

PacRite® ™
Penbotec
PENICILLIUM BOTRYTIS PROTECTION

*A New Era
in Decay Control*

 **Pace** International LLC

A NEW ERA IN DECAY CONTROL

FEATURES & BENEFITS

- **PacRite® Penbotec™** prevents growth of TBZ & IMZ resistant strains that cause penicillium mold.
- **PacRite® Penbotec™** is the latest chemical fungicide for the citrus industry in 25 years.
- **PacRite® Penbotec™** does not exhibit cross resistance to sterol-inhibiting or benzimidazole fungicides.
- **PacRite® Penbotec™** is an easy-to-use, easy-to-mix liquid formulation.
- **PacRite® Penbotec™** has preventative and curative activity.
- **PacRite® Penbotec™** is an excellent tool for packers in resistance management programs.
- Safe and effective, **PacRite® Penbotec™** is classified by the Environmental Protection Agency as a reduced-risk fungicide.

MODE OF ACTION

The biochemical mode of action of **Penbotec™** is the inhibition of fungal secretion of cell wall degradation enzymes like proteinases, cellulases, pectinases and laccase. The active ingredient inhibits the biosynthesis of methionine by a reduction of spore germination, an inhibition of germ tube extension and prevention of lesion expansion. The latter is the result of the blockage of the lytic function of infection hyphae. As a consequence, **Penbotec™** is a fungicide with preventative and curative action.

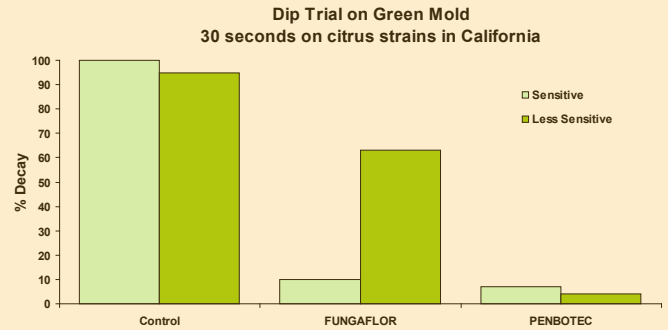
This mode of action differs from existing fungicides in pre- or post-harvest application on citrus or pome fruit: Mitochondrial respiration, Osmotic stability, Ergosterol Biosynthesis (SBI or DMI) or interference with nucleus or cell division.

COMPATIBILITY

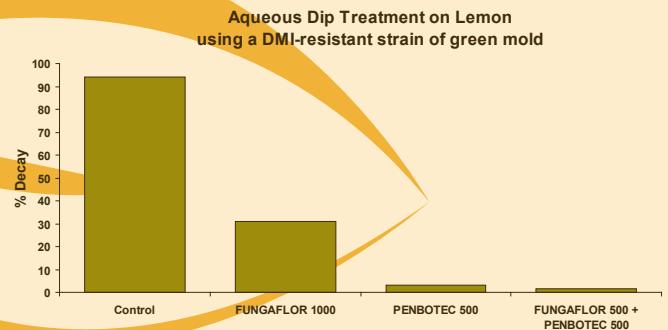
- **PacRite® Penbotec™** can be tank mixed with other fungicides like TBZ, Fungaflor™ or sodium bicarbonate. It is not compatible with chlorine for desinfestation of treatment water. **PacRite® Penbotec™** is physically compatible with Pace International's popular citrus products such as: **Natural Shine™ 990 and 960, PacRite® 425 and 505 Lemon Storage** coatings. For compatibility with other plant protection products or sanitizers, contact Pace's Technical Services.

SPECTRUM AND ACTIVITY

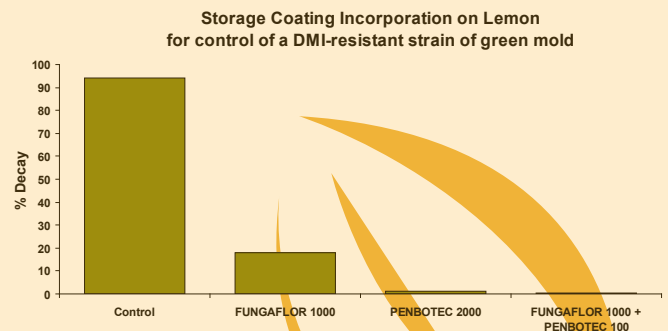
Penbotec controls the following post harvest citrus diseases: *Penicillium digitatum* (green mold) and *P. italicum* (blue mold).



A dip (30 second) trial to measure sensitivity between Penbotec and Fungalor on green mold on citrus strains in California.



An aqueous dip treatment to measure results of Penbotec and Fungalor individually and in combination on lemon using a DMI-resistant strain of green mold.



Control of a DMI-resistant strain of green mold on lemon by storage coating incorporation.

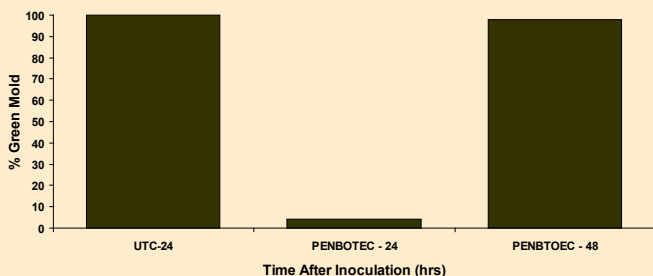
SELECTIVITY

No signs of phytotoxicity or visible residue were observed after recommended treatment and storage conditions.

