



The Managed Mentoring Program on getting started in beekeeping.

# Managed Mentoring



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## Monitoring for Varroa Mites

Lesson | Mite Monitoring



# What is Covered in this Module

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Mite Sampling Process Introduction

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Mite Sampling Run Through

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Interpreting Thresholds in Context

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HBHC Varroa Mite Management Tool

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# Presentation Overview

## □ Monitoring Background

- *Why Monitor*

- We will start with the basics of monitoring – what are we looking to achieve

- *Monitoring Methods*

- We will cover various methods and for reasons explained settle on the alcohol wash method for monitoring

- *How to perform an Alcohol Mite Wash*

- We will end with a step-by-step review of how to perform an alcohol wash
- We will provide an invaluable resource at the end of the lesson





# The Premise of Monitoring

## □ Thresholds

- *Mite monitoring is a proactive activity to forecast the percentage of mites in the colony population*
  - Beekeepers monitor mites by collecting bees, and 'washing' them of any varroa mites that are attached to the bee.
  - Additionally, random sampling can be conducted by opening capped larva and inspecting the contents of the cell to get a sense of varroa presence
- *It is an indicator process and not a foolproof way to fully understand the quantity of mites present in the colony*
  - But it is the best thing we have, and the standard of care in the industry



# Exceeded Thresholds

## □ Harm to the bees

- *It is perceived that when a certain percentage of mites is realized, then harm will come to the health and longevity of the colony*
  - Sampling is done on the basis of total mites found per 100 bees sampled
  - The calculation represents an estimate of the total mite population in the hive
  - If the percentage goes above recommended threshold, then treatments are warranted
- *Sampling must be done at periodic intervals*
  - The number one goal is to never allow the percentage of varroa mites to reach a population that inflicts damage on the health of the colony



# Did you Monitor?

## □ This is a very important question

- *Time after time, when beekeepers lose their colonies, the first question they are asked is **Did you Monitor?** .... and **what were your thresholds?***

## □ Bees will most definitely perish from Varroa Mites

- *If you are not monitoring...*

***You will be quite compromised to know the health of the colony.***

- Bee sometimes starve overwinter – this is completely preventable

*It might be a simplification to say, but it is quite true.*

*If your bees die overwintering, it is truly universal that it was from impacts of varroa mites.*





