



Sunshine Hill Farm, LLC

Responsible Treatment Free Beekeeping | 10/19/2026



Pawtuckaway Beekeepers Assn.
October Monthly Meeting

OCTOBER 19, 2026

Responsible Treatment Free Management

Pawtuckaway Beekeepers Association – June 24, 2025



15+ year hobbyist beekeeper – 15 to 20 hives

EAS Master Beekeeper

Past President – NWNJBA

Day Job > IT Administrator, Paper Strategies Inc

INTRODUCTION
– Kevin Inglin

Our Home Yard



**EASTERN
APICULTURAL
SOCIETY**



Susquehanna Beekeepers Association



Maryland State Beekeepers Association
Dedicated to beekeeping since 1908

Montgomery County
BEEKEEPERS
Association



**THANK YOU FOR
THE OPPORTUNITY**



Essex County Beekeepers Society, Inc



This >
Saturday!

NOV
2026 >



JAN >
2027

The **BEE**
27
EXPO

MANAGED MENTORING PROGRAM

FOR GETTING STARTED IN BEEKEEPING

A free program for getting started in beekeeping. For clubs and new beekeepers.



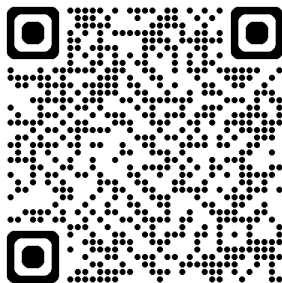
Teaching beekeepers from scratch....

- I want bees, to bees in the box
- Bees in the box to box full grown
- Full grown to overwinter
- Start of season two and all that follows

**Self-Serve Succinct Video Lessons
Supported with Online Meetings**

Clubs can organize period in-person visits

www.managedmentoring.com



THE BEEKEEPERS CORNER PODCAST

THE VIBE IS TWO BEEKEEPERS MEET AT THE CORNER COFFEE PLACE



BKCORNER

THE BEEKEEPERS CORNER
PODCAST

www.bkcorner.org

First episode – April 2010

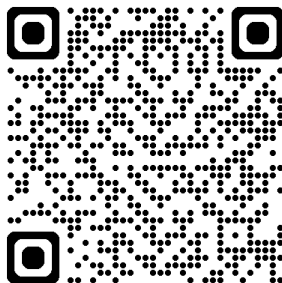
305 Episodes and still going strong

Focus on hobby beekeeping topics, colony management and industry news coverage

Many interviews with prominent beekeepers over the years in the back catalog

AVAILABLE ON ALL PODCAST PLATFORMS

www.bkcorner.org



The Slides are Available

PRESENTATION ACCESS

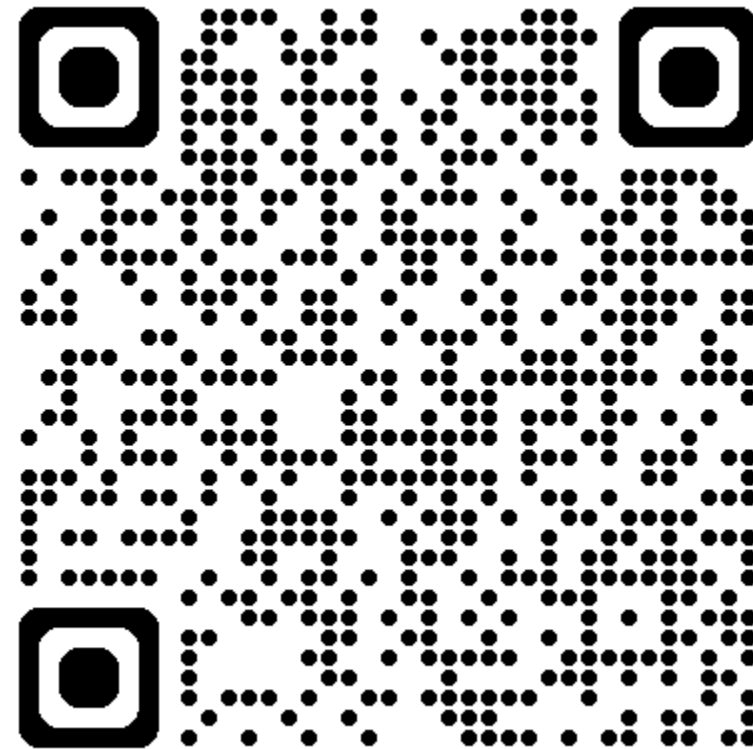
- This presentation is available for download

Visit **BKCORNER.ORG**
Click PRESENTATIONS

- I always provide my presentations so you can refer to them later

To save you the trouble of taking photos of slides you may want to reference later, we've made the full presentation available online

Please feel free to access it anytime through our website.



WARNING: This a deep dive on the subject

- Take it in; Enjoy the ride
- Consider your point of view
- It is meant to make you think
- It is a large amount of information
- It shares a lot of data points
- Let it stimulate your perspective of how to think of this topic

I will periodically stop and ask for questions



VARROA MITES TODAY

Rethinking Our Relationship

16



VARROA CAUSE HARM

Understanding the Potential for Harm

16



THRESHOLDS

Is mite monitoring a viable indicator?

28



EXPLORING COLONY EVOLUTION

Are today's bees better equipped?

27



EXAMINING TREATMENTS

Is it the right time to consider a change?

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POPULATION DYNAMICS

Colony tolerance to Mite Impacts

50



CYCLICAL LOSSES

The risk of losses increases over time

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LOW TREATMENT APPROACH

My Tweak on Treatment Free

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ADDRESSING MITE BOMBS

Reexamining Mite Bombs > Robber Lures

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PROXIMITY & ISOLATION

Pockets of isolation aid in genetic stabilization

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TF MANAGEMENT TAKEAWAYS

Summation of the Concepts

112



VARROA MITES TODAY

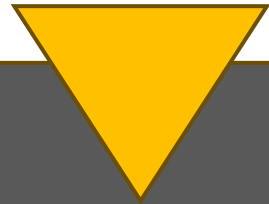
Rethinking Our Relationship

1987



**Varroa Mites
discovered
in Florida**

1987



**Varroa Mites
discovered
in Florida**

The craft of
beekeeping
changed
drastically
with the
introduction
of Varroa
Mites

Impressions of the time

1990s

This is a
DIRE CRISIS
For the U.S.

*Bees will not
evolve fast
enough*

*The food
chain is in
peril!*

Government
will find a
solution

We will solve it
through science
and research

The collective stakeholders assessing the problem reviewed the options

Incidentally, Some did speak up
and say...The Bees will find a way
Let nature tackle the problem

This is a
DIRE CRISIS
For the U.S.

*Bees will not
evolve fast
enough*

*The food
chain is in
peril!*

Government
will find a
solution

We will solve it
through science
and research

The collective stakeholders assessing the problem reviewed the options

- Consensus advocated for the treatment path
- **Much of it was predicated on the evolution factor**

The position to treat is presently still
the prevalent industry guidance

Fast Forward

▶ 39 Years

- **If you review beekeeping today, you can still see...**
 - Treatment is still the norm, but it is not a panacea
 - Unlike the 90s.... **Treatment Free is no longer in the shadow**

This presentation is going to explore the dynamics and viability of going treatment free



Let's explore how mites impact bees, and consider options and tactics for today's beekeeping

VARROA CAUSE HARM

Understanding the Potential for Harm

Underlying Varroa Mite Impacts to Colony Operations

Varroa Mites Cause Damage

- Varroa Mites Wound Bees
- Varroa Vectors **Viruses** which harm larva and adults

Harm to the Superorganism

- Bees die prematurely
- Sick bees do not produce

Population Dynamics Matter

- Summer Impact
- Winter Impact

Underlying Varroa Mite Impacts to Colony Operations

Varroa Mites Cause Damage

- Varroa Mites Wound Bees
- Vectoring Viruses

Harm to the Superorganism

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Underlying Varroa Mite Impacts to Colony Operations

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- Vectoring Viruses

Harm to the Superorganism

- Bees die prematurely
- Sick bees do not produce

Population Dynamics Matter

- Summer Impact
- Winter Impact

We must take into account the colony development stages

THRESHOLDS

Is mite monitoring a viable indicator?

ECONOMIC THRESHOLDS

WHEN DOES THE MITE LOAD BURDEN CAUSE IRREPRABLE HARM?

- **We monitor mite counts to assess risk**
 - The ratio of mites in a half cup sample represents the economic threshold of harm
 - In layman's terms, the impact of the mites to the colony is such that it is in your best interest to intervene
 - When it is too harmful, it is beneficial to invest the time and expend the effort if the ratio is exceeded in a sample
 - The mite monitoring process **is the key tool** to gauge if our bees are being irreparably harmed

Terminology

Economic Threshold: The density of a pest at which control treatment will provide an economic return.

A Quick Poll

A Quick Survey

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Post a note in chat....

For those that have bees already...

- Have you ever lost a colony over winter while it was carrying mites **below** the threshold?
- Have you ever had colonies that survived the winter while carrying mites **above** the threshold?



False Positive

Even if you monitor

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False Positive

Even if you monitor

24



☐ Varroa mites hiding in plain site

- ☒ Mites under capped comb do not show up in mite samples! Mites on drones (are they sampled?)

CONSIDERING THESE POSSIBLE FLAWS IN THE MEASUREMENT

□ **With some possible gaps in monitoring...**

- Is it possible that we are giving hives that should be treated a pass?
 - If we monitor and do not get a threshold for treating – were we misled because of mite dynamics?
 - This nets out to some one-off treatment free hives

Think back as you consider these questions....

Do you keep track?

- Do you always treat your hives, 100% of the time?
- Have you ever found that a hive did not warrant treatment?
- Is this not a form of treatment free beekeeping?
- How much of this is going on presently?

THE TAKEAWAY

**The mite monitoring process
might be allowing colonies
with high mite loads to slip
through, and they are
surviving!**

EXPLORING COLONY EVOLUTION

Are today's bees better equipped?

LET'S TALK ABOUT THE BEES TODAY, IN 2026



- **Tom Seeley – Arnot Forest**
 - Tom summarized high impacts to feral colonies from initial varroa devastation
 - Data in the 90s > high impacts
 - Reversal in the forest area
 - Data indicates the impacts from the 1990s has seen recovery
 - His data from 2000s indicate recovery *and* natural resistance without human intervention

COLONY EVOLUTION

HYGIENIC BEES, TRAITS, AND TOOLS



□ Mite Defenses & Tactics

- Bees of today have developed varroa mite defenses
 - Ankle biter bees
 - Varroa Sensitive Hygiene
 - Pol Line Bees

□ We have new tools at our disposal

- Ubee-O & Bawden Assays...
 - Testing procedures that inform how hygienic a colony is

COLONY EVOLUTION

RECOVERY AND DENSITY OF FERAL BEES

□ **Feral vs. Managed**

- The latest census put feral bees between 2.5 and 2.7 million colonies in the US¹
- Feral numbers are not documented – Good guess: hundreds of thousands

□ **Some speculation that is is higher**

- Some estimates suggest there might be up to one million feral colonies in the United States



COLONY EVOLUTION

RECOVERED FERAL COLONIES CONTRIBUTE TO THE EVOLUTION

□ Feral colonies

- If Seeley's conjecture rings true: The recovery of feral stock is a factor on colonies overall
- These unmanaged bees are providing their genetics to the colonies in the U.S.
- They are all around us

Feral Bees it seems are our silent partner in the treatment free genetic pool



39Years

THE TAKEAWAY

It has been 39 years.
Perhaps the turning point is
already in play. Is it time we
rethink our treatment
approaches?

EXAMINING TREATMENTS

Is it the right time to consider a change?

GETTING INTO THE GAME of BEEKEEPING

34

STARTING TREATMENT FREE (INNOCENTLY)



- **This happens every year**
 - Someone buys a kit as a gift
 - It is a shot-in-the-dark gift for someone who might have said something one day
 - The person receiving the kit knows nothing about beekeeping
 - This includes anything about varroa mites
 - ***They start beekeeping treatment free!***
 - They buy bees and put them in the box. It proceeds from there

GETTING INTO THE GAME of BEEKEEPING

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STARTING TREATMENT FREE (BY CHOICE)



☐ Others do it by choice

☒ Some do research

- They know about treatments and they also have seen information about withholding
- They purposefully choose not to put treatments
- They want a more natural experience
 - ☐ Or they judge treatments to be misguided
 - ☐ Some start, fail and quit; never considering treating – its just not in their DNA

GETTING INTO THE GAME of BEEKEEPING

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THE MAJORITY ARE COACHED THAT TREATING IS RESPONSIBLE



- **They follow the norms**
 - They learn treatment keeps bees from dying
 - Beekeeping is expensive
 - Dead bees do not make honey
 - Treatments make beekeeping viable (...sustainable)
 - Monitor, and treat if necessary

ONCE YOU ARE IN, DO YOU HAVE TO STAY THE COURSE?

