



The Food and Environment
Research Agency

Bee Health - A UK Perspective

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Beekeeping in the UK

- 275,000 colonies
- Approx. 40,000 hobbyists
- 300 professionals
- Honey crop approx 6000 tonnes



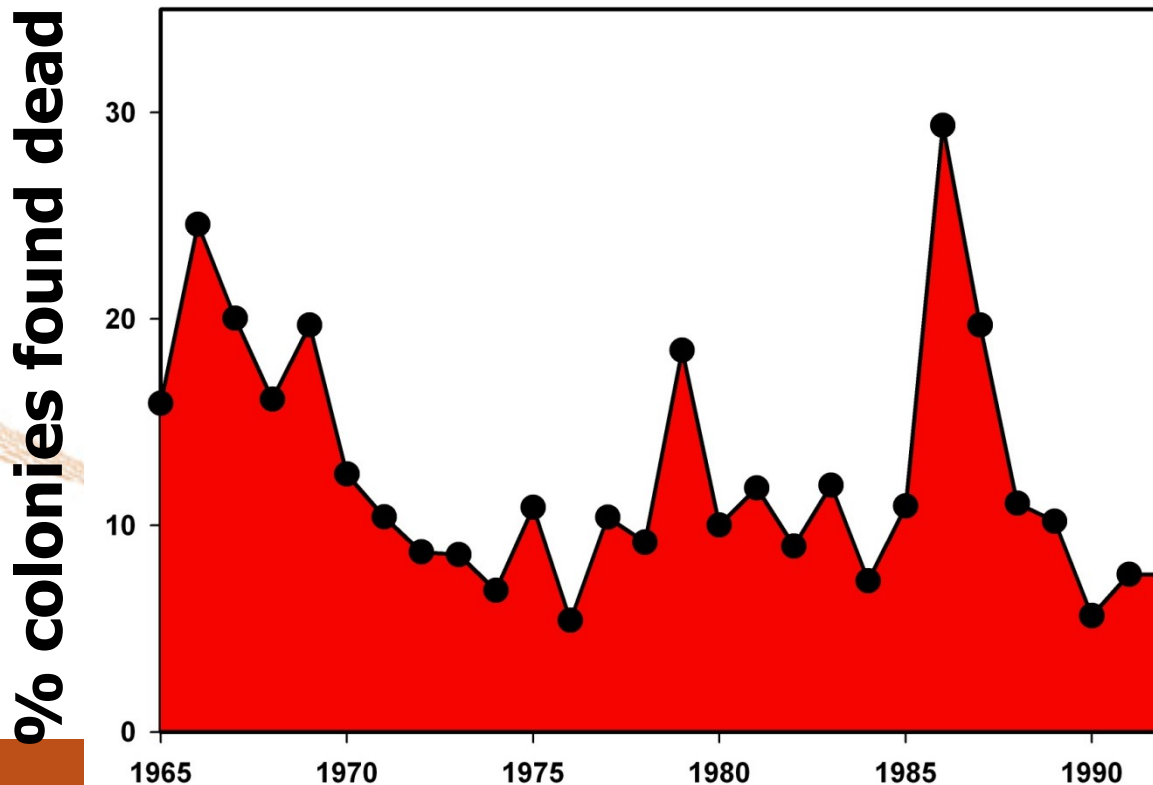
National Bee Unit

- Support England and Wales
 - Field inspection team (x70)
 - 11 support staff at York
 - Control of statutory bee diseases (EFB/AFB)
 - Training beekeepers in disease recognition and good husbandry
 - Risk-based inspections
 - First formed in the 1950s
- www.nationalbeeunit.com

