



Sunshine Hill Farms, LLC

Non-Chemical Pest Management: EAS 2026 | July 28, 2026



Non Chemical Pest Mgmt.

Keeping Honeybees without/with less Chemicals



15+ year hobbyist beekeeper – 15 to 20 hives

EAS Master Beekeeper

Past President – NWNJBA

Day Job > IT Administrator – Paper Strategies, Inc.

Beekeeping Podcaster

Managed Mentoring Program for Getting Started in Beekeeping

INTRODUCTION
– Kevin Inglin

Our Home Yard

**IT IS A
CHEMICAL
WORLD**

**NON
CHEMICAL
PEST
MANAGEMENT**

**NON
CHEMICAL
TACTICS**

**BROOD
BREAK
INTRODUCTION**

**EXECUTING
BROOD
BREAKS**

**CULLING or
CONSOLIDATION**

**FEEDING/
NUTRITION**

**QUALITY
BEE STOCK**

**CLOSING &
INSPIRATION**

**IT IS A
CHEMICAL
WORLD**

WHAT DO THESE HAVE IN COMMON?



WHAT DO THESE HAVE IN COMMON?

WATER

**SHOULD WE PROVIDE OUR
HONEYBEES WITH WATER?**



WATER IS H₂O



WATER

= H₂O

WATER IS A CHEMICAL



H₂O

=chemical

NON-CHEMICAL CONTEXT



NON-CHEMICAL REFERS TO TREATMENT CHEMICALS

Setting Context

- When we review this content, let's do it with context
- Water is a chemical, sugar is a chemical, and so on
- When referring to non-chemical, let's set the context to **chemicals used for treating varroa mites**

**NON
CHEMICAL
PEST
MANAGEMENT**

Defining Non-Chemical Concept

NON-CHEMICAL REFERS TO...

Beekeeping Without Chemicals (NC)

- No Chemicals Allowed (soft or hard chemicals)
- Brood breaks and manipulations are permitted and emphasized
- Feeding is permitted and advisable
- Testing for varroa mites should be a part of the program
- Manage, when care is required

Definition

Chemical:

a substance obtained by a chemical process or producing a chemical effect

NC
≠
TF

NC

≠

TF

NOT TREATMENT FREE

≠TF | Treatment Free

- No Chemicals Allowed (soft or hard chemicals)
- Brood breaks and manipulations are not permitted and considered a form of treatment
- Feeding is not allowed in some treatment free definitions
- Traditionally, limited or no testing for varroa mites
- Live and let die (natural selection)

TACTICS
NON
CHEMICALS

NON-CHEMICAL APPROACH

WHAT IS A NON CHEMICAL APPROACH?

Non-Chemical Tactics

- TACTICS that forgo use of soft or hard chemicals
 - Management practices and mechanical solutions to lower the impact of Varroa Destructor (brood breaks, IPM, feeding)
 - Clever ideas and concepts, as well as taking cues from natural defenses developed by the bees
 - A combination of techniques employed throughout the season

*While still leaving the door open for chemicals when the situation calls for it.

NON-CHEMICAL APPROACH

WHAT IS A NON CHEMICAL APPROACH?

*While still leaving the door open for chemicals when the situation calls for it.

Why the asterisk?

- Sometimes you might need a chemical intervention
 - **Non-chemical approaches may only go so far to prevent varroa impacts**
 - In situations where the problems brought on cross thresholds, we would encourage you to opt to do a treatment
 - Allow a touch-up and then carry on