37

SOME DESPARATELY WISH THEY COULD STOP TREATING



- **They treat and follow norms**
 - Many wish to switch, but are apprehensive
 - They practice treatment beekeeping, but harbor a curiosity for treatment free
 - They are risk averse but see others doing it and have a curiosity about feasibility

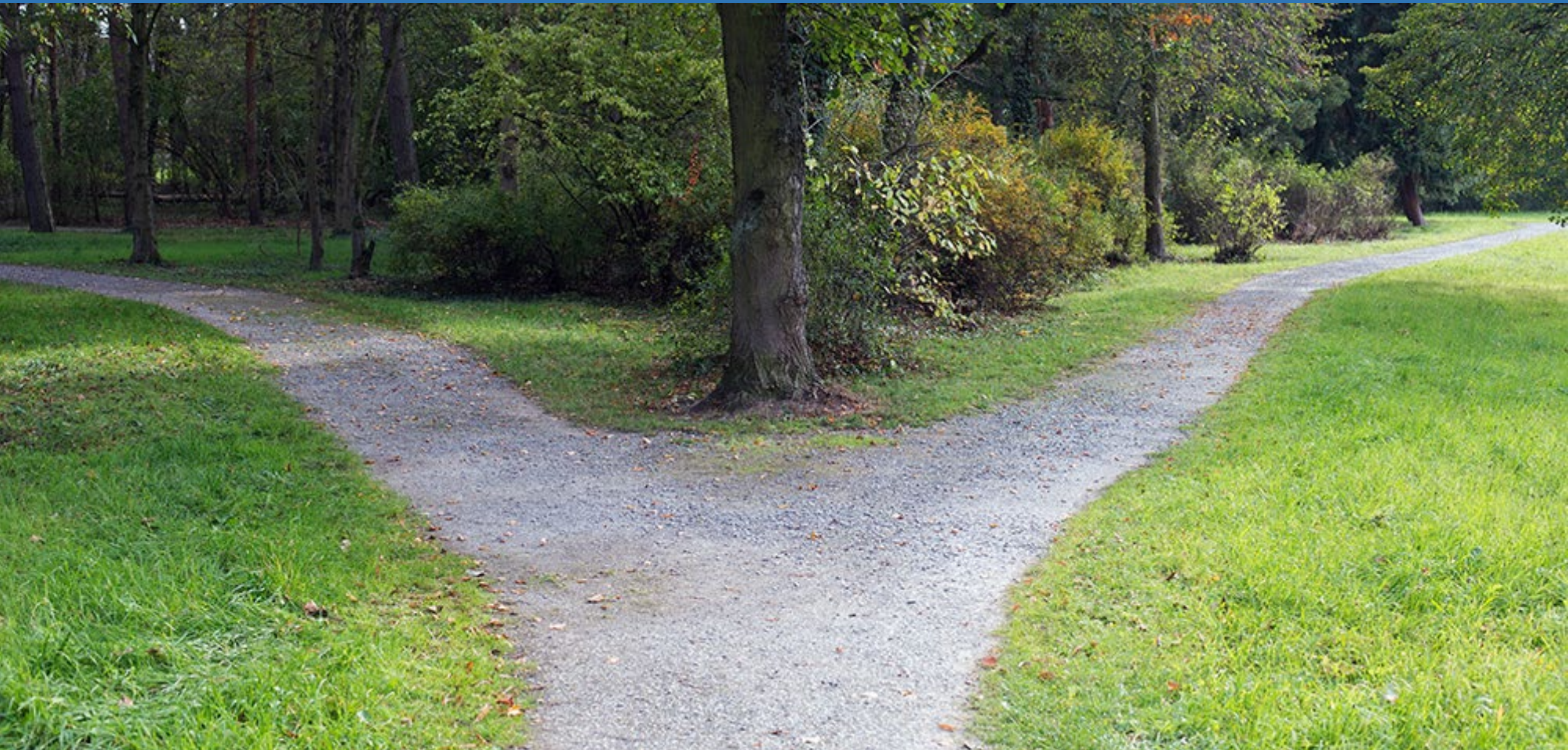
“Could you envision switching your practices to adopt treatment free style management?”

LET'S EXAMINE SOME OF THE FACTORS

EXPLORING THE PATH OF GOING TREATMENT FREE (TF)

39

THERE IS LITTLE TO NO PRACTICAL ACADEMIA GUIDANCE



EXPLORING THE PATH OF GOING TREATMENT FREE (TF)

T H E R E I S L I T T L E T O N O P R A C T I C A L A C A D E M I A G U I D A N C E

□ **No Textbooks, No Government Brochures**

- Community based support
- If you want to be treatment free: Most resources are in the form of forums, Facebook pages, some websites, and a sampling of social media outlets

□ **TF Styles are diverse**

- Support for treatment free practices vary depending upon where you engage: philosophy, structure, guidance – guidance diverges widely at times
- Illustratively – TF is not too dissimilar to practices of food preference choices
- There are distinct differences between a vegan, vegetarian, pescatarian, etc.

WHAT EXACTLY DOES IT MEAN TO BE TREATMENT FREE

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WHAT CONSTITUTES A TREATMENT? DIFFERENT ALTERNATIVES

Let's review a few common variations of styles that withhold treatment altogether or use less conventional methods

These are illustrative

Note that there are many variations on approaches

Strict Treatment Free

- **No treatments, *including...***
 - No splits
 - No soft chemicals
 - No packages
 - Feral bees rule, etc.

The “James Bond” Method

- Live and Let Die, period

Treatment

- A more l...
with res...
- Still N...
- Moni...
done
- Some...
are pe...

Still 'Live a

Strict Treatment Free

- **No treatments, *including...***
 - No splits
 - No soft chemicals
 - No packages
 - No stock selection (survivor!)
 - Feral bees rule, etc.

The “James Bond” Method

- Live and Let Die, period

SOURCES AND INFLUENCES

- Ed and Dee Lusby
- Kirk Webster
- Facebook Treatment Free Group (Solomon Parker/ Bruce Rodriguez)
- Sam Comfort (Anarchy Bees)

■ Still No Treatments

- Monitoring optional, often not done
- Some management practices are permissible

Still ‘Live and Let Die’

Treatment Free *(with concessions)*

- **Natural Select & Genetic Resilience**
 - Still No Treatments
 - Monitoring Mites is conditional
 - Survivor Stock/Local Survivors
 - Genetic Stock Selections
 - Some management practices are permissible

Still 'Live and Let Die'

SOURCES AND INFLUENCES

- Michael Bush/Dee Lusby Era
- James Lee – Northern Queen Initiative
- Corey Stevens – Sevens Bee Company

- **Not traditional treatment free per se**

- It does however forgo the industry treatment options
- Often it has a slant toward essential oils and biodynamic practices

Biodynamic Beekeeping

- ❑ **Soft Chemicals**
 - Allowance for natural products
- ❑ **Not traditional treatment free per se**
 - It does however forgo the industry treatment options
 - Often it has a slant toward essential oils and biodynamic practices

SOURCES AND INFLUENCES

- Rudolf Steiner's lectures (1923)
- Gunther Hauk's "Toward Saving the Honeybee" [Spikenard Farms]
- Melissa Garden Institute practices.

- ❑ **Natural**
 - Hive equipment that aids in better alignment with biology
 - Top Bars, Vertical hives, Bee Trees
 - Methods that imparts more natural Handling
 - Top Bar, Natural Materials
 - Low Impact management
 - Focus on Bee Biology Alignment

Natural Beekeeping

□ Natural Leaning Methods

- Hive equipment that aids in better alignment with biology
 - Top Bars, Vertical hives, Bee Trees
- Methods that imparts more natural Handling
 - Low Impact management
 - Swarming is permitted
 - Focus on Bee Biology Alignment

SOURCES AND INFLUENCES

- Phil Chandler's "The Barefoot Beekeeper"
- Ross Conrad's "Natural Beekeeping"
- Michael Bush's "The Practical Beekeeper."
- Less Crowders / Nathalie "B"
- Jacqueline Freeman
- Leo Sharashkin

the rest

- Use the treated hives as stock to requeen and make into survivor hives

Toward Treatment Free

☐ **Treat Thresholds**

- Treat on your way to treatment free
 - Monitor and treat those that exceed thresholds – sustain with the rest
 - ☐ Use the treated hives as stock to requeen and make into survivor hives

SOURCES AND INFLUENCES

- Tom Seeley
- Marla Spivak
- Meghan Milbrath

LET'S COME BACK TO THIS – AFTER SEEING ALL THAT

*If you are not already treatment free,
I'll ask again* “Could you envision
switching your practices to
adopt treatment free style
management?”

For the majority, the **toward treatment free** approach
would be the most practical and approachable

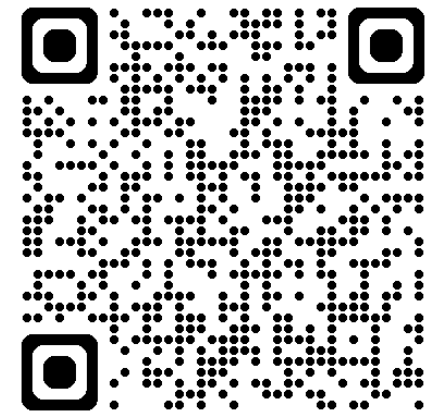
Save Lives - Monitor Hives

[Bee Culture: July 1, 2019]

Meghan Milbrath

– Toward Treatment Free article: Bee Culture

See the July 2019 Bee Culture article on page 54 entitled:
SAVE LIVES!, MONITOR HIVES!



- Available online: <https://www.beeculture.com/save-lives-monitor-hives>

CONSISTENT BETWEEN ALL OF THE METHODS

- **There is overlap in these methods, but also clear differences**
 - Almost all agree on these foundational principles
 - Colony health and nutrition is beneficial
 - Bees in good locations, and are bees that are healthy, out perform less fortunate bees
 - Use good bees
 - Breed from survivors, Source Feral Bees, Use prime swarms, setup bait traps in your apiary
 - Swarming is natural
 - Swarms are a sign of strength – catching your swarms, or supplying them to the neighborhood (responsibly I might add) is a long term benefit to your operation
 - Mimicking Nature is a better choice
 - Avoid manipulations that aid bees that are performing poorly – let nature run its course
 - Treatments alone cannot solve Varroa mite impacts long term

