

Contingency Planning for the Small Hive Beetle

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Vital information and advice about this potential threat to our bees

THE EXOTIC SPECIES *Aethina tumida*, commonly known as the small hive beetle (SHB), is a serious pest of honey bees. Its arrival in the United Kingdom would pose a significant threat to the long-term sustainability and economic prosperity of beekeeping and, as a consequence, to agriculture and the environment through disruption to pollination services. For these reasons, the National Bee Unit (NBU) and Bee Health Policy (BHP) have taken a number of measures to intercept the arrival of the SHB into the UK and to prevent its establishment should any incursion arise.

Monitoring Imports of Bees

In terms of keeping the SHB out, stringent health certification requirements must be met before bees can be imported into the UK. We do not import from any country where SHB is present, with the single exception of Australia. In this case, imports are only permitted from limited areas which are certified as being at least 100 km from any SHB-restricted area.

Imports of honey bees from countries outside the European Union are restricted to queen bees and attendant workers. Packaged honey bees are prohibited, apart from New Zealand. Packages and single colonies of bumble bees (maximum 200 bees) are permitted, provided they have been bred and kept under a controlled environment within a recognised establishment which is supervised and controlled by the competent authority. Non-EU imports must enter the UK through designated Border Inspection Posts (BIP), where Veterinary Officers carry out a documentary and identity



Aethina tumida, the small hive beetle

check. NBU staff then carry out full physical inspections of all attendant workers and cages accompanying honey bee imports at the Food and Environment Agency's (Fera's) central diagnostic facilities.

Imports from other EU states include a much wider variety of bees/bee-related materials. Although these do not need to enter through a BIP, these too must have the correct health certification. This is issued electronically, at the



Checking a small hive beetle trap

point of export, and placed onto the Trade Control and Expert System (TRACES). The NBU uses TRACES to monitor EU (and also third country) imports closely and *in situ* spot checks are carried out on imported honey bee consignments.

Checking Our Colonies

Regarding surveillance of national bee stocks to check that they are SHB-free, the NBU carries out Exotic Pest Surveillance in England and Wales for *Aethina tumida* (and other exotic pests and diseases) as part of its annual apiary inspection programme (AIP). We use GIS (geographic information system) to target 'at risk' apiaries, such as those situated close to civilian and military airports, close to freight depots and ports of entry, or belonging to bee importers (see BeeBase map). Owners of 'at risk' apiaries are made aware of their status and their need to be especially vigilant.

Exotic pest surveillance comprises up to 10% of the total annual AIP activities; 863 exotic pest surveys were carried out between 2011 and 2012. In addition, nearly 120 Sentinel Apiary holders (beekeepers who monitor their colonies for exotic pest threats to honey bees on behalf of the NBU) routinely submit hive samples to our laboratories to be screened for any signs of the SHB. The NBU also receives a number (about 50) of suspect SHB samples each year, submitted by concerned beekeepers.

Contingency Planning

To date, none of these various interception and monitoring regimes has ever picked up any sign of the SHB. This beetle has never been detected in any imports to the UK, from any source, and we are very confident that this pest is currently absent from colonies in England and Wales. However, the experiences of other countries where the SHB has been introduced, including the USA, Australia, Mexico, Canada, Jamaica and Hawaii, show us just how quickly it is able to establish itself and spread.

Should this situation ever arise here, we have in place a Contingency Plan for SHB (and *Tropilaelaps* mites) which

would be invoked immediately in the event of any incursion.

This Plan, produced by the NBU on behalf of Defra and the Welsh Government, is an operational document that details the response to an SHB or *Tropilaelaps* mite outbreak in England and Wales. (Similar arrangements apply in Scotland and Northern Ireland.)

Information about Contingency Planning can be viewed on the BeeBase website (www.nationalbeeunit.com). The essential elements of the plan are communication, assessment of the extent of infestation, eradication and containment.

