

MBKA Beekeeping Course

Session 3

Handling bees

Apiary hygiene

Colony records

Weather

Smoke

Frame handling

Defensive bees

Stings

Coffee

Health and Disease

Pests

Healthy Bees

Brood diseases

Adult bee diseases

Varroa



Lunch

Apiary Session

Opening hives and handling frames

Reading the brood nest

Using the smoker

Plan for this course

- Sat 25 Feb **1. Introduction and colony lifecycle**
Plas Tan y Bwlch Paul Aslin, George Kay, Sharon Watkin
- Sat 11 Mar **2. Hives, apiaries and the beekeeping year**
PTyB with Carys Edwards
- Sun 26 Mar Hive collection & building day, Arthog
- Sat 1 Apr **3. Handling bees. Pests and diseases**
- Sat 8 Apr First MBKA Apiary meeting, Plas Tan y Bwlch
- Sat 22 Apr **4. Swarming, Varroa, Honey, Feeding**
 with mentors
- Sat 6 May MBKA Apiary meeting, Llanwrin
- Sat 17 June MBKA Apiary meeting, Tywyn
.....? **with Mentors**



Apiary Hygiene

Why

- To avoid spreading disease between colonies / apiaries
- To keep the bees calm and minimise disturbance
- To prevent robbing

How

- Disinfect equip. (espec. hive tool) in washing soda between apiaries
- Disposable gloves
- Keep bee suit clean (especially after a few stings)
- Regular comb changing don't keep using dark combs more than about 3 years old – move to edge and replace with foundation
- Avoid dropping wax or honey or spilling syrup in apiary - use a wax bucket
- scrape brace comb & excess propolis from frame edges, queen excluder, etc.
- label supers and replace on same hive!
- be wary of introducing a swarm of unknown origin
- don't exchange combs between colonies unless confident of disease status
- scorch woodwork before reusing



Apiary: Wimpole Orchard Colony: Q77 Hive Record History: Art. swarm from Q64 June 2010

Date 2011	Q	QC	Health	Temper	Brood	Room	Stores		Supers	Honey Harvest	Notes
							Brood	Supers			
22/3					alc on 2		7-8				few bees
9/4	✓	-		10	5	✓	lots				Queenless Q51 combined on top
14/4	✓	-			alc 7	✓	✓ 4		+1 drawn		Happily combined
22/4		-		10		✓	✓	none			Not strong
29/4		-		10	alc 8				-	1	Growing ok now
14/5	✓	1 x	✓	10				2 nests		2	Needs art. swarm
5/5	✓								-2 +1 =1	45/6	Wilson split. Q on top. Most brood below swap over in a week.
21/5											Swapped boxes so Q below, ACS on top
30/5		several		9		✓			+1 =2		B: re-emerged. Q: several ACS. so called ACS and recombined.
8/6		dearly 4 back		9					-1 =1		
2/7									-1 +1=1	20/6	Moved to Erus Ground
13/8			✓ bees regain	9	alc 67	✓	✓				
31/8				8			✓	1 part full		2	No Apistan or V. control
23/9			1st 1st 2nd Apr 10							-1 =0	20/6
7/10							some but need more				

Hive record

When opening hives

Weather

Time of day

Smoke

Calm, gentle movements

Frame handling

Shaking frames

Dealing with defensive bees

Gentle handling

Fine weather

Mid day

Manipulation cloth

Move hive 10m away

Two people

Marking the Queen

Cage

Special marker pen or Tippex

Practice on drones



The bee's sting

When and why do they sting?

What to do about it.

One sting attracts others

What is a normal reaction?

What is an anaphylactic reaction?



Honey Bee Health and Disease

Healthy Bees

Pests

Brood Diseases

Adult Bee Diseases

Varroa

Hygiene

NBU Inspectorate
& Beebase



What contributes to healthy bees?

- **Nutrition** - especially variety of pollen
- **Fresh comb**
- **Good nest environment** – weatherproof and allowing for ventilation
- **Lack of stress** – including weather; frequent beekeeper interventions; pests; pathogens; lack of food.
- **Hygienic behaviour** – removing dead or diseased individuals. May be a genetic trait.
 - Consider the bees' nest from the point of view of a pathogen!