POPULATION DYNAMICS

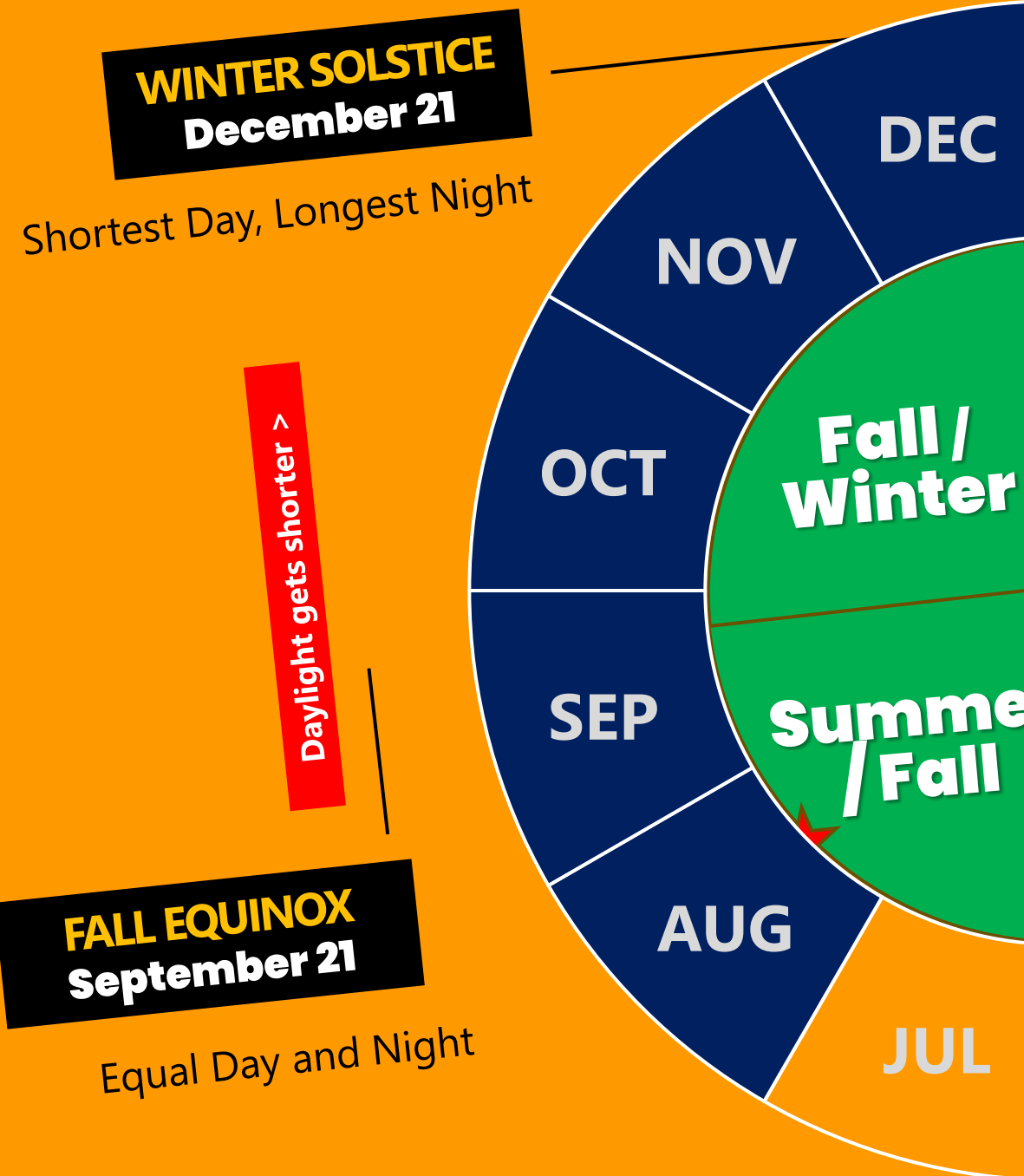
Colony tolerance to Mite Impacts

“Responsible management
lies in *understanding when
risks are the highest* and
maintaining vigilance”

BUILDING A PROGRAM

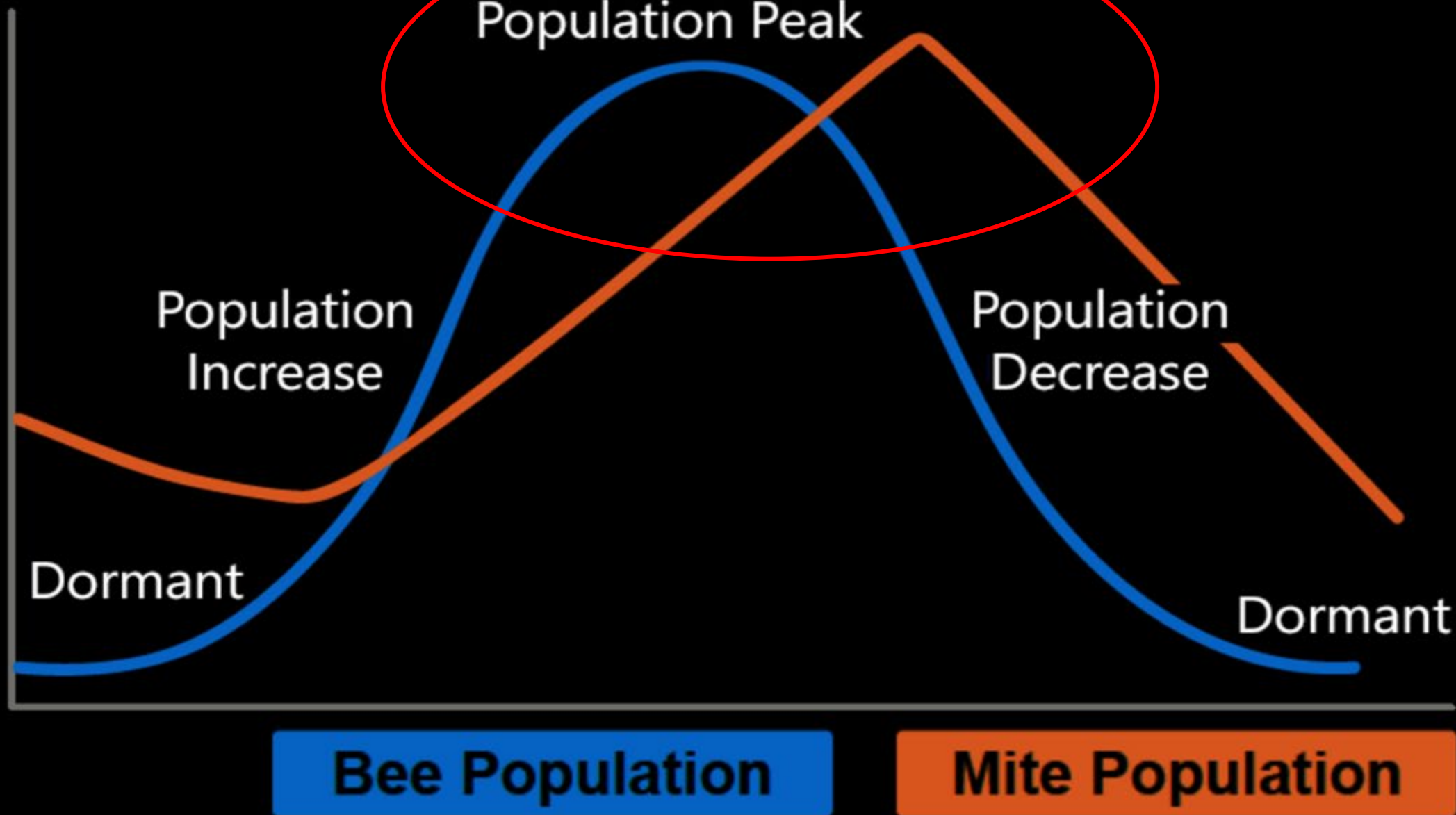
ADDRESSING THE RISKS

- **By my way of thinking**
 - Any program you design must address June - December
 - Bees do quite well during spring
 - Optimal conditions
 - The second half of the year is harder
 - Winter bees are a big factor in the equation