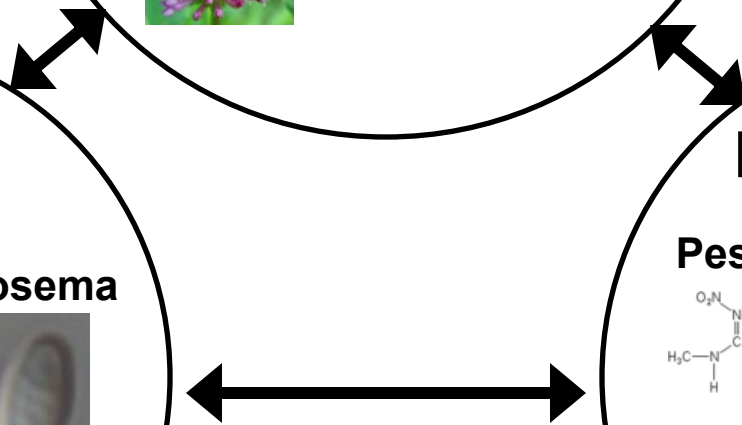
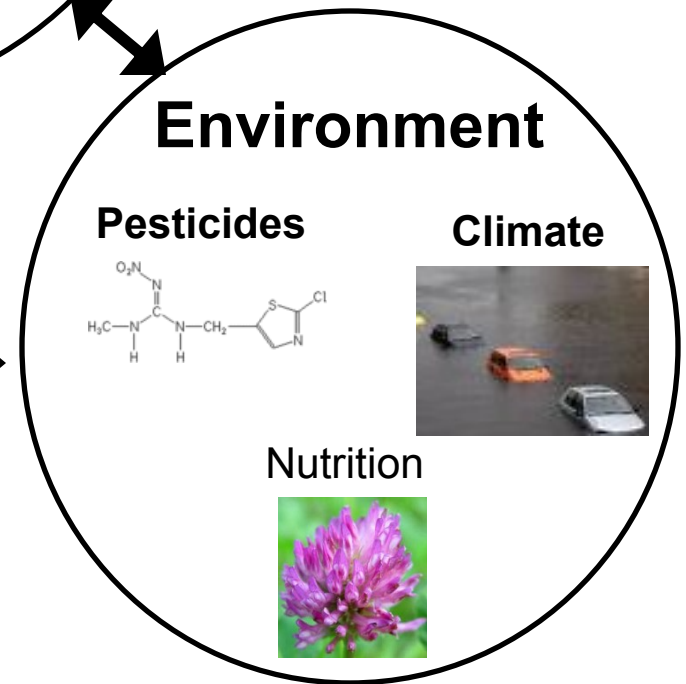
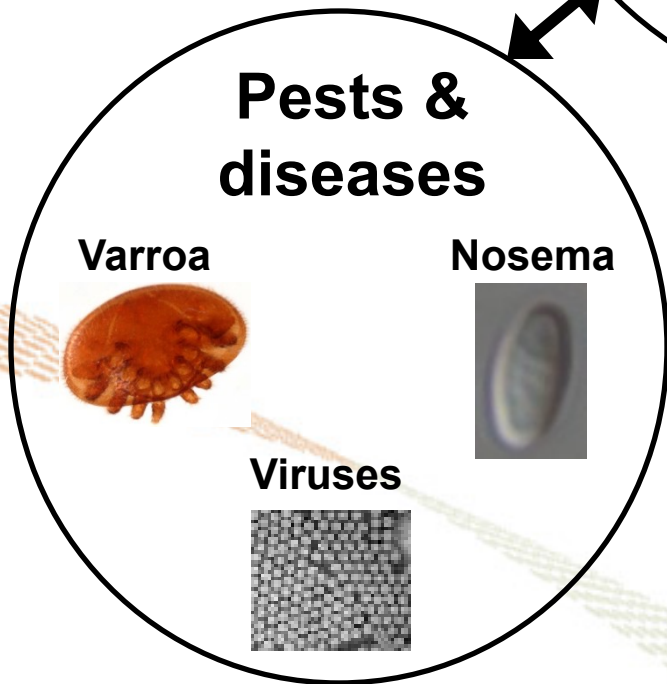
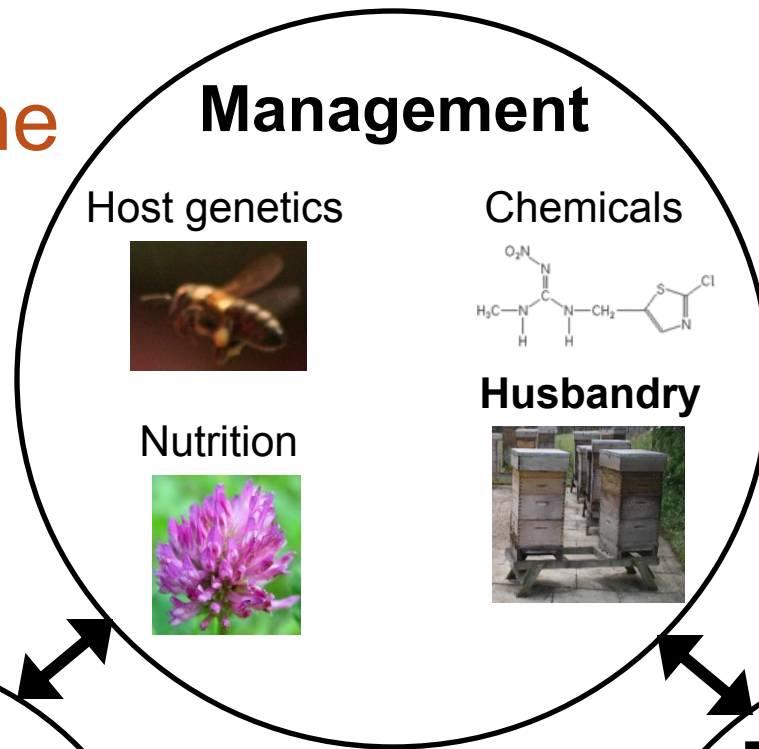


