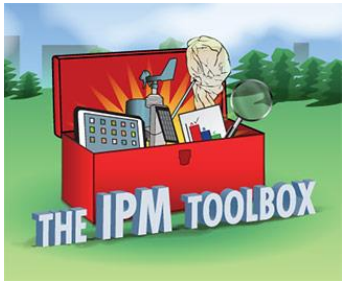
Northeastern IPM Center

Varroa Mite IPM Series

Part 4: Varroa Mite IPM: Creating Your Own IPM Plan



maine DEPARTMENT OF Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

https://neipmc.org/go/vm2020

ABOUT US | IPM IN ACTION | GRANT PROGRAMS | WORKING GROUPS | PARTNERS IN IPM | IPM PLANNING | Search

Northeastern IPM Center

We promote and fund integrated pest management for environmental, human health, and economic benefits.

Signature Programs | Got Pests? | Need Funding?

HOME / IPM IN ACTION / The IPM Toolbox Webinars / Varroa Mite IPM: Four-Part Series for a Healthy Hive in 2020

Varroa Mite IPM: Four-Part Series for a Healthy Hive in 2020

Monday, March 9 — Part 1: Varroa mite biology and life history – [Recording]
Monday, March 23 — Part 2: Varroa mite IPM and sampling – [Recording]
Monday, April 6 — Part 3: Varroa mite management tools – [Recording]
Monday, April 20, 1:00–2:30 p.m. — Part 4: Varroa Mite IPM: Creating your own IPM plan – *Join Jen and Kim as they discuss how to create an IPM plan and interactively engage participants to take time/space to create their own plan during the workshop.*

Kim Skyrm, Apiary Program Coordinator/Apiarist, Massachusetts Department of Agricultural Resources
Jen Lund, Apiarist, Maine Department of Agriculture, Conservation and Forestry

Kim Skyrm, Apiary Program Coordinator/Apiarist, Massachusetts Department of Agricultural Resources

Jen Lund, Apiarist, Maine Department of Agriculture, Conservation and Forestry

Description

They're back by popular demand! Kim and Jen dive deeper into managing the most detrimental pest affecting honey bees, varroa mites (*Varroa destructor*). Join them in this multiple part webinar series where they will discuss the varroa mite biology and life history, available and effective mite management tools, how to create a dynamic varroa mite IPM plan, and a demonstration on the steps involved in performing an alcohol wash in the field including tips to make sure you get an accurate count. Participants will have an opportunity to ask questions and get real live support needed to jump start your thinking and planning for mite management this season. These presentations will be tailored to current and future beekeepers, but others with interest in honey bee health are also encouraged to attend! Join Kim and Jen and let's FIGHT THE MITE!

About the Presenters

Dr. Kim Skyrm has been the Chief Apiary Inspector and Apiary Program Coordinator at the Massachusetts Department of Agricultural Resources since August 2015. Prior to this appointment, Kim was a Post Doctoral Researcher at the University of Massachusetts-Amherst working with bumble bees and cranberry pollination. Kim has been working with native and managed bees, beekeepers, and farmers for the past 12 years through outreach education, research, and extension type projects. Kim is truly passionate about apiculture and ensuring the viability and sustainability of bee populations!

Jennifer Lund has a Master's degree in Entomology from the University of Maine and has over 20 years of entomological experience. Before becoming the Maine State Apiarist in 2016, Jen was a research technician in the entomology department at the University of Maine in Orono (UMO). While at UMO, Jen worked on many honey bee projects including a national colony collapse disorder study, honey bee colony health comparisons of top bar and Langstroth hives, integrated varroa mite control effectiveness, the role of honey bees as vectors of blueberry disease, sub-lethal effects on colonies to low-level pesticide exposure, and health of migratory hives arriving in the State of Maine for blueberry pollination. Jen is passionate about honey bee health and helping beekeepers succeed. Aside from managing the honey bee inspection program and helping Maine beekeepers protect their hives, Jennifer also has several of her own hives that she maintains on her farm in Maine.

To Register

https://cornell.zoom.us/webinar/register/WN_FwNfRD6pRgWgHArjgHWvYg

Download the Varroa Mite IPM Plan template (DOCX format).

Got an IPM question? Need to know the latest IPM information? The Northeastern IPM Center has the answers with our webinar series, "The IPM Toolbox."

Varroa Mite IPM Brochure This brochure introduces the varroa mite, provides steps to doing an alcohol mite wash, and lists IPM options for controlling varroa mites.

USDA Developed and managed by the Northeastern Integrated Pest Management Center, located at Cornell University. This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award numbers 2018-70006-28882 and 2014-70006-22484. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture. The Northeastern IPM Center is one of four Regional IPM Centers.

Back to top

If you have a disability and are having trouble accessing information on this website or need materials in an alternate format, contact web-accessibility@cornell.edu for assistance.

Webinar Details

- Welcome

- A recording of this webinar will be available within a week at
- http://www.neipmc.org/go/ipmtoolbox

We Welcome Your Questions

- Please submit a question **at any time** using the Q&A feature to your right at any time

- If you'd like to ask a question anonymously, please indicate that at the beginning of your query.

Webinar Presenters

Jennifer Lund,
Apiarist
MDACF Apiary Program
207-287-7562
jennifer.lund@maine.gov

Kim Skyrm, Ph.D.,
Chief Apiary Inspector
MDAR Apiary Program
617-626-1801
bees@mass.gov

Northeastern IPM Center

Some Questions For You

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Outline

- Integrated Pest Management (IPM)

Tools Overview

- IPM Plan Basics
- Creating Your Own IPM Plan
- IPM Plan Examples

Northeastern IPM Center

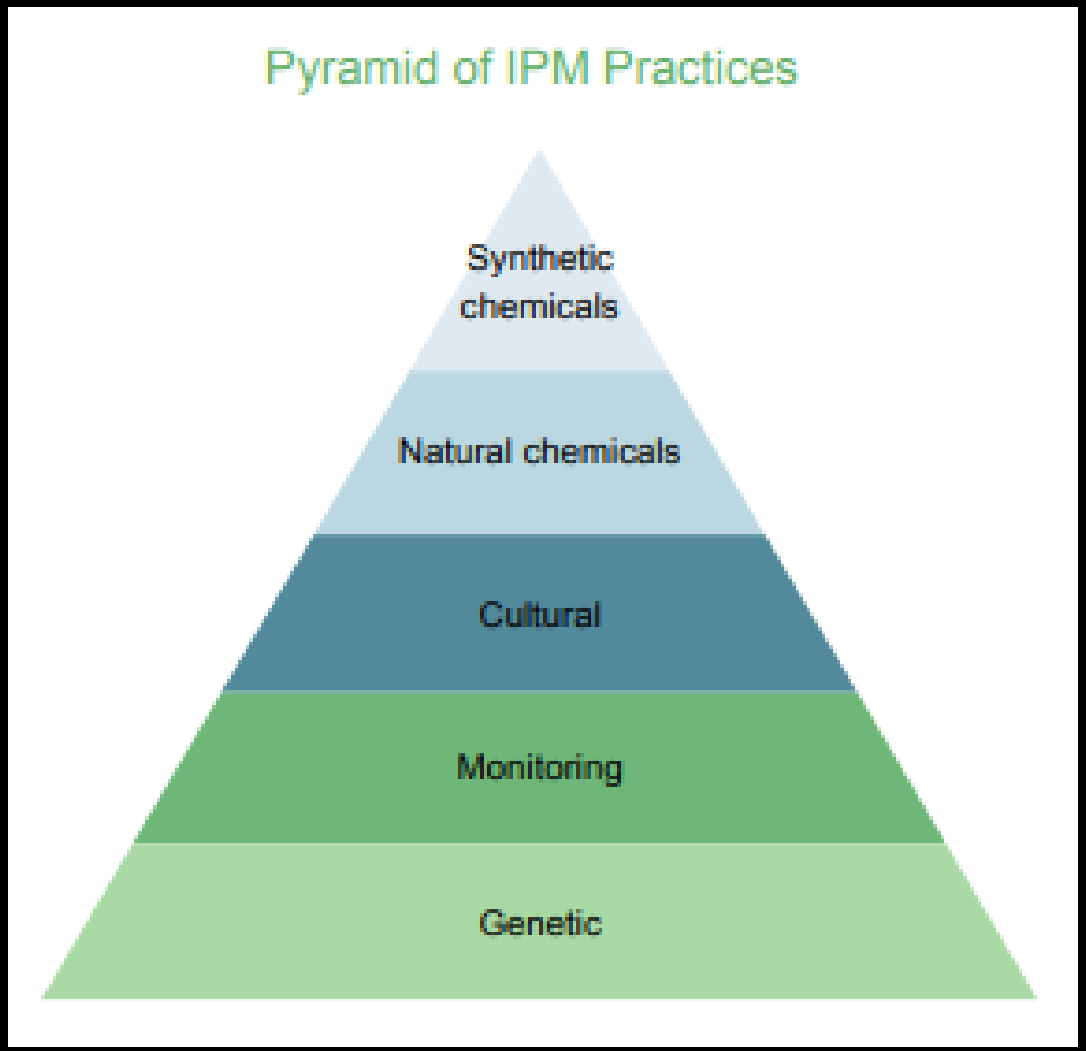
Varroa Mite Integrated Pest Management (IPM) Tools Overview

