

Hunting the Asian Hornet

On the 17th September a hornet sample was collected by a beekeeper in Gloucestershire and reported to the local Bee Inspector, who submitted it to the FERA Science laboratory in York. The sample was confirmed as an Asian hornet by an expert entomologist. The NBU Asian Hornet Contingency Response Plan was immediately activated and a Local Disease Control Centre (LDCC) set up in Gloucester to allow us to co-ordinate the response on the ground.

Initially Bee Inspectors were deployed across a five-kilometre surveillance area around Tetbury, to inspect local apiaries and look for any of the typical hawking behaviour of the Asian hornet. However, possibly due to the abundance of forage available, and the low Asian hornet population in the area, there was little or virtually no hawking behaviour observed. To find the nest we used a range of methods from deploying traps, looking for hornets on forage, triangulation (traps and sightings were used to assist with this), leafletting members of the public, local association and public buildings, infrared imaging and triaging hundreds of calls and emails from vigilant members of the public.

The main forage available to insects at this late time of year was ivy which was in abundance and being visited by wasps, bees, hoverflies, butterflies and both European and Asian hornets. The Asian hornets were observed mainly on ivy and also preying on aphids on willow, but monitoring their lines of flight required great patience. They were on a feeding mission and were only going to return to their nest when replete. However bearings were taken from a number of different sights which, when plotted on a map, all pointed to a 500 metre zone in the built up area. This was in line with findings in France where Asian hornets show a preference for nesting in inhabited areas rather than the open countryside and are often high up in tall trees.

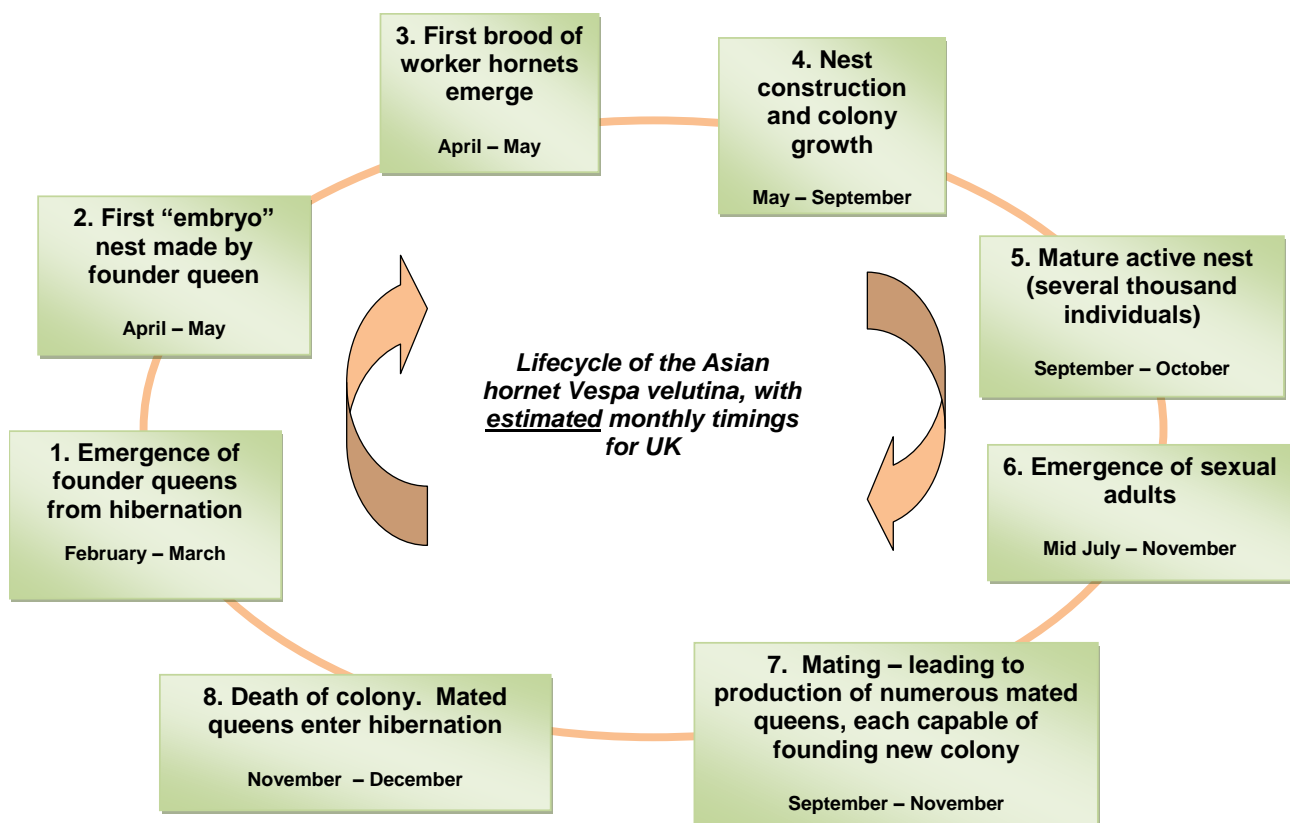
The mapping proved correct and the nest was spotted by an observant Bee Inspector 55 feet up a tall conifer tree at the back end of September, two weeks after the first sighting. Members of the APHA's Wildlife team, who are responsible for destruction of Asian hornet nests during an outbreak, destroyed and removed the nest that night and it was taken to our laboratory for further analysis, which is still ongoing. We continued our surveillance in Tetbury up until the end of October but no further Asian hornet activity was observed and no further nests were found. We are still continuing surveillance right through the winter.