Healthy unsealed brood

- Even brood pattern
- Pearly white larvae
- C shaped larvae
- Clear segmentation



Healthy sealed brood

- Even brood pattern
- Light to dark brown cappings
- Dry looking cappings
- Domed or convex



Healthy
Brood



**Problem
Brood**



Exotic Pests

Potential threats not yet found in UK:

Small Hive Beetle



Asian Hornet

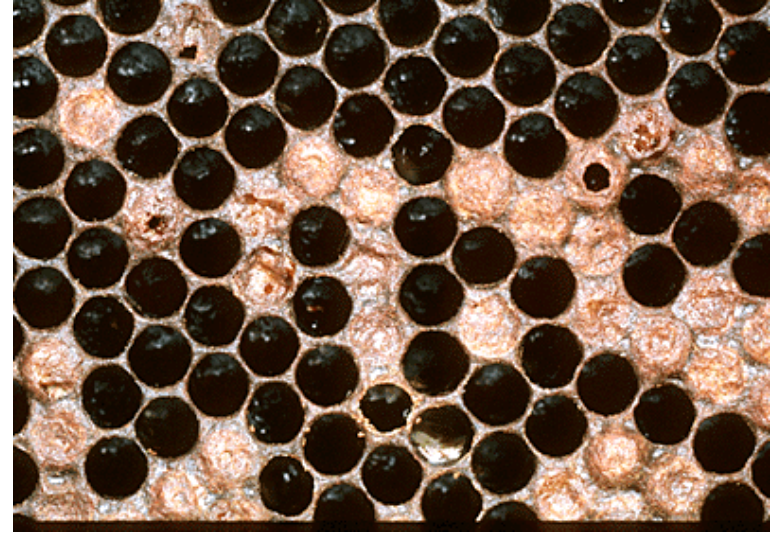


Tropilaelaps mite



American Foul Brood (AFB)

- Spore forming bacteria (*Paenibacillus larvae*) kills larvae in the sealed cells
- Sunken, greasy, perforated cappings, confirmed by ropiness test
- Pepperpot brood pattern
- Spread by moving of comb or bees, robbing of infected honey, swarms
- Dried remains form 'scales'
- Comb, honey and hive parts infectious for many years



American Foul Brood - Treatment

- Infection will always result in the death of the colony
- All infected colonies are destroyed by burning
- Bees killed and burned in a deep pit with all moveable hive parts
- Boxes scorched out with gas torch
- BDI insurance
- Standstill order
- 5km search



European Foul Brood (EFB)

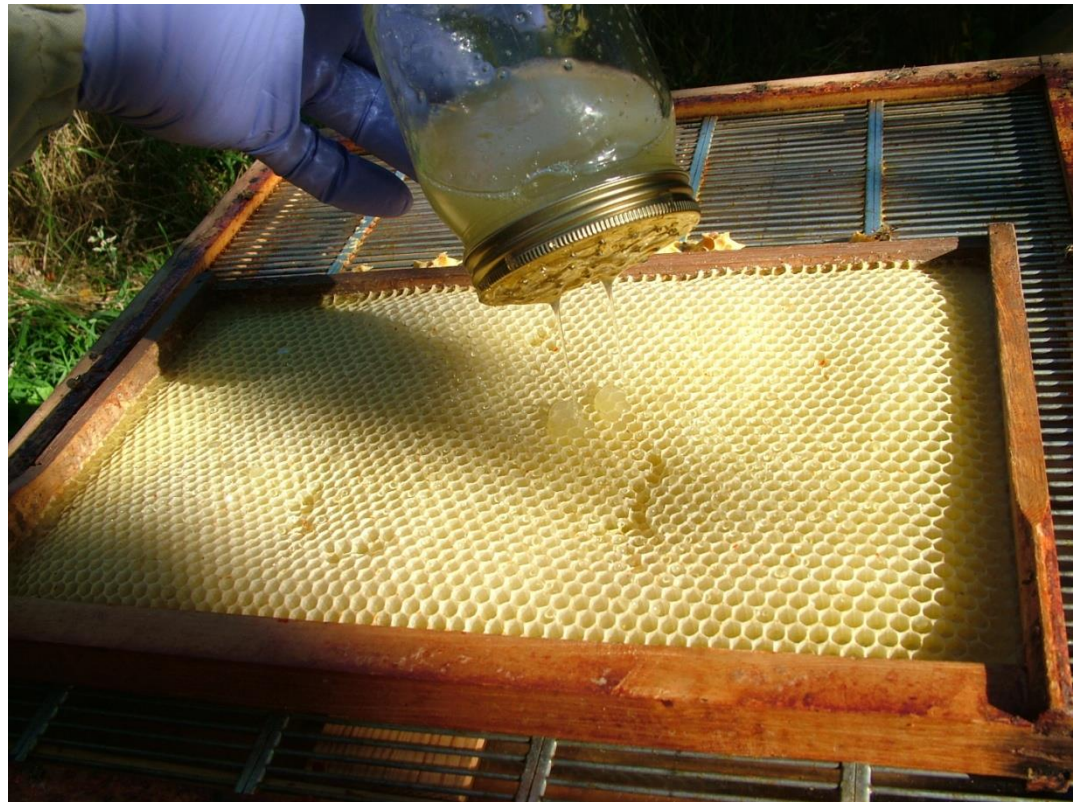
- Caused by bacteria (*Melissococcus plutonius*) in the gut of the larvae which causes them to starve
- Detected in unsealed brood - larvae assume contorted position in cell, discoloured, melted down appearance
- Colony may survive untreated and infection can persist at sub-clinical level, getting worse under stress or food scarcity
- Spread by moving of comb or bees, robbing of infected honey, swarms





