Varroa Mites – August Is “The” Month
– August 2017 –

Micky Cross
Co-First Vice President
Overview

• Why August Is Important

• Integrated Pest Management

• Sampling

• Treatments

• Summary of Options

August is “Monitor & Decide” Month
Some Background

• Having A Few Mites In The Hive Isn’t A Problem For The Colony.
  - Varroa Becomes A Problem If The Bees Can’t Keep The Mites In Check
  - That Level Used To Be Surprisingly High > 25,000 Mites!
  - Led To The Original “Safe” Numbers Being Relatively High

• But Now Viruses, Notably Deformed Wing Virus (DWV), Have Evolved To Take Advantage Of Varroa As A Vector.
  - This Dramatically Reduced The “Safe” Level
  - Most Hives Can’t Survive More Than ~1000 Mites Going Into Winter
  - “Safe” Numbers Now Much Lower

• So, The Problem Is Really A Varroa And DWV Problem

Going Into Winter / Starting Spring With A Low Mite Count Is Critical
Why Is August So Important?

- Bee Population Growth Has Started to Decline -- Mite Population Growth Hasn’t
- Honey Supers Are Off (A Must For Most Treatments)
- New Brood Is Low (A Good Idea For Most Treatments)
- August Is The Month To Decide Your Course Of Action For Each Hive
- If Treatment Is Warranted, Treat By Mid-October

August Is Monitor & Decide Month – Then Act

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.
Integrated Pest Management (IPM)

• So, August Is The Time To Decide A Course Of Action.

• But, What Are The Alternatives?
  - Integrated Pest Management (IPM)
  - Honey Bee Health Coalition

<table>
<thead>
<tr>
<th>Colony Phase</th>
<th>Acceptable Further control not needed</th>
<th>Caution Control may be warranted</th>
<th>Danger Control promptly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dormant with brood</td>
<td>&lt;1%</td>
<td>1-2%</td>
<td>&gt;2%</td>
</tr>
<tr>
<td>Dormant without brood</td>
<td>&lt;1%</td>
<td>1-3%</td>
<td>&gt;3%</td>
</tr>
<tr>
<td>Population Increase</td>
<td>&lt;1%</td>
<td>1-3%</td>
<td>&gt;3%</td>
</tr>
<tr>
<td>Peak Population</td>
<td>&lt;2%</td>
<td>2-5%</td>
<td>&gt;5%</td>
</tr>
<tr>
<td>Population Decrease</td>
<td>&lt;2%</td>
<td>2-3%</td>
<td>&gt;3%</td>
</tr>
</tbody>
</table>

Doing Nothing May Be Fine
Sampling

Alcohol/Soap Wash

Powdered Sugar Shake

Drop Boards

See the Tools for Varroa Management Guide and/or the Sampling Methods video to learn how to use them.

While mite densities may vary across colonies, all colonies in an apiary should be treated at the same time with the same chemical or non-chemical technique.
Treatment: “An” IPM Pyramid

- **Miticides**
  - Amitraz (Apivar)
  - Fluvalinate (Apista)
  - Coumaphos (CheckMite+)

- **Organic Acids**
  - Oxalic Acid
  - Formic Acid MAQS
  - Hops Beta Acids
    - MAQS (Mite-Away Quick Strips)
    - HopGuard II

- **Essential Oils**
  - Thymol (Apiguard)
  - Thymol + Others
    - ApiLife Var

- **Powdered Sugar**

- **Do Nothing**
  (i.e. “treatment free”)
Miticides
- A Declining Method -

Studies at Texas A&M Honey Bee Lab Indicate Growing Level of Amitraz in Comb

- Mites Have Shown A Strong Ability To Evolve Resistance To Pesticides
- Pesticides Bring Along Many Associated Problems
- Commercial Operations May Still Need/Use Them, But Use Is Declining

My Recommendation: Don’t Use Miticides
Treatment Free

- Subject Of A Long-Standing & Very Heated Debate

- Pros
  - Allows Natural Selection To Operate
    - Bees Adapt Over Generations and Develop Resistance
    - Working In Feral Population
  - Does Not Introduce Chemicals Into The Hive Or Expose Bee Keeper

- Cons
  - High Loss Of Hives Until Evolution Wins
  - Dying Hives Increase Mite Counts Of Nearby Hives (Robbing)
    - “Mite Bombs” -- Be Prepared To Have Upset Bee Keepers Around You
  - Intentionally Letting Creatures Under Your Care “Suffer” & Die

- Mite Resistant Bees Are The Ultimate Solution
  But There Are Better Ways To Get There

My Recommendation: Treat If Warranted
## Organic Treatments
- Heat & Presence of Brood Key Considerations -

<table>
<thead>
<tr>
<th>Category</th>
<th>Active Ingredient</th>
<th>Sold As</th>
<th>Effectiveness</th>
<th>Treatment Length</th>
<th>Temperature Considerations</th>
<th>Brood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Oils</td>
<td>Thymol</td>
<td>Apiguard</td>
<td>74% - 95%</td>
<td>Two, 14 Day Intervals</td>
<td>Good Temperature Range (59° to 105°) – Warmer Better</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thymol, Camphor, Menthol, Eucalyptol</td>
<td>ApiLife Var</td>
<td>70% - 90%</td>
<td>Three, 10 Day Intervals</td>
<td>Poor Temperature Range (65° to 85°) – Warmer Worse</td>
<td></td>
</tr>
<tr>
<td>Organic Acids</td>
<td>Oxalic Acid</td>
<td>Oxalic Acid Dihydrate (Wood Bleach)</td>
<td>82% - 99%</td>
<td>~ One Hour</td>
<td>None (Note: Several Approved Application methods – Be Safe!)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formic Acid</td>
<td>Mite-Away Quick Strips (MAQS)</td>
<td>61% - 98%</td>
<td>10 Days</td>
<td>Temperatures Above 92° Can Cause Brood &amp; Queen Death</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hops Beta Acids</td>
<td>HopGuard II</td>
<td>75% - 95%</td>
<td>Four Weeks</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>Powdered Sugar</td>
<td>Various</td>
<td>&lt; 50%</td>
<td>Minutes (but repeated often)</td>
<td>High Humidity Can Effect Sugar Dispersion in Hive</td>
<td></td>
</tr>
</tbody>
</table>
Options Summary

Sample?
- Yes
  - Treat?
    - Yes
      - How?
        - Drop Board
          - Sugar Shack
          - Alcohol Swirl
          - Treat?
            - Yes
              - How?
                - Vary Treatments Over Time
                - Congrats!
            - No
          - Treatment Free
        - No
    - No
  - No
- No
  - Treat?
    - Yes
      - How?
        - Miticides
        - Organic Acids
        - Essential Oils
        - Powdered Sugar
      - Sample?
        - Yes
          - Congrats!
        - No
      - Trusting Treatment Worked
    - No
  - Treatment Free
QUESTIONS