What next?

Painstaking analysis of the nest in the laboratory has so far failed to find any evidence of young queens, despite the nest's priorities shifting from foraging and nest expansion to producing potential queens and male hornets for mating during autumn. After this period, the fertilised queens would leave the nest to hibernate over winter, whilst all the other occupants die. Vigilance will be required next spring if any founding queens will begin building new colonies.

The queen, usually measuring up to 3 cm, starts building an embryonic nest in spring and rapidly lays eggs, during which time she is alone and vulnerable until the first workers emerge. As the colony and nest size increases, a larger nest is either established around the embryonic nest or they relocate and build elsewhere, often high in tall trees.

During the summer, Asian hornet foraging and predation on honeybee colonies increases and will continue until the end of November. Hornets can be seen hovering outside a hive entrance, waiting for returning foragers, this is the characteristic “hawking” behaviour. When they catch a returning bee, they will take it away and transform it into flesh pellets, as their brood requires animal proteins to feed on and the protein rich thorax is given to the larvae.



What can you do to help?

Being able to distinguish between hornets is essential, European hornets, wood wasps and hover flies are all commonly mistaken for the Asian hornet. The Asian hornet, *vespa velutina*, can be easily distinguished from our native hornet, *vespa crabro*, it is smaller and the first obvious feature is the abdominal colouration. The European hornet resembles a large wasp and has a yellow and black striped abdomen, with some brown and brownish yellow variation. The Asian hornet is mostly black with a yellow/orange band on the fourth abdominal segment, characteristic yellow legs and an orange face.

A typical adult wood wasp *Urocerus giga spp* is brown or black with more yellow colouration towards the end of the abdomen than an Asian hornet. The insect often reaches up to 4 cm long, making it greater in size than the 2.5 cm of the Asian hornet. They are certainly impressive, which is probably one of the reasons why it is mistaken for

the hornet. Females have a long sting like ovipositor on the end of the abdomen which is a giveaway feature of female wood wasps. This is used for laying eggs in timber or tree trunks.

The hoverfly is not commonly mistaken for an Asian hornet, but since the current outbreak there have been a lot of reports sent in of them, hence the mention here. The abdominal colouration can sometimes be similar to the Asian hornet, which may account for why people misreport it. Several species of hoverfly have been reported, but the most common this year has been *Volucella zonaria*, the 'hornet mimic hoverfly'. This insect is harmless to humans and the main feature which sets it apart is the large pair of compound eyes and the stubby abdomen.

Up until this year, all reports had proven to be other, native insects which had been mistakenly identified. However, this year, the Asian hornet made several appearances close to our shores. The first sighting was in Alderney in July where a nest was discovered and subsequently destroyed. The following month, a single adult hornet was photographed by an amateur entomologist at Mount Bingham in Jersey. The image was confirmed as being of an Asian hornet by the National Bee Unit. However, a thorough search of the area failed to find further evidence. No further hornet activity has been detected on either island since.

In Europe, the Asian Hornet was confirmed for the first time in Lot-et-Garonne in the South West of France in 2004, twelve years ago. It has since extended its geographical range to Spain, Majorca, Belgium, Portugal, Italy and Germany. It can travel up to 60km/year and it could reach the UK by flying across the channel or by hitching a ride in vehicles or imported goods and through an airport or seaport, one of which method will account for the present incursion.

Traps

You could consider hanging traps for the Asian hornet. On warm spring days, mated queen hornets may emerge from hibernation as early as February and worker hornets will be on the wing throughout the beekeeping season, right up until November. So hanging out traps between these two dates is a useful monitoring tool. .

It's believed that, from different designs used for the Asian hornet in France, bottle funnel traps work best. Field trials show that, when funnel traps are hung in apiaries where hornets are present, they capture considerable numbers of individuals (~400 hornets/week/trap) and nest numbers are reduced by over 90% in areas where traps are deployed in the spring.

The National Bee Unit recommends sugar based baits, for example a dark beer, strawberry syrup and orange liqueur. In early spring sugary food resources are comparatively rare in the environment, so sweet baits are highly attractive to them. In the field we have also found that an autumn protein bait of mashed fish e.g. prawns or trout,

diluted to 25% to be effective, however, be sure not to leave the bait out for any longer than four or so days as the odour from the meat becomes very strong and very unpleasant!.

Finally, if you believe you have seen an Asian hornet, you should report it to alertnonnative@ceh.ac.uk. When emailing, please include your name, the location of the sighting and if possible, a photograph of the hornet. Please do not put yourself in any danger of getting stung when trying to take a photo. Even if you are unsure, send it in anyway – it's better to be safe than sorry. There is a helpful Asian hornet identification sheet and poster on Beebase along with a design for a home-made bottle trap, see <http://www.nationalbeeunit.com/index.cfm?pageid=208>

Last but not least!

If you haven't already done so, please sign up to BeeBase! Although not compulsory, it is important so that we can help protect your colonies, especially in and around the area of any outbreak. Knowing where apiaries are helps enormously in knowing where to send our Bee Inspectors. Not knowing where apiaries are means that our eradication and containment efforts could be less effective. If you have been inspected by your Seasonal Bee Inspector, you will be registered on Beebase.

Frank Gellatly, Regional Bee Inspector, Wales

Jason Learner, Technical Advisor, National Bee Unit

Images



Adult Asian hornet worker specimen found in Gloucestershire.



Asian Hornet nest found in Tetbury



Inside the Asian Hornet nest



European Hornet nest in Dutch barn in Carmarthenshire



Wood wasp



Hover Fly