) was found to be difficult to fit into the specific field area. Therefore, the WG suggested to keep Denmark, Poland and Portugal as the three EU regulatory zones (i.e. north, centre and south, respectively) for the data collection, to have the controlled pesticides exposure in Denmark, the testing of the landscape fitness in Poland and Portugal and the site in France as an additional opportunity to collect data on different levels of pesticides exposures as a result of normal farming practices (i.e. intensive *versus* organic farming). Given the high potential increase of variability in an apiary containing a high number of colonies competing for resources, it was suggested to reduce the size of the apiary from 10 to 5 colonies making a new total of 50 colonies (20 colonies across 4 sites in Denmark and 10 colonies across 2 sites each in Portugal, Poland and France). The tools and methods (video/camera and image analyses) to assess foraging, in-hive bees, brood and food stores were presented by M Wang. The WG considered that some of those methods (foraging, brood and food stores) would be useful for some aspects of the project providing they are fine-tuned. Those new decisions will be reflected in the technical report for finalisation.

## 7. Any Other Business

Not Applicable

## 8. Next meeting

- Not applicable

## Scientific Committee

### Minutes of the 20<sup>th</sup> meeting of the Working Group on MUST-B

Held on 15-16 February 2017, Parma (Italy)  
(Agreed on 16 February)

#### Participants

- **Working Group Members:**

Gérard Arnold

Jos Boesten

Simon More (Chair)

Chris Topping

- **Hearing Experts<sup>1</sup>:**

Magali Chabert

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais

AMU Unit: Gilles Guillot

- **Others:**

Not Applicable

#### 1. Welcome and apologies for absence

The Chair welcomed the participants. Apologies were received from Ullrika Sahlin.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 19th Working Group meeting held on 24-25 January 2017, Parma.**

The minutes of the 19<sup>th</sup> Working Group meeting were agreed by written procedure on 1<sup>st</sup> February 2017.<sup>4</sup>

## **5. Hearing Expert**

Dr Magali Chabert was invited to present the view of the EURL on honeybee health.

## **6. Scientific topics for discussion**

### **6.1. MUST-B (EFSA-Q-2016-00359)**

The working group reviewed thoroughly the draft technical report, in particular the section on the general requirements for the field data collection and model evaluation and the section related to the selection of the sites, sampling design and design hierarchy. The selection of the chemical compounds to be used to create effects on bees were re-discussed considering their ability to induce observable effects on bees (via nectar/pollen consumption), the current availability of data (toxicity, residues) and the possibility to use them in an experimental setting. The selection of the crops was also re-discussed and it was concluded that oilseed rape (in addition to maize if present) was the best choice and that

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

in the selected countries, where pesticides exposure would be controlled (France and Denmark), winter oilseed rape would be the dominant crop. Such crops require that treatment plans are agreed with farmers the summer before they are grown, i.e. one year ahead of the actual data collection. The WG elaborated a new section to provide details on the sampling (type of variables/data, measurement methods, sampling size and timing/frequency). The appendices on the description of the variables and methods taken from HEALTHY-B were re-discussed to find the best way to make the link with the section on the sampling. The WG drafted conclusions and recommendations and made a detailed list of questions and issues to be addressed at the next meeting on methods to assess changes in food storing and effects on colony (foragers/in-hive bees). Finally, action points were identified.

## **7. Any Other Business**

Not Applicable

## **8. Next meeting**

- MUST-B 21, 20-21 March 2017 (14.00-18.00 first day and 09.00-16.30 second day CET); Parma

## Scientific Committee

### Minutes of the 19<sup>th</sup> meeting of the Working Group on MUST-B

Held on 24-25 January 2017, Parma (Italy)  
(Agreed on 1 February 2017)

#### Participants

- **Working Group Members:**

Gérard Arnold  
Jos Boesten  
Simon More (Chair)  
Ullrika Sahlin  
Chris Topping

- **Hearing Experts<sup>1</sup>:**

Magali Chabert

- **European Commission and/or Member States representatives:**

Not Applicable

- **EFSA:**

SCER Unit: Angelo Maggiore and Agnès Rortais  
AMU Unit: Gilles Guillot

- **Others:**

Not Applicable

#### 1. Welcome and apologies for absence

The Chair welcomed the participants.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## 2. Adoption of agenda

The agenda was adopted without changes.

## 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## 4. Agreement of the minutes of the 18th Working Group meeting held on 1-2 December 2016, Parma.

The minutes of the 18<sup>th</sup> Working Group meeting held on 1-2 December 2016 were agreed.<sup>4</sup>

## 5. Hearing Expert

Magali Chabert was invited to present the view of the EURL on honeybee health.

## 6. Scientific topics for discussion

### 6.1. MUST-B (EFSA-Q-2016-00359)

The working group revised the different sections of the technical report. The title of the technical report was aligned with the objective of this work on defining specifications of a field data collection for honey bee model development and evaluation. The interpretation of the terms of reference and the criteria to assess the model performance were thoroughly discussed and revised. Recommendations on how to consolidate the model development with estimation of parameters and sensitivity analysis were made. A definition of what is meant by "landscape fitness" and guidance on how to select high *versus* low landscape fitness were provided. The sampling design was re-discussed in the light of the site

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>



and subspecies selection. Considering data access, variability across geographic zones and in agreement with the contractor developing the model, for the data collection, the WG suggested 4 sampling sites across the 3 EU zones (2 in the South with Portugal and France, 1 in the Centre with Poland and 1 in the North with Denmark). In particular, the WG proposed high and low fitness landscapes at the 4 sampling sites and an intensive data collection (having a pesticides gradient exposure) at 2 sites (Denmark and France) and a less intensive data collection (no pesticides exposure) at the 2 other sites (Portugal and Poland). This design would accommodate a wider representativeness, at lower cost, of the various geographic landscapes in EU using *A. m. mellifera* at the three EU zones where it naturally occurs (Denmark, France and Poland) and *A. m. iberiensis* in PT, also providing an opportunity to evaluate the performance of the model with another subspecies. The criteria to select the crops and pesticides to be tested at the two sites where intensive data collection is planned (Denmark and France) were discussed as well as methodological and logistical aspects of the setup of the protocols (e.g. multi- and/or mono-residual analyses, sampling frequency, etc.). Preparatory work (i.e. the year before the actual data collection), e.g. validation of precise/accurate methods for colony endpoints assessment and rearing of sister queens, was identified by the WG and will need to be further explored and discussed within the WG. Action points were identified for the next meeting.

