

# Asian Hornets

Identifying, tracing & destroying invasive pests



# Introduction - Gary Cain

- Registered Pest Control Officer
- 26 years field experience
- Practitioner of rodent control, dog control and bee & wasp control
- Recently trained and certified competent in identification, tracking and control of Asian Hornets
- Bee Keeper & DEFA Bee Inspector



# What we'll cover today

- understanding the threat presented by invasive Asian Hornets
- learn the life cycle of an Asian Hornet and their nesting habits
- share relevant information, ensuring that if Asian Hornets arrive on the Island, you will have the information to identify them
- ensure you know what to do if you suspect you've sighted an Asian Hornet
- provide information about how we will trace and destroy Asian Hornets, should the sighting be confirmed

# Asian Hornet (*Vespa velutina*)

a 'flying' overview...



# Asian Hornet

(*vespa valutina*)

Native to Southeast Asia, the Asian Hornet or Yellow Legged Hornet is a predatory wasp.

Due to its hunting capabilities it is considered highly dangerous as an invasive species to our native bee and insect populations.



# Asian Hornet

(*vespa valutina*)

First sighted in Europe in 2004, in Lot-et-Garonne in the South West of France. The species is believed to have been accidentally imported with pottery.



# Asian Hornet

(*vespa valutina*)

The species has spread rapidly across the continent with recorded cases in Spain, Portugal, Italy, Germany, Belgium, Luxemburg, Switzerland, the Netherlands, and the United Kingdom



# Asian Hornet

*(vespa valutina)*

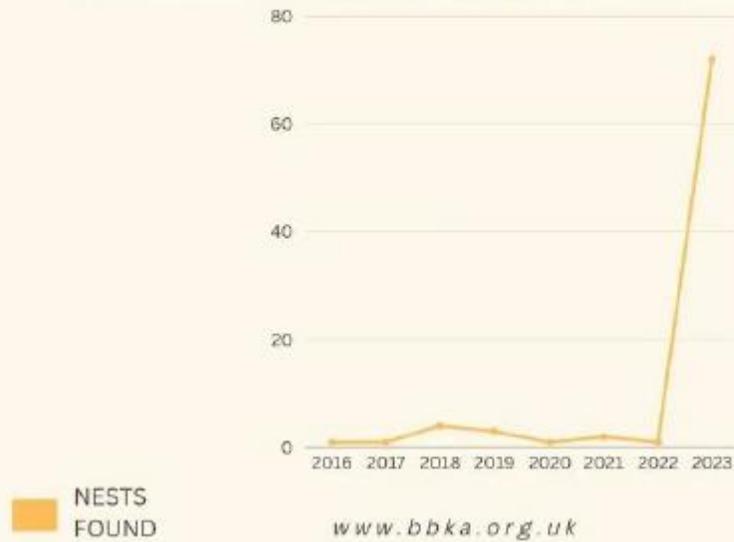
The species was sighted  
in 2016 in Tetbury, UK.

As of 20/10/23 gov.uk  
report a total of 77  
confirmed sightings since  
2016. This figure includes  
a total of 75 nests, all of  
which were destroyed.



# Asian Hornet (*Vespa velutina*)

ASIAN HORNET NESTS 2016 - 2023



# Asian Hornet (*Vespa velutina*)



# Asian Hornet

(*vespa valutina*)

First sighted in 2016 on Jersey. Nests destroyed in following years;

2017	17
2018	55
2019	83

Guernsey had their first sighting in 2017 and have reported 22 nests have been destroyed in the intervening years.



# Asian Hornet

(*vespa valutina*)

Asian Hornets are adept hunters and will predate on any and all local bees and flying insects in a radius of 1.5km from the nest.

It is estimated that honey bees make up around **30%** of the species diet.



# Asian Hornet

*(vespa valutina)*

When the Asian hornet's nest is at its maximum capacity in August-September, the workers aggressively prey on many insects.

It is at this time of the year that honey bee colonies are at their most vulnerable because they are an easy source of prey. Each Asian hornet is capable of taking 25-30 honey bees a day back to the nest.

