ALBERTA BEEKEEPERS COMMISSION
TECHTRANSFER PROGRAM

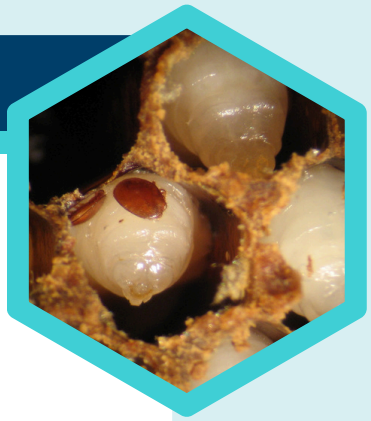
VARROA MITE

Varroa mites or *Varroa destructor* are a parasitic mite known as the biggest threat to honey bee health in Alberta today. *Varroa* act as a vector for many other honey bee viruses and diseases. The mites primarily feed on the fatty tissues of bees at all stages of development. This can compromise the immune system and make the bees more susceptible to diseases. *Varroa* mites are a major threat to the health of your colonies and require diligent monitoring and tracking.

LIFE CYCLE

A mature female mite enters the brood cell of an advanved larvae and hides beneath the larva until the cell is capped. The mother mite may lay up to six eggs every ~30 hours. Once capped, she lays one male egg and a few females eggs. The male hatches first and after the females mature, mates with them inside the cell. The male then dies, while the mated females emerge and repeat the cycle.

SYMPTOMS



- Varroa on adult bees abdomen or thorax, and/or on larvae.
- High infestations can impact colony strength.
- Reduced honey production.
- Increased chances of **overwinter mortality.**
- Presence of smaller and weaker bees.
- Presence of spotty brood due to Parastic Mite Syndrome (PMS).
  - **PMS:** Partly removed, chewed out larvae.
- Associated diseases, such as:
  - **Deformed Wing Virus:** Shriveled wings
  - **Sacbrood:** Dark uncapped pupae in a sac-like skin

CAUSES

- **Intra-Colony Spread** → Within a hive, mites are spread when adult bees come into contact with each other.
- **Inter-Colony Spread** → When bees from one colony invade another to steal honey and other resources (robbing) and when worker bees fly into the wrong hive (drifting).

IPM STRATEGY FOR PREVENTION

- Reference our **Integrated Pest Management Plan** for Varroa mites.
- Use queens that have been genetically selected for Varroa Sensitive (VSH) traits.
- Monitor before and after Varroa treatments to ensure that treatments are working and to make management changes when needed.
- Cultural/Physical practices such as drone brood removal and brood breaks can help remove mites from colonies and disrupt reproductive cycles.

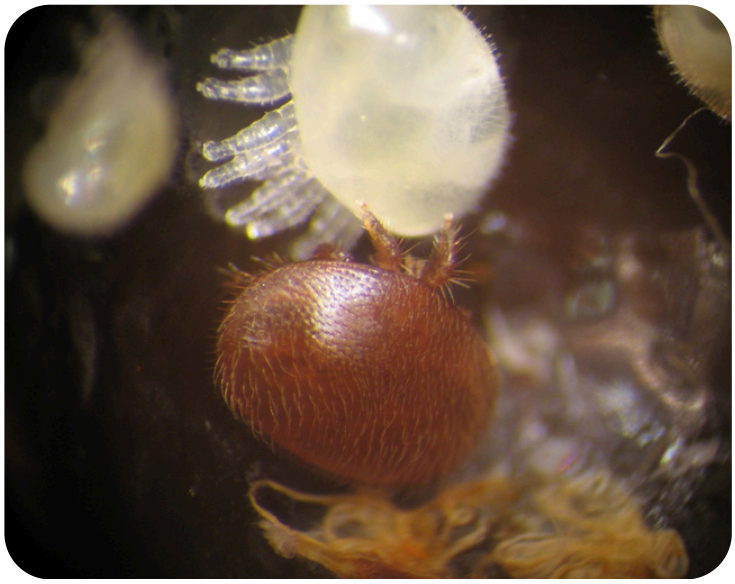
Integrated Pest Management Plan

I HAVE VARROA MITES, WHAT SHOULD I DO?

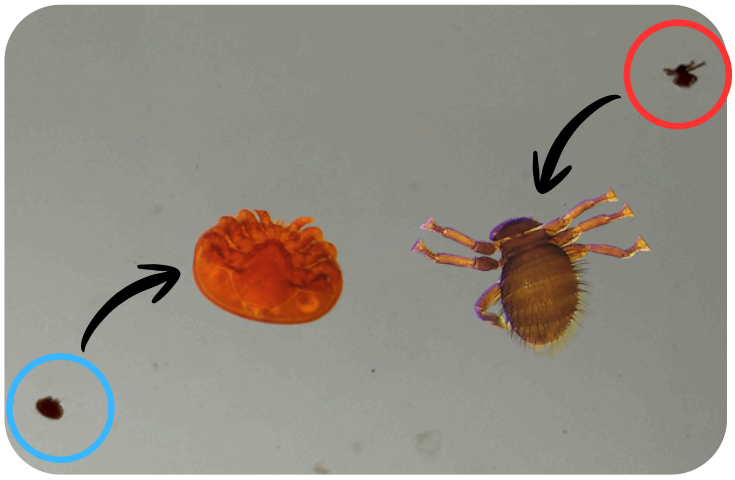
- Use a sugar shake, alcohol shake, or sticky board to determine mite level.
  - Ideal: **less than 1% (1 mite/100 bees)** for sugar shake and alcohol washes, or **< 10 mites per 24 hour** period for sticky board counts.
- Move highly infested colonies to hospital yards to prevent spread of the mites to healthy hives.
- Reference our ***Varroa* treatment decision tree** to determine what treatments to use based on time of year, severity of infestation, and previously used treatments.
  - It is recommended to use a flash treatment when varroa levels are above 10%.
- Re-queen with a hygienic queen once mites levels are below the economic threshold to help manage mite levels long term.

