

Basic Beekeeping Course



Week 4

Honeybee Pests & Diseases

www.moraybeekeepers.co.uk

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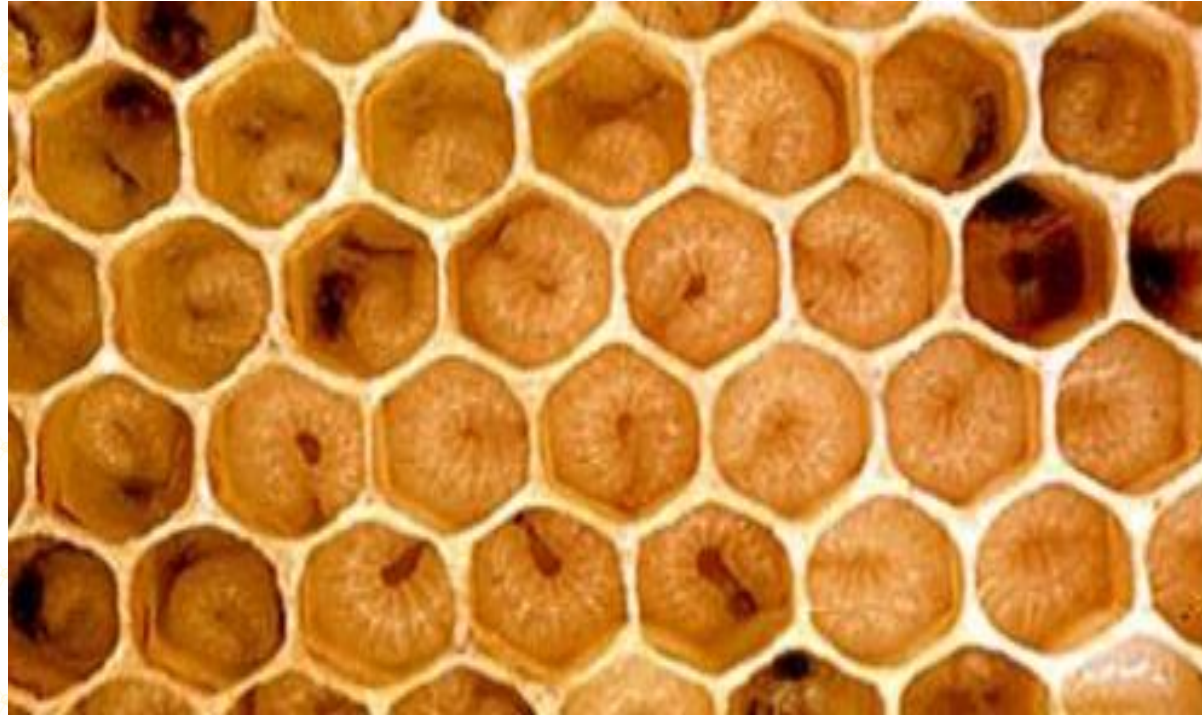
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Appearance of Healthy Brood EGGS



Q lays eggs in base of cells in brood nest. These hatch after 3 days and develop into tiny translucent larvae lying at base of cell in a bed of milky brood food

Appearance of Healthy Brood LARVAE



Healthy Larvae – pearly white in colour, shiny, lie in bottom of cell in a distinct 'c' shape

Appearance of Healthy Brood



Cell is sealed after 9 days. Wax cappings vary in colour from light to dark brown and are dry, dull looking and slightly convex

Appearance of Healthy Brood SEALED BROOD



A good brood pattern with very few empty cells within patches of brood suggest Q is laying well and larvae are developing normally



Foul Brood



Signs of Brood Disease

larvae – discoloured, distorted, melted

sealed brood – sunken, concave, perforated or discoloured cappings, with darkened damp appearance

brood pattern – eggs, larvae, sealed brood?

scales in open cells

pepper pot patterns, i.e. empty cells amongst sealed brood



European Foul Brood (EFB)



EFB is caused by the bacterium

Melisococcus plutonius

and affects **unsealed brood**, killing larvae before they are sealed in cells (E – early)

Notifiable disease



European Foul Brood (EFB)

Signs

uneven brood pattern

twisted larvae with creamy white guts visible through body wall

'waxy' looking larvae

loosely attached brownish scales

an unpleasant smell

EFB



twisted & discoloured larvae

EFB



twisted larvae



'waxy' looking larvae



American Foul Brood (AFB)

AFB is caused by the bacterium

'Paenibacillus larvae'.

