

Best Use Guidelines for Graduate A+ on All Citrus

Label Instructions

Use Graduate A+™ fungicide for the control of postharvest diseases caused by green mold (*Penicillium digitatum*) and blue mold (*Penicillium italicum*).

High-volume (Dilute) Applications

In flooders or dip tanks, use 300 to 600 parts per million (ppm). For high volume spray applications using t-jet nozzles or other spraying systems, the 1,200-ppm rate should be applied in either a recovery or non-recovery application system. Maintain the desired treatment concentration using the addition of Graduate A+ in a recharge system.

Desired ppm – High Volume Applications		
fl. oz./100 gal.	PPM A.I.	Application
8-16	300-600	Flooders, Tanks, Drenchers
32	1,200	Sprays, Non-recovery

Low-volume Wax or Aqueous Sprays

In low-volume wax or aqueous sprays, apply 32 to 64 fluid ounces per 250,000 pounds of fruit (approximately 6,500 40-pound cartons). Desired ppm in the wax will vary based on the number of cartons processed per gallon of wax – ppm adjustments are shown below:

Desired ppm* Applications – based on cartons/gal. of wax			
fl. oz./250,000 lbs of fruit	150 40-lb cartons/gal.	200 40-lb cartons/gal.	250 40-lb cartons/gal.
32	2,880	3,835	4,800
64	5,730	7,640	9,550

*Total A.I. – 1 gallon of Graduate A+ contains a total of 3.98 pounds "total A.I.," 1.99 pounds of fludioxonil and 1.99 pounds of azoxystrobin, use total A.I.

Note: Ensure that Graduate A+ solution remains in suspension by using agitation.

Best Use Guidelines for Lemons

Use recommended rates shown in tables for high volume or wax applications. Aqueous applications are more effective than wax applications, as with other postharvest fungicides.

- Because Graduate A+ contains two different modes of action, it may be used on both the wash and pack sides in lemons. It may be applied in several locations on wash or pack areas, but do not apply more than twice per crop.
- For effective sporulation control apply Graduate A+ in both aqueous and wax applications.

Best Use Guidelines for Oranges, Mandarins and Other Citrus

- Use desired rates shown in tables for high volume or wax applications.
- Aqueous applications are more effective than wax applications, as with other postharvest fungicides.
- For effective sporulation control, apply Graduate A+ in both aqueous and wax applications.

Product Stewardship and Resistance Management

As with other postharvest fungicides, the improper use of Graduate A+ can present the risk of resistance in target organisms. Use of the following stewardship practices may decrease the development of fungicide resistance.

- Do not repack setbacks over the packing line. Repack in an area isolated from sound fruit and sanitize afterwards.
- Avoid using similar classes of fungicides in the field prior to packing or in the packinghouse. The ingredients of Graduate A+ are in fungicide Groups 11 (azoxystrobin) and 12 (fludioxonil), and there are no similar materials in the postharvest market.
- Use good sanitation processes in postharvest fruit handling. Clean the line daily, clean bins prior to returning to the field and clean storage rooms at the end of the season. Use effective sanitizers when cleaning.
- Properly sanitize bins and buckets after harvest to minimize contamination that will spread disease.
- Do not use rates that are lower than recommended use rates. Sub-lethal rates impose selection pressure for fungicide resistance.



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Maximizing Profit by Protecting Fruit Quality through pack-out and delivery

Decay Control in Citrus Packinghouses

- Built-in Resistance Management
- Sporulation Control
- Flexible Protection



For more information, visit these Syngenta Crop Protection Web sites: www.syngentacropprotection.com, www.FarmAssist.com, www.PostharvestUniversity.com or call the Syngenta Customer Center at 1-866-SYNGENT(A) (796-4368).

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Best Use Guidelines for Graduate A+ Fungicide

Key Benefits of Graduate A+™ Fungicide

- Highly effective decay control
- Best-in-class sporulation control
- Compatible with sanitizers (CI, PAA)
- Compatible with wax
- Built-in resistance management (two modes of action not previously used in packinghouses)

Graduate A+ was Designed for Decay Control Important Characteristics for Packing

Characteristics	Graduate A+ (AZO and FDL)	TBZ	IMZ	Penbotec™ (PYR)
Chlorine Compatible	Y	Y	N	N
Sporulation Control	Y	N	(Y)	N
Heat Stable	Y	Y	Y	Y

Legend: AZO-azoxystrobin, FDL-fludioxonil, TBZ-thiabendazole, IMZ-imazalil, PYR-pyrimethanil

Maximize Profit with Potent Decay Control

Graduate A+ has been documented to provide effective decay control when treatments are done 18 hours after inoculation (simulating a postharvest application 18 hours after picking); this is called “reach-back” or “kick-back” activity. The fungicide is highly effective against the key decays of citrus – green mold, blue mold, gray mold and stem end rots. It remains effective during storage and shipping to maximize fruit quality.

