



# Technology Transfer Program

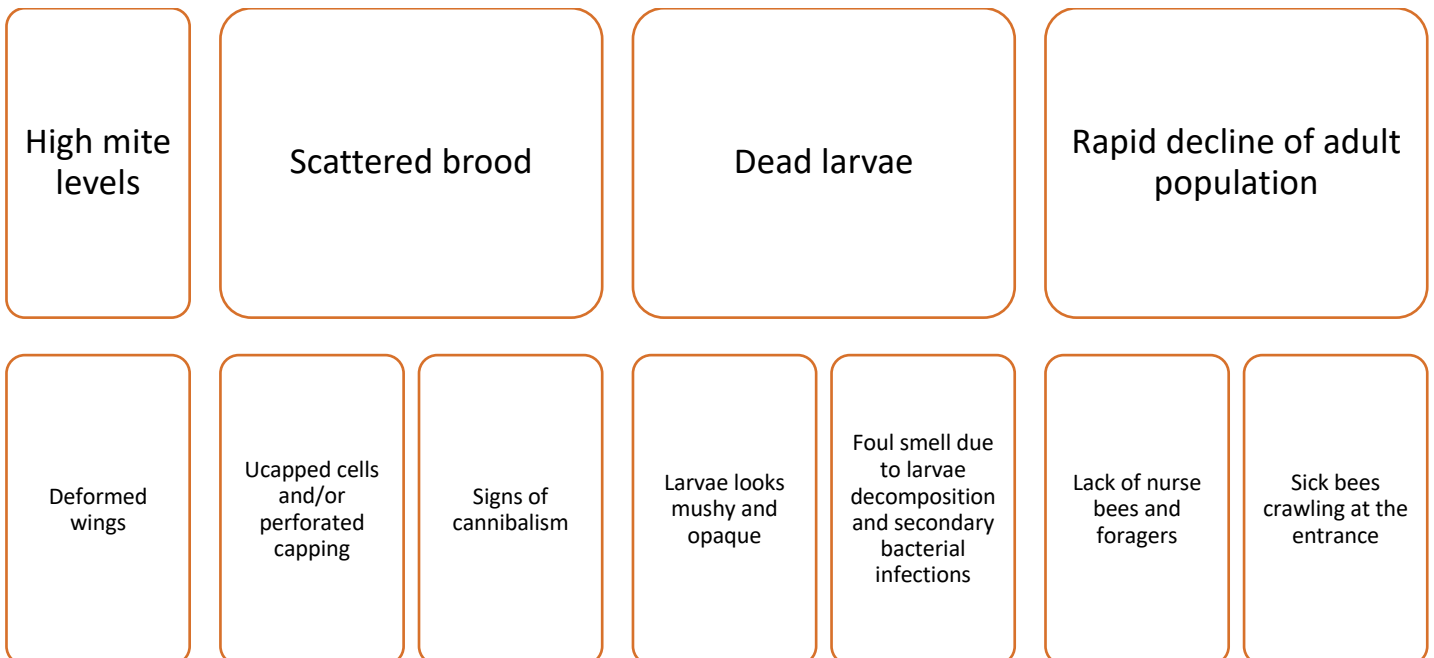
BC Honey Producers' Association

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## Parasitic Mite Syndrome

As we enter the fall, we are starting to see higher *Varroa destructor* levels in our colonies. If not properly monitored and treated, varroa can reach damaging levels that are irreversible; colony collapse due to varroosis can happen very quickly. The parasitism caused by varroa is highly damaging to bee health because the mite transmits virulent viruses, like *Deformed wing virus* (DWV), it causes immunosuppression in the honey bees, and it helps transmit other pathogens through the open wound it inflicts on the bees while feeding (including bacteria). Also, there is evidence of negative effects of varroa parasitism on bee metabolism, cognition, and behaviour. The term Parasitic Mite Syndrome (PMS) describes a complex condition that leads to colony collapse due primarily to *V. destructor* parasitism. Even though most beekeepers are familiar with varroosis, PMS is commonly misdiagnosed. Surprisingly, PMS is often confused with brood diseases like American Foulbrood (AFB), European Foulbrood (EFB) or *Sacbrood* virus. The pupae parasitized by varroa are unable to develop, due to the harm inflicted by the mite. Consequently, when mite levels are high, there is a rapid decrease in newly emerged bees, and the few workers that emerge have a reduced lifespan and would likely show signs of wing deformity (hence, being unable to fly and forage). Also, the production of royal jelly by nurse bees could be compromised as varroa parasitism can cause degeneration of the hypopharyngeal glands. As a result, there are fewer nurse bees able to tend the larvae, and the brood can die of starvation and thermal dysregulation, as the remaining adult workers cannot maintain the ideal environment inside the hive, including temperature. The signs of PMS include:



