


**Basic Course**  
**Session 4**

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



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**This Session**

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



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**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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### 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



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### 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



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### 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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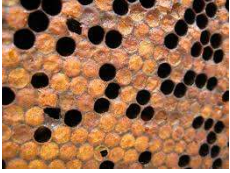

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 **American Foul Brood**

 showing sunken and perforated cappings 

Crown Copyright Crown Copyright



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 **AFB late stage** 

Crown Copyright 



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 **AFB – roping test** 

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 **AFB Scale** 

Very heavy infestation



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 **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



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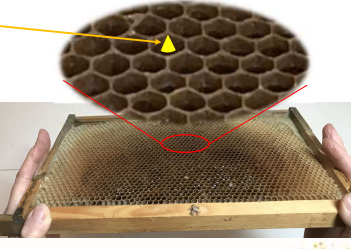
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 **Examining comb for AFB scale** 

This is where the scale will be



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## 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



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## European Foul Brood



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



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## European Foulbrood Symptoms



- Younger larvae die and become transparent
- Older larvae twist, lose segmentation, turn yellow & die
- Decomposition starts, dead larval remains turn brown & eventually form a dark, rubbery scale. Scale easy to remove.
- EFB infections can have a sour smell (but not always)



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**European Foulbrood**

Crown Copyright

**Healthy Brood**

- Larvae pearly white
- "C" shaped in bottom of cell
- clear segmentation

**Warning signs**

- Discoloured larvae
- Lack of segmentation
- Distorted "stomach ache" position
- Melted appearance
- Pepper pot brood pattern

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**EFB – early stage**

Courtesy Shirley Bond

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**EFB – early stage**

Courtesy Shirley Bond

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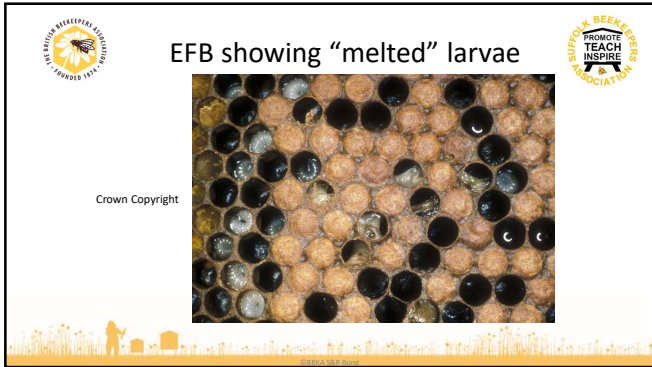
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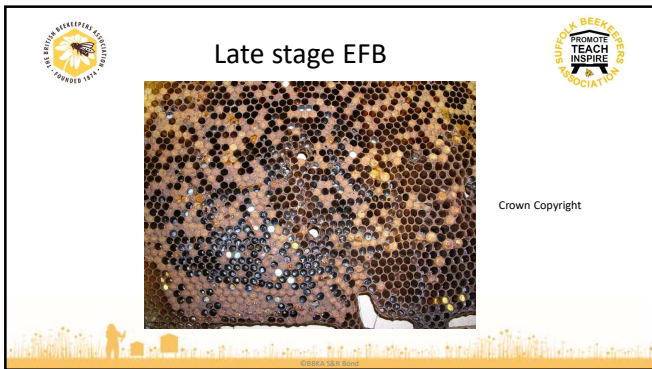
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 **EFB Scale** 

EFB scale easy to remove



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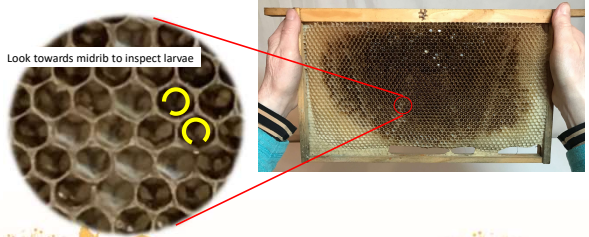
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 **Examining comb for EFB** 

Look towards midrib to inspect larvae



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 **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