## 7. Any Other Business

Not Applicable

## 8. Next meetings

MUST-B 20, 15-16 February 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma

MUST-B 21, 23-24 March 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma

## Scientific Committee

### Minutes of the 18<sup>th</sup> meeting of the Working Group on MUST-B

Held on 1-2 December 2016, Parma (Italy)  
(Agreed on 2 December)

#### Participants

- **Working Group Members:**  
Gérard Arnold  
Jos Boesten  
Simon More (Chair)  
Ullrika Sahlin
- **Hearing Experts<sup>1</sup>:**  
Magali Chabert  
Chris Topping
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Angelo Maggiore and Agnès Rortais  
AMU Unit: Gilles Guillot
- **Others:**  
Not Applicable

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 17th Working Group meeting held on 17 October 2016, Parma.**

The minutes of the 17<sup>th</sup> Working Group meeting were agreed by written procedure on 24<sup>th</sup> November 2016.<sup>4</sup>

## **5. Hearing Expert**

Magali Chabert was invited to present the view of the EURL on honeybee health. Chris Topping was invited to present his view on the study design and site selection of the field data collection.

## **6. Scientific topics for discussion**

### **6.1. MUST-B (EFSA-Q-2014-00881)**

The working group reviewed and further elaborated the different sections of the first draft of the technical report. In the morning of the first day, the working group validated some variables to be selected for the model, in particular for the modules related to the colony, foraging, biological

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

agents, beekeeping management practices and external drivers. It was suggested to link all modules to all selected variables (modules, entities, state variables). This will be prepared for the next WG meeting. In the afternoon of the first day, the working group brainstormed on the selection of criteria and strategies to assess the performance of the evaluation of the accuracy of the model and data collection. The identification of risks with respect to the project and mitigation measures on both the evaluation process and data collection were listed to overcome some potential shortcomings. Then, the working group discussed the selection of the subspecies and study site. To reflect on the bee diversity and ecological traits, it was recommended that colonies of three different subspecies are used in the three EU zones. To support this selection, information on the native distribution of those subspecies was provided. The working group provided further details regarding the selection of the study sites (minimum distance between sites, landscape features, pesticides exposure). On the second day, the working group discussed in more detail the data collection related to pesticides exposure and effects (study design, choice of crops, pesticides, number of sampling in time and for each colony matrices). Towards the end of the meeting, the working group made new suggestions regarding the structure of the technical report and identified action points for the next meeting.

## 7. Any Other Business

Not Applicable

## 8. Next meetings

- MUST-B 19, 24-25 January 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 20, 15-16 February 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 21, 23-24 March 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma

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## Scientific Committee

### Minutes of the 17<sup>th</sup> meeting of the Working Group on MUST-B

Held by tele-conference on 18 November 2016  
(Agreed on 24 November 2016)

#### Participants

- **Working Group Members:**  
Gérard Arnold
- **Hearing Experts<sup>1</sup>:**  
Magali Chabert
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Agnès Rortais (Chair) and Giorgio Sperandio
- **Others:**  
Not Applicable

#### 1. Welcome and apologies for absence

The Chair welcomed the participants.

#### 2. Adoption of agenda

The agenda was adopted without changes.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### **4. Agreement of the minutes of the 16th Working Group meeting held on 20-21 October 2016, Parma.**

The minutes of the 16<sup>th</sup> Working Group meeting were agreed by written procedure on 28 October 2016.<sup>4</sup>

### **5. Hearing Expert**

Ms. Magali Chabert was invited to present the view of the EURL on honeybee health.

### **6. Scientific topics for discussion**

#### **6.1. MUST-B ([EFSA-Q-2014-00881](https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf))**

This focused meeting aimed at discussing part II of the technical report on the specifications for the data collection. The experts selected variables for which data is required (i.e. to assess colony/in-hive products/biological agents/resource providing unit/pesticides), the respective equipment to be used in field to collect those data as well as its accuracy and cost and the approximate number of field operators. EURL will further inquire to confirm the proposed figures (equipment cost and manpower). EFSA prepared a list of variables and methods as described by HEALTHY-B and the experts distinguished those variables for which data will be collected via the literature or by the production of GIS maps (first procurement on the model development) from those variables for which data will be collected via field experiments (second procurement on the field data collection). In particular, experts focused on the selection of the variables linked to "queen performance and presence", "beekeeping management

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencypolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

practices”, ‘foraging activity” and ‘biological agents”. The variables on colony, in-hive products, resource providing unit, pesticides and external drivers were pre-screened by EFSA and will be checked by the experts by the next working group meeting in December. High quality data being required (for the model calibration), the visual identification methods described by HEALTHY-B are not suitable. Automatic tools such as video/image analysis under development are preferred and will need to be fine-tuned before the start of the project, in 2017. The progress made during this meeting will be shared with the working group and further discussed at the next working group meeting.

## 7. Next meetings

- MUST-B 18, 1-2 December 2016 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 19, 24-25 January 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 20, date and place to be confirm

## SCIENTIFIC COMMITTEE AND EMERGING RISKS UNIT



## Scientific Committee

### Minutes of the 16<sup>th</sup> meeting of the Working Group on MUST-B

Held on 20-21 October 2016, Parma (Italy)  
(Agreed on 28 October 2016)

#### Participants

- **Working Group Members:**  
Gérard Arnold  
Jos Boesten  
Simon More (Chair)  
Ullrika Sahlin
- **Hearing Experts<sup>1</sup>:**  
Magali Chabert; Chris Topping
- **European Commission and/or Member States representatives:**  
Not Applicable
- **EFSA:**  
SCER Unit: Angelo Maggiore, Agnès Rortais and Giorgio Sperandio  
Pesticides Unit: Franz Streissl  
AMU Unit: Gilles Guillot
- **Others:**  
Not Applicable

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **1. Welcome and apologies for absence**

The Chair welcomed the participants.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 15th Working Group meeting held on 8-9 September 2016, Parma.**

The minutes of the 15<sup>th</sup> Working Group meeting were agreed by written procedure on 14 September 2016.<sup>4</sup>

## **5. Hearing Expert**

Ms. Magali Chabert was invited to present the view of the EURL on honeybee health. Dr Chris Topping was invited to present his view on the inclusion of landscape information for modelling purposes of the present meeting.

