



Plant Health for **ORNAMENTALS**

This guide provides an integrated approach to protecting your greenhouse ornamentals from common diseases and problematic insects. We explain when and how to use our biologicals products in conjunction with other products to ensure you experience the best results possible. For more information or to speak to a technical expert, visit www.ProFarmGroup.com.

PROTECT ORNAMENTALS FROM:

-  Spider Mites
-  Leaf Spots
-  Alternaria
-  Caterpillars
-  Mildews
-  & more!

INSECTS & MITES

Foliage, Flowers & Fruit:

Aphids, western flower thrips, spider mites, russet mites, cyclamen mites, broad mites, caterpillars, whiteflies & mealybugs

- Apply foliar sprays of Grandevo® CG Bioinsecticide at 2 lb./100 gal. in rotation with Venerate® CG Bioinsecticide at 1-2 qt./100 gal. every 7 days as a preventative strategy. Reduce the time between applications to every 4-5 days during warm growing conditions for 3 applications when dealing with periods of rapid population growth to prevent egg laying by mature adults.
- Tank mixing other insecticides labeled for control of key pests with Grandevo CG Bioinsecticide or Venerate CG Bioinsecticide will provide additional modes of action, thus improving control.
- Including a pyrethroid or spinosad insecticide can provide immediate knockdown of a pest population. Use these materials only as needed to avoid creating locally resistant pest populations as they are single modes-of-action, thus use sparingly.
- While Venerate CG Bioinsecticide provides good control of many Lepidopteran pests (caterpillars), the addition of a *Bacillus thuringiensis* (*Bt*) insecticide (Agree® WG, Javelin®, DiPel®, XenTari® & others) can boost that control. It is important to identify your specific caterpillar as there are two primary strains of *Bt* & caterpillars vary in their sensitivity to each. Also, Venerate CG Bioinsecticide & the *Bt*'s tend to work much better on younger/early instar caterpillars. Older caterpillars may require a pyrethroid application for control.
- Adjuvants can improve insect & mite control by improving coverage & assisting in delivering material into very small spaces where the surface tension of water can prevent spray deposition & where very small pests such as broad mites often reside.

DISEASES

Pre-Plant Root Dip:

Apply Regalia® CG Biofungicide as a pre-plant dip for improved plant health & suppression of certain soilborne diseases. Apply Regalia CG Biofungicide at a rate of 0.64 fl. oz./gal. of water as a dip (submerge roots or plugs ensuring full coverage, then remove) prior to transplanting, unless specified differently in the selected crops section of the product label.

Foliage, Flowers & Fruit:

Powdery mildews, downy mildews, *Botrytis*, Alternaria, leaf spots in general & bacterial diseases

- Regalia CG Biofungicide at 2 qts./100 gal. can be used in sprays or fogging systems as a disease preventative strategy. As Regalia Biofungicide's primary mode of action is to 'switch on' plants native SAR/ISR biochemical pathways, it is often combined with other materials such as Stargus® Biofungicide & Jet-Ag® 5% that can provide direct activity against diseases.
- Stargus Biofungicide at 2-3 qts./100 gal. acts directly against a wide range of flower, fruit & foliar diseases & should be applied every 7-10 days as a preventative, but can be applied in shorter intervals when plants are under heavy disease pressure when conditions are conducive for the development of diseases. The use of a pH neutral spreader adjuvant such as yucca will enhance the efficacy of Stargus Biofungicide.
- Jet-Ag 5%: Apply at a rate of .75-3.8 fl. oz./5 gal. of water as needed to control *Botrytis*, leaf spots, powdery mildews & downy mildews. Thoroughly wet all surfaces of the plant on 5-7 day intervals. At the first sign of disease, use the curative rate of 3.9-7.8 fl. oz./5 gal. of water. Then resume weekly preventative treatment rates. Can be tank mixed with Regalia CG Biofungicide.