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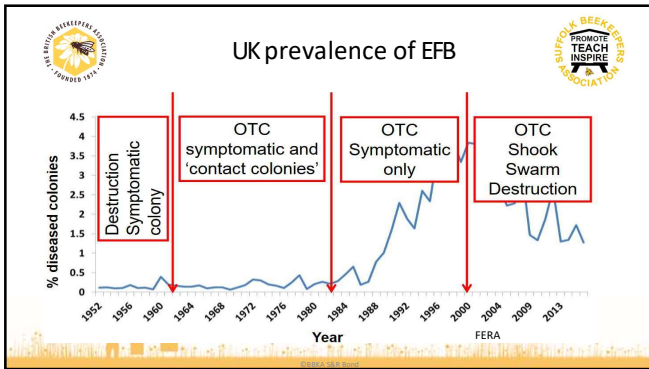
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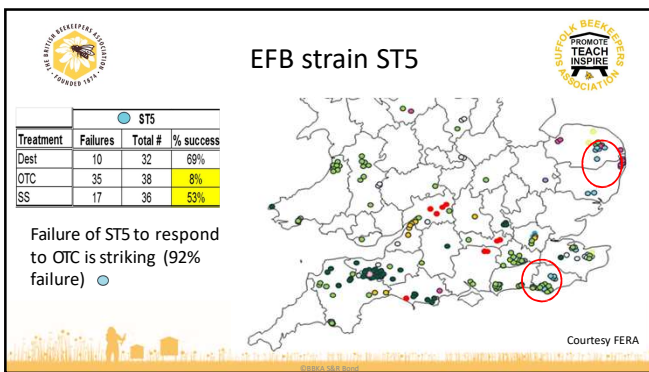
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**Confirmation of infestation**

- 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

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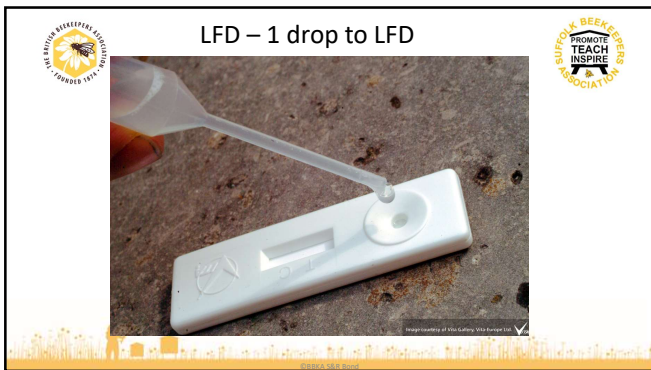
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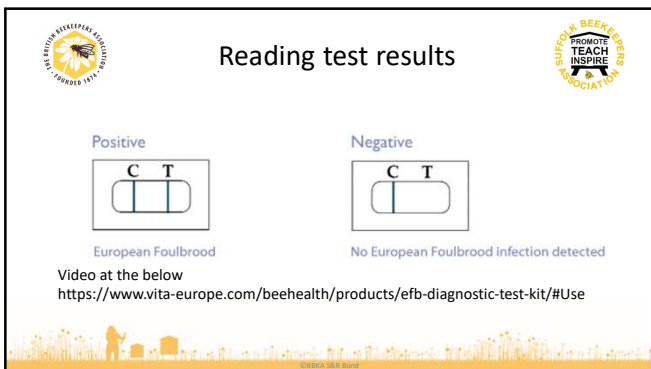
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**NOTIFIABLE PESTS**

SHB and Tropilaelaps



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





Adult



Larva

Crown Copyright



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"Courtesy The Food and Environment Research Agency (Fera), Crown Copyright"



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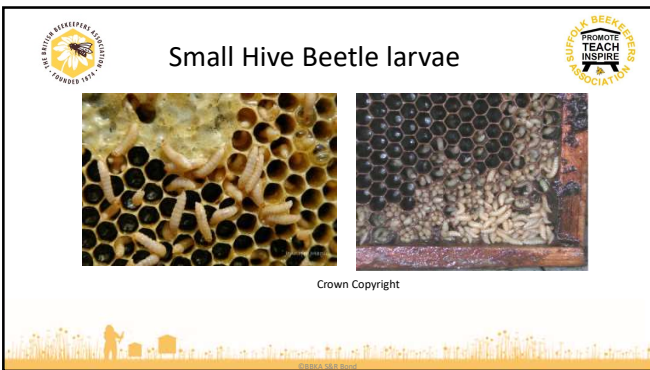
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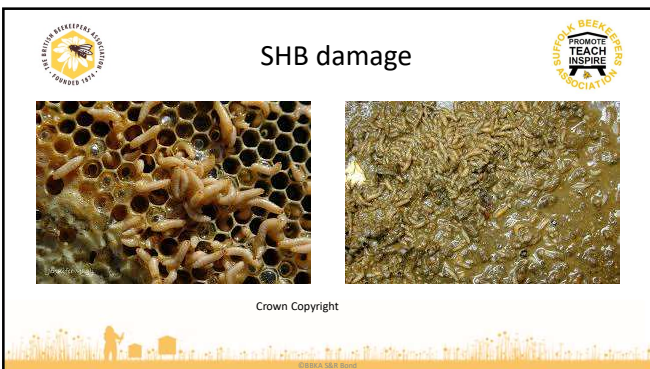
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### History of SHB in Europe