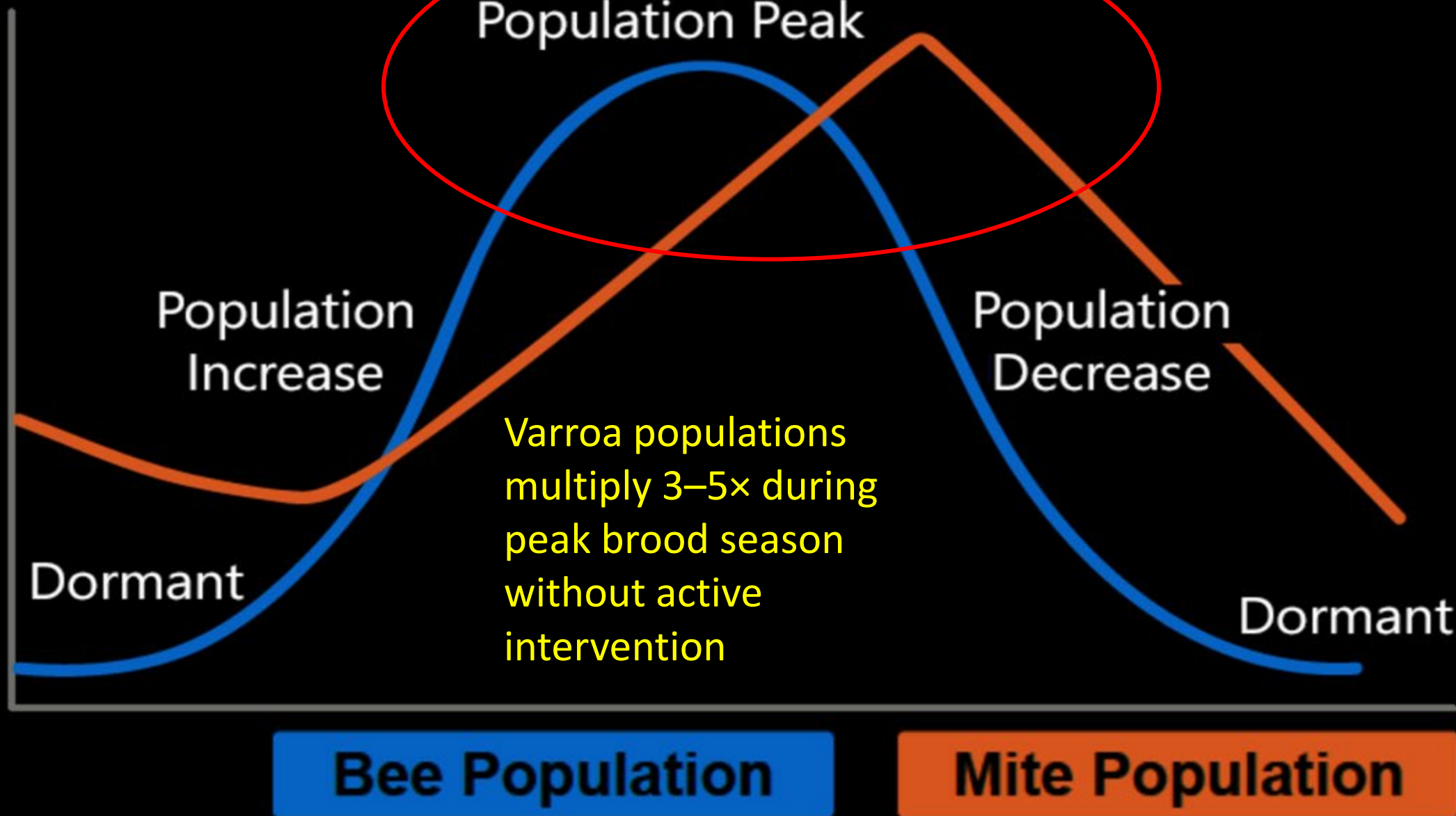
THE INSIDIOUS VARROA MITE

KNOWING THE BIOLOGY HELPS US THE CAMPAIGN

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

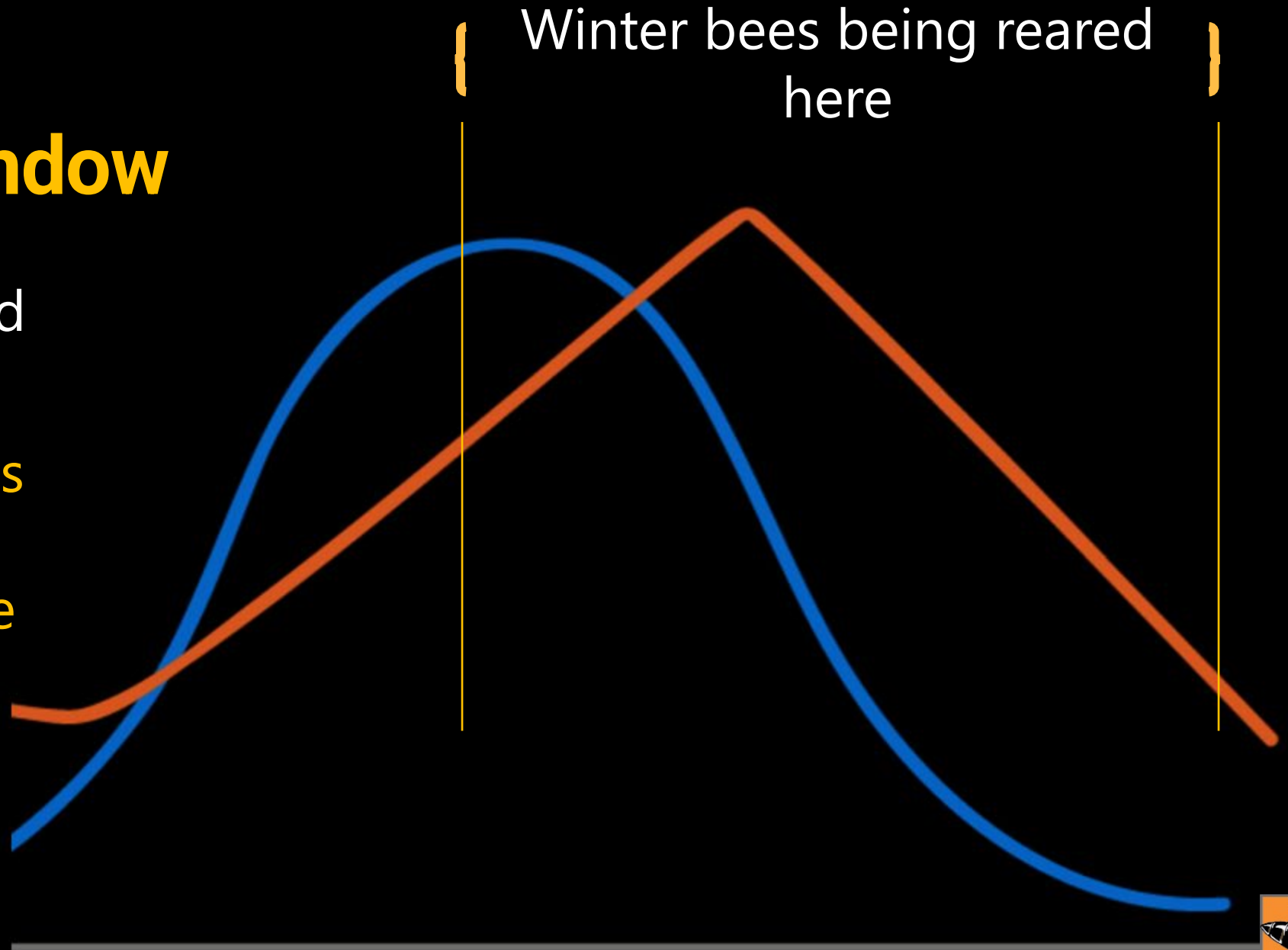
Varroa Mite Interaction

- Make note of the lag



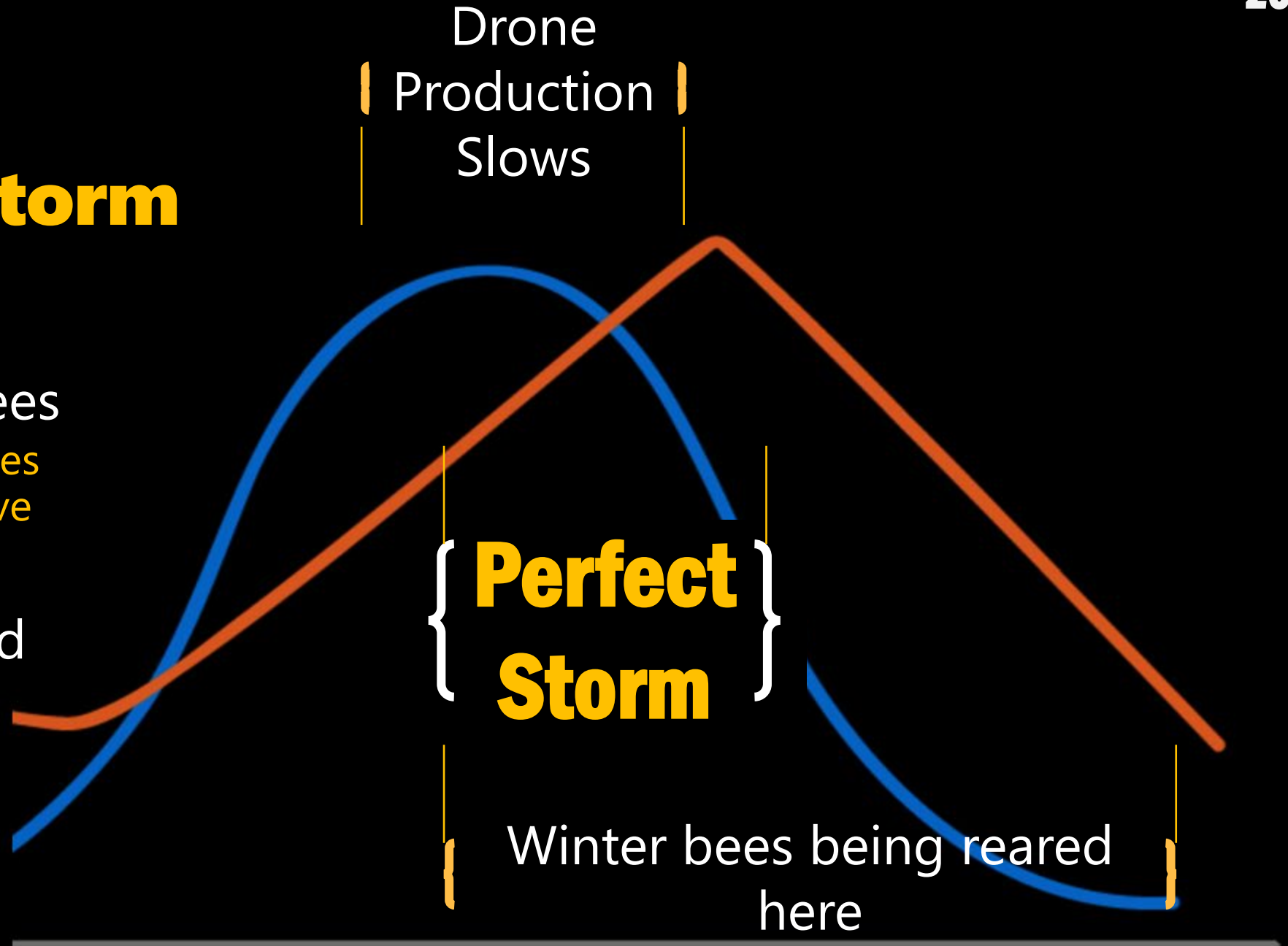
Winter Bee Window

- 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

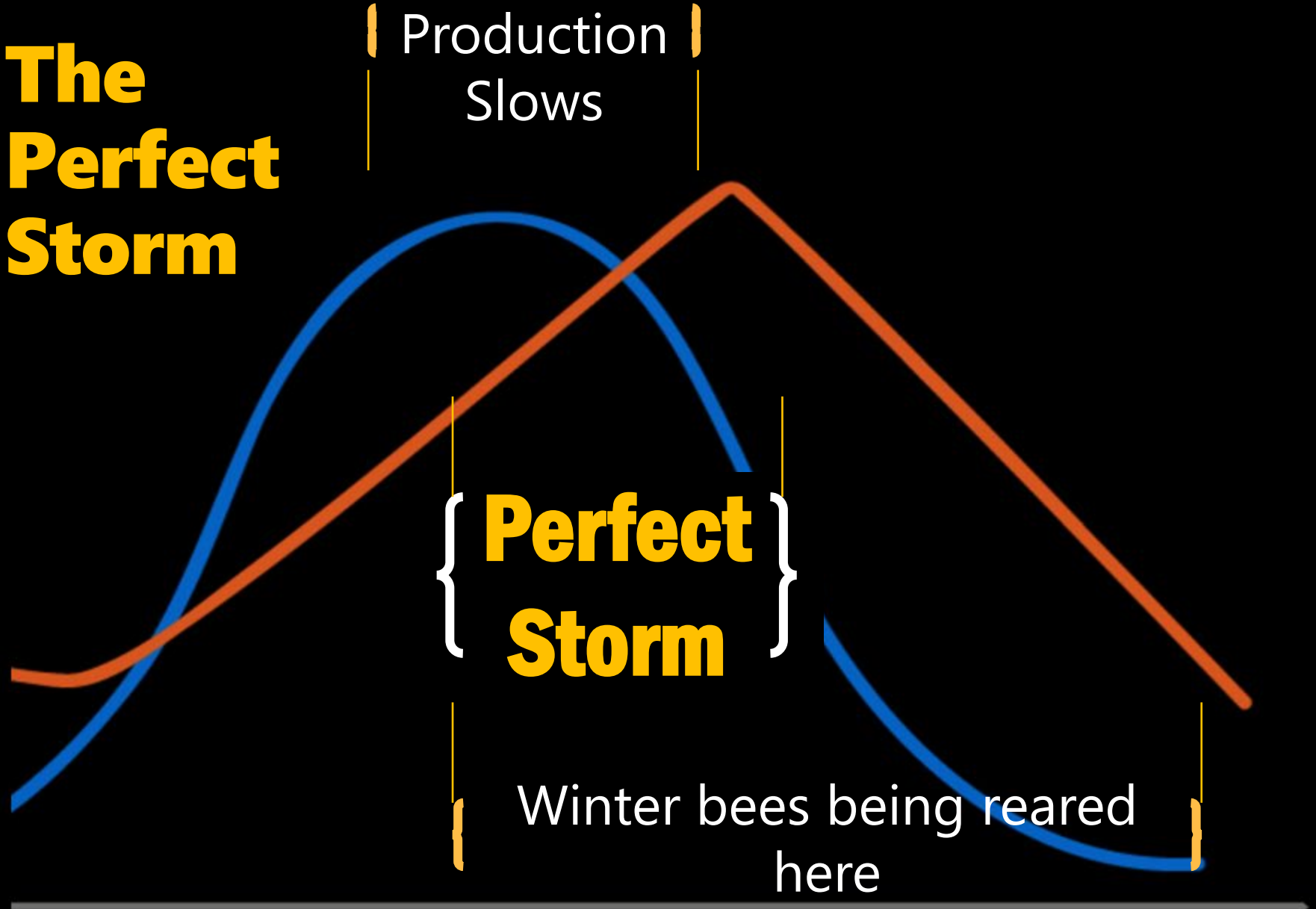


The Perfect Storm

Drone
Production
Slows

{ Perfect Storm }

Winter bees being reared
here

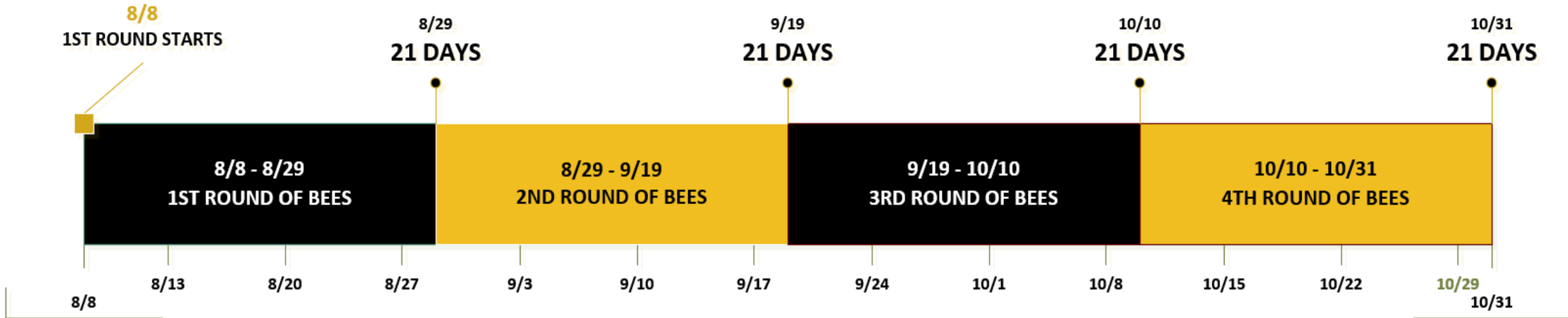


THE INSIDIOUS VARROA MITE

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
- We need to care for our ADULT WORKFORCE



THE INSIDIOUS VARROA MITE

ADULT WORKER BEES FIGHT VARROA MITES



Colony Defense Force



Zero Defense Ability

THE INSIDIOUS VARROA MITE



70%

□ **Reproductive Cycle Hidden**

- 70% of varroa's reproductive cycle occurs inside sealed brood cells —shielded from adult bees