*Sick hives rarely  
present as abnormal*

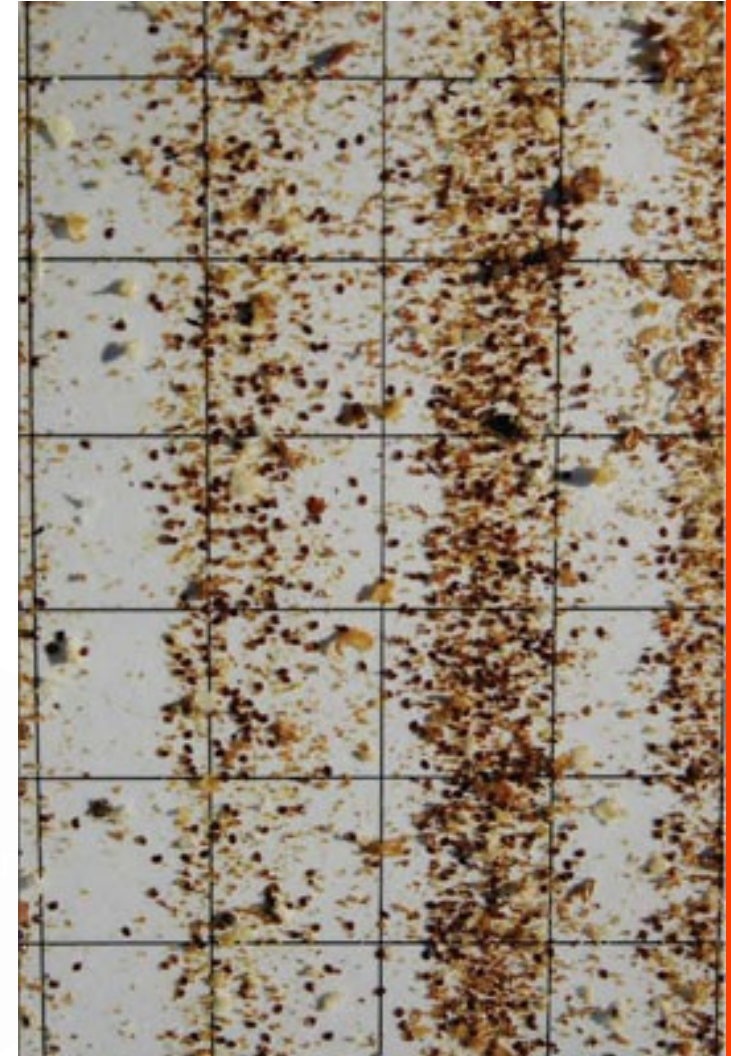
# Parasitic Mite Syndrome





# How Many Mites?

- Many methods have been devised
  - *There have been several mite monitoring methods devised*
    - The evolution of mite monitoring methods have progressed over the years.
    - The reason for the progression from one method to another was centered on accuracy and effectiveness/repeatability
      - In the beginning for example, we used to count varroa mites on **sticky boards** placed under the colony.
      - It was tedious, inaccurate, inconsistent, and quite frankly a lot of beekeepers loathed doing it, so it didn't get done.





# The Wash Method

## □ Sugar and Alcohol Washes

- *After years of review, the 'wash' method of testing won out*
  - To Wash the bees, they are sampled by volume (1/2 cup) and dumped into a container.
  - In the container is some substance that is used to free any varroa mites that are present on the bees and dislodge them for counting.
  - Two methods were conceived, powdered sugar or some form of liquid; rubbing alcohol being the primary choice
- *How washes are conducted*
  - You place bees in a container with a substrate (sugar or alcohol) and it serves to dislodge the mites from the body of the bees so they can subsequently be counted

*1/2-cup is  
equivalent to 300  
bees in a sample*



# Powdered Sugar vs. Alcohol

## □ Powdered Sugar is inferior for testing

### ● *Killing Bees*

- Of the two choices, beekeepers would prefer to use powdered sugar
  - The premise of substrate choice is an alcohol wash kills all of the bees in the sample.
  - Sugar serves to dislodge the mites, and make not mistake bees are harmed in the sampling method, but they do survive

### ● *Sugar Method is Flawed*

- The knock on the powdered sugar method is that it is not effective at dislodging mites
- Additionally, hot weather and humidity cause inconsistent results when powdered sugar is moistened during these conditions



# Alcohol Washes are the Standard

- ❑ To get an accurate reading use 'Alcohol'
  - *Researchers, and industry practice, have settled on this principle*
    - Over time it has proven out that using the **Alcohol Wash Method** is the most effective means for dislodging the mites from the bees in the sample
  - 'Alcohol'
    - When originally conceived, the substrate used in the sample by researchers was Isopropyl Alcohol (aka Rubbing Alcohol)
    - In time it has been noted that other fluids serve equally well.
      - ❑ Automotive windshield washer fluid has been accepted as an alternative as well as using low sudsing soaps.



# Mite Sampling Process Overview

## □ Steps for mite monitoring

1. *Prep your kit*
2. *Choose a brood frame*
3. *Sample 1/2-Cup of bees*
4. *Shake Vigorously to dislodge*
5. *Swirl and count*
6. *Calculate the percentages*



# Varroa Monitoring Kit



## Prep Your Kit

- A tub for collecting bees for sampling
- A measuring cup (1/2 Cup Size)
- Varroa Easy Check Device
- Rubbing Alcohol or some other suitable liquid
  - Blue Windshield washer fluid is another alternative...





# Choose the sampling Frame

- Choosing the right frame to sample is important
  - *Smoke the hive*
  - *Work your way into the brood nest*
  - *Choose a frame that has developing larva, on the cusp of being capped (the more mature the larva, the better the sample will be)*
    - Varroa mites want to enter into the cells just before the larva in development is capped.
    - Additionally, the varroa mites are on the nurse bees caring for the brood







**Good one?**

**Picking the right frame to sample**





**Good one?**



**Picking the right frame to sample**







**Good one?**

**Picking the right frame to sample**







**Good one?**

**Yes!**  
*Very Soon*

**^ Brood Preparation Area**

This area will soon be capped, and mites will go into the cell prior to capping.