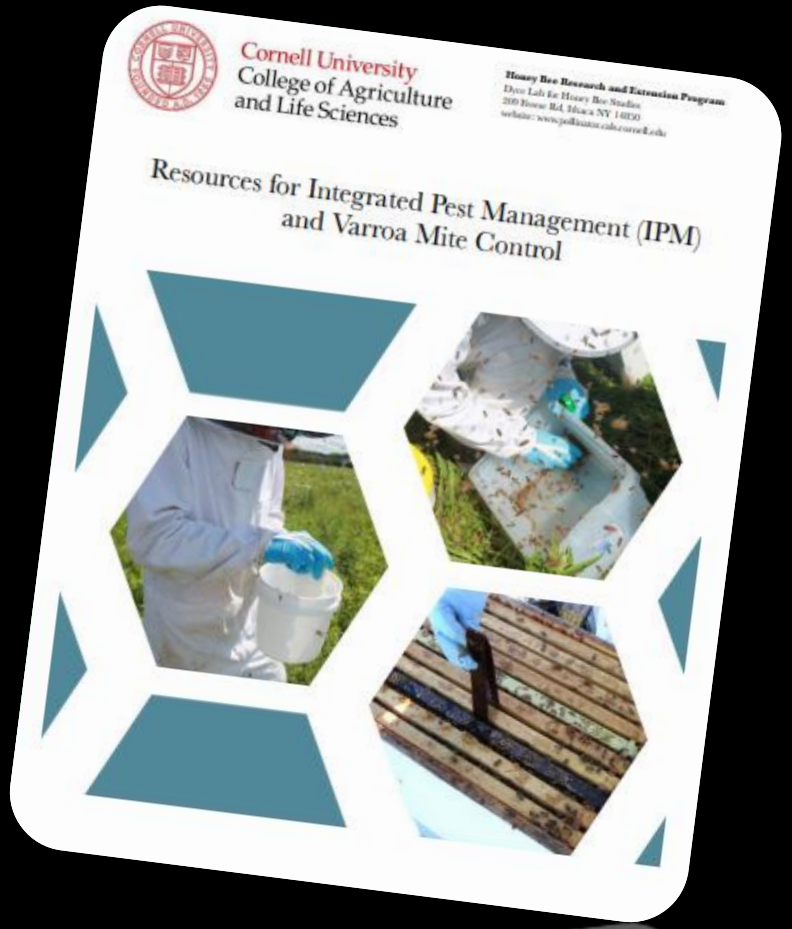
maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

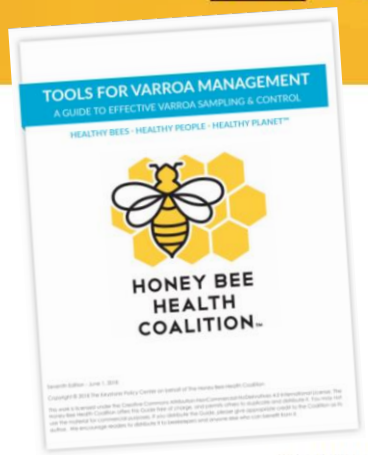
MDAR Massachusetts Department of Agricultural Resources Division of Crop and Pest Services Apiary Program

What Is Varroa Mite IPM?



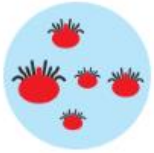


TOOLS FOR VARROA MANAGEMENT



FREE VARROA RESOURCES

Below you can access the Tools for Varroa Management Guide and Watch the Demonstration Videos



The Guide explains practical, effective methods to manage Varroa mites within your hives. The videos provide practical step-by-step demonstrations on monitoring and controlling varroa mites.

DOWNLOAD THE GUIDE

Access the Coalition's Varroa Management Decision Tool

This tool will walk you through the decisions you need to make to determine how best to manage varroa mites

CLICK HERE TO ACCESS THE TOOL

Host an Evening Varroa Bee Club Program

The Honey Bee Health Coalition has developed an informative evening program for your bee club or association. You can either use the prepared presentation or play the recording to your club.

DOWNLOAD THE PRESENTATION & RECORDING

Integrated Pest Management (IPM) Options for Varroa Mites

NAME	ACTIVE INGREDIENT [CHEMICAL CLASS]	MODE OF ACTION	APPLICATION MATERIAL	APPLICATION SEASON & TEMPERATURE GUIDELINES	TREATMENT DURATION	KEEP HONEY SUPER ON?	NOTES
Apivar®	amitraz [amidine]	contact	plastic strip	Spring, Fall	42-56 days	no	honey supers put on 14 days after strip removal
[illegible]	tau-fluvalinate [pyrethroid]	contact	plastic strip	Spring, Fall [>50°F]	42-56 days	no	mite resistance shown; honey supers put on after strip removal
[illegible]	coumaphos [organophosphate]	contact	plastic strip	Spring, Summer, Fall	42-45 days	no	mite resistance shown; do not use for queen-producing colonies
Apiguard®	thymol	fumigant	gel or gel tray	Spring, Fall [60°F to 105°F]	28-42 days	no	Restricted Entry Interval (REI) of 48hrs; honey supers put on after gel removal
Api Life Var®	thymol, menthol, eucalyptus oil	fumigant	tablet	Spring, Summer, Fall [64°F to 95°F]	26-32 days	no	honey supers put on 30 days after tablet removal
Mite-Away Quick Strips® (MAQS)	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	7 days or 21 days	yes	penetrates wax cappings; check queen vitality after treatment
Formic Pro®	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	14 days or 20 days	yes	penetrates wax cappings; check queen vitality after treatment
Oxalic Acid	oxalic acid dihydrate	contact, fumigant	vapor or liquid	Spring, Fall	varies by application type	no	most effective when brood-less
HopGuard®II	potassium salt of hops beta acids	contact	cardboard strip	Spring, Summer, Fall	30 days	yes	most effective when brood-less
Screen Bottom Board	cultural, non-chemical options for management		varies depending on management type	Spring, Summer, Fall, Winter	all year	yes	check mite drop for effectiveness
Drone Brood Trapping/Removal				Spring, Summer, Fall	14-20 days	yes	remove comb/open drone cells before emergence
Brood Interruption				Spring, Summer	14-20 days	yes	split hive or allow to swarm; but capture swarm
Re-Queen/Cage Queen				Spring, Summer	28 days	yes	select mite resistant stock when available

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center

USDA United States Department of Agriculture National Institute of Food and Agriculture

Northeastern IPM Center

Questions

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Northeastern IPM Center

VARROA MITE IPM PLAN BASICS

maine DEPARTMENT OF Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR MASSACHUSETTS DEPARTMENT OF AGRICULTURAL RESOURCES Division of Crop and Pest Services Apiary Program

Fundamentals of a Varroa Mite

IPM Plan

1) **Bee-a-Planner!** Determine short/long-term goals of your apiary

2) **Bee Practical!** Schedule time in your calendar for apiary management to coincide with bee development

3) **Bee-a-Keeper!** Monitor hives frequently to determine mite levels and compare with established thresholds

4) **Bee Prepared!** Incorporate prevention (non-chemical) tools and purchase intervention (chemical) tools & PPE in advance

5) **Bee Creative, but Safe!** Use multiple tools safely to achieve best control

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	**Colony Inspection Timeline** (i.e. time - type)	**Colony Population** (i.e. stage)	**Honey Flow** (i.e. super)	**Mite Monitoring Timeline** (i.e. time - notes)	**Non-Chemical Tools** (i.e. cultural, mechanical, genetic)	**Chemical Tools** (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

