

THE SITUATION SO FAR

Small Hive Beetle

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In early September 2014, the small hive beetle (SHB) was discovered in South West Italy, in the port city of Gioia Tauro in Calabria. This was formally confirmed by the Istituto Zooprofilattico Sperimentale delle Venezie, the Italian National Reference Laboratory for Apiculture.

Since its discovery, the Italian Ministry of Health, in conjunction with the Veterinary Services, has implemented emergency searches and is working hard in order to ensure its eradication and to control its spread.

At the time of writing, our latest notification stated that *Aethina tumida* was isolated in three nuclei which were put in place for research purposes by the University of Agriculture of Reggio Calabria. Since then it has been detected in a number of other apiaries several kilometres away from the first site.

Following inspections which were made within a 20 km radius of the initial discovery, a second outbreak was found in Rosarno, Reggio Calabria, on 17 September. This was approximately 2 km from the original site. Seven adults were collected during the first visit. The next day (second visit), the 41 colonies of this apiary were visited. While no larvae were found, new adult beetles (18) were collected from 12

colonies. The discovery of the adult beetles will mean that an apiary destruction will be carried out along with treatment of the surrounding soil.

Subsequently, *A. tumida* was identified in two other apiaries in Gioia Tauro and Rosario. Some inspections were carried out in the Province of Crotona and Vibo Valentia with negative results.

The situation is evolving and no doubt, as soon as this article is published, the information will be out of date. However, further and more specific details on the outbreak will be posted regularly on the websites of the Istituto Zooprofilattico Sperimentale delle Venezie (IZSV) and the ANSES European Union Reference Laboratory for Bee Health. In addition, the World Organisation for Animal Health (OIE) has published information from the Chief Veterinary Officer in Italy which can be viewed as it is updated on the OIE website.

The websites will include details of levels of infestation and maps of the outbreak. The situation as we go to press can be seen in the map overleaf.

Links to the websites are available at the end of the article.

What is the Small Hive Beetle?

For those of you who do not know, the SHB is a statutory notifiable pest of honey bee colonies across Europe. This beetle, which is indigenous to Africa, has spread to the United States of America, Australia, Canada, Jamaica, Mexico and Cuba, where it has proved that it can be a very serious pest of European honey bees. Now it is present in Southern Europe.

What Happened Upon the Discovery of SHB in Italian Apiaries?

Italian national measures for the surveillance and eventual eradication of the parasite include inspections in all apiaries within a radius of 20 km from the place of occurrence. In addition, movement restrictions are placed in

a Statutory Infected Area or buffer zone of 100 square km radius from the infested apiaries. Controls have been established in respect of the apiaries where colonies of bees have been moved and sold in the Region of Calabria. In the event of the presence of small hive beetle adults and/or larvae, destruction of the entire apiary and the removal and treatment of the ground around the infested hives and apiary follows.

What the National Bee Unit is Doing

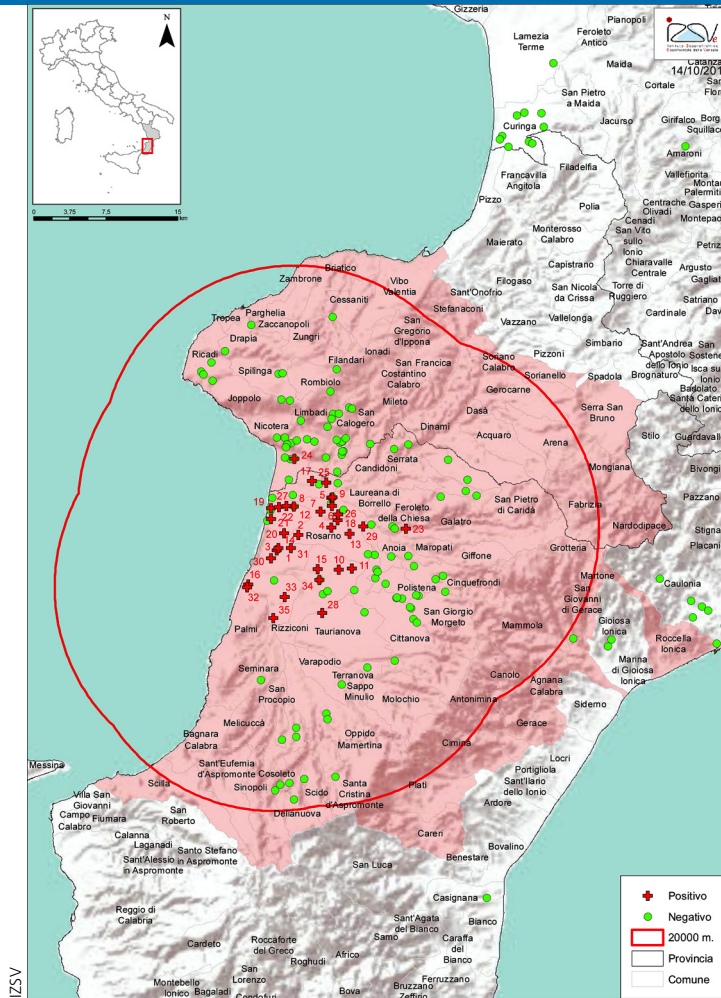
There have been substantial imports of bees into the UK of both queens and package bees from Italy since 2011.