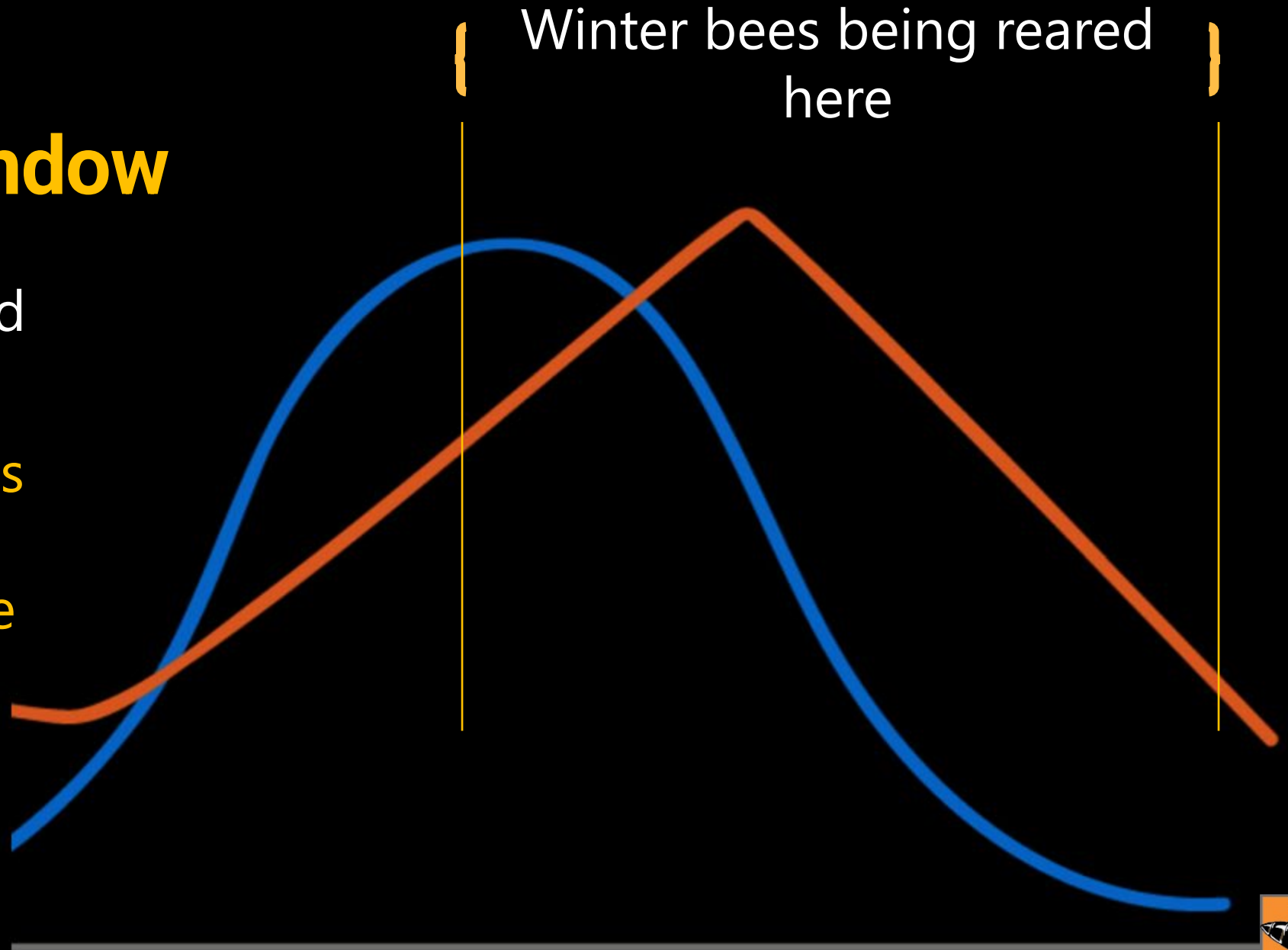
Varroa Mite Interaction

- Make note of the lag



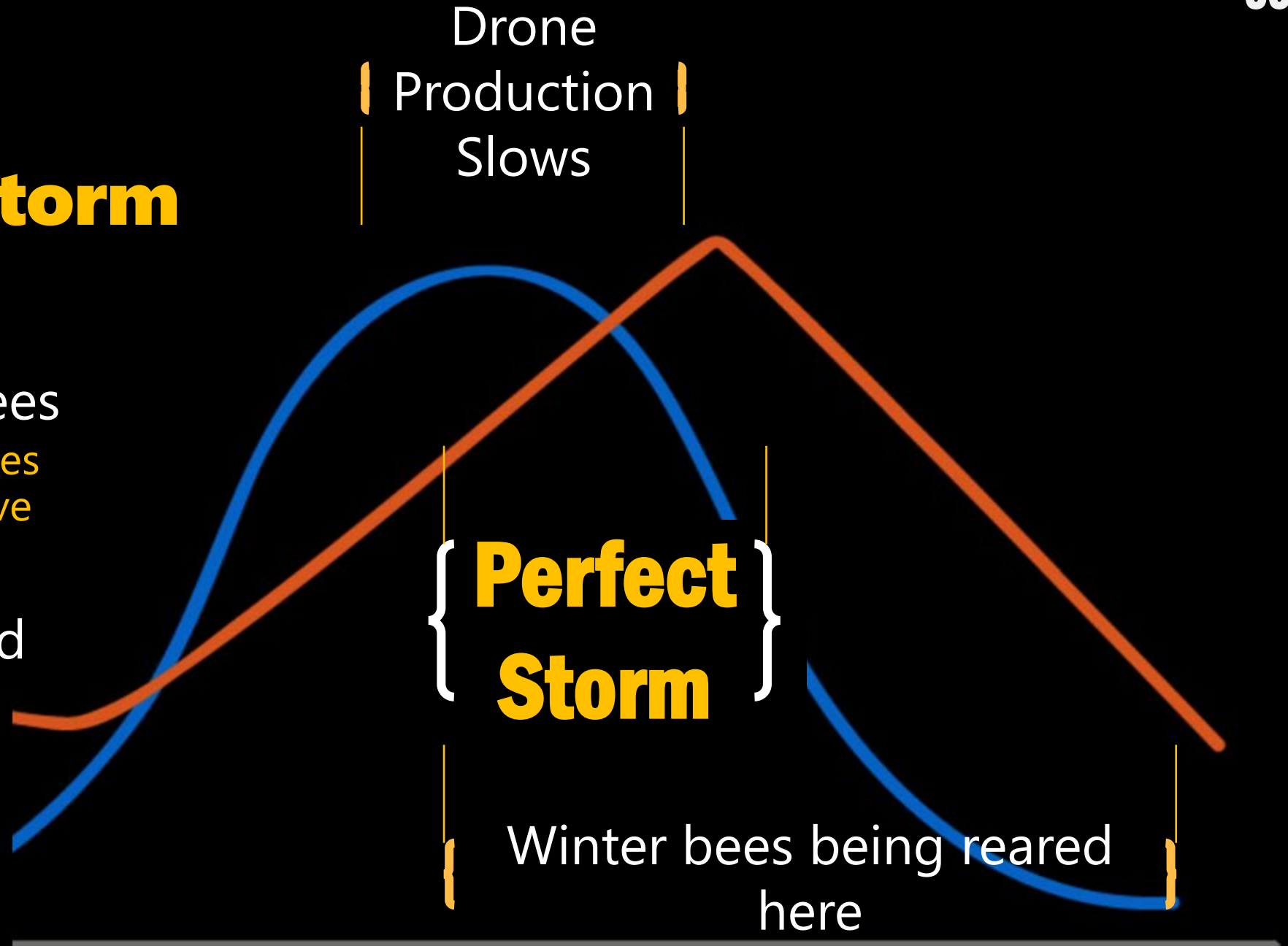
Winter Bee Window

- Winter Bees reared in this timeframe
- If mite populations are not addressed winter bees will be compromised



The Perfect Storm

- Mites on Drones switch to nurse bees
 - There are less drones present so they have no choice
- Winter Bees reared in this timeframe are compromised



The Perfect Storm

Drone
Production
Slows

{ Perfect Storm }

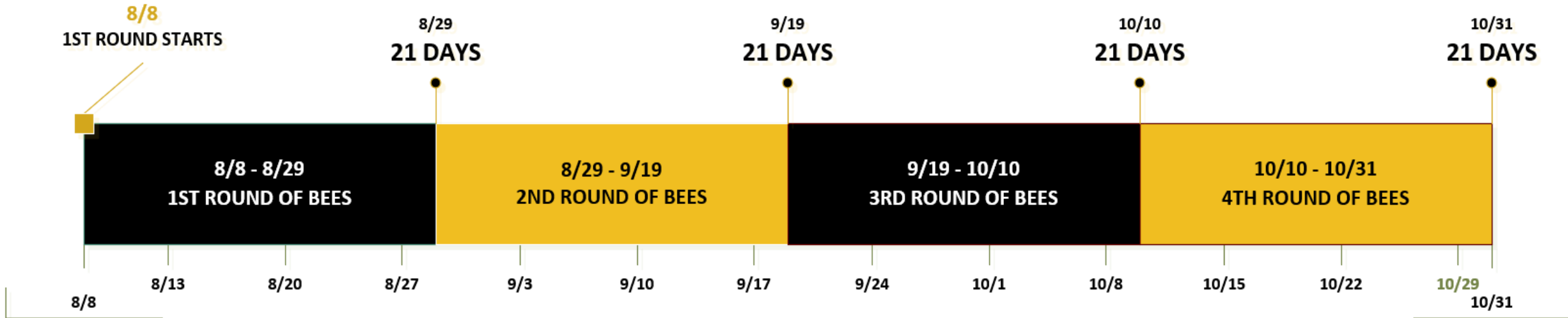
Winter bees being reared
here



Protecting Winter Bees (Timing)

□ August through October

- If a bee takes 21 days to emerge.... Then there are about 4 to 5 generations of bees before winter bees are established
- In this time period bees change over from short term lifespans to ones that will live overwinter – they physically change in several ways

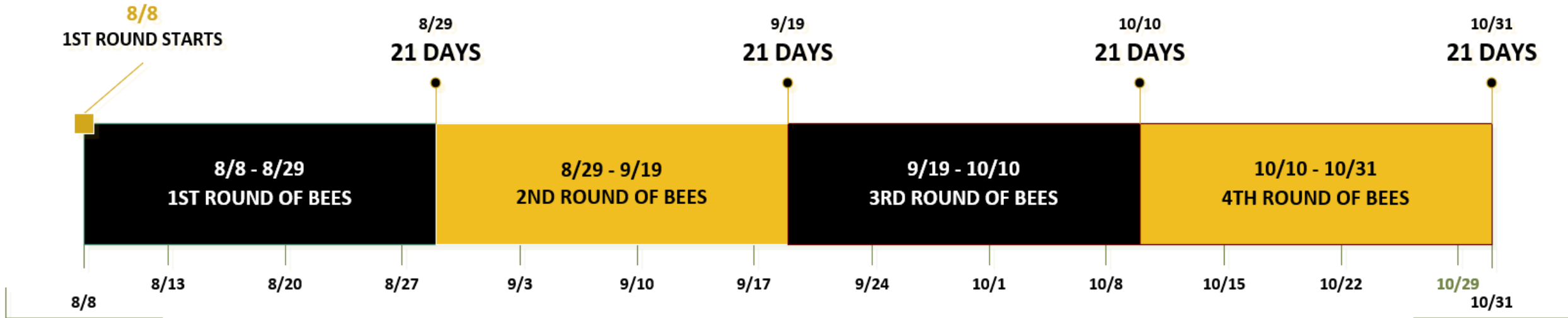


Winter Bees

We would benefit from generations of CLEAN Bees to overwinter

□ 4-Cycles (of 21 days)

- In the mid-Atlantic the first frost can come as early as Nov 1.
 - Some years it turns cold by Nov end or mid December
 - Since we cannot tell, we plan for Halloween (Oct 31)
 - By Halloween, we want our bees fat and happy
 - And we want all honey ripened and pollen stores flush throughout the comb.



WHEN COLONY RISK IS THE GREATEST

SUMMATION: THE SECOND HALF OF THE YEAR IS THE CONCERN

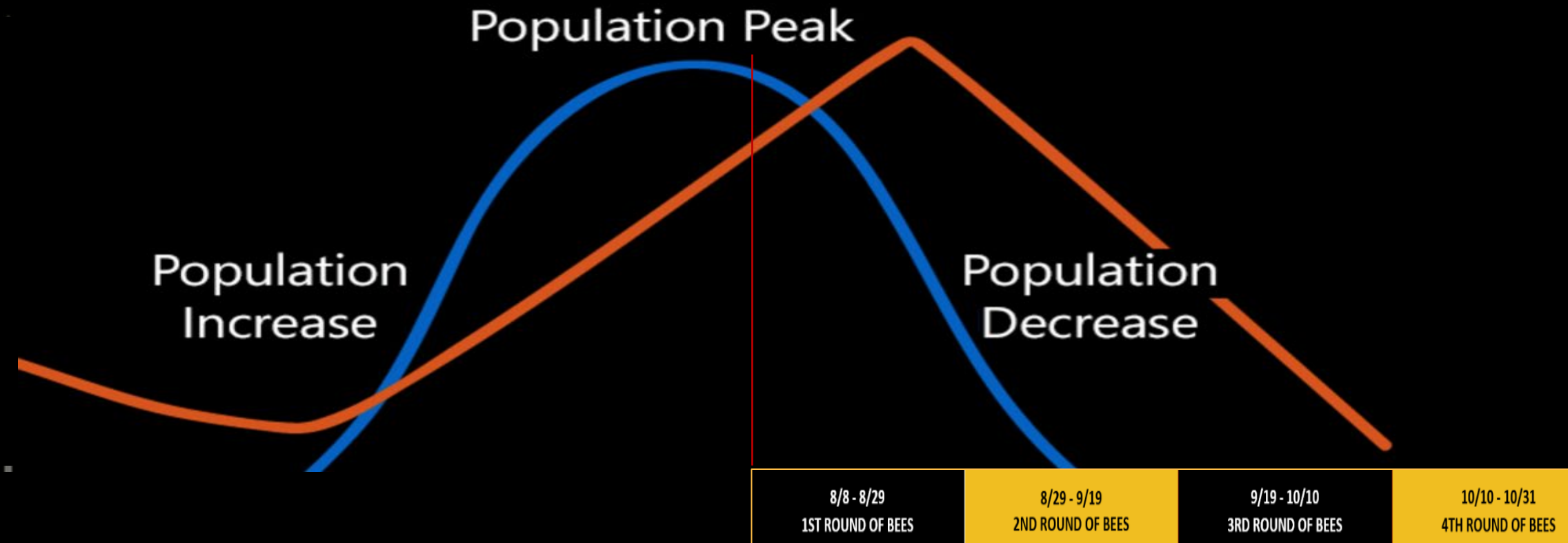
Low Risk

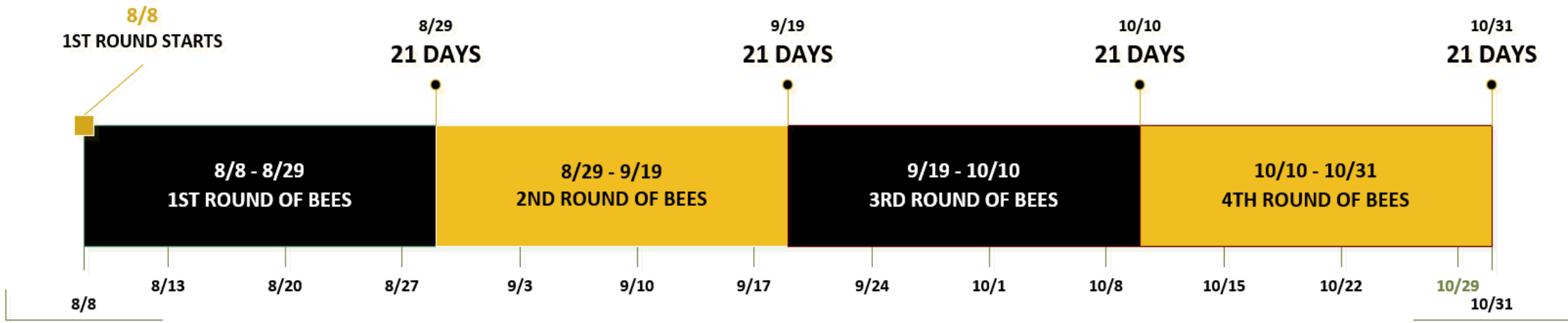
- *Colony Growth*
 - Low mite counts with high population of recycled 'fresh' bees

Higher Risk

- *Colony Decline* through Overwinter
 - Possibility for high mite impacts and compromise to the ability for a colony to overwinter

MITE RISK





{ This is the **high risk window**. The period to **monitor the apiary for disease and mite impacts** }

□ Beekeeper Vigilance

- If in this window the bees are compromised in some way – **intervene**
 - Compromised bees will struggle to get through the winter
 - At minimum, if you have bees that are not optimal here, you know the colony is a watch

LET'S TAKE A PAUSE FOR A

QUESTION CHECK-IN



CYCLICAL LOSSES

The risk of losses increases over time

PUBLISHED APRIL 13, 2023

scientific reports

Article | [Open access](#) | Published: 13 April 2023

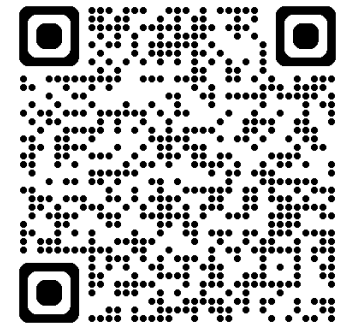
A longitudinal experiment demonstrates that honey bee colonies managed organically are as healthy and productive as those managed conventionally

[Robyn M. Underwood](#) , [Brooke L. Lawrence](#), [Nash E. Turley](#), [Lizzette D. Cambron-Kopco](#), [Parry M. Kietzman](#),
[Brenna E. Traver](#) & [Margarita M. López-Urbe](#) 

[Scientific Reports](#) **13**, Article number: 6072 (2023) | [Cite this article](#)

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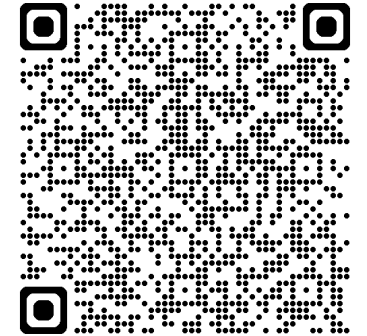
11k Accesses | **18** Citations | **78** Altmetric | [Metrics](#)



Study Link

□ **Penn State Three-Year Study Overview**

- Penn State entomologists conducted a longitudinal study comparing different methods
 - Comparisons of conventional, organic, and chemical-free beekeeping management systems
 - The “Chemical Free” track is equivalent to “Treatment Free”
 - The research involved nearly 300 honey bee colonies on 8 certified organic farms across Pennsylvania and West Virginia
 - This was done in collaboration with 30 experienced beekeepers.
 - Conducted evaluations on honeybee health, productivity, and colony sustainability.