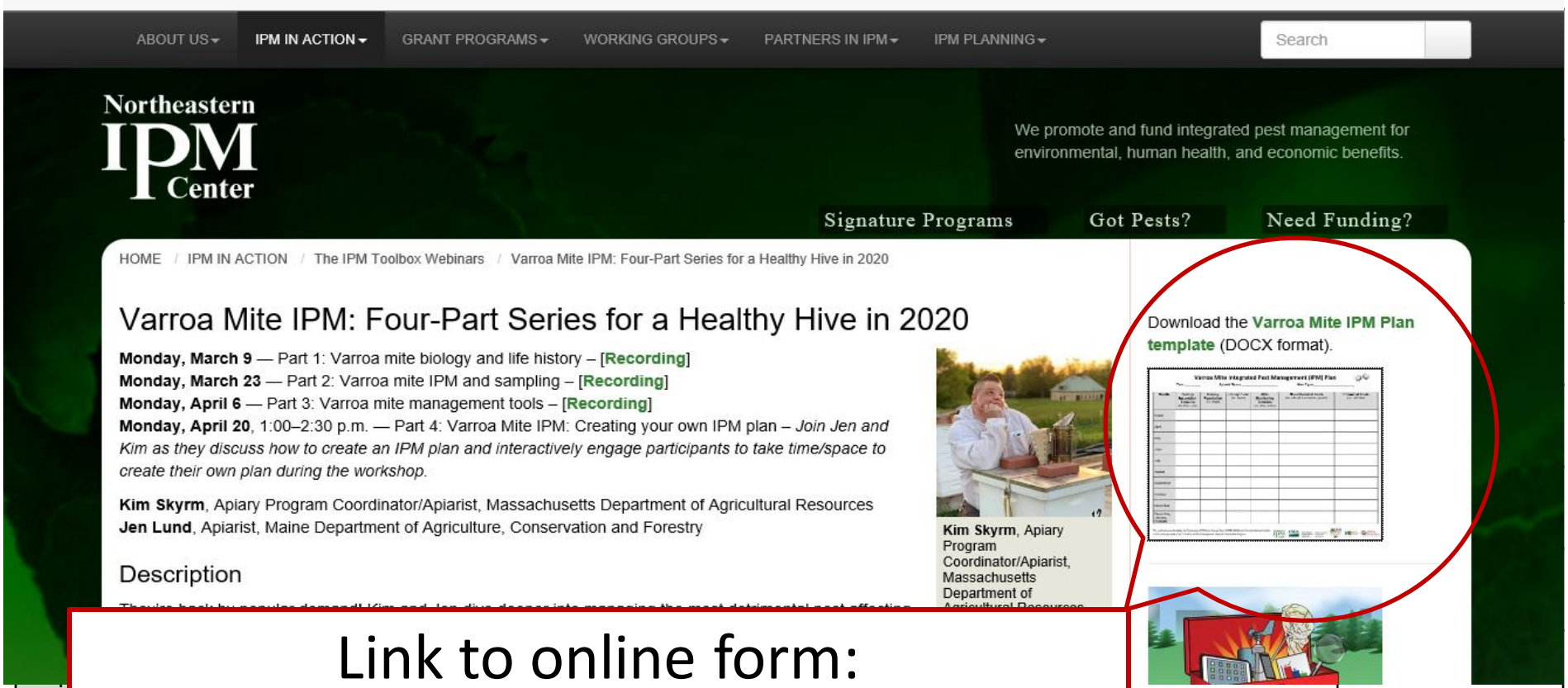
Example

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____



Link to online form:

https://neipmc.org/go/vm2020

Oct						
November						
December, January, February						

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center

Creating your Own Varroa Mite IPM Plan

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources Division of Crop and Pest Services Apiary Program

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

Steps to Creating an IPM Plan:

1. Make separate sheet for different hive types/apiaries
2. Fill in as much info as possible – leave room for notes
3. Account for your schedule – bee realistic!
4. Plan for colony development
5. Share with fellow beekeepers to get suggestions
6. Create a notebook to store plans in accessible place
7. Post reminder in calendar about management needs
8. Purchase supplies in advance – multiple tools & PPE
9. Monitor mites PRE & POST treatment

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Start with the easy stuff!

Month	Colony Inspection Timeline (i.e. time - type)	Colony Popu (i.e.	Honey Flow	Mite (i.e. time - notes)	Non-Chemical Tools	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

When you plan to inspect colonies – i.e. external inspection of entrance, quick check open cover, fully open hives:

1. Weekly
2. Biweekly
3. Monthly

- Remember to consider external temperatures
- Put a dates on calendar

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center | USDA United States Department of Agriculture | National Institute of Food and Agriculture | MDAR Apiary Program | Maine Department of Agriculture Conservation & Forestry | UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

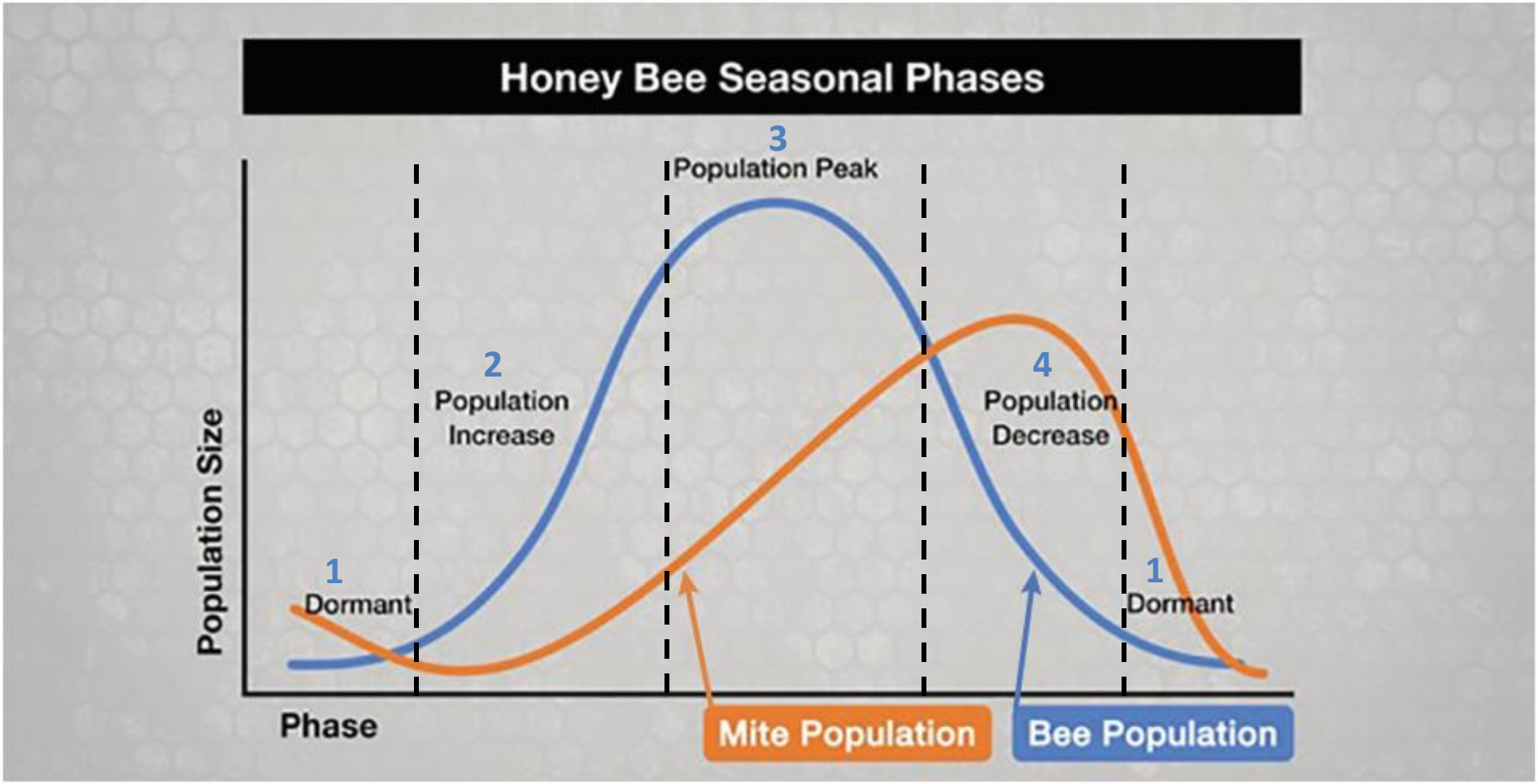
What you expect will be the hive development – i.e. quantity of worker and brood population:

1. Dormant: Winter
2. Increase: Spring-Summer
3. Peak: Summer-Fall
4. Decrease: Fall-Winter

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

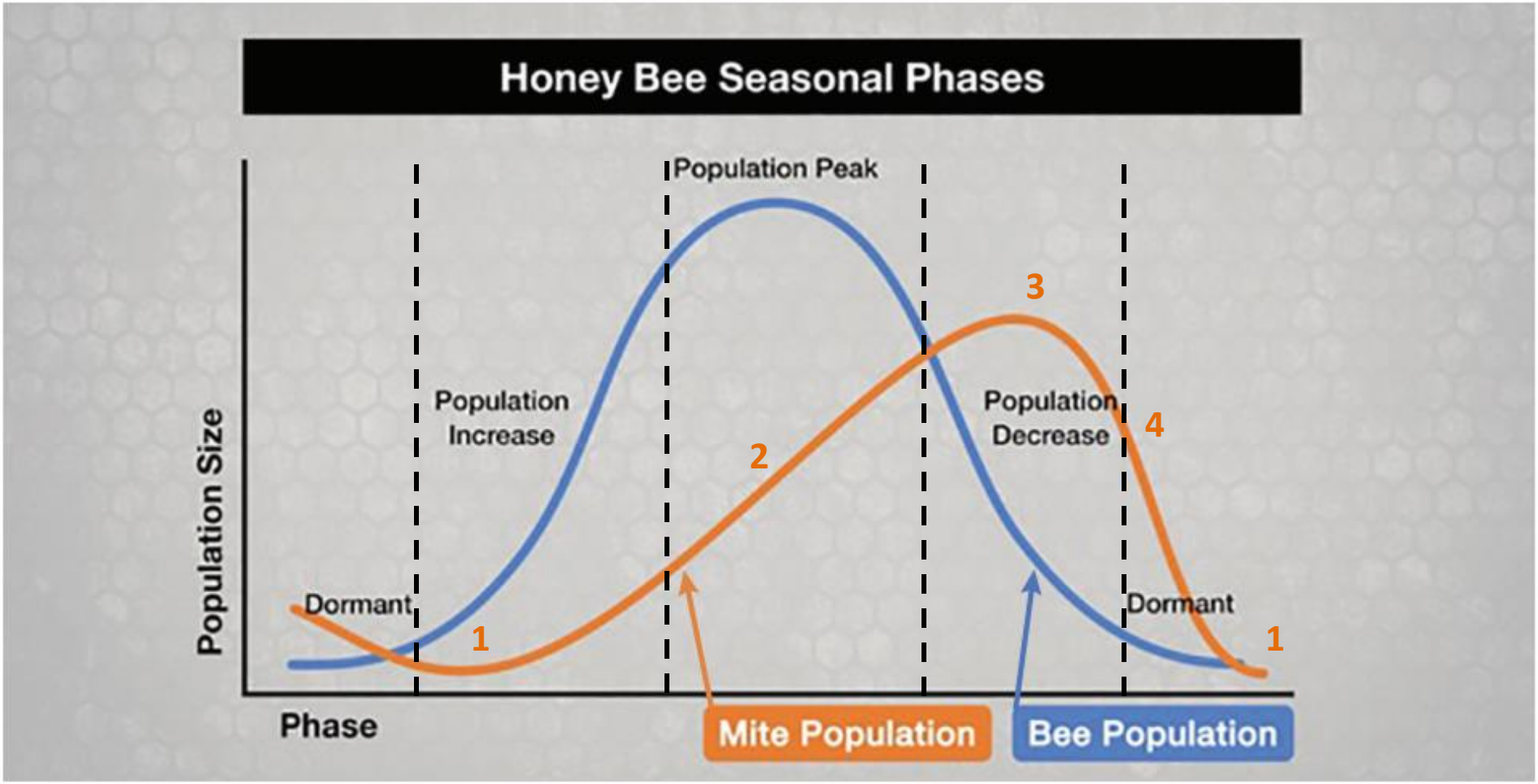
Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Figure 1: Varroa Mite Life Cycle