The package bees, which represent a higher risk commodity, have been imported primarily from the north of Italy, well away from the



current area of investigations in Reggio Calabria, so we currently estimate the risk of an incursion following these imports to be low. However, the National Bee Unit Inspectors are conducting priority inspections of apiaries belonging to beekeepers in England and Wales who have recently imported honey bees from Italy comprising:

- checking and/or rechecking imports that took place in 2014 into England and Wales
- working hard to trace subsequent sales and movements of these bees within the UK
- checking/rechecking colonies within the sentinel apiary network, which is a routine part of the risk based Exotic Pest Survey (EPS) surveillance which is conducted each year
- encouraging beekeepers to be extra vigilant now that the small hive beetle has been confirmed in Italy
- working closely with beekeeper importers who have been helpful indeed in assisting with the inspections and tracings of movements of bees from their businesses. Many bees are subsequently sold on from importers
- inspections have continued in recent weeks – over 500 colonies have been inspected since the outbreak, many of these for the second time
- in addition to other activities, visits to Sentinel and Exotic Pest Risk Apiaries will continue while the weather holds. Currently 1192 apiaries at risk for Exotic Threats have been visited in England and Wales in 2014, which is equivalent to the 2013 visit frequency and is a 10% increase in



Map showing the apiaries where small hive beetles were found to be present on 14 October. Red crosses indicate positive detection of SHB; green circles show apiaries where SHB was not found upon re-inspection. The red outline represents the 20 km protection zone

such inspection activity since 2012.

The Link to Plant Health

Following the discovery of small hive beetle in Italy, we are working closely with those growers who use managed bees for pollination services (eg, fruit growers) and with the Chief Plant Health Officer to raise awareness of SHB among our Plant Health Inspectorate and importers of plant products. Note: fruit imports (eg, avocado, grapes, bananas and grapefruit) and soils or composts associated with the plant trade could present risk pathways through which SHB could be introduced. Guidance notes on what Plant Health and Seeds Inspectors

should look out for, including identification images, have been distributed.

Could It Reach the UK?

Yes, it could. Although indigenous to Africa, the beetle has spread to a number of countries around the world. There is a significant risk that the small hive beetle could be transported and introduced into the UK. The detection of the small hive beetle in Italy re-emphasises these risks. A pest risk analysis completed in March 2010 identified the following pathways through which the beetle could be carried:

- movement of honey bees: queens and package bees (workers) for the purposes of trade

- movement of alternative hosts, eg, bumblebees for pollination purposes
- trade in hive products, eg, raw beeswax and honey in drums
- soil or compost associated with the plant trade
- fruit imports, in particular avocado, bananas, grapes, grapefruit, kei apples, mango, melons and pineapples. Small hive beetle may oviposit (lay eggs) on fruit
- movement on beekeeping clothing/equipment
- movement on freight containers and transport vehicles themselves
- natural spread of the pest itself by flight, on its own or possibly in association with a host swarm.

The UK has not permitted the import of colonies of bees or package bees from Third Countries (outside the EU) for many years. EU legislation now prohibits (with the exception of New Zealand) imports of package bees or colonies from Third Countries.

Could the SHB Survive in the UK?

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

Could SHB be Eradicated?

Probably not. Unless the small hive beetle is detected very soon after its arrival, it will spread rapidly into

the surrounding honey bee population, making eradication very difficult. A major limiting factor to eradication would be the unknown distribution of managed beehives and the potential for populations of the beetle to survive in wild hosts (eg, feral bees and bumblebees)

How Do We Keep an Eye Out for SHB?

Beekeeper vigilance must now be heightened following the recent confirmed spread into a number of new countries outside the beetle's native area on top of the USA and Australia: Canada, Hawaii, Mexico, Jamaica and Cuba – and now Italy. Keeping an eye out for the beetle must be a routine part of colony management in the UK.

In addition to apiary inspections for statutory bee diseases, the NBU provides advice and assistance to beekeepers on a range of bee health topics and good husbandry and runs training courses for beekeepers on disease recognition and control, usually in conjunction with local beekeeping associations. These include how to look for and recognise the small hive beetle. The confirmation of SHB in Italy only serves to re-emphasise the importance of beekeeper vigilance.