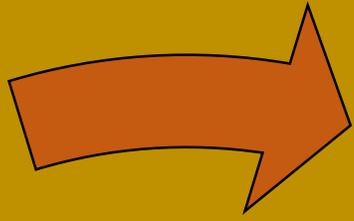


# Asian Hornet

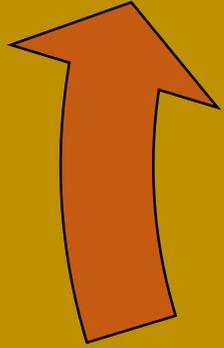


Life Cycle

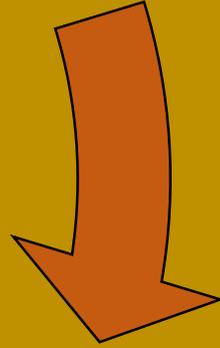
Winter



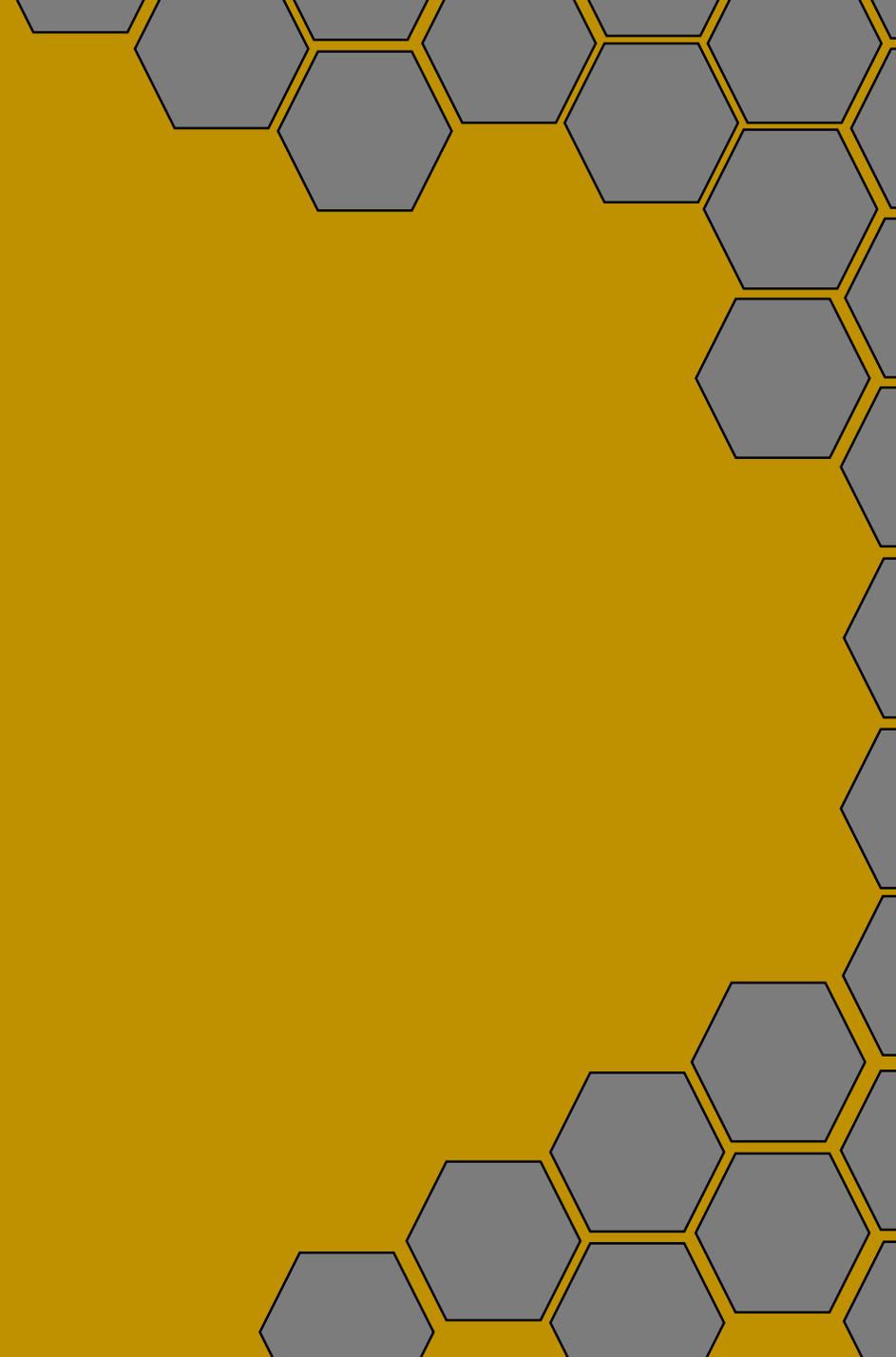
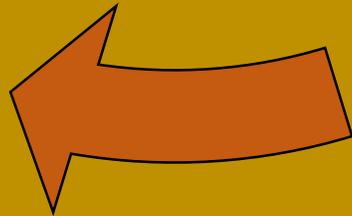
Spring



Autumn



Summer



Winter

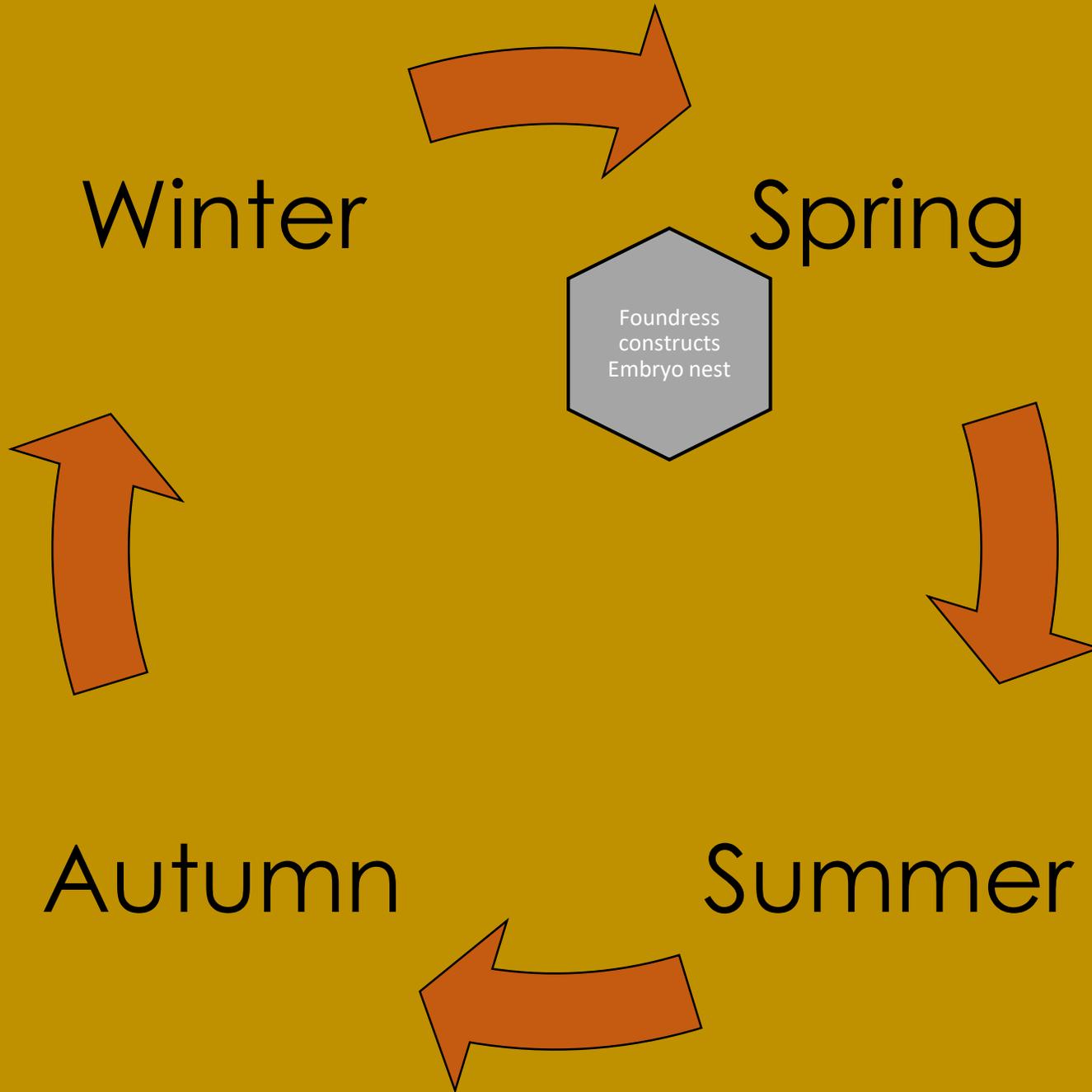
Spring

Foundress  
constructs  
Embryo nest

- The annual lifecycle of the Asian hornet begins around February/March when the queens that were mated in the previous autumn come out of hibernation and start to build their paper nests (normally the size of a tennis ball). At this stage, it's very difficult to tell the difference between a wasp's nest and an Asian hornet's nest as the entrances for both nests are at the bottom and therefore look similar.

