Section VI: Monitoring

6.1 Honey bee poisoning incidents in Germany

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Abstract

Poisonings of honey bees may occur following exposure to bee toxic substances, e.g. pesticides, biocides and varroacides. In agricultural cropping systems, bees are often exposed to a number of different pesticides, like insecticides, fungicides and herbicides. Some products used in agriculture, especially insecticides, may be harmful to bees if used inappropriately. Depending on the properties of a substance, the formulation, the mode of action, the number of bees oversprayed, the concentration in and quantity of contaminated nectar and pollen and water brought back to the hive, pesticide exposure may result in a detectable damage of adult bees and/or bee brood. However, some symptoms which are observed following a poisoning, such as disorientation, aggressive behaviour, cramping, paralyzed bees, bees showing abnormal wing movements, weakening of the colony, high mortality, brood damage and/or pupal mortality may also be caused by various bee diseases or mistakes in bee management. Often the cause of a bee incident is not clear in the first instance and the extent to which it may be caused specifically by pesticides may be uncertain, triggering the need for biological investigations and residue analyses.

In many countries systems are established for reporting and analyzing bee incidents that may have been caused by agrochemicals. As an example, in Germany beekeepers who suspect an incident possibly linked to a pesticide application can send samples free of charge to the JKI for further investigation.

Samples of bees and relevant plant matrices are needed for residue analyses to identify those substances relevant and to establish a cause-effect relationship between an agricultural treatment and the incident.

The most important causes for poisoning incidents are contact exposure after overspraying of bees and oral exposure, by the uptake of contaminated nectar, honeydew and/or pollen from flowering crops following inappropriate insecticidal spray treatments, often caused by a misuse or wrong way of applying a product classified as hazardous for bees. Cases of mistakes, misuse or abuse of pesticides are frequently reported in the incident schemes.

An overview on the reported incidents of the last years that were analysed and interpreted in the JKI will be presented in the talk.