

Apiary Hygiene

Introduction

The purpose of good apiary hygiene is to help reduce or prevent the spread of disease between honey bee colonies and to concentrate the mind of the beekeeper on what should always be considered a permanent threat.

Low levels of disease are not always recognised and their presence can stress bees, making them even more susceptible to other diseases.

Apiary hygiene will not always prevent disease as it can often be introduced from outside and all apiaries should be considered to be permanently under threat. Beekeepers are encouraged to understand diseases and learn how to identify and deal with them. A good way to learn is at a local BKA where disease awareness, recognition and treatment as well as vigilance, should be an important part of every teaching programme.

Constant vigilance should be part of every colony inspection and regular disease checks will identify any problems at an early stage.

Apiary hygiene will not prevent the spread of disease if it is already in the apiary undetected; all it might do is slow down the spread. Disease recognition and the knowledge of how to deal with it must be seen as an important part of beekeeping that should be learnt at an early stage.

1. Disease transmission and its prevention.

The major agent in the spread of foul brood disease is the beekeeper.

If any infected bees, contaminated combs or hive equipment are transferred to a healthy colony it becomes infected.

Action

- Check for signs of both EFB and AFB at EVERY colony inspection, as well as all colonies BEFORE bringing them into your apiary
- Avoid moving both brood and super frames between hives more than necessary.
- Replace supers after extracting back to the same hive for cleaning. Supers can be marked with the hive identification.
- Keep all equipment (hive tools, queen cages, brushes etc) as clean as possible, as explained in sections 2 & 4.

2. Inspection Routine.

- Take a bucket of washing soda solution to the apiary to rinse tools and gloves between inspecting each hive. Use rubber or latex gloves as they can be washed easily. Replace gloves regularly.
- Take a container with a bee-proof lid in which to put wax and propolis etc., and plastic sacks for frames that you need to seal and remove from the site.



- Wash protective clothing regularly to remove pathogens and promote a clean image of beekeeping.

3. Cleaning and caring for equipment

Have a routine for separating used items needing cleaning from clean stock.

- Clean all used equipment (supers, brood boxes etc) in between use. If solid floors are used or there is a solid sheet below the varroa mesh these should be changed and treated regularly. A blow torch is a convenient way of sterilising these wooden parts. Fumigation with acetic acid or sulphur dioxide is very effective if reuse is not urgent. (see section 4). Second-hand equipment should be thoroughly sterilized before taking to the apiary and any second-hand comb unless from a known disease free apiary should be burned.
- The wax from older combs can be cut out and recycled and the frames boiled in soapy washing soda solution to clean and disinfect them. (An electric boiler or old tea-urn is a valuable piece of equipment for the beekeeper).
- Old brood combs should be cut out and burned, preferably in an incinerator. This should be done as early as possible to avoid wax moth infestation. Take care when burning a large quantity of wax as it is highly inflammable. The frames can be boiled in soapy washing soda solution as in 3b. above.
- Super frames with clean comb should be taken care of. Good quality drawn comb is a valuable asset for the beekeeper and must be stored carefully to avoid damage by mice, wax moth or mould.
- Supers with good combs usually winter well if stacked outside with a queen excluder on the bottom and another below the roof. This allows air to circulate but keeps out mice as well as allowing the freezing winter temperatures to kill off the wax moth. Don't stack them too high otherwise the wind may blow them over.
- Combs that have had brood in are more susceptible to wax moth although about 5 days in a freezer, then sealing the boxes containing the combs to avoid further infestation

should solve the problem. Acetic acid or sulphur dioxide can be used to disinfect and control wax moth. B401 (formerly called Certan) or Mellonex can be used to control wax moth (see section 4).

These treatments may need to be repeated during the winter to prevent re-infestation.

The bees also have a part to play.

Bees will rob out weak colonies and forage round combs and equipment left lying around, carrying any infection back to their own hive.

Action

- Don't leave old combs or wax lying around near hives, collect it into a container that is bee-proof and remove it from the area of the hives.
- Avoid lengthy colony inspections during a nectar dearth when bees are often looking to rob other colonies.
- Seal hives where colonies have died. Move well away from flying bees, dismantle and treat as in 3c, also burn the dead bees.

In certain circumstances bees alone can transport infection.

Worker bees and drones in particular can move from hive to hive, especially in exposed apiaries where strong winds can cause drifting to occur, spreading any infection to neighbouring colonies.

Action

To minimise drifting;

- Arrange hives to enable the bees to find their own colony with ease. It helps to have some kind of marker, coloured roofs and entrances facing in different directions
- Hives should be spaced at least 1.2 – 1.5 m apart
- Avoid placing hives in straight lines close together, especially in exposed places that are subject to strong winds.

Bees from another apiary could bring in disease.

