



Chemical Poisoning

(This is not a notifiable disease but chemical poisoning incidence should be reported to the Scottish Beekeepers' Association Spray Liaison Officer without delay)

Poisoning from natural substances such as pollen, nectar, poor water and man made sugars that are inadvertently toxic can 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 below). Fortunately there are few plants in Scotland likely to cause problems, one of the few validated instances being a poisoning incident in Colonsay in 1955 from a species of *Rhododendron (thomsonii)* which contains the poison andromedotoxin.

However poisoning of bees is usually caused by exposure to spray or dusting chemicals, namely, pesticides, herbicides or fungicides. The main spray or dusting chemicals are 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. The alimentary system is usually affected, the failure of which leads to starvation.

Note: poisoning of bees is usually caused by exposure to spray or dusting chemicals, namely, pesticides, herbicides or fungicides. Suspected incidents of Chemical Poisoning of this nature must be reported without delay to the SBA Spray Liaison Officer

Recognition:

The signs of poisoning from spray or dust application would be:

- 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

Vectors

The list of plants most likely to be sprayed are fruit trees, soft fruit, field crops such as oil seed rape, beans, borage, vegetables, legumes, cereals (fungicides) and weeds such as poppy, ragwort, dandelion and charlock. Users of sprays are most likely to be farmers/horticulturists, local authorities (weed spraying) and gardeners.

There are quite stringent legal controls on the use of sprays covered by the Control of Pesticides Regulations 1986. The operator must have a certificate of competency and must notify the beekeepers spray-warning scheme 48 hrs prior to spraying. IBRA publishes a book "Pest Controls Safe for Bees" which lists 4 categories: Most toxic – 67 substances which have high toxicity 10 hrs after application

Very toxic –9 substances where the toxicity is low 8 hrs after application

Less toxic – 49 substances where the toxicity is low 3 hrs after application

Least toxic –50 substances where the toxicity is low on application

The toxicity is defined as the lethal dose in micro grams per bee to cause a 50% kill (LD 50)

Bee Diseases and their Management



Bees can receive spray poisons by direct contact, eating or ingesting the chemical or by breathing it in. They can receive the chemical from flowers, by being caught in the spray stream on the flower or in flight. Airplane spraying is worst and tractor spraying is safest as it can be carried out at night (after 8 pm and before 8 am)

Note: beekeepers have a responsibility to report spraying incidents to the SBA Spray Liaison Officer without delay.

How to Manage Chemical Poisoning

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Detection

Hive Examination - Examination of the hive and bee activity. 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.

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)

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.

Note: 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**