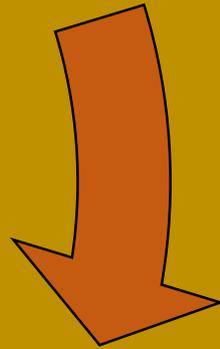
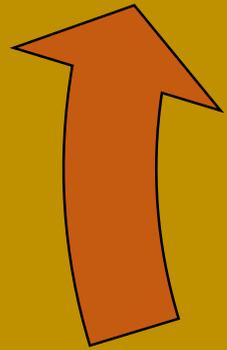
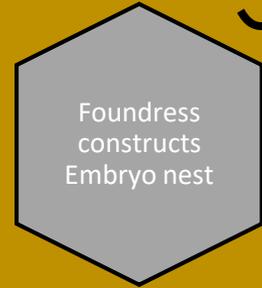
Autumn

Summer



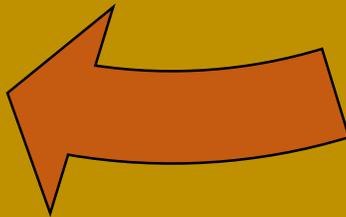
Winter

Spring

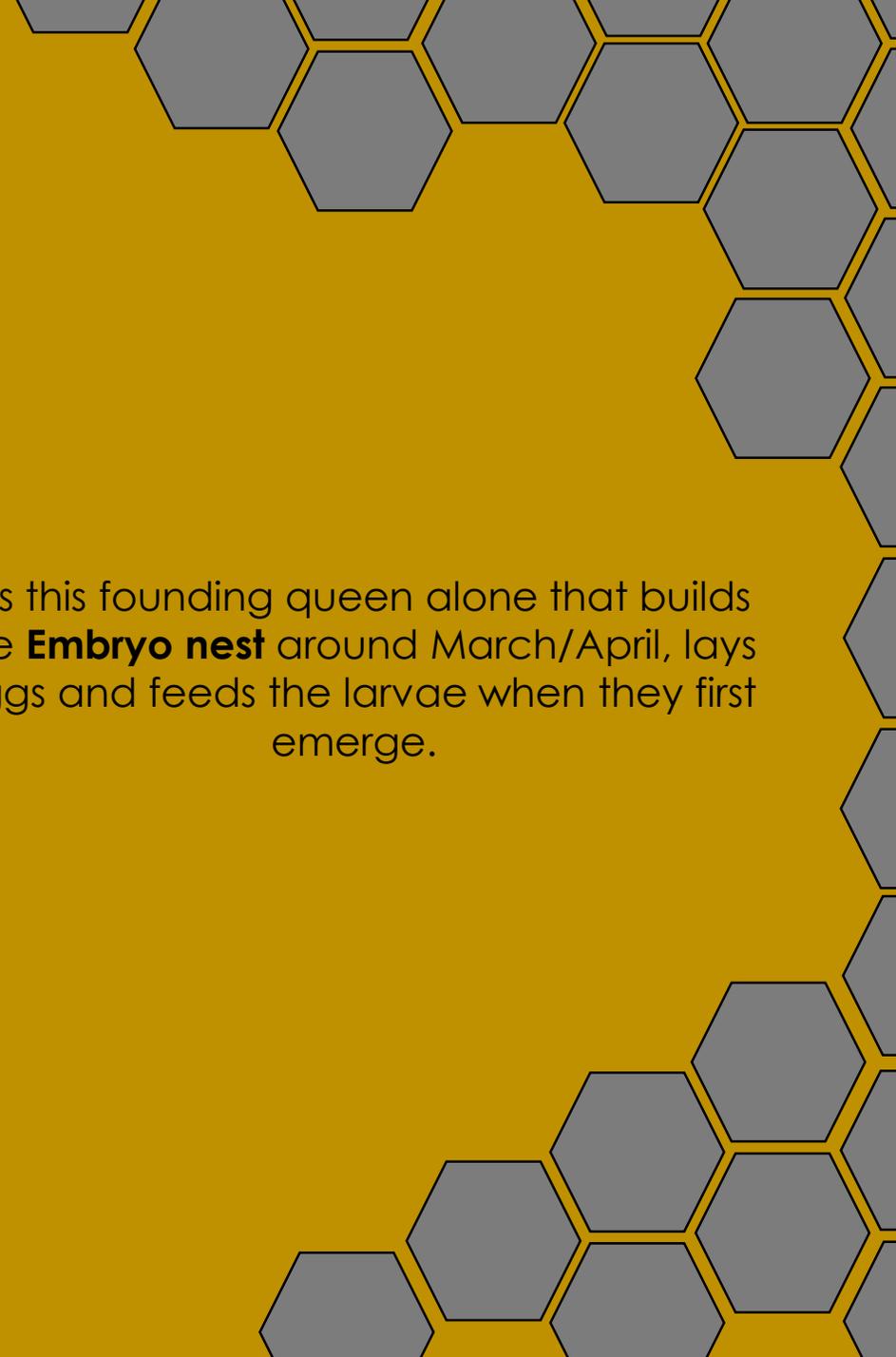


Autumn

Summer



- It is this founding queen alone that builds the **Embryo nest** around March/April, lays eggs and feeds the larvae when they first emerge.



Winter

Spring

Foundress constructs Embryo nest

First workers hatch and nest progresses to Primary

Autumn

Summer

- When the first generation of workers reaches the adult stage and numbers in the nest reaches 50-100, they may build another nest not very far away. This second nest is often in a higher place but they are also being found in hedges, brambles - even cliff tops.

Winter

Spring

Foundress constructs Embryo nest

First workers are hatched and nest progresses to Primary

Predation begins and Secondary nest is constructed

Autumn

Summer

- This second nest is called the **secondary nest** and tends to be built between the months of May-July and will be home to the Asian hornet colony through to the winter.