Penn State Website Summary

OVERVIEW OF THE METHODS

Conventional

Allowances for synthetic and natural chemicals, antibiotics for pests/pathogens

Organic

Uses only mechanical and non-synthetic chemical treatments (e.g., formic acid, oxalic acid, thymol) when thresholds are met

Chemical Free

Relies primarily on colony genetics and cultural / mechanical controls, avoiding most chemical interventions

COLONIES WERE MONITORED FOR

□ Methodologies

- Colonies were monitored for:
 - Overwintering survival
 - Honey production
 - Parasite and pathogen load [Varroa mites, Vairimorpha ceranae (aka Nosema Ceranae), deformed wing virus]
 - Expression of immune-related genes as biomarkers of bee health
- Varroa mites were managed using IPM in the organic system,
 - These were triggered when mite thresholds were exceeded
 - Oxalic acid and formic acid treatments applied strategically as the organic treatments

REVIEWING THE OUTCOMES

□ Survival:

- Organic and conventional systems increased winter survival by >180% compared to chemical-free colonies.
- **Chemical-free management had the lowest winter survival (~27–30%).** —

UM OUCH!

□ Honey Production:

- Organic: ~50 kg per colony over three years.
- Conventional: ~46 kg per colony.
- Chemical-Free: ~23 kg per colony.

□ Parasite & Pathogen C

- Organic and conventional systems effectively reduced Varroa, Nosema levels, and viral loads compared to chemical-free colonies. Immune gene expression was higher in organic and conventional colonies, indicating reduced phy

REVIEWING THE OUTCOMES

- **Parasite & Pathogen Control:**
 - Organic and conventional approaches effectively reduced Varroa mite loads, Nosema levels, and viral infections compared to chemical-free colonies.
 - Immune gene expression was lower in organic and conventional colonies, indicating reduced physiological stress.

CHEMICAL FREE (Akin to TREATMENT FREE) DID NOT FARE WELL

Organic beekeeping can
match or exceed
conventional methods in
colony health and
productivity without
routine synthetic
chemical use

[SHOW NOTES](#)

Episode 214 – Leap Of Faith

Bkcorner 4 Years Ago 0 1 Mins

POSTED JUL 31, 2022

LENGTH 1:30:00



EPISODE LINK – [CLICK / TAP TO LISTEN](#)

Episode #214 – Leap of Faith

SYNOPSIS:

Beeswax Wreck, Mentor Visits, Plastic Foundation, Almond supply chain issues, Honey filtering tip – dealing with clogged filters, transition to TF beekeeping, the Gainesville Florida Bee Lab, Local Hive Report

EPISODE GUIDE

Agenda

| Topic 1: Going Treatment Free

This was before the
Penn State study
info was out there

☐ BKCorner Episode 214

- I shared with the world that I was treatment free
 - I started in the springtime with a plan to not use treatments
 - I shared what I was doing in July

☐ Why try treatment free?

- Walking the Walk
 - I wanted to be able to talk about the experience from a point of practice
 - I wanted to know how the experience would play out in my zone of New Jersey

THERE WERE SEVERAL BUILDING BLOCKS PRIOR TO STARTING

In anticipation of
doing going
treatment-free
we pre-planned
working with
high-quality,
survivor stock

□ **Started with Good Stock**

- In the years prior to starting
 - For six years I concentrated on improving my stock in the apiary
 - A friend in beekeeping (Bob Kloss) and I sourced higher quality bees
 - We captured feral stock from several locations
 - We performed cut-outs and bread from bees that were in locations without being treated for years
 - We used Bob's survivor stock
 - Bob was a treatment free beekeeper for a decade up to that point (and still is!)
 - We sourced quality queens
 - We were purchasing high-quality queen stock

☐ **It was not sustainable for me**

- Over three years I had mixed losses
 - The first year went very well – low losses
- Year 2 and Year 3, were not enjoyable
 - It was a mix of losses *and stress about losing colonies*
 - The colonies did not look healthy
 - ☐ They were showing signs of mite burden
 - Poor brood patterns, low productivity, sick bees
- **Losses were not a sustainable path forward**
 - Moderate and High losses is a lot of work
 - ☐ I had to compromise the bees that survived to restore what I lost
 - ☐ This led to an impact of my honey business
 - ☐ It was also a spectacular amount of work

In Three Years
Hive Suffer
under the
Mite Burden

Losses are
to be
Expected

- **Treatment Free Results (2022 – 2024)**
 - ZERO treatments, no purposeful TF style interventions
 - No chemicals, no brood breaks, no drone brood culling, etc.
 - Some queen rearing was conducted with the colonies
 - Splits were made to recover losses
 - Mite counts, were mixed
 - Occasionally they were low, Occasionally, they were high

Some perspective...

Overall, this was a 53% loss average. The typical colony loss for hobbyist beekeepers is not far off from this.

Still, it felt like a lot of work and a high burden

3-Year Results Report

- **2022 (Y1=30% loss) | 4 hives lost out of 14**
- **2023 (Y2=70% loss) | 10 hives lost out of 15**
- **2024 (Y3=59% loss) | 5 survived out of 12**

RESPONSIBLE MANAGEMENT

Assessing your Tolerance – Planning an Approach

IT HAS TAUGHT ME A FEW THINGS THAT I WILL TAKE FORWARD

□ There were some learnings

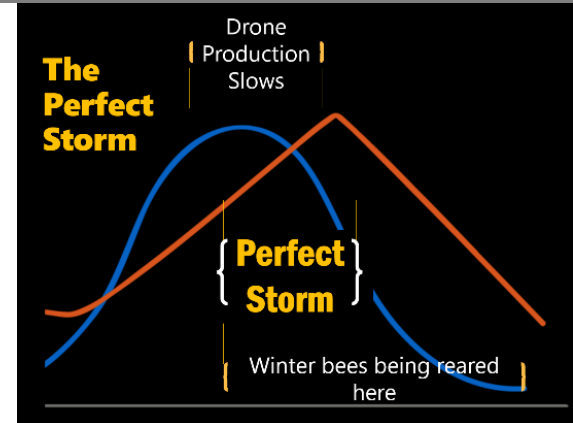
- A hypothesis came true – Cyclical Losses
 - As time progresses colony health declines
 - Loses are cyclical – you lose bees – and then you recover
- There are colonies can sustain with mites
 - Some colonies could get by perfectly fine with high mite loads
 - The alcohol wash numbers were high, but the colonies survived winter
 - **My net takeaway is our colonies can live with more mites than we think**
 - I reviewed these colonies and came away with a new impression of how to proceed with them (*more on this in a moment*)
 - What was different about them – you simply cannot tell
 - You must review how they present on an ongoing basis to observe it

We anticipated going in that this would happen

Bob experienced cyclical losses every few years

This matched up with Penn State's Findings

- **Risk Realized: The Second Half**
 - The premise of how mites impact colonies in the second half was on full display
 - Colonies in spring hummed along – likely because mite burdens are always low coming out of winter due to mite attrition
 - But in mid summer, and late fall, if the stock inside is not equipped to deal with varroa mites, the impact is apparent
 - I never saw a colony die in fall
 - The bees I had seemed strong enough to get through, and the colonies succumbed in late winter
 - Not much of a victory, mind you, but an interesting observation



THERE SEEMS TO BE THE POSSIBILITY FOR A FORMULA 77

WITH THE RIGHT CONDITIONS AND PERSISTENCE, IT SHOULD WORK

☐ If you have several components in place...

☒ Some takeaways, or I should say speculations

■ You need to have good queens

- ☐ I feel like you need to breed from those queens and replenish losses with well mated queens from your operation

■ An isolated location is a bonus

■ I am a believer that management practice are not treatments, they are stewardship. So...

- ☐ I believe you should rotate out old comb
- ☐ Testing is data, and even if you are not going to act on test results, it clarifies what is going on
 - Which bees – are doing what – and their performance by both observation and data are more powerful than speculation
- ☐ Colonies with disease and excessive mite burdens should be culled



BEES with DISEASE & EXCESSIVE MITE BURDENS SHOULD BE CULLED

☐ **Be a good neighbor**

- If a colony is going down, do something
 - TF beekeepers would claim that it does not deserve to persist
 - ☐ That in nature it would perish and that will be its fate
 - In the real world, that colony is a risk
 - ☐ TF beekeepers might argue that it tests other colonies and it should stay in the fold
 - ☐ By my way of thinking, it is a risk to my other colonies and my neighbors bees
 - If it dies, it gets robbed, and it becomes a liability to hives nearby
 - Colonies with high mite burdens transfer nasties into the comb and then you cannot use it for recovery
 - ☐ Either cull (euthanize) the colony, or break protocol and requeen it, fix it, treat it – do something – do not just let it fester in the yard

This is one of the principles in the responsible part of being a TF beekeeper



- **Insure for the inevitable losses**
 - Cover the spread by keeping a lot of colonies
 - Colonies that perish are recovered by splitting the survivors
 - Carry on with the survivors: Losses are also supplanted by catching swarms, doing cutouts, and setting up bait hives
 - Build a process for cleaning up dead hives
 - In time you will lose less – **but** the inevitability of having a very bad year seem **cyclical**
 - You should plan on staying the course
 - Beekeepers with fortitude typically report getting to a state of equilibrium
 - Higher quality bees (Queens) play a major role in successful outcomes



TREATMENT FREE ≠ MAINTENANCE FREE

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NO BURDENS OF TREATING, BUT IT IS STILL WORK

- **Good Beekeeper Required**
 - TF Beekeeping requires colony stewardship
 - Inspections and ensuring the colony is queen right
 - Recognizing / Managing colonies that are queen challenged
 - Skilled in splits and colony operations
 - From new to fully operational
 - Swarm Management – Management of queen cells
 - Recordkeeping required
 - With a lot of colonies, you need to keep good records to keep things straight



LOW TREATMENT APPROACH

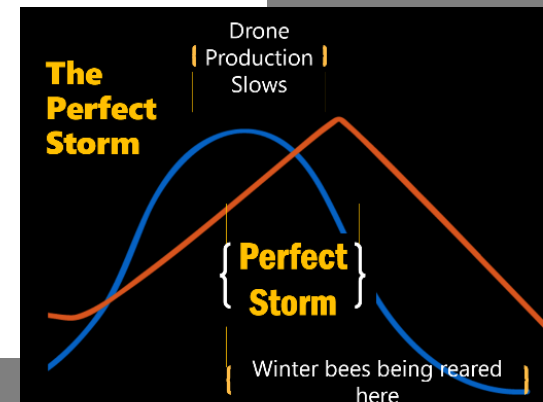
My Tweak on Treatment Free

A MADE-UP NAME FOR A MANAGEMENT STYLE IN TESTING

□ Low Treatment Elaboration

■ What does Low Treatment mean?