For details on the Varroa Life Cycle consult:
www.extension.org/pages/65450/varroa-mite-reproductive-biology

Figure 1: Varroa Mite Life Cycle



For details on the Varroa Life Cycle consult:
www.extension.org/pages/65450/varroa-mite-reproductive-biology

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

When you think honey flow will occur – i.e. plan to add/take off honey supers:

1. Super
2. No super

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

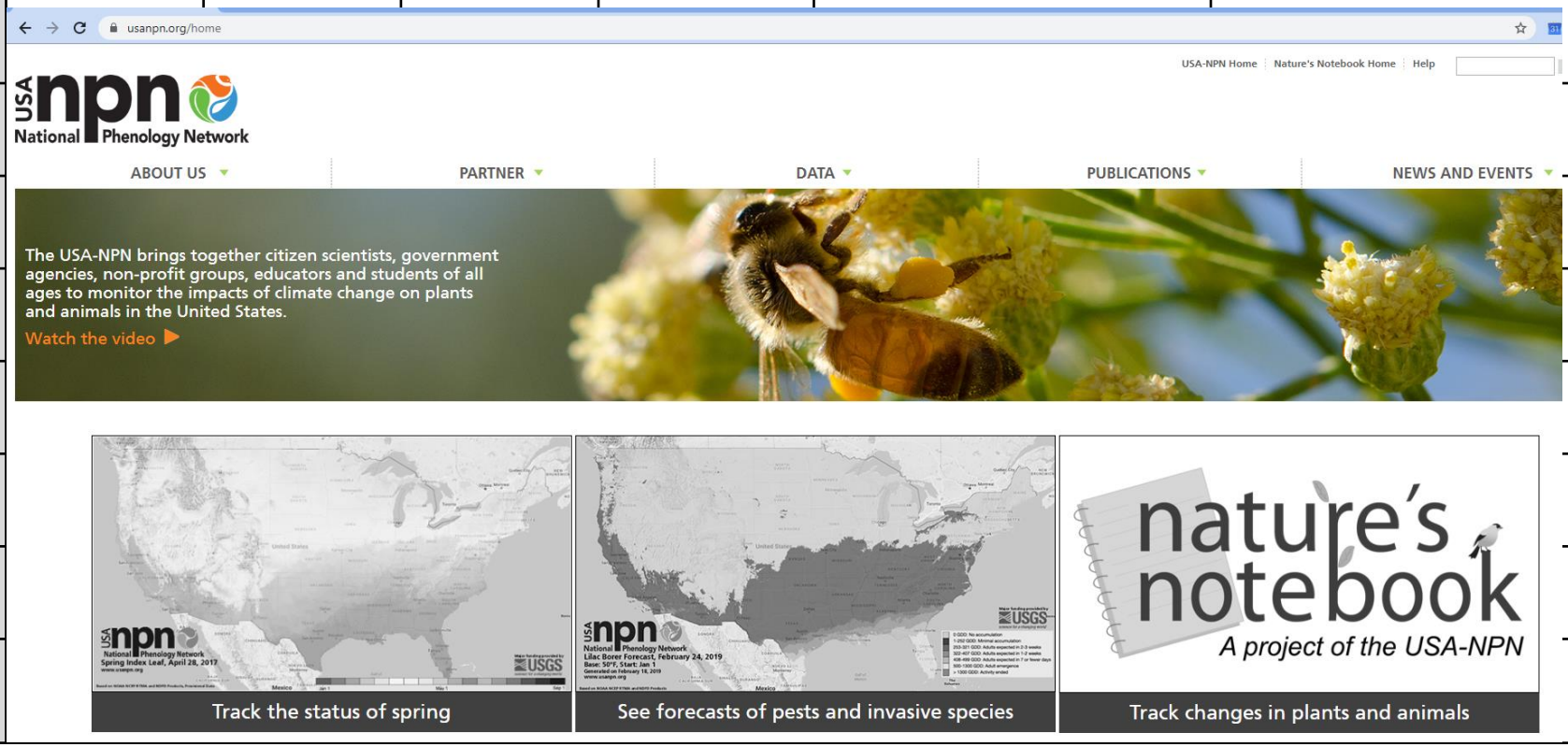
Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

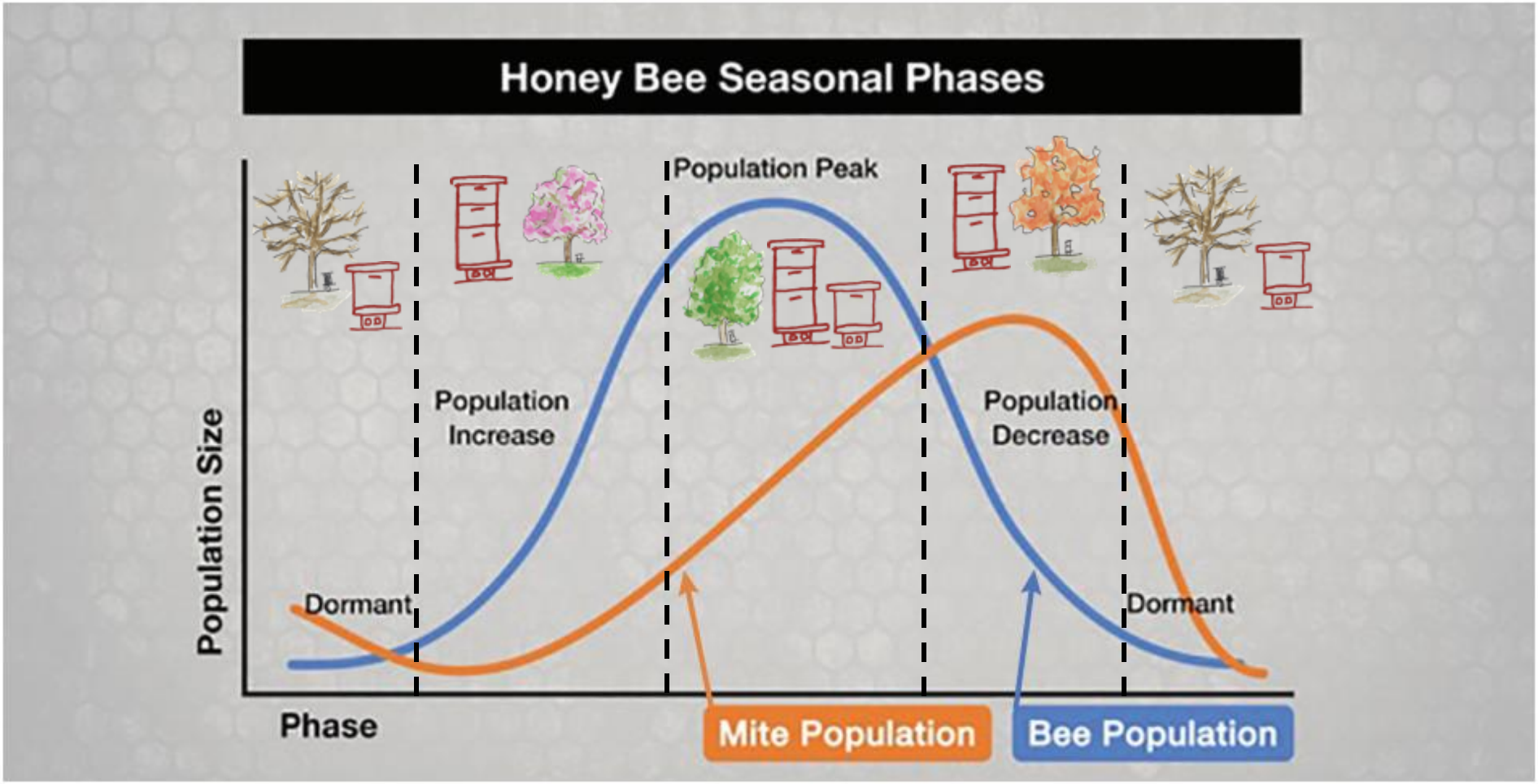
Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

When you think honey flow will occur – i.e. plan to add/take off honey supers



This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Figure 1: Varroa Mite Life Cycle



For details on the Varroa Life Cycle consult:
www.extension.org/pages/65450/varroa-mite-reproductive-biology

