

2.16 Semi-field and field testing on the honey bee working group

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Introduction

Guidance on semi-field and field testing of pesticides on honey bees is provided in the current version of the EPPO 170 publication (EPPO, 2010). These methods together with the OECD guidance document 75 (OECD, 2007) constitute the toolbox for checking if a product exerts, under realistic conditions of use, impact on honey bee survival, development and behaviour.

Although the EPPO guidance has been updated in 2010 in order to provide more recommendations on the testing of systemic products and seed treatments, further input and discussions have occurred, as more experience has been gained with these methods and feedback from testing facilities implementing them and also thanks to the ongoing exchanges with the Pesticide Effects on Insect Pollinators (PEIP) group of the OECD. Finally, both North America and Europe are revising their recommendations on risk assessment of pesticides to bees and pollinators and questions/recommendations with regards to semi-field and field testing were shared (EPA, 2012 and EFSA, 2013). A revision of the OECD 75 and the EPPO 170 guidance documents has been agreed upon.

Study endpoints and detection of significant treatment-related effects

The endpoints that can be derived from a test and the capacity of that test to detect treatment-related effects on which endpoints may be derived is determined by the study design and the number of measurements/replicates. This is also dependent on the test system and on the number of parameters that may reasonably be monitored without disturbing the colonies.

Indeed in the standard semi-field study, each enclosure contains one colony and so the level of intervention (brood assessment) may be limited in order to not compromise colony development. By contrast, a field test involves several colonies which may be dedicated to the assessment of different parameters e.g. (mortality, pollen collection, brood assessments etc) in each field.

In this context, acceptability criteria (*i.e.*, parameters or criteria on which levels of acceptable effects may be defined) are being redefined for control and toxic standard data as well as significant treatment effects, which include statistical and biological significance. Input from statisticians is being prepared.

Level of mortality to be detected in semi-field and field studies

Semi-field studies

A first analysis of control mortality and toxic standard data and level of foraging from 10 semi-field tests was performed in 2012 (Miles and Alix, 2012) based on data collected in studies performed by Dow AgroSciences. This analysis is being expanded to other active substances and data are being collected from a number of companies. It includes foraging (control), toxic standard mortality, and control mortality and information from the bee traps (height). Additionally information on colony strength, location, bee trap design, *etc.* is collected in order to identify any influencing factors.

The exercise should encompass the 10 most recent trials of EPPO 170 compliant studies, *i.e.*, up-to-date trials selected without any bias, on *Phacelia* only, from each company. Data collection (only) will be coordinated by the European Crop Protection Agency Non-Target Arthropods and Bee group. This information will also be made available to the regulatory authorities within the group.

The applicability of *Phacelia* trials for North America and the possibility of expanding to other crops will be considered when the initial exercise with *Phacelia* has been completed. The influence of the season during which the studies are conducted, will also be considered.

Field studies

A similar analysis is being run for field trials. The exercise will encompass control mortality 7 days after application in a "standard" attractive crop, such as *Phacelia*, OSR/canola, buckwheat, or mustard. Colony strength, foraging activity, will be analysed. The exercise should encompass the 10 most recent trials from each company (EPPO 170 compliant) as well as from JKI.

Input of other tools

The simulation model BEEHAVE is considered as a useful tool in addition to field studies. The potential input provided by this model and modelling in general will be documented in the guidance in preparation.

Conclusions

Semi-field trials are currently covered by two guidance documents: the EPPO 170 guidance and the OECD 75 guidance. The group unanimously agreed to the remit of developing two semi-field test guidance documents (one for brood and one general).

The group agreed to pass the revision of the OECD 75 brood guidance primarily to the ICPPR brood group and the *Bienenschutz* group. For both the new semi-field guidance and the revision to the OECD 75 guidance, the set-up established in OECD will be kept as it provides recommendations to assess colony health. Elements from the revised OECD 75 may also be applicable in the new semi-field guidance and it will be important to maintain co-ordination between the groups.

Field studies are currently described in the EPPO 170 guidance and a OECD guidance is also to be prepared. For consistency, the group agreed to propose one set of recommendations which will be used to revise the EPPO guidance which will in turn be submitted to OECD as a future guidance document.

The ongoing tasks of revising/developing Guidance documents are summarized below:

- OECD 75: coordinating with the ICPPR brood group and the *Bienenschutz* group
- OECD Semi-field standard guidance document (new)
- OECD Field guidance document (new)

A proposal to revise the current OECD 75 standard has been submitted to OECD-WNT.

References

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