Kills larvae after cell is sealed (A - After)

Notifiable disease

AFB Signs



AFB affects only sealed brood.

sunken, moist, greasy or perforated cappings

uneven 'pepperpot' brood pattern

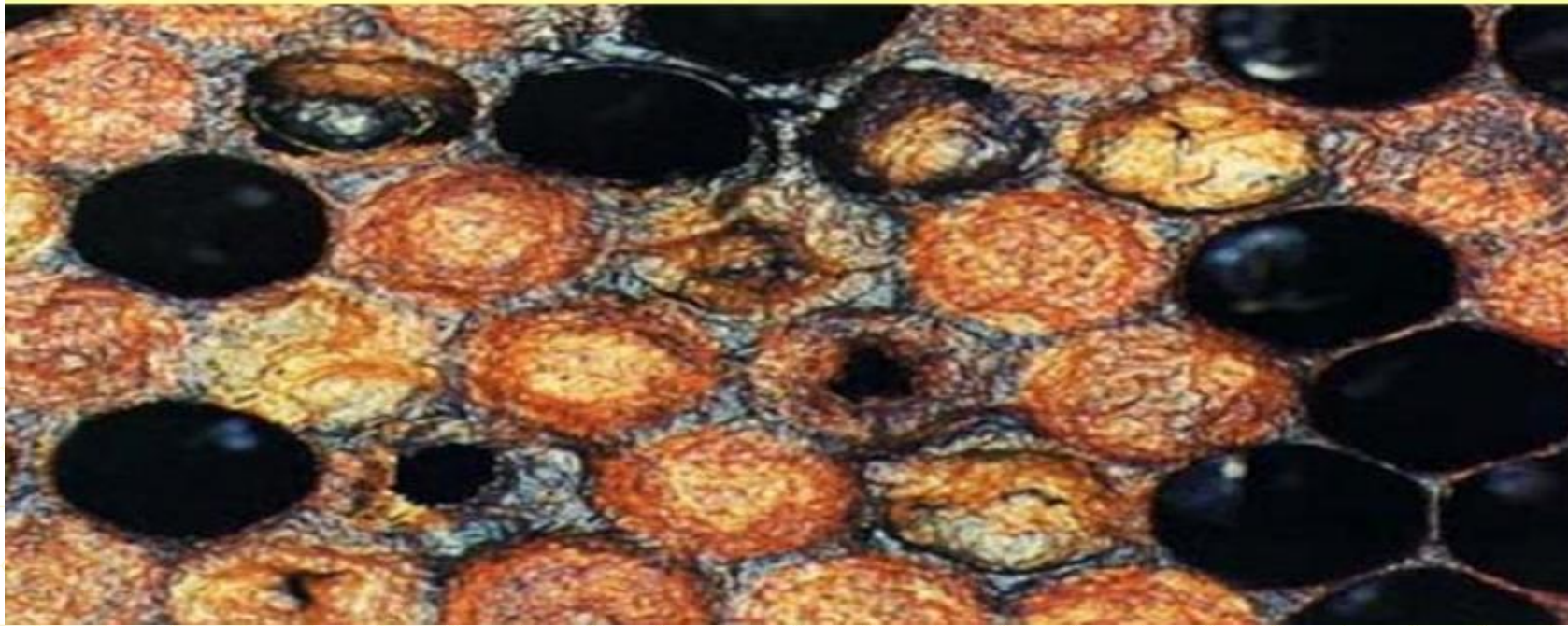
slimy consistency

dark scales which are difficult to remove

may be an unpleasant smell

AFB

Note the greasy looking capped cells. These cells will be concave instead of convex. Also the holes in the cappings is where the bees have tried to remove the pupa.



How can we as beekeepers 'test' to see if the hive has AFB?