- Philosophically I learned with TF that bees can live with higher mite burdens
- Thresholds are important and sound, but the trajectory of the mites is more informative than the mite threshold from an alcohol wash
 - Discovering the PERFECT STORM opened my eyes to a potential management practice
- LOW TREATMENT is an approach that uses as few treatments as possible
 - It is coupled with a handful of management techniques
 - Treatments are applied at various times to combat mite problems when mite burdens show up visually
 - The selective application of treatments is used as a 'helper', a course correction to aid the bees when high mite burdens are present
 - Otherwise colonies are left to fight the good fight



HIGH THRESHOLDS ARE PERMITTED

A MADE-UP NAME FOR A MANAGEMENT STYLE IN TESTING

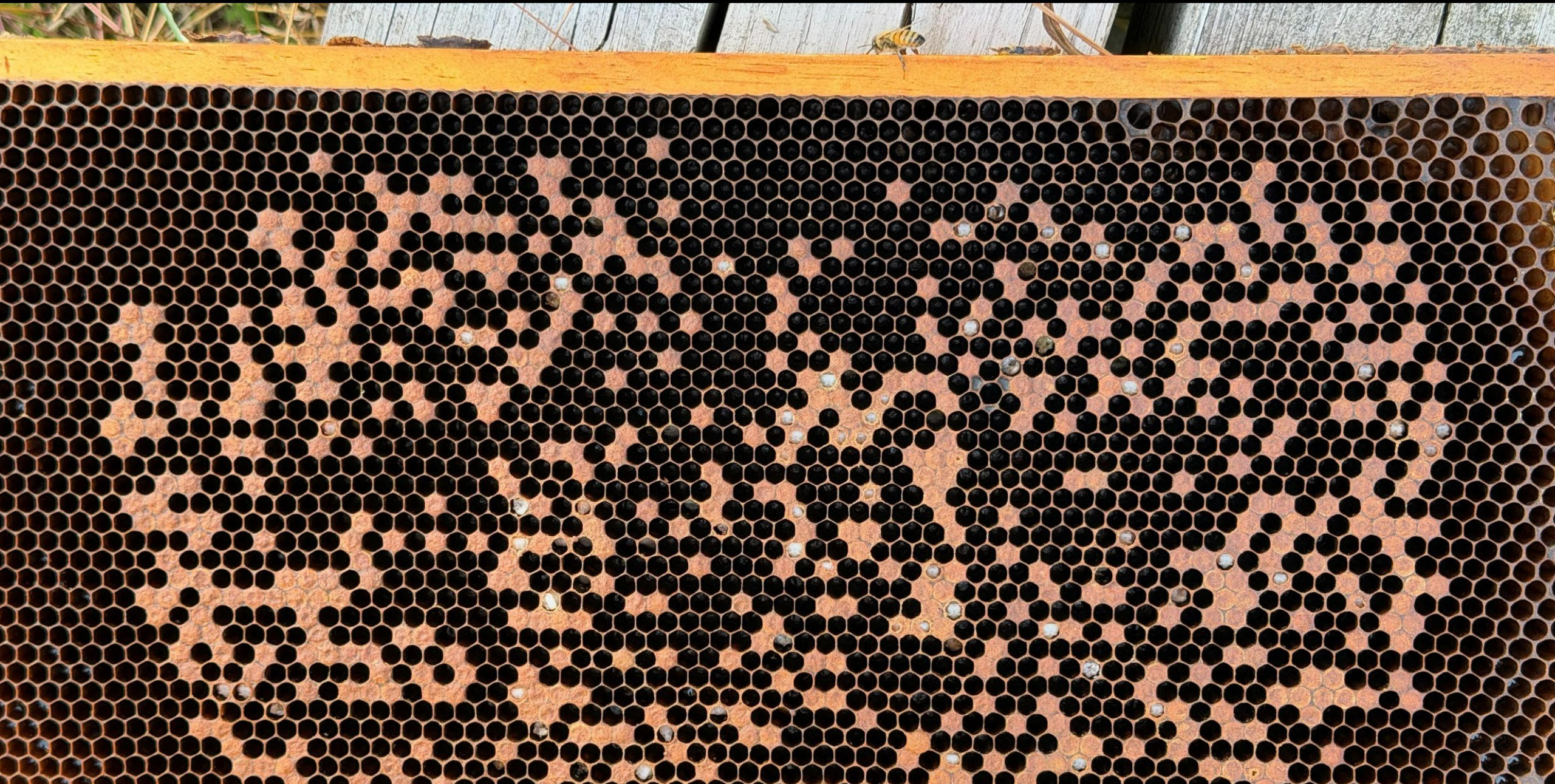
▼ A Variation on Treatment Free (**my current philosophy**)

□ High Thresholds are allowed

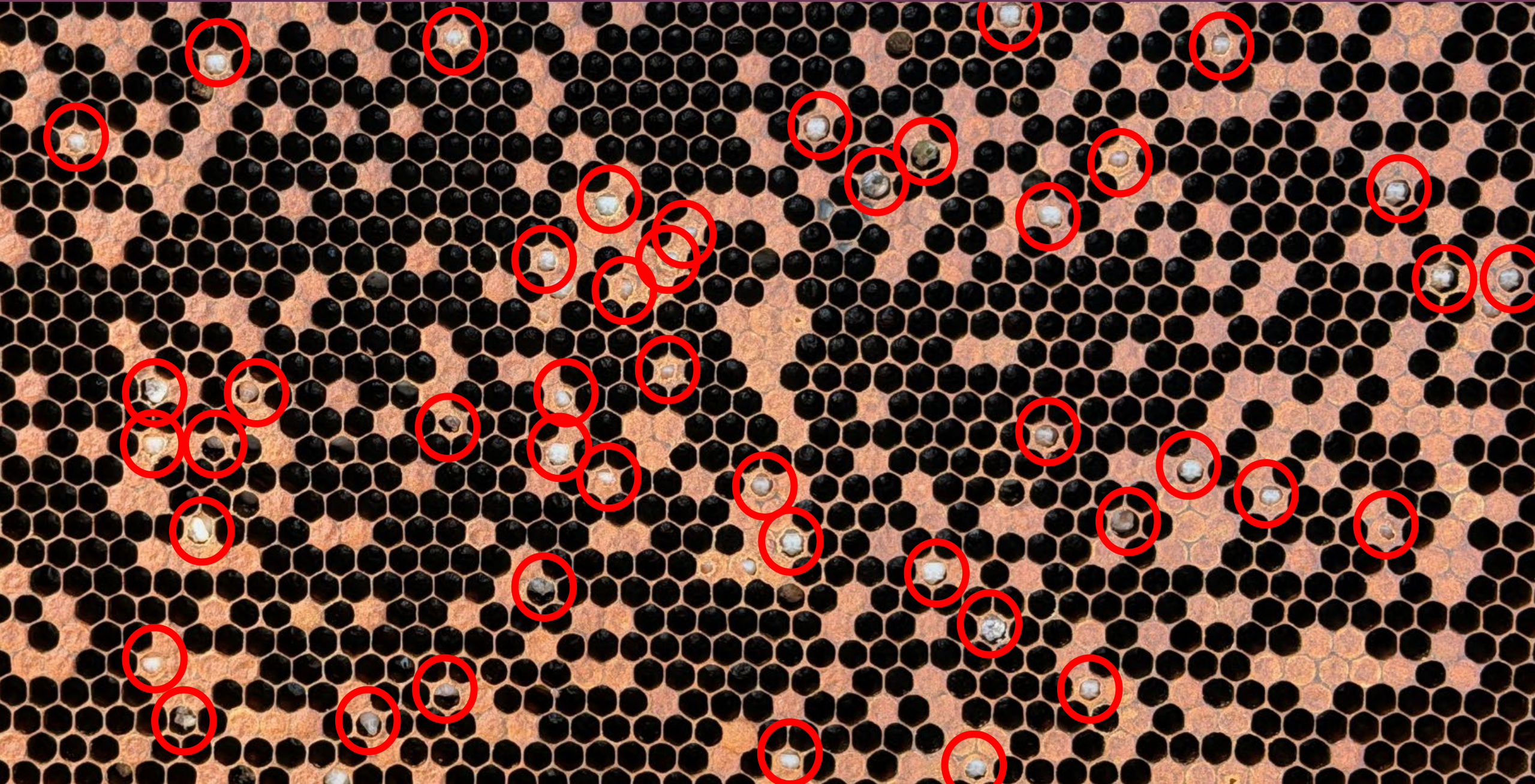
- I am monitor with alcohol washes, but use them as an input
 - If a colony has a large number of mites (8,10, 12+) in a wash, it is treated
 - If it is just above the threshold, I am assessing, not treating
 - If a hive were to exhibit unacceptable conditions that warrants treatments, I will use that as an additional input
 - I protect my apiary, and my neighborhood, by not permitting harmful conditions to manifest
 - I watch for Viral Decline, European Foulbrood, Chalkbrood, Very high hygienic behaviors, Bee PMS, etc.
 - At the first signs of these things, I take action

But to be clear, if mite thresholds are above 2, 3, 4% ***I might let things go***

