



A Monitoring Trap for the Asian Hornet

The Asian Hornet, *Vespa velutina*, is an aggressive predator of honey bees and other beneficial insects. It has extended its geographical range from Asia to mainland Europe following an accidental introduction into France and is now also present in Spain, Majorca, Portugal, Italy Belgium, Germany and Switzerland. Adult hornets are highly mobile; the rate of spread across France was approximately 60-100 km/year. In September 2016, the hornet was confirmed for the first time in the UK but it is still not clear whether it is established or not. Therefore, it is vitally important that beekeepers monitor for the presence of the hornet in their area. This sheet explains how to make an Asian hornet monitoring trap. Hanging this device in your apiary will allow you to monitor for the Asian hornet, but it will trap our native hornet *Vespa crabro* and other beneficial insects. It will therefore need regular monitoring (preferably daily) to release them. Traps are especially effective if used in spring when hornet queens first emerge from hibernation while they are in search of sugary foods.

Materials and tools for making the trap:

- A 2 litre plastic bottle - look for pop or fizzy water bottles which have ridged sides with the bottom section marginally wider than the middle. The one pictured is from Asda, but other stores may stock them;
- Two lengths of plastic coated garden wire – approx.150mm and 300mm long;
- A 100mm square off-cut of **epoxy** coated (not loose woven) wire *Varroa* floor mesh (available from some beekeeping suppliers);
- A 150mm square off-cut of rigid black plastic sheet – Wickes surface protection sheet is ideal;
- A piece of stiff cardboard which is cut to the internal diameter of the bottle (just under 100mm);
- A sharp knife and/or scissors;

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- Sheet metal cutters;
- A fine point soldering iron (or a nail held with pliers and heated in a gas flame);
- Pliers;
- Stapler;
- 'Pop' riveter and rivets;
- A fine marker pen.