- 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!



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### Tropilaelaps



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### Size comparison



"Courtesy The Food and Environment Research Agency (Fera), Crown Copyright"



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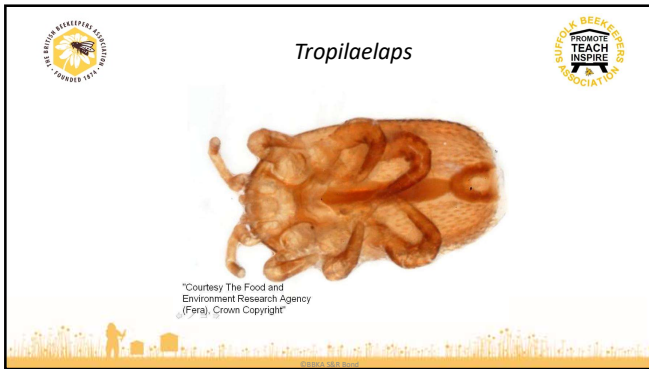
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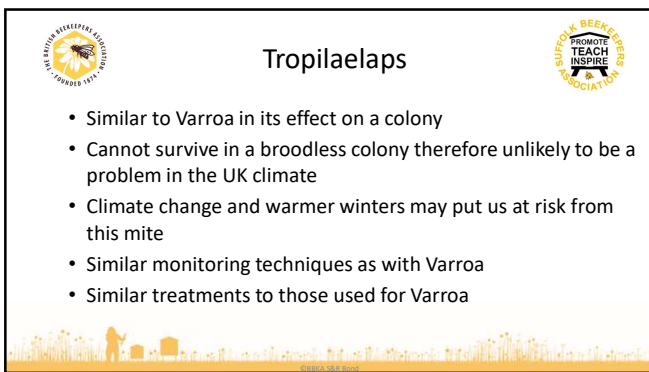
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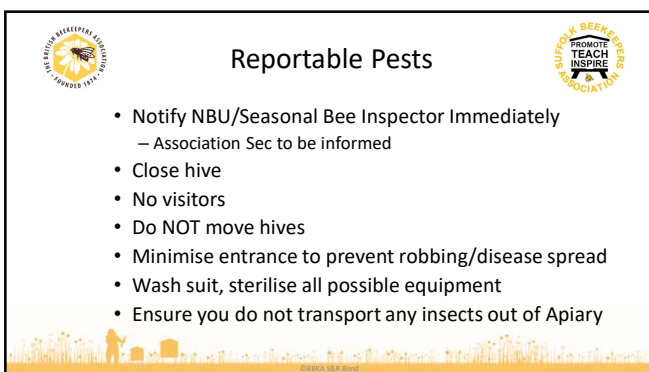
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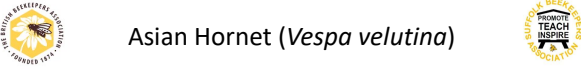
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### Asian Hornet (*Vespa velutina*)

- 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 overwintered Queens



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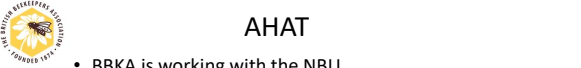
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### AHAT

- 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>



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### Asian Hornet (*vespa velutina*)



NBU WEB SITE



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**Asian vs European**

NBU WEB SITE

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**European Hornet**

European Hornet  
Brown & yellow not black.  
Bigger than Asian not a threat to bees

© Neil Fletcher Sussex Wildlife trust

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**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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 **Asian Hornet** 

Asian Hornet  
Predominately  
BLACK  
Yellow legs and  
one orange  
segment



www.planetepassion.eu



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 **Nests may reach 1 metre diameter** 



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 **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



