**SCALE INSECTS**

**BASF Insect Management Guide**

**Take an Integrated Approach to Scale Insects**

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

- Scouting: visual inspection
- 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

**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><strong>Ventigra®</strong> insecticide</td>
<td>Mainspring® GNL insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>9D, 28</td>
</tr>
<tr>
<td>2</td>
<td>Altus® insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>4D, 9D</td>
</tr>
<tr>
<td>3</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>Aria® insecticide</td>
<td>Kontos® insecticide/miticide</td>
<td>9D, 29, 23</td>
</tr>
<tr>
<td>4</td>
<td>TriStar® 8.5 SL insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>4A, 9D</td>
</tr>
<tr>
<td>5</td>
<td>Marathon® insecticide + IGR</td>
<td><strong>Ventigra</strong> insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>4A+7, 9D</td>
</tr>
<tr>
<td>6</td>
<td><strong>Ventigra</strong> insecticide</td>
<td><strong>Ventigra</strong> insecticide</td>
<td>Ultra-Pure® Oil horticultural fungicide, insecticide and miticide</td>
<td>9D, NC</td>
</tr>
</tbody>
</table>

- Apply Ventigra insecticide at 4.8-7.0 fl oz/100 gallons; apply all others at standard local rate (SLR)
- Choose an IGR (Insect Growth Regulator) by use site and rate: Enstar® AQ insect growth regulator, Fulcrum® insect growth regulator, or Distance® insect growth regulator
- Begin applications early; include adjuvant in applications 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) or azadirachtin (Group UN)
- Make no more than two (2) sequential applications of any group before rotating to another MOA

**Typical Scale Insect Life Cycle**

![Scale Insect Life Cycle Diagram](image)
Biological Control

Commonly used biological control agents (BCAs) for scale insects

Consult with your BCA supplier for availability, rates, timing, and compatibility

Natural Enemy

*Aphytis* spp. – parasitoid

*Cryptolaemus montrouzieri* – predator

*Encarsia* spp. – parasitoid

Various lady beetles

*Beauveria bassiana* – beneficial fungus

- Check the compatibility of BCAs with your chemical applications prior to releases
- Control ants as they work against BCAs by protecting scales from natural enemies
- There are a number of naturally occurring beneficial organisms that may predate or parasitize scales. When possible, avoid using broad spectrum insecticides to preserve these natural enemies.

Cultural Control

- Maintain good sanitation practices with special focus on host crop and host plant areas
- Scout the landscape plantings around the nursery for potential reservoirs of scale insects
- Pay careful attention to perennial stock or “mother” plants that may harbor pest populations
- Thoroughly inspect new plant material for eggs and juveniles

Mechanical Control

- Oils and insecticidal soaps are key for controlling scale insects
- After control is established, plants may need to be cleaned to remove pests and residues – oils, insecticidal soaps, or plant-safe adjuvants can be helpful
- Trap boards and sticky cards are useful for intercepting adults and motile juveniles as an early scouting technique, but will not provide suppression or control

Best Management Practices for Scale Insects

- Scout known host plants in spring and all new plant material
- Be able to identify the common scale species to your area and crops
- Treat affected plants at the onset of infestation; treat known hosts preventatively
- Always read and follow label instructions
- Use all four approaches for an integrated program: chemical, biological, cultural and mechanical

Always read and follow label directions.

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