



# Apiculture Factsheet

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## Factsheet #219

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### TRACHEAL MITES IN HONEYBEE COLONIES

The Honeybee Tracheal Mite (HBTM) was first introduced into Canada in the late 1980s and has since spread to most of Canada's beekeeping areas. This microscopic mite parasitizes adult bees causing the weakening of the colony and increased winter mortality. The widespread use of Formic Acid has rendered the tracheal mite as a minor pest.

#### Field Diagnosis

- The tracheal mite *Acarapis woodi* is a microscopic mite that lives in the tracheal tubes (~breathing tubes) of adult honey bees.
- Disease is called Acarine disease or Acariosis
- Confirmation of infestation requires microscopic examination.
- Infected colonies may show signs in spring and fall when mite populations reach their peak.
- A TM infestation is not uniformly distributed in an apiary; some colonies may have elevated levels while other colonies may not have any detectable levels. For the collection of a sample, an equal number of adult bees must be collected from each colony for a total sample size of about 50-75 bees.
- In cases of severe infestation, large numbers of adult bees crawl in front of the hive, incapable of flight and coordination. Many adults extend their wings outward, often described as "**K-Wing**". (This condition may be caused by K-Wing Virus ~KWV).
- Infected adult bees may be lethargic. Even on good days, a high proportion of bees are in the hive instead of flying.
- Colonies are slow in spring population build up and lack vigor. In the fall, population declines may be higher than normal before the onset of winter.
- Colonies show variability in their sensitivity to tracheal mites. Some colonies are resistant and unaffected by tracheal mites, while other colonies may be severely affected and collapse.
- **After the introduction of Varroa mites, Formic Acid has been widely used. The acid effectively controls tracheal mites.** Tracheal mite infestations may have also declined as beekeepers have selected for tracheal mite resistant bee stock.

#### Laboratory Diagnosis

- *Acarapis woodi* is an obligate, endo-parasitic mite infesting the tracheae or breathing tubes of adult honey bees.
- Using a dissecting microscope, adult bees are placed on their back, decapitated and the frontal section (collar) of the thorax removed to expose the major tracheae.
- Healthy, non-infected trachea appear milky-white in color and almost transparent. Infected tracheae are mottled, sometimes bronzed in appearance, and with darkened patches. Higher magnification sometimes shows adult mites in the trachea.
- Light infestation generally involves one tracheal tube affected by mites (mono-lateral) while heavy infestation involves the damaged tissue of both tracheal tubes (bi-lateral).
- The dissection of all the bees of the sample will provide an indication of "non-detectable", "light" and "heavy".



### **Control and Treatment**

- Before applying chemical controls, closely examine the colonies for signs of HBTM infection. Look for adult bees crawling in front of the hive, lack of vigor, display of K-Wing.
- When symptoms have been noted, a chemical control may be applied without having to collect bee sample for laboratory analysis first.
- In Canada, menthol and formic acid have been registered for control of HBTM. See **Factsheet #221** for application instructions.
- Apply chemicals **only** in spring or fall, with honey supers removed.
- Select for tracheal mite resistant bee stock or purchase resistant stock from a bee breeder.
- Increased incidence and severity of infestation is worsened when bees are stressed. Stress factors may include other diseases, poor forage availability, too many colonies placed in one location causing interference and robbing, lack of feed and pollen, poor beehive equipment, inclement weather, etc.