## **6. Scientific topics for discussion**

### **6.1. MUST-B (EFSA-Q-2014-00881)**

The meeting was focused on discussing comments on previous notes that were circulated among experts before the meeting. During the first day, the WG had a thorough discussion on the study objective, sampling

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

<sup>4</sup> <https://www.efsa.europa.eu/sites/default/files/assets/scmustb.pdf>

design and site selection and during the second day, the WG focused on the timing of the sampling and on more specific issues related to the data collection (e.g. exposure via wax). The study objectives need to clarify the criteria to determine the ability of the model to predict exposure and effects and to account for uncertainty and the inherent variability of the system. For the sampling design, the WG recommended 4 apiaries of 10 colonies each in the 3 EU regulatory zone (i.e. total of 3 zones X 40 colonies = 120 colonies). The working group highlighted that the number of subspecies in the South is higher than in the North of EU leading to more variability in the South and although the model will not be able to account for such variability, the working group recommended that this needs to be clarified in the technical report (e.g. for future data collection). Each apiary should include gradients in pesticide exposure (high versus low) and landscape "fitness" (rich versus poor). Data on landscape "fitness", pesticide residues (both from the landscape and inside the hive) and effects at the colony level are required to validate the model under different levels of exposure. For pesticides exposure, the WG recommended conducting experiments with spray (to simulate acute toxicity) and seed dressing (to simulate chronic exposure) treatments. It was also clarified that the conceptual model designed by MUST-B account for additivity between 2 molecules and therefore, the selection of the two molecules to be tested, should have such an effect in bees (excluding antagonistic and/or synergistic effects). In order to link effects with the specific protection goals, accurate tools and methods to assess colony effects are required. In this respect, the working group discussed the availability of such methods, in particular the use of digital photos to assess numbers of in-hive bees (both adults and brood) and the use of cameras for foragers as provided by Magnus Wang to the WG. EFSA will liaise with M Wang to further clarify the accuracy of the tools and cost of the software to analyse images. Next meeting dates were confirmed and tasks were assigned for the next meetings.

## 7. Any Other Business

Not Applicable

## 8. Next meetings

- MUST-B 17, 18 November 2016 via teleconference (10.00-13.00 CET)
- MUST-B 18, 1-2 December 2016 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 19, 24-25 January 2017 (09.00-18.00 first day and 08.30-16.30 second day CET); Parma
- MUST-B 20, date and place to be confirmed

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 15<sup>th</sup> meeting of the Working Group MUST-B**  
**Held on 8-9 September 2016, Parma (Italy)**  
**(Agreed on 14 September 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gérard Arnold and Ullrika Sahlin
- **Hearing Experts<sup>1</sup>:**
  - Magali Chabert
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Angelo Maggiore, Agnès Rortais and Giorgio Sperandio
  - Pesticides Unit: Franz Streissl
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants.

**2. Adoption of agenda**

The agenda was adopted with no change.

**3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

#### **4. Agreement of the minutes of the 14<sup>th</sup> Working Group meeting held on 18-19<sup>th</sup> May 2016, Parma.**

The minutes of the 14<sup>th</sup> Working Group meeting were agreed by written procedure on 9 June 2016.

#### **5. Hearing Experts**

Magali Chabert invited to represent the EURL on honeybee health.

#### **6. Scientific topics for discussion**

##### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

The background, terms of reference and the key objective of MUST-B were presented to the working group. The WG will draft a technical report with specifications for a field data collection to calibrate and evaluate a mechanistic model to assess risks of pesticides on honeybee colonies in the context of multiple stressors. The first day of the meeting was dedicated to the listing and discussion of main issues to be covered in the technical report (i.e. study objective, sampling design, site selection, sample size and data selection at each site). During the second day of the meeting, the working group split into two groups to further elaborate on the topics identified the day before; one group focused on sampling design, site selection, sample size and the other group on data selection. A merged document reporting the information collected during the meeting will be circulated to the WG by 16 September. The WG will review the merged document by 30 September and a list of pending issues and questions to be addressed at the next meeting will be made. Next meeting dates were agreed.

#### **7. Next MUST-B WG meetings**

- MUST-B 16, 20-21 October 2016 (09.00-18.00 first day and 8.30-16.30 second day)
- MUST-B 17, 09-10 November (09.00-18.00 first day and 8.30-16.30 second day)
- MUST-B 18, 1-2 December 2016 (09.00-18.00 first day and 08.30-16.30 second day)
- MUST-B 19, 24-25 January 2017 (09.00-18.00 first day and 08.30-16.30 second day)

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 14<sup>th</sup> meeting of the Working Group MUST-B**  
**Held on 18-19 May 2016, Parma (Italy)**  
**(Agreed on 9 June 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gianni Gilioli, Robert Luttik, Rob Smith, Jos Boesten, Fani Hatjina (via TC), Gérard Arnold (via TC) and Sophie Roelandt
- **Hearing Experts<sup>1</sup>:**
  - Simone Tosi (on 18<sup>th</sup> May afternoon, via TC) and Cecilia Costa (on 18<sup>th</sup> May afternoon, via TC)
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio,
  - Pesticides Unit: Csaba Szentes and Franz Streissl
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Frederic Delbac, Jos Boesten (on 18 May morning) and Rob Smith (on 19 May morning).

**2. Adoption of agenda**

The agenda was adopted with no change.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 13<sup>th</sup> Working Group meeting held on 17<sup>th</sup> May 2016, Parma.

The minutes of the 13<sup>th</sup> Working Group meeting were agreed by written procedure on 9 June 2016.

### 5. Hearing Experts

Dr. Simone Tosi and Dr. Cecilia Costa were invited to present information they collated to determine impacts from beekeeping management practices.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

On 18 May morning, the structure of the technical report was discussed; in particular the inclusion of the layered approach as an overview of the approach used by the WG for the model development (as proposed during MUST-B 13). Then, the newly drafted and amended sections of the technical report (e.g. sections on 'pesticides in the landscape', '(sublethal) effects' from pesticides, 'foraging', 'colony and in-hive products', 'beekeeping practices', 'biological agents' and 'conclusions and recommendations') were discussed. On 18 May afternoon, questions raised by the modelers and answers provided by the bee experts were screened for validation and new action points were identified to be further discussed in small subgroups. In addition, clarifications on definition and descriptions of impacts from beekeeping practices were made with the hearing experts. On 19 May, each subgroup reported the results of their work to the WG and new action points were identified. Final amendments and revisions of the technical report will be made by the WG in the best timeline to allow publication of the technical report by the end of July 2016, at the same time as the publication of the Tender Specifications for the outsourcing of the development of the model.