European Foul Brood - Treatments

- Shook swarm
- Destruction of colony
- Treatment with oxytetracycline (OTC)
- BDI insurance
- Standstill order
- 5km search

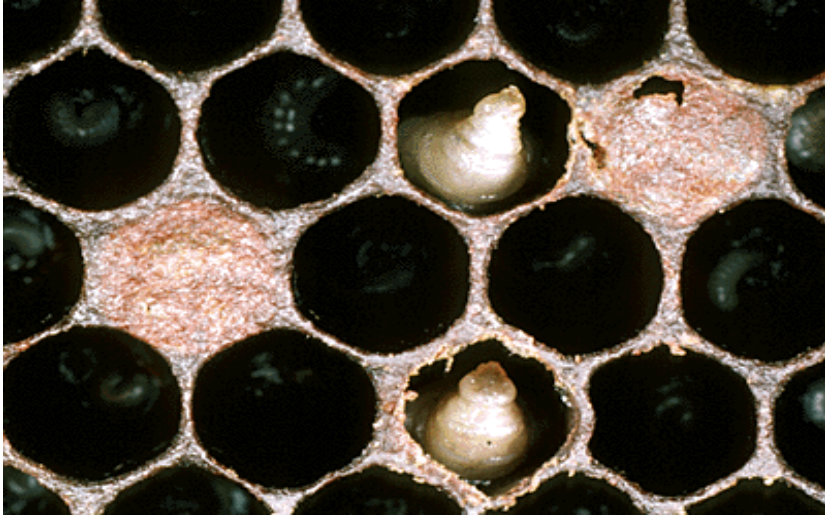


Chalkbrood

- Common fungal infection
- Chalkbrood “mummies” in cells or often discarded on hive floors or outside hive entrance
- Can be related to damp conditions, stress and brood chilling
- Perforated cappings
- Re queen or refresh comb



Sac Brood



- Common viral disease
- Fluid filled sacs
- Pale yellow with head curled up
- Typical “Chinese slipper” appearance
- Larva fails to pupate
- No ropey exudate

- In severe cases – requeen

Bald brood

- Normally developing larvae in uncapped cells
- Genetic origin
- Infestation by wax moth larvae
- Development of larvae into pupae and adults unhindered





Drone brood in worker cells

- Not a disease
- Caused by either:
 - a drone laying queen - failing because she was poorly mated or getting old
 - or laying workers – normally if the queen has been missing for some time
- Raised cappings in worker cells
- Drone brood is often neglected

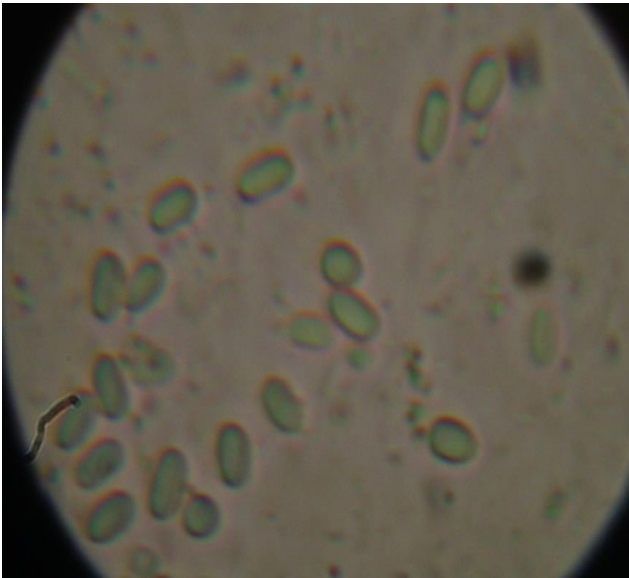
also **Chilled Brood**







Nosema



- Spore-forming protozoa parasite of mid gut
- Associated with dysentery - fouling on hive and comb
- Upsurge in recent years
- Correlation with poor nutrition
- Spread during winter confinement in hive
- Downward spiral once affecting young bees
- Shortened lifespan leads to spring dwindling
- Feed additive treatments

Chronic Bee Paralysis Virus

- Two types
- Hairless black syndrome
- Trembling on crown board



Deformed wing virus

Associated with varroa

Previously rare

Developing pupae are weakened by varroa mites and become susceptible to virus attack

