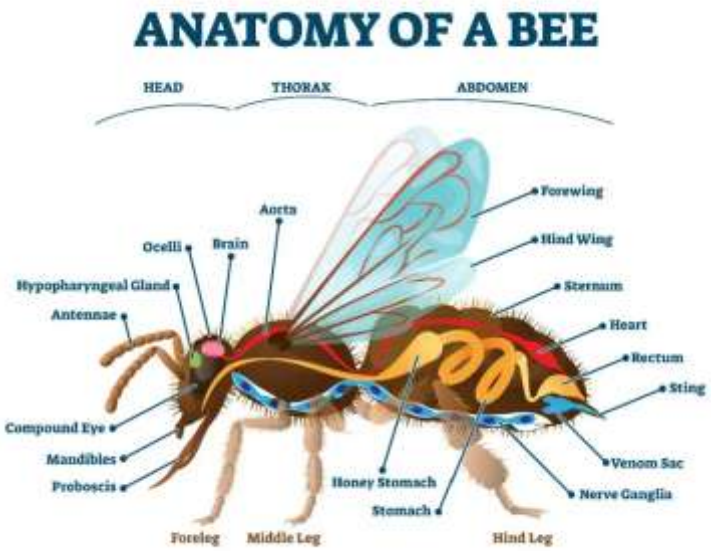
Nosema

What is Nosema?
Nosema is a parasitic organism that is similar in nature to a fungus (it is actually a *microsporidia* which produces spores but not the mycelium found with other fungi). Two types have been identified – *Nosema apis* (European) and *Nosema ceranae* (Asian). Both have been detected in the UK.

Although most beekeepers still talk about "Nosema" it was renamed *Vairimorpha* several years ago.

How does it cause disease?
The fungal parasite invades the cells that line the midgut of the bee (labelled "stomach" in the diagram).



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The fungus multiplies rapidly until the cell is filled with fungal spores which affects the bee's ability to digest food, especially pollen. When the cell ruptures the spores spill into the gut and are excreted in the faeces. The faecal material contaminates the frames and is picked up by other bees from the comb material, water droplets and by trophallaxis (bee to bee feeding). This leads to a cycle of reinfection and spread.

How does this affect the bees?
Nosema does not cause any outward symptoms of disease in the individual bees but can lead to diarrhoea (dysentery) with spotting and splashing of faeces across the tops of frames, at hive entrances and on the outside of brood boxes (see pictures). Infected bees have a

shortened life span, reduced production of brood food for larval rearing and affected winter bees are smaller with a reduced fat content and are less likely to survive the winter.

Images courtesy of National Bee Unit

The problem is worsened during periods when the bees are unable to leave the hive for long periods e.g. poor weather. This makes spread more likely as the bees cannot go on cleansing flights and instead defaecate in the hive.

Nosema weakens a colony making it less productive and more prone to other diseases such as chalk brood and foulbrood. It can lead ultimately to colony collapse, especially over the winter months.

How is it spread?

It is spread by the spores which can remain viable on combs for up to a year. It is therefore important not to swap contaminated combs between hives and to regularly replace and disinfect frames (see previous article on Apiary Hygiene).

How is it diagnosed?

The presence of dysentery is very suggestive of *Nosema*. By inspecting the gut contents or faeces of infected bees, the spores of *Nosema* can be seen under a light microscope where they appear as white / pale green rice shaped bodies. More accurate genetic testing is possible.

Image courtesy of National Bee Unit

If you lose a colony, it is recommended that you consider the likely causes (the most common being starvation, queen problems and colonies weakened by disease especially varroa).

If the reason for the colony loss remains unclear, SASA offers a limited service where a sample of adult bees is examined for the presence of Acarine mites, *Nosema* and evidence of Varroa damage. More information can be found here.

How is it treated?

There is no specific licenced treatment for *Nosema*. Instead, good bee husbandry should be practised with good hive and apiary hygiene, regular inspections and removal of frames that show evidence of dysentery. Spores can be inactivated by acetic acid or by heating to 60C for 15 minutes.

The Bee Healthy Team

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Email the Bee Health Team. We would love to know about any topics you would like covered in future Bee Healthy bulletins.

You can read previous bulletins and find useful links on the DSBA Bee Healthy web page.

Remember the DSBA Mentoring Team can be contacted via the 'Members Only' section of the website for further advice.