The Small Hive Beetle

A serious new threat to European apiculture

About this leaflet

This leaflet describes the Small Hive Beetle (*Aethina tumida*), a potential new threat to UK beekeeping. This beetle, indigenous to Africa, has recently spread to the USA and Australia where it has proved to be a devastating pest of European honey bees. There is a serious risk of its accidental introduction into the UK. All beekeepers should now be aware of the fundamental details of the beetle's lifecycle and how it can be recognised and controlled.

Introduction: the small hive beetle problem

The Small Hive Beetle, *Aethina tumida* (Murray) (commonly referred to as the 'SHB'), is a major threat to the long-term sustainability and economic prosperity of UK beekeeping and, as a consequence, to agriculture and the environment through disruption to pollination services, the value of which is estimated at up to £200 million annually.

The beetle is indigenous to Africa, where it is considered a minor pest of honey bees, and until recently was thought to be restricted to that continent. However, in 1998 it was detected in Florida and it is now widespread in the USA. It is called the small hive beetle to distinguish it from other minor pests of bee hives in Africa, known as large hive beetles.

At the time of writing, the SHB is not thought to be present in the UK.

The beetle can multiply to huge numbers within infested colonies where it eats brood, destroys combs and if uncontrolled ultimately destroys them.

The resulting economic impact on the beekeeping industry in the USA has been severe. Within two years of its discovery, at least 20,000 colonies were destroyed by the beetle, costing many millions of dollars. It has also been found in Manitoba, Canada where it arrived with beeswax imported from the USA.

In October 2002, it was found in New South Wales and Queensland, Australia. The economic consequences to the beekeeping industry in Australia are likely to be extremely serious, jeopardising bee exports, pollination services and honey production.

It is not known how the beetle reached either the USA or Australia, although in the USA shipping is considered the most likely route. By the time the beetle was detected in both countries it was already well established.

The potential implications for European apiculture are enormous, as we must now assume that the SHB could spread to Europe and that it is likely to prove as harmful here as in Australia and the USA.

Package bees and honey bee colonies are the principal means of spread, but it could also be transmitted inadvertently and unnoticed through swarms in shipping or air cargo, or in consignments of fruit, unrefined wax and used beekeeping equipment.

Beekeeper vigilance must be heightened following the discovery of the SHB in Australia. In the future, keeping an eye out for the beetle needs to become a routine part of colony management in the UK.

Fig 1. *Aethina tumida* (adult small hive beetle), unusually on the outside of a brood box. Normally they move down into the hive to get away from the light

Fig 2. The large hive beetle *Hyplostoma fuligineus*

Potential impact of the small hive beetle on UK beekeeping

Could the SHB reach the UK?

Yes it could. There is a serious risk that the SHB could be transported and introduced into the UK, for instance:

- within imported honey bees (particularly package bees and complete colonies)
- in swarms of bees or feral colonies inadvertently carried on container shipping or airfreight
- in used beekeeping equipment, comb and beeswax
- on imported goods such as fruit
- in soil material, for instance with imported plants or carried on heavy machinery

The UK has not permitted the import of colonies of bees or package bees into the UK from Africa, America or Australia for many years. However, there is considerable trade in package bees into certain other European countries for example, from Australia.

Fig 3. Black adult SHB clearly visible on hive frame. They can also be found hiding in empty cells at the margins of the brood nest

Import regulations are our main defence against the introduction of the SHB (and other very serious bee pests and diseases) from overseas to the UK and it is absolutely essential that all beekeepers abide by them.

Could the small hive beetle survive in the UK?

Yes. The SHB is well able to survive even in the colder climates of North America, such as Minnesota and Wisconsin. It has also reached Manitoba in Canada. Studies in the USA show that the adult beetle can survive during winter in the bee clusters and can therefore survive in any location where bees exist.

Light sandy soils are preferred and warm conditions are required for pupation and completion of the life cycle. Consequently we can predict that apiaries on light soils in milder parts of the UK would be more affected than those on heavy clay in colder areas.

Could we eradicate the SHB from the UK?