Not all infected bees show the obvious symptoms



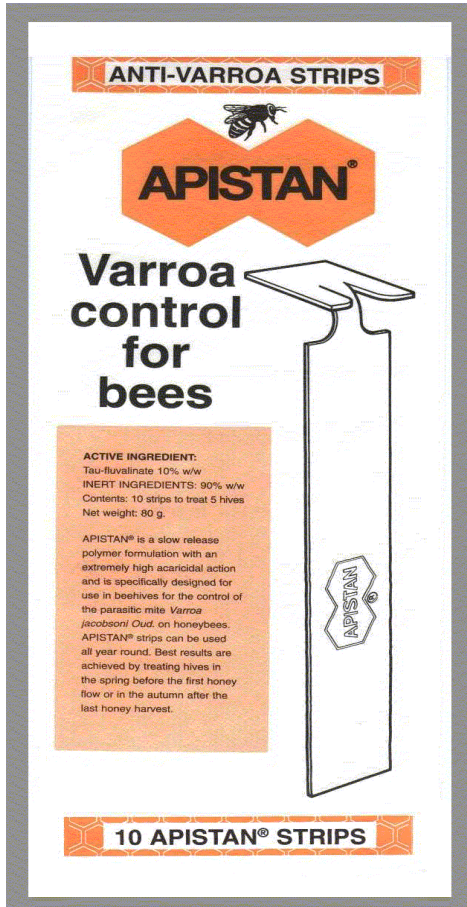


Varroa

- Parasitic mite
- Arrived in UK in 1992, now endemic
- Reproductive cycle within sealed brood cells
- 80% of mites are within brood cells at any one time
- feed on haemolymph of larvae and adults
- ideal vector for viruses
- excessive varroa load indicated by punctured cell cappings, “pepperpot” brood, deformed wings



Synthetic chemical arsenal



- Initially very effective
- Widespread mite resistance to synthetic pyrethroids developed
- Residues in wax from pyrethroids and coumaphos

Thymol treatment



- Apiguard or Thymovar
- Use Above 15°C
- Two applications over four weeks
- Minimise ventilation
- Maximise concentration of vapour
- Use 1/2 dose on small colonies
- Use eke spacer
- Start treating before end of August
- Can use in April



Oxalic acid



- Api Bioxal
- 5ml per seam of bees
- Broodless period (December)
- Monitor mite drop
- Treat only once per year
- Don't overdose





- Formic Acid
- Lay strips across top of brood frames
- Must have good ventilation - fully open entrance
- Can use with honey supers on
- Add an empty super
- Only takes 10 days because it attacks mites inside sealed brood

Coming soon - Hopguard

Biotechnical control physical, non-chemical methods



- Mesh Floor
- Drone brood trapping
 - During active season
- Icing sugar dusting
 - Encourages bees to groom off the phoretic mites
- Some swarm control techniques help to reduce mite levels





Drone brood uncapping

	Proportion of infested drone pupae		
April, May, June	Less than 2% No Action	2% – 4% Plan controls for season	More than 4% Consider control
June, July	Less than 3% No Action	3% – 7% Light Control	More than 7% Effective Control
August	Less than 5% No Action	5% – 10% Light Control	More than 10% Effective Control

Integrated Pest Control



- Keep mite load down but don't expect to eradicate
- Monitor mite levels:
 - count natural mite drop
 - or uncap drone brood
- Use Beebase Varroa calculator to determine urgency of treatment

Apiary hygiene

- Strong washing soda solution for personal equipment, hive tools, etc. 1kg/5l water
- Clean bee suit
- Disposable or easily cleaned rubber gloves
- Container for wax scrapings
- Gas torch for sterilisation



Preventing the spread of brood disease

- Inspect specifically for brood disease twice annually - shake bees from the brood combs and examine the cells
- Number hives - return supers to same hive or apiary
- Investigate colonies which don't thrive
- Seal up dead hives and check combs for disease
- Sterilise second-hand equipment (blow torch)
- Prevent robbing
- Replace old brood combs in colonies annually
- Quarantine swarms of unknown origin for two brood cycles (6 weeks)
- Don't feed honey from another source



Legislation

- Although there's no requirement to register as a beekeeper there are two legal requirements you should be aware of and one highly recommended registration:
- Notifiable diseases and pests:
AFB, EFB, Small Hive Beetle, Tropilaelaps mite
{Bee Diseases and Pests Control (Wales) Order 2006}
- Medication records should be kept
- Register on Beebase – membership of a BKA does not mean you are registered

The importance of Beebase

- www.nationalbeeunit.com
- Excellent source of information on many subjects for beekeepers – numerous factsheets available
- Updates of useful seasonal information
- Disease outbreak notifications
- Beekeeper not ‘missed out’ when something happens in their area.
- Advertising training events and on-line booking of places (upcoming)
- Access to inspection records, import regulations
- No information shared – even across government, ultra secure site.

Disease recognition workshops

A rare opportunity to handle and learn to recognise diseased comb

Saturday 3rd June, 2pm, near Aberystwyth

Saturday 17th June, 2pm, Flintshire