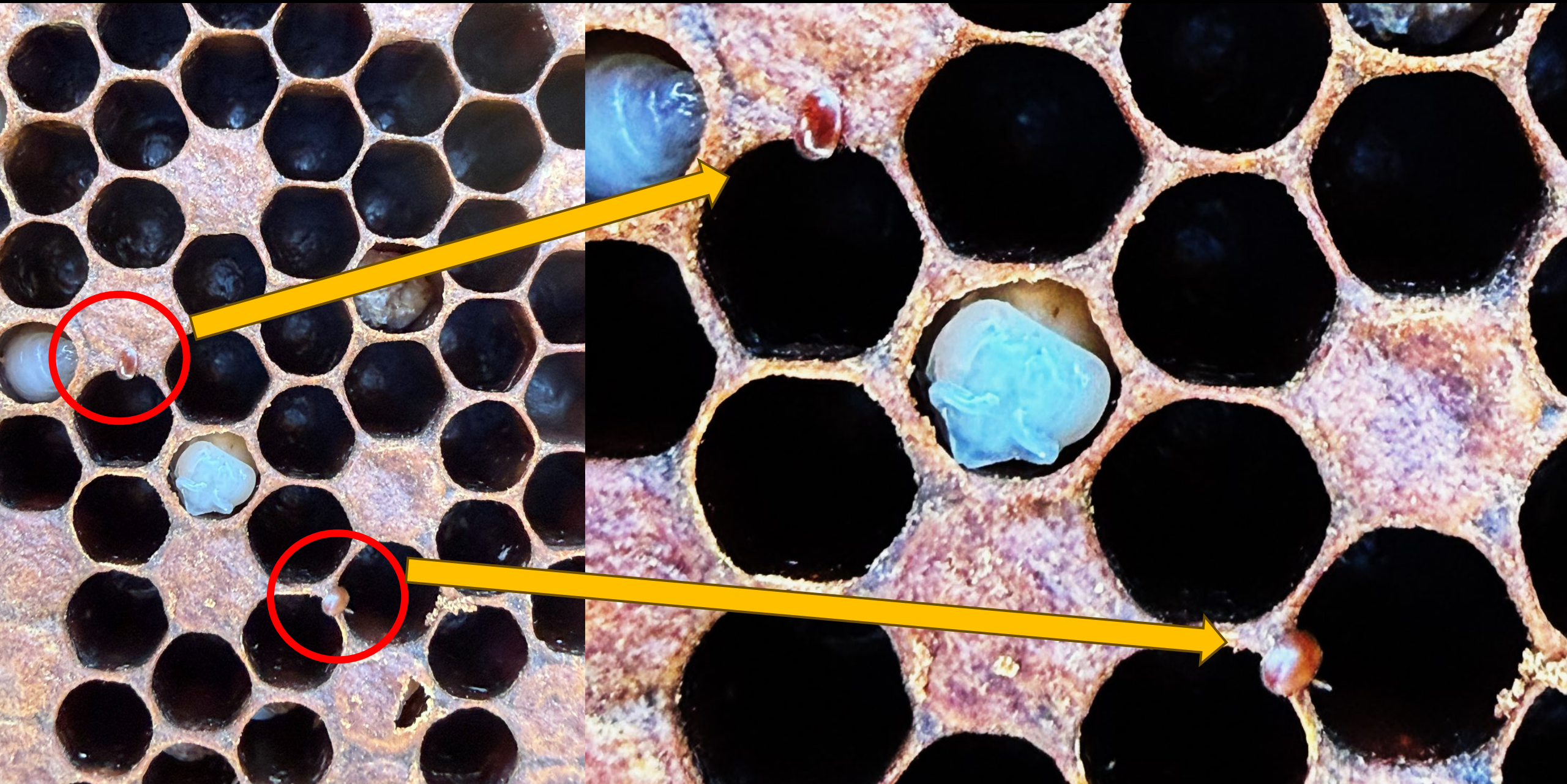
THIS IS AN EXAMPLE OF A FRAME THAT HAS A HIGH MITE BURDEN



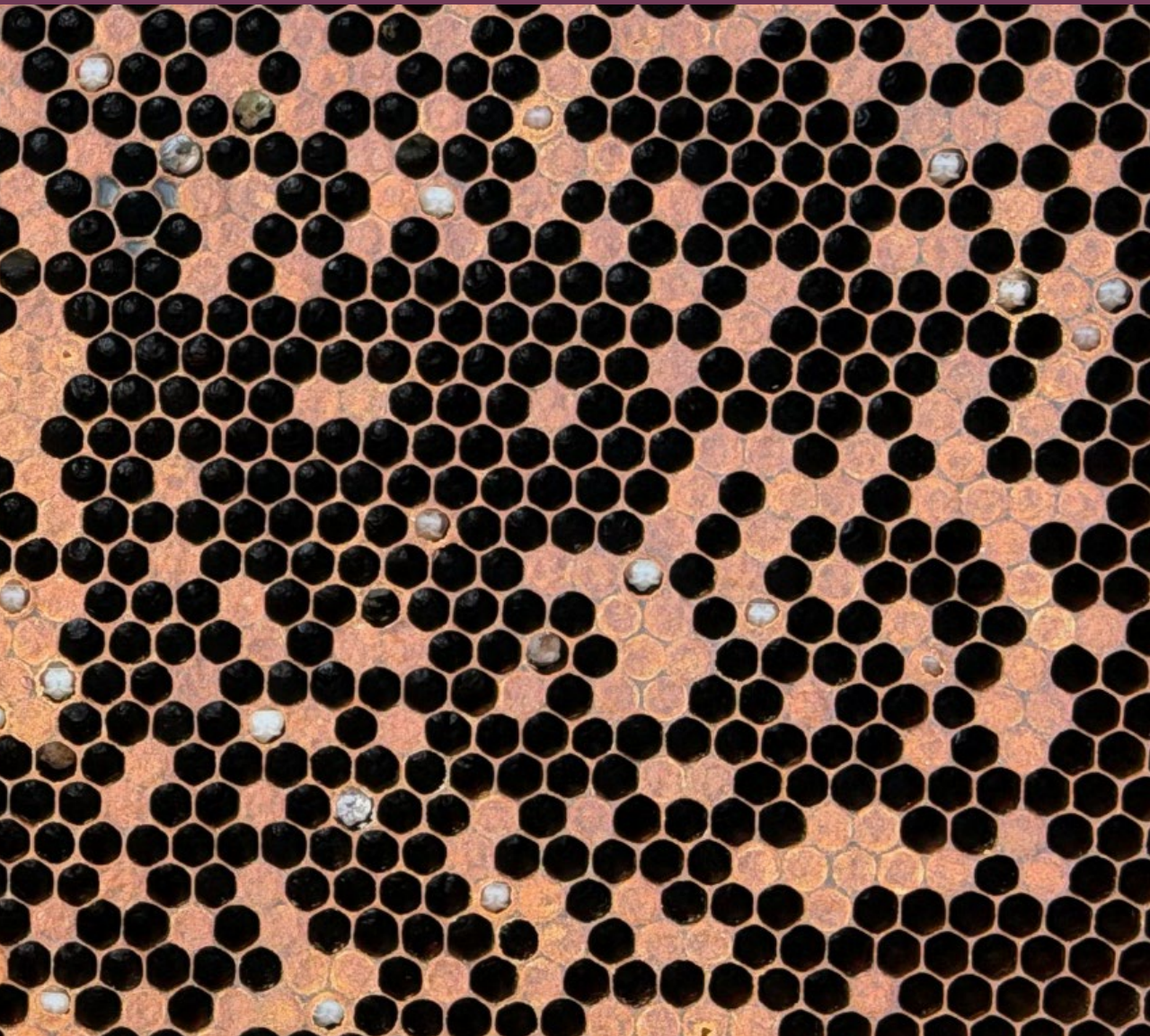
THERE IS A HIGH INCIDENCE OF HYGENIC BEHAVIOR (UNCAPPING)



THERE ARE LITTERALLY VARROA WALKING AROUND ON THE COMB



EVEN WITH THIS AMOUNT OF INFESTATION, COULD IT REBOUND?



- **This one got too far astray**
 - To say it has a high mite burden is an understatement
 - I don't normally let them get this far into a mite burden
 - *But yet, upon inspection*
 - The other cappings on this frame... *They seem healthy*
 - And the hygienic bees are doing what they should
 - If you gave this colony a treatment - Would the good bees help it rebound?

- **They seem similar but they are slightly different**
 - Meghan has indicated that you monitor and if your colony is over the threshold, treat it
 - Treat colonies immediately over thresholds
 - Breed from colonies that are not being treated to go forward toward TF
 - I am trying to see where the threshold is *–for the long game*
 - I want to learn how much duress hives can withstand
 - I am giving specific emphasis on the second half of the year and protecting winter bees
 - I ensure that my colonies are healthy enough to go through winter
 - And if I get it wrong, If the mite burden was too impactful, my colonies will die while overwintering
 - This assures that they do not impact my other hives, and my neighbors hives

I breed high-quality queens along with this management practice

IS THIS A GOOD TIME TO CONSIDER AN ALTERNATIVE?

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THE COLONY DEATH LOSS RISK IS HIGH, EVEN WITH TREATING

Year	Beekeeper responses	Number of colonies	Total LOSS %	No treatment LOSS %	Treated LOSS %
2007-2008	62	721	16%	26%	12%
2008-2009	158	1318	35%	41%	30%
2009-2010	164	1030	34%	50%	29%
2010-2011	218	1939	33%	65%	18%
2011-2012	428	3073	21%	44%	17%
2012-2013	322	1852	31%	48%	29%
2013-2014	430	2415	32%	44%	29%
2014-2015	361	2097	35%	50%	32%
Avg			30%	46%	25%

< 2015 colony loss data

TF Loss: 46%

2025 colony loss data

Treatment Loss ~50%



Hobbyist beekeepers (1-49 colonies) lost an average of **50%** of their colonies.

I went back into the records: this table data is from the NJ State Apiarist report in 2015

MASSIVE COLONY SIZE NETS OUT MASSIVE MITE BURDENS

□ Splits and Swarming

- I do not care for colonies to be 'booming'.
 - I think one fault of '**supreme colonies**' is they often succumb to mites
 - I hear often that 'My best hive did not make it through'
- Splits
 - Splits can be used to make replacements for losses
 - To recover from any losses, I use the strongest colonies to take splits for rebuilding
 - This eliminates the buildup of supreme colonies, *which are mite factories*, but it still allows for adequate colonies that make a least two boxes of honey
- Darwinian Beekeeping
 - Tom Seeley is a key advocate for keeping small hives – he expresses there are several benefits – **Recommended Book on the Topic: The Lives of Bees**

SWARMS ARE NOT A TERRIBLE THING

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I HAVE A FORTUNE THAT SWARMS ARE NOT DETRIMENTAL

- **I try to keep swarms at bay, but I also don't mind them**
 - Some happen to swarm
 - Even with swarm management, the natural order for a colony is to swarm
 - Casting swarms is not recommended if you cannot accommodate this occurring where you keep bees
 - Swarms have not been a problem in my location as I have farms all around me and houses are not close – We are quite fortunate (I know) that we do not have a big concern here
 - I feel like our operations benefit from genetics cast off –*almost 20 years of genetics*

We have bee trees in our woods
This is one that I didn't even know was
there until a storm brought it down

Our good genetics are being spread
in and around our property

Bee Tree In My Yard



□ **WORKER Brood Culling** (*This is not drone brood*)

Started this
in 2025

■ Capped Worker Brood Isolation and Treatment

- What if you went through colonies **during the perfect storm window** and pulled all capped **worker brood**
 - **They can afford it as they are at peak population – it serves to slow down booming colonies**
- Move the comb and the nurse bees to a Nuc Box and let it emerge fully then treat the colony with something that kills all the mites
- I do this in conjunction with queen rearing and supply them a queen

IT REMOVES MITE BURDEN at a critical time and lowers the need for treatments in the origin colonies

RELIGIOUSLY CULLING OLD COMB

□ Comb Management

- Comb replacement for disease control and health
 - I have come to believe that a key measure I healthy bees is fresh honeycomb
 - I mark my frames with dates and cull comb that has been in service for 5 years
 - I feel that bees making comb in spring somehow improves overall colony health
 - I saw how vibrant my colonies were after culling old comb
 - In the following years, the colonies tasked with building new fresh comb just seemed better



ROTATING OUT OLD COMB IN WINTER

□ Comb Management

■ Comb Rotation

- Every year I place older comb in the bottom of the hive in late summer early fall with intention of cull it in spring
 - I put terrible comb down there too
- In winter bees move up and leave the lower boxes empty
- I pull old comb and put in fresh foundation before doing spring reversals
- The newer comb is organized in the top box



MAINTAINING YOUNG QUEENS IMPROVES OUTCOMES

- **I make sure I minimize older queens in my colonies**
 - My experience tells me that queens are capable for two years
 - **Queens in the third season often show signs of decline** and these colonies do not hold potential (less bees, stressed, haphazard productivity)
 - There is emerging research that demonstrates fresh queens are progressive
 - Research shows with each generation genetics are adapting to address challenges with each evolution (In this case, it appears newer is sometimes better)
 - **Older Queens Doomed? Not Necessarily**
 - We will hold old productive queens to the side
 - I keep resource Nucs and maintain some older queens in them
 - The ones we like, we breed from keep going on the side
 - We've kept and bred from some queens that were five and six years old

FEEDING IN FALL IS AN ESSENTIAL COMPONENT

☐ **Bees are fed sugar solution when needed**

- We experience a dearth in August/September
 - If we do not feed, our bees will not be well suited to go into winter
 - ☐ I conducted an experiment of purposefully not feeding for two years
 - ☐ Those selected colonies did not do well
 - ☐ Most did not overwinter and several starved outright
 - ☐ Not keeping 60 to 80 pounds of food on a colony (our region) will lead to the necessity of emergency feeding in winter – which I avoid at all costs
- We feed in late summer and fall
 - Bees go into winter with abundant stores and there is zero need to examine them for food – no colony ever starves if this is looked after

Incidentally, feeding is not usually practiced in
"Live and Let Die"
TF beekeeping

LET'S TAKE A PAUSE FOR A

QUESTION CHECK-IN



ADDRESSING MITE BOMBS

Reexamining Mite Bombs > Robber Lures

A Quick Poll

Let's do a survey
What is a Mite Bomb?

For those that have bees already...

- Have you ever heard of a mite bomb?
- What exactly is a mite bomb – who can describe what it is?