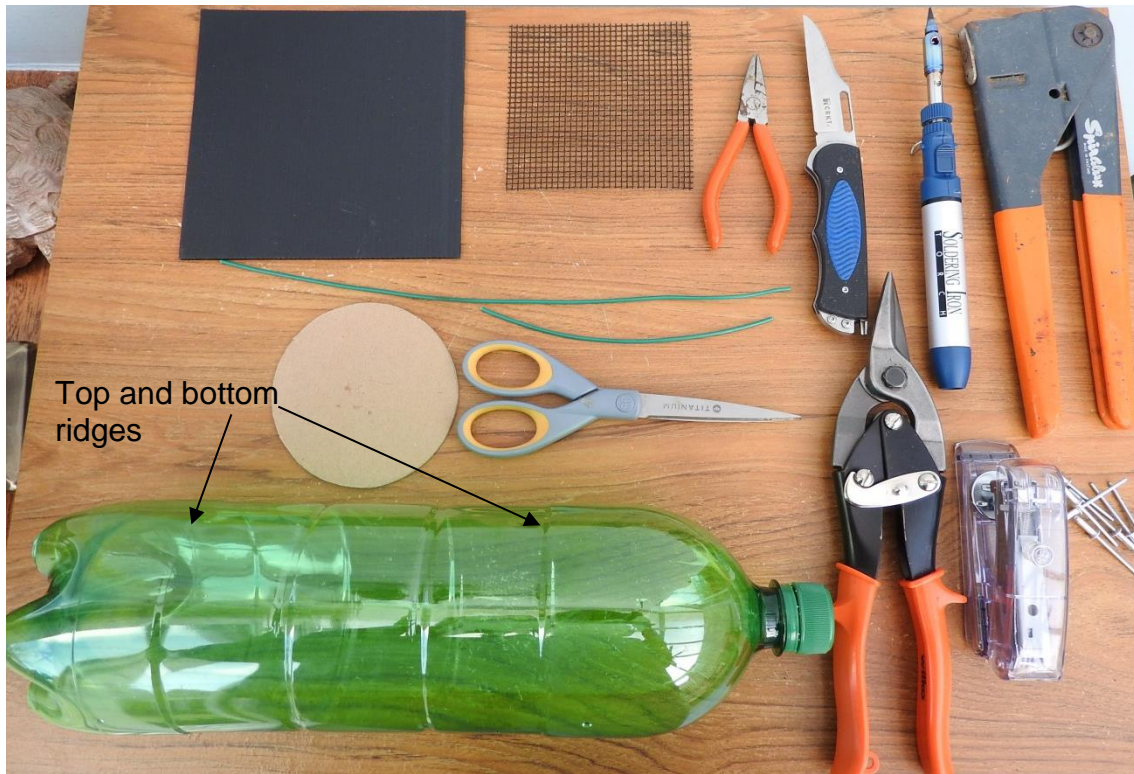


Fig. 1 Materials and tools

Method

1. Make an incision with a sharp knife and neatly cut around both just above and below the lower ridge of the bottle with scissors. Once done, this will give a sleeve effect, allowing the middle of the bottle to freely slide into the bottom section of the bottle;
2. Next make a similar incision at the top ridge and cut neatly around just under the bottom of the ridge;
3. You should now have three sections; the base, a middle tube and the top of the bottle. Remove the bottle lid;
4. Next invert the coned top section into the middle tube, hold the bottle neck centrally and mark the cone around the top of the tube with a fine marker pen;
5. Cut on this line to remove excess plastic and form a snug fitting cone;

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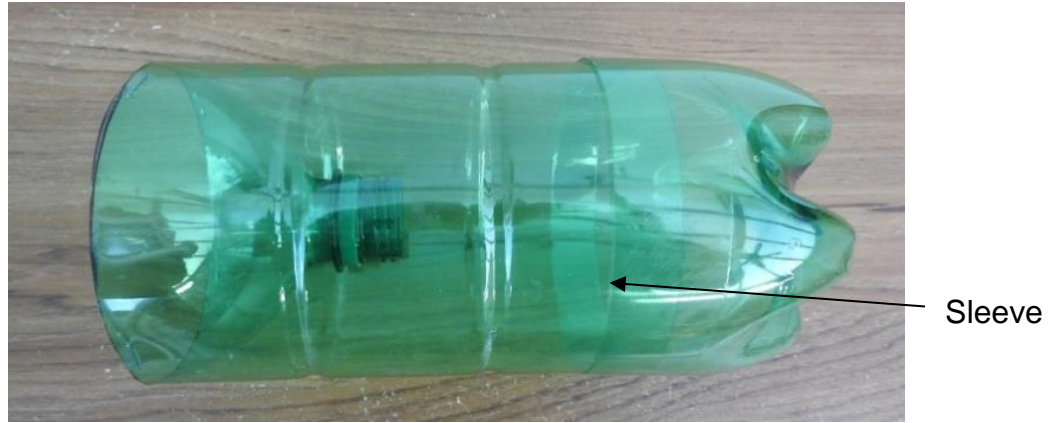
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Fig.2
Cone attached and
bottom sleeve



