

# Asian Hornet Update from the National Bee Unit

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*Recent experiences with Asian hornet outbreaks in the UK emphasise the need for us all to be continually looking for Asian hornets and their nests. Nigel Semmence shares lessons learned from these outbreaks.*

With Asian hornet, *Vespa velutina*, established in mainland Europe and with the two nests that have been found in the UK, one in 2016 and one in 2017, the importance of being prepared cannot be exaggerated. The National Bee Unit (NBU) working alongside the GB Non-Native Species Secretariat (NNSS) and Defra have developed contingency plans and pest risk-analysis as described in March 2018 *BBKA News*.<sup>1</sup>

## UK outbreak history

In spring 2016 an Asian hornet was trapped in a simple bottle trap in North Somerset, but it was not identified as such and was not reported until during the subsequent outbreak. This hornet was dried out and whether it was a worker or a queen could not be established. In September 2016 an Asian hornet was reported by an observant beekeeper in Tetbury, which was confirmed. After ten days of searching a nest was found in a Cyprus tree in a garden. During subsequent surveillance in both apiaries and other suitable foraging sites around

Tetbury and North Somerset no further Asian hornets were seen. During this period another hornet was reported in Bath, which had hitchhiked in camping equipment from a recent trip to France. The insect was sent to the NBU and confirmed as an Asian hornet.<sup>2</sup>

In March 2017 an Asian hornet was discovered in a supermarket distribution depot in Scotland. It had died on-site and a photograph was sent to the NNSS alert email address, but unfortunately the sample was not retained. In September 2017 an Asian hornet was seen by another observant beekeeper in an apiary in Woolacombe, North Devon and, after confirmation that it was Asian hornet, a response was launched and the nest was discovered in a hedge near a driveway within three days.

In both cases the nests were killed on-site and removed for analysis at Fera Science Ltd. Importantly, laboratory examination of the nests and adult hornets indicated that the nests were detected and destroyed before the production of queens and that these hornets had originated from the European population rather than from a new ingress into the UK from Asia.<sup>2,3</sup>

In April 2018 while all the NBU inspectors were attending their annual technical conference at Sand Hutton near York, a member of the public sent a photo of an insect to the NNSS alert email address. This was triaged and forwarded to the NBU for follow-up. The insect had emerged from a cauliflower when the person was preparing it for lunch. The householder had not seen such an unusual insect like this before, quickly took both the leaves and insect to the garden table to take photos, after which the insect promptly flew away. They checked on-line and on realising that it may be an Asian hornet sent the photos in.

From the photographs it was immediately confirmed to be an Asian hornet, *Vespa*



An Asian hornet on cauliflower. Note the characteristically dark abdomen with the fourth abdominal segment being yellow and the yellow-tipped legs.



Above: Rook nests in trees seen from an unmanned aerial vehicle. Inset: A DJI Matrice 210 unmanned aerial vehicle.

*velutina*, and the local Regional Bee Inspector left the conference to visit and follow up this report. Tracing the route of the cauliflower revealed that it had been bought from a farmers' market in Lancashire, but had been transported (under refrigeration) from Lincolnshire.

*“With Asian hornet established in mainland Europe and two nest findings in the UK, the importance of being prepared cannot be exaggerated.”*

The contingency plan was enacted and a forward operating base (FOB) was established in Lincolnshire at a nearby fire station. At that time of year any active hornets would be queens that have emerged from hibernation and traps were put out to monitor for any further Asian hornets. Additionally, hedgerows and large trees were surveyed for the previous year's nests (in case it had been established in the area). Thanks to the agricultural nature of Lincolnshire and its large fields most hedgerows and large trees were accessible from the roadside or public paths.

During this period the researchers from Fera Science Ltd. were deployed to use an unmanned aerial vehicle (UAV) to survey any large gardens and other sites that could not easily be accessed or viewed from the roadside for any old (non-active) nests. As well as the obvious benefit of using the UAV to view into trees this also allowed the experts to gain further experience in dealing with outbreaks.

Monitoring around both sites has been done with traps placed in the locality of the source field for the cauliflower in Lincolnshire and the house in Lancashire. So far, no further Asian hornets and no nests have been detected. National and local beekeeping associations have been made aware and further monitoring will occur later this summer in both areas to check if any nests have been established.

### Developing the contingency response

Many lessons have been identified during the last two years and improvements to aspects of the response have been implemented. Some examples are described below.

During the Tetbury response we expected there to be many nests in the locality. Inspections were therefore conducted in apiaries and other sites which would attract insects, including Asian hornets. These inspections took place over a range of approximately 18km from the original sighting. This used a lot of resource and it was realised that a response from the centre working out would lead to us finding the nest in a shorter time. Subsequently, at Woolacombe this was implemented and the nest was found within three days.

