

# **Guideline on use of oxalic acid for varroa control**



**Ministry of Agriculture and Forestry**  
Te Manatu Ahuwhenua, Ngaherehere

This guideline has been produced by the Ministry of Agriculture and Forestry Biosecurity Authority, and distributed to all registered beekeepers in New Zealand.

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This guideline outlines a method for the application of oxalic acid to beehives for varroa control. It has been prepared from international literature on varroa control. The method of oxalic acid application described has not been extensively trialed in New Zealand. Effectiveness may be influenced by environmental factors at the time of application.

### Disclaimer

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Products used to control pests and diseases of bees must be approved by the Minister of Agriculture. Oxalic acid and formic acid have now been approved by the Minister of Agriculture for varroa control in beehives, under section 62(2) of the Animal Products (Ancillary and Transitional Provisions) Act 1999. This approval is subject to two conditions:

- They are not applied to hives while honey supers are in place
- They are used in compliance with the Code of Practice for “Own use of compounds” issued under section 28 of the Agricultural Compounds and Veterinary Medicines Act 1997.

Under the Agricultural Compounds and Veterinary Medicines (ACVM) Regulations 2001, certain compounds which are not registered trade name products can be prepared and applied by a person to bees they own, on land they own or lawfully occupy, on condition that the person complies with the Code of Practice for “Own use of compounds”. While these compounds are not subject to registration, they must be used in a responsible manner. A copy of the draft of this code of practice is available in AgVetLink, a MAF ACVM publication found at: <http://www.maf.govt.nz/acvm/index.htm> or by writing to:

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People who use these compounds are subject to statutory obligations under the ACVM Act 1997, and are likely to be subject to statutory obligations under other legislation (i.e. Resource Management Act 1991, Health and Safety in Employment Act 1992, Hazardous Substances and New Organisms Act 1996, Animal Products Act 1999 and the Food Act 1981).

**Exempting compounds from registration under the ACVM Act does not exempt anyone from obligations imposed under any other legislation.**

# Oxalic acid

## Conditions on use of formic and oxalic acid for varroa control

Use of formic acid and oxalic acid is subject to two conditions:

- They are not applied to hives while honey supers are in place
- They are used in compliance with the Code of Practice for “Own use of compounds” issued under section 28 of the Agricultural Compounds and Veterinary Medicines Act 1997.

### **Key points of the Code of Practice that are relevant to beekeepers include:**

- 1) Oxalic or formic acid must only be used on your own hives, on land you own or lawfully occupy.
- 2) The compounds must not produce residues in products that fail to comply with applicable food residue standards. While no residue limits have been set for formic or oxalic acid in honey, the Food Act 1981 section 9(4)(b) stipulates that no person shall pack or sell any food containing any extraneous thing that is injurious to health, offensive, or the presence of which would be unexpected and unreasonable in food of that description prepared or packed for sale in accordance with good trade practice.
- 3) The compounds must not be stored, prepared, administered or disposed of in a manner that causes unnecessary hazard to people, animals or the environment.
- 4) Any likely third parties must be advised of any hazards to themselves or their property.
- 5) Where necessary, appropriate officials must be advised of the use, and time and place of application of the compound. This could apply in the case of an accident or significant spillage, or if a compound is inadvertently used outside the conditions of this approval. Official notification of routine treatments is not required.
- 6) Adequate records must be kept to show that the points above have been considered, and due care taken to comply with them. For example, a beekeeper might record the date of application (after the date honey supers were removed), the rate and method of application, advice given to landowner, and disposal of used materials.
- 7) Where compounds are used by employees or subordinate persons who are not under direct personal supervision of the beekeeper, written instructions must be provided that direct:
  - How the compound is to be stored, prepared, administered and disposed of;
  - How third parties will be notified and advised of hazards;
  - How officials are to be informed of the use, time and place of administration.
- 8) Subordinates or employees using the substances must be appropriately trained and provided with whatever is needed to carry out their instructions safely.

# Guideline on use of oxalic acid for varroa control

**Sources of product:** oxalic acid dihydrate can be purchased in powder form from a range of industrial chemical suppliers in new zealand, and in small quantities from some pharmacies.

