Department of Primary Industries

primefact

Pesticides - reducing damage to honey bees

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Introduction

Pesticides are used in agriculture, horticulture and in field and forest situations to control a wide range of insect pests and weeds. About 50 pesticides that are registered in NSW have been identified as toxic to bees and are used in situations where bees may come into contact with them.

Practices to minimise damage to honey bees from pesticides are essential components in programs developed by persons applying pesticides and by beekeepers operating apiaries in areas where pesticides are applied.

How bee poisoning occurs

- Bee poisoning generally occurs after a pesticide has been applied to crops or weeds which contain flowers or are providing secretions attractive to bees, e.g. from extra-floral nectaries.
- The pesticide is applied directly onto bees foraging on the crop.
- Bees fly to the treated plants and collect contaminated nectar and/or pollen.
- Bees collect contaminated water on or near treated plants.
- Bees forage on a cover crop associated with the treated crop, e.g. clover in an orchard.
- Pollen collecting bees collect pesticide dust and/or contaminated pollen and return these to the hive.
- Pesticides drift from their point of application onto flowering plants or across apiaries.

Field symptoms of pesticide poisoning

- Most commonly, large numbers of adult bees are found dead on the ground in front of the hives.
- Most or all of the hives in the apiary are affected.
- Adult bees all die within a few days of each other.
- Dead adult bees typically, but not always, have their wings unhooked and at odd angles to their body, their proboscis fully extended, and their hind pair of legs outstretched behind them.
- In severe cases, dead adult bees will be present inside the hive between the frames and on the hive floor.
- Beekeepers observe a lack of foraging bees.
- Live adult bees may move slowly or behave abnormally, showing signs of paralysis.
- Surviving bees often show signs of aggressiveness.
- In severe cases, when insufficient numbers of adult bees remain, temperature and humidity control in the brood area is lost and brood is not fed. Brood die from chilling, overheating or starvation.
- Queen failure may occur within 30 days.
- Some pesticides, particularly systemic pesticides, have a less noticeable, but debilitating effect, resulting in an overall weakening of the colony. Signs are reduction in adult bee numbers and stages of the brood cycle or complete brood cycles missing.

Management of poisoned hives

- Move hives to a safe area.
- Keep bees warm by removing excess supers
- Feed colonies inside the hive with a 1:1 water:sugar syrup until recovered. Loss of field bees results in a lack of fresh nectar and water being brought into the hive.
- Add frames of sealed brood and adult bees from healthy hives, if required.
- Be prepared to manage the hives for queen failure or supersedure problems which may occur a number of weeks after the pesticide problem occurred.

Beekeeper practices to reduce bee poisoning

- Publicise the presence of your apiaries to persons and authorities likely to be applying pesticides:
  - property owners within bee flight range of your apiaries.
  - aerial operators applying pesticides in areas around your apiaries. More than one company may be involved and aerial operators often travel large distances from their home base to apply pesticides. Information on aerial operators in your area may be obtained from the Local Land Services (LLS) nearest to the site.
- Advise your Local Land Services (LLS).
- Beekeepers placing apiaries in all cotton growing areas in NSW and Qld have access to a service provided by the Cotton Catchment Communities Cooperative Research Centre which enables the beekeeper to provide information to cotton growers and to aerial operators on locations of their apiaries. For further information on this service see the Bee Alert section in this Primefact .
- The Bee Alert program is being extended to include apiaries placed near other major flowering crops where pesticides hazardous to bees are applied, e.g. canola and sunflowers.
- Information required to be provided by the beekeeper to property owners and aerial operators include: property name, property address, date hives moved onto site, date hives to be moved from site, beekeeper's email address, home phone number, mobile phone number and a fax number if applicable.
- Place apiaries in sheltered areas away from crops and fields likely to be treated with pesticides to provide protection from pesticide drift.
- Have reserve apiary holding sites a minimum of 7 km from pesticide treated areas where apiaries can be moved to quickly if required.
- Inspect your apiaries regularly so that any problem from pesticide damage is identified quickly and action can be taken to rehabilitate the apiary.
- Identify your apiary so that you are easily contactable should a pesticide application be required. Place a sign in your apiary in large letters able to be read from a distance, containing your name, beekeeping registration number and a phone number where you can be reliably contacted.
- When an area has been treated with a pesticide, do not move the apiary back to that area until sufficient time has passed for the residual toxic effect (the amount of time a pesticide will continue to affect honey bees after application) of the pesticide to have diminished. See Primefact 149 for information on toxic effects of pesticides on bees.
- Become familiar with the names of pesticides likely to be applied to crops and fields in the area you are operating in. Find out the possible application dates of the pesticides, their contact toxicity, and their residual toxic effect. See Primefact 149 for information on pesticide names.
- Maintain contact with property owners and other agencies applying pesticides within foraging range of your apiaries. Provide information, where applicable, on benefits to the crop from honey bee pollination. Discuss management programs the property owner is able to practise which will assist in reducing pesticide damage to your apiaries.
- Pesticide applicator practices to reduce bee poisoning
- Apply pesticides only when needed.
- Choose the pesticide with the lowest hazard rating for bees, particularly the lowest residual toxic effect, from the list of pesticides available for a particular pest control program.
- Liquid or granule applications are less hazardous than dusts. Microencapsulated forms of pesticides have a significantly longer residual life than other application forms.
- Ground application is less hazardous than aerial application, particularly when applied in close distances to apiaries.