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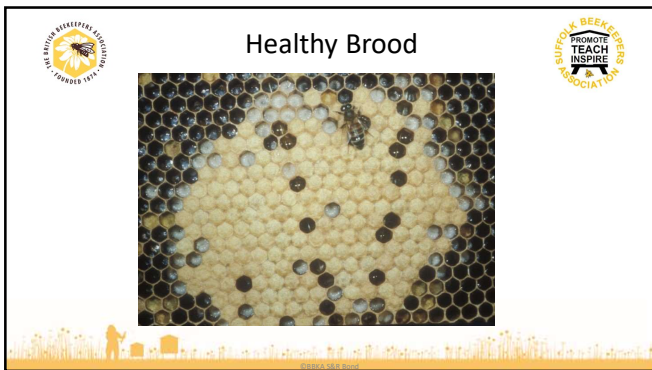
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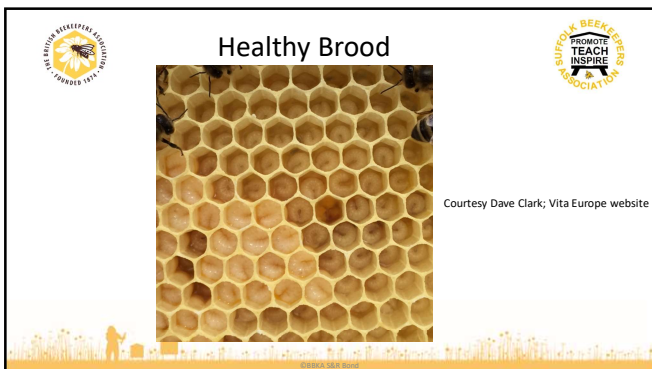
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### The Importance of Clean Comb



- 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



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### 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



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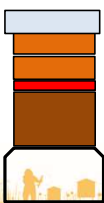
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### Shook Swarm





3 Remove roof crown board and supers to one side



1 Get clean stand, BB, floor and Qex put next to colony

2 Put 6 frames of foundation in the box 3 each side of space in the middle





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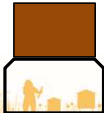


### Shook Swarm


6 Take frames out of brood box and shake bees into centre of new box


4 Find Q put her and frame in another box safely to one side





5 Move Q to new box and shake in last of bees  
Close up frames and add more to fill box





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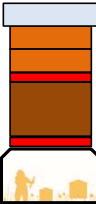

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### Shook Swarm

8 Replace top Qex Supers and Roof  
Once Q starts laying in new box, btm Qex can be removed

7 Remove original brood box and replace with new one and Qex



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### 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.



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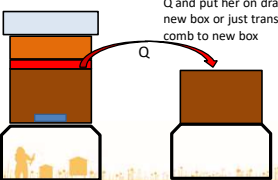
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### Bailey Frame change



- 1 Have brood box with foundation Or better 2 frames of drawn comb and remainder foundation
- 2 remove roof, supers and Qex find Q and put her on drawn comb in new box or just transfer her on comb to new box



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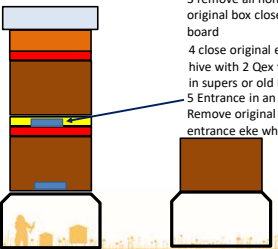
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### Bailey Frame Change



- 3 remove all non-brood comb from original box close up with dummy board
- 4 close original entrance rebuild hive with 2 Qex to prevent Q laying in supers or old BB
- 5 Entrance in an eke facing same way Remove original box, 2<sup>nd</sup> Qex, and entrance eke when all brood hatched



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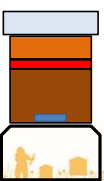
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### Bailey Frame Change



- 6 Feed with 1:1 syrup if there is not a strong flow apparent
- 7 removed comb can be rendered for wax/burnt or if clean can be fumigated for future use



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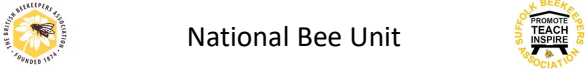
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### National Bee Unit

- 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.



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### 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



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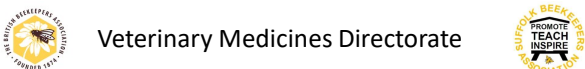
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### Veterinary Medicines Directorate

- 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



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**Poisoning**



Courtesy Shirley Bond

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Courtesy Shirley Bond



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**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!!

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