**Minimum grade / standard of product:** Minimum 97% oxalic acid dihydrate. Maximum heavy metals {as Pb (lead)} 0.0005%.

## Operator safety

**Warning:** Irritating to eyes. Harmful in contact with skin and harmful or fatal if swallowed. May produce skin discomfort. Read label before using.

### Precautions:

- Keep out of reach of children.
- Corrosive to eyes and skin by direct contact.
- Harmful or fatal if swallowed.
- Do not get in eyes, on skin or on clothing.
- Do not breathe in dust.
- Wear goggles or face shield and chemical-resistant gloves when handling oxalic acid. A dust mask is recommended.
- Keep away from food, drink and animal feeding stuffs.
- Wash skin thoroughly with soap and water after handling.
- Remove clothing immediately if contaminated by splash or spill.
- Store and wash contaminated clothing separately from household laundry.

**Spills:** Avoid dust. Sweep/shovel to safe place. Take off immediately all contaminated clothing and store in a plastic bag or wash separately as soon as possible. Use water to clean floor and all objects contaminated by this material.

### FIRST AID:

**Skin:** Remove contaminated clothing immediately. Wash affected area with soap or mild detergent and large amounts of water. If chemical burn develops, cover area with a sterile, dry dressing and bandage securely. Contact a physician immediately.

**Eyes** Wash eyes immediately with large amounts of water. Cover with sterile bandages. Contact a physician immediately.

**Ingested:** Do not induce vomiting. Drink large quantities of water or milk. If vomiting occurs, administer fluids repeatedly. Never give anything by mouth to an unconscious person. Contact a physician or Poison Control Centre immediately.

**Inhaled:** Remove victim to a safe, uncontaminated area. Rest, keep warm. If breathing is shallow, give oxygen. Get immediate medical attention.

## Directions for use

**Definition of product as used to treat bees:** 3.2% oxalic acid (weight by volume or w/v) in sugar syrup.

**Preparation:** Mix 1 litre (L) of water with 1 kg sucrose (table sugar) using a clean container in a secure area. Add 75 g oxalic acid dihydrate (which contains 71.4% oxalic acid). Mix thoroughly. The resulting solution will provide 3.2% oxalic acid (w/v).

This should be enough to treat about 25 hives that have an average of 10 frames of bees. The concentration used is very important, so it is essential that accurate scales are used. Your local pharmacy may be able to help.

Use oxalic acid once in late autumn/early winter when little or no brood is present. Use a large volume syringe (e.g. 150 millilitres or mL). Use 5 mL of the sugar syrup/oxalic acid mixture per frame of bees (bees filling the inter-space between two frames end to end). Take up the proper dose for the population of bees in the hive and trickle the syrup over the bees between the top bars in each box. Using larger volumes or higher concentrations of oxalic acid may kill bees and or brood. Do not use when honey supers are on the hive.

The effect of feeding oxalic acid at the same time as colonies are being fed sugar syrup to maintain colony food stores is unknown, and should be avoided until it has been tested



Applying oxalic acid in sugar syrup directly to a colony

**Frequency of use:** Only use once in the autumn or winter. Using it more than once may cause bee mortality or reduce the ability of the colonies to build up the following spring

**Record Keeping:** A record should be kept of all oxalic acid applications, including site name, number of hives, date of application, and amount of product used. This will provide valuable information when assessing the effectiveness of different control strategies.

**Effectiveness:** Oxalic acid will only kill varroa on adult bees. Therefore it may only kill 30 –40% of mites if there is brood in a hive. It has been reported to kill up to 95% of mites in a broodless colony.

**Withholding period:** Do not use when honey supers are in place to prevent contamination of marketable honey by unwanted residues.

**Residues:** Oxalic acid is naturally present in honey at low levels. At higher levels (400 – 900 ppm) it can produce noticeable tastes in honey.. When applied in autumn no noticeable increase in oxalic acid residue was found in honey produced the following season.

**Monitoring efficiency:** The effectiveness of oxalic acid at killing varroa can be variable. It is therefore important to measure varroa levels after treatment to ensure that varroa has been reduced to the required level.

**Storage:** Store solution in a cool, dry, well-ventilated area. Avoid storage with oxidising agents, strong alkalis and silver compounds. Do not use solutions that have been made up for more than 6 months.

**Disposal of waste material:** Dispose of used containers in a suitable landfill. For information on the disposal of unused, unwanted or damaged product contact local Regional Council.