studied the effect of coumaphos in beeswax on larval development. Fifteen *Apis mellifera* colonies were treated with CheckMite® containing 2.72 g of coumaphos per application. During the following spring season, average coumaphos levels of 65 mg/kg were measured in combs that came into contact with the strips and average concentrations of 6.7 mg/kg were measured in combs that did not come into contact with the strips. Coumaphos was also detected in wax that was not present during the treatment, such as newly constructed wax, wax of honeycombs and capping wax, respectively. *In vitro* larval rearing in cups coated with beeswax containing coumaphos at a concentration of 70 mg/kg or 10 mg/kg demonstrated that coumaphos levels of 70 mg/kg in beeswax negatively affected larval development, while no differences to the controls (0 mg/kg) were observed for larvae exposed to beeswax containing coumaphos at 10 mg/kg. Therefore, beeswax exposed to CheckMite® should not be recycled in order to prevent elevated coumaphos residues in new foundations and hence to prevent honeybee larvae from being exposed to high residue levels. For further information please see Kast, C., Kilchenmann, V. and Droz, B. (2019) Distribution of coumaphos in beeswax after treatment of honeybee colonies with CheckMite® against the parasitical mite *Varroa destructor.* Apidologie

1.11 Exposure following pre-flowering insecticide applications to pollinators

Edward Pilling[1], Jeremey Barnekow[1], Vincent Kramer[1], Anne Alix[1], Olaf Klein[2], Lea Franke[2], Julian Fricke[2],

[1, 2]Eurofins Agroscience Services GmbH

E-Mail: edward.pilling@corteva.com

DOI 10.5073/jka.2020.465.011

Abstract

Applying insecticides pre-flowering can mitigate the risk to pollinators by significantly reducing exposure via both contact and dietary routes. Methods have been developed to quantify the exposure of foraging honeybees, bumblebees and solitary bees to insecticides following pre-flowering applications. The insecticide sulfoxaflor was applied pre-flowering at BBCH 55 to a variety of target crops at five different sites across Europe. The subsequent residue levels on foliage after application were determined to investigate the decline of residues prior to flowering. When the crop reached the flowering stage at BBCH 60, residue levels in pollen and nectar were determined to provide an estimate of potential maximum exposure to pollinators and rate of decline in pollen and nectar. Exposure levels were compared to results from effect studies with honeybees, bumblebees and solitary bees. With honey bees, effect assessments included mortality, foraging activity, behaviour and colony condition assessments. Nectar and pollen were sampled from forager bees, pollen traps, and from combs to determine levels of dietary exposure. Effects on bumblebees were investigated by mortality assessments in the colony and tunnel, together with assessments of foraging activity, colony weight, queen production and brood assessments at the start and end of the study. Dietary exposure to bumblebees was determined by analysis of nectar and pollen collected from forager bees and in nectar and pollen pots in the colony. Effects on solitary bees (*Osmia bicornis)* were assessed following applications to oilseed rape in tunnels. Assessments included hatching rate, nest occupation, flight activity, cell and cocoon production and hatching success. Dietary exposure was determined in nectar and pollen collected from plants. Results from both exposure and effect studies will be presented together with a discussion on risk to pollinators and mitigation with pre-flowering applications.

1.12 Assessing effects of insecticide seed treatments on pollinators in oilseed rape and maize

Edward Pilling[1], Anne Alix[1], Olaf Klein[2], Lea Franke[2], Julian Fricke[2], Marco Kleinhenz[2], Heike Gätschenberger[2]