- Varroa population doubles every 3–4 weeks during peak brood



**BROOD
BREAK
INTRODUCTION**

TACTIC #1 | BROOD BREAKS



WORKERS CANNOT DEFEND WHAT THEY CANNOT ATTACK

WHAT IS A BROOD BREAK?

**A planned
period with no
capped brood in
the colony**

**One deliberately
deprives varroa
of reproduction
capabilities**

**With no active
brood, varroa
are deterred
from feeding
and reproducing**

TACTIC #1 | BROOD BREAKS



WORKERS CANNOT DEFEND WHAT THEY CANNOT ATTACK

WHY IT WORKS

- ☐ **When on adult bees they are exposed, not reproducing, and vulnerable to grooming**
 - Varroa have no place to reproduce
 - They also lack some food from not feeding on larva
 - As they move around in dispersal, they suffer natural attrition

Ways to Execute

- ☐ **Can be achieved through**
 - Caging a queen for a period (Sequestering)
 - Splitting a colony
 - Removing a queen
 - Allowing the bees to rear a new queen and by proxy creating a brood break

Benefits

- ☐ **Studies can reduce mite levels by 50–90%**
- ☐ **This is applicable to all colonies**
- ☐ **It is one of the most effective interventions**

TACTIC #1 | BROOD BREAKS



WORKERS CANNOT DEFEND WHAT THEY CANNOT ATTACK

WAYS TO EXECUTE

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Benefits of Brood Breaks

- ☐ Studies show brood breaks can reduce mite loads by 50–90%
- ☐ This is without any chemical application
- ☐ It is one of the most effective non-chemical intervention available

TACTIC #1 | BROOD BREAKS



WORKERS CANNOT DEFEND WHAT THEY CANNOT ATTACK

BENEFITS OF BROOD BREAKS

- ☐ **Studies show brood breaks can reduce mite loads by 50–90%**
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Brood Breaks provide the opportunity for worker bees to groom mites off bodies, chew off legs, and provide time to mount a defense against varroa mites that are not hiding under capped cells