Northeastern IPM Center

Questions

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

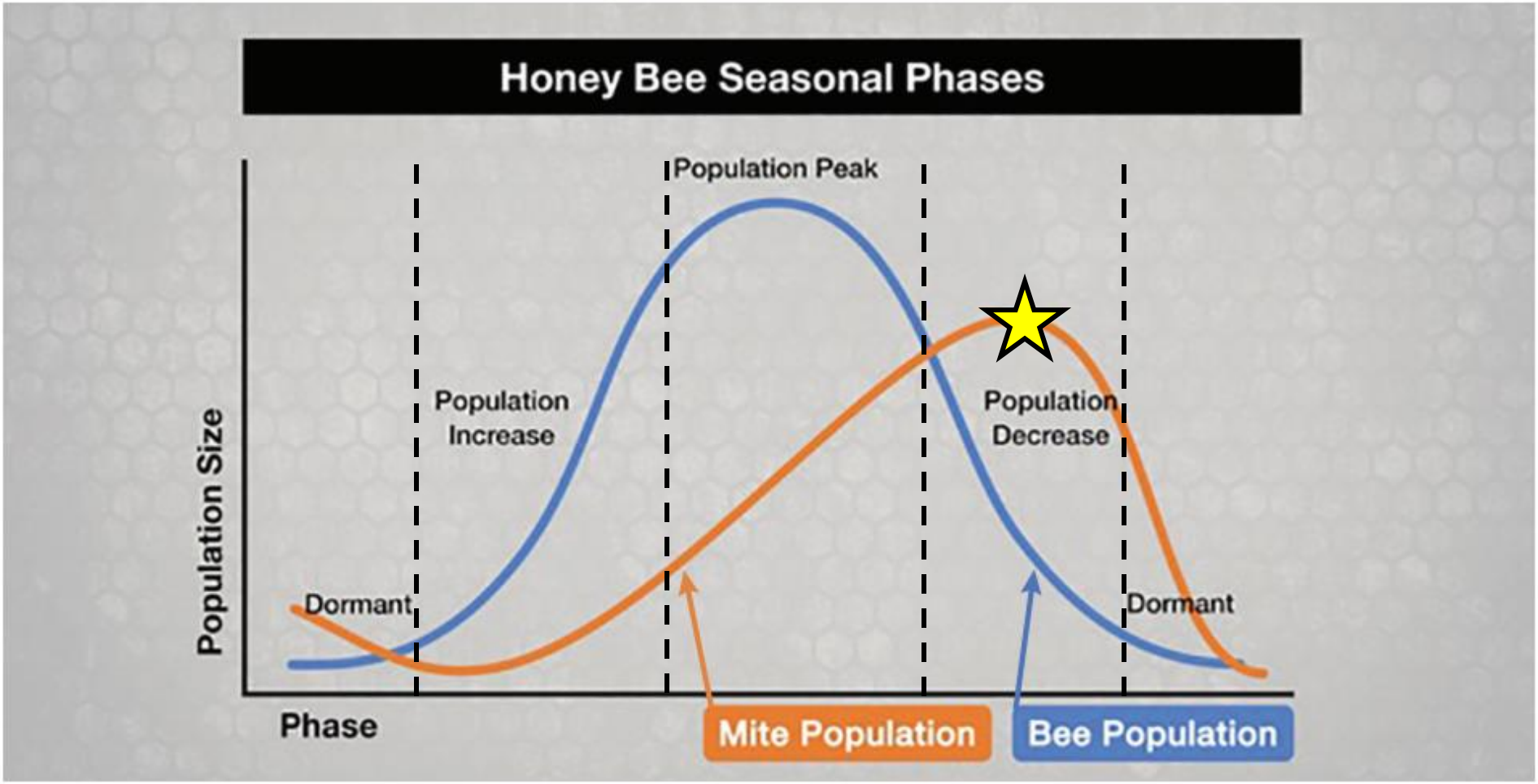
Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

When you will monitor hives using alcohol wash/roll to determine Varroa mite level?

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

Figure 1: Varroa Mite Life Cycle



For details on the Varroa Life Cycle consult:
www.extension.org/pages/65450/varroa-mite-reproductive-biology

Monitor and Sampling….YES!

Hive Type	First Monitoring Event	Future Monitoring Events	Mite Threshold (#mites/100bees)
Overwintered	Early Spring when bees are active & outside temps allow hive inspection	Monthly (at least), & After treatment 	1% (ideal) to 3% (treatment threshold) 
Package	At install? (ask supplier)		
Nuc	At install? (ask supplier)		
Split	At install? (mite monitoring of original hive?)		
Swarm	At install		
Cut-Out	At install		

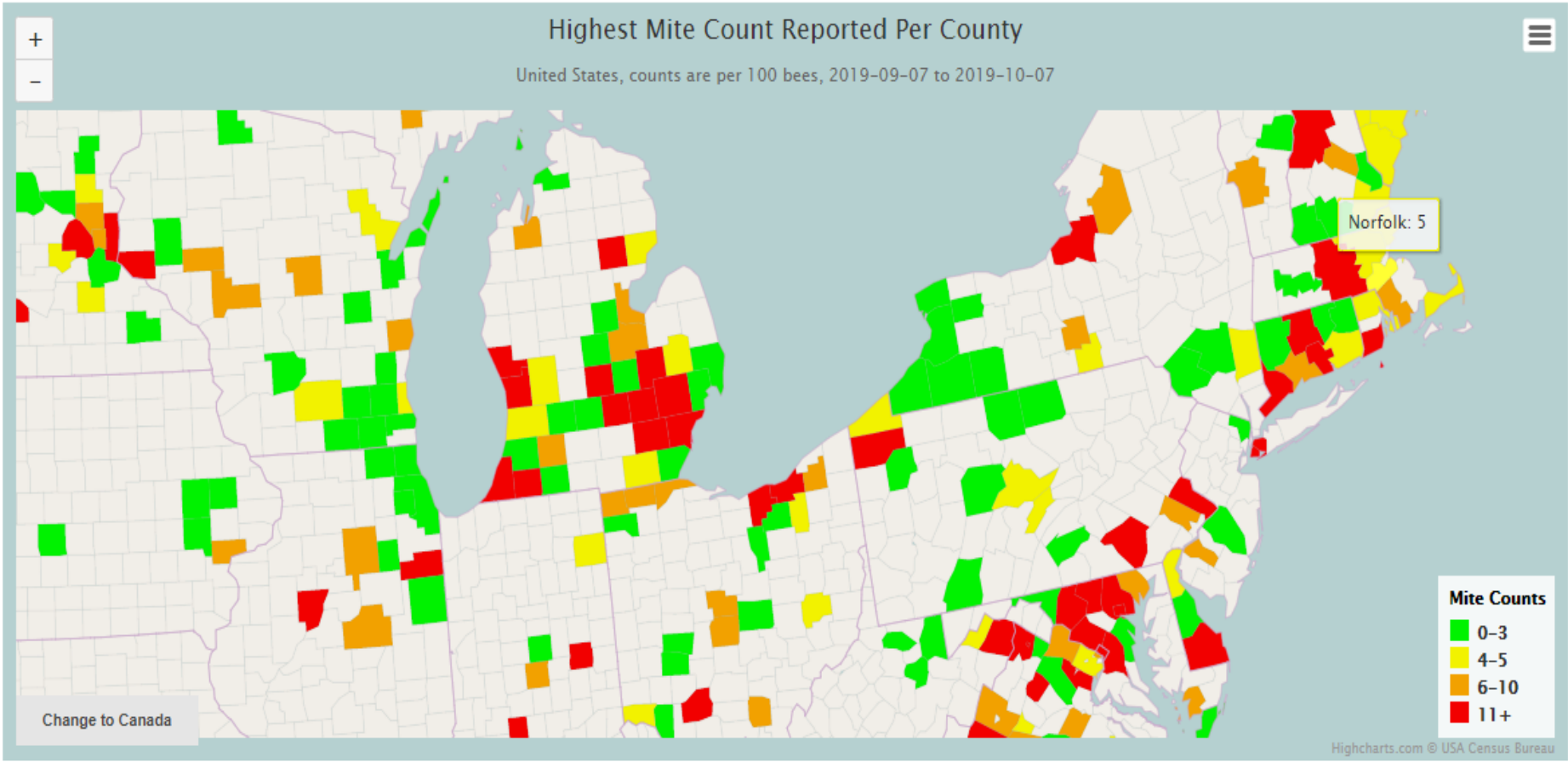
Remember to Always Monitor <u>Pre</u> AND <u>Post</u> Treatment!

Varroa Integrated Pest Management – Sampling & Control Tracking Worksheet

Inspection Date	Apiary	Colony #	# of Sampled colonies	Initial Sampling Results	Action/treatment taken	Treatment date applied	Treatment date completed	Follow-up Sampling Date	# of Sampled Colonies After Treatment Completed	Sampling Results After Treatment	Notes (i.e. observations, batch number if chemical used, follow-up treatment if any, etc.)

MiteCheck

Responses sampled from **August 1st, 2019** to **October 7th, 2019** Change



0 - 3: Relatively low mite level, keep monitoring and managing (splitting, drone trapping, brood breaks, screened bottom boards) mite populations.

4 - 5: Intervention (use of a miticide) will greatly increase chances of colony survival.

6 - 10: Colony loss or damage likely. Intervention is critical to prevent colony loss from mite infestation.