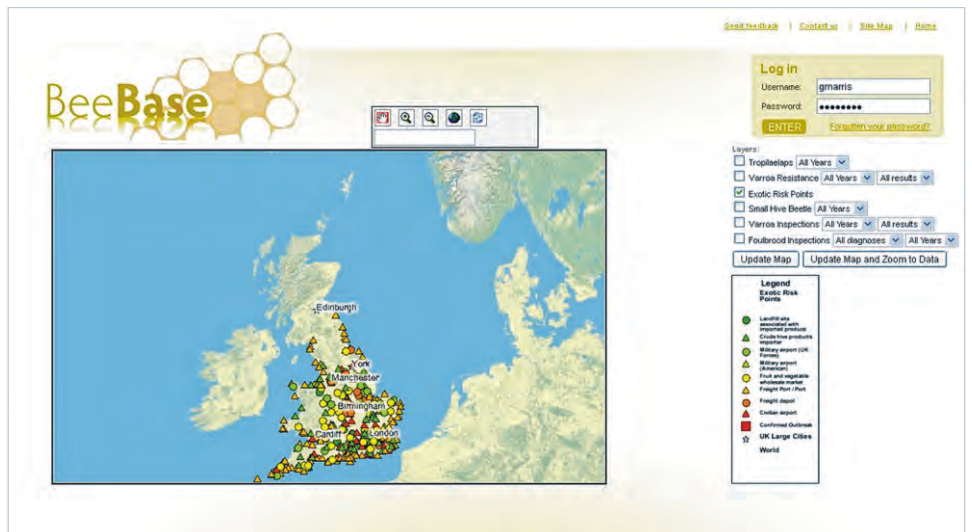
Despite our best efforts to the contrary, sooner or later the SHB could arrive on our shores. It is important that beekeepers prepare for this possibility and understand the consequences if the incursion is not detected rapidly and eradicated.

If the SHB is found, what happens first?

Assessing the Extent of Infestation

In the first instance, a statutory infected area (SIA) will be declared. The SIA is a zone of radius 16 km around the original SHB incursion site. This might be an apiary but could also be any other entry point for the SHB, such as a freight depot that imports fruit. The size of this initial SIA reflects what we know about the SHB's ability to disperse and can be altered and enlarged rapidly should circumstances

Exotic risk points identified on the BeeBase map (<https://secure.fera.defra.gov.uk/beebase/maps/map.cfm>)



change. Movement restrictions will be placed on all apiaries within the designated SIA, effectively restricting removal of colonies, queen bees, used beekeeping equipment, hive debris, all unprocessed hive products, including honey and raw beeswax, or any other thing which is liable to spread any life stage (egg, larva or adult) of the SHB within, into, or out of the infected area. These restrictions would take immediate effect and remain in force while the NBU completes emergency apiary searches.

What Happens Next?

Emergency searches of apiaries around the first find would be completed very quickly and, depending on our findings, decisions would be made as to how to proceed.

The first priority would always aim to stamp out the SHB as quickly as possible. However, under some circumstances, depending on the number and geographical spread of the outbreaks, it would be necessary for an eradication strategy, aimed at completely eliminating all SHB from England and Wales, to be replaced by a containment strategy, designed to contain pest spread and limit damage.

Eradication

The key elements of eradication are destruction of affected apiaries and all contaminated equipment, stringent surveillance and movement restrictions in the SIA, as described above.

Pesticides may be available (subject to confirmation from the Chemicals Regulation Directorate) but the use of these would also require specifically trained personnel and they cannot be applied by the beekeepers.

Containment

Containment strategies are not designed to eliminate the pest but only to minimise impact and spread. SIAs are no longer in place and no colony destructions are involved; no special surveillance measures are required other than to monitor the beetle's distribution; no movement restrictions are involved.

Key elements are use of husbandry methods, good hygiene practices and

apiary management. Modified honey extraction and handling methods will limit factors that can allow SHB numbers to rise. All of these practices are the responsibility of the beekeeper without the need for input by NBU Bee Inspectors (other than in their usual general support role).

Eradication Versus Containment

Any approach taken for the control of the SHB, whether eradication or containment, would be dictated by the extent of the infestation. If the outbreak is in a limited number of apiaries in a restricted geographical area, an eradication strategy could be put in place. Otherwise, a containment policy would be implemented.