### 7. Next MUST-B WG meetings

To be confirmed.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencpolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 13<sup>th</sup> meeting of the Working Group MUST-B**  
**(colony & in-hive products, foraging and biological agents)**  
**Held on 17 May (afternoon) 2016, Parma (Italy)**  
**(Agreed on 9 June 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Fani Hatjina (via TC), Gérard Arnold (via TC) and Sophie Roelandt
- **Hearing Experts<sup>1</sup>:**
  - Not Applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Gianni Gilioli.

**2. Adoption of agenda**

The agenda was adopted with no changes.

**3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>



screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

#### **4. Agreement of the minutes of the 12<sup>th</sup> Working Group meeting held on 30-31 March 2016, Parma.**

The minutes of the 12<sup>th</sup> Working Group meeting were agreed by written procedure on 15<sup>th</sup> April 2016.

#### **5. Hearing Experts**

Not applicable.

#### **6. Scientific topics for discussion**

##### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

To introduce the overall approach of the model development, the Chair proposed to elaborate a layered approach to be further discussed within the whole WG for inclusion in the technical report. The first layer would include the 'landscape' (including the resource providing unit and external drivers), 'foraging' and 'colony and in-hive products' modules and the following layers would be composed of the 'pesticides', 'biological agents' and 'beekeeping practices' modules. The first layer would interact with the other layers. Further discussions followed on how to describe and define colony traits (susceptibility, food consumption, genetic origin, queen age). The tables elaborated by the bee experts on the effects of the 'biological agents' on the colony/foraging/in-hive products modules were discussed and validated.

#### **7. Next MUST-B WG meetings**

- MUST-B 14, 18-19 May 2016 (09.00-18.00h the first day and 08.30-16.00h second day)

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 12<sup>th</sup> meeting of the Working Group MUST-B**  
**Held on 30-31 March 2016, Parma (Italy)**  
**(Agreed on 15 May 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gianni Gilioli, Fani Hatjina, Gérard Arnold, Jos Boesten, Robert Luttik, Sophie Roelandt, Rob Smith
- **Hearing Experts<sup>1</sup>:**
  - Richard Sibly, Cecilia Costa and Simone Tosi
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais, Jean-Lou Dorne (1<sup>st</sup> day), Ana Afonso and Giorgio Sperandio
  - Pesticides Unit: Franz Streissl and Csaba Szentes
  - COMMS: Simon Terry (2<sup>nd</sup> day)
  - AMU Unit : José Cortinas-Abrahantes
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Frédéric Delbac.

**2. Adoption of agenda**

The agenda was adopted with no changes.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 11<sup>th</sup> Working Group meeting held 9 February 2016, Parma.

The minutes of the 11<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> March 2016.

### 5. Hearing Experts

Richard Sibly presented [item 7 of the agenda](#) on the ecotox module developed by Syngenta for BEEHAVE. Cecilia Costa and Simone Tosi participated in the discussion of agenda item 9 on the modules related to the effects on colony.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

The main achievements made by each subgroup during the series of teleconference meetings in January and February 2016 (pesticides, colony + in-hive products; beekeeping practices and biological agents; landscape and weather; model calibration/validation) was summarised to the whole WG and pending issues were further discussed. The first sections of the technical report (from interpretation of the terms of reference to problem formulation) were revised by the WG. The figure presenting the overall conceptual model and the accompanying text were taken as an example to determine the level of details required for the subsequent sections on the specific modules. As an exercise, a draft on the section related to the landscape module was prepared and presented to the WG. A brief presentation of the ecotox module developed by Syngenta for BEEHAVE was provided to the WG who also asked for clarifications. On the second day, the WG split into three subgroups to further process information on the pesticides, landscape and beekeeping practice modules. In order to finalise the work within the timeline, it was agreed that the WG should inquire further to make better use of the existing data and knowledge (e.g. JRC maps for the landscape module and beehave as a starting point for the implementation of the colony module).

### 7. Next MUST-B WG meetings

To be confirmed

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencpolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 11<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “beekeeping practices”)**  
**Held on 9 February 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Gianni Gilioli, Cecilia Costa, Fani Hatjina, Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Not applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - ALPHA Unit : Edoardo Carnesecchi
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants.

**2. Adoption of agenda**

The agenda was adopted with no changes.

**3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

#### **4. Agreement of the minutes of the 10<sup>th</sup> Working Group meeting held on 5 February (afternoon) 2016, Parma.**

The minutes of the 10<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> March 2016.

#### **5. Hearing Experts**

Not applicable.

#### **6. Scientific topics for discussion**

##### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

The list of beekeeping practices identified by HEALTHY-B WG was reviewed by the experts to determine those which have a direct impact on the model components (demography, physiology, behaviour, pesticides, in-hive products) and being influenced by scenario components (resources in the landscape, climatic and geographic position in the landscape, weather, biological agents and abiotic factors). To record the scoring of the experts, a table was elaborated and within the time of the TC, the scoring on the scenario component was completed. The scoring on the model component was identified as an action point for the experts. As a next step, together with the results of the discussions on the biological agents (MUST-B9) and colony (MUST-B10), it was agreed that EFSA would prepare tables to determine influences of beekeeping practices with the model components (colony, in-hive products and scenarios) to be further populated by experts and re-discussed at the next physical WG meeting.

#### **7. Next MUST-B WG meetings**

- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencpolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 10<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “core module: colony and in-hive products”)**  
**Held on 5 February (afternoon) 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Gianni Gilioli, Gérard Arnold, Fani Hatjina and Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Not applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - ALPHA Unit : Eliana Lima
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants.

**2. Adoption of agenda**

The agenda was adopted with no changes.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 9<sup>th</sup> Working Group meeting held on 5 February (morning) 2016, Parma.

The minutes of the 9<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> March 2016.

### 5. Hearing Experts

Not applicable.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

The conceptual model for the core model “colony (demographic, behavioural and physiological traits) and in-hive products” was presented for discussion and implementation, in particular, the different life stages and tasks to be considered in the core module. A category “non-nurses (in hive)” comprising all in-hive bees doing various tasks in the hive other than nursing (e.g. handling food, cleaning cells, producing and handling wax) was added. Two-way relationships were made between nurses, non-nurses, foragers and winter bees to reflect behavioural plasticity. The various tasks to be considered were aligned with the different bee stages to be considered. As a result, 13 behavioural traits were identified by the experts with 6 life stages associated with those tasks. Together with the results of the discussions on the biological agents (MUST-B9) and beekeeping practices (MUST-B11), EFSA will prepare tables on basic and modified rates for demographic, behavioural and physiological traits to be further populated by experts and re-discussed at the next physical WG meeting. Within the time of the TC, there was not enough time to discuss the “in-hive products”.