Winter

Spring

Foundress constructs Embryo nest

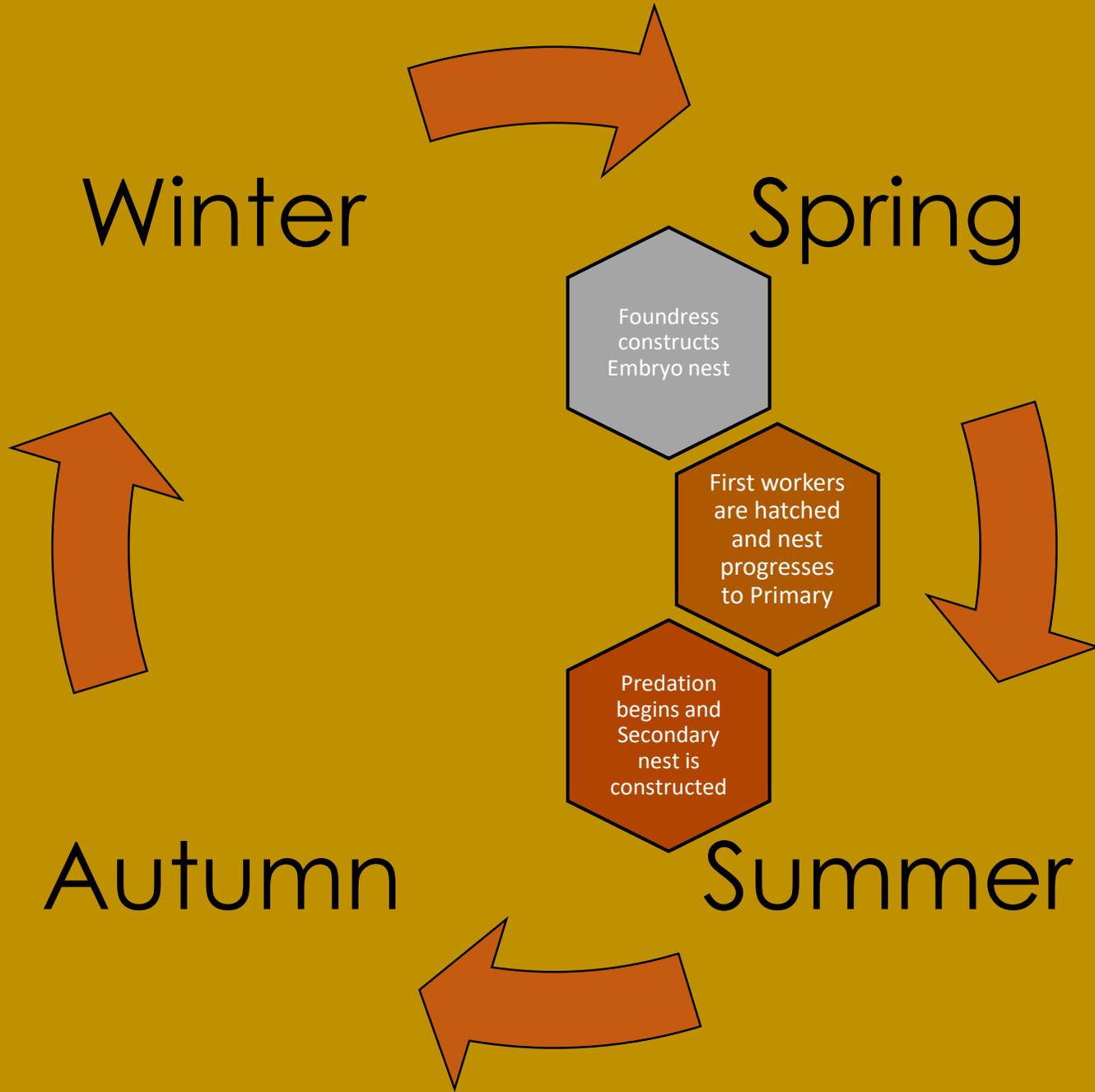
First workers are hatched and nest progresses to Primary

Predation begins and Secondary nest is constructed

Autumn

Summer

- Research has revealed that secondary nests tend to have their entrances on the side of the nest and around 70% of Asian hornet colonies will relocate to the secondary nest.



Winter

Spring

Foundress constructs Embryo nest

First workers are hatched and nest progresses to Primary

Predation begins and Secondary nest is constructed

Autumn

Summer

- With her workforce building in numbers, the queen concentrates on laying eggs while the workers continue to build the nest in size for more space to raise more hornets.

Winter

Spring

Foundress constructs Embryo nest

First workers are hatched and nest progresses to Primary

Reproduction begins

Predation begins and Secondary nest is constructed

Autumn

Summer

- It is estimated that around 6,000 Asian Hornets will emerge from a nest of which **150-500** will be **new queens**. In comparison, a colony of 40,000-60,000 honey bees will only have one queen!

