



Graduate

Best Use Guidelines for Graduate Fungicide

- Graduate® contains the active ingredient fludioxonil, which is a Group 12 fungicide.
- For best results, citrus fruit should be treated as soon as possible following harvest. With weak fruit and high disease pressure, treatments should be made within 12-24 hours, if possible.
- Graduate is a contact fungicide and is not systemic. Therefore combinations of aqueous applications and applications in wax may be necessary to provide good coverage on the surface of the fruit.
- Graduate can be applied as a dip, flood, drench or spray. Recommended guidelines for each application method are provided below.
- Graduate has a tolerance of 10 ppm on citrus. The recommended target residue level on fruit for best decay control is 1-2 ppm and 2-4 ppm for sporulation control. Residues of fludioxonil should be monitored periodically to ensure that adequate levels are on the fruit.
- Ensure that the Graduate solution remains in suspension by using agitation.

For Dip, Flood or Drench Applications

- Apply 16-32 oz. of Graduate in 100 gals. of water for treatment levels of 600-1200 ppm active ingredient. The treatment solution should be inspected periodically to insure the proper concentration of active ingredient is available.
 - Select the use rate to deliver 1-2 ppm residues onto the fruit using your equipment, and based on disease pressure. Under heavy disease pressure, apply the 32 oz. rate (1200 ppm).
 - In re-circulating systems, Graduate is compatible with sodium hypochlorite (e.g., 100 ppm free chlorine) or peroxyacetic acid.

For Non-Recovery Line Spray Applications

- For low-volume non-recovery sprays, apply 16-32 oz. of Graduate in 20-80 gals. of water, wax/oil emulsion or aqueous dilution of wax/oil.
- For high-volume non-recovery sprays, apply 16-32 oz. of Graduate in 100 gals. of water, wax/oil emulsion or aqueous dilution of wax/oil.
- Apply to 250,000 lbs. of freshly cleaned citrus fruit.
- If used as an aqueous treatment, then apply immediately prior to waxing.

For Maximum Sporulation and Decay Control Prior to Packing

- **Apply Graduate as an aqueous application followed by Graduate in a wax application.**
 - Apply 16 oz. of Graduate in 100 gals. of water (600 ppm) as an aqueous application followed by 16-32 oz. of Graduate in 20-80 gals. of wax/oil emulsion or aqueous dilution of wax/oil (750-6000 ppm).
 - Treat 250,000 lbs. of fruit.
 - Because Graduate is not systemic, for best decay control **and** sporulation control, apply Graduate in an aqueous treatment followed by Graduate in a wax treatment.

Resistance Management Guidelines for Graduate Fungicide

Although green mold is most apparent in the packinghouse, most infections begin in the field. The fungus (*Penicillium digitatum*) survives as spores from season to season in the grove, and infections occur when airborne spores land on fruit, germinate, and the fungus penetrates the rind through wounds, punctures, or injured oil glands, etc.



Infected fruit on the tree (A) and up to harvest (B) often do not exhibit symptoms or signs of infection. However, green mold can be isolated on nutrient agar from these seeming healthy fruit. The environmental conditions in storage are ideal for the growth and sporulation of the fungus (C). Therefore both postharvest decay management and fungicide resistance management must begin in the field.

Resistance Management in the Field

- P**revent disease establishment by using effective field fungicide programs.
- A**void use of fungicides with related chemistries to any fungicide that potentially might be used in a packinghouse (See Table 1).
- C**ultural practices are critical. Avoid fruit bruising and injury during harvest and transport.
- K**eep it clean. Sanitize to reduce inoculum entry into the packinghouse.
 - Use only clean bins & wash between loads.
 - Never return culls from the packinghouse to the field.

Resistance Management in the Packinghouse

- R**otate between different fungicide classes or use mixtures from different classes.
- U**se labeled rates and use only when needed.
- L**imit the total number of applications of any one class of fungicide to 2 per season.
- E**ducate yourself about fungicide activity, mode of action and class.
- S**tart with a clean house by eliminating resistant isolates via physical and chemical sanitation.

Fungicide Cross-Resistance Groups

Active Ingredient	Product Name	Fungicide Group*	Pre-Harvest Brand in Same Group
Fludioxonil	Graduate	12	None
Thiabendazole	TBZ	1	Topsin® M
Pyrimethanil	Penbotec®	9	Scala™, Vanguard®
Imazalil	Freshgard, Fungiflor®, Deccoziil®	3	Triazoles

* Fungicide groups are designated by FRAC (Fungicide Resistance Action Committee) based on fungicides with similar modes of action or potential for cross resistance. Avoid using fungicides from the same group both in the field and in the packinghouse.



©2005 Syngenta Crop Protection, Inc., Greensboro, NC 27409. **Important: Always read and follow label directions before buying and using this product.** Syngenta Crop Protection, Inc. warrants that its products conform to the chemical description set forth on the products' labels. NO OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO SYNGENTA PRODUCTS. Syngenta Crop Protection, Inc. neither assumes nor authorizes any representative or other person to assume for it any obligation or liability other than such as is expressly set forth herein. IN NO EVENT SHALL SYNGENTA CROP PROTECTION, INC. BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY USE OR HANDLING OF ITS PRODUCTS. No statements or recommendations contained herein are to be construed as inducements to infringe any relevant patent now or hereafter in existence.

Graduate®, Vanguard® and the Syngenta logo are trademarks of a Syngenta Group Company. Penbotec® is a trademark of Johnson & Johnson Corporation. Topsin® is a trademark of Cerexagri, Inc. Scala™ is a trademark of Bayer CropScience. Fungiflor® is a trademark of Janssen Pharmaceutica. Deccoziil® is a trademark of Pennwalt Corporation.

For more information visit www.syngentacropprotection.com or call the Syngenta Customer Resource Center at 1-866-Syngenta.