**Picking the right frame to sample**





# Fill EasyCheck





# Select a frame





**Look for a queen!**





**Look carefully!**





**Cannot find the queen?**

**Shake off some of the bees**





**Move to container**





**Measure  $\frac{1}{2}$  cup**





300 bees = 1/2 cup





# Cover and Momentarily Set Aside





# Return Extra Bees & Close the Hive



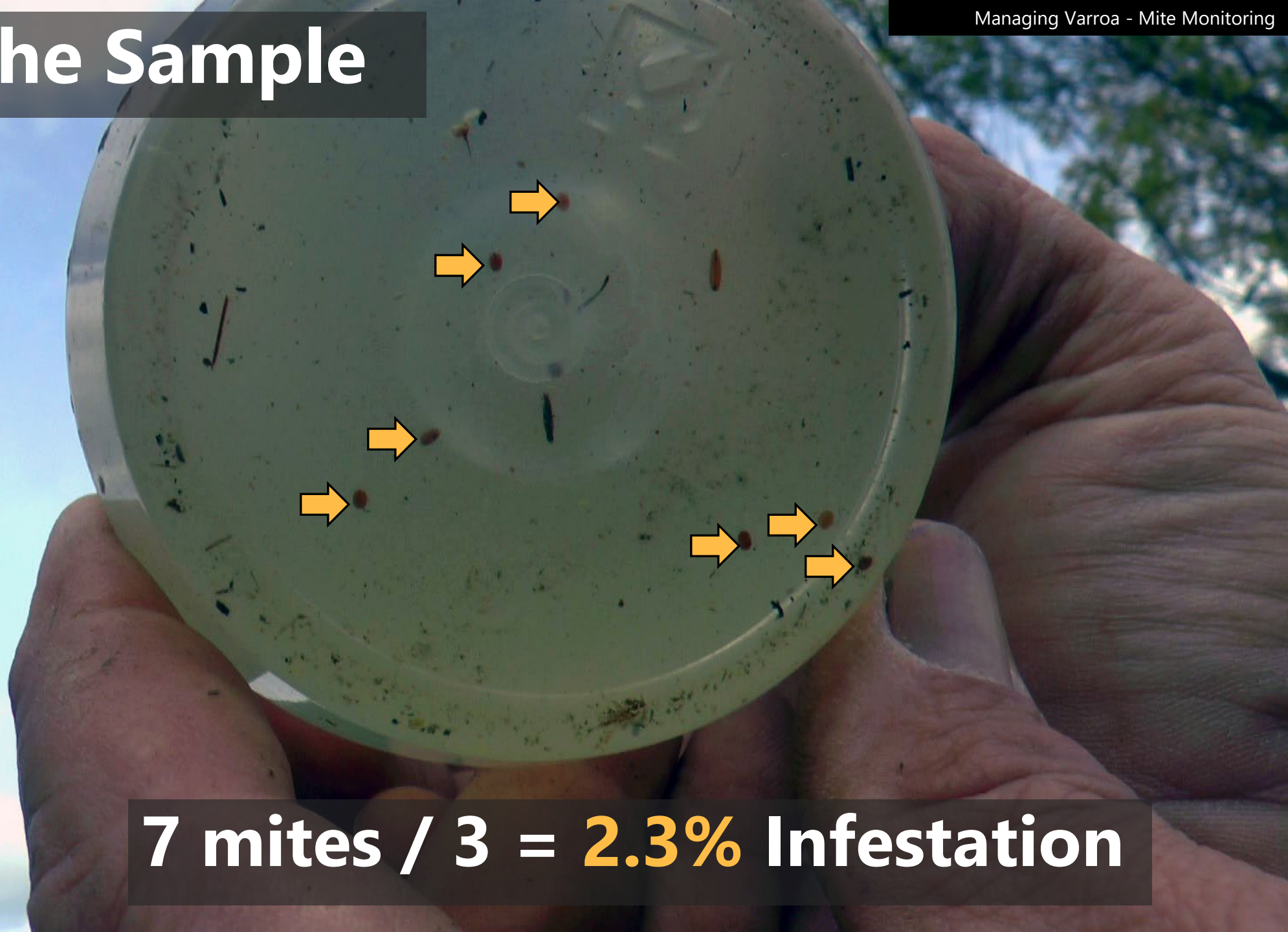




**Shake VIGOROUSLY**



# Mites in the Sample



**7 mites / 3 = 2.3% Infestation**

# Percentage Variations

## □ Percentage thresholds have changed over time

- *When the processes were coalescing, the percentage threshold for treatment were originally higher*
  - Over time the percentage threshold has dropped from previous highs to currently 2% and 3%.
  - This is attributed to notions that viruses have become more impactful and that damage inflicted by varroa mites is more harmful than in the past
- *Percentage recommendations vary*
  - No standard perse but the Honey Bee Health Coalition is the gold standard





# State of the Colony

## □ Mite Tolerance

- *Naturally colonies grow and contract across the seasons*
  - When bees are being produced at a prolific rate, mite infestations can be tolerated better due to the attrition of bees
  - When bees populations are static, or declining, mite impacts can be more detrimental (think summer into fall, fall into winter)
- *Percentages aim to take this into account*
  - Sometimes a 3% infestation is acceptable, and other times is too high