Probably not. Unless the SHB is detected very soon after its arrival in the UK, it will rapidly spread into the surrounding honey bee population, making eradication very difficult. Control methods used overseas so far have not been completely successful in eliminating the SHB, merely controlling it to below damaging population levels.

If the SHB does become established in the UK, then beekeepers here will have to learn to control it - just as beekeepers in the USA and Australia are doing now.

Small hive beetle facts

Latin Name	*Aethina tumida* (Murray).
Common name	The Small Hive Beetle (often abbreviated to "SHB").
Host	Mainly lives and breeds on its primary host the honey bee - in colonies, stored comb and beekeeping equipment, but it can also survive and reproduce on certain types of fruit, particularly melons.
SHB lifecycle	Adult beetles lay large numbers of eggs in the hive. Beetle larvae eat brood, pollen and honey. Larvae crawl out of the hive to pupate. Pupation usually occurs in soil outside the hive. Preference for warm sandy soils. Adults can fly at least 5 miles to infest new colonies.
Current distribution	Indigenous to Africa. First found in United States (Florida) in 1998. Now widespread in the USA. First found in Australia (Queensland, New South Wales) in 2002. Well established. Detected in Canada (Manitoba) in 2002. Not yet established.
UK status	Exotic pest not currently considered present in the UK. Quarantine pest status with surveillance programmes in place.
Methods of spread	Spread by movement of package bees, honey bee colonies, swarms, honeycomb, beeswax, soil and fruit. Adults can survive for two weeks without food and water, 50 days on used comb and several months on fruit.
Damage caused to beekeeping	In Africa it is a minor pest to beekeeping as native African bees have natural defences. For European honey bees in America and Australia (and therefore almost certainly the UK) the SHB is an extremely serious problem. The beetles multiply to huge numbers, their larvae tunnel through comb to eat brood, ruin stored honey, and ultimately destroy infested colonies or cause them to abscond.
Control methods used overseas	The SHB cannot be eradicated once well established. In the USA, beekeepers control SHB by using pesticides within the hive and in the surrounding soil, together with improved bee husbandry and changes to honey handling procedures.

Small hive beetle biology

The small hive beetle belongs to a family of scavenger beetles known as the Nitidulidae. Many of them are pests of fruit and stored food, and some like the SHB have a close association with social hymenoptera (bees, wasps and ants).

Adult beetle anatomy

Adult beetles are oval in shape, 5-7 mm long and 3-4.5 mm wide. Immediately after emergence they are coloured reddish-brown, but darken to dark brown or black when fully mature. There is some variation in size but they are about one-third the size of a worker bee. They have club shaped antennae, their bodies are broad and flattened dorso-ventrally, their wing cases (elytra) are covered with fine hairs and are short so that a few segments of the abdomen are visible.

Fig 4. View of beetle's head and club shaped antennae

Fig 5. View of beetle's abdomen showing shortened wing case (elytra)

Fig 6. Adult small hive beetle on hive floor

Egg laying

Adult beetles are attracted to bee colonies to reproduce. Once inside, adult beetles lay eggs in irregular masses in hive crevices or brood combs containing pollen or brood. The eggs are pearly white and about 1.5 x 0.25 mm, two-thirds the size of honey bee eggs. Each female beetle is capable of laying an enormous number of eggs, and so it takes relatively few beetles to produce a severe infestation.