[1]Corteva Agriscience, [2] Eurofins Agroscience Services GmbH

E-Mail: edward.pilling@corteva.com

DOI 10.5073/jka.2020.465.012

Abstract

To fully assess the risk of insecticide seed treatments in oilseed rape and maize, methods have been development to investigate effects of seeds treated with cyantraniliprole on pollinators. Tunnel studies were conducted with oilseed rape grown from treated seed combining exposure and effects assessment on honey

bees, bumblebees and solitary bees in Germany and Italy. With honey bees, effect assessments included mortality, foraging activity, behaviour and colony condition assessments. Nectar and pollen were sampled from forager bees, pollen traps, and from combs to determine levels of exposure. Effects on bumblebees were investigated by mortality assessments in the colony and tunnel, foraging activity, colony weight, queen production and brood assessments at the start and end of the study. Exposure to bumblebees was determined by analysis of nectar and pollen collected from forager bees and in nectar and pollen pots in the colony. Effects on solitary bees were assessed with oilseed rape treated seed in tunnels with *Osmia bicornis*. Assessments included hatching rate, nest occupation, flight activity, cell and cocoon production and hatching success. Exposure was determined in nectar and pollen collected from plants. Honeybee field studies with cyantraniliprole treated maize seed were conducted in Germany and Italy. Colonies were placed in the fields prior to the onset of the guttation period at BBCH 10. Mortality, foraging activity on guttation fluid and colony condition assessments were made throughout the guttation period, together with residue analysis of the guttation fluid. Colonies were then exposed to maize pollen during flowering and similar assessments conducted plus residue analysis of pollen collected from pollen traps and combs. The abundance and species richness of naturally occurring wild bees in treated and untreated field plots of maize and adjacent field margins during pollen shedding were also investigated to gain further understanding of exposure and effects on wild pollinators in maize. To evaluate a wide range of wild bee species occurring at field sites during pollen shedding period, two methods were used: a non-selective method and a selective method. For the non-selective method two different types of traps were used. Vane traps and bee bowls were installed at three sampling areas: in the centre of the maize fields, at the borders of the fields (inside the maize crop) and outside at in the adjacent field margin. The selective sweep netting method was used in the crop centre and at the border of the fields (inside the maize crop) via transect walks in a defined distance and time interval. Additionally, nesting units were provided for solitary wild bee species that breed in woody cavities. The trap nests were set up at the centre and adjacent field margin and used for sampling of pollen to assess how attractive the maize pollen is to the cavity breeding species compared to other available pollen sources at the time of the year by pollen identification of pollen mass samples. In addition, residue analysis was performed with samples of pollen mass. Results from all the studies will be presented together with the risk of cyantraniliprole treated oilseed rape and maize seed to honeybees and wild pollinators.

1.13 Conservation and creation of multi-functional margins to maintain and increase the pollinator biodiversity in agricultural environments (d)

Francisco Javier Peris-Felipo[1], Oscar Aguado-Martín[2], Luis Miranda-Barroso[3]

[1]Syngenta Crop Protection AG, Rosentalstrasse 67, 4058 Basel (Switzerland),

[2]Andrena Iniciativas y Estudios Medioambiental S.L. c/. Gabilondo 16bis, 47007 Valladolid (Spain),

[3]Sustainable Agriculture Syngenta Spain, c/. Ribera del Loira, 8, 10, 28042 Madrid (Spain),

E-Mail: oscaraguado@lepidopteros.com, javier.peris@syngenta.com, luis.miranda@syngenta.com

DOI 10.5073/jka.2020.465.013

Abstract

When a natural ecosystem changes its use in agriculture, factors that greatly affect its fauna, especially insects, are introduced. This kind of land change, and especially intensive production models causes a clear loss of biodiversity, with a drastic decrease in the number of plant species that in turn affects the natural pollinator entomofauna.

In 2010, one of the main conclusions reached by the European Commission for the Conservation of the Environment was the need to promote research on the conservation, restoration and sustainable use of the diversity of pollinators in agriculture. This situation together with the climate change and the notable decrease in the number of wild pollinators has meant that the European Union, FAO (United Nations Food Organization) and other important international organizations have raised the alarm about the need to look for how to maintain and increase the presence of wild pollinators.

In order to find practical solutions, the company Syngenta Crop Protection launched the “Operation Pollinator (OP)” project in 2009, a European-level initiative launched in Britain as part of the EU action called EPI (“European Initiative on Pollinators”), whose main objective is to protect pollinators, increase their biodiversity and promote their presence and also other beneficial or auxiliary arthropods in the crops.