Winter

Spring

Foundress constructs Embryo nest

First workers are hatched and nest progresses to Primary

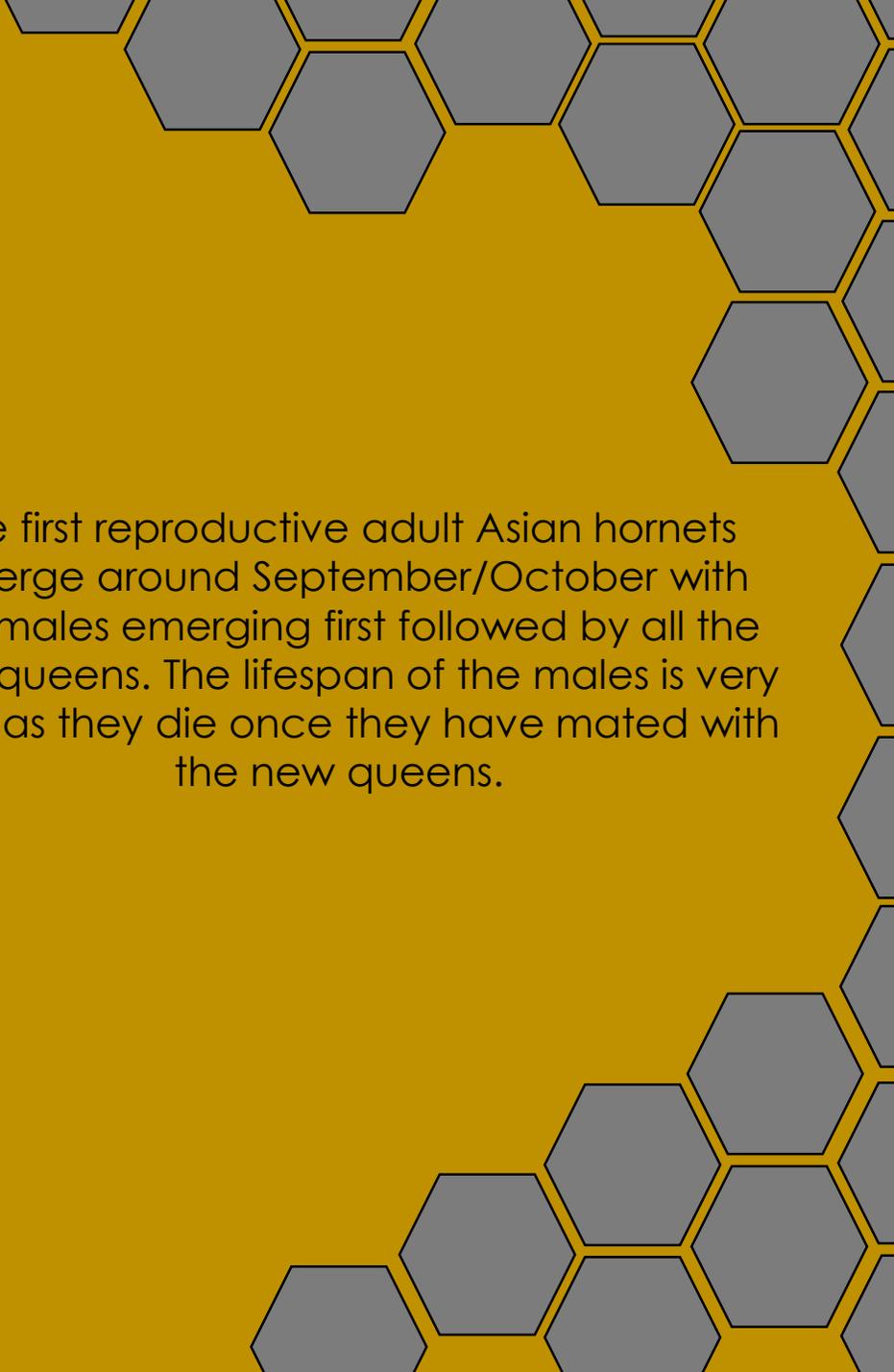
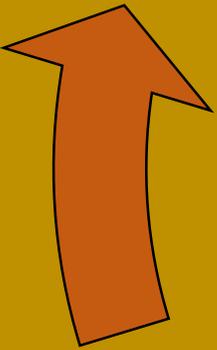
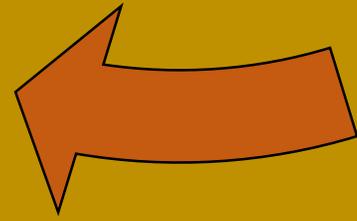
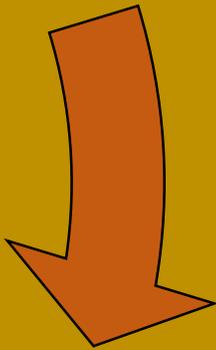
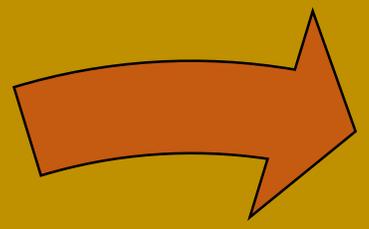
Reproduction begins

Predation begins and Secondary nest is constructed

Autumn

Summer

- The first reproductive adult Asian hornets emerge around September/October with the males emerging first followed by all the new queens. The lifespan of the males is very short as they die once they have mated with the new queens.