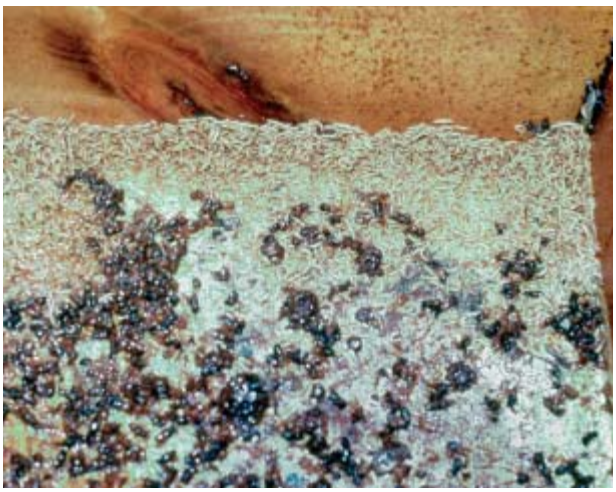


Fig 7. Masses of larvae and adult beetles on hive floor

Larval development

After 2-6 days SHB eggs hatch, and the young beetle larvae begin to feed. Both larvae and adults prefer to eat bee eggs and brood but they will also eat pollen and honey. As the larvae grow they burrow through brood combs, often in enormous numbers, causing great damage and ultimately consuming the colony's brood nest.

SHB larvae have characteristic rows of spines on the back and 3 pairs of tiny prolegs near the head (which distinguishes them from wax moth larvae). After 10-14 days, the larvae have completed their growth and measure 10-11 mm in length. There is no webbing or 'frass' (particles of comb debris) as found with wax moth infestation, but instead infested combs have a "slimy appearance".

Fig 8. Views of small hive beetle larvae showing three pairs of prolegs and distinctive rows of spines, with two large spines protruding from the rear

Pupation

The next phase of the SHB's lifecycle takes place in the soil. Mature larvae will often mass on the hive bottom board and in corners of frames before moving outside the hive. They move towards the light at the hive entrance and then exit the hive and burrow into the soil close to the hive entrance constructing smooth-walled earthen cells in which they pupate. Pupae are white and darken as metamorphosis takes place.

They have a preference for sandy soils, so apiaries on these soils are particularly prone to attack. Pupation is a vulnerable time for the SHB and there is probably high natural mortality. This is a point in their lifecycle where they could be eliminated by the beekeeper - for instance using pesticides or a biological control method.

Fig 9. SHB larvae in corners of brood frame. Adult SHB also visible in the top left hand corner

Emergence of adults

Adult beetles first emerge on average 3-4 weeks later but pupation can last from 8-60 days depending on environmental conditions.

About one week after emergence adult beetles search for colonies in which to lay eggs. They disperse rapidly over large distances (perhaps 5-10 miles). The adult beetles are attracted by the odours from the hive, adult bees and brood. Beekeepers in the USA have observed that the day following an apiary inspection there is often a huge influx of beetles, suggesting that colony odours released serve as a stimulus for beetles to "home-in" on the apiary. Opening the hive triggers beetles already present in the hive to lay eggs. The beetle has been detected in swarms and is thought to travel with or follow them.

The chemical signals the SHB uses to locate apiaries are currently being investigated, and potentially form the basis of future control methods, such as pheromone bait traps.

Reproductive potential

Small hive beetles have a huge reproductive potential. Individual female beetles are capable of producing up to a thousand eggs during their 4-6 month life. In South Africa as many as five generations a year are possible, a new generation being produced every 5-12 weeks. Under ideal conditions, the SHB population is capable of very rapid growth.

Warm temperatures (above 10°C) are however required for completion of the life cycle. Where the ground temperatures remain low for much of the year, the population will build up more slowly. This is likely to be the case under UK conditions.

Alternative diets

Beetles can survive and lay eggs not only in bee colonies but also on a range of fruit, particularly melons. However, it is not known if beetles regularly eat fruit as an alternative food source, or whether this is important for their spread.

Adult beetles are able to survive for up to 2 weeks without food or water. On used brood combs they are able to survive up to 50 days.

Fig 10. Thousands of larvae from a dead colony being poured into soapy water to kill them. Infestation levels can reach 30,000 larvae per colony, 6,000 per brood frame

Fig 11. Pictured is a pre-pupal larva, pupa and newly emerged adult SHB. The reddish colour is typical and will darken as the beetle emerges from the soil and flies off to locate a bee hive

Harmful effects of the small hive beetle

SHB and African Bees

In Africa, the SHB is considered to be a very minor economic pest of weak honey bee colonies and stored honey supers. There it is a scavenger beetle, consuming dead colonies, in much the same way as wax moth in the UK.

