

ANNUAL RESEARCH REPORT BEE RESEARCH AT HORTRESEARCH

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1999/2000 Projects

- Effects of honey on nosema spore viability
- Effects of heat on nosema spore viability
- Honey feeding and nosema infections
- Nosema work for Auckland branch
- Transgenic plants – risk assessment for bees
- Bee immune response to disease
- Honey tests to identify beekeepers with AFB problems
- Source of antibiotic properties of manuka honey
- Pollination of gold kiwifruit Hort 16A
- Pollination of nashi
- Risk assessment of honeybee commodities
- Varroa response research
- Other commercial work

Nosema Experiments

Experiments were undertaken to answer the following questions:

- Can nosema spores survive in honey?
- How long do nosema spores stay viable inside the hive?
- Would heat sterilisation work at lower temperatures than 49°C for longer times than 24 hours?
- Could some honeys be used as “natural” alternatives to fumagillin?

Two experiments were carried out in order to answer the first two questions. Spores were stored in active manuka or multifloral honey or sugar syrup or water at 33°C for various time periods: 3, 7, 14 or 21 days or 1, 3 or 6 months. Samples were removed at each time and fed to healthy young adult bees to check how the treatments had affected nosema's ability to infect the bees. These bees were kept in cages in an incubator until all had died naturally. By examining each dead bee body under the microscope, we obtained two measures of spore viability: percentage of infected bees and spores per infected bee at death.

These experiments showed that:

- storing spores in manuka or multifloral honey for any time between 3 days and 6 months reduces spore viability markedly. Sugar syrup will not give the same result, suggesting it is some property of honey other than the sugar content which causes this.
- even spores not kept in honey will lose viability steadily over 3 weeks at hive temperature.

Heat treatment experiments, in which spores were dried onto glass slides and kept at 33, 40, 45 or 49°C for 3 or 5 days showed that:

- dried spores kept at 45°C have a similar loss in viability to those kept at 49°C for 3 or 5 days, suggesting that heat sterilising frames at 45°C for 3 days might provide effective nosema disinfection.

The effects of feeding active manuka or thyme honey to bees dosed with nosema showed that:

- neither honey reduced the percentage of bees that became infected or the severity of their infections
- bees kept in cages and fed active manuka did not live as long as bees fed thyme honey or sugar syrup

Future work

Projects for the coming year include work on:

- transgenic plant risk assessment
- AFB
- manuka honey
- pollination
- varroa