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4.5 Are flowering weeds in agricultural treated fields a significant exposure route for risk assessment?

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Abstract

As part of an industry-led initiative, the European Crop Protection Association (ECPA) have used available industry efficacy trial data to check the hypothesis of significant exposure via 'weeds in the treated field' exposure scenario, referred to in the EFSA bee Guidance Document, which suggests that if <10% of the area of use contains attractive flowering weeds then the exposure route is not relevant.

Weed recordings from over 8500 industry herbicide efficacy trials from a range of arable (sunflower, maize, oilseed rape, cereals, sugar beet, potatoes, peas and beans) and permanent crops (orchards, citrus and grapes) were analysed to check the hypothesis of significant exposure route via weeds in the treated field. Information was extracted from efficacy trial control data to determine if the occurrence of attractive flowering weeds constitutes less than 10% of the area of use, thereby highlighting that attractive flowering weeds in treated agricultural fields are not applicable for many commercially grown crops.

Here we present the analysis on the presence of weed species, growth stage of the weed species, attractiveness to bees of the weed species, the ground coverage of the weed species, the trial location and dates and the crop growth stage in the trials. The most pertinent questions being asked were 'are attractive flowering weeds likely to be present in arable and permanent crop fields?' and 'what percentage of the area of the treated field might be occupied by attractive flowering weeds?'. The project builds on the initial work from Maynard et al, 2014.

4.6 Guttation as an exposure route in the risk assessment for plant protection products – Review of available data

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Abstract

Based on increased concern and awareness of the risks to pollinators from exposure to plant protection products (ppp), focus has been drawn to additional potential routes of exposure other than *via* pollen/nectar and direct contact. One potential source being considered for risk assessment is exposure following collection of contaminated guttation droplets by honey bees, which are known to exploit different water sources to satisfy colony needs. A risk could occur from this source when residues of water-soluble/systemic substances applied to a crop are present in the guttation liquid at levels which could result in toxicity to exposed honey bee colonies. Whereas toxicity can be measured in standardised laboratory tests, potential exposure via guttation droplets is more complex and three elements need to be considered as follows:

- 1: The concentrations of residues occurring in guttation water following ppp application;
- 2: The occurrence of guttation on a certain crop species; and,
- 3: The extent to which honey bees are actively collecting water via guttation droplets

These three points were used as the basis of a review of available data, which included 25 extensive regulatory studies conducted by industry specifically to evaluate the risk to honey bees from the occurrence of guttation in different crops. Assessments included the collection of guttation droplets by honey bees and almost always the potential effects at the colony level and measurement of residues in guttation liquid. Additionally, a review

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of published literature was performed in which 16 relevant papers were identified. The aims were to determine a 90th percentile for occurrence of guttation on a certain crop and the 90th percentile for numbers of honey bees collecting guttation droplets, along with consideration of measured residue levels. Results of this evaluation are presented here in the context of the exposure risk from ppp residues in guttation droplets to honey bees at the colony level.

4.7 Measures taken - the Swiss national action plan for bee health

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Abstract

The annual winter losses of honey bees in Switzerland vary between 9% and 23% during the years 2008 to 2019 and are exceeding the as normal defined 10% level. The causes for the losses can have several reasons. However, one of the main reasons is the infection of the honeybees with the Varroa mite. Therefore, a health services for bees was founded to offer education programs for beekeepers and to support beekeepers in preventing and combating diseases. Switzerland further decided in 2014 to implement an action plan to promote the health of bees. Measures have been taken in the areas of disease prevention, promotion of food supply and reduction of risks from plant protection products. Immediate measures have been implemented such as the inclusion of a flowering strip in the Direct Payments Ordinance and measures to protect bees from plant protection products. Switzerland is actively involved in the development of new OECD test guidelines to evaluate the acute and chronic risk to honey- and wild bees. Honey and wild bees play an important role in pollination of agricultural crops and wild plants. The current situation is in evaluation to decide if further measures are needed.

Keywords: Prevention, diseases, Varroa, Plant protection product, habitat, pollination

Introduction

In recent years, the Confederation has implemented many measures to promote bee health. Based on the concept for bee promotion in Switzerland and the National Plan of Measures for the Health of Bees, measures have been taken in the areas of disease prevention and control for the protection of honeybees, the promotion of food supply and the reduction of risks from plant protection products. A large number of different research projects are underway to answer outstanding questions on bee health, pollination safety and biodiversity. Switzerland also participates in various international research activities on these topics.

Materials and Methods

The Federal council was mandated in 2014 to develop a strategy to promote the health of bees taking into account existing efforts and measures already taken. By the end of 2015, the causes of bee mortality should have been scientifically understood and suitable strategies developed to combat them. The action plan for the health of bees included recommendations of an expert group composed of representatives from research (Agroscope, ETH, University of Bern), authorities (FOEN, BLW, BLV), the Swiss Farmers Association, apisuisse and the Bee Health Service under the auspices of the Federal office for agriculture. For measures which have already been consolidated between the offices it was decided to implement them immediately. Further measures are reviewed for their effectiveness in sustainably promoting bee health and their suitability for practical use (national action plan 2014).

Results

Winter losses

The losses of honey bee colonies over the winter have been recorded for 12 years by an annual survey of more than 1,000 beekeepers. Winter losses in Switzerland have fluctuated on average