### 7. Next MUST-B WG meetings

- MUST-B 11 - TC6: Beekeeping practices, 9 Feb. 2016, 15-18h00 (CET)
- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencypolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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**Scientific Committee and Emerging Risks Unit (SCER UNIT)**

**Scientific Committee**  
**Minutes of the 9<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “biological agents”)**  
**Held on 5 February (morning) 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Gianni Gilioli, Fani Hatjina, Cecilia Costa, Gerard Arnold and Frederic Delbac
- **Hearing Experts<sup>1</sup>:**
  - Not applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - ALPHA Unit : Eliana Lima
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

EFSA welcomed the participants.

**2. Adoption of agenda**

The agenda was adopted with no change.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.



### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 8<sup>th</sup> Working Group meeting held on 4 February (afternoon) 2016, Parma.

The minutes of the 8<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> March 2016.

### 5. Hearing Experts

Not applicable.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

It was reminded that following previous WG discussions, the core module (comprising the demographic, physiological and behavioural traits of the colony and the in-hive products) would be dynamic and influenced by "biological agents" and "beekeeping practices" in a series of potentially realistic scenarios. The biological agents to be considered in the model, i.e. Varroa and associated viruses and AFB, were selected according to the scoring made by the HEALTHY-B WG which determined indicators and factors influencing the health of the colony and methods to identify and measure those biological agents in the field. Together with the results of the discussions on the biological agents (MUST-B9) and beekeeping practices (MUST-B11), it was agreed that EFSA would prepare tables to determine influences of biological agents with the model components (scenarios, colony and in-hive products) to be further populated by experts and re-discussed at the next physical WG meeting.

### 7. Next MUST-B WG meetings

- MUST-B 10 - TC5: Colony and in-hive products - 5 Feb. 2016, 14-17h00 (CET)
- MUST-B 11 - TC6: Beekeeping practices, 9 Feb. 2016, 15-18h00 (CET)
- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 8<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “model validation/calibration”)**  
**Held on 4 February (afternoon) 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Sophie Roelandt, Richard Sibly and Robert Smith
- **Hearing Experts<sup>1</sup>:**
  - Chris Topping
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - AMU Unit : Gilles Guillot
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants. Apologies were received from Richard Sibly and Robert Smith.

**2. Adoption of agenda**

The agenda was adopted with no change.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### **4. Agreement of the minutes of the 7<sup>th</sup> Working Group meeting held on 4 February (morning) 2016, Parma.**

The minutes of the 7<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> January 2016.

### **5. Hearing Experts**

Dr Chris Topping was invited to present his view on model validation/calibration based on his experience and knowledge of good modelling practices.

### **6. Scientific topics for discussion**

#### **6.1 MUST-B (EFSA-Q-2014-00881)**

The cyclical process of the model development including parameterization, calibration and validation was discussed in the light of the data collection process including literature, expert opinion and ad-hoc data collection. The WG discussed approaches to conduct sensitivity and uncertainty analyses and the EFSA Guidance on uncertainty was mentioned as a useful source.

### **7. Next MUST-B WG meetings**

- MUST-B 9 - TC4: Biological agents – 5 Feb. 2016, 9-12h00 (CET)
- MUST-B 10 - TC5: Colony and in-hive products - 5 Feb. 2016, 14-17h00 (CET)
- MUST-B 11 - TC6: Beekeeping practices, 9 Feb. 2016, 15-18h00 (CET)
- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 7<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “landscape and weather”)**  
**Held on 4 February (morning) 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Jos Boesten, Gianni Gilioli and Robert Luttik
- **Hearing Experts<sup>1</sup>:**
  - Chris Topping
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - ALPHA Unit : Edoardo Carnesecchi
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

The Chair welcomed the participants.

**2. Adoption of agenda**

The agenda was adopted with no change.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 6<sup>th</sup> Working Group meeting held on 26<sup>th</sup> January 2016, Parma.

The minutes of the 6<sup>th</sup> Working Group meeting were agreed by written procedure on 29<sup>th</sup> March 2016.

### 5. Hearing Experts

Dr Chris Topping was invited to present his view on the temporal and spatial scales of the landscape and weather components for the design of a population-based model.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

The WG discussed the inclusion of landscape and weather components into a computer model to assess risks to honeybee colonies from exposure to pesticides in a context of multiple stressors. The WG agreed that the model shall include a complex landscape, varying both in time and space, with different foraging scenarios reflecting various levels of exposures of foragers. The inclusion of mixtures in the conceptual module for pesticides exposure/effects needs to be further investigated by the WG. The WG acknowledged that the calibration of the model will require high quality datasets at each site. During model calibration, historical data on landscape and weather from each study site can be used but accurate real-time data, at a fine temporal scale, will be required for the local testing of the model. It was noted that data availability and quality will be crucial for the design of the data collection on landscape and weather components for the model calibration. Finally, for regulatory purposes, it will need to be tested under three different EU climatic zones (with replications at each site).

### 7. Next MUST-B WG meetings

- MUST-B 8 - TC3: Model calibration/validation - 4 Feb. 2016, 14-17h00 (CET)
- MUST-B 9 - TC4: Biological agents – 5 Feb. 2016, 9-12h00 (CET)
- MUST-B 10 - TC5: Colony and in-hive products - 5 Feb. 2016, 14-17h00 (CET)
- MUST-B 11 - TC6: Beekeeping practices, 9 Feb. 2016, 15-18h00 (CET)
- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencypolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 6<sup>th</sup> meeting of the Working Group MUST-B**  
**(subgroup “pesticides module”)**  
**Held on 26 January 2016, Parma (Italy)**  
**by TELE-conference**  
**(Agreed on 29 March 2016)**

**Participants**

- **Working Group Members:**
  - Jos Boesten, Richard Sibly, Robert Luttik and Rob Smith
- **Hearing Experts<sup>1</sup>:**
  - Not applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - Pesticides Unit : Csaba Szentes and Franz Streissl
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

Apologies were received from Rob Smith.

**2. Adoption of agenda**

The agenda was adopted with no change.

**3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest,<sup>3</sup> EFSA

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

screened the Annual Declarations of Interest and the Specific Declarations of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process.