6. Staple the inverted cone to the middle tube (Fig. 2);



Fig. 3 Forming the corner tabs

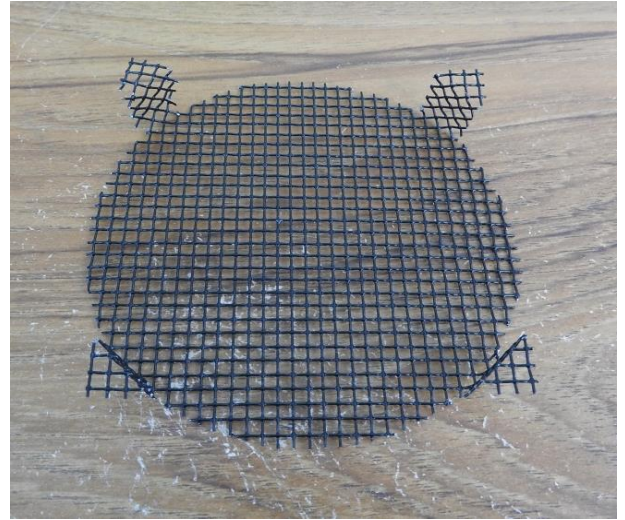


Fig. 4 Circular grid cut and finished

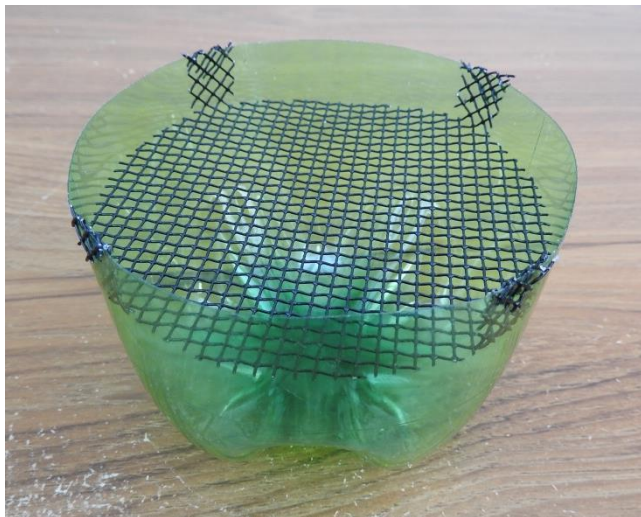


Fig. 5 Grid in place

7. Cut a circle of card to fit inside the bottom section of the bottle. Place over the square of *Varroa* floor epoxy mesh and cut inward towards the card circle at either side of each corner of the mesh to give an 11-12mm wide tab;

8. Fold up the tabs vertically at 90° firmly against the card. (Fig. 3), Turn over the mesh and using the card as a template, cut at a slight angle to remove the excess wire mesh and fold back the top 8mm (approx.) of the tab, (Fig.4);

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9. Seat the finished grid into the bottom section of the bottle and bend the tabs over the plastic to fix securely (Fig. 5);
10. Slide the open end of the middle tube into the base so that it rests against the mesh;
11. Make two small diametrically opposed holes through both layers of plastic with the fine tip soldering iron (or a hot nail held with pliers) about 6mm from the top of the base section Fig. 6. The seams of the bottle can be used as a guide. The short length of garden wire is pushed through the holes to keep the middle and lower section secured together;
12. Make another pair of holes diametrically opposed 6-8mm from the top of the funnel;



Fig. 6 Creating diametrically opposed holes to secure bottom and middle sections of trap

13. Bend the black plastic sheet in half and make a fold approx. 12mm along each edge. Make holes in the ridge about 40 mm from each end and 6-8 mm from the edge at the mid-point of the folded sections;



Fig. 7 creating black roof for trap

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14. Feed each end of the 300mm length of wire through the apex and fold over with pliers to link together (Fig. 7);
15. The black cover is then attached to the bottle trap – rivets have been used here for convenience, but small nuts and bolts or other fixings could be used.

The completed monitoring trap (Fig. 8) is then ready for use. Fill with a suitable sweet bait to just below the level of the mesh and hang in a sheltered sunny position in the apiary.



Fig. 8 Completed trap ready to add bait

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Note: This trap is meant for monitoring in areas where the Asian hornet is not yet established. The previous version has been adapted with a wider entrance to give increased opportunity for the Asian hornet to enter the trap and a black rain cover added to minimise the chance of hornets escaping back through the entrance. This however makes the trap less selective and it should therefore be checked regularly (preferably daily) and other captives released. If a suspect Asian hornet is captured it is best to enclose the whole trap in a plastic bag and place in a freezer for 12 hours before removing the insect.