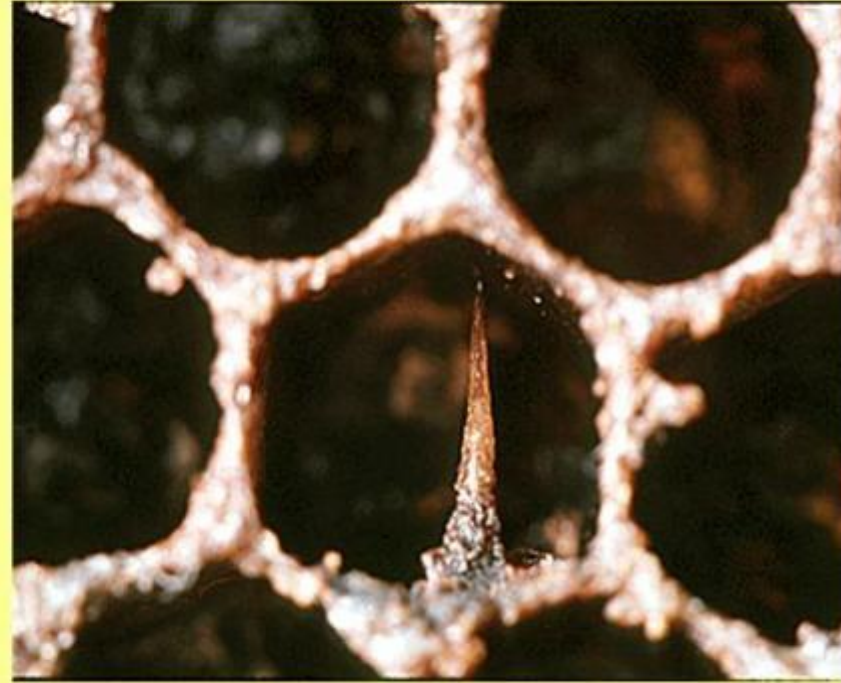
Testing in the field is done with a matchstick, if its ropey and dark brown then this is a good indication of AFB.

After a while all that is left is the proboscis and a scab in the bottom of the cell.

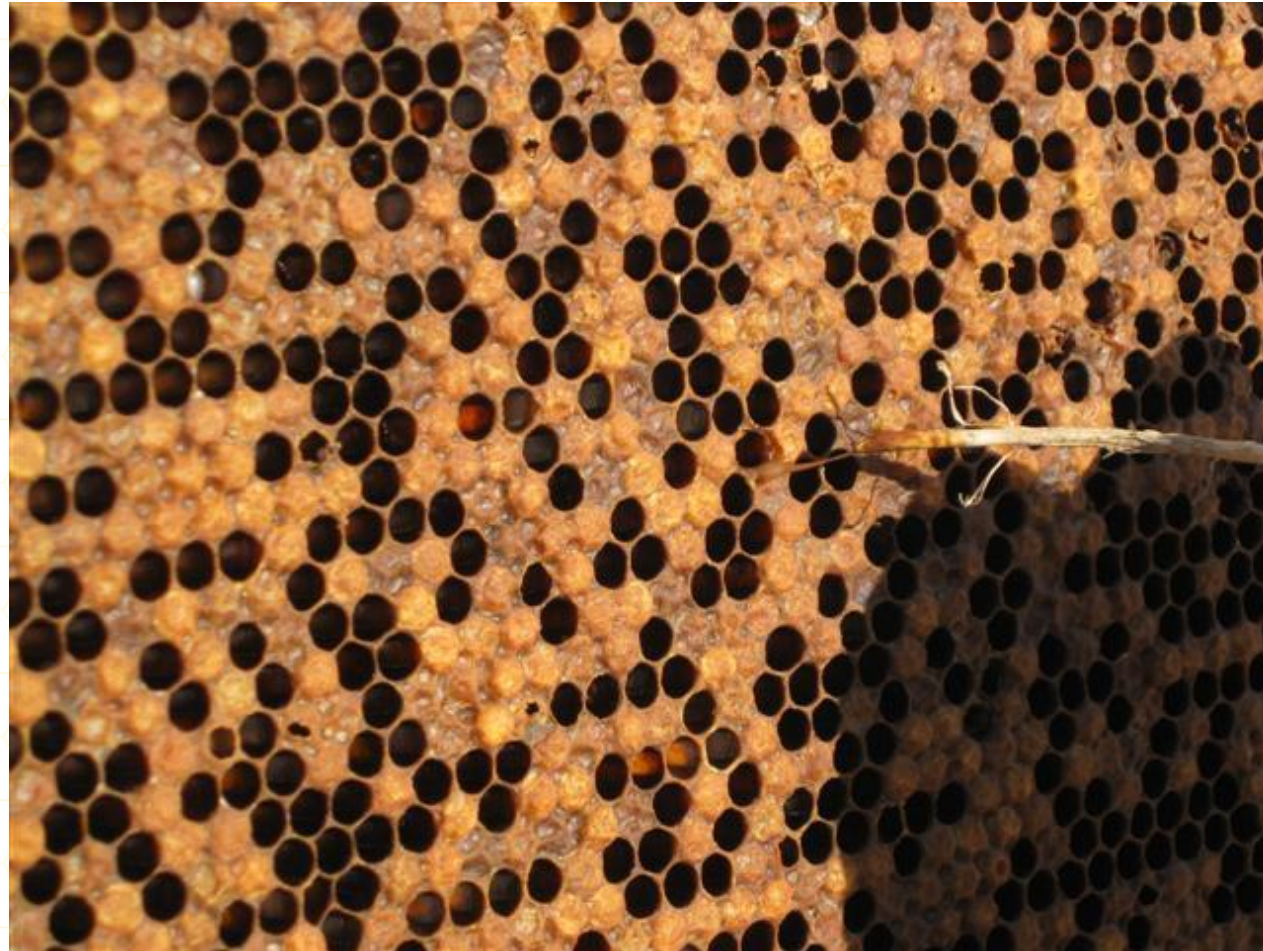
The rope test.