THE ORIGINAL MITE BOMB THEORY

- **What is a Mite Bomb?**
 - A Large Distribution of Mites from an impacted colony
- **How do mite bombs spread? *The Theory...***
 - **Colonies of under duress leave their hive equipment and spread mites to other colonies**
- **Does the bomb danger even exist?**
 - Colonies that leave, do they join other colonies?
 - Yes, and No
 - Research shows there is drift. The colony is not likely to go as a group and take over
 - More conventionally, the absconding colony establish somewhere else, as a colony
 - When they abscond, they either make it or they perish

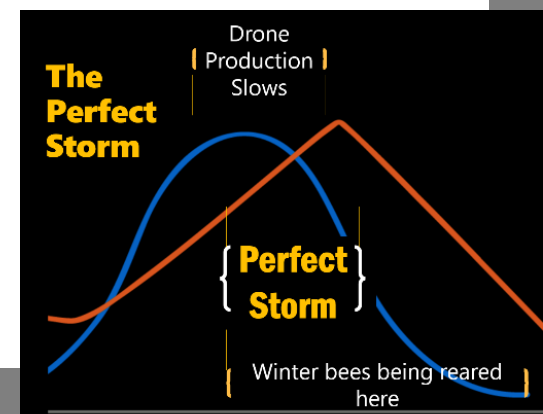
We will address robbing on the next slide

ROBBER LURES

- **Robbing of infested colonies is the real concern**
 - Research has shown that infestations come from robbing, *not from mass exodus 'bombs'*.
 - Under inspection, it is just a case of the wrong nomenclature from the get-go
 - Some drifting occurs, but mostly **research shows that the real risk is the act of transference from bees robbing infested hives**
 - Researchers have coined the term **“Robber Lures”** for this phenomenon
 - Fringe Acknowledgements
 - Mite transference does take place with foragers taking mites out of the colony
 - The incidents of mites going out in highly infested colonies is higher than typical
 - Still, the higher transfer of mites to other bees encountered during foraging is nominal and not at the 'bomb' level – its not happening at pollination exchanges

REASONABLE MANAGEMENT PREVENTS MITE BOMBS

- **Second half of the year risks show up again...**
 - IMO - Mite bombs are **lock-step with implosion of failing colonies**
 - Late season infested colonies could distribute mites
 - **Drift:** Mites go out on honeybees, this is true, but this is a low ratio. Predominantly mites are resident in the colony space as this is their food source
 - When the colony implodes however mites are getting out of dodge by leaving with absconding bees (**when there is nothing to stay for**)
 - Mass transport out on daily foragers is likely with implosion as mites know there is no place to reproduce in failing colonies
 - Responsibility wise – management mostly addresses this
 - Imploding colonies are not healthy – *they show up on inspection*
 - Tactically, **responsible beekeepers inspect and detect** outliers
 - Outliers are addressed and kept from imploding and absconding



□ **Live and Let Die Beekeepers**

- Some beekeepers will let hives perish – *during active seasons*
 - When beekeepers leave hives to dwindle and perish under high mite loads, they setup the situation for robber lures
 - In defense of responsible Treatment Free beekeepers, most typically do something to address a colony that is in trouble
 - It should be said, most TF beekeepers are conscientious and pretty good beekeepers

□ **Robber Lures**

- Trouble occurs when you simply let nature take them down
 - Feral colonies, and neglected colonies, hosted by irresponsible beekeepers, setup the scenario where other colonies will come into robber lures and get infested

THEY PERSIST AND CREATE A STEADY STREAM OF PRESSURE

- **There is no direct solution for ferals**
 - No one is watching out for ferals
 - It is nature - Unmanaged feral bees are mite bombs (Robber Lures)
 - Incidentally, this has been this way for millions of years | Before mites, *before us*
- **Blessing and a curse**
 - Some wanted bees to be left alone to resolve the problem
 - This is what ferals represent; especially since they have recovered
 - In the periphery, they are representing a contingent of unmanaged bees that are pushing the evolution of living with mites forward
 - We have no choice but to accept this and embrace it – *and it is likely good for us in the end*

PROXIMITY & ISOLATION

Pockets of isolation aid in genetic stabilization

ISOLATION GOES A LONG WAY IN SUPPORTING A TF OPERATION

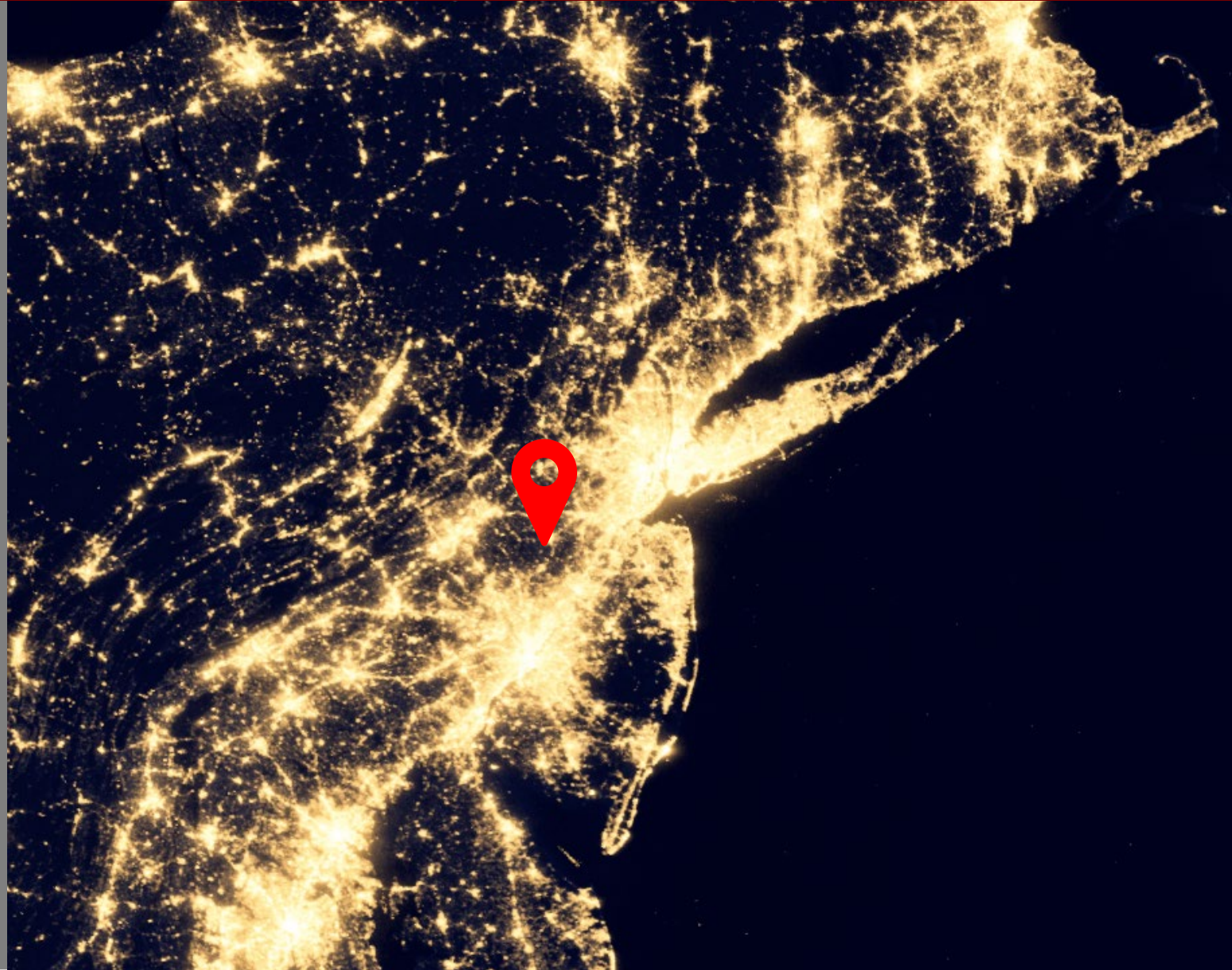
☐ **When encountering TF beekeepers**

- I often ask, what are your surroundings
 - Are you in close proximity of other beekeepers?
 - ☐ If so are you bigger or smaller than them?
 - Are you near other commercial beekeepers?
 - Do you spread your bees out on your property?
 - Is there a beekeeping operations supply a large quantity of packages into your area year on year?
 - Do you have geographical features that isolate you from others?
 - ☐ Alongside large reserves where there are not bees, etc.
- Isolation is often mentioned when claiming success
 - There seems to be some correlation

ISOLATION GOES A LONG WAY IN SUPPORTING A TF OPERATION

□ **Isolation Dearth**

- We unfortunately do not have many opportunities for isolation in New Jersey
- Bees commonly fly 1 to 3 miles, and up to 5 miles
- This makes NJ almost one one big contiguous Apiary



ISOLATION GOES A LONG WAY IN SUPPORTING A TF OPERATION

□ Isolation Options

- Your density is superior to the crowded northeast corridor
- There are likely a lot of beekeepers in all parts of the US
- The density in the new England states is a lower scale
- You have a lot of forest landscape



ISOLATION GOES A LONG WAY IN SUPPORTING A TF OPERATION

□ Isolation Options

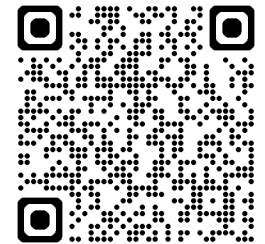
- Your density is superior to the crowded northeast corridor
- There are likely a lot of beekeepers in all parts of the US
- The density in the new England states is a lower scale

□ Hypothesis: Success if you are farther away you are from others

- Why? Some interesting speculation
 - Isolation from other beekeeper problems shields you from their impacts
 - Research demonstrates that spacing hives apart aids in limiting contact and results in better outcomes
 - Isolation buffers help to maintain a good gene pool as your genetics dominate the area, and with isolation they can build over generations

TO WHAT EXTENT IS IT PREVALENT IN YOUR AREA?

- **Consider where you live**
 - Think about the colony density in the Arnot forest as reported by Dr. Tom Seeley
 - Then, think about the survival; specifically with feral colonies
 - Only 23% of founder (first-year) colonies survive
 - **But** - Established colonies | 84% of established colonies survive winters
 - Established colonies have a mean lifespan of 5–6 years
 - Most (87%) have a queen turnover (probably by swarming) each summer
 - Where do all the swarms go?
 - Highest percentage – into the trees



Pileated Woodpeckers

I am sure you have these...

- We have them in spades
 - They excavate **large cavities in trees** for nesting and roosting
 - Think about how big the cavity is for these guys
 - Same for squirrels and other creatures
- You might be surprised to discover that there is an abundance of feral nests in play considering these factors



TF MANAGEMENT TAKEAWAYS

Summation of the Concepts

☐ **WE EACH SHARE SOMETHING IN COMMON**

- None of us wants to treat honeybee colonies
- Each of us would forgo treatments in an instant

**39Years**

☐ **If there was some path to stop treating...**

- But as we've learned there are many considerations

☐ **Could we be considering our options**

- With some proper countermeasures, we could take on a little more risk
 - Good quality bees, a measured approach to management practices...
 - Stay with the common wisdom
 - ☐ Monitoring bees and breed from mite resistant stock | Make an investment in quality queens

☐ **Can our bees withstand more pressure? (*a key question*)**

- **Consider the Toward Treatment Free Approach**
 - This is a great gateway for treatment beekeepers
 - It simply means you monitor and if thresholds do not warrant – **do not treat**
 - Carry forward with the best bees
 - Use the bees that are being treated as resources for the greater operation of going treatment free
 - In time, *as results improve*, you can switch your operation and wean off of treatments
- **Cease treating proactively**
 - Many have come to simply treat
 - This is often pragmatic, but the truth is some 40 years later, if we want to see change, we will benefit from not treating bees that are getting by

ADDITIONAL COLONIES BUFFER THE HIGHER RISKS OF LOSS

□ Have strength in numbers

■ Spread your risk: **Have extra hives to fall back on**

- It is not advisable to conduct a Treatment Free approach with only a few hives.
 - It is quite plausible to lose a large number in any given year
- Having more hives means a greater prospect for getting some hives through and providing a path to recovery
 - Starting over from scratch is not a very sound strategy
 - Experience seems to prove that it is rather risky to operate with five or less hives
- Eight to Ten seems to be a wide enough spread to cover the risk

□ Responsible is Proper

- Responsibility is an open term
 - What passes for responsible in your situation is going to differ from others
 - If you choose to forgo treatments – consider the implications
 - Do this especially with some context to your situation
 - Follow local regulations, consider your neighbors,
 - Consider your reputation with others, *who will judge you*
- Do the right thing
 - When you consider the potential pros and cons, be conservative when it comes to the cons
 - Do the right thing for all of the potential impacted stakeholders

Definition

Responsible: being the primary cause of something and so able to be blamed or credited for it

- ❑ **In a similar way to my experimental *Low Treatment* Approach**
 - Maybe you can devise something better that works for you
- ❑ **Manage Proactively**
 - Whether you decide to treat at thresholds, or let it ride, be sure to do no harm
 - If bees show any signs of disease or potential impacts to colonies around them – take action to remediate the situation
 - Bee a beekeeper, not a “bee-haver” | Bee-Havers are not good treatment free models
- ❑ **Keep Records**
 - Track how things are going
 - Share your honest outcomes with others so there is legitimate information about how your approach nets out

QUESTIONS

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THANK YOU FOR YOUR TIME