African bees have strong house cleaning and defensive traits, which include:

- preventing the beetles access to the colony by aggressively harassing them
- filling cavities where the SHB could hide with propolis
- removing SHB larvae and by confinement of beetles to 'propolis prisons'

Such behaviour limits SHB reproduction in African colonies and so keeps the beetle population down to manageable levels and below damage thresholds.

SHB and European Bees

Unlike African bees, European bees - as are present in the UK, USA and Australia - generally have fewer natural defences against the small hive beetle. Consequently, the beetle reproduces very successfully and the population grows much larger than in African colonies, and with far more harmful consequences.

Weak colonies are at the greatest risk of infestation. Strong colonies will actively remove larvae (much as they can deal with wax moth larvae), but they are not able to deal with adult beetles due to their hard exoskeleton and their defensive behaviour.

In the USA colonies vary in their ability to resist the SHB. Scientists and bee breeders believe that bees that display these defensive traits and the ability to incarcerate beetles in propolis prisons should be selected for.

Damage to the colony

SHB larvae do the most damage in the colony, burrowing through brood combs and consuming the brood and stores.

The level of harm to the colony depends on the number of beetle larvae present. Once present in large numbers, the survival of the colony is at great risk. Queens stop laying and colonies can quickly collapse.

In heavy infestations, tens of thousands of SHB larvae may be present within the colony. In such cases there can often be up to 30 larvae per cell. Such large numbers can generate enough heat inside the hive to cause combs to collapse and subsequently for the colony to abscond.

Fig 12. SHB larvae burrowing through comb, all the pollen and brood has been consumed

Fig 13. A severely infested colony

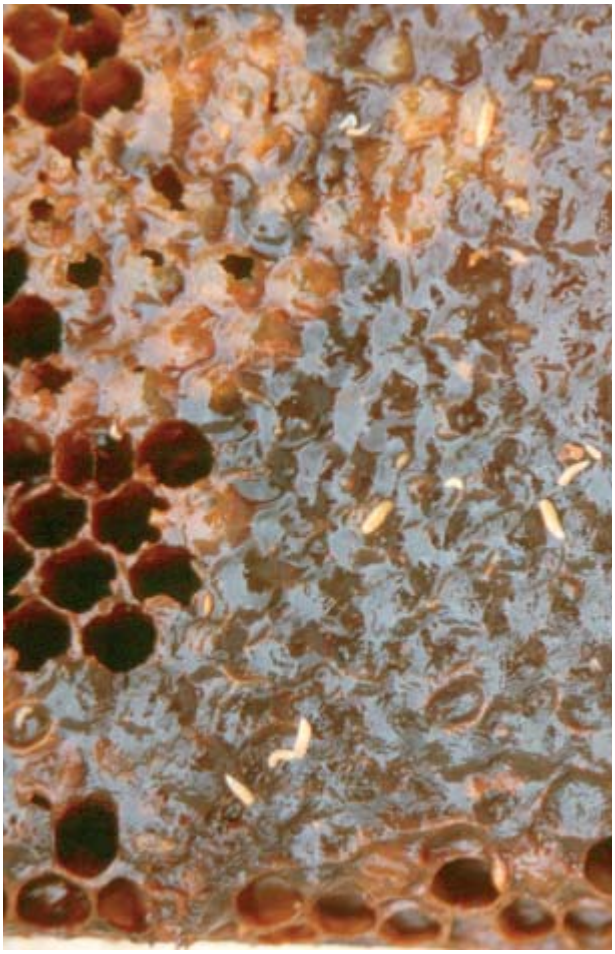


Fig 14. Honey spoilage. Damaged and spoiled honeycomb, with a "slimy" appearance caused by SHB larval feeding and defaecation

Fig 15. Fermented honey (“slime”) that has leaked out of frames onto the hive floor

Honey spoilage

Defaecation of adult beetles and larvae in honeycomb causes the honey to ferment and drip out of cells. Affected combs become slimy and have a characteristic odour reminiscent of "rotten oranges". These combs are repellent to bees and can also cause absconding.