Highly Effective Sporulation Control

Graduate A+ has been documented by Dr. James E. Adaskaveg, professor, University of California, to effectively control sporulation and “white mold” growth

on fruit surfaces. Currently, no other postharvest fungicide provides this benefit against imazalil insensitive green mold.

- Prevents spread of spores and decay in storage and in packinghouses
- Reduces allowances and repacking
- Reduces soilage and cullage of adjacent fruit

Sporulation Control Comparison



Imazalil + Penbotec, Flooder and Wax



Graduate A+, Flooder and Wax

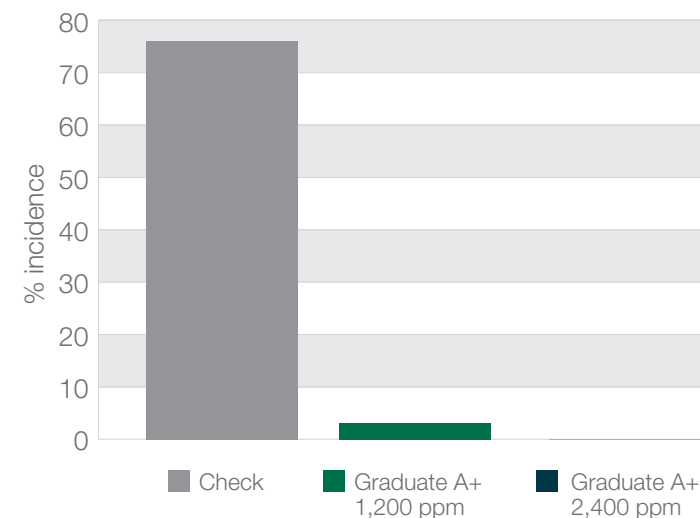
Source: Dr. James Adaskaveg, University of California

Fruit were marked with lines (for easy retrieval), internally inoculated for intentional decay and treated after 14 hours on a commercial packing line together with commercial fruit. Fruit were retrieved from the packing line and incubated at 20 C.

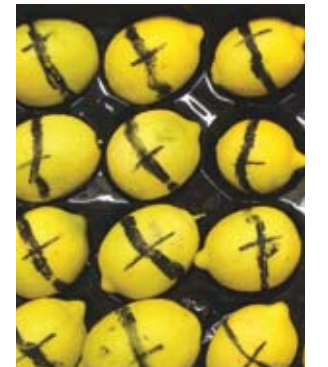
Calamondin, citrus citron, citrus hybrids (includes chironja, tangelo, tangor), grapefruit, kumquat, lemon, lime, mandarin (tangerine), sour orange, sweet orange, pummelo and Satsuma mandarin

Graduate A+ Maximizes Citrus Growers' Yields by Preventing Losses in Storage and Shipping

- Buyers receive more of the growers' fruit
- Improved quality and fewer complaints will improve volume and support from produce buyers
- Breaks the resistance cycle – this prevents fungicide failures and decay losses, and may help clean up storages and packing facilities and render older materials more effective after breaking the resistance pressure
- Controls sporulation and “soilage” – this reduces the impact of any decay that does develop
- Flexible – effective in flooders, storage and pack wax, tanks, drenchers and postharvest sprays. Compatible with chlorine and heat stable
- Improves packer quality by effectively controlling decay – this builds customer support and improves sales volume



Untreated, Inoculated Fruit



Graduate A+, Inoculated Fruit

Source: Dr. James Adaskaveg, University of California

Fruit were marked with lines (for easy retrieval), internally inoculated for intentional decay and treated after 14 hours on a commercial packing line together with commercial fruit. Fruit were retrieved from the packing line and incubated at 20 C.

Built-in Resistance Management

For the first time, citrus packers will have a resistance-breaking combination material. Graduate A+ contains two classes of fungicides that are new to the postharvest market: fludioxonil and azoxystrobin. Experts agree that combinations of two effective materials will help control resistant molds. Because both ingredients are effective and there is no reported resistance, Graduate A+ is the only product on the market that offers this benefit.