Drivers of Honey Bee Losses

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MD Winter Losses
Answers must be data driven
"For every complex problem there is an answer that is clear, simple, and wrong."

H. L. Mencken
What is killing the bees?

Parasites
Pathogens
Pesticides
Habitat destruction
Mono-cultures
Poor Nutrition

Multiple, Interacting Causes of Death

Manage ment
Self-reported causes of loss by MD Beekeepers

- Backyard beekeepers (n=120)
  - #1: Starvation
  - #2: Weak in the fall
  - #3: Poor wintering conditions

- Sideliners (n=3)
  - #1: Varroa mites
  - #2: Small Hive beetle

- Commercial (n=2)
  - #1: Varroa/Small hive beetle
  - #2: Queen failure/pesticides/weak in the fall/CCD
“Some beekeepers equate CCD in bees to AIDS in humans, with Varroa performing the equivalent function of hypodermic needles.”

- Joe Traynor, Beekeeper

1. Before the cell is capped, the mite crawls down between the larva and cell wall and embeds itself in the brood food.
2. Once the cell is capped and the brood food is eaten the mite is liberated and begins to suck the blood of the prepupa.
3. The mite lays its first egg (a male) 60-hours after capping and lays subsequent eggs (all females) at 30-hour intervals.
4. Mite feces begin to build-up within the cell.
5. Mites continue to develop and feed upon the bee, transferring viruses.
7. Adult female mites leave with emerging honeybee while male and immature mites stay in the cell and die.
Varroa Seasonality

Varroa Load by Month: 2010-2018 (Positive Samples Only)
Mean Varroa population by month

Varroa mites by sampling month

Mites per 100 bees

Month

EF EF C-E EF DE F CD C B A B C-F
1 2 3 4 5 6 7 8 9 10 11 12
Varroa effectively controlled
Varroa no control

Varroa Load

Varroa load per 100 bees

Sampling Month

Legend: S16-SABF  APHIS
Re-infestation?
Mite-A-Thon (MiteCheck)

- 914 total submissions representing 3026 samples taken
  - 318 alcohol washes
  - 580 powdered sugar rolls
  - 16 “other”

National average = 4 mites/100 bees
Mite-A-Thon (MiteCheck)
Nutrition
Pesticides
N=633
21% had no detectable contamination
Mean 2.36 products
Mean excluding no detects: 3

Pesticide Detections

Number of Residues Detected per Sample
Frequency of Samples with varying HQ

- 0: 55%
- 0-100: 21%
- 100-500: 13%
- 500-1000: 5%
- 1000-5000: 5%
- 5000+: 1%
Oregon: HQ = 5,669.97 ± 455.8
Nebraska: HQ = 1,617.51 ± 466.8

Majority had a mean HQ below 500.