Final salute by the bee!!!!



AFB



Rope test and pepper pot brood pattern!

AFB



hard black scales

Nosema



Cause

Nosema/Vairimorpha Apis and Cerranae are microsporidial, fungal parasites which multiply in the ventriculus and impair the digestion of pollen thus shortening the life of the bee

Nosema



Signs

no outward signs and only observable under microscope

Effects

shortens life of the bees

colonies fail to build up in spring

signs of dysentery may be evident, i.e. soiled combs and entrance (diarrhoea) and dead bees outside

can lead to demise of colony

Nosema



Treatment:

fumidil 'B' in syrup inhibits the spores reproducing in the ventriculus. (banned 2012)

place bees onto new comb (Bailey comb change)

good beekeeping practices prevent spread of infection, e.g. no squashed bees, prevention of robbing/drift, minimising stress

disinfect infected combs and hive parts with 80% acetic acid

Acarine



Cause

Acarine is caused by a parasitic mite, 'Acarapis woodi' that affects the first thoracic tracheae

Acarine

Signs

no visible external signs. It has no effect on the flying ability of the bee but does shorten its life slightly

some suggest crawling bees and K wing

diagnosis can only be confirmed by dissection and microscopic examination of the first thoracic tracheae

when the disease is present the tracheae will be discoloured and not the normal creamy colour of healthy adult bees



K wing

Acarine



Treatment

Folbex strips, Frow mixture, fumes of burning sulphur. No longer approved

Largely controlled by Varroa treatments(Miticides)

Chalkbrood



extremely common brood disease caused by the fungus,
'Ascosphaera apis'

Cause

presence of spores on nurse bees, combs and hive parts
of an infected hive

it is a stress disease (nb drop in temperature, CO₂, lack
of protein)

temperature drop from the normal brood nest 35C to
below 32C is sufficient for spore germination(Bailey and
Ball, 'Honey Bee Pathology', 1991)

Chalkbrood

Signs – affects only sealed brood

perforated cappings over cells containing hard, white or mottled grey chalklike remains (like a mummy), also found on hive floor or at hive entrance