For further details on the outcome of the Oral Declaration of Interest made at the beginning of the meeting, please refer to Annex I.

#### **4. Agreement of the minutes of the 5<sup>th</sup> Working Group meeting held on 3-4 December 2015, Parma.**

The minutes of the 5<sup>th</sup> Working Group meeting were agreed by written procedure on 14<sup>th</sup> January 2016.

#### **5. Hearing Experts**

Not applicable.

#### **6. Scientific topics for discussion**

##### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

The WG discussed the conceptual model for the pesticides module. In particular, the input flows from the landscape (nectar, pollen and water) and the exposure routes by contact and by consumption within the hive. Several items which required further investigation from the experts to be brought to the next WG meeting were identified and discussed (e.g. contact exposure to larvae via wax; larvae food consumption; energy consumption based on bee body mass; use of individuals versus cohorts per day in the context of mixtures; pesticide fate in-hive; inclusion of the queen in the model; lack of toxicity data for larvae; sublethal effects in foragers; drivers affecting food storage in-hive).

#### **7. Next MUST-B WG meetings**

- MUST-B 7 - TC2: Landscape and weather – 4 Feb. 2016, 9-12h00 (CET)
- MUST-B 8 - TC3: Model calibration/validation - 4 Feb. 2016, 14-17h00 (CET)
- MUST-B 9 - TC4: Biological agents – 5 Feb. 2016, 9-12h00 (CET)
- MUST-B 10 - TC5: Colony and in-hive products - 5 Feb. 2016, 14-17h00 (CET)
- MUST-B 11 - TC6: Beekeeping practices, 9 Feb. 2016, 15-18h00 (CET)
- MUST-B 12, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 13, 18-19 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

## Scientific Committee and Emerging Risks Unit (SCER UNIT)

### Annex I

Interests and actions resulting from the Oral Declaration of Interest done at the beginning of the meeting

CONFLICT OF INTEREST: Dr Richard Sibly declared having research funding from private sector of more than 25% since December 2015. In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>[1]</sup> and the Decision of the Executive Director Declarations of Interest<sup>[2]</sup>, and taking into account the specific matters discussed at the meeting in question, the interest above was deemed to represent a Conflict of Interest.

The expert was excluded from any discussion, voting or other processing of the agenda item "Specifications for the development of an integrated model for the risk assessment of honeybee colonies exposed to pesticides under different environmental scenarios".

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<sup>[1]</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>[2]</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014>



**Scientific Committee and Emerging Risks Unit (SCER UNIT)**

**Scientific Committee**  
**Minutes of the 5<sup>th</sup> meeting of the Working Group MUST-B**  
**3 and 4 December 2015, Parma (Italy)**  
**(Agreed on 14 January 2016)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gérard Arnold, Jos Boesten, Cecilia Costa (on 4<sup>th</sup> December, via TC), Frédéric Delbac, Gianni Giglioli, Fani Hatjina, Richard Sibly (on 4<sup>th</sup> December), Rob Smith and Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Kristina Garber, Gloria Degrandi-Hoffman, Andrew Kanarek and Thomas Steeger (on 3<sup>rd</sup> December via TC from 14h to 18h)
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais and Giorgio Sperandio
  - Pesticides Unit: Csaba Szentes and Franz Streissl (on 4<sup>th</sup> December)
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

On 3 December, the Chair of the MUST-B WG welcomed the participants of the WG. Apologies were received from Rob Smith (3 December morning), Cecilia Costa and Richard Sibly (3 December) and Robert Luttik (3 and 4 December).

**2. Adoption of agenda**

The agenda was adopted with no changes.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### **4. Agreement of the minutes of the 4<sup>th</sup> Working Group meeting held on 5-6 November 2015, Parma.**

The minutes of this 4<sup>th</sup> Working Group meeting were agreed at the beginning of the meeting on 3 December 2015.

### **5. Hearing Experts**

Dr Gloria Degrandi-Hoffman, Dr Kristina Garber, Dr Andrew Kanarek and Dr Thomas Steeger were invited to present to MUST-B WG the development made on the Beepop and Varroapop models for the risk assessment of pesticides.

### **6. Scientific topics for discussion**

#### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

On the first day, a TC was organised with EPA to discuss the development made by EPA on the beepop and varroapop models for the risk assessment of pesticides. In the morning, the WG pre-viewed the presentation sent by EPA and elaborated a list of questions that was further discussed in the afternoon with EPA during the TC. The new structure of the technical report, following the model cycling of the EFSA opinion on good modelling practices, was refined and approved by the WG. An overview of the conceptual model of the core module, including colony and in-hive products, was presented to the WG for further discussion. On the second day, the WG subdivided into two subgroups to make further detailed discussion and progress on the respective conceptual models (pesticides and colony). After a thorough discussion on how the various stressors should be linked to the core module (as modules or as scenarios), it was concluded that the model developed as a tool for the risk assessment of pesticides would need to have different scenarios to integrate effects from various stressors (biological agents and beekeeping practices). In order to further develop the conceptual and formal models, as well as to address the issues on data collection for model validation and sensitivity analysis, it was suggested to split the WG into subgroups and to schedule several TC for MUST-B 6. The results made from these various subgroups would then be re-discussed in a general WG meeting in MUST-B 7 scheduled in March.

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencypolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

## **7. Next MUST-B WG meetings**

- MUST-B 6:
    - TC1: Landscape and weather - 4 Feb 2016, 9-12h00 (CET)
    - TC2: Model validation & sensitivity analysis - 4 Feb. 2016, 14-17h00 (CET)
    - TC3: Biological agents - 5 Feb 2016, 9-12h00 (CET)
    - TC4: Colony and in-hive products - 5 Feb 2016, 14-17h00 (CET)
    - TC5: Pesticides, 26 Jan 2016, 14-17h (CET)
    - TC6: Beekeeping practices, 9 Feb 2016, 15-18h00 (CET)
  - MUST-B 7, 30-31 Mar 2016 (09.00-18h00 the first day and 08.30-16h00 second day)
  - MUST-B 8, 11-12 May 2016 (09.00-18h00 the first day and 08.30-16h00 second day)
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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 4<sup>th</sup> meeting of the Working Group MUST-B**  
**5 and 6 November 2015, Parma (Italy)**  
**(Agreed on 3<sup>rd</sup> December 2015)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gérard Arnold, Jos Boesten, Frédéric Delbac, Gianni Giglioli, Fani Hatjina, Robert Luttik, Richard Sibly, Rob Smith (on 6 November) and Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Not Applicable
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais, Stefania Volani and Jean-Lou Dorne (on 5<sup>th</sup> November morning)
  - ALPHA Unit : Eliana Lima (on 6<sup>th</sup> November)
  - AMU Unit : Gilles Guillot (on 5<sup>th</sup> November morning)
  - Pesticides Unit : Csaba Szentes and Franz Streissl (on 5<sup>th</sup> November and via TC on 6<sup>th</sup> November)
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

On 5 November, the Chair of the MUST-B WG welcomed the participants of the WG. Apologies were received from Cecilia Costa, Sophie Roelandt, Rob Smith (on 5 November).