The NBU has a risk-based apiary inspection programme for exotic pests such as the SHB. Although the small hive beetle is not thought to be present in the UK, since 2003, the NBU and its inspectors have increased statutory surveillance programmes to monitor for exotic pests including small hive beetle (and *Tropilaelaps* mites). These Exotic Pest Surveillance (EPS) inspections represent 10% of the annual statutory programme. Please see the

Tropilaelaps advisory leaflet for more details, or the NBU's BeeBase website www.nationalbeeunit.com

Following the confirmation of SHB in Italy, the NBU inspectors are making further visits to beekeepers who have recently imported honey bees from Italy. The recent Defra policy review *Improving honey bee health. Proposed changes to managing and controlling pests and diseases* placed renewed emphasis on increased surveillance for exotic threats to the UK, which could have a very serious impact on the honey bee industry and its ability to provide pollination services for agriculture.

How Can We Manage It Should It Arrive?

Experience from countries where the beetle is present has shown that the best line of defence is good management or Integrated Pest Management (IPM), which begins with maintaining strong colonies. As with many pests, strong healthy colonies can exert considerable control over this beetle. Weak colonies, supers or chambers empty of honey bees are all prime targets for rapid infestation. There are a number of techniques that can reduce the impact of the beetle that could be adopted and applied here in the event of its arrival into the UK. 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
- looking for and selecting bees that seem to have lower beetle populations.

There is likely to be genetic variation in the ability of colonies to resist beetle infestation.

Experiences from Abroad

In the USA and Australia, it has been shown that management of the pest is possible by using an Integrated Pest Management (IPM) system. IPM is a principle where chemical inputs are kept to a minimum and where the aim is to keep pest populations below the level which causes significant harm, using a combination of controls at different times of the year.

What are the Harmful Effects of the Small Hive Beetle?

Small hive beetle 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 very survival of the colony is at great risk. Queens stop laying and colonies can collapse quickly. In heavy infestations, tens of thousands of small hive beetle larvae may be present in a single hive. 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. Defecation by 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.

What Should We Be Doing Now?

Despite our wishes and efforts to the contrary, sooner or later the small hive beetle could arrive in the UK. It is important that beekeepers prepare for this

Small hive beetle larva

Note the characteristic spines at the top which run along the entirety of the larva and the three pairs of legs towards the front



Small hive beetle adult, *Aethina tumida*

Note the clubbed antennae

possibility. Some advice targeted at what beekeepers should do now is illustrated below.

- Make sure your details are recorded on BeeBase. It is extremely important that all beekeepers register on BeeBase. If we don't know where 'at risk' colonies are located, then our chances of effectively monitoring for the arrival of the small hive beetle, or achieving control in the event of an invasion,



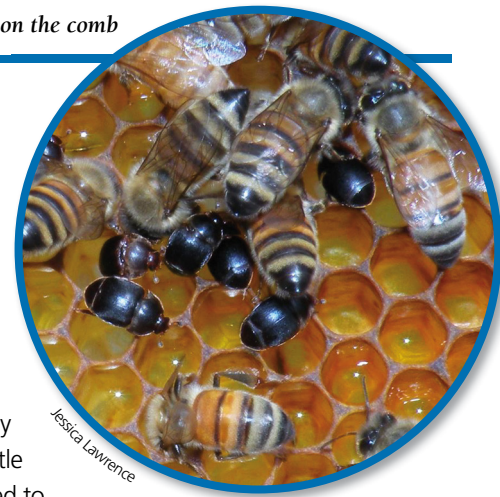
Larvae on the comb

are seriously jeopardised. This is the responsibility of the beekeeper. To register as a beekeeper, please visit www.nationalbeeunit.com

- Make sure you only import bees through the proper channels and with appropriate health certification. Do NOT be tempted to import bees illegally.
- Make sure you understand the essential details of the small hive beetle's life cycle and how to recognise larvae and adult beetles.
- Be vigilant – you should keep an eye out for the small hive beetle when you examine your bees. This should be 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.

- Aim to stay informed and up to date on the spread and emerging biology of the small hive beetle and the methods used to control it overseas. If it does enter the UK, you will need to be ready to start to deal with it. There is a great deal of new information on the small hive beetle. The NBU



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provides regular updates to beekeepers as part of its bee health advisory work.

To find more information please see the advisory leaflet *Small Hive Beetle*. [↗](#)

Website Links

OIE – <http://tinyurl.com/mnu52jl>

ANSES European Union Reference Laboratory – <http://tinyurl.com/okb298g>

IZSV – <http://tinyurl.com/nsq52eo> (in Italian)

– <http://tinyurl.com/pe2okra> (in English)

Defra policy review – <http://tinyurl.com/oknna6g>

Small Hive Beetle leaflet (NBU) – <http://tinyurl.com/5tnpvfk>



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