Depending on the size and distribution of the outbreak, any shift from eradication to containment could be very swift – perhaps within just a few days of the first confirmed detection of SHB. In order to understand the effects of scale on the decision-making process, it is helpful to present the reader with a few facts and figures.

Facts and Figures

The geographical concentration of beekeeping practices across England and Wales, coupled with the need for such a wide SIA (due to the flying ability of SHB) mean that the number of apiaries put at risk, even if just one incursion is confirmed, will be very high.

Based on current data obtained from BeeBase (the NBU's database for beekeeping statistics), the typical number of apiaries in any area of radius 16 km (= 804 km²) is 500 apiaries; the typical number of colonies is 5, ie, 2500 colonies could fall within a single SIA. Every one of these colonies would require at least one inspection by an NBU Bee Inspector and all suspect samples generated would require specialist diagnostics by science staff at Fera. There would be a concomitant rise in office support services, for example, in data handling.

The consequences of any outbreak are thus far reaching, not just for those beekeepers who are directly affected,

but also for the beekeeping community in general and for the inspectorate and associated services with responsibility for eradication. Moreover, even a small degree of spread results in an extremely rapid escalation in the surveillance efforts required to limit the outbreak.

Put in the simplest terms:

if the number of confirmed incursion sites is n

then the number of colony inspections required = $n \times 2500$

This means that unless SHB is eliminated rapidly and its spread is halted very soon after the initial incursion, it may become impractical to pursue eradication if there are a number of outbreaks. There are many circumstances under which containment may become the best (if not the preferred) option.

In order to demonstrate the impact of spread on the relative viability of eradication versus containment, we outline opposite the implications of three different incursion scenarios on the scale of response required from the Inspectorate (and beekeepers). Each has an accompanying map by way of illustration (Maps 1–3).

Scenarios range in severity from the least extreme (a single incursion) to worse case (single incursion, but with multiple primary and secondary trade links).

How Beekeepers Can Help



Only import bees in accordance with the regulations. Guidance is available on the BeeBase website. Do NOT be tempted to import bees illegally – legal action may be taken in such cases. Compliance with the Import Regulations is 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.

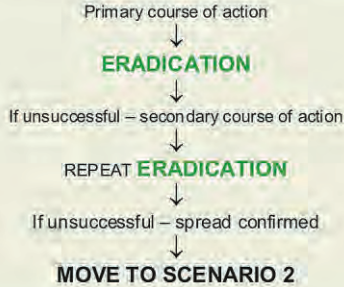


Make sure you understand the essential details of the SHB's lifecycle and how to recognise larvae and adult beetles. You can find out more about the SHB from

SCENARIO 1 (Map 1)

The SHB is confirmed present only at one site - the original suspect apiary.
 The suspect apiary has no links with any other apiaries, and **no further cases are found** beyond initial incursion site.

Number of SIAs = 1
 Area = 804 km²
 Number of apiaries destroyed = 1
 Number of apiaries affected by movement restrictions = 500
 Number of apiaries at risk = 500
 Number of colonies requiring inspection = 2,500



Map 1

SCENARIO 2 (Map 2)

The SHB is confirmed at original incursion site and in a limited number of other sites (e.g. + 3 apiaries) with proven trade links with the primary outbreak.

Secondary affected apiary(ies) have no further trade links with other apiaries – i.e. source of any “new” infections is known.

No further cases are found beyond initial incursion site and established trade partners.

Number of SIAs = 4
 Area = 4 x 804 = 3,216 km²
 Number of apiaries destroyed = 4
 Number of apiaries affected by movement restrictions = 2,000
 Number of apiaries at risk = 2,000
 Number of colonies requiring inspection = 10,000



Map 2

SCENARIO 3 (Map 3)

The SHB is confirmed at original incursion site and in (n) other sites with proven links with the primary outbreak (i.e. source of infections known).

Secondary affected apiary(ies) also has/have further links with other apiaries - i.e. source of “new” infections known but spread effectively uncontained.