Swarms from an infected hive may carry disease and introduce it to your apiary e.g. foul brood. Bees from a colony badly infested with varroa have been known to abscond and take refuge in neighbouring hives.

Action

- Swarms of unknown provenance should be hived on new foundation and not fed for at least 4 days so that any infected honey they carry is used for wax production, rather than being stored in the comb. Don't be tempted to give any comb 'to help them get started' as they will probably use that first and the benefit of hiving on foundation will be lost. Hive the swarm as far away from other colonies as you reasonably can, or if space is limited face the entrance in a different direction to the nearest colony. They should be treated for varroa and need to be kept in isolation for 4-6 weeks so the health of the brood can be properly assessed.
- Regular monitoring of varroa in all colonies will alert the beekeeper to a sudden infestation. Appropriate steps can be taken according to the season.

4. Treatment agents for equipment

Washing Soda [NOT caustic soda]

Used for washing tools, rubber or latex gloves, wooden frames etc. It is a mild disinfectant and helps to remove wax, propolis and honey that may harbour disease. Washing soda crystals are widely available and cheap. Make up a solution by dissolving 1 kg of washing soda in 5 litres of water. Use with care; it is mildly corrosive.

Sulphur Dioxide

It is produced by burning sulphur strips, (obtainable from bee-keeping suppliers) and is used for treating wax moth in stored combs. Six supers containing the frames are stacked and 2 strips placed in a metal container which is suspended from the top of an additional empty box. The strips are lit and the roof put on quickly. The fumes are heavier than air and will fall through the stacked combs. Avoid inhaling the smoke. Sulphur dioxide is not fat soluble and so its use poses very little risk to wax and honey.

B401 (formerly known as Certan) and Mellonex

These are safe biological treatments for wax moth obtainable from beekeeping suppliers. They are a spore suspension of *Bacillus thuringiensis* which infects and kills wax moth larvae. It is sprayed on both sides of the frames. After drying, the frames are then stored in supers or brood boxes.

Acetic Acid

Used for sterilization of comb and boxes. Obtainable from bee-keeping suppliers as 80% acetic acid.

Make a stack of boxes and combs needing treatment. On top of each set of frames place an absorbent pad on a saucer or plastic tray and pour 120 ml of acetic acid onto the pad. Place a solid cover board on the top of the stack and seal all joints; packing tape can be used to seal off the joints or pallet wrapping can be wrapped around the stack rather like "stretch and seal". An alternative is to put the boxes in polythene tubes that carpets are wrapped in. Let the fumigation proceed for about a week, then air the combs thoroughly for another week.

Acetic acid is very corrosive. It will remove skin very quickly. Wear overalls, rubber gloves, eye protection and a breathing mask. Don't place the stack on a concrete or brick floor and remove or cover metal parts such as metal ends, runners or castellated spacers with petroleum jelly.

Plastic and polystyrene hive parts

These clearly can't be treated with a blow torch otherwise they will melt. The parts should be scraped clean and treated with washing soda to remove wax and propolis, then treated with a solution of household bleach.

For further reading see the Fera leaflet 'Hive Cleaning and Sterilisation'

Note

PDB (*para dichloro benzene*) is NOT recommended and should not be used as the substance can accumulate in wax. Moth balls or any product containing naphthalene should NEVER be used as they are poisonous to bees.

In Conclusion

The main disease threats to your apiary are likely to come from outside. Disease and its prevention is the responsibility of everyone. Here are some suggestions that might help individual beekeepers:

- Be aware of all other colonies around you. If any seem neglected or abandoned inform your Bee Inspector.
- If your BKA doesn't include disease recognition as part of teaching then ask them to. Disease affects all beekeepers and even the most experienced beekeeper will benefit from repeated instruction.
- Avoid leaving honey of any origin where bees can access it and encourage others, including non-beekeepers to do the same. An open part filled honey jar is potential danger.
- Inspect all bees that are brought into your apiary for foul brood BEFORE moving them.
- Regular comb change will help reduce the level of disease and should be part of good management.
- Good apiary hygiene is only part of the fight against bee diseases. The beekeeper should be fully focused at all times.

These guidelines are intended to reduce the chance of disease spreading, they are not intended for controlling an outbreak of a serious notifiable disease such as AFB or EFB where guidance will be given by the Bee Inspector.

General points:

This leaflet is one of a series intended to help beekeepers and non-beekeepers. If you believe the contents of this leaflet are relevant to you, please seek further advice from an experienced beekeeper or your tutor.

Information is updated regularly – please check with the BBKA web site at: www.bbka.org.uk – for the latest information.

This leaflet supersedes: (B12 2007 4th edition).

Note: The same information is published in our printed leaflet L012 available from the BBKA.

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