Integrated Pest Management
IPM

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IPM

- Several techniques employed simultaneously to solve specific pest problems
- IPM is a decision making process
- Pest may be: pathogen, parasitic or predators

IPM--Varroa

- Pest
- Parasitic vector

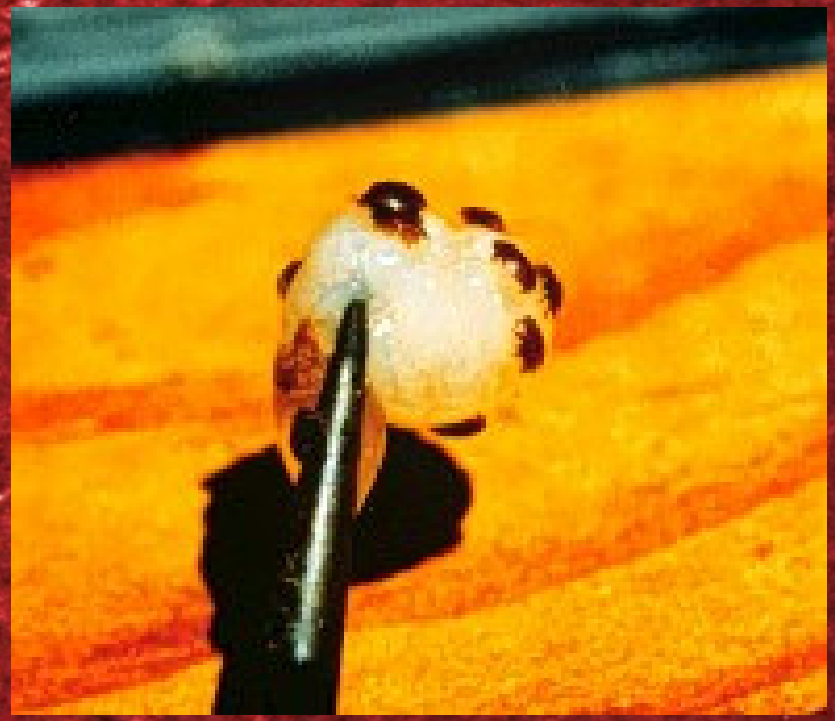
Varroa jacobsoni
Varroa distructor

- Arachnid (like spiders and ticks)
- Brown at maturity--white during immature stage
- Difficult to see

Life cycle of mite:

- Female enters brood cell just before it is to be capped to feed on the developing pupa
- Lays male egg (Parthnogenic--males develop from an unfertilized eggs)
- Lays female eggs.
- Mites attach to pupa and emerge with adult bee.

Mites on larva



Mites on bee

- Bees may suffer in many ways from mite damage

- Shortened abdomen, misshapen wings and legs, less body weight, shortened life expectancy and other viral diseases (PMS)

Do you have mites?

- Do you have bees?
- IPM--keep mite levels below economic threshold
- Mite populations build under prosperous conditions
- Mite populations lowest in spring
- 80% of mites IN the brood

Step one: detection

- How many mites do you have?

- Ether roll
- Drone brood removal
- Natural mite drop with sticky board
- ☐Powdered sugar roll--Neb Guide

Powdered sugar roll

1. Fill jar with 300 bees
2. Cover with screen
3. Add 2 tablespoons powdered sugar
4. Gently shake to coat bees
5. Shake out mites

Sugar roll

Sugar roll

- Evaluating results:
  - In fall (no brood in the colony) a hive with 36 mites on a 300 bee sample will have increased chance of winter mortality
  - A hive with 85 mites will almost always perish in winter
  - Treat when you have .03 mites/bee (9+ mites in a 300 bee sample in August

Economic threshold

- 3000 mites--damage to bees
- In spring 5-10/day on sticky board
- 5% of drone brood infestation
- In fall 50-60/day on sticky board
- Treat bees!

Mite suppression

1. Genetic controls
2. Physical/cultural controls
3. Biological controls
4. Chemical controls
5. Do nothing

Mite suppression

- Genetic controls
  - Varroa sensitive hygenic queens
  - Russian queens
  - Choose your stock carefully