If signs of PMS appear, the best approach is to a) monitor mite levels in the apiary, b) treat immediately, c) provide open brood and young worker bees to the parasitized colony from a strong and healthy colony, d) provide food if needed, and

e) follow biosecurity practices. For more information about biosecurity practices visit <[www.ttp-bchpa.ca](http://www.ttp-bchpa.ca)> → Media → Print BC-TTP Best Management Practices & Biosecurity and <[www.honeycouncil.ca](http://www.honeycouncil.ca)> → Education/Resources → Canadian Beekeepers' Practical Handbook to Bee Biosecurity and Food Safety.

In many cases, it is difficult to reverse the signs of PMS and the colonies will quickly collapse, so constant monitoring of mite levels and immediate action when levels are  $\geq 3\%$  is strongly recommended.

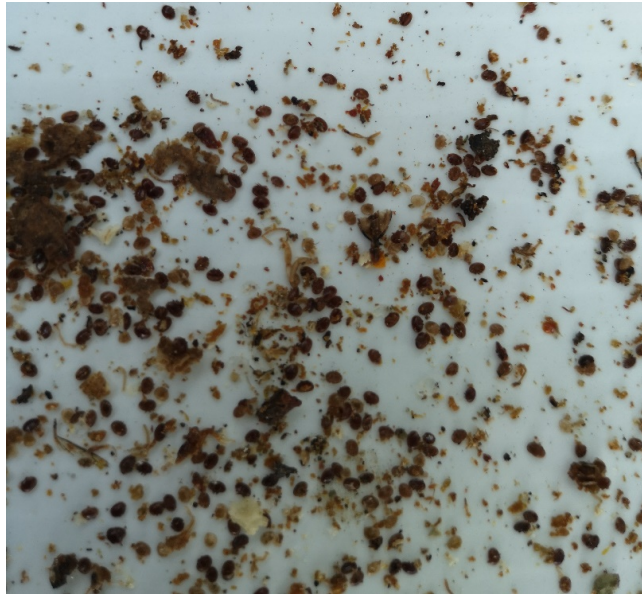


Figure 1. Sticky paper left for three days, showing a high level of varroa mites.

