


Complete Beekeeping Short Course

Part 15:
Integrated Pest Management & Sampling Bee Hives

 **DIVISION OF AGRICULTURE
RESEARCH & EXTENSION**
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integrated pest management

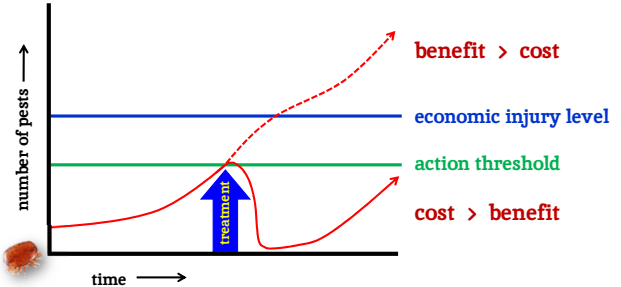
- IPM is an approach to pest control that is sensitive to the **environment** and the **economics** of each pest situation
- IPM is not necessarily the same as organic pest control, although organic solutions can be part of an IPM approach
- we **manage** pests because **eradication** is rarely a viable option

integrated pest management

- IPM **integrates** all the tools have, for the most effective, and least intrusive solution
 - cultural & mechanical controls
 - prevention is the best control
 - good beekeeping practices
 - screen bottom boards
 - mechanical traps
 - genetic controls
 - MN Hygeinic, VSH, Russian, Buckfast...
 - chemical controls
 - begin with highly targeted, less toxic compounds
 - move up the scale only as needed



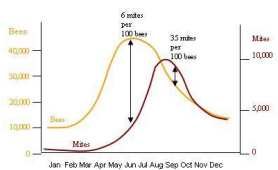
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The graph plots 'number of pests' on the y-axis against 'time' on the x-axis. A red curve shows pest population rising and then falling after a 'treatment' event. A blue horizontal line represents the 'economic injury level', a green line represents the 'action threshold', and a red horizontal line represents the 'cost > benefit' level. Labels indicate 'benefit > cost' above the economic injury level and 'cost > benefit' below the action threshold.

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- how many pests can a colony handle?
- influenced by many factors
 - colony population
 - colony health
 - time of year
 - weather
 - fecundity of queen
 - genetics




The graph shows 'Bees' (left y-axis, 0-40,000) and 'Mites' (right y-axis, 0-10,000) over months from Jan to Dec. The bee population peaks in late summer at 6 mites per 100 bees, while the mite population peaks in late fall at 32 mites per 100 bees.

Figure 1. Simplified bee and mite population growth curves for a temperate climate. The mite growth curve lags behind the bee curve. Note how the number of mites per hundred bees greatly increases in fall. A colony is unlikely to survive a fall infestation rate this high.

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- sampling pest populations is the key
 - does this hive have a pest problem?
 - how many pests does it have?
 - how many pests can this colony handle?
- what is the most effective method to manage this problem?



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- sampling for varroa mites



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- sampling for varroa mites

1/8" wire mesh & wide-mouth jar



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- sampling for varroa mites



white container (or other light color)

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- sampling for varroa mites

1/4 cup = about 100 bees

you need minimum of 300 bees for an accurate sample



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- sampling for varroa mites



find a comb with nurse bees (open brood cells) and gently move jar down the backs of bees and they will backflip right into the sampling container

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- sampling for varroa mites



add 2 tablespoons powdered sugar

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- sampling for varroa mites



gently roll bees
for 30 seconds



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- sampling for varroa mites



tip jar over white container and gently shake for 1 minute

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- sampling for varroa mites



return the
bees to
their hive



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- sampling for varroa mites



count the total
number of
varroa mites

integrated pest management

- sampling for varroa mites

- CO₂ knocks out
bees and mites



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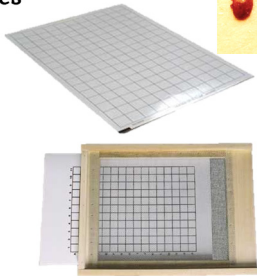
- sampling for varroa mites

- alcohol wash is most accurate
- fatal to bees and mites



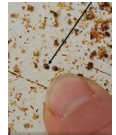
integrated pest management

- sampling for varroa mites



integrated pest management

- sampling for varroa mites



- leave in place for 3 days
- calculate average mite-fall per day
- not an estimate of infestation
- compare hive to itself over time

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- what is the threshold for varroa?
 - there is no absolute rule!
 - consider mite treatment if...
- sugar sample (300 bees)
 - spring: 1-3
 - summer/fall: 9+ (3% infestation)
- sticky board count:
 - spring: 3-10 mites/day
 - fall: 40+ mites/day
- what's *your* comfort level?

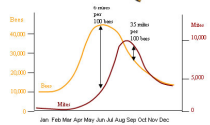
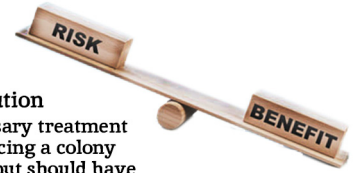


Figure 1. Simplified bee and mite population growth curves for a temperate climate. The mite growth curve lags behind the bee curve. Note how the number of mites per hundred bees greatly increases in fall. A colony is unlikely to exceed a 10% infestation over the year.

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- what is the threshold for varroa?
 - based on what you know about your hive...
 - time of year
 - bee population
 - resistant genetics
 - overall colony health
 - err on the side of caution
 - applying an unnecessary treatment is cheaper than replacing a colony that you didn't treat but should have

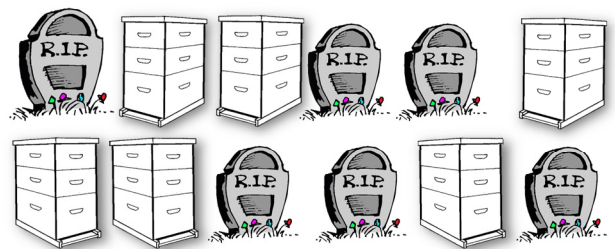


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- *the most popular method of pest control...*
- "live and let die"



integrated pest management



- breeding from "survivor stock"

healthier honey bees

- breeding from “survivor stock”
 - the only sustainable future for beekeeping
- as long as we continue to put pesticides into our bee hives, we do two things:
 - breed stronger pests
 - breed weaker bees
- chemical treatments have their place
 - last resort – not first choice