Honey supers removed from colonies and stored before extraction are at great risk from the SHB, particularly if they are stored in a warm room, and contain pollen or brood. They can quickly be rendered useless for extraction and the honey within completely ruined and unfit for sale.

Small hive beetle and bumble bees

It has also been demonstrated in quarantine facilities that small hive beetles can parasitise bumble bee colonies (*Bombus* spp.) causing very serious damage. This could have important ecological consequences if the beetles became established in the UK. However, it is not known if the beetles can find and infest these nests in the wild.

Fig 16. Bumble bees may also be affected by the SHB

Your responsibilities as a beekeeper

What should we be doing now?

The experience of the USA and Australia shows us that despite our wishes and efforts to the contrary, sooner or later the small hive beetle may arrive in the UK. It is important that beekeepers prepare for this possibility.

1. Make sure you only import bees through the proper channels and with appropriate health certification. Do not be tempted to import bees illegally.
2. Make sure you understand the essential details of the beetle's lifecycle, and how to recognise larvae and adult beetles.
3. You should keep an eye out for the SHB when you examine your bees - this should become part of routine colony management. If the beetle does enter the UK, early detection will allow control action to be targeted promptly where it is most needed and help reduce the spread of this pest throughout the country.
4. Aim to stay informed and up to date on the spread and emerging biology of the SHB and the methods used to control it overseas. If it does enter the UK, you will be ready to start to deal with it.

There is currently a great deal of new information on the small hive beetle, emerging from infested countries (see further help and advice section). The National Bee Unit (NBU) will provide regular updates to beekeepers as part of its bee health advisory work.

Small hive beetles and the law

At the time of writing, the SHB is not subject to legislation in the UK. However, proposals to amend UK bees legislation are likely to include and make notifiable a number of exotic pests and diseases of particular quarantine concern such as the SHB.

Import regulations are our main defence against the introduction of the SHB (and other very serious bee pests and diseases) from overseas to the UK, and it is absolutely essential that all beekeepers abide by them.

Contact the NBU, or your appropriate government agriculture department for details of the import regulations.

Sending suspect SHB samples to the NBU

Suspect SHB adults or larvae should be sent to the NBU for examination in a sealed container, such as a plastic tube or stiff cardboard box.

Please provide as many details as possible - such as your name, the apiary name and location (including, where possible, its Ordnance Survey map reference).

Do not send live beetles in the post. Kill them first by keeping them in a freezer overnight or by putting them in 70% ethanol (e.g. methylated spirits).

Sampling forms and details are available to download from the NBU website www.nationalbeeunit.com or contact your local bee inspector.

How to check your hives for the small hive beetle

Method: Scanning combs and boxes

Remove the hive roof and place it upside-down next to the hive. Remove the supers and upper brood chamber (in double brood chamber colonies) and place them on the upturned roof for a few minutes. Place the crown board on top. A few minutes later lift the boxes out of the way and scan for beetles on the inner surface of the upturned roof.

When hives are opened adult beetles quickly scuttle away from the light, so look for adult beetles moving inside the hive, running across combs, crown boards and the hive floor.

In warm weather, adult beetles will be mostly on the hive floor; in colder weather they hide themselves in the cluster for warmth. Look for clusters of eggs (two-thirds the size of bee eggs) in irregular masses usually in cracks and crevices in the hive.

Look for larvae in the combs or on the bottom board. Remove combs one at a time and carefully examine each of them for evidence of SHB larvae or adults. Although they may at first glance look like wax moth, they can easily be distinguished after close examination.

Fig 17. SHB larvae are maggot-like, with 3 pairs of prolegs near the head

Fig 18. Wax moth larvae have small pairs of legs on each segment (like all caterpillars)