Chalkbrood



Treatment

no specific treatment

keep strong colonies

Feed 1 gallon of warm 2: 1 syrup

Sprinkle salt on top bars to encourage
hygienic behaviour

re-queen if severely affected

Dysentery



caused by excess water in the intestine which manifests itself mainly in the winter due to any of the following:

unripe honey and/or late feeding of syrup

granulated stores

brown sugar, raw sugar and acid inverted sugar

possibly wintering for long periods solely on heather honey

alcohol due to fermenting stores

Dysentery



brown stains (excrement) around the hive entrance

Dysentery

effects

severe cases in bad weather it can kill a colony but more likely that bees are so weakened they succumb due to viral infections

treatment

feed thick warm syrup

Bailey comb change



Braula Coecca



is called a bee louse but is actually a wingless fly

it is not a mite or a parasite rather an insect that steals food

develops and lives under the cappings of honey cells and is not associated with brood cells at all

rides on individual honey bees, in particular the Queen

no harm to colony but damages cappings on honey sections / cut comb
(freeze at -15°C for couple of days to kill eggs/larvae)

not necessary to treat for braula infestation – varroacides kill it anyway

Braula / Varroa



Braula -
6 legs
1.2mm
more rounded
legs visible from above

Varroa –
8 legs
1.1 – 1.7mm
crab shape
legs not visible from above

Braula on Queen



Notifiable Diseases



American Foul Brood

European Foul Brood

Also 2 exotic pests must be reported

Small hive beetle & tropilaelops

Varroa or absence of varroa has to be reported via BeeBase.

Notifiable Diseases



Inform

Bee Inspectors - **Bees_mailbox@gov.scot**

SASA

Ask Association Secretary for Assistance

Small Hive Beetle



Small Hive Beetle Larvae



Tropilaelops



varroa

tropilaelops

Bee Disease Analysis



Send floor scrapings, dead bees or brood comb to

Mrs Fiona Hightet,(Lead Entomologist)

- **SASA** (Science and Advice for Scottish Agriculture)
Roddinglaw Road
Edinburgh
EH12 9FJ
- T: +44(0)131 244 8890
F: +44(0)131 244 8940
E: info@sasa.gov.scot
W: www.sasa.gov.uk

OR arrange with MBA Microscopist for analysis

Poisoning

if you suspect spray poisoning

feed poisoned stock with 50:50 syrup

record everything inc photos, video of sprayed crop and affected colony

box 3 samples of 300 bees each for analysis by SASA or Bee inspectors



Wax Moth



In larval stage it causes considerable damage, especially to stored comb, by eating the wax

Storing Comb to prevent wax moth damage



certan – available from suppliers, spray on stored comb
(Currently awaiting new approval)

acetic acid fumigation kills eggs and the adult moth

freezing 0 to -17°C for a few hours or days depending on
temperature and bulk of frames, kills eggs, larvae, chrysalis
and adults