**2. Adoption of agenda**

The agenda was adopted with no changes.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts: <http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 3<sup>rd</sup> Working Group meeting held on 24-25 September 2015, Parma.

The minutes of this 3<sup>rd</sup> Working Group meeting were agreed at the beginning of the meeting on 5 November 2015.

### 5. Hearing Experts

No hearing experts were invited to this meeting.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

The WG discussed and agreed on the overall approach which is in two steps: (i) the development and validation (with high quality field data) of the full model incorporating the biological core module, the various modulators (i.e. weather, landscape, beekeeping practices), and the stressors (i.e. pesticides, biological stressors, etc.) and (ii) the use of the model as a tool for pesticide risk assessment, in the context of multiple stressors. The WG acknowledged the usefulness of the guidance provided in the EFSA opinion on good modeling practices for the model development. Following the modeling cycle described in this opinion, the WG noted that a detailed section on problem formulation, the first step within the cycle, would be required. Thereafter, the WG discussed thoroughly the conceptual model and specific modules and split into two sub-groups (biological agents and pesticides). The work of each sub-group was further shared and discussed within the whole WG along with the landscape module. From these discussions, outsourcing needs and action points were identified for the next MUST-B WG meeting.

### 7. Next MUST-B WG meetings

- MUST-B 5, 3-4 Dec. 2015 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 6, 4-5 February 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 7, 30-31 March 2016 (09.00-18.00 the first day and 08.30-16.00 second day)
- MUST-B 8, 11-12 May 2016 (09.00-18.00 the first day and 08.30-16.00 second day)

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencpolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 3<sup>rd</sup> meeting of the Working Group MUST-B**  
**24 and 25 September 2015, Parma (Italy)**  
**(Agreed on 5 November 2015)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gérard Arnold, Jos Boesten, Cecilia Costa, Frédéric Delbac, Gianni Giglioli, Fani Hatjina, Robert Luttik (from 24 September afternoon), Richard Sibly, Rob Smith and Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Christopher Topping (on 24 September afternoon)
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais, Stefania Volani and Ana Afonso
  - ALPHA Unit : Eliana Lima
  - AMU Unit : Gilles Guillot
  - Pesticides Unit : Franz Streissl
  - Risk Communication Unit : Simon Terry
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

On 24 September, the Chair of the MUST-B WG welcomed the participants of the WG. Apologies were received from Sophie Roelandt, Robert Luttik (on 24 September morning) and Christopher Topping (on 24 morning and 25 September).

**2. Adoption of agenda**

The agenda was adopted with no changes.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

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### 3. Declarations of Interest of Working Groups members

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

### 4. Agreement of the minutes of the 2<sup>nd</sup> Working Group meeting held on 20-22 May 2015, Parma.

The minutes of this 2<sup>nd</sup> Working Group meeting were agreed at the end of the meeting on 22 May 2015.

### 5. Hearing Experts

Dr Christopher Topping was invited to present his views for agenda item 7, in particular on issues related to the development of the landscape module and the steps required for the model calibration and validation with data from field studies.

### 6. Scientific topics for discussion

#### 6.1 MUST-B ([EFSA-Q-2014-00881](#))

An overview of the discussions and conclusions made at the 2<sup>nd</sup> MUST-B WG meeting was presented to the new members of the MUST-B WG by the chair, Simon More and EFSA, followed by a presentation provided by Jos Boesten on the conclusions and recommendations made by the PPR Panel on the BEEHAVE evaluation. The WG further discussed those conclusions and recommendations and clarifications were made on the objective and expected deliverables and timeline regarding the model development. The WG is expected to draft specifications for the outsourcing of a model and a survey (each published as a technical report in 2<sup>nd</sup> and 4<sup>th</sup> quarter of 2016, respectively). The model will be designed to assess risks to honeybee colonies from exposure to pesticides under different conditions/scenarios (i.e. considering other stressors and factors influencing bee health status as defined by the HEALTHY-B WG). The WG members thoroughly discussed the structure and content of the first technical report on the model development to be drafted by March 2016 for subsequent adoption by the Scientific Committee. Action points were identified for the next MUST-B WG meeting to start the drafting of the report.

### 7. Next MUST-B WG meetings

- MUST-B 4, 5-6 Nov. 2015 (09.00-18.00h on the first day and 08.30-16.00h on the second day) to be confirmed via doodle poll
- MUST-B 5, 3-4 Dec. 2015 (09.00-18.00h on the first day and 08.30-16.00h on the second day)
- MUST-B 6, 4-5 February 2016 (09.00-18.00h on the first day and 08.30-16.00h on the second day)
- MUST-B 7, 30-31 March 2016 (09.00-18.00h on the first day and 08.30-16.00h on the second day)

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

- MUST-B 8, 11-12 May 2016 (09.00-18.00h on the first day and 08.30-16.00h on the second day)



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Scientific Committee and Emerging Risks Unit (SCER UNIT)

**Scientific Committee**  
**Minutes of the 2<sup>nd</sup> meeting of the Working Group MUST-B**  
**20, 21 and 22 May 2015, Parma (Italy)**  
**(Agreed on 22 May 2015)**

**Participants**

- **Working Group Members:**
  - Simon More (Chair), Gérard Arnold, Cecilia Costa, Ryszard Laskowski, Robert Luttik, Sophie Roelandt and Simone Tosi
- **Hearing Experts<sup>1</sup>:**
  - Jan Baas (for items 13 and 15), Rémy Beaudouin (for items 13 and 15), Matthias Becher (for items 12 and 15) and Christopher Topping (for items 14 and 15)
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais, Stefania Volani and Jean-Lou Dorne (20-22 May)
  - ALPHA Unit : Sybren Vos (20 May)
  - AMU Unit : Fulvio Barizzzone (20-21-22 May)
  - Pesticides Unit : Franz Streissl (20-21 May), Maria Arena (21 May)
  - Risk Communication Unit : Simon Terry (20, partly 21 and 22 May)
  - PTT Unit : Ana Afonso (20 and 21 May)
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

On 20 May, the Chair of the MUST-B WG welcomed the participants of the WG. Apologies were received from Frédéric Delbac and Yves Van der Stede.