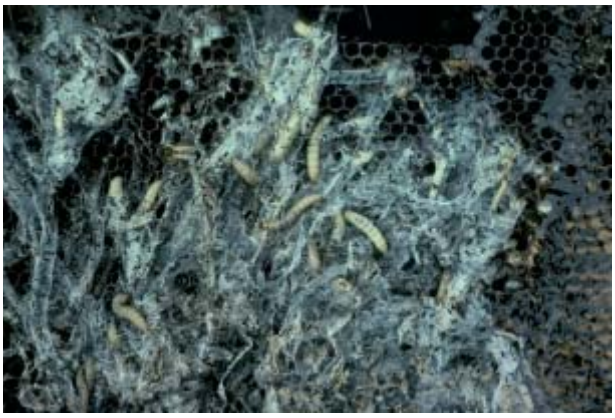


Fig 19. Wax moth larvae move away from the light and spin silken galleries, whereas SHB larvae are active in the light and do not spin webbing

Method: Using corrugated cardboard hive floor inserts

A simple detection method using cardboard hive-floor inserts has been used successfully in the United States for detecting the SHB. This exploits the beetle's tendency to seek dark crevices in which to hide.

A corrugated cardboard insert (with the paper removed on one side to expose the corrugations) is placed corrugated side down on the bottom board towards the rear of the hive. (Corrugated plastic can also be used and is longer lasting).

Regularly examine the debris under this insert for evidence of adult beetles or eggs in crevices on the hive floor.

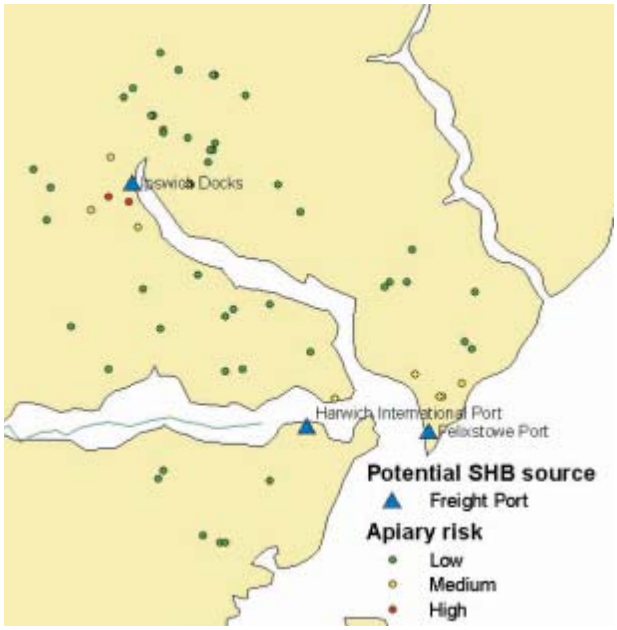


Fig 20. Use of GIS to identify apiaries at potential risk

CSL small hive beetle surveillance

The SHB is not thought to be present in the UK. However, from 2003, CSL bee inspectors are increasing statutory surveillance programmes to monitor for SHB presence. The NBU will use Geographical Information Systems (GIS) to prioritise this programme and target apiaries identified as "At risk". For instance, apiaries situated:

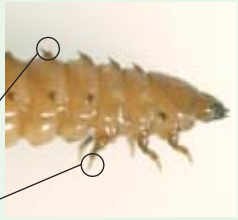
- in warmer parts of the country (where soil temperature exceeds 10°C)
- on sandy soils (suitable for SHB development)
- close to civilian and military airports
- close to freight depots and ports of entry - for instance for fruit and other foodstuffs
- close to other apiaries containing imported bees from countries where the SHB is known to be present or, if the SHB is found here, apiaries containing bees moved from declared infested areas

Have I found a small hive beetle?

Many types of beetle, insect eggs and larvae may sometimes be found in bee hives. Check to see if those you have found match the key identification points below.

Adult beetles

- size: 5-7mm
- colour: black
- clubbed antennae
- behaviour: hides from the light
- short wing cases



Larvae

- size: 10-11mm
- colour: beige
- spines on dorsum
- 3 pairs prolegs
- Absence of frass and webbing

Eggs

- size: 1.5 x 0.25 mm (two-thirds size of honey bee eggs)
- colour: white
- location: masses of eggs, e.g. in hive crevices or hive floor

Small hive beetle control methods

SHB control overseas

This section provides information on the current treatment and husbandry methods used overseas to combat the small hive beetle and reduce its impact. In the UK at present there is no product registered for use against any life stage of the SHB. Products used abroad are included here for information only. No mention should be taken as an endorsement of safety, efficacy or a recommendation for use.

