NOSEMA

- A unicellular fungus (microsporidia)
- Adult infected in its spore (resting) form
- Spores germinate inside the gut (injects spores into the epithelial cells of the ventricullus)
- Interfers with the bees ability to digest food by inhibiting digestive enzymes

Effects on Bees

-do not exhibit obvious external disease symptoms

- increased energy consumption

-underdeveloped hypopharyngeal glands of nurse bees

-shortened lifespan (50 to 75%)

-young queen if infected superceded (often within 2 to 3 weeks)

-forage earlier, more often, and collect less pollen

-reduced willingness to share food in hive

N. apis

Seasonal relationship: spore levels lowest in Summer

N. ceranae

-most common type in US

-reduces homing abilities (? Orientation vs energy)

- increases as season progresses

-common cause of failure to thrive

Treatment

-Fumagillin B

Heat sensitive (only add to cool syrup); light sensitive ; viable for 2 weeks in syrup

Toxic to mammals (birth defects) NOT FOR USE DURING FORAGING SEASON

-increased feeding

-oxalic acid (? Formic acid)

Things You can Do

-clean hive tools between hives

-freeze frames X 1 week

- better nutrition (pollen) at all times when broodrearing

-minimize crushing of bees during hive manipulation

-winter hives in sunny locations to encourage cleansing flights

-rotate out old frames

-oxalic acid

-disinfect with bleach solution (1 part bleach to 9 parts water)

-sunlight (UV light)

- ? probiotic two weeks after treatment with Fumagillin B

Nosema Sampling

-need older bees (Nosema 2.9X higher in older bees)

- bees at entrance midday or off inner lid

- 15 bees

-freeze in baggie

-add 15ml water (1/2 oz)

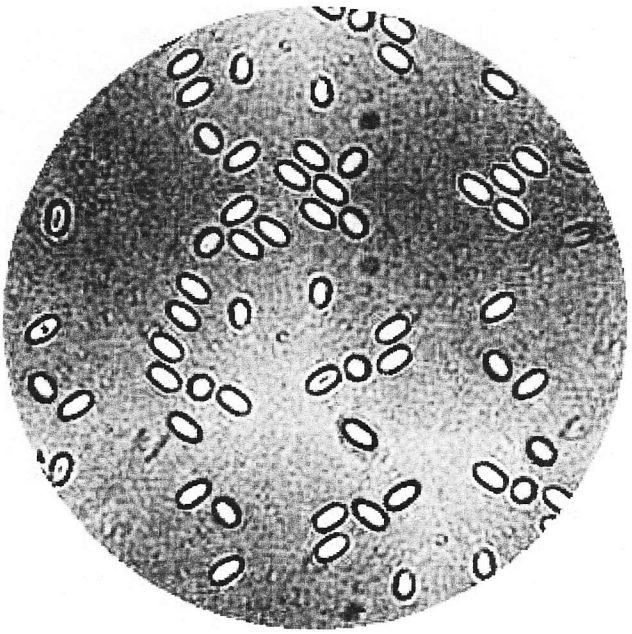
-crush with rolling pin to macerate bees (break open all abdomens)

- place drop on slide, apply cover slip

Microscope

- 400X magnification
- Lens magnification "40" and ocular magnification " 10"
- Make sure light is on – not too bright- "5 or 6" is usually good
- Adjust the deck (forward/backward; left/right)
- Search for Nosema spores: lift slide till almost touching, slowly back away using smaller knob in ¼ turns till Nosema comes into view
- Look at 3 fields of view (3 areas of slide) and count Nosema in each

- If average 15 or more, you have reached treatment threshold
- Although the spores of N. apis and N. ceranae have slight morphologigal differences, the only reliable way to differentiate them is an electron microscope or polymerase chain reaction (PCA) analysis



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