Winter

Spring

Foundress constructs Embryo nest

Males & workers die off

First workers are hatched and nest progresses to Primary

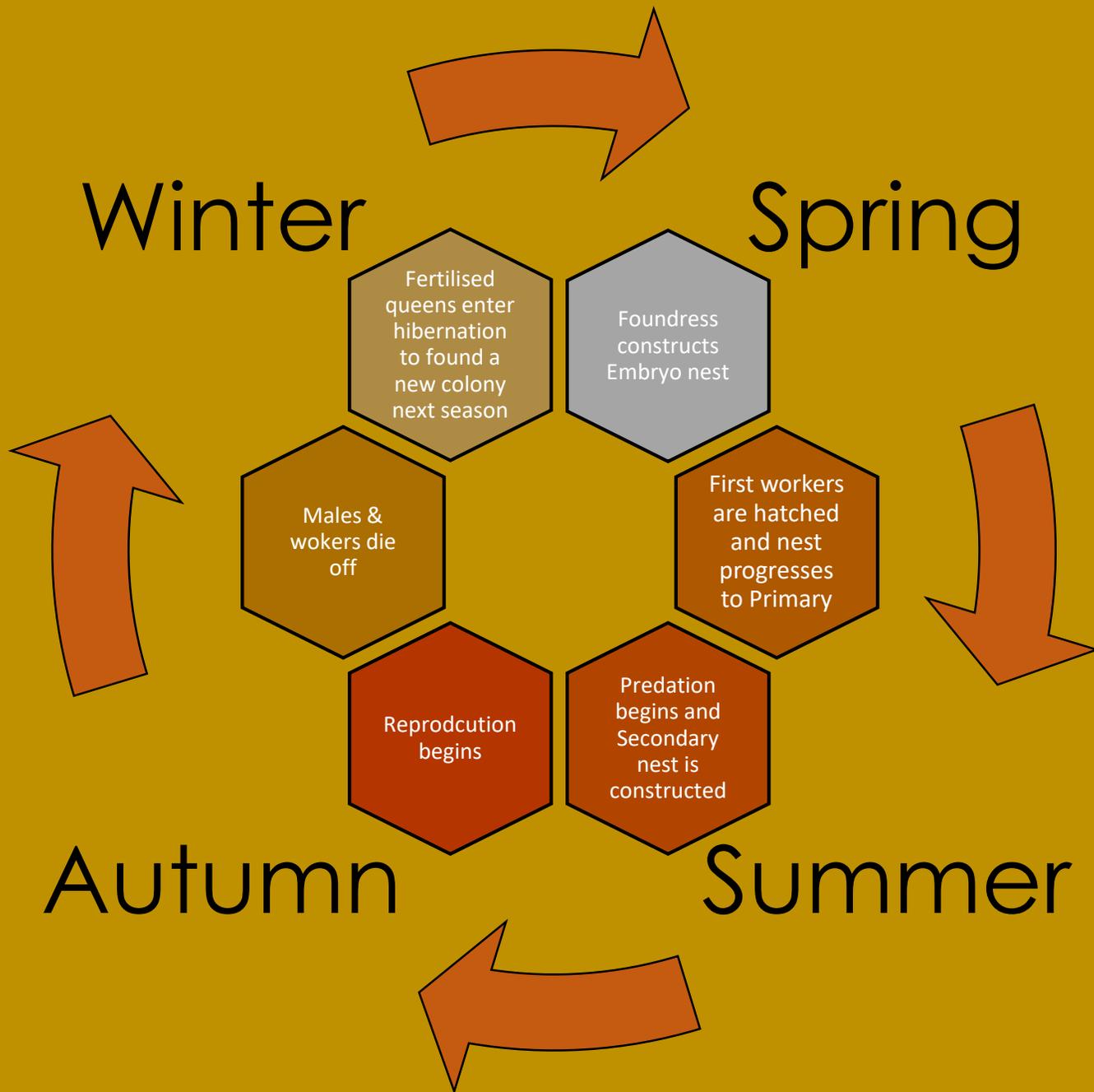
Reproduction begins

Predation begins and Secondary nest is constructed

Autumn

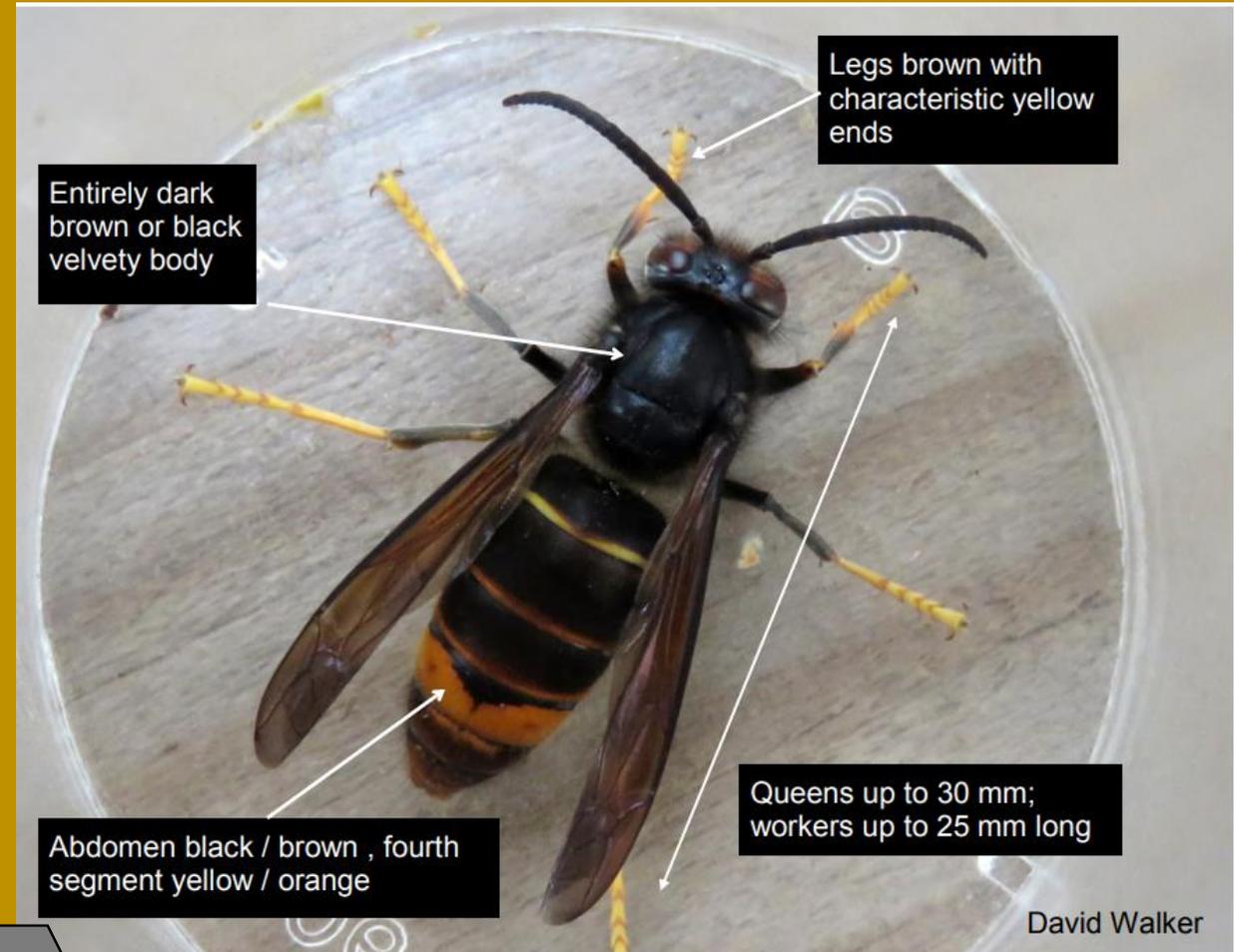
Summer

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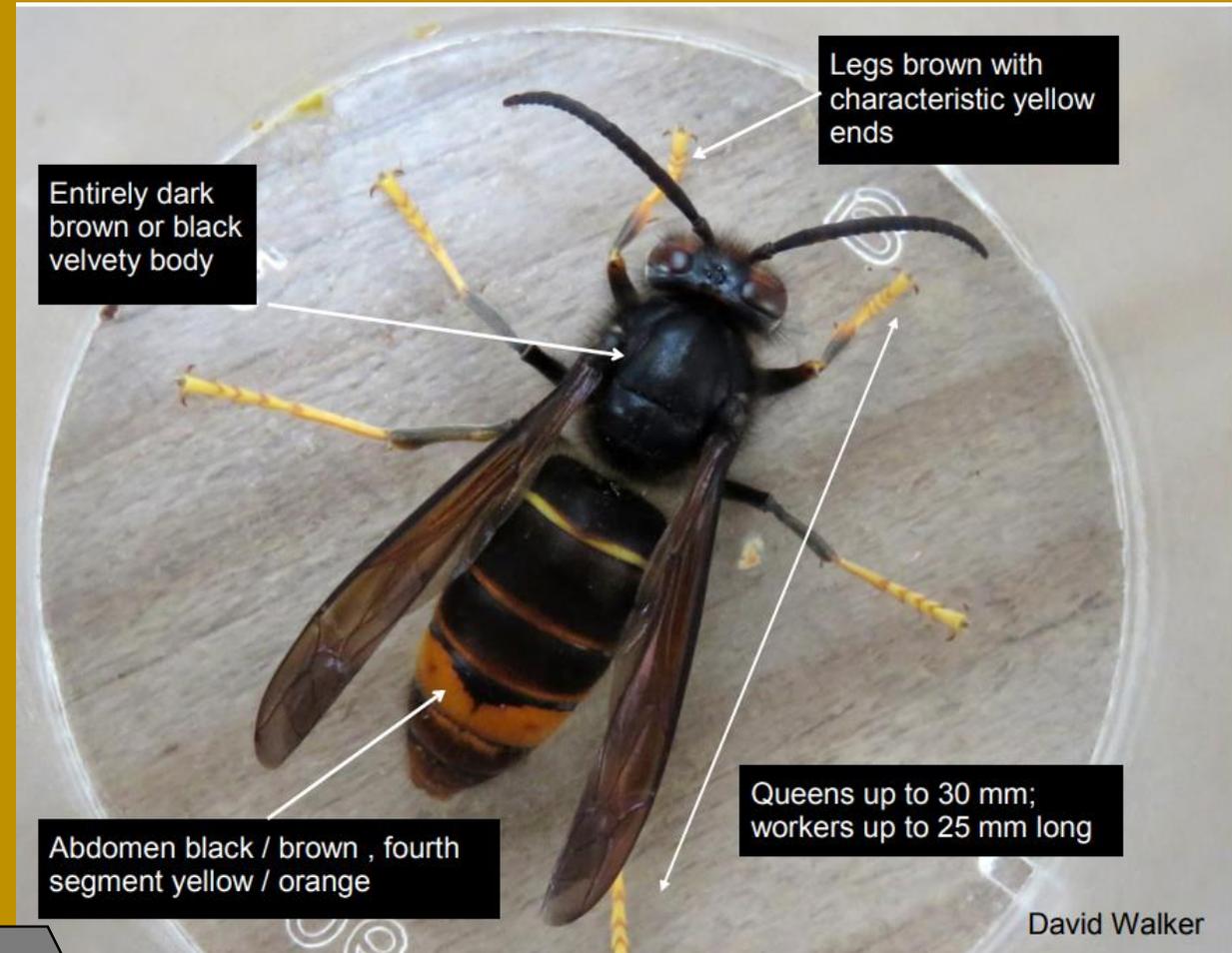
- With no new Asian hornets emerging, the size of the colony inside the nest gradually reduces and the newly mated queens fly the nest to find somewhere to hibernate over winter. Any remaining hornets in the nest will die as the temperature begins to drop and the life cycle of the Asian hornet comes to an end for that year.

# Identifying Asian Hornets



# Identifying Asian Hornets

- Legs yellow at the ends
- Dark brown / black abdomen with a yellow / orange band on 4th segment
- Head dark from above, orange from front
  - Dark coloured antennae
  - Entirely black velvety thorax
    - Never active at night
- Queen up to 30mm long, worker up to 25mm long



# Identifying Asian Hornets

## Key Features



**BLACK THORAX**  
(YELLOW 4<sup>TH</sup> ABDOMINAL SEGMENT)



**YELLOW LEGS**



**ORANGE FACE**

# SUSPICIOUS SIGHTINGS – DO'S & DON'T'S

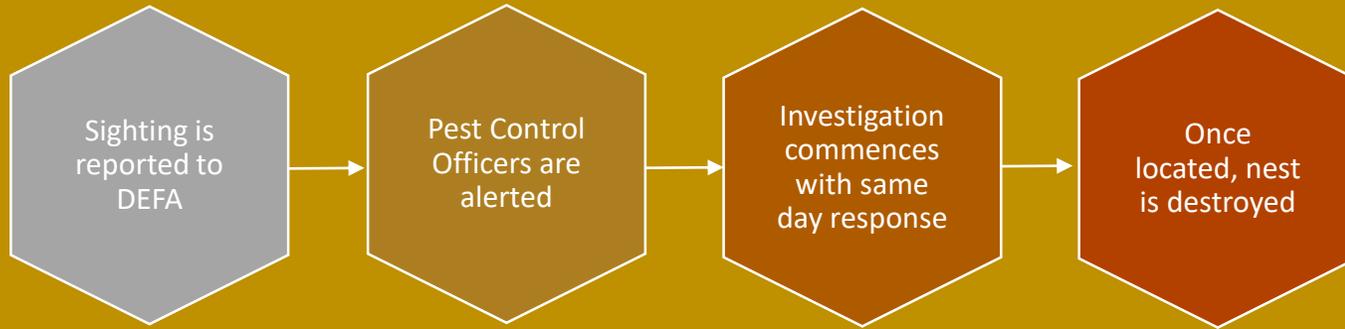
## DO

- ✓ Contact DEFA Pest Control immediately to report the sighting.
- ✓ Use what.3.words to precisely mark the sighting location.
- ✓ Take a photo or video, if it is safe to do so.
- ✓ Carefully & calmly leave the area, paying attention to where you walk

## DON'T

- × Approach the nest, if you can see it.