Experience from the USA has shown that the best line of defence is good management and there are a number of techniques that can reduce the impact of the beetle. These include:

- good bee husbandry, good hygiene practices and apiary management
- changes to extraction and honey handling procedures to limit delays
- use of pesticides to kill beetles in the hive and surrounding soil

Using bee husbandry to control SHB

- Manage strong colonies - weak colonies are more vulnerable, because there are not enough bees to protect comb and defend the brood nest (just as with infestation of wax moths)
- Avoid static sites, particularly if these are on light sandy soil, as this will allow the beetle population to increase steadily. It may be preferable to move the colonies to new sites periodically
- Look for and select bees that seem to have lower beetle populations. There is likely to be genetic variation in the ability of colonies to resist SHB infestation and by selecting for colonies with this characteristic, fewer other controls may be required

SHB control using pesticides

Beekeepers in the USA with SHB infested apiaries have used pesticides to kill the beetles.

The main in-hive control method adopted employs treatment strips, originally approved for use against varroa mites. The strips are fixed to the underside of cardboard floor inserts to kill adult and larval beetles that are attracted there. Appropriate precautions need to be taken to prevent possible contamination of honey and other hive products with treatment residues.

To kill soil-based stages of the SHB's life cycle, a soil-drench is applied to the ground around the hives in the apiary.

Fig 21. Cardboard trap combined with treatment

Precautions in the extraction room

The SHB can be a serious problem for supers containing honey prior to extraction or combs in storage, kept in the protected environment of the extraction room.

- Beekeepers should always use queen excluders in hives to prevent queens from laying in supers. Otherwise, if brood is brought into the extraction room with the honey crop, any SHB larvae hatched from eggs laid in supers will rapidly cause spoilage of the honey and destruction of comb
- Maintain efficient practices in the extraction room. Supers should be extracted rapidly after harvesting from hives to give the SHB the minimum time to cause damage. Freezing of honeycomb kills all life stages. It is common practice for many beekeepers (usually small producers) to put super frames through the freezer prior to extraction or storage for wax moth control. Stored comb should be regularly checked for signs of infestation
- It is important to employ good hygiene around the extraction room, clear up thoroughly after extraction
- Do not leave comb or wax cappings lying around for beetles to lay eggs in
- Keep relative humidity down to below 50% where honey is stored prior to extraction. This inhibits SHB egg hatching and eliminates larval damage to honey. This can be done by circulating air down through stacks of supers raised up off the ground on pallets (using a fan or dehumidifier)
- Fluorescent light sources placed on the floor of the extraction room at night attracts larvae looking for soil in which to pupate. These can be swept up and destroyed by pouring into soapy water

Future research into SHB biology and control

As the small hive beetle has only been subjected to intensive scientific study for a comparatively short time, there are still significant gaps in our understanding of many aspects of its biology. These include, for instance, mating behaviour, natural enemies, methods of host location, and flying range.

As more research is carried out, our understanding of the beetle's habits will undoubtedly increase and this could suggest new methods that might in the future be used to control it. So far chemical measures to control the SHB have not been fully effective and are considered short-term measures.

Research work is being carried out to find alternative methods - such as beetle traps within or outside the hive, chemical lures and biological controls using natural enemies - that may in the future provide more effective and preferably more environmentally friendly means of control.

Fig 22. PC™ Floor Trap and PC Trap (PC stands for Pitfall Cone) developed by CSL. Examples of trapping systems

Further help and advice

The National Bee Unit

The Central Science Laboratory National Bee Unit (NBU) provides a statutory and advisory service to beekeepers in England and Wales. It provides diagnostic, consultancy and research services to the Department for Environment, Food and Rural Affairs (Defra), National Assembly for Wales Agriculture Department (NAWAD), commerce and beekeepers. The Unit has modern facilities, including laboratories with first class computer support, as well as 150 colonies and the apiary buildings to support them.