SPECTRUM AND ACTIVITY

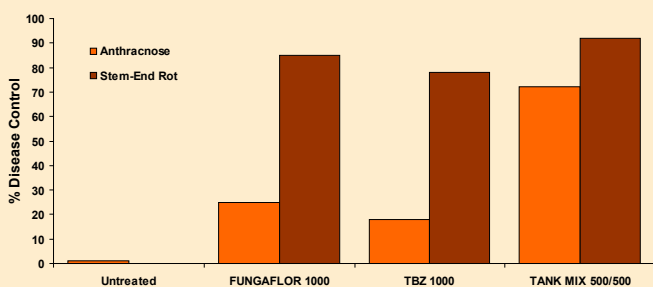
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Curative Activity of PENBOTEC Treatment After Inoculation



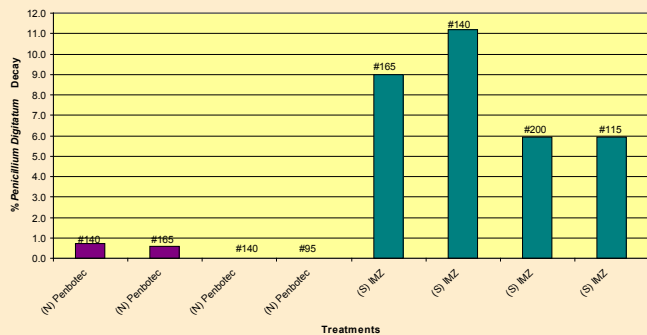
Penbotec provides good curative activity against green mold when applied within 24 hours of harvest.

Improved Efficacy of PENBOTEC - FUNGAFLOX Tank Mix



The tank mix of Penbotec and Fungaflor provides good activity against anthracnose and stem-end rot diseases on citrus fruit. Neither product alone provides sufficient control of anthracnose. Penbotec and Fungaflor combined improves stem-end rot activity.

Total % of *Penicillium Digitatum* Decay at the 13 DAT Evaluation
PackinghouseX North Line (Penbotec 2000 ppm + TBZ 3500 ppm + Aq IMZ 200 ppm)
VS South Line (IMZ @3000 ppm)
June 22, 2006



The above graph compares the total percentage of *Penicillium digitatum* decay found in two separately treated lines. The north line using Penbotec 2000 ppm + TBZ 3500 ppm + Aq IMZ 200 ppm showed considerably lower percentages than the south line that used only IMZ at 3000ppm.



DIRECTIONS FOR USE

- Fill tank with half of the required amount of water or wax* and start mechanical agitation.
- Add the required amount of **PacRite® Penbotec™** slowly and add the remaining volume of water or wax*.
- Maintain agitation after mixing and during application. Begin application with the treating solution only after **PacRite® Penbotec™** has uniformly dispersed into the mix carrier. Although the dispersion is very stable, do not allow the treatment solution to stand for prolonged periods without agitation.
- **PacRite® Penbotec™** activity is not reduced by fluctuations in a pH range between 4 and 9, nor by differences in water hardness.

APPLICATION AND DOSES

- **PacRite® Penbotec™** can be used for aqueous application (dip, drench, spray) or incorporation in wax. A residue loading of 1 ppm pyrimethanil should be targeted. Depending on the efficiency of the application method and the use of multiple treatments (maximum 3 treatments), this loading can be reached by the following dose rates or their combinations.

Application Type	ppm of Active Ingredient*
Dip, Wash Tank, Drench	500-1000
Aqueous Spray	2000
Coating**	2000

* Follow use recommendations and registration specifications per country.

** Consult your Pace representative for compatibility.

- Fruit should be treated with **PacRite® Penbotec™** within 16 hours after harvest.
- Re-application is possible after storage.
- Fruit should be dry before storage.

Pace International Brings Innovative Solutions to Control Postharvest Disease with Unsurpassed Service Quality



Pace introduces **PacRite® Penbotec™** to you as a new tool for decay control and your resistance management program. With this new and innovative technology is the Pace promise of quality service unlike any other. Frequent visits from Pace sales, service, and technical support teams ensure a successful program. Pace's Technical Service Team is committed to working hard to maximize the efficiency of your packing operation and the solutions being used.

The following tasks are conducted regularly for our contract customers:

Fruit Condition

- Rank condition of fruit
- Measure decay at dump site
- Rank fruit texture
- Measure pulp temperature

Line Operation

- Evaluate water elimination
- Determine brush speed
- Measure dump rate
- Measure washer dwell period

Decay Control

- Customized sanitation programs
- Fungicide monitoring
- Spore assays
- Identify and calculate spore loads
- Calculate resistant spore levels

Treatments

- Measure pH and chlorine concentration
- Perform fungicide concentration and residue analysis

Coating Application

- Meter coating output for proper rate and fungicide concentration
- Determine cartons treated per gallon of coating applied (mileage)

Fruit Appearance

- Rank shine for quality control
- Measure and rank coverage
- Estimate and rank drying



The Leading Postharvest Specialist

Innovative Technologies
High Quality Products
Efficient Application Systems
Professional Services & Support
Global Experience & Research

 **Pace International**

For more information contact your local Distributor, Pace Representative or Pace International, LLC
1201 3rd Avenue, Suite 5450, Seattle, WA 98101
Customer Service: 1.800.936.6750

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Penbotec™ is a trademark registered to Janssen Pharmaceutica.
PacRite® Penbotec™ contains Pyrimethanil, a product from Bayer Crop Science AG.
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