UK Colony losses pre-Varroa

- 30,000-100,000 colonies inspected/year
- Colonies found dead/Total colonies inspected
- Varied in-season losses from 5-30%



What are the possible causes of colony losses??

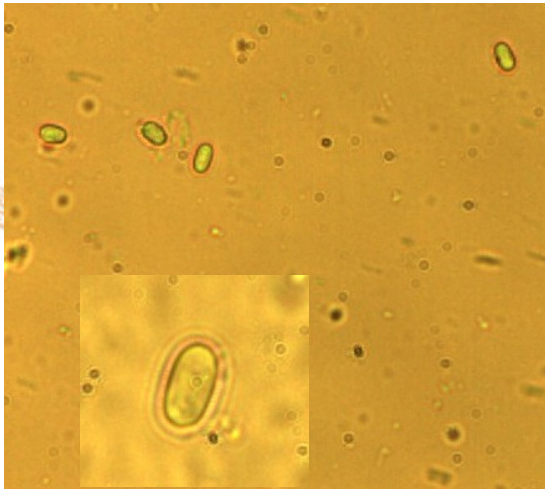


Weather and Colony Loss

- Key factors
- Heavy spring rainfall
- High summer rainfall
- Low spring temperatures

Heavy Spring rainfall

- Lack of opportunity to forage
- Long periods of confinement
 - *Nosema* spp. (microsporidium)
 - *Chronic bee paralysis virus (CBPV)*
- Poorly mated queens