11+: Loss of colony likely. Intervention is essential to decrease the threat of horizontal transmission (spread) of mites to neighboring colonies.

https://research.beeinformed.org/mitecheck/

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March						
April						
May						
June						
July						
August						
Septem						
Octobe						
Novem						
Decem January February						

What tools are you planning to use? Ask yourself…

- Do I need to remove it?
- Will I have time to remove it?
- Do I have time to re-queen, if needed?
- Do I have time to build-up before winter?

Options:

1. Space/paint/barrier/rotate entrances
2. Replace frames
3. Screened bottom boards
4. Drone frames
5. Brood interruption/cage queen
6. Re-queen
7. Split
8. Swarm management

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

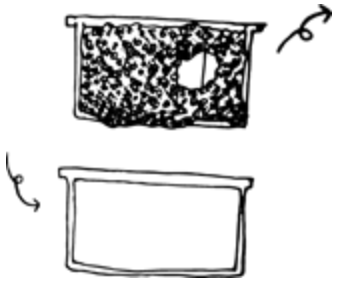
Cultural, Mechanical & Genetic Tools

Apiary Design & Population Density

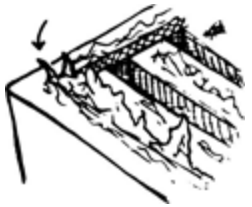
Reduce Transmission

Keep Hives Small

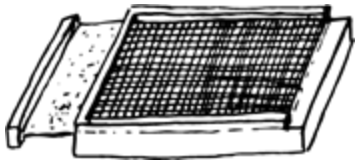
Support Social Immunity



Swap Old Frames

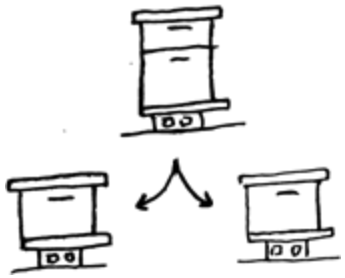


Leave Propolis



Screened Bottom Boards

Genetics



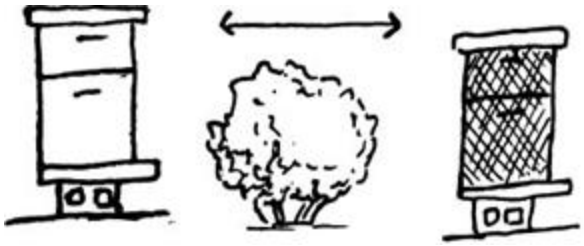
Queen Stock/Colony Selection

Swarm Management

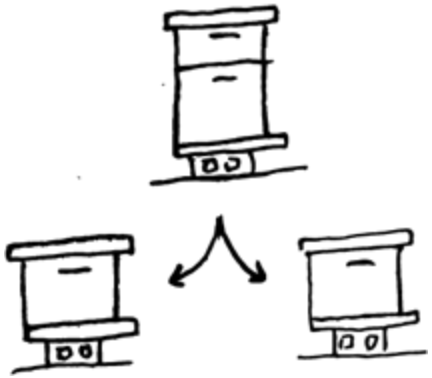
UMass Extension

Apiary Design & Population Density

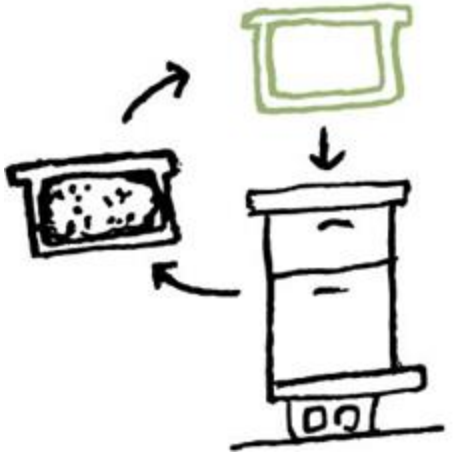
- **Control Drift Between Hives:**
  - Space hives at least 10ft apart
  - Separate hives on stands
  - Paint hives different colors
  - Provide barrier between hives
  - Rotate hive entrances to face different directions



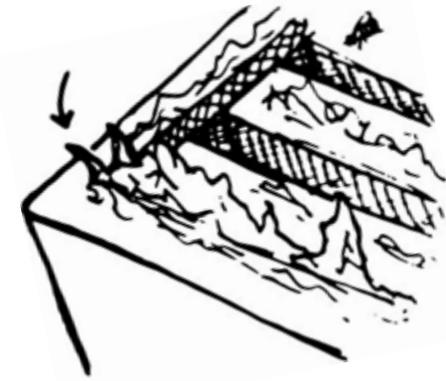
- **Reduce Robbing:**
  - Monitor for strength
  - Keep hives small – single box?
  - Do not open-air feed bees
  - Do not leave equipment/comb exposed
  - Replace damaged equipment



Support Social Immunity



- **Hive Hygiene:**
  - Replace old comb every 3-5 years
  - Replace broken & damaged frames
  - Do not:
    - purchase/sell used equipment
    - rotate boxes/equipment in apiary without records
  - Encourage propolis
  - Consider benefits of screen bottom boards
  - Monitor drone brood frames



Queen & Colony Genetics

- **Queen**
  - Use or re-queen with “Varroa Warriors” - Russian, VSH, Ankle Biter
  - Re-queen using local stock of survivor colonies
  - Keep genetics of *high grooming behavior* and low Varroa mite level queens in apiary – graft/splits

- **Colony**
  - Take splits from colonies - low Varroa mite levels & high overwinter survival
  - Manage swarms - misconception that they have low Varroa mite levels - sample, then decide
  - Do not combine declining/weak colonies or those with high Varroa mite levels

Using genetic stocks to reduce *Varroa* mite loads

Stock	Description of the behavior	Institution that selected or imported stock	Mite life stage affected
Varroa-sensitive hygienic (VSH) bees	• Bees uncap and remove or chew infested pupae; immature mites die	USDA Bee Breeding Laboratory in Baton Rouge, Louisiana Minnesota Hygienic Line, University of Minnesota	Reproductive
Grooming behavior bees	• Bees remove mites from their own bodies and/or their nestmates' bodies • Stocks with grooming behavior also tend to express VSH behavior	Clemson University, South Carolina (still in development)	Dispersal
Ankle Biter bees	• Bees remove mites from their bodies and bite mites' legs off; mites can no longer attach onto bees	Purdue University, Indiana	Dispersal
Russian bees	• Russian bees encountered mites nearly a century ago and have had more time to naturally develop tolerance • They have increased VSH behavior and cease brood production (causing a break in the brood cycle) in times of food shortage	Imported by the USDA Bee Breeding Laboratory in Baton Rouge, Louisiana	Reproductive

Dispersal mites adult mites present on bee bodies

Reproductive mites: reproducing mites present in capped pupae

Source: Cornell University College of Agriculture and Life Sciences – *Resources for Integrated Pest Management (IPM) and Varroa Mite Control*

Northeastern IPM Center

Questions

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	**Colony Inspection Timeline** (i.e. time - type)	**Colony Population** (i.e. stage)	**Honey Flow** (i.e. super)	**Mite Monitoring Timeline** (i.e. time - notes)	**Non-Chemical Tools** (i.e. cultural, mechanical, genetic)	**Chemical Tools** (i.e. miticides)
March						
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

<u>What tools are you planning to use? Ask yourself…</u>

- Current/Future outside temperature?
- Colony population
- Need to penetrate brood-cappings?
- Will honey supers be on?
- Treatment duration conflict with management?
- Have equipment to apply treatment?
- Have time to re-queen, if needed?
- Have time to re-treat, if needed?

<u>Options:</u>

1. Apivar
2. Apiguard
3. Api Life Var
4. MAQS/Formic Pro
5. Api-Bioxal/Oxalic Acid
6. HopGuard II/III

This publication was funded by the Northeastern IPM Center th
70006-22484 from the National Institute of Food and Agricultu
Pest Management, Regional Coordination Program.

Center Agriculture Agriculture

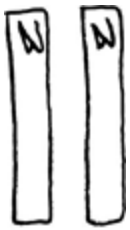
UMass Extension

Chemical Tools – SAFETY

UMass Extension

Gloves

Apivar



Apistan

CheckMite+

Gloves + Protective Eyewear

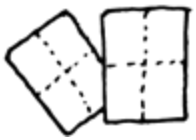
Hop Guard II/III

Apiguard

MAQ/Formic Pro

Gloves + Protective Eyewear + Respirator

Api-Bioxal/Oxalic Acid



Api Life Var

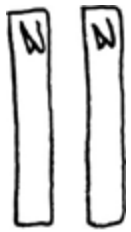
Chemical Tools – TEMPERATURE

UMass Extension

<50°F

Oxalic Acid/Api-Bioxal

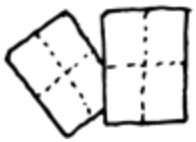
Hop Guard II/III



Apivar

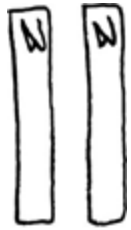
≥50°F

Apiguard



Api Life Var

Api-Bioxal/
Oxalic Acid



Apivar

MAQ/Formic Pro

Hop Guard II/III

Chemical Tools – HONEY SUPERS

UMass Extension

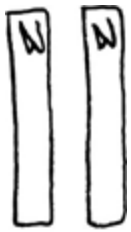
Can apply with **supers**

Hop Guard II/III

Kills under capped brood →

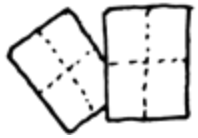
MAQ/Formic Pro

Cannot apply with supers

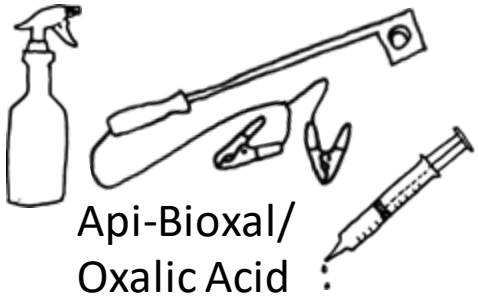


Apivar

Apiguard



Api Life Var



Api-Bioxal/
Oxalic Acid

Northeastern IPM Center

VARROA MITE IPM PLAN EXAMPLES

maine DEPARTMENT OF Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR MASSACHUSETTS DEPARTMENT OF AGRICULTURAL RESOURCES Division of Crop and Pest Services Apiary Program