- × Release a hornet if it is trapped (i.e. garden shed, garage, under a dish or plant pot)
- × Run away, Asian Hornets appear to consider this a provocation.

# If a Sighting is Confirmed



An initial investigation will be carried out to positively identify Asian Hornets.

If the sighting is confirmed to be Asian Hornets, our Officers will deploy equipment and treat appropriately and proportionately to the size of nest or number of individuals that are found.

Treatment will be carried out where appropriate for wasps or bees.

## Required Equipment

- PPE
- Several colours of Queen bee marker pen.
- Bespoke streamering kit (developed specially for this purpose).
  - Queen cage
- Compass (to record flight directions)
- Stopwatch or appropriate timing device (phone)
  - Walkie talkies
  - Google maps on phone/device for terrain checking
  - Binoculars

Officers will attend **all** suspected sightings that are reported.

DEFA Officers are trained to identify, track and destroy Asian Hornets – please **do not** attempt to treat a suspected nest yourself.

# If a Sighting is Confirmed

## CATCH & CONTAIN

- Attractant is released into the trap
- Trap is hung near to the sighting location
- Trap is then regularly monitored for activity
- Traps can be modified to ensure that other species will be able to leave, but that hornets will remain contained
- Early Spring (April/May) sightings will likely be Queens, looking to establish their nest.
- Early Summer (June onward) sightings may be workers/foraging hornets and so should be not only eradicated by trapping but should be tracked to locate the nest.



