Take an Integrated Approach to Whiteflies

Adopt an Integrated Pest Management (IPM) program that includes:

- Scouting: visual inspection + sticky traps
- Positive identification of pests and their signs
- Record keeping
- Decision making based on historical information
- Use of different control practices: chemical, biological, cultural, and mechanical

Typical Whitefly Life Cycle

- Apply Ventigra insecticide at 4.8-7.0 fl oz/100 and Velifer fungal contact insecticide/miticide at 3-13 fl oz/100; apply others at standard local rate (SLR)
- Choose an IGR (Insect Growth Regulator) by use site and rate: Enstar®, Fulcrum®, or Distance® IGR
- Begin applications at the onset of infestation; include adjuvant as needed for best results
- Target insecticide applications to juvenile lifestages: larvae through pupae
- Refer to product labels and recommendations for additional instructions
- For additional MOA groups, include a pyrethroid (Group 3), abamectin (Group 6), or azadirachtin (Group UN)
- Make no more than two (2) sequential applications of any group before rotating to another MOA

Chemical Control

<table>
<thead>
<tr>
<th>Option</th>
<th>Rotation 1</th>
<th>Rotation 2</th>
<th>Rotation 3</th>
<th>IRAC Mode of Action Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ventigra™ insecticide</td>
<td>Velifer® fungal contact insecticide/miticide</td>
<td>Velifer fungal contact insecticide/miticide</td>
<td>9D, UN</td>
</tr>
<tr>
<td>2</td>
<td>Ventigra insecticide</td>
<td>Mainspring® insecticide</td>
<td>Ventigra insecticide</td>
<td>9D, 28</td>
</tr>
<tr>
<td>3</td>
<td>Altus® insecticide</td>
<td>Ventigra insecticide</td>
<td>Ventigra insecticide</td>
<td>4D, 9D</td>
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<tr>
<td>4</td>
<td>Ventigra insecticide</td>
<td>Aria® insecticide</td>
<td>Kontos® insecticide/miticide</td>
<td>9D, 29, 23</td>
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<td>5</td>
<td>Tristar® insecticide</td>
<td>Ventigra insecticide</td>
<td>Ventigra insecticide</td>
<td>4A, 9D</td>
</tr>
<tr>
<td>6</td>
<td>Marathon® insecticide + IGR</td>
<td>Ventigra insecticide</td>
<td>Ventigra insecticide</td>
<td>4A+7, 9D</td>
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<tr>
<td>7</td>
<td>Ventigra insecticide</td>
<td>Azatin® O biological insecticide</td>
<td>Ultra-Pure Oil insecticide/miticide</td>
<td>9D, UN, NC</td>
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</tbody>
</table>
Biological Control
Commonly used biological control agents (BCAs) for Whiteflies
Consult with your BCA supplier for availability, rates, timing, and compatibility

Natural Enemy
- Encarsia formosa – parasitoid
- Eretmocerus eremicus – parasitoid
- Chrysoperla spp. – predator
- Delphastus spp. – predator
- Hippodamia convergens – predator
- Amblyseius swirskii – predator
- Beauveria bassiana – beneficial fungus

• Check the compatibility of BCAs with your chemical applications prior to releases
• There are a number of naturally occurring beneficial organisms that may predate or parasitize whiteflies. When possible, avoid using broad spectrum insecticides to preserve these natural enemies.

Cultural Control
• Maintain good sanitation practices with special focus on host crop or host plant areas
• Whiteflies may be repelled by reflective mulches and other materials (UCCE IPM)
• Use yellow sticky cards or ribbon/tape in greenhouses and other production areas; check, count and replace them regularly
• Avoid overfertilizing, particularly with nitrogen which increases the rate of whitefly reproduction
• Manage weeds in landscapes, nurseries and productions area – they may harbor whiteflies
• Scout the landscape plantings around the nursery for potential reservoirs of whiteflies

Mechanical Control
• Include mechanical insecticides in your program, like oils (see rotations for recommendation)
• Screening enclosures such as hoop houses, high tunnels and Cravo houses can help exclude whiteflies from entering production areas
• During whitefly season, closing houses during windy periods can reduce immigration

Best Management Practices for Whiteflies
• Scout known host plants in spring
• In addition to monitoring whitefly populations, watch for the presence of wax, webbing and honeydew
• Honeydew may require fungicide applications for sooty mold
• Treat affected plants at the onset of infestation
• Always read and follow label instructions
• Use all four approaches for an integrated program: chemical, biological, cultural and mechanical

Consult with your BASF representative for more specific recommendations.

Visit betterplants.basf.us for more information about BASF products and innovations.

Always read and follow label directions.

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