In areas where the Asian hornet is already established a trap without mesh can be used. Experience in France has shown that a trap already containing some Asian hornets is even more attractive to other Asian hornets but other insects are deterred from entering. French beekeepers will therefore sometimes 'bait' a trap with a few Asian hornets.

When to hang out monitoring traps?

Reports from France suggest that in areas where spring trapping has been used, subsequent numbers of Asian hornet nests are reduced by as much as 90% (2 or 3 nests in trapping areas versus >70 nests where no traps have been hung). Monitoring should begin in early spring when queen hornets emerge from hibernation and search for food to begin constructing a small cup-shaped primary nest and raise the first cycle of brood. Weather conditions allowing for foraging activities and founder nest establishment will vary but typically, this will probably be between late February and early April; however this could be later or even earlier due to erratic behaviours in regional climatic conditions. Adult hornets will be on the wing throughout the beekeeping season, so monitoring should continue right into the autumn.

In areas where Asian hornets are established the demand for food to rear the rapidly expanding hornet population increases as the season progresses and predation on honey bee colonies can be very severe from late summer into autumn. Simple traps without mesh may be a useful way of reducing the stress on the colonies. Traps will need to be regularly changed as they can become full very quickly where high hornet activity is experienced. In the autumn, it is a good idea to hang traps near favourable hibernation sites, such as wood piles, stones, tiles etc.

What bait should I use?

At the end of hibernation emergent queens have a raised energy requirement and show a preference for sweet foods. In early spring such food resources are comparatively rare in the environment, so this means that sweet baits are highly attractive for the early capture of Asian hornet queens. There are many variations of sugar baits, all of which appear to be reasonably effective. These include mixes of sugar and various types of dark beer, various types of alcohol and even simple sugary baits such as apple juice. French beekeepers have also used a mixture of dark beer, mixed with 25ml of strawberry dessert sauce and 25ml of orange liqueur.

At the height of the beekeeping season, when predatory worker hornets are seeking high protein foods to feed the larvae, consider creating a protein bait by adding raw meat or fish to water. In the field we have found that a protein bait of mashed fish e.g. prawns or trout, diluted to 25% is highly attractive. However, if you use protein bait, it will need changing after 3 days due to decay and an unpleasant aroma.

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Additionally, you can buy proprietary brands of hornet (wasp) trap bait from many garden centres, DIY stores and beekeeping suppliers, some of which have a tested and proven efficacy against the Asian hornet.

Where should I hang traps?

Traps should be hung in sunny areas, avoiding deep shade where hornets are unlikely to forage. Traps can be hung in trees and on hive stands, in and around affected apiaries, at the height of a person.

How to empty the trap

Release all other live insects. In order to preserve as many non-target species as possible traps should be visited and emptied regularly; ideally **daily**. As stated above, it is very important that damage to native hornets, wasps and any other insects is kept to an absolute minimum. If your trap is adapted from an off the shelf design and you think you have caught an Asian hornet, then you may find it helpful to place the whole trap, unopened, into a freezer bag that you can seal tightly; place the bag containing the trap into a domestic freezer for 12 hours before opening, to avoid losing your suspect specimen.

How do I know if I have caught an Asian hornet?

The Asian hornet is not easily confused with any other species. Superficially similar to our native European hornet (*Vespa crabro*), it has a characteristically brown or black velvety body with a dark abdomen and yellow tipped legs. Only the fourth abdominal segment is yellow. In spite of its fearsome reputation, the Asian hornet is smaller than *V. crabro*. For further guidance on identification, there is an ID sheet for the Asian hornet:

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

How do I report captures?

You need to alert the relevant authorities as soon as possible. It is important to note the location as accurately as possible as well as obtain a photograph, to allow experts to confirm identification of the specimen. Please report the sighting immediately (sending a photograph if possible) to: alertnonnative@ceh.ac.uk, the NBU office and your Regional Bee Inspector.

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