

1 **Basic Course**
Session 4

Slides and photographs by
NBU/FERA/APHA (Dr Stainton) as well as
John Drakes and others have been used

2 **This Session**

- Pests & Diseases
 - Reportable AFB EFB
 - Lateral Flow Device
 - SHB Tropilaelaps
 - Asian Hornet

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3 **This Session**

- Healthy Brood
 - Recognition, keeping it that way
 - Comb replacement, Shook swarm, Bailey change
- NBU, VMD where do they fit, how do they help
 - Sentinel apiaries
- Spray risks
 - Recognition and actions, help

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4 **Notifiable Brood Diseases**

- American Foul Brood
- European Foul Brood
 - Named for where they were discovered
 - Affects Brood only
- Symptoms seen
 - European – (Early, before sealing)
 - American- (After sealing)
- Download the NBU leaflets for free!
- Do the e-learning on Beebase

5 **Notifiable Diseases**

- Notify NBU/Seasonal Bee Inspector immediately
 - Association Secretary to be informed
- Close hive
- No visitors
- Do NOT move hives
- Minimise entrance to prevent robbing/disease spread
- Wash suit, sterilise all possible equipment

6 **American foulbrood**

- AFB is caused by the spore-forming bacterium *Paenibacillus larvae*
- Intestinal infection of larvae caused by eating infected brood food

- The spore germinates in the gut and the bacteria consume the food in the gut before penetrating the gut and infecting the larva

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7 **American Foul Brood**

8 **AFB late stage**

9 **AFB – roping test**

10 **AFB Scale**

11 **Examining Comb for Brood Diseases**

- How you hold the comb is important
- To see AFB scale you need to look at the cell gravity bottom
 - Light from behind you
- To see EFB affected larvae look towards midrib
- Following slides demonstrate this

12 **Examining comb for AFB scale**

13 **AFB**

- No approved treatments
- Destruction of colony under supervision
- AFB forms millions of spores in the larval remains
- The scale - larval remains - very difficult to remove
- These spores are hard shelled and can survive 30+ years
- Rare in UK due to policy of destruction
- Compensation through BDI for frames and wax foundation

14 **European Foul Brood**

- Have been out breaks in most areas
- Much less prevalent in North than in South
- Affects Early i.e. Unsealed brood

15 **European Foulbrood Symptoms**

16 **European Foulbrood**

17 **EFB – early stage**

18 **EFB – early stage**

19 **EFB showing “melted” larvae**

20 **EFB Distorted Larvae with Belly ache**

21 **Late stage EFB**

22 **EFB Scale**

23 **Examining comb for EFB**

24 **EFB**

- Treated under SBI supervision depends on stage/severity
 - Antibiotics
 - Shook Swarm
 - Destruction of colony

- Many strains of EFB
 - treatment efficacy depends on strain
 - NBU researching strains and best treatments
- Can re-occur
- Present at sub-clinical levels in many colonies
 - Stress can lead to outbreak

25 **UK prevalence of EFB**26 **EFB strain ST5**27 **Confirmation of infestation**

- Used to require laboratory investigation
- Now use Lateral Flow Device
 - Pregnancy Test Technology
 - Done at site
 - Immediate results
- Laboratory investigation to determine strain of EFB
 - Some strains very resistant - need destroying
 - Other strains can be treated by Antibiotics/shook swarm

28 **Lateral Flow Device (LFD) AFB/EFB**29 **LFD – suspect larva into buffer**30 **LFD – shake vigorously**31 **LFD – fill pipette with solution**32 **LFD – 1 drop to LFD**33 **Reading test results**34 **NOTIFIABLE PESTS**

SHB and Tropilaelaps

35 **Small Hive Beetle
(*Aethina tumida*)**

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Adult

Larva

36 37 38 **Small Hive Beetle larvae**39 **SHB damage**

40 **History of SHB in Europe**

- Discovered in Calabria (South West Italy) 2014
- Spread to Sicily. Found in 60 apiaries
- Sicily NOT clear Calabria NOT clear
- Bee imports from Italy/Sicily Banned
- Details via NBU site as situation is changing
- <http://www.nationalbeeunit.com>

SEND SUSPECT SAMPLES TO NBU... BUT FREEZE FIRST!

Photos really help!