Varroa Mite

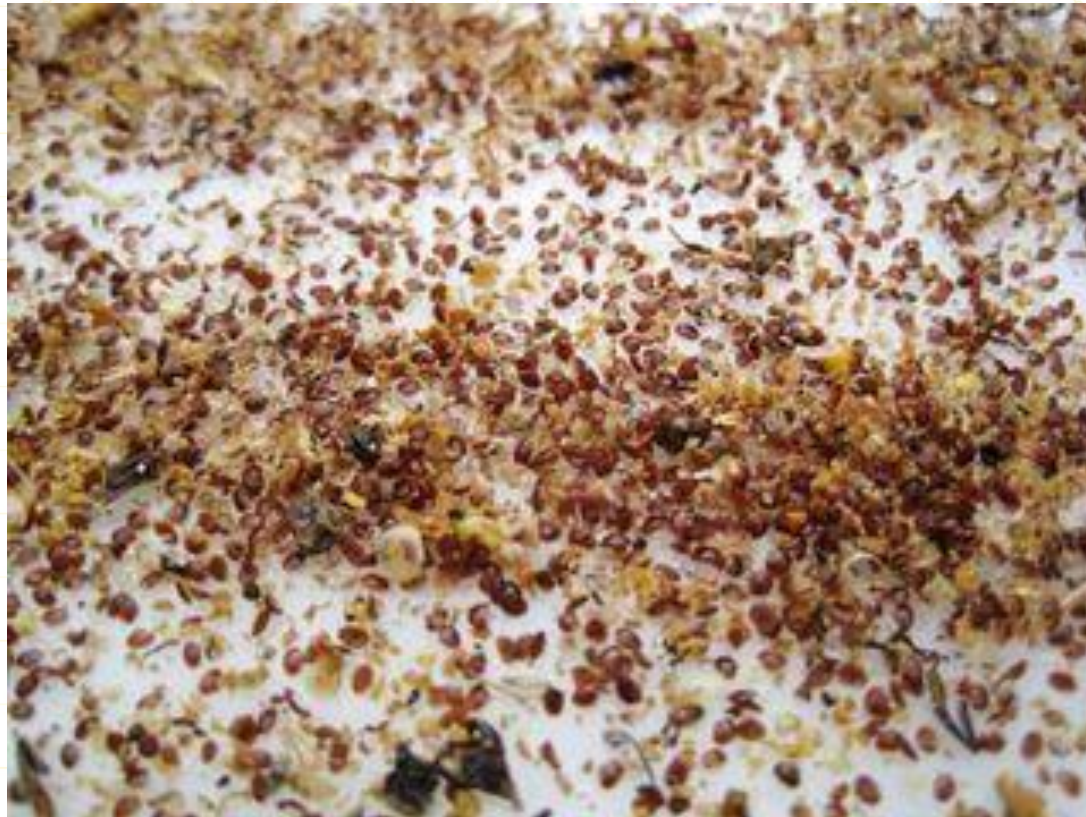


Detecting Varroa



visible on individual adult bees

Detecting Varroa



use monitoring floor insert to test mite drop
(no need to count this severe drop)

Detecting Varroa



abnormalities of the brood, e.g. poor brood pattern,
perforated cappings, neglected and dead brood

Signs - Varroa



associated viruses include deformed wing virus & acute bee paralysis virus

Varroa



Effects on Colony

dramatic decline in adult population and brood area, with spotty brood pattern

foraging, brood rearing and colony defence diminish and colony's entire social organisation begins to deteriorate – a process known as 'colony collapse'

colony collapse can be very rapid (weeks) even in strong colonies, can occur any time of year but most often in August / September

Varroa – I.P.M.



Integrated Pest Management (IPM) is a system which aims to keep pests below the level where they cause significant harm by using a combination of controls, applied at different times of the year, keeping chemical input to a minimum

IPM



August – thymol based treatments, apiguard, apilifevar

late August/September – 2 Apivar strips in B.C. for 6-10 weeks only (be aware of resistant mites)

December – when colony is broodless, trickle oxalic acid, 5ml per seam of bees or sublimate

May – measure for varroa using natural mite mortality drop on an open mesh floor. Monitor again in July

April to July – drone brood removal

April to July – dust bees in B.C. with 1 cup of icing sugar every fortnight

IPM



bio technical – comb trapping, drone brood removal, icing sugar, open mesh floor, artificial swarm

drone brood removal, april to july

place a shallow combs in B.C. in spring and allow bees to build natural drone comb beneath

when drone comb is full of sealed drone brood, cut it from frame before it emerges and destroy

repeat the process several times a season

IPM



open mesh floors – throughout the season

live mites which fall from colony, fall through mesh and out of hive without returning

if used in conjunction with sugar dusting, which knocks mites off adult bees it is more effective

How Does Varroa Spread



varroa are mobile and can readily move between bees within the hive

however, to travel between colonies they depend on adult bees for transport, through the natural processes of drifting, robbing & swarming

varroa can spread slowly over long distances in this way but the movement of infested colonies by beekeepers is principle means of spread over long distances

Asian Hornet?



Asian Hornet?