Maximum no. of SIAs unknown – likely to be high or very high
 Area involved = n x 804 km² – likely to be very high >>4,824km²
 Maximum number of apiaries destroyed unknown – likely to be high or very high
 Number of apiaries involved unknown – likely to be very high >> 3,000
 No. colonies requiring inspection unknown – likely to be very high >> 15,000





Map 3


Key for Maps


- SIA around original suspect apiary
- SIAs around further affected apiary(ies)
- link between sites (eg, used equipment/bee sales; movement for purposes of pollination services)

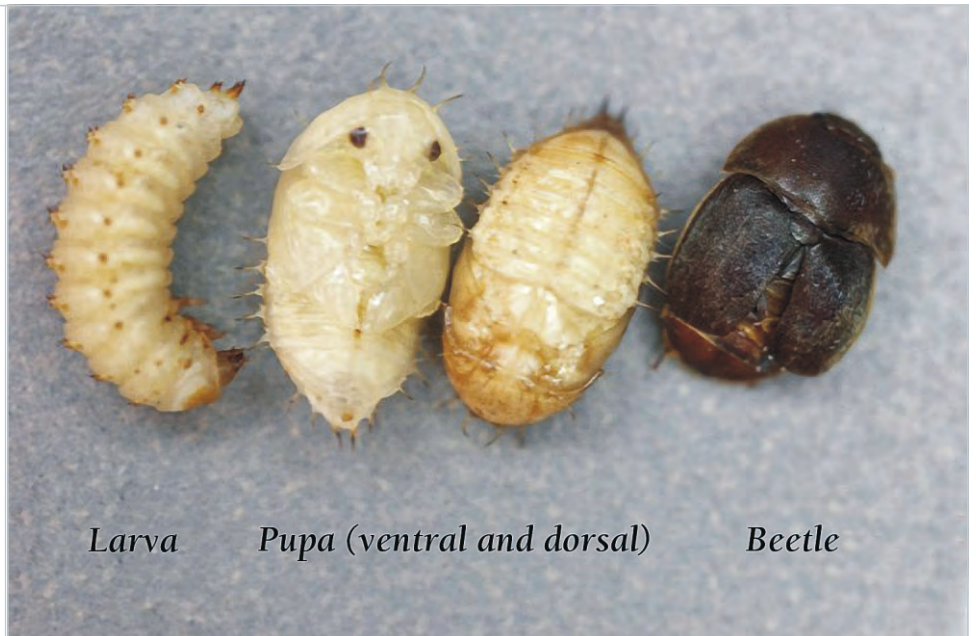
the BeeBase website, from where you can also download the NBU advisory leaflet *The Small Hive Beetle – a serious threat to European apiculture* (hard copies are also available on request from the NBU office (see below)).

 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.

 Suspect SHB adults or larvae should be sent immediately to the NBU for examination. Use a sealed container, such as a plastic tube or stiff cardboard box. Please provide as many details as possible – your name, the apiary name and location (including, where possible, the 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. A simple-to-use sampling form is available to download directly from the National Bee Unit website, www.nationalbeeunit.com

 Aim to stay informed and up to date on the spread and emerging biology of the SHB and the methods used to control it. If it does enter the UK, you will need to be ready to start to deal with it. The NBU provides regular updates to beekeepers as part of its bee health advisory work. Check the BeeBase website.

 Register on BeeBase, the NBU's database for England and Wales. As well as containing useful



Larva Pupa (ventral and dorsal) Beetle

Small hive beetle life stages

information on beekeeping, BeeBase is a vital tool in the control of bee diseases and pests. Where pests are confirmed, we use BeeBase to identify apiaries at risk in the local area and, as a result, target control measures effectively. If we don't know where apiaries are, then in the event of any incursion by the SHB, all our eradication and containment efforts will be seriously jeopardised.

In Summary

A number of monitoring measures are in place to protect beekeepers in England and Wales from the arrival of the SHB.

In the event that the SHB is ever found in the UK, our first priority will always be immediate eradication.

Under certain circumstances, prolonged attempts at eradication may not be possible and containment measures will be the most practical option.

The speed with which eradication efforts may be replaced with containment will depend on the nature of arrival and subsequent spread, but may be very rapid.

In order to keep the SHB out, beekeepers need to follow the guidelines provided above. *



Larvae



Club-shaped antennae



Adult beetle to scale (5–7 mm)

Contact Details

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