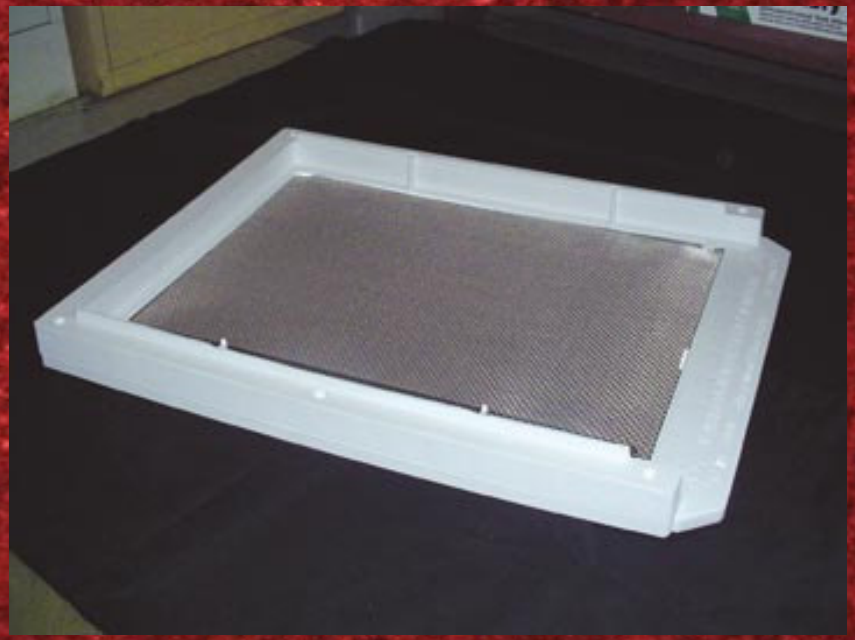
Mite Suppression

- Physical controls
  - Drone comb removal
  - Apitherm--104° kills varroa, 113° kills bees
  - Inert dust
  - Screened bottom boards

Mite suppression

- Physical controls

Screened bottom board



Mite suppression

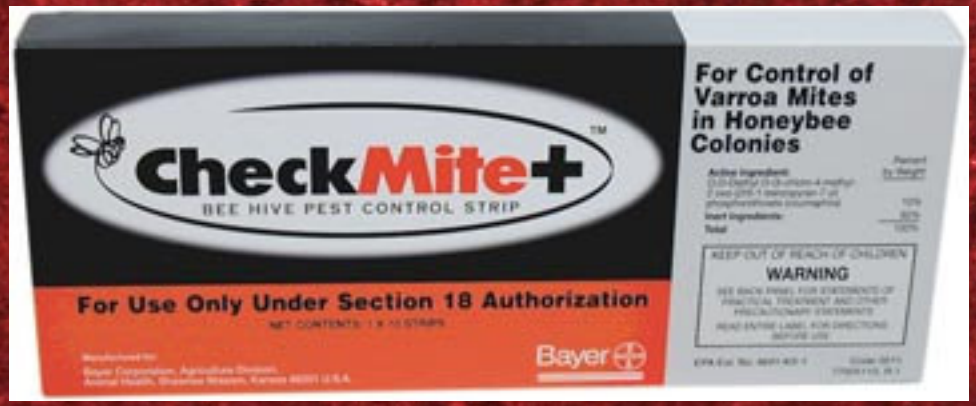
- Biological controls
  - New research
    - Baited traps--phermone research
    - Fungus

Mite suppression

- Chemical controls
  - Apistan
    - Fluvinate
    - No longer effective in most areas

Mite suppression

- Chemical controls
  - Checkmite
    - Coumaphos--toxic to humans
    - Remains in wax
    - Some resistance



Mite suppression

- Chemical controls
  - Apiguard--gel
    - Active ingredient --thymol
    - 85-95% efficacy
    - 2 treatments
    - Temperatures 60-105°

Mite suppression

- Chemical controls
  - Api Life Var
    - Thymol
    - Wafers--break and place on bars of colony
    - 2-7 to 10 day treatments
    - Avg. daily temp 59-69°

Mite suppression

- Chemical controls
  - Mite-Away II
    - Formic Acid in presoaked pad
    - Leave on top bars 14 days
    - Temperatures between 50-79 degrees

Mite suppression

- Chemical controls
  - Sucrocide
    - Nontoxic
    - Physically demanding

Mite suppression

- Chemical controls
  - Oxyalic acid
    - 3.5% soluction in sugar syrup as a drench
    - >90% efficacy in a broodless situation
    - Very safe--no residues in honey
    - Being tested at U. Neb and Tuscon lab
    - Not USDA approved at this time--packaging problems

Mite Suppresion

- Food Grade Mineral Oil
- Other essential oils

- Use research based interventions

IPM

It’s a process--on going and constantly vigilant.

There is little economic difference between one mite and 100.

One hive’s mite count is not representative of all hives in a bee yard.

Resources & Credits

- University of Nebraska & Dr. Marion Ellis
- Dr. Dewey Caron
- Dadant (pictures from web site)
- Mid-Atlantic Apiculture