TACTIC #1 | BROOD BREAKS



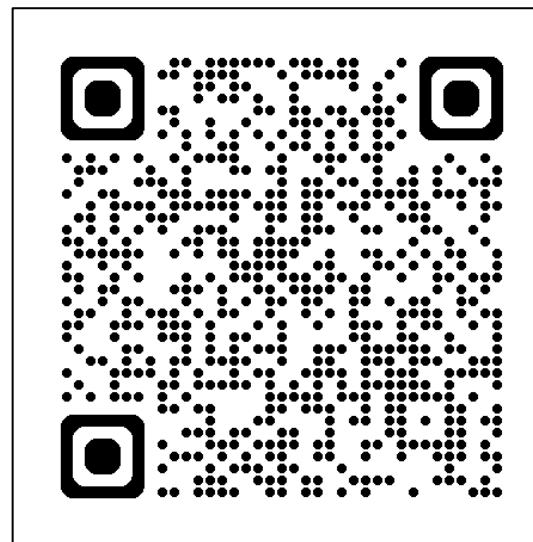
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BENEFITS OF BROOD BREAKS

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FURTHER RESEARCH

- ❑ **Immediate and long-term effects of induced brood interruptions on the reproductive success of *Varroa Destructor***



**EXECUTING
BROOD
BREAKS**

EXECUTING BROOD BREAKS

SPLITTING COLONIES



TIMING: Mid Spring – Early Summer

TECHNIQUE: COLONY SPLITS

- **Divide a strong colony by making a split**

- The **queenless half** raises a new queen naturally
 - This results in a 28–35 day broodless period

- In the interim brood runs its course, the virgin emerges and mates

- During this changeover period, **you benefit**
 - Mite reduction because mites have no place to reproduce
 - The queenless colony has unemployed bees
 - Unemployed bees do a lot of housework and they can groom phoretic mites
 - Given they have no brood to care for, they collect a lot of nectar and tend to produce a lot of honey
 - This is a swarm prevention method for both colonies

EXECUTING BROOD BREAKS

SPLITTING COLONIES



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 - During this changeover period, **you benefit from:**
 - Mite reduction because mites have no place to reproduce
 - The queenless colony has unemployed bees:
 - Unemployed bees do a lot of housekeeping and they can groom phoretic mites
 - Given they have no brood to care for, they also collect a lot of nectar and tend to make a lot of honey
 - This is a swarm prevention method for both colonies

EXECUTING BROOD BREAKS

SPLITTING COLONIES



TIMING: Mid Spring – Early Summer

TECHNIQUE: COLONY SPLITS

- **Divide a strong colony by making a split**

- The **queenright half** rebuilds
 - The queen will replenish the population
 - A percentage of the mite population went to the other half of the split lowering the impactful varroa population

- During this changeover period, **you benefit from:**
 - Mite reduction simultaneously
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EXECUTING BROOD BREAKS

SPLITTING COLONIES



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EXECUTING BROOD BREAKS

SPLITTING COLONIES



TIMING: Mid Spring – Early Summer

TECHNIQUE: **ALLOW SWARMING**

- **Allow your colonies to swarm**
 - Swarming is a natural defense against varroa mites
 - The queen leaves and takes a large contingent of bees
 - Many varroa mites go with the bivouac
 - The resultant colony raises a new queen and they the colony carries on with a form of “nature’s brood break”

- Letting swarming happen has its pros and cons
- It is not for everyone of course, but it is one way to experience a brood break

EXECUTING BROOD BREAKS

TEMPORARY QUEEN REMOVAL & RECOMBINE



TIMING: Mid Spring – Early Summer

TECHNIQUE: QUEEN REMOVAL

- **Move queen aside to a 5-Frame Nuc**
 - The **queenless original colony** will try to raise a new queen
 - Cull any queen cells until they do not have any materials for a queen
 - Let the in-progress brood run its course
 - Hold the queenright Nuc for a week or so and then recombine
 - During this separation period, **you benefit from:**
 - Mite reduction because mites have no place to reproduce
 - Unemployed bees / Swarm Prevention

- **Move queen aside to a 5-Frame Nuc**
 - The **queenless original colony** will try to raise a new queen
 - Return queen by joining the Nuc back through a combine
 - Optionally you can introduce the queen to the queenless colony to start a new colony
 - This is a great opportunity to try a different approach with an old colony

EXECUTING BROOD BREAKS



TEMPORARY QUEEN REMOVAL & RECOMBINE

TIMING: Mid Spring – Early Summer

TECHNIQUE: QUEEN REMOVAL

- **Move queen aside to a 5-Frame Nuc**
 - The **queenless original colony** will try to raise a new queen
 - Return queen by joining the Nuc through a combine
 - Optionally you can issue a treatment to queenless colony to take out the nucs
 - This is a great opportunity for a hybrid approach with an oxalic acid vaporization

Hold the Nuc for a week or so. Then recombine so the queenless colony does not become a drone laying colony

EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A PUSH IN QUEEN CAGE

TIMING: Mid Spring – Early Summer

TECHNIQUE: SEQUESTER QUEEN

- ❑ **Hold queen to a single frame**
 - Use a device to keep the queen contained from laying
 - Use a push in queen cage
 - Keep the queen laying in a small space
 - Allow the brood in progress to run its course
 - ❑ 28-day cycle, or all the way out to a 35-day cycle
 - ❑ *Optionally*, issue a treatment when the colony is queenless
 - Even if you do not treat, you benefit from the broodless period
 - After the window of time - return the queen to laying fully in the box

EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A PUSH IN QUEEN CAGE

PUSH IN QUEEN CAGES

Let's talk about this for a second...