Varroa Mite Integrated Pest Management (IPM) Plan

Year_____ **Apiary Name**_____ **Hive Type(s)**_____

Month	**Colony Inspection Timeline** (i.e. time - type)	**Colony Population** (i.e. stage)	**Honey Flow** (i.e. super)	**Mite Monitoring Timeline** (i.e. time - notes)	**Non-Chemical Tools** (i.e. cultural, mechanical, genetic)	**Chemical Tools** (i.e. miticides)
March	*N/A, monthly, bimonthly - external, quick check, open*	*dormant, increase, peak, decrease*	*N/A, no super, super*	*N/A, monthly – pre/post treatment*	*N/A, space/paint/barrier/rotate entrances, replace frames, screened bottom board, drone frames, brood interruption/cage queen, re-queen, split, swarm management*	*N/A, Apivar, Apiguard, Api Life Var, MAQS/Formic Pro, Api-Bioxal/OA, Hopguard II/III*
April						
May						
June						
July						
August						
September						
October						
November						
December, January, February						

Example

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture Conservation & Forestry · UMass Extension

INTEGRATED PEST MANAGEMENT STRATEGY for VARROA

YEAR:_____

Month	Supers on?	# Colony Inspections	Monitor for Mites?	Mite Threshold (/100 bees)	Cultural Treatment Options	Chemical Treatment Options (if over threshold)
April		1				
May		2	✓	1	Drone	
June	✓	2	✓	1	Drone	
July	✓	2	✓	1		
August	✓	2	✓	1		
September	✓	2	✓	1		
October	~~✓~~	2	✓	1		
November	~~✓~~	2	✓	1		
Dec/Jan/ Feb/Mar		2				

INTEGRATED PEST MANAGEMENT STRATEGY for VARROA

YEAR:_____

Month	Supers on?	# Colony Inspections	Monitor for Mites?	Mite Threshold (/100 bees)	Cultural Treatment Options	Chemical Treatment Options (if over threshold)
April	N	X	X	1	Potential requeen	Oxalic acid
May	N	X	X	1		Oxalic acid
June	Y	X	X	1		Formic acid
July	Y	X	X	2		As needed based on mite load
August	Y	X	X	2		
September	Y	X	X	2		
October	Y	X	X	2		Apivar
November	Y	X	X	2		
Dec/Jan/ Feb/Mar						

+ Alcohol washes

++ Education w/ local beekeepers

Varroa Mite Integrated Pest Management (IPM) Plan

Year *2020* **Apiary Name** *MDAR State Apiary* **Hive Type(s)** *10 frame Langstroth - overwintered*

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March	*monthly - external, quick check, open?*	*dormant to increase*	*N/A*	*N/A*	*screened bottom board*	*N/A*
April	*monthly - open*	*increase*	*no super to super*	*monthly*	*space/rotate entrances, screened bottom board*	*N/A*
May	*bi-monthly - open*	*increase*	*super*	*monthly - pre/post treatment*	*screened bottom board, replace frame, re-queen, split, swarm management*	*Api Life Var*
June	*bimonthly - open*	*increase*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board, re-queen, split, swarm management*	*N/A*
July	*monthly - open*	*increase to peak*	*super*	*monthly - pre/post treatment*	*screened bottom board*	*MAQS/Formic Pro, if needed*
August	*bi-monthly - open*	*peak*	*super*	*monthly - pre/post treatment*	*screened bottom board, swarm management, re-queen, combine*	*Apiguard*
September	*bi-monthly - open*	*peak to decrease*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board, combine*	*Api-Bioxal/OA dribble or Apivar*
October	*monthly - open*	*decrease*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board*	*N/A*
November	*monthly - external*	*decrease to dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*
December, January, February	*monthly – external, quick check*	*dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture, Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year *2020* **Apiary Name** *MDAR State Apiary* **Hive Type(s)** *10 frame Langstroth - overwintered*

Month	Colony Inspection Timeline (i.e. time - type)	Colony Population (i.e. stage)	Honey Flow (i.e. super)	Mite Monitoring Timeline (i.e. time - notes)	Non-Chemical Tools (i.e. cultural, mechanical, genetic)	Chemical Tools (i.e. miticides)
March	*monthly - external, quick check, open?*	*dormant to increase*	*N/A*	*N/A*	*screened bottom board*	*N/A*
April	*monthly - open*	*increase*	*no super to super*	*monthly*	*space/rotate entrances, screened bottom board*	*N/A*
May	*bi-monthly - open*	*increase*	*super?*	*monthly - pre/post treatment*	*screened bottom board, replace frames, re-queen, split, swarm management*	*Api Life Var?*
June	*bimonthly - open*	*increase*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board, re-queen, split, swarm management*	*N/A*
July	*monthly - open*	*increase to peak*	*super*	*monthly - pre/post treatment*	*screened bottom board*	*MAQS/Formic Pro, if needed*
August	*bi-monthly - open*	*peak*	*super?*	*monthly - pre/post treatment*	*screened bottom board, swarm management, re-queen, combine*	*Apiguard?*
September	*bi-monthly - open*	*peak to decrease*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board, combine*	*Api-Bioxal/OA dribble or Apivar*
October	*monthly - open*	*decrease*	*super to no super*	*monthly - pre/post treatment*	*screened bottom board*	*N/A*
November	*monthly - external*	*decrease to dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*
December, January, February	*monthly – external, quick check*	*dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture, Conservation & Forestry · UMass Extension

Varroa Mite Integrated Pest Management (IPM) Plan

Year *2020* **Apiary Name** *EXAMPLE* **Hive Type(s)** *10 frame Langstroth - package*

Month	**Colony Inspection Timeline** (i.e. time - type)	**Colony Population** (i.e. stage)	**Honey Flow** (i.e. super)	**Mite Monitoring Timeline** (i.e. time - notes)	**Non-Chemical Tools** (i.e. cultural, mechanical, genetic)	**Chemical Tools** (i.e. miticides)
March	*N/A*	*N/A*	*N/A*	*N/A*	*space/paint/barrier/rotate entrances*	*N/A*
April	*install*	*increase*	*N/A*	*ask supplier*	*screened bottom board, drone frame*	*Api-Bioxal/OA spray at install if supplier did not treat or Hopguard II/III*
May	*monthly - open*	*increase*	*super*	*monthly*	*screened bottom board, drone frame*	*N/A*
June	*monthly - open*	*increase*	*super*	*monthly - pre/post treatment*	*screened bottom board, drone frame, swarm management, brood interruption/cage queen*	*MAQS/Formic Pro, if needed*
July	*monthly - open*	*increase to peak*	*super*	*monthly*	*screened bottom board, drone frame*	*MAQS/Formic Pro, if needed*
August	*bimonthly - open*	*peak*	*N/A*	*monthly - pre/post treatment*	*screened bottom board, drone frame, swarm management, brood interruption/cage queen*	*Apiguard*
September	*bimonthly - open*	*peak to decrease*	*N/A*	*monthly - pre/post treatment*	*screened bottom board, drone frame*	*Apivar*
October	*monthly - open*	*decrease*	*N/A*	*monthly - pre/post treatment*	*screened bottom board*	*N/A*
November	*monthly - external*	*decrease to dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*
December, January, February	*monthly – external, quick check*	*dormant*	*N/A*	*N/A*	*screened bottom board*	*Api-Bioxal/OA vaporizer*

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture, Conservation & Forestry · UMass Extension

INTEGRATED PEST MANAGEMENT STRATEGY for VARROA

YEAR:_____

Packages

Month	Supers on?	# Colony Inspections	Monitor for Mites?	Mite Threshold (/100 bees)	Cultural Treatment Options	Chemical Treatment Options (if over threshold)
April	No	Queen release Capped brood Every 7 days	Alcohol WASH ASAP!	1	Set up hives 10' apart Paint different colors Openings different direction Feed them syrup	Apivar if mites high
May	No	Every 7 days	1st Sat every month	2	drone frames feed syrup	Hop guard or formic acid depending on temperature
June	YES	↓	↓	3	drone frames	If over use ~~mite~~ formic acid
July	No	↓	↓	3	drone frame	Apivar ↓ 42 days +14 days before adding supers
August	No	↓	↓	2	drone if needed	↓
September	YES	↓	↓	2		Formic Acid
October	No	↓	↓	1		if needed Apivar
November			—		Prepare for winter, last mite check mouse guard, candy boards moisture board	
Dec/Jan/ Feb/Mar			—			