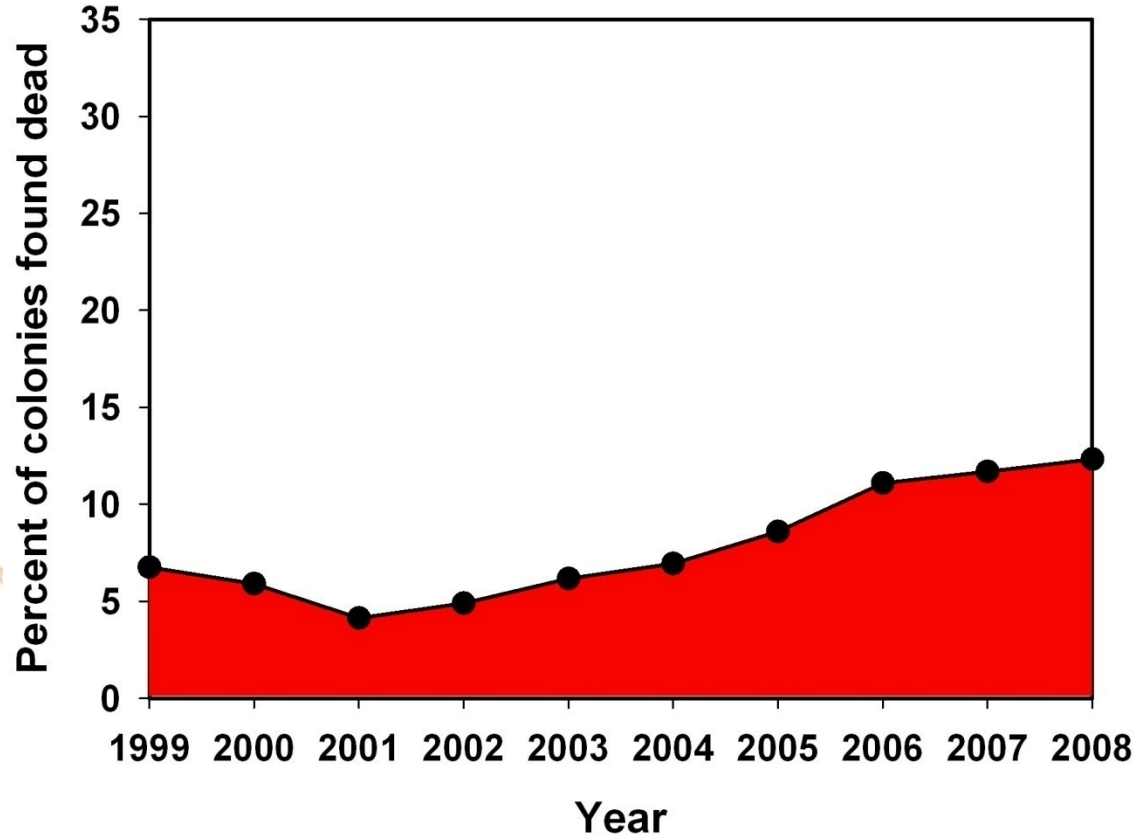


- How will climate change affect mortality rates?



UK Colony losses since Varroa

- Steady rise in colony losses from 2001
- Suggested link to pyrethroid resistant mites



Disease/Pathogens and Colony Loss

- Attempted to explain colony health using pathogen presence - **Real-time (RT) PCR screen for pathogens**
- Sampled over 500 'healthy' and 'unhealthy' colonies (2007-2009)
- Colony health: number of frames adult bees

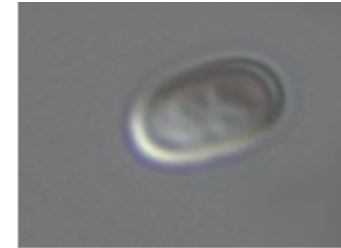


Significant risk indicators of poor health

Deformed wing virus (DWV)-
associated with high levels of Varroa



Nosema apis



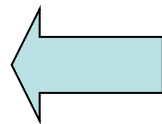
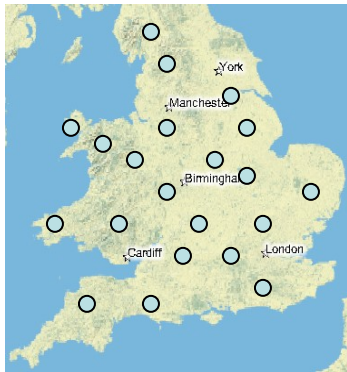
- No association of *Nosema ceranae* with small colonies

Apiary survey: England & Wales

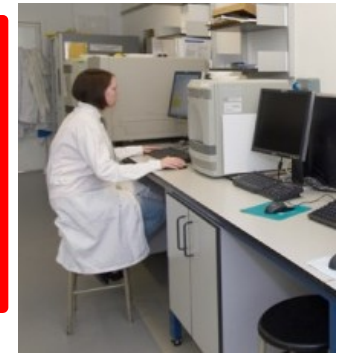
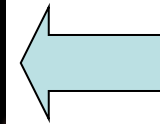
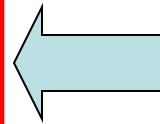


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- Project to establish disease and pathogen prevalence across England & Wales - 4600 apiaries over 2 years



BeeBase



Generates inspection



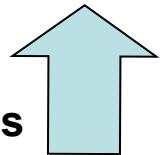
Composite sample
of adult bees
collected (n=60)



Nucleic acid
extracted



Real-time (RT) PCR
screen for 14 pathogens



Provisional results 2009-2010

- 53% *Nosema* negative
- Low incidence of suggested risk indicators of colony collapse disorder (CCD)
 - Israel acute paralysis virus (IAPV) (0%)
 - Kashmir Bee Virus (KBV) (1%)
- No 'CCD type' symptoms reported



