



The Scottish Beekeepers' Association

Registered Charity No. SCO 09345

SBA Technical Data Sheet no. 24

Fumigation of Comb Using Acetic Acid

Acetic Acid

Acetic acid (CH_3COOH) is a colourless liquid, usually called glacial acetic acid in its concentrated form as it can form crystals at low temperature. It is diluted to 80% for fumigation purposes and can be purchased at this strength. The acid evaporates at room temperature. The fumes are heavier than air. It is thus necessary to place the acid at the top of a stack of sealed boxes. The fumes smell of vinegar.

It will kill the following:

Nosema apis spores (*Nosema apis*)

Nosema ceranae spores (*Nosema ceranae*)

Malpighamoeba mellificae cysts (*Amoeba*)

Achroia grisella and *Galleria mellonella* eggs, larvae and adults (Small and Greater wax moths). Pupal forms may resist due to cocoon protection.

Ascosphaera apis spores (Chalk brood)

Mellissococcus plutonius (European foul brood -EFB) provided the bacteria are not buried in wax or debris.

Safety

Acetic acid fumes are highly corrosive and care must be taken to avoid skin contact and especially to avoid breathing in the fumes as they attack lung tissue. The fumes have a smell of vinegar.

Use an acid gas mask Type FFP3 (as used for treating Varroa with Oxalic acid vaporisation)

Use eye protection goggles

Use rubber gloves and only open the acid bottle outside and only build a treatment stack outside.

Ensure the treatment area is secure and guarded from children and pets.

Apply a warning notice to the stack "Danger Corrosive Acid Gas"

Ensure that the acid is stored safely and clearly labelled.

Dispose of used wick rag in general waste.

Materials Required

Rubber gloves, Eye protection and breathing mask

80% Acetic acid (usually sold in 1 litre by bee equipment suppliers)

Dish – ceramic or glass, sufficient size to hold required quantity (100ml per broodbox) –(size can be checked with water before using)

Piece of cotton rag to act as a wick

Graduated plastic or glass jug – ½ litre

5 cm wide duct tape or strong Sellotape for sealing

E strip self-adhesive rubber draught proof strip - for sealing if placing broodbox on a flat wooden board

Piece of chalk

5cm eke

Sealed crown board

Warning sign

Method of Fumigating comb in frames

1. Remove frame/combs from the brood box and clean the wood of the frames by scraping off propolis and brace wax which can shelter pathogens if not removed.
2. Remove metal end spacers if used, as the acid attacks metal. Sterilise these in boiling water.
3. Similarly clean the interior of the brood box(es). Clean the metal runners with wire wool and then protect them with a good smear of petroleum jelly (Vaseline).
4. Replace the frames in the box and place the box on a well-supported flat board or a completely sealed solid floor, in the open, that is, outside, not in a building. Do not place on a concrete slab as Acetic attacks concrete.
5. Two or three brood boxes may be stacked together. All joints should be sealed with duct tape to make the stack as airtight as possible.
6. Place a 5cm deep eke on top of the boxes to provide space for the Acetic acid dish & wick. Arrange a sealed crown board as a top cover to sit on top of the eke.
7. Place a ceramic or glass shallow dish such as an old saucer, on top of the frames in the top box. Check that it is large enough to contain the quantity of acid needed. Place an old rag in the saucer overhanging the sides to act as a wick. The Acetic acid fumes are heavier than air and the liquid poured onto the rag will wick over the sides of the dish, evaporate, and fall down over the combs.
8. Pour Acetic acid onto the rag in the dish. Use 100ml per brood box.
9. Chalk the date of application on the outside of the stack. In summer temperatures, fumigation should be complete in a week. The higher the ambient temperature the faster the acid will evaporate (and leak out, so, sealing of the stack is important). However, the acid will evaporate best at temperatures above 15 Celsius.
10. The frames may then be stored or re-used after airing for 24 hrs.

Notes:

It is good practice to fumigate all brood comb taken out of action prior to storage, especially if there is any suspicion of pests or disease.



Alan Riach ISSUE 2 Feb 2022