Month	Supers on?	# Colony Inspections	Monitor for Mites?	Mite Threshold (/100 bees)	Cultural Treatment Options	Chemical Treatment Options (if over threshold)
April	N	N/A (Install)	N	N/A	Screen Bottom 10' distance Paint Hives different directions Paint Different colors, add landmarks	N/A
May	N	2	1	1		Formic Oxalic Hopguard
June	N	2	1	1	Re-queen w/ hygenic queen	Above + Apiguard, ApiLife VAR
July	N	3	1	1		↓
August	N	3	2	1		
September	N	2	1	1		Above + Apivar ↓
October	N	2	1	1		
November	N	1	0	N/A	Solid bottom board on winter prep	N/A
Dec/Jan/ Feb/Mar	N	1 Check Sugar Brick	0	N/A		N/A

Varroa Mite Integrated Pest Management (IPM) Plan

Year *2020* **Apiary Name** *EXAMPLE* **Hive Type(s)** *10 frame Langstroth - nuc*

Month	**Colony Inspection Timeline** (i.e. time - type)	**Colony Population** (i.e. stage)	**Honey Flow** (i.e. super)	**Mite Monitoring Timeline** (i.e. time - notes)	**Non-Chemical Tools** (i.e. cultural, mechanical, genetic)	**Chemical Tools** (i.e. miticides)
March	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
April	*N/A*	*N/A*	*N/A*	*N/A*	*space/paint/barrier/rotate entrances*	*N/A*
May	*install*	*increase*	*super*	*install*	*screened bottom board, drone frame*	*N/A*
June	*monthly - open*	*increase*	*super*	*monthly - pre/post treatment*	*screened bottom board, drone frame, swarm management, brood interruption/cage queen*	*MAQS/Formic Pro, if needed*
July	*monthly - open*	*increase*	*super*	*monthly*	*screened bottom board, drone frame*	*MAQS/Formic Pro, if needed*
August	*bimonthly - open*	*Increase to peak*	*no super*	*monthly - pre/post treatment*	*screened bottom board, drone frame, swarm management, brood interruption/cage queen*	*Apiguard*
September	*bimonthly - open*	*peak to decrease*	*no super*	*monthly - pre/post treatment*	*screened bottom board, drone frame*	*Apivar*
October	*monthly – open*	*decrease*	*N/A*	*monthly - pre/post treatment*	*screened bottom board*	*Api-Bioxal/OA Vaporizer*
November	*monthly - external*	*decrease to dormant*	*N/A*	*N/A*	*screened bottom board*	*N/A*
December, January, February	*monthly – external, quick check*	*dormant*	*N/A*	*N/A*	*screened bottom board*	*Api-Bioxal/OA vaporizer*

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Northeastern IPM Center · USDA United States Department of Agriculture · National Institute of Food and Agriculture · MDAR Apiary Program · Maine Department of Agriculture, Conservation & Forestry · UMass Extension

Northeastern IPM Center

Questions

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Northeastern IPM Center

Some Questions For You

maine Department of Agriculture Conservation & Forestry

USDA United States Department of Agriculture National Institute of Food and Agriculture

MDAR Massachusetts Department of Agricultural Resources
Division of Crop and Pest Services
Apiary Program

Find a Colleague

- To post a profile about yourself and your work:
  - http://neipmc.org/go/APra
- "Find a Colleague" site
- http://neipmc.org/go/colleagues

Recording of Varroa Mite IPM Webinar Series

- Past recordings and today's Webinar will be available to view **on demand** in a few business days.
- http://www.neipmc.org/go/ipmtoolbox
- You can watch as often as you like.

apiaryinspectors.org

APIARY INSPECTORS OF AMERICA

Home | About | Inspection Services | Laws and Regulations | Documents | Resources | Contact

Welcome to the Apiary Inspectors of America

The Apiary Inspectors of America is a non-profit organization established to promote better beekeeping conditions in North America. Members of the Association, atives, and individual beekeepers, effective laws and methods for the as a mutual understanding and The AIA goal is to provide accurate ement of honey bees, while seeking nent and plant pollination.

ed over the past decade from an nore information about colony loss see the Bee Informed Partnership

Search ...

April

M	T	W	T
		1	2
6	7	8	9
13	14	15	16
20	21	22	23
27	28	29	30

« Jan

We love talking about bees!

Fight The Mite Workshop for Beekeepers

~~Saturday May 2nd, 9am-4pm – UMass-Amherst, MA~~

Postponed – contact to get put on list

COST: $40

https://ag.umass.edu/pollinators/events/fight-mite

Registration Includes:

- Bee-themed T-Shirt
- Sampling jar
- IPM brochure

Chance to win Apiary Diagnostic Kit!

mass.gov/apiary-program-honey-bees

Mass.gov

Search

LIVING WORKING LEARNING VISITING & EXPLORIN

OFFERED BY Massachusetts Department of Agricultural Resources

Apiary Program (honey bees)

MDAR's Apiary Program mission is to promote and sustain apiculture and honey bee health in the Commonwealth by provi support to honey beekeepers, pesticide applicators, farmers, lar managers, educators, regulators, and government officials.

The Apiary Program serves in the role of both an extension outreach education service ar regulatory authority for the enforcement of laws and regulations that pertain to honey

What would you like to do?

Top tasks

- Request an Inspection →
- Register Your Apiary →

All other tasks

- Massachusetts Apiary and Pesticide Locator (MAPL) →
- Have Honey Bees? Then Complete the BEE AWARE: MA Honey Bee Health Survey →
- MA Honey Bee FAQ →
- Find Local Honey →
- Visit a State Apiary →
- Join the Apiary Program Mailing List! →

BEE AWARE: The 2019-2020 Massachusetts Honey Bee Health Survey

Thank you for participating in the BEE AWARE Health Survey by providing feedback on the health of your honey bee colonies!

This survey has been created by the Massachusetts Department of Agricultural Resources (MDAR) to serve as a tool for Massachusetts honey beekeepers to share data on colony health for the past to current bee season: April 2019 - April 2020.

Participation in this survey is voluntary. A summary of results will be provided to the beekeeping community and presented at the Massachusetts State Beekeepers Association Annual Meetings. After the completion of this survey, if requested, a FREE - BEE AWARE sign will be sent to the first 250 respondents.

Happy Beekeeping,
-The MDAR Apiary Program Bee Team

Next

Page 1 of 8

Never submit passwords through Google Forms.

Division of Animal and Plant Health
About Us
FAQ
Laws & Rules
Programs
Agricultural Compliance
Animal Health
Animal Welfare
Apiary (Bees)
Arborist
Board of Pesticides Control (BPC)
Compost
Ginseng
Hemp
Horticulture
Integrated Pest Management (IPM)
Nutrient Management
Pest Survey (CAPS)
Seed Potato Certification
Contact Us

CONNECT!
DACF
Maine Board of Pesticides Control
No More Pests! IPM for Teachers and Kids
Maine Bug Watch (invasive pest news)
Maine Bug Watch (invasive

Apiary (Honey Bee) Program

The purpose of the Apiary Program is to prevent the introduction and/or spread of regul honey bee diseases, parasites, and undesirable genetic material in resident and migrat honey bee colonies, as well as encourage and maintain interstate movement of honey for crop pollination and honey production.

Fill Out the 2019/2020 Maine Beekeeper Survey

The annual Maine beekeeper survey of losses and management practices is now live ready for your input! Gathering this type of data is important for seeing trends, recogni determining where to focus education/outreach activities in the future. A summary repo Maine State Beekeepers annual meeting in October and available online.

- Take the 2019/2020 Maine Beekeeper Survey

Licensing, Importing and Inspection of Honey Bees

Anyone who keeps honeybees in Maine MUST obtain an apiary license.

- Apiary License Application (PDF) (DOCX)
- Fee Schedule (PDF)

Anyone who imports bees into Maine MUST submit an Import Notification of Bees form and pay the appropriate fee.

- Import Notification of Bees (DOCX)
- Fee Schedule (PDF)

Honey bee colonies in Maine may be inspected for regulated diseases and parasites. Inspections of colonies may also be performed upon request.

- Hive Inspection Request Form

Education, Training and Events

The Apiary program educates beekeepers, growers and the general public about bee keeping techniques and the value of honeybees to Maine agriculture.

Fact Sheets

Maine Beekeeper Survey 2019/2020

Maine Honey Bee Survey April 2019 - April 2020

Thank you for taking part in the Maine Honey Bee Survey. Data collected will be used to summarize beekeeping practices and losses in the State of Maine for the 2019/2020 beekeeping season. All responses are confidential. This survey should take about 15 minutes and we ask that you please provide information about honey bee colonies that you owned from April 2019 - April 2020.

A summary of the survey can be found on the Maine Department of Agriculture, Conservation and Forestry Apiary website mid July 2020 and will be presented at the 2020 Maine State Beekeepers Annual Meeting.

Thank you!

* Required

1. In what county do you live? *
Enter your answer

2. In what town do you live?
Enter your answer

3. In what Maine town(s) are your apiary/apiaries located? *
Enter your answer

PROGRAM CONTACTS

Apiary Program
28 State House Station
Augusta, ME 04333
phone: (207) 287-3891
fax: (207) 287-5576

Acknowledgements

This presentation was funded in part by the Northeastern IPM Center through Grant #2014-70006-22484 and #2018-70006-28882 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.

Thanks for Joining Us!

Jennifer Lund

MDACF Apiary Program

207-287-7562

jennifer.lund@maine.gov

Kim Skyrm, Ph.D.

MDAR Apiary Program

617-626-1801

bees@mass.gov