  - The Honey Bee Health Coalition has recommendations on Interpreting Sample Findings in the Varroa Management Guide



# ▲ A need to Monitor... *why not simply treat?*

## □ This is often a conundrum

- *Treating Proactively is Frowned Upon*

- Philosophically there has often been a stigma to monitor, and if only treat if samples indicate to do so.
- Doing otherwise is irresponsible. It is synonymous with taking medicine proactively and risking resistance to treatment options.

- *But mite problems are real, and thresholds will be high, it is a given*

- In our experience, this is often true, **but not always**
- After a decade plus of observation, it is true that for some reason mite presence is lower in some seasons and treatments would not be warranted.





# Monitoring Expectations

## □ You could time your monitoring

- *Treat, Monitor for results*

- The only true way to know if a treatment was effective is to monitor post treatment.
  - Treatments are not 100% effective.
  - Different circumstances prevent treatment effectiveness (ex. How many mites were under capping, and did they find a way not to be exposed to the treatment?)
- If you monitor, and the mites are knocked down, you might buy a window – but the mites will come back
  - Proactive monitoring during **population cycle changes** simply makes sense



# Monitor before the Perfect Storm

## □ Mite Population Peak during Population Decrease

- *When the spring nectar flow declines, the mites are hitting their stride.*
- *This is where mite impacts compromise colony health*