- **Push-in Queen Cages – IN PRACTICE**
 - Sequestered for that long – under a small push in cage – there could be problems
 - Not enough brood cohesion
 - Not enough queen pheromone dispersal
 - Queen does not lay enough eggs in the time she's constrained

OUT OF BALANCE

- **Do know that doing this is a bit risky**
 - Do research on push in cage options
 - Choose large containment cages that cover a lot of space
- **Lowering Risk**
 - Move the queen around – move the cage on the frame
 - Use a large push-in cage

PUSH IN CAGE, examples

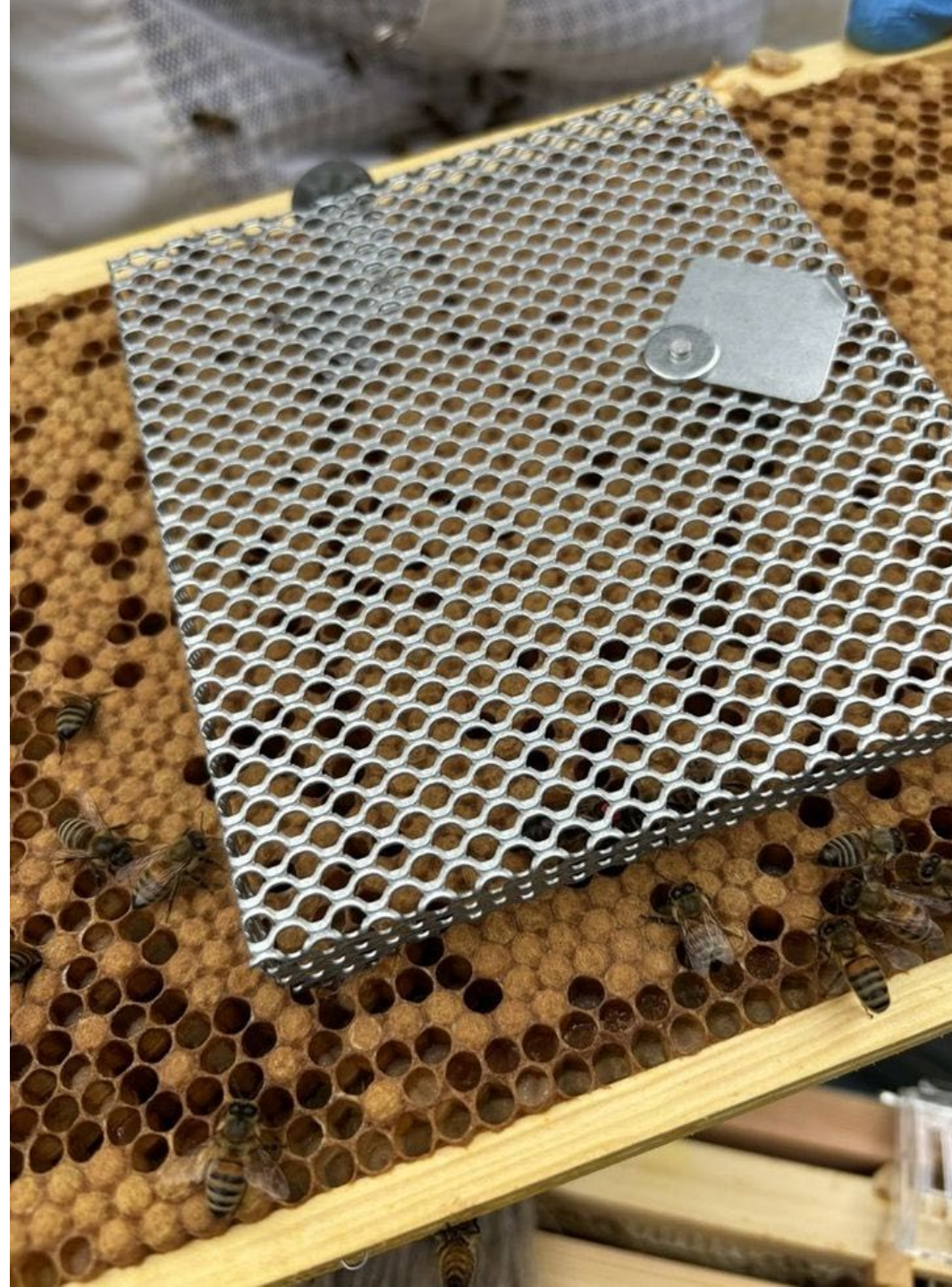
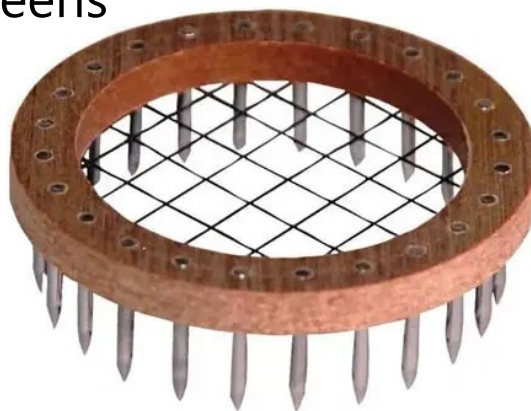
Let's look at a few examples

□ Qualities

- Holes where the queen cannot get out
- Holes that allow worker bee access
- Large size optimal for the queen to have access to a large swath of comb

□ Appropriate Size

- Do not mistakenly use queen push in cages made for marking queens



Push in cages made from hardware cloth

You **must** add and remove worker bees from this kind of cage as they cannot pass through the wire





EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A QUEEN CONTAINMENT FRAME

TIMING: Mid Spring – Early Summer

TECHNIQUE: SEQUESTER QUEEN

- **Hold queen to a single frame**
 - Use a device to keep the queen contained from laying
 - Use a **physical queen containment frame**
 - Keep the queen laying on a full frame

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EXECUTING BROOD BREAKS



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EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A QUEEN CONTAINMENT FRAME

TIMING: Mid Spring – Early Summer

TECHNIQUE: SEQUESTER QUEEN

- **Hold queen to a single frame**
 - Use a **physical queen containment frame**
 - Keep the queen laying on a full frame
 - These are offered in beekeeping catalogs
 - **Better choice for cohesion**
 - The queen can lay on a full frame
 - You can take the frame out and address the mites (cull the brood) if that is something you want to do



EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A QUEEN CAGE

TIMING: Mid Spring – Early Summer

TECHNIQUE: SEQUESTER QUEEN

EXPANSION OF WHY IT WORKS

- ☐ No new mites are born
- ☐ Existing mites age
- ☐ Mites cannot enter cells to reproduce
- ☐ Mites die naturally
- ☐ **Lowers the ratio of reproductive foundress mites at a critical time**
- ☐ Adult bees groom each other more strenuously
- ☐ Higher mite drops
- ☐ Hygienic have more time to bite mites
- ☐ Mites are more exposed to environmental stress
- ☐ Mites become “out of sync” with brood cycles
- ☐ They enter cells too early or too late in the next round
- ☐ Results in failure to produce viable daughters

EXECUTING BROOD BREAKS



SEQUESTER A QUEEN WITH A QUEEN CAGE

TIMING: Mid Spring – Early Summer

TECHNIQUE: SEQUESTER QUEEN

LONGER TERM BENEFITS OF BROOD BREAKS

- ❑ Nurse bees shift from feeding larvae to feeding each other
- ❑ Colony nutrition improves
- ❑ Queen pheromone distribution stabilizes
- ❑ Colony stress decreases

Lower impact to future generations of reared larvae

Varroa populations abate because their birth rate drops to zero while their death rate continues normally

**CULLING or
CONSOLIDATION**

CULLING TECHNIQUES

IPM: DRONE BROOD CULLING



TIMING: Early to Mid Spring – Early Summer

TECHNIQUE: DRONE BROOD CULLING

- **Integrated Pest Management: Cull Drone Brood Comb**
 - Place drone brood frames within a colony early in the season
 - Put them in positions 2/3 or 7/8 (periphery of the brood nest)
 - Workers will concentrate drones in one place (instead of all over your brood area)
 - Pull and destroy (cull) the drone brood
 - Do this prior to drone emergence
 - Mites prefer drone brood for reproduction and this is a proven method to eliminate varroa mites without using chemicals

Ensure you cull the comb prior to drone emergence – or you will be rearing mites instead of destroying them

CULLING TECHNIQUES

CULLING WORKER BROOD COMB



TIMING: Mid Spring – Early Summer

TECHNIQUE: **WORKER BROOD CULLING**

- **Integrated Pest Management: Cull WORKER Brood Comb**
 - Not very common in the US, but something that is gaining popularity in Europe
 - The premise is to remove capped worker brood at the midway point of the main flow
 - Inspect and remove frames of capped brood. Shake the bees off and take the frames
 - The benefit – When you remove capped brood later in spring, it likely contains a large contingent of varroa mites under the cappings
 - What to do with it?
 - Cull it. A large colony can likely afford losing a handful of capped frames worth of population
 - Cull it in the way that you would cull drone brood
 - You lose a generation of population (at a time they can afford it)
 - And you **lose a large contingent of varroa mites** in progress at a good time to do so

CULLING TECHNIQUES

CULLING WORKER BROOD COMB



TIMING: Mid Spring – Early Summer

TECHNIQUE: **WORKER BROOD CULLING**

- **Integrated Pest Management: Cull **WORKER** Brood Comb (continued)**
 - Some considerations about this approach...
 - Test your thresholds, if mites are not high, hold off on this technique
 - There is a full workforce in the colonies you've removed the comb from
 - This means you can put foundation in, and they will likely have the optimum workforce and conditions (bees, food, heat) to build fresh new replacement comb for you
 - To keep continuity – you also could put in drawn comb, and the queen will lay right away

This is best performed on ***fully functioning, large colonies***. Review the colony strength and choose candidates that qualify for this type of disruption

- In other words, don't take brood from colonies that need the population

CONSOLIDATION TECHNIQUE

CULL AND CONSOLIDATE WORKER COMB



TIMING: Mid Spring – Early Summer

TECHNIQUE: **WORKER BROOD CONSOLIDATION**

- **Integrated Pest Management: Consolidate WORKER Brood Comb**
 - An alternative take on culling worker comb
 - Go into colonies and extract all frames with capped brood
 - Place the capped brood frames (with bees) in a separate hive stack, by themselves
 - Replace the frames in the origin hives with drawn comb
 - Restating that the origin colonies can afford to lose this cycle of bees
 - Treat, *or not*
 - The origin colonies benefit from reduction in mites. Additionally, they have a broodnest with no capped brood – which means treatments would be quite effective
 - The box where you consolidate all the capped brood. This one it is recommended that you let all the bees emerge and treat – so it is not a mite bomb

EXECUTING BROOD BREAKS

CULL AND CONSOLIDATE WORKER COMB



TIMING: Mid Spring – Early Summer

TECHNIQUE: **WORKER BROOD CONSOLIDATION**

☐ **Integrated Pest Management: Consolidate WORKER Brood Comb**

■ Let's talk about this...

- The box where you consolidate all the capped brood.

- ☐ This one it is recommended that you let all the bees emerge **and treat**

- **THIS IS ONE YOU WILL WANT TO TREAT:** So it is not a mite bomb

■ It Is an interesting play

- You consolidate all the mites in one place. You can forgo treatment in the origin hives (or not) as they benefit from a reduction in reproducing mites

- When you treat the colony where consolidation occurred, you can effectively concentrate the mites and get more from your treatment



- ☐ I did this last year – using Formic Pro. The origin colonies did quite well, and the consolidation colony did extremely well. It's a clever play the devised by the Europeans.