Many methods of marking and tracking hornets were tested during the Tetbury response and it was realised that handling of hornets should be kept to a minimum and bait stations could be used to help us calculate the approximate location of the nest. The bait stations were used where hornets were foraging on high hedgerows. A mixture of 25% shrimp mashed up in water in a dish placed nearby soon attracted hornets. This enabled us to get a line of sight measurement of the route taken by the hornet from the bait station back to the nest. When these are combined from multiple sites, the approximate location of the nest can be



A tree containing an Asian hornet nest in Portugal in 2017 viewed using visible light photography (left) and viewed using thermal infra-red imaging in the photo on the right.

triangulated. At Woolacombe line of sight measurements were obtained from three apiaries.<sup>4</sup>

A project funded by Defra was undertaken during 2017 by scientists at Fera Science Ltd. trialling the use of UAVs fitted with a thermal infra-red camera. This was done originally in Portugal and the technology was found to be useful in detecting the heat signature of active Asian hornet nests in trees or bushes.

Another project funded by Defra, also undertaken in 2017, was led by Dr Peter Kennedy from the University of Exeter. This involved the use of radio telemetry tags to track hornets and was carried out in France and Jersey. Nests were successfully detected but the technique requires some expertise so we are hoping to train bee inspectors so we can use it in future years.

### What beekeepers and associations can do

With many press reports, awareness of Asian hornet in the UK is increasing. However, correct identification is key, as the great majority of the reports of sightings received, over 4,500 in 2017, were not Asian hornets. The most commonly mistaken insect is the European hornet, which to the public is large and terrifying and must be an exotic pest. The identifying features of Asian hornet along with similar species are outlined on the NNSS alert sheet, which also contains details of how to report Asian hornet sightings. I would recommend that all beekeepers have a small supply of these, which can be used to aid themselves and the public with correct identification of mystery insects. Beekeepers and associations can also increase awareness of Asian hornets in their locality and a poster is also available from the NBU.

Local associations could set up responsible people to follow up local reports of Asian hornets and ensure correct identification. Monitoring traps can be used and a

method for making these is described on BeeBase along with a video, and on page 273 of this issue of *BBKA News*. We recommend that these are visited daily so non-target insects can be released unharmed. In spring these traps may catch any recently emerged queen hornets particularly when used with a sweet bait and set up in a wide range of locations, not just apiaries. We have recently updated the apiary records on BeeBase so, if you are using Asian hornet traps this can be recorded. Please see the recent news item on the front page of BeeBase.

Advice on how to catch a sample and get a photograph is also available from the NBU Asian hornet pages. Asian hornets sometimes hide under the colonies, so they can ambush bees as they return to the hive or land on adjacent vegetation. So placing material around the legs of stands may force them out into the open making them easier to observe and catch. If an apiary is large, getting a fellow beekeeper to help will prove invaluable as the hornets can move fast from hive to hive.

At the association level, training on Asian hornet, as well as other diseases and pests, is available from the NBU's bee inspectors in the form of talks, apiary safaris or apiary demonstrations from your Seasonal Bee Inspector (SBI) or bee health days in the summer and talks in the winter from your Regional Bee Inspector (RBI).

### Sightings

Sightings of Asian hornets should be reported urgently to us and this can be done in a number of ways. Smartphones or tablets can be used by downloading the Asian hornet watch app for Androids and iOS. The app also uses GPS, which allows the user to submit the exact location of their finding, allowing any confirmed sightings to be followed-up quickly and efficiently. Alternatively, you can submit your sighting by email to: [alertnonnative@ceh.ac.uk](mailto:alertnonnative@ceh.ac.uk) When doing so, please include as much information as

possible, including where you saw the sighting, name, contact number/ address and if possible an image. All records received are reviewed by entomologists at the Centre of Ecology and Hydrology (CEH) and credible records are passed to us in APHA, at the NBU and the GB NNSS for further investigation.

### Further information

BeeBase: [www.nationalbeeunit.com](http://www.nationalbeeunit.com)

NBU Contingency plans:

<http://www.nationalbeeunit.com/index.cfm?pageid=206>

NBU Asian hornet page:

<http://www.nationalbeeunit.com/index.cfm?pageid=208>

NNSS Asian hornet pages with Asian hornet watch app:

<http://www.nonnativespecies.org/alerts/index.cfm?id=4>

### References

1. Semmence N. (2018) Contingency planning, *BBKA News* 225 March p85-86.
2. Budge GE, Hodgetts J, Jones EP, Ostoja Starzewski JC, Hall J, Tomkies V *et al.* (2017) The invasion, provenance and diversity of *Vespa velutina* Lepeletier (Hymenoptera: Vespidae) in Great Britain. *PLoS ONE* 12(9): e0185172.
3. Wakefield M, Jones E. (2018) Asian hornet analysis. *BeeFarmer* Jun p8-9.
4. Fouracre D. (2018) The Asian hornet in the UK. *BeeCraft* 100(7) July.

Pdfs for all references listed above can be found on BeeBase in the publications section at <http://www.nationalbeeunit.com/index.cfm?pageid=167>

*“... starting a response from a sighting, working outwards, can lead to finding a nest in the shortest time. Bait stations at multiple sites, enable triangulation of routes taken by hornets to their nests and UAVs with infra-red thermal imaging can help detect active Asian hornet nests.”*