

Honeybee Pests & Diseases - Poisoning

Poisoning - from natural substances such as pollen, nectar, poor water and man made sugars that are inadvertently toxic can and does occur. The signs of natural substance poisoning would be disabled or dead bees found under the offending plant or bees behaving strangely outside the hive (see 'Recognition' below).

Poisoning of bees is usually caused by exposure to spray or dusting chemicals, namely insecticides, herbicides or fungicides. There are a wide range of spray or dusting chemicals, some based on chlorinated hydrocarbons, phosphates, carbamates and pyrethroids. Dusting is worse than spraying and coarse droplet sprays are worse than fine droplet sprays. The death of a bee from chemical poisoning is usually caused by the poisons affecting the nervous system leading to lack of co-ordination of the body functions including the alimentary system, the failure of which leads to starvation. Suspected incidents of Chemical Poisoning of this nature should be reported without delay to your local beekeeping association / community.

Note: *This is a not a notifiable disease however any suspected incidence of Poisoning should be reported without delay to your local beekeeping association / community to alert them of its occurrence.*

Recognition

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Spraying Oil Seed Rape with foliar pesticide treatments.

High numbers of dead or absent bees from otherwise healthy colonies. Dead bees with tongues extended, odd behaving bees, bees unable to fly - at or near the hive entrance. Bee death from chemical poisoning is usually caused by the poisons affecting the nervous system leading to lack of co-ordination of the body functions such as flight, mobility

and orientation. Effects of poisoning can occur quickly resulting in affected bees not returning to the hive or being rejected at the entrance. These signs can be quite obvious.

Pesticides are considered an essential component in modern agriculture to maintain food production, and include herbicides, fungicides and insecticides. All have a relative toxicity the latter being more toxic than the others to pollinators such as honeybees, and the effect on bee colonies will vary accordingly. To compound the problem, while individual pesticides have known effects and may individually have little effect on bees, when used in combination with other treatments the overall effects are as yet unknown.

Pet treatments for fleas and ticks often contain broad spectrum insecticides such as Fipronil which is lethal to honeybees and other insects. Although banned for use as an agricultural insecticide it is widely available in the UK for home use on pets and easily transfers from them to feed bowls, drinkers and water courses where bees and other insects drink from. The toxicity of Fipronil is staggering - one flea treatment contains enough pesticide to kill 60 million bees!

Toxins such as Fipronil and Imidacloprid are in common use around urban areas for the control of pests such as fleas, ticks, ants, wasps, cockroaches etc. and most if not all are highly toxic and deadly to honeybees, other pollinators and aquatic life. Pest control products containing

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these toxins are available at most stores where there are no controls on their sale, use or disposal. Recent research (University of Sussex, March 2021) has found widespread contamination of rivers with two neurotoxic pesticides commonly used in veterinary flea products: Fipronil and the neonicotinoid Imidacloprid. The concentrations found often far exceeded accepted safe limits. Garden hive colonies can be prone to inadvertent poisoning from these toxins by drinking / foraging from contaminated sources in and around urban areas.

Below are links to video clips of an otherwise healthy honeybee close to its hive showing classic signs of an 'acute toxic event' - poisoning. Distressed, unable to fly or return to the hive, and dead within 20 minutes, the source of the poison was likely to be relatively close by in the urban location, probably a pet treatment or other home use insecticide.

<https://youtu.be/wRODAGNhj1o>

A short video of distressed bee less than 2 meters from hive.

<https://youtu.be/EfGN6l4cOzM>

A short video of the same bee in its last few moments before dying unable to move.

Detection

Hive Examination - Examination of the hive and bee activity, particularly around the entrance. Watch for:

- Large numbers of dead bees at the hive entrance.
- Proboscis extended in dead bees.
- Crawling, trembling or aggressive bees outside the hive.
- Bees being refused admission to their own hive.
- Large numbers of forager bees failing to return to the hive

Monitoring - Vigilance is important with all honeybee diseases. Check all apiaries and colonies regularly for health and suspect any colonies that are not thriving where there is no already known reason. Colonies that die out should be examined thoroughly and sealed to prevent robbing and spread of any disease present. Liaise with local farmers to establish mitigating the effects of spraying activity.

Treatment

Have a plan in place for mitigating spray poisoning, know when spraying is likely to occur. Action to be taken when spraying is in process:

- Keep in touch with farmers on whose ground your bees are likely to forage, leaving them with your telephone number. Most farmers are sympathetic to beekeeping and will take the trouble to advise you if they know you have bees in the area.
- Participate in local beekeeping association Spray Liaison schemes and keep in contact with the Spray Liaison Officer.
- Close up the colonies (provide sufficient ventilation and water (a soaked sponge)).
- Move the colonies (at least 3 miles away)

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Action to take when spray damage is suspected

- Record as many details possible (photograph the colonies affected and the sprayed crop).
- Take a large sample of the dead bees (3 samples of 300 bees).
- Estimate the number of dead bees per colony.
- Note colour of pollen on the dead bees.
- Sketch a map of the area.
- Note the weather conditions.
- Discuss with crop owner and ascertain spray type.
- Contact your local association Spray Liaison Officer to find where to send samples for analysis.

Suspect colonies should have samples taken (100 - 300 bees) and sent off to SASA in a paper bag for analysis.

The UK has a unique scheme for monitoring the effects of pesticides on wildlife, including honey bees, called the Wildlife Incident Investigation Scheme (WIIS). The WIIS in Scotland is administered by SASA.

Note: beekeepers have a responsibility to report spraying incidents to their local beekeeping community / association without delay.