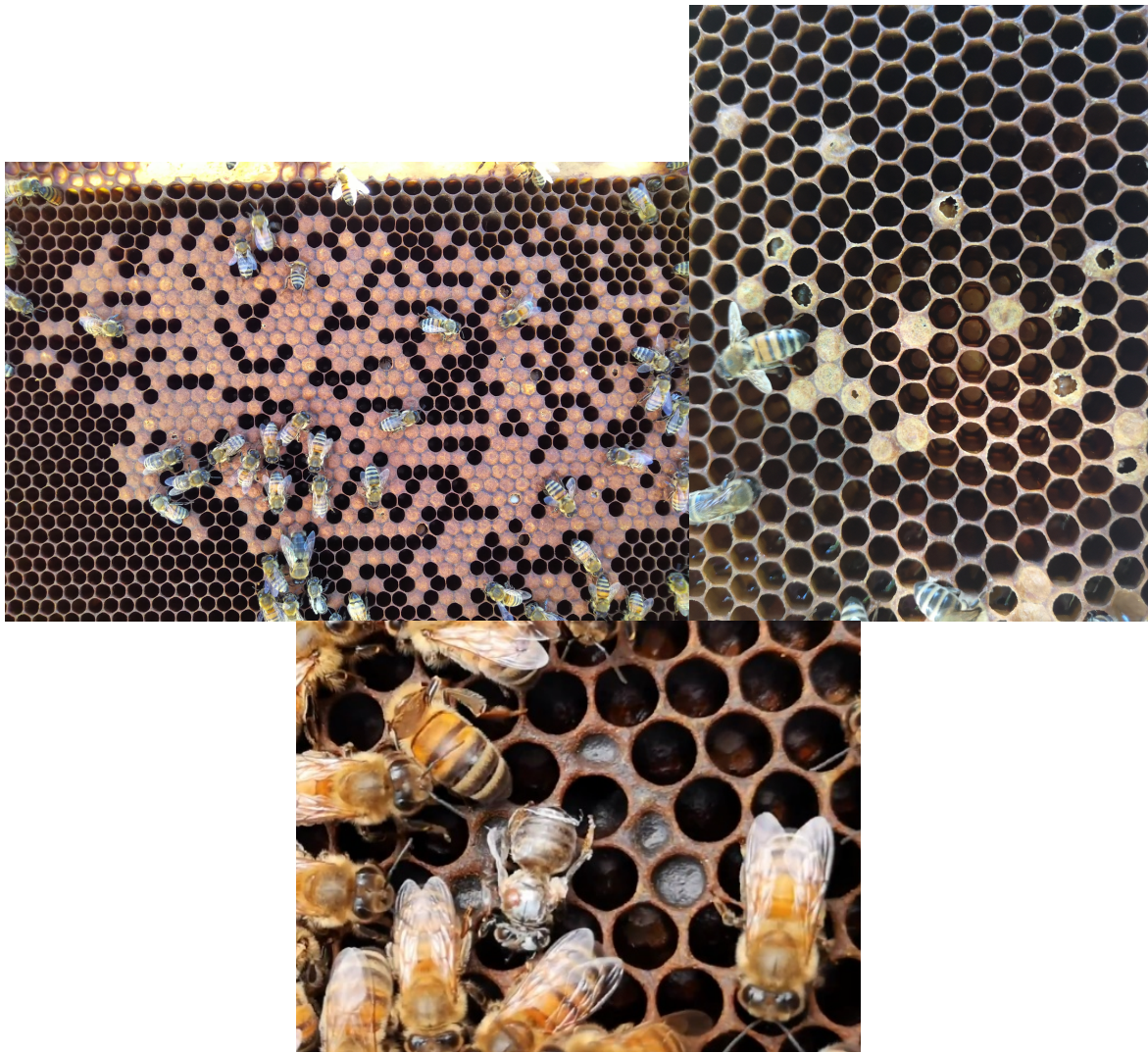
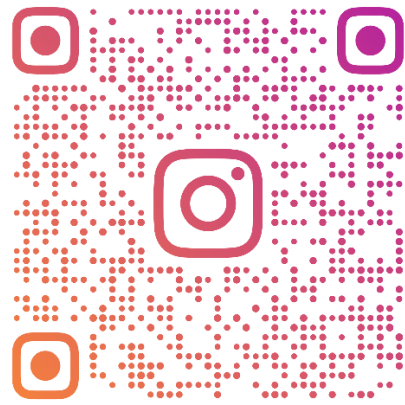
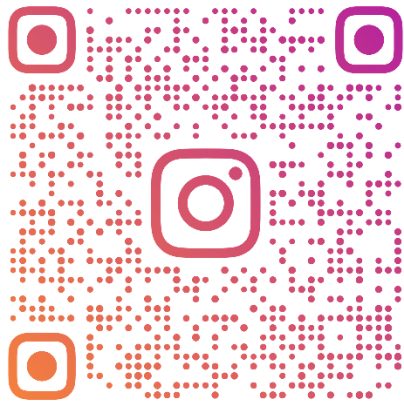


Figure 2. Frames showing signs of PMS, including depopulation, a scatter brood pattern, open caps, dead pupae, and an adult bee with deformed wings.

### **BC-TTP is looking for highly parasitized colonies**

We are currently working on a project to assess synthetic acaricide resistance, and we are looking for colonies with high mite levels in the Lower Mainland. Please, get in touch with us if you find  $\geq 3\%$  mites in your colonies and before you treat! [info@ttp-bchpa.ca](mailto:info@ttp-bchpa.ca) or [nuriamorfin@ttp-bchpa.ca](mailto:nuriamorfin@ttp-bchpa.ca)

If you need a reminder on how to monitor for mites, visit our website: <https://ttp-bchpa.ca/> and click on Resources → Disease and Pest Management → Varroa Mite → BC-TTP Alcohol Wash Method and Icing Sugar Shake (video tutorials) or use these QR codes:



## BC-TTP updates

The BC-TTP received funding from the Abbotsford Community Foundation for a project in collaboration with Simon Fraser University (Dr. Erika Plettner's lab) where we will be testing a new synthetic acaricide and assessing amitraz resistance. Also, the Vancouver Foundation will support the BCHPA and the BC-TTP with a three-year grant (total of \$216,000). We are very grateful and excited for the support of our community!



Photo: The BCHPA receiving funds from the Abbotsford Community Foundation, Agricultural Enhancement Grants at Campbell's Honey in Abbotsford (June 23, 2023). From left to right Ross Siemens (Mayor of the City of Abbotsford), Heather Higo (BCHPA, President), Nuria Morfin (BC-TTP Lead), and Marcus Janzen (Chair, Agricultural Enhancement Grants).

**Acknowledgements:** Special thanks to Kerry Clark and Heather Higo and for their support in seeking grants and helping us in the field!

## BC-TTP Team

Nuria Morfin – Lead

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Leilani Pulsifer – Science Communicator

## References



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