# If a Sighting is Confirmed

## CATCH & CONTAIN

- A homemade marking trap is prepared



# If a Sighting is Confirmed

## CATCH & CONTAIN

- A homemade marking trap is prepared
- An individual is caught and trapped
- Spongy base ensures that the hornet is comfortable
- Slit in lid ensures easy application of marking and streamer



# If a Sighting is Confirmed

## CATCH & CONTAIN

- A homemade marking trap is prepared
- An individual is caught and trapped
- Spongy base ensures that the hornet is comfortable
- Slit in lid ensures easy application of marking and streamer
- Streamer is applied with microscopic dot of non-toxic glue, abdomen is marked with Queen Pen



# If a Sighting is Confirmed

## CATCH & CONTAIN

- A homemade marking trap is prepared
- An individual is caught and trapped
- Spongy base ensures that the hornet is comfortable
- Slit in lid ensures easy application of marking and streamer
- Streamer is applied with microscopic dot of non-toxic glue, abdomen is marked with Queen Pen
- Individual is released near feeding station



# HOW DO WE TRACE A NEST

- Once the hornet is regularly feeding (4-5 repeat feeds) we will capture and mark.
- The hornet is captured in a cellophane tube, and transferred into a marking cage.
- It will be marked with a pen, either on the thorax or abdomen and released to time the flight from release to return.
- Asian Hornets fly at roughly 100m p/min, a time of 10 minutes would indicate the nest is 1,000m away. When tracing, Officers aim to have a flight differential of 1.5mins, ensuring that the nest is close by.
- Once flight times are established, a streamer will be applied to a hornet and this will give us a better and further sight line of the hornets flight line to it's nest.
- The feeding station is then adjusted towards the nest, following the flight line of the streamered hornet.
- Streamers can also be marked, for example if four individuals are streamered, we will need to be able to tell them apart.
- There is no preferred location for a nest to be built, we must be aware that the nest could be very high up as well as on ground level or even in drain or subterranean spaces/cavities.

# Factors affecting investigation

- Identifying individuals taking different flight lines indicates that multiple nests may be present – this is why it's important to mark streamers.
- Flight times can be reduced significantly once an individual has identified the shortest route to the feeding station, they will naturally take the route they initially found even if this is longer. This is why multiple timing sessions between feeds must be carried out.
  - Night time sightings are very unlikely to be hornets as they are not active at night.
- Hornets will fight individuals from different colonies at feeding stations. If you see or suspect hornets to be fighting, it is a good indication that there is another nest and colony nearby.
- Wind speed and direction will interfere with the hornets ability to smell attractant, if we find that we are downwind and not experiencing activity we will look to move the feeding station towards the initial contact/sighting site.
- European Hornets (although not present on the Isle of Man) are known to be dominant over Asian Hornets and will not tolerate their presence. Investigators & Officers in the UK have been known to trap European Hornets whilst investigating Asian Hornets to ensure that they don't interfere with tracing the nest.

# NEST TRACING & TREATMENT IN ACTION



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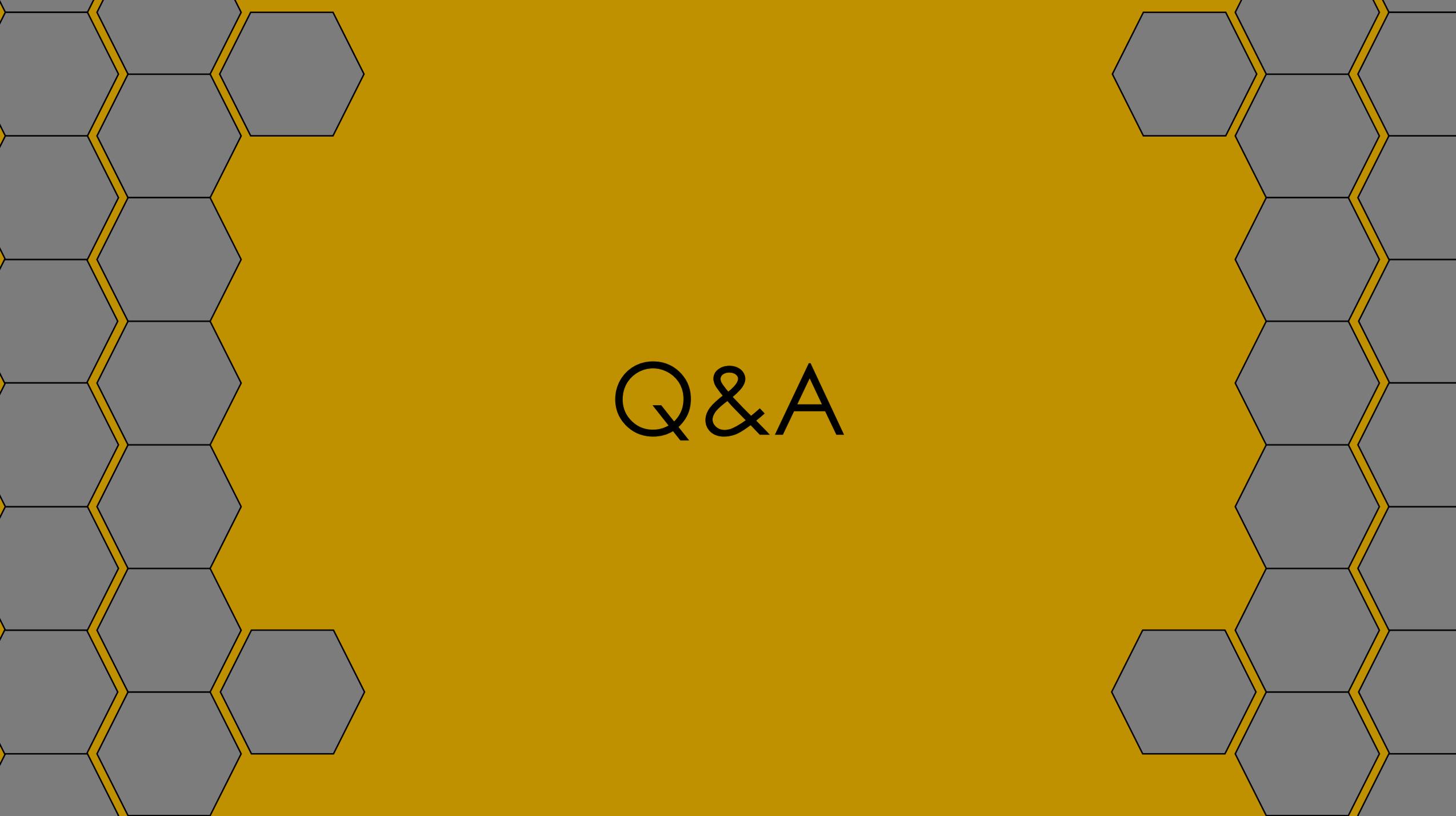


# NEST TRACING & TREATMENT IN ACTION



# NEST TRACING & TREATMENT IN ACTION





Q&A