41 ***Tropilaelaps***42 **Size comparison**43 ***Tropilaelaps***44 ***Tropilaelaps***

- Similar to Varroa in its effect on a colony
- Cannot survive in a broodless colony therefore unlikely to be a problem in the UK climate
- Climate change and warmer winters may put us at risk from this mite
- Similar monitoring techniques as with Varroa
- Similar treatments to those used for Varroa

45 **Reportable Pests**

- Notify NBU/Seasonal Bee Inspector Immediately
 - Association Sec to be informed
- Close hive
- No visitors
- Do NOT move hives
- Minimise entrance to prevent robbing/disease spread
- Wash suit, sterilise all possible equipment
- Ensure you do not transport any insects out of Apiary

46 **Asian Hornet (*Vespa velutina*)**

- Voracious killer of honeybees and any other bee/insect
- Can spread at the rate of 100 km /year
- First found in France in 2004 and now in Channel Isles
- Nests are found high up on trees and pylons
- Characteristic dark abdomen except for fourth abdominal segment which is yellow
- Hornet traps are most successful in early spring to catch over wintered Queens

47 **AHAT**

- BBKA is working with the NBU
- Asian Hornet Action Teams in every association
- Purpose
 - Allow local Associations to be prepared
 - Coordinate response with NBU/CET
 - Inform Association members on methods of early detection
- Each Association should have an AHAT coordinator
- This Association AHAT Coordinator is Jane Corcoran

- AHAT training exercise
 - <https://www.bbka.org.uk/asian-hornet-team>

48 **Asian Hornet (*vespa velutina*)**

49 **Asian vs European**

50 **European Hornet**

51 **Actions**

- Download the NBU pdfs
 - Alert Poster
 - Information
- Laminate and have them in your Apiary
- Get the Apps on your phone to report
- Can report to NBU
- Officially an invasive species and dealt with by
 - Non-native section: Centre for Ecology and Hydrology
- Be aware of how to identify and report, photos/samples are your best aid when reporting
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52 **Asian Hornet**

53 **Nests may reach 1 metre diameter**

54 **Healthy Brood**

- Learn to recognise Healthy Brood
 - Clean biscuit coloured cappings
 - Even, slightly domed cappings
 - Not perforated
 - Not greasy
 - Pearly White larvae
 - Evenly segmented
 - Curled - "C" shape - at bottom of cell

55 **Healthy Brood**

56 **Healthy Brood**

57 **Healthy Brood**

58 **The Importance of Clean Comb**

- Old comb is a potential disease reservoir
- Aim to have brood comb no older than 3 seasons
- Move older comb toward outside of brood box
- Remove comb and replace with foundation
- 3-4 combs per year is 3 year rotation

59 **Bulk comb changes**

- There are 2 methods of a full brood comb change
 - Shook swarm
 - For strong colony on old comb

- For diseased colony
- EFB (under supervision)/Nosema
- Bailey frame change
 - Get new comb during a flow
 - Treatment for weaker colony with Nosema

60 **Shook Swarm**61 **Shook Swarm**62 **Shook Swarm**63 **Shook swarm**

- Looks drastic but if in a flow bees recover well
- If there is limited forage you need to feed them!
- Qex on bottom is to prevent colony absconding
- All removed comb
 - If EFB will be burnt under SBI supervision
 - Nosema render for wax for candles not foundation
 - If it is as black as coal burn it.

64 **Bailey Frame change**65 **Bailey Frame Change**66 **Bailey Frame Change**67 **National Bee Unit**

- NBU based in Sand Hutton just outside York
- Part of Animal and Plant Health Agency
- Responsible for implementation of Healthy Bees Plan
- Manages reportable disease outbreaks
- Employs Regional Bee Inspectors
 - Seasonal Bee Inspectors
- Manages the Sentinel Apiary Scheme.

68 **Sentinel Apiary**

- Selected apiaries at locations around UK
- Locations selected to be close to areas at risk of pest incursion
 - Ports
 - Airports
 - Container unpacking depots
- Beekeepers given training and support to spot incursions early
- Visited at least annually by SBI

69 **Veterinary Medicines Directorate**

- Responsible for approval of all medicines used on animals
 - Consumed by humans
 - Producing substances for human consumption
- Also on animals such as as pets etc
- All use of Medicines to be recorded
- Record type name and stock ID
- Only use approved medicines

- <https://www.vmd.defra.gov.uk/ProductInformationDatabase/>
– Sort by species i.e. Bees

70 **Poisoning**

71

72 **Spray Liaison**

- Bees are very vulnerable to insecticides – lack detox ability
- Simple solution is to close hives while crop is sprayed
- Oilseed Rape, Top and Soft Fruit
- Spray liaison sends beekeepers' contact details to local spray contractors and farmers
- Means beekeepers can be contacted to shut up hives.
- Currently "not a problem" – BUT!!