Soil-borne Diseases & Crown Rots:

Fusarium, Pythium, Phytophthora, Rhizoctonia & others

- Drench media with Regalia CG Biofungicide at 1 qt./100 gal. to control root & shoot diseases & boost root health. Apply every 14 days.
- Stargus Biofungicide applied as a drench at 2-3 qt./100 gal. has been shown to control many soil & crown diseases. Reapply every 10 days when under heavy pressure. Stargus Biofungicide & Regalia Biofungicide can be tank-mixed & applied simultaneously in drench applications.
- Soil drench Jet-Ag 5% at the time of seeding & transplanting, as well as a periodic drench. Treat every 3-4 weeks as a preventative or when diseases are present. Use Jet-Ag 5% on potting media prior to transplanting at a rate of 3.9-7.8 fl. oz./5 gal. of water. Apply to the growing to the point of saturation. Wait 15 minutes after drenching to plant or water. Reapply beneficial microbes after treatment.
- Beneficial microbes for root health: RootShield® Plus or Actinovate® or TerraGrow® are living microbial products that help to prevent multiple root & crown diseases & to stimulate healthy root growth. All 3 can be tank mixed with most drench applied biopesticides, but do not tank-mix Regalia Biofungicide with Actinovate.
- Both Stargus & Regalia CG Biofungicides can be applied with plant nutrients.

GENERAL GREENHOUSE SANITATION

Propagation:

Sanitize all non-porous surfaces including pots, flats, trays & cutting tools with Jet-Ag 5% until run-off, at 1.3-1.8 fl. oz./5 gal. of clean water. Soak cutting tools with Jet-Ag 5% ensuring complete coverage. Allow 10 minutes of contact time.

Surfaces & Equipment:

Use Jet-Ag 5% to control fungi, slime & kill fungal & bacterial spores on greenhouse surfaces & structures, including glass, plastic, benches, floors, fans, ventilation ducts & equipment. Recommended rate is 7.8 fl. oz./5 gal. of clean water. A foaming adjuvant is recommended for extra contact time & pattern indicator.

Line Cleaning:

Control biofilm by holding Jet-Ag 5% in the water lines for 8 hours at 1:2000, then do a freshwater flush. In severe cases, a second application may be necessary. Jet-Oxide® 15% may also be used at 1:6000.

Water Treatment:

Jet-Ag 5% or Jet-Oxide 15% are recommended for water treatment. This keeps the lines free of biofilms & also kills water borne pathogens, ex. *Pythium* zoospores, before they reach plant material. Algae reduction & spore knockdown is an additional benefit.

IMPORTANT NOTES

- **Plant Health:** Regalia CG Biofungicide works primarily by switching on plants SAR/ISR biochemical pathways. These are often called the salicylic acid & jasmonic acid pathways. These are very complex, natural biochemical pathways within plants that cause the plants to deposit suberin in epidermal cells resulting in tougher plants for fungi & bacteria to penetrate & for the plants to generate multiple compounds such as phytoalexins & PR proteins that act internally as bactericides & fungicides. Regalia CG Biofungicide also increases the production of leaf chlorophyll resulting in plants that are greener & healthier which often results in yield increases that are measurable & substantial.
- **Sprayers:** Good coverage is one of the keys to great insect, mite & disease control. Finer droplet size under sufficient pressure to get complete coverage will result in better pest management. Periodically take the time to use water sensitive papers to make sure you are getting good spray coverage. Spray nozzles wear out & require regular replacement
- **Adjuvants:** Spray adjuvants can have a substantial impact of the efficacy of pesticides. Biopesticides work best within a pH range of 6.0 – 8.0 with the recommended adjuvants. Avoid acidifying adjuvants, often known as buffering agents, when using biopesticides. In general, yucca extracts & Nu-Film-P® have provided the highest efficacy with Regalia CG Biofungicide, Stargus Biofungicide, Grandevo CG Bioinsecticide & Venerate CG Biofungicide.

Due to the wide variety of plants grown as ornamentals along with wide variations in growing conditions, it is impossible to accurately predict each genus, species & variety's reaction to any particular biopesticide or pesticide tank mix. We strongly recommend 'jar testing' any new tank mixes prior to crop application to confirm physical compatibility. Then apply the mix to a small number of plants to check for any phytotoxic symptoms. Under most conditions 48 hours is sufficient time for any adverse effects to develop. Remember that plants become more sensitive to phytotoxic damage after multiple days of low light such as heavy clouds & rainy conditions. Any conditions that stress a plant can cause a phytotoxic reaction including high heat, high soluble salts & even extremes in lighting to name but a few.