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<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **2. Adoption of agenda**

The agenda was adopted with slight changes. The meeting on 20 May was extended from 18h00 to 18h30 and agenda item 7 was merged with the last agenda item 6 both to be presented by Cecilia Costa.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting were identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 1<sup>st</sup> Working Group meeting held on 12-13 March 2015, Parma.**

The minutes of this 1<sup>st</sup> Working Group meeting were agreed by written procedure on 20 March 2015.

## **5. Hearing Experts**

Dr Jan Baas, Dr Rémy Beaudouin, Dr Matthias Becher and Dr Christopher Topping were invited to present their views for agenda items 12-15 of the present meeting.

## **6. Scientific topics for discussion**

### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

The specific terms of reference, deliverables and workplan for the MUST-B WG was presented and discussed as well as an update on the progress on Healthy-B WG (item 5). An overview of the available information collected by the Bee Task Force and experts on interactions between multiple stressors as well as on the lessons learnt from data collection of the analysis from the Belgium (EPILOBEE) and Italian (APENET/BEENET) bee monitoring schemes were presented and discussed. The usefulness of the BEEHAVE, DEB-TOX and ALMaSS models to assess multiples stressors at the landscape level in honeybee colonies was discussed with the hearing experts to identify the pros and cons of each modelling approach and to determine how to best integrate the different approaches and how to best fine-tune the model and the survey (in terms of timing and data requirement). Further data availability collection (e.g. literature reviews, JRC data maps) and expert knowledge (e.g. from EU/US Bee monitoring schemes) were identified and will be explored by the Bee Task Force for the next MUST-B WG meetings.

## **7. Next MUST-B WG meeting**

- To be confirmed

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<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencpolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

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**Scientific Committee and Emerging Risks Unit (SCER UNIT)**

**Scientific Committee**  
**Minutes of the 1<sup>st</sup> meeting of the Working Group MUST-B**  
**12 and 13 March 2015, Parma (Italy)**  
**(Agreed on 20 March 2015)**

**Participants**

- **Working Group Members:**
  - MUST-B WG: Simon More (Chair), Gérard Arnold, Frédéric Delbac, Robert Luttik, Sophie Roelandt, Simone Tosi, Yves Van der Stede
  - HEALTHY-B WG: Howard Browman (Chair), Gérard Arnold, Margaret Couvillon, Gianni Gilioli, Pascal Hendrix, Chiara Polce, Mohan Raj
- **Hearing Experts<sup>1</sup>:**
  - Cecilia Costa
- **European Commission and/or Member States representatives:**
  - Not Applicable
- **EFSA:**
  - SCER Unit: Agnès Rortais, Jean-Lou Dorne, Stefania Volani
  - ALPHA Unit : Frank Verdonk, Sybren Vos, Renata Leuschner
  - Pesticides Unit : Franz Streissl (via TC)
  - EDIT Unit : Simon Terry
- **Others:**
  - Not Applicable

**1. Welcome and apologies for absence**

On 12 March, the Chair of MUST-B WG welcomed the participants of the WG. On 13 March, the Chair of HEALTHY-B WG welcomed the participants of the two working groups. Franz Streissl only participated for agenda point 6.2. Apologies were received from Robert Luttik for 13 March.

<sup>1</sup> As defined in Article 17 of the Decision of the Executive Director on the selection of external experts:  
<http://www.efsa.europa.eu/en/keydocs/docs/expertselection.pdf>.

## **2. Adoption of agenda**

The agenda was adopted without changes.

## **3. Declarations of Interest of Working Groups members**

In accordance with EFSA's Policy on Independence and Scientific Decision-Making Processes<sup>2</sup> and the Decision of the Executive Director on Declarations of Interest<sup>3</sup>, EFSA screened the Annual Declaration of Interest and the Specific Declaration of Interest filled in by the working group members invited for the present meeting. No Conflicts of Interest related to the issues discussed in this meeting have been identified during the screening process or at the Oral Declaration of Interest at the beginning of this meeting.

## **4. Agreement of the minutes of the 1<sup>st</sup> Working Group meeting held on 12-13 March 2015, Parma.**

The minutes of this 1<sup>st</sup> Working Group meeting were agreed by written procedure on 20 March 2015.

## **5. Hearing Expert**

Dr. Costa was invited to present her views for topics 6.1 and 6.2 of the present meeting.

## **6. Scientific topics for discussion**

### **6.1 MUST-B ([EFSA-Q-2014-00881](#))**

The MUST-B mandate was presented, in particular the background, the terms of reference, the hypotheses to be tested, the approaches and framework to be developed by the working group. The working group discussed the hypotheses and the different approaches (modeling, experimental and monitoring) as well as their relationships (in terms of timing and data requirement) to achieve the overall conceptual framework on the development of a holistic approach to the risk assessment of multiple stressors in bees. EFSA presented the various projects and data available that are relevant for the work of MUST-B. The working group was asked to provide input at the next meeting on each of the identified projects. It was proposed to invite modellers (BEEHAVE and DEB-TOX models) at the next meeting to discuss the feasibility and data requirement for the implementation a model combining processes based on population dynamics and energy demand.

<sup>2</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencepolicy.pdf>

<sup>3</sup> <http://www.efsa.europa.eu/en/keydocs/docs/independencerules2014.pdf>

## 6.2 Joint MUST-B and HEALTHY-B ([EFSA-Q-2015-00047](#))

The HEALTHY-B mandate was presented and the complementarity with the overarching MUST-B mandate was discussed in detail. The attributes of a healthy bee colony and definitions of indicators/factors were discussed and agreed. The MUST-B WG will further define the objectives of the future field survey before the HEALTHY-B WG will initiate its activities on TOR4. The experts listed some field studies that have been performed in the past and which would be interesting to consult to identify indicators/factors of a healthy honey bee colony.

## 7. Next MUST-B WG meeting

- 20 May(14.00 -18.00 CET) + 21 May (9.00 -18.00 CET) + 22 May (9.00 -13.00 CET)  
2015: MUST-B 2 WG meeting, Parma.