

Nosemosis

What is nosemosis?

Nosemosis, or nosema disease, is caused by two species of microsporidian parasites (a type of spore forming fungus) called *Nosema apis* and *Nosema ceranae*. Both species can infect worker bees, queen bees and drones. Both species produce spores which are ingested by adult honey bees through contaminated water or food, through food exchange with other honey bees or from cleaning contaminated combs. The spores then germinate in the mid-gut of the honey bee and infection may result in reduced adult honey bee life, colony health and performance.

What do they look like?

Nosema apis causes general symptoms such as crawling honey bees with swollen and greasy abdomens and dislocated wings, honey bees crawling onto and around the hive entrance, dysentery within and around the hive, a reduction in queen bee egg laying ability and her possible supersedure, as well as the rapid dwindling of colony strength and heavy winter losses. *Nosema ceranae* causes similar symptoms; however, none of the dysentery or crawling honey bee behaviour usually related to *N. apis* infection has been reported for *N. ceranae*. Signs of nosemosis are more evident in the cooler months, particularly in autumn and spring when nutrition is poor and/or weather conditions are cold and wet. Unlike *N. apis*, *N. ceranae* appears to thrive in warmer climates.

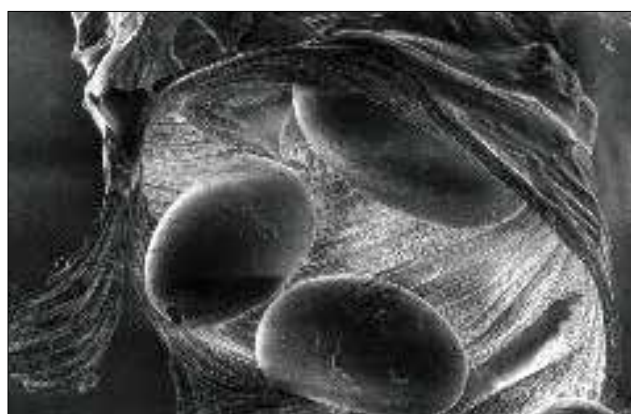
What can they be confused with?

There are no reliable field diagnostic symptoms associated with nosemosis, and many of the general symptoms associated with the disease could be confused with symptoms caused by other honey bee pests, diseases and/or disorders.



Hives should be regularly checked for signs of pests and diseases

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Nosema spores in mid-gut of a honey bee

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Honey bees defecating at the entrance of the hive can be a symptom associated with *N. apis* infection

D.Brøberg, www.flickr.com/photos/dbrøberg

What should beekeepers look for?

Beekeepers should look for colony symptoms such as a declining population, poor honey production, reduced brood production, dysentery in and around the entrance of the hive, poor survival over winter and worker bees crawling around the hive with swollen and greasy abdomens.

How do they spread?

Nosema spores are passed from infected honey bees to non-infected honey bees through contaminated water or food, through food exchange with other honey bees or from cleaning contaminated combs. It is also spread through bees removing waste material, specifically faeces from within and around the entrance of the hive. The spores are long lived and can quickly spread throughout the hive. Nosemosis can also be spread between colonies by using contaminated equipment and through the drifting behaviour of worker bees and drones.

Where are they now?

Both species of nosema (*N. apis* and *N. ceranae*) are found in all states and territories of Australia, except for *N. ceranae*, which has not been reported in WA.

How can beekeepers protect their hives from nosemosis?

Good management practices such as appropriate nutrition, young queen bees with populous hives and comb rotation every 3-4 years will keep colonies strong and remove possible causes of stress. Beekeepers should place their hives in a warm and sunny position over the autumn, winter and spring periods allowing the colony to regularly forage and defecate outside of the hive to prevent the accumulation of nosema spores in faeces deposited in the hive. Beekeepers should always ensure that any hive equipment that may have been infected with nosema spores is decontaminated before and after use.



Dysentery around the hive entrance

D. Broberg, www.flickr.com/photos/dbroberg



Dysentery within a hive

Michael Plein

For more information about nosemosis, go to www.beeaware.org.au/nosema. The BeeAware website contains extensive information on nosemosis, including:

- Disease cycle
- Symptoms
- Detection methods
- Similar pests
- Spread and distribution
- Management options
- Additional fact sheets and videos

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