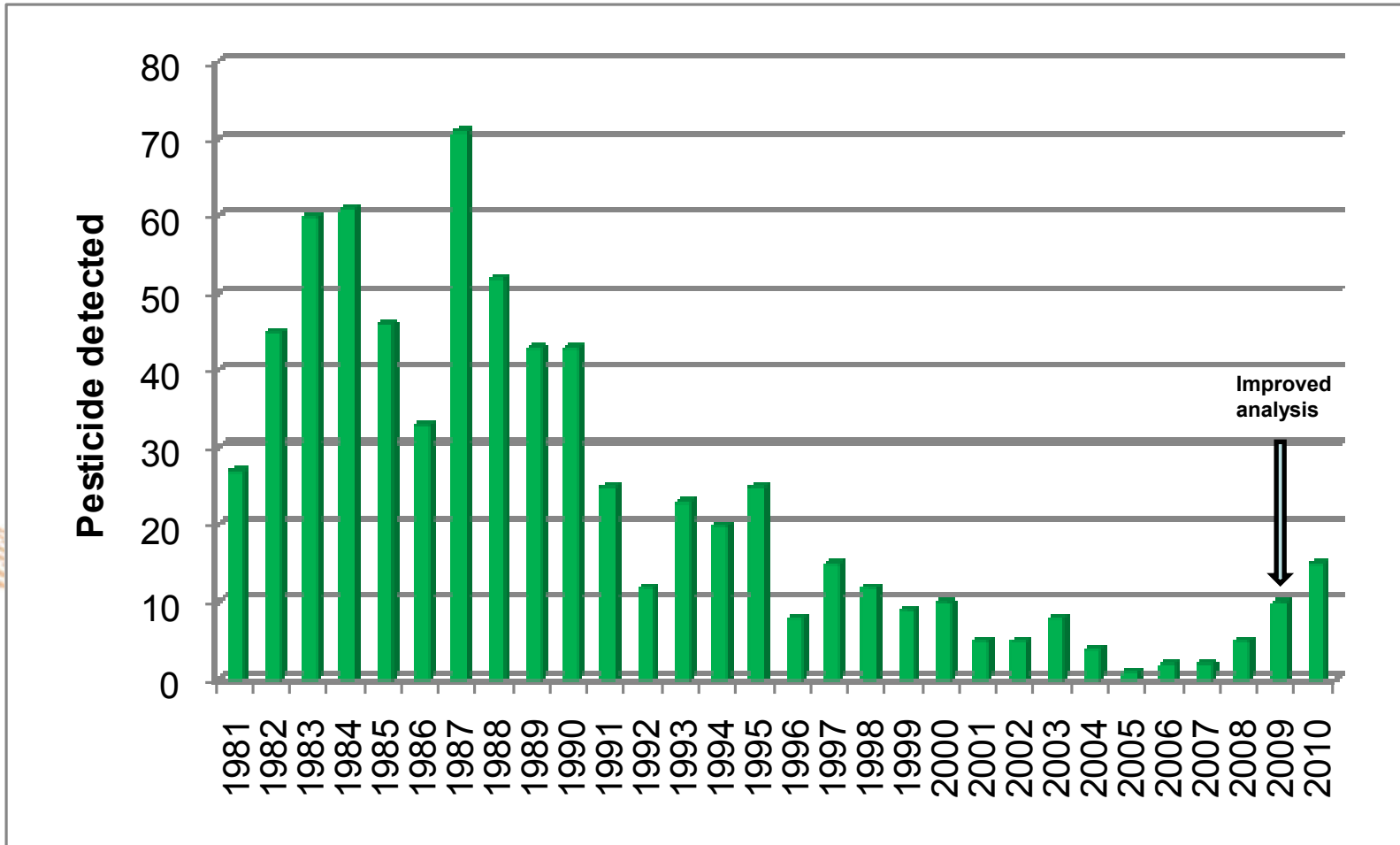
Images courtesy Jeff Pettis, USDA-ARS

- Clear impact of Chronic Bee Paralysis Virus (14% prevalence)



- 150/400 colonies lost
- Symptoms: shaking/trembling black/shiny bees

Pesticides – Wildlife Incident Investigation Scheme – Bee mortalities



Ongoing Pesticide Research

- Synergism between pesticides and between varroacides and pesticides – currently no evidence of issues in the UK in realistic exposure scenarios
- Longer term impacts of pesticides on bees: Modelling effects of changes in longevity, precocious foraging, queen egg laying on colony productivity/survival
- Risks to honeybees from guttation – no evidence that bees use guttation fluid from crops as a significant source of water

Conclusions

- Importance of good husbandry and pest/disease control by beekeepers
- UK Healthy Bees Plan
 - Biosecurity
 - Beekeeper training and education
 - Scientific evidence supporting policy
- Research collaboration across EU (e.g. COLOSS) and with North America
- UK Insect Pollinator Initiative - £10M for 5 years funding for 9 projects covering pollinator aspects from disease to biodiversity