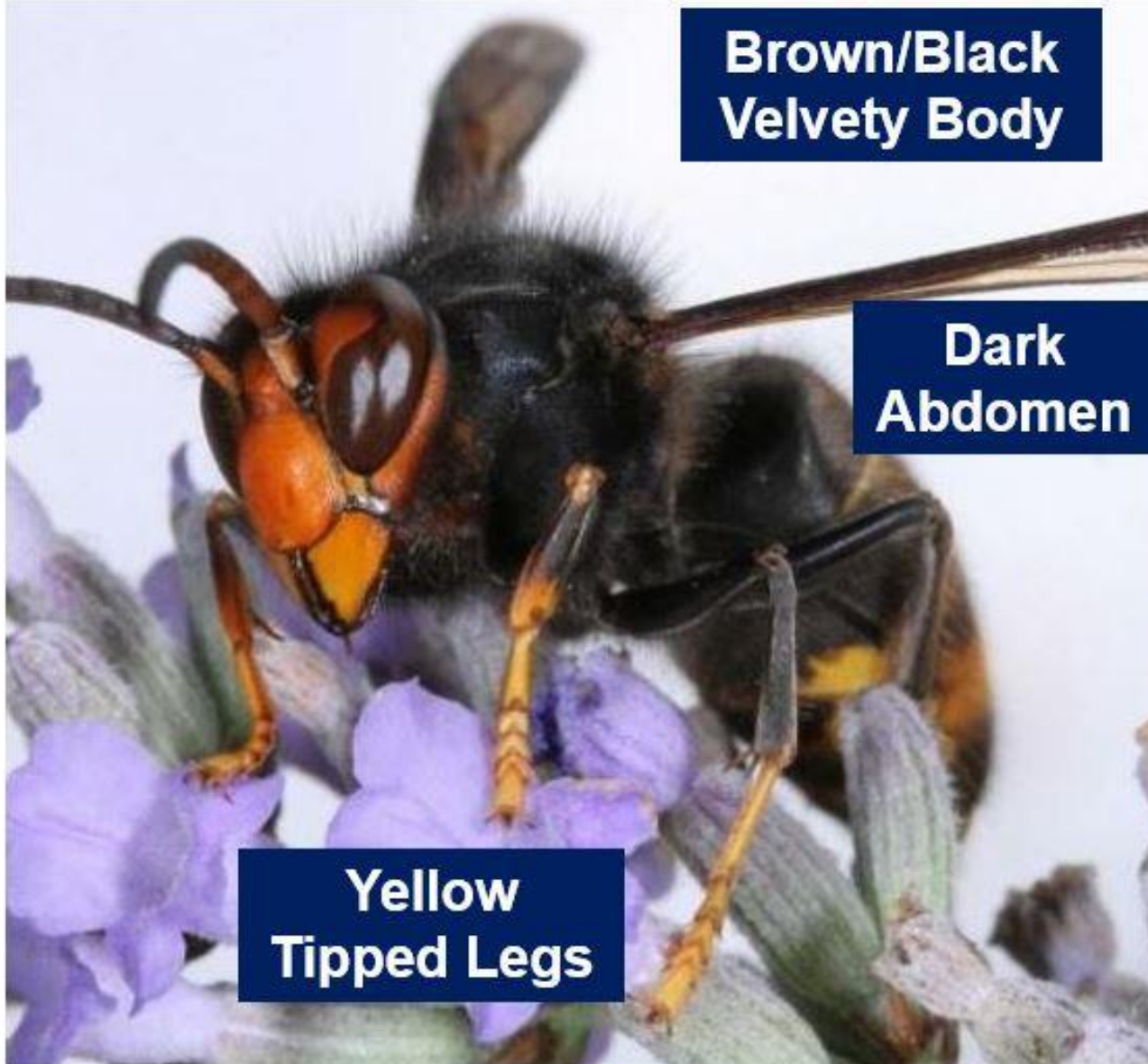


Asian Hornet

**Brown/Black
Velvety Body**

**Dark
Abdomen**

**Yellow
Tipped Legs**



Asian Hornet

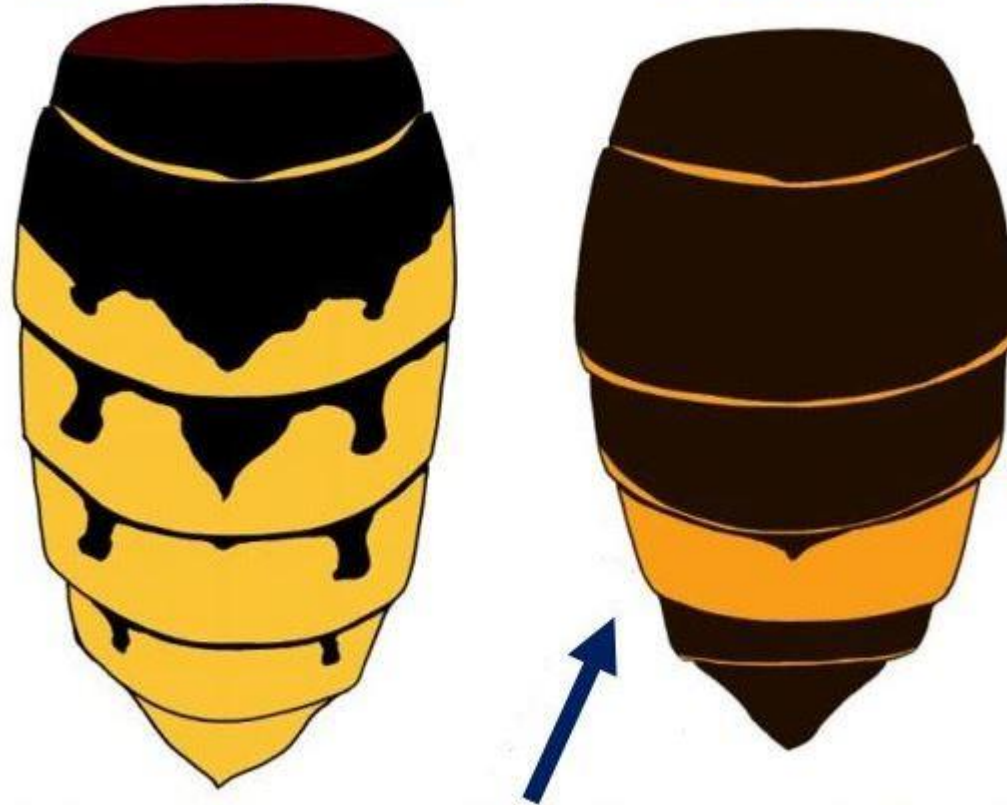
European Hornet



Hornet Abdomens

European

Asian



The Asian hornet's abdomen is nearly entirely dark, except for the 4th abdominal segment

Likely Impact?



- They eat honey bees
- Hornet activity limits foraging, so low pollen reserves, reduced brood rearing and potential colony loss
- Hornets will enter weak colonies and eat brood
- Commercial pollination
- Greater environmental impact as they also eat other pollinators!



In Conclusion



- Be vigilant this spring
- Keep up to date
- Learn ID
- Bee Base
- Report



alert_nonnative@ceh.ac.uk
Or Asian Hornet watch App



Other Pests of the Honeybee

Mice



Mice will feed on pollen, honey and bees

In winter they will disturb the cluster and this disturbance can kill the colony in very low temperatures

Mice can be excluded from the hive with a mouse excluder or reduced entrance block 7mm or less in height

Mouse Excluder



Galvanised excluder with 10mm holes
Can knock pollen off bees legs



Reduced entrance block less than 7mm
high

Other Pests



Badgers – protect hive with a strong stock fence buried 2ft into the ground

Green Woodpecker



Green woodpeckers can peck large holes in hives

Woodpeckers



protect by surrounding hives with chicken netting (at least 6 inches from hive walls)



10 Rules to Help Prevent Brood Disease



1. Make sure you are familiar with the signs and causes of foulbrood and other brood disorders
2. Inspect colonies in spring & autumn specifically to check for brood disease and seek expert advice if needed
3. Never transfer combs between colonies without first checking for signs of brood disease
4. Never bring colonies, combs or equipment into apiaries unless sure they are from a disease free source
5. Never buy old comb & always sterilise second hand hives by scorching with a blow torch



10 Rules to Help Prevent Brood Disease

6. Control robbing. Never leave comb or honey exposed to robbing bees & never feed honey from another source
7. If a colony dies out, seal it to prevent remaining stores being robbed, pending examination of brood combs for disease
8. If a colony is not thriving and the reason is not known, examine the brood for sign of disease
9. Be suspicious of stray swarms. Hive in isolation apiary for 2 brood cycles on foundation rather than drawn combs and inspect for disease once established.
10. Regularly and systematically replace old brood comb in the apiary and replace with frames fitted with foundation



The End

Any Questions