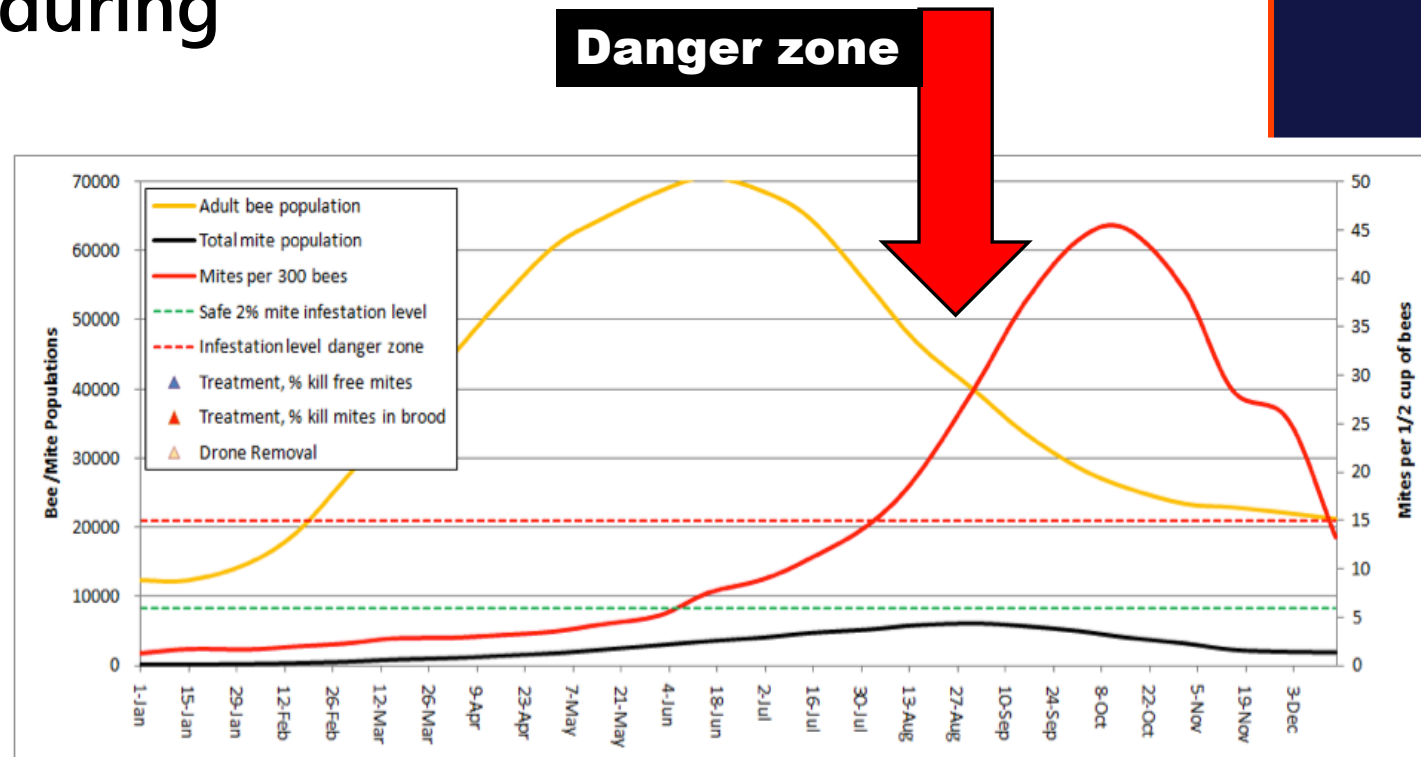


Image credit: Randy Oliver – Scientific Beekeeping





# Winter Bees are Imperative

## □ Population and Resources Mask Problems

- *Many colonies can live with problems during population growth*
  - New bees born every day take the place of any compromised bees

## □ Winter Bees are not as fortunate

- *During the summer and fall months, the plethora of new bees are not happening.*
  - Impacts are more prevalent to the population when the replacement pool is not as abundant.

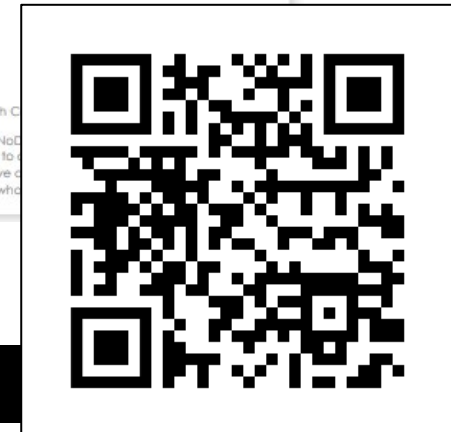
*Winter Bees are  
made in summer  
and fall*



# Varroa Management Resource Website

## Honey Bee Health Coalition

- *A free resource with an abundance of resources for understanding and managing varroa mites in beehives*
  - Instructions, pest insights, how to videos, decision guide, and more
  - A key resource for varroa management and more



<https://honeybeehealthcoalition.org> >





# Closing Comments

- **Customary Close**
  - Where we stand, where we are going...
    - *This module closes out some of the philosophical reasons to monitor and treat as well as how to conduct a mite wash*
    - *Our next topic moves to the preparatory steps for getting started:*
      - Varroa mite treatment options
      - Small hive beetles as pests of the beehive
      - Summer Management



# Q&A

- **What Questions did we not anticipate?**
  - If you have feedback, you can leave a constructive comment; but be nice.
  - You could also send an email to [comments@managedmentoring.com](mailto:comments@managedmentoring.com)
    - *Please refer to this video in the subject so we know what the reference is.*