- Where practicable, apply pesticides when bees are not active on the crop. For pesticides considered a low hazard when they have dried, early morning may be suitable. For pesticides with a residual toxic effect of a few hours, apply in the late afternoon or early evening.
- The time of day when a pesticide is applied should be chosen to minimise the risk of spray drift occurring either over apiaries or over plants being foraged by bees.
- Where practical, beekeepers should be given prior notice, preferably a minimum of 48 hours, of a pesticide application to allow apiaries to be moved from the area.

Crop growers are aware of benefits to their crops from beneficial insects such as wasps which reduce numbers of insect pests. Honey bees are important beneficial insects because of the pollination benefit they provide to most flowering crops. Many agricultural and horticultural crops benefit in terms of increased yield and improved quality. Crop growers can become aware of the benefits honey bee pollination provides and introduce management practices to increase honey bee pollination of their crops.

Crop grower practices to reduce bee poisoning

- Inform beekeepers placing hives on their property of potential pesticide use on their property, and adjacent properties if known.
- Inform contract pesticide applicators operating on their property of the location of apiaries.
- Provide beekeepers with prior notice, preferably a minimum of 48 hours, of a pesticide application on their property.
- Mow cover crops to reduce damage to bees foraging on the cover crop from pesticides applied to the principal crop, e.g. clover growing in an orchard.
- Mow flowering weeds as an alternative to applying a herbicide.
- Where practical, develop pesticide application control programs to be applied before and after bees have been in the area.

Bee Alert

Bee Alert is a free service which allows beekeepers to notify crop growers and aerial operators of the position of their apiaries.

Beekeepers can place information on the Bee Alert website at any time providing information on hive locations and the dates hives will be at those sites.

At present Bee Alert is available to all cotton growers and aerial operators in NSW and Qld cotton growing areas. It is to be extended to include all growers of major agricultural crops and aerial operators in NSW and Qld able to access the website.

To assist in developing this program, beekeepers are encouraged to use this service when placing apiaries in areas within bee flight range of flowering agricultural crops where pesticides are usually applied.

Bee Alert is at:
http://www.cottoncrc.org.au/industry/tools/bee_alert

Bee Alert Disclaimer

Beekeepers are free to place information on this website to inform crop growers, aerial operators and other persons applying pesticides of the location of beehives to assist in reducing damage to their honey bees from the application of pesticides.

However, apiarists rely on the placement of this information on this website to protect their bees at their own risk. The Department of Primary Industries, the State of New South Wales and the Cotton Catchments Communities CRC have no control over the actions of pesticide operators and accept no responsibility for any damage which might be caused to any apiary arising from any person acting on, or relying on, or upon the fact that information has been placed on this site.

Beekeepers can place information on the website either by email or fax.

Email – email the required information, below, to David Larsen at

david.larsen@dpi.nsw.gov.au

Fax – complete the required information and return to – David Larsen Fax (02) 6799 1582.

Information to be supplied by the beekeeper

- Nearest town
- Date apiaries moved to site
- Date apiaries to be moved from site
- Region, e.g. Lower Namoi

- Location – property name and address or clear description of apiary site position
- Beekeeper's name
- Beekeeper's email address
- Beekeeper's business/home phone number
- Beekeeper's mobile phone number
- Beekeeper's fax number
- Description of crop of concern, e.g. cotton, sunflower etc.

This Primefact should be read in conjunction with Primefact 149 *Pesticides – a guide to the effects of pesticides on honey bees.*

More information

For updates go to

http://www.dpi.nsw.gov.au/factsheets

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