Fig 23. Central Science Laboratory, Sand Hutton, York

NBU Laboratories are fully compliant with the international Good Laboratory Practice (GLP) quality scheme to ensure a high professional standard. All staff are trained practical beekeepers supported by teams of scientists in CSL: analytical chemists, agricultural specialists, entomologists, pest and disease population modellers, pest risk analysts and pest management specialists.

The NBU has a bee health support service operating in England and Wales, comprising a network of Regional Bee Inspectors who manage teams of Seasonal Bee Inspectors. In addition to apiary inspections for statutory bee diseases, bee inspectors provide advice and assistance to beekeepers on a range of bee health topics and run training courses for beekeepers on disease recognition and control, usually in conjunction with local beekeeping associations. Bee inspectors also assist with field trials within the NBU's experimental programmes.

For further information, contact the NBU who will put you in touch with the appropriate bee inspector for your area, or visit the NBU website (www.nationalbeeunit.com)

Beekeeping Associations

In many areas, beekeeping associations operate disease control schemes and provide practical advice to members on bee disease recognition and control. Contact your local beekeeping association for details or your local Disease Liaison Contacts (DLC).

Fig 24. Beekeepers training session at the NBU's teaching apiary at Sand Hutton

The Bee Health Advisory Panel

CSL hosts a panel of independent beekeeping scientific experts including representatives from national beekeeping associations. Its aim is to keep the official bee health programme under review, suggest improvements to it and advise on research and training likely to be of direct help to beekeepers.

UK information sources

CSL National Bee Unit (NBU)
Central Science Laboratory
National Bee Unit
Sand Hutton, York
North Yorkshire
YO41 1LZ
Tel: 01904 462510
Fax: 01904 462240
email: nbu@csl.gov.uk
Web: www.csl.gov.uk
Web: www.nationalbeeunit.com

Department for Environment, Food and Rural Affairs (Defra)
Horticulture and Potatoes Division
Eastbury House
30/34 Albert Embankment
London
SE1 7TL
Tel: 020 7238 1047/1045
Web: www.defra.gov.uk
Bee health pages:
Web: www.defra.gov.uk/hort/bees.htm

National Assembly for Wales Agriculture Department (NAWAD)
Agricultural Policy Division
Crown Buildings, Cathays Park Cardiff, CF1 3NQ
Tel: 02920 825111

Caenarfon Divisional Office
Penrallt
Caenarfon
Gwynedd
LL5 1EP
Tel: 01286 662 012
Web: www.wales.gov.uk

Bee Farmers Association of UK
Web: www.beefarmers.co.uk

British Beekeepers Association (BBKA)
National Agricultural Centre
Stoneleigh, Warwickshire
United Kingdom, CV8 2LZ
Tel: 01203 696679
Web: www.bbka.org.uk

International Bee Research Association (IBRA)
18 North Rd
Cardiff
Wales, CF10 3DT
Tel: 02920 372409
Web: www.ibra.org.uk
Email: ibra@cardiff.ac.uk

Overseas information

NSW Department of Agriculture, Australia
Web: www.agric.nsw.gov.au/reader/16402

Queensland Department of Primary Industries, Australia
Web: www.dpi.qld.gov.au/bees/

Department of Entomology, University of Georgia, USA
Small Hive Beetle Fact Sheet
Web: www.bugwood.org/factsheets/small_hive_beetle.html

Florida Department of Agriculture and Consumer Services, USA
Web: doacs.state.fl.us/~pi/enpp/ento/aethinanew.htm

United States NAPIS Cooperative Agriculture Pest Survey Programme
Web: www.ceris.purdue.edu/napis/pests/shb/

USDA Bee Research Laboratory
Beltsville, Maryland, USA
Web: www.barc.usda.gov/psi/brl/

USDA Beneficial Insects Research Center
Weslaco, Texas, USA
Web: weslaco.ars.usda.gov/biru.html

ARC Plant Protection Research Institute Honey Bee Research
Stellenbosch, South Africa
Web:
www.arc.agric.za/institutes/ppri/main/divisions/beekeeping/honeybeeresearch.htm

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