

PARASITIC MITE SYNDROME

MEASURE - TREAT - REPEAT

3 STEPS FOR HEALTHY BEES



Parasitic mite syndrome (PMS) is a disease complex which causes rapid deterioration of honey bee (*Apis mellifera*) colonies. In the state of Utah, it is the most common contributor to late season colony losses. PMS is highly correlated with excessive Varroa mite (*Varroa destructor*) infestations. Varroa mites can quickly spread between hives in the same apiary. Varroa mites are known vectors of multiple bee viruses such as acute paralysis virus (APV), Kashmir bee virus (KBV), and deformed wing virus (DWV), all of which have negative impacts on colony health and contribute to the pathogenesis of PMS. The simplest way to keep your bees healthy and avoid PMS is to keep the Varroa mites under control.

1 MEASURE

Check your hives for Varroa mites regularly.



Find instructions at:
honeybeehealthcoalition.org/resources/varroa-management

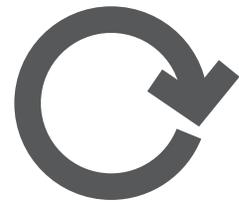
2 TREAT

If Varroa mite levels are excessive, apply a miticide.



Find instructions at:
honeybeehealthcoalition.org/varroatool

3 REPEAT!



A single treatment cycle may not be enough.

Continue monitoring and treating as needed.

CALCULATING MITE LOAD

The alcohol wash and powdered sugar roll methods both require a sample size of **1/2 cup of bees**. This amounts to an approximate sample size of 300 bees. Count the number of mites that are shaken out of the jar and divide that number by 300. Then multiply by 100 to get your percentage mite load. Scientific authorities have determined that most colonies are unlikely to survive if the Varroa mite infestation exceeds 3% of the bee population. To prevent colonies from reaching that threshold, beekeepers should treat if monitoring reveals four or more mites in a sample.

Number of mites counted = _____

Number of bees sampled = 300



$$\left(\frac{\# \text{ MITES}}{\# \text{ BEES}} \right) \times 100 = \% \text{ MITE LOAD}$$

SCAN ME



to access the Honey Bee Health Coalition Varroa Management Decision Tool

SCAN ME



to view the Honey Bee Health Coalition series of instructional videos



Utah Department of Agriculture & Food
4315 South 2700 West
TSOB South Bldg, Floor 2
Taylorsville, UT 84129-2128

UTAH APIARY PROGRAM | 801-982-2313
UDAF-INSECTS@UTAH.GOV

For more information about Varroa mites and bee health visit:
ag.utah.gov/farmers/plants-industry/apiary-inspection-and-beekeeping

LARVA WITHOUT PMS



Healthy larva are c-shaped, pearly white, and plump.

LARVA WITH PMS



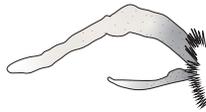
Larva with PMS are uncoiled, off-white, and deflated.

HEALTHY WINGS



Healthy wings are smooth, fully formed, and have clearly visible veins.

DEFORMED WING VIRUS



Deformed wings are small, shriveled, and appear wrinkled.

PUPA WITHOUT PMS



Healthy pupa are enclosed under capping until they hatch.

PUPA WITH PMS



Pupa with PMS are often uncapped because the bees are attempting to interrupt the mite life cycle. After uncapping, adult bees will eat the pupal head to recover protein.

CHEMICAL CONTROLS

If any colony in the apiary has too many mites, a chemical treatment of all hives will be necessary. Every mite treatment has different conditions for use, and most treatments require honey supers be removed from the hive before application. Be aware of environmental factors such as the ambient temperature and hive growth phase before applying treatments, as treatment efficacy depends on these conditions. No matter what chemical treatment you choose, **always read the entire product label and strictly follow the label's instructions.**

INTEGRATED PEST MANAGEMENT

Non-chemical control methods such as drone-brood traps, brood interruptions, and hygienic stock bees can provide an additional level of mite protection, and may reduce the overall number of chemical treatments required throughout the year. But these are not fail-safe methods. It is vital to consistently monitor Varroa levels and use appropriate chemical treatments to prevent mite infestations from exceeding 3% of the honey bee population; this is especially important between late summer and early fall.

WORKS CITED & FURTHER READING

UDAF Fact Sheet:
Parasitic Mite Syndrome V1.0 (2/2022)

DESIGNED BY



Choi, Y. S., Lee, M. L., Lee, M. Y., & Lee, K. G. (2008). Detection of Seven Bee Viruses from Varroa destructor Mite. *Korean Journal of Apiculture*.
 Delaplane, K. S., Berry, J. A., Skinner, J. A., Parkman, J. P., & Hood, W. M. (2005). Integrated pest management against Varroa destructor reduces colony mite levels and delays treatment threshold. *Journal of Apicultural Research*, 44(4), 157–162. <https://doi.org/10.1080/00218839.2005.11101171>
 Gregorc, A., & Sampson, B. (2019). Diagnosis of Varroa Mite (Varroa destructor) and Sustainable Control in Honey Bee (Apis mellifera) Colonies—A Review. *Diversity*, 11(12), 243. <https://doi.org/10.3390/d11120243>
 Honey Bee Health Coalition. (2015). Tools for Varroa Management. *The Keystone Policy Center*. https://honeybee-healthcoalition.org/wp-content/uploads/2015/08/HBHC-Guide_Varroa-Interactive-PDF.pdf
 Hung, A., Shimanuki, H., & Knox, D. (1996). The Role of Viruses in Bee Parasitic Mite Syndrome. *American Bee Journal*. <https://www.ars.usda.gov/research/publications/publication/?seqNo115=74184>

VARROA MITE MONITORING CHART

Use this chart to track your Varroa mite infestations and keep it for your records. Perform monitoring according to the schedule below. If you have five or fewer colonies, check all of them. If you have more than five hives, randomly select five hives to sample per beeyard.

Sampling Method	Mite counts					Treatments applied
	Hive 1	Hive 2	Hive 3	Hive 4	Hive 5	
Mar						
Apr						
May						
Jun						
Jul						
Aug						
Aug						
Sep						
Sep						
Oct						
Oct						

*Note that certain mite treatments cannot be applied when honey supers are present or during temperature extremes. Always read and follow the pesticide label before applying.