

An Overview of Nosema in Honey Bees and some of the Preventative and Curative Actions that can be Taken

These notes are a concatenation of publicly available material.

Introduction

There are two species of Nosema – Nosema Apies (which originated in Europe) and Nosema Ceranae (which originated in Asia). The latter, which only arrived in the UK in 2007, is proving to be a more aggressive form of the disease. They are microscopic fungi which infect honey bees via spore ingestion and once in the gut, they reduce the bees' ability to digest food, particularly pollen, and can also lead to dysentery. Since the house bees maintain hive cleanliness by removing waste material using their mandibles and other mouth parts, the removal of faeces produced by infected bees can expedite the spread the disease throughout the colony.

It is worth noting that >50% of colonies in the UK have Nosema present at all times, so it is the responsibility of the beekeeper to look out for tell tale signs and take appropriate steps to minimise the impact.

Symptoms

Inside a vigorous healthy hive, either or both species of Nosema can exist without causing any apparent symptoms. However, when a colony is stressed by factors such as long confinement, starvation or poor nutrition, all of which can be exacerbated during the winter period, then signs of the disease may emerge as follows:

- Dysentery - indicated by darkish brown faecal streaks, initially visible round the entrance of the hive, but if the bees have been confined for long periods; it will also be evident throughout the hive, on frames, comb, and crown board.
- A slow build-up of the colony in spring.
- The colony dwindling, and if intervention is too late, its ultimate demise. This happens because the disease reduces the bees' ability to forage and shortens its adult life.

NB. The presence of Nosema in a colony and the degree of infection can only be determined by the detection of spores in a sample of the gut when viewed under the microscope.

Prevention and Control

The first point to note is that an anti-biotic called Fumidil-B was produced to treat Nosema, but it is no longer registered for use in the UK. It was withdrawn in 2012 and since its withdrawal there have been no legal products available to treat Nosema.

However, there are a number of management actions that beekeepers can take to minimise and regulate the disease.

- Make sure hives are appropriately ventilated at all times, particularly when solid floors are being used.

- Maintain a tidy hygienic apiary. In particular, do not leave remnants of deceased colonies and redundant hive parts laying around. These can harbour nosema the spores for up to 12 months!
- Wash hive tools between hives with a solution of one part washing soda and five parts water (e.g. 1kg of soda dissolved in 5 litres of water).
- Keep bee suits clean.
- Regularly replace dark combs with foundation.
 - There are several ways of achieving this. e.g. for established colonies of reasonable size, a Shook Swarm or a Bailey Comb Change can be used, but for smaller developing colonies, progressive replacement is a safer option.
 - [file:///C:/Users/DavidA/Downloads/Shook_Swarmingv2%20\(2\).pdf](file:///C:/Users/DavidA/Downloads/Shook_Swarmingv2%20(2).pdf)
 - [file:///C:/Users/DavidA/Downloads/Replacing_Old_Brood_Comb%20\(3\).pdf](file:///C:/Users/DavidA/Downloads/Replacing_Old_Brood_Comb%20(3).pdf)
- Sterilise any reused frames and fumigate any drawn comb before reuse.
 - See BeeBase Sterilisation advisory sheets:
 - <https://secure.fera.defra.gov.uk/beebase/index.cfm?pageid=167>
- Sterilise solid floor boards and brood boxes; use a blow lamp to torch-sterilise wooden material or use washing soda solution to scrub down polystyrene/plastic equipment.
- Position hives to minimise drifting of bees between colonies.
- Maintain strong healthy colonies because healthy bees can cope with minor levels of infection.
- If you suspect your bees have Nosema at an unmanageable level, contact the HBKA and arrange to get a sample tested.

David Holmes
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