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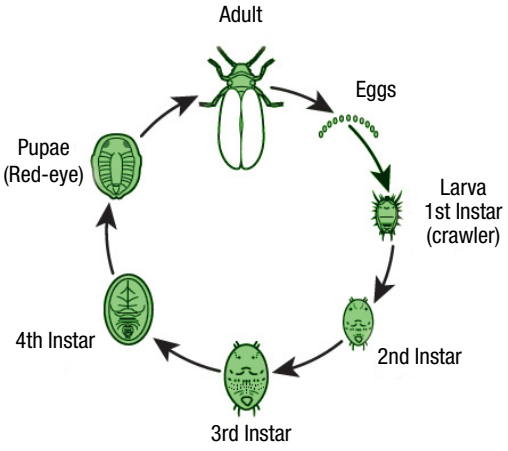
# WHITEFLIES
## BASF Insect Management Guide

### 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




### Chemical Control

| Option | Rotation 1 | Rotation 2 | Rotation 3 | **IRAC** Mode of Action Groups |
|---|---|---|---|---|
| 1 | **Ventigra®** insecticide | **Velifer®** bioinsecticide/ miticide | **Velifer** bioinsecticide/ miticide | 9D, UN |
| 2 | **Ventigra** insecticide | Mainspring® GNL insecticide | **Ventigra** insecticide | 9D, 28 |
| 3 | Altus® insecticide | **Ventigra** insecticide | **Ventigra** insecticide | 4D, 9D |
| 4 | **Ventigra** insecticide | Aria® insecticide | Kontos® insecticide/ miticide | 9D, 29, 23 |
| 5 | TriStar® 8.5 SL insecticide | **Ventigra** insecticide | **Ventigra** insecticide | 4A, 9D |
| 6 | Marathon® insecticide + IGR | **Ventigra** insecticide | **Ventigra** insecticide | 4A+7, 9D |
| 7 | **Ventigra** insecticide | Azatin® O biological insecticide | **Ultra-Pure® Oil** horticultural fungicide, insecticide and miticide | 9D, UN, NC |

- Apply Ventigra insecticide at 4.8-7.0 fl oz/100 and Velifer bioinsecticide/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® AQ insect growth regulator, Fulcrum® insect growth regulator, or Distance® insect growth regulator
- 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

## 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

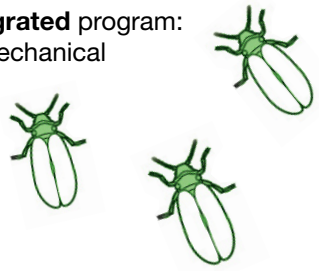
- Maintain good sanitation practices with special focus on host crop or host plant areas
- Whiteflies may be repelled by reflective mulches and other materials (UCCE IPM)
- Use yellow sticky cards or ribbon/tape in greenhouses and other production areas; check, count and replace them regularly
- Avoid overfertilizing, particularly with nitrogen which increases the rate of whitefly reproduction
- Manage weeds in landscapes, nurseries and production 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



**Always read and follow label directions.**



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