**FEEDING/
NUTRITION**



WELL FED BEES

NOURISHMENT

□ Food/Nutrition

Let's talk about food

■ Human Comparison

- We have food all the time
- Day, night, every day
- We humans can get our fill of nutritious food
- Nutrition maintains our health, productivity, immune system and keeps us going with little challenge

■ Honeybees

- Insects may not necessarily enjoy our luxuries

FOOD IMPROVES HONEYBEE HEALTH



PERSISTENT FOOD SUPPLY BOLSTERS PEST MANAGEMENT

TIMING: Mid Spring through Fall

TECHNIQUE: SUPPLEMENTAL FEEDING

FEEDING SUPPORTS COLONY PRODUCTIVITY AND RESILIENCE

- **This includes aspects of pest management**
 - Healthy, well-fed bees maintain stronger populations and perform colony tasks more effectively
 - Higher colony populations improve overall productivity, including foraging, brood care, thermoregulation, and defense
 - More bees also means more workers available for grooming and mite-sensitive hygiene,
 - Good nutrition supports immune function, helping bees better tolerate stressors such as pathogens and parasites

FOOD IMPROVES HONEYBEE HEALTH



PERSISTENT FOOD SUPPLY BOLSTERS PEST MANAGEMENT

TIMING: Mid Spring through Fall

TECHNIQUE: SUPPLEMENTAL FEEDING

- **This includes aspects of pest management**
 - Good nutrition supports immune function, helping bees better tolerate stressors such as pathogens and parasites (continued)
 - When bees process nectar or sugar syrup, they produce gluconic acid, a natural component of honey
 - Gluconic acid contributes to the formation of small amounts of hydrogen peroxide, which plays a role in honey's antimicrobial properties. This supports colony hygiene, though it is not a direct Varroa control mechanism
 - Well-nourished bees cope better with Varroa-related stress, maintaining brood viability, adult longevity, and overall colony stability
 - Reduced nutritional stress improves colony operations, including cleaning, brood care, and defense

FOOD IMPROVES HONEYBEE HEALTH



PERSISTENT FOOD SUPPLY BOLSTERS PEST AVOIDANCE

TIMING: Summer through Fall

TECHNIQUE: SUPPLEMENTAL FEEDING

- **Feed through the dearth and right up until cold weather sets in**
 - One method to employ is feeding to keep the colony 'home'
 - Colonies that require food will go out – even in a dearth – and seek food
 - Opportunistic feeding includes 'ROBBING'
 - By feeding in the summer and fall, less bees will be prone to go out and rob other colonies
 - This could result in less circumstances where bees encounter failing colonies and bring back mites into the nest

FOOD IMPROVES HONEYBEE HEALTH



PERSISTENT FOOD SUPPLY BOLSTERS PEST MANAGEMENT

TIMING: Mid Spring through Fall

TECHNIQUE: SUPPLEMENTAL FEEDING

□ The takeaway

Optimal nutrition doesn't "fix" Varroa, but it strengthens the colony's ability to function despite parasitic pressure



FOOD IMPROVES HONEYBEE HEALTH



PERSISTENT FOOD SUPPLY BOLSTERS PEST MANAGEMENT

TIMING: Early Spring through Fall

TECHNIQUE: HEAT APPLICATION

- **Use a device within the hive equipment to heat the environment**
 - Varroa mites cannot tolerate heat
 - Honeybees, however, are tropical and can tolerate high heat environments
 - Heat the chamber high enough to impact the mites, but not the bees and honeycomb
 - Requires dedicated hardware to conduct this operation
 - Hardware is coming to the marketplace
 - The cost and feasibility of treatments is a consideration
 - You might have only one hive configuration due to cost – what do you do if you have multiple hives
 - An emerging technology that will likely be more mainstream in years to come

CAPPED BROOD REMOVAL



TRADITIONAL INTEGRATED PEST MANAGEMENT APPROACHES

TIMING: Mid Spring – Early Summer

TECHNIQUE: SCREENED + STICKY BOTTOM BOARDS

☐ **Employ Screened Bottom Boards**

- Used screened bottom boards instead of solid bottom boards
 - Mites groomed off bees will fall through to the ground under the hive equipment
 - Not overly effective... *but*, any dead mite is a good mite
 - ☐ Even with grooming, mites are very good at holding on
 - ☐ Couple with Sticky Boards

☐ **Employ Sticky Boards**

- Place coroplast sticky boards under the brood nest
 - Sticky boards are literally 'sticky'
 - ☐ Meaning they have some sort of adhesive coating
 - ☐ More often than not, beekeepers apply a substance (Vaseline)
 - When mites fall on the surface they get stuck and cannot get free

**QUALITY
BEE STOCK**

QUALITY BEE STOCK



GENETICS ARE A CORE OF NON-CHEMICAL PEST MANAGEMENT

Genetics & Local Bees: Improve the overall program

- Genetics determines how well a colony can naturally resist pests without chemical intervention
 - VSH stock serves to actively suppresses mite populations
 - Hygienic lines remove brood before pests can be impactful
 - Hygienic behavior reduces viral load and brood disease
 - This leads to improved overall colony health
 - Locally adapted bees are proven best
 - They handle climate, forage cycles, and regional pests better
- Strong genetics reduce colony stress and improve resilience

QUALITY BEE STOCK

BEES DOING THE WORK FOR YOU



**Varroa Sensitive
Hygiene (VSH)**

**Bees detect
and remove
mite-infested
brood before
reproduction
completes**

**Suppressed Mite
Reproduction (SMR)**

**Genetic trait
limiting mite
offspring
viability within
sealed cells**

**Inherently Strong
Grooming Behavior**

**Strong
Grooming
Behavior
Active
mite removal
from nestmate
bees reduces
phoretic mite
survival**

QUALITY BEE STOCK

BEES DOING THE WORK FOR YOU



**Invest in good stock,
bring in quality bees**

**Breed from the
best colony
performers and
bring in quality
bees when
possible**

**Seek out survivor bees
and feral stock**

**Try to support
bees that are
surviving with
out treatments
and seek local
feral bees if you
have access**

**Support Research and
Keep Informed**

**Support
organizations
that are running
programs to
produce higher
quality queens**

**CLOSING &
INSPIRATION**

NON-CHEMICAL is a Journey and a Progression

- **Like Integrated Pest Management, combinations of non-chemical tactics are even stronger**
 - Be a student of non-chemical tactics
 - Use Observation-Led Decisions — let data drive action
 - Monitoring data drives action — not the calendar.
 - Mite washes, brood patterns, population, inform on what's needed and when
 - Run good bees; keep them well fed and healthy
 - Practice and use brood break technologies
 - Don't be afraid to lightly fall back on chemicals as you learn on your journey

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