Varroa treatment decision tree

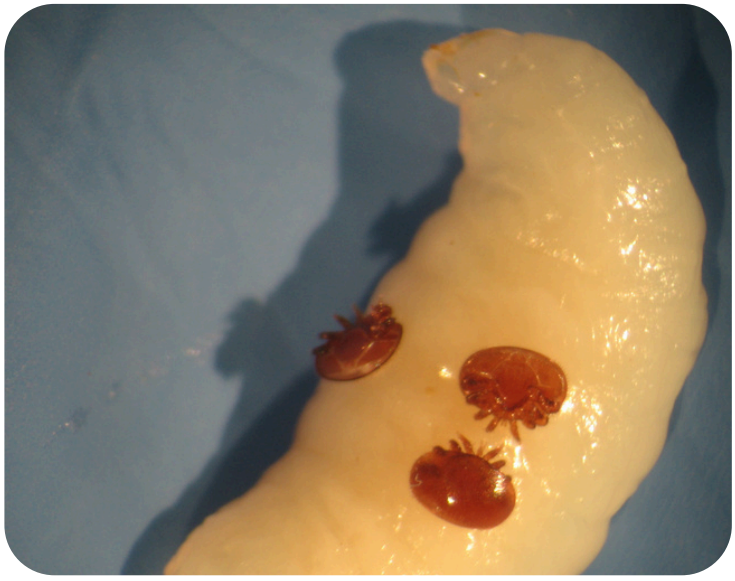
VARROA MITE GALLERY



Adult Varroa mite alongside several younger, lighter mites. Varroa levels can **double every 22 days** if unchecked.



Varroa mite (blue) versus a bee louse (red). Although similar looking, bee louse have l**onger legs** clearly out to the side while Varroa mites have theirs **tucked underneath**.



A bee larvae with several adult Varroa mites. Sometimes **several** adult female mites will enter the same cell and **coexist inside**.

VARROA MITE BOMBS

What is a mite bomb?

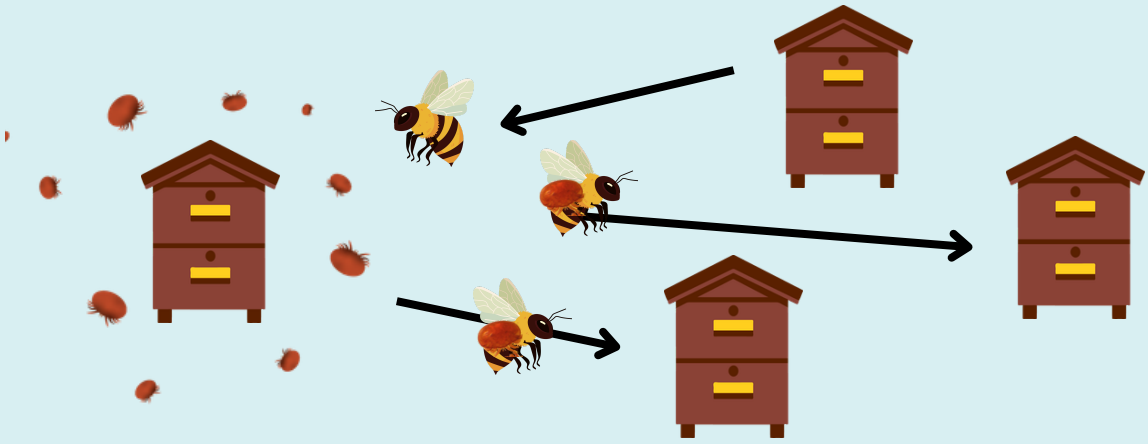
A mite bomb is a colony with very high mite levels amidst other, healthier colonies. When this colony surpasses 5-10% mite levels (5-10/100 bees) the transmission rate of the Varroa mites increases such that it creates a bomb-like effect of mite distribution throughout a yard. Drifting and robbing are the main mechanism of Varroa movement between mite bomb and healthier hives.

Solutions

Flash Treatment: by applying a treatment of formic or oxalic acid to a strong colony, mite levels can be dropped quickly and efficiently.

Hospital yards: moving a hive (at night) to a hospital yard can isolate the mites from healthy colonies and prevent spread during recovery.

Euthanasia: weak colonies tend to be robbed at a higher rate, therefore eliminating the mite bomb may be the best choice for preventing further Varroa transmission throughout an otherwise healthy yard.



Resources:

McCormick, Nicole. “Mite Bombs.” Alberta Bee News, Nov, 2024.

Pernal, S.F., & Clay, H. (2013). *Honey bee diseases and pests* (3rd ed.). Canadian Association of Professional Apiculturists.

Honey Bee Health Coalition. (2022) *Tools for Varroa Management* (8th ed.).

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