

## Freshgard® 400



### The right MEDICINE against imazalil resistance in CITRUS PACKHOUSES

Suspension concentrated of fungicide with systemic and translaminar action, with high efficacy for the control of post-harvest decay caused by *Penicillium digitatum* (green mold) and *Penicillium italicum* (blue mold), including imazalil-resistant *Penicillium* populations.

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## Introduction

**Freshgard 400** is a newly registered post harvest fungicide to be used in, amongst other, citrus.

The active ingredient is pyrimethanil, which is part of the aniline-pyrimidines (AP) chemical class. The mode of action is:

- The **inhibition of fungal secretion of cell wall degradation enzymes** (e.g. proteinases, cellulases, pectinases and lactase)
- The **inhibition of methionine biosynthesis** via the enzyme cystathione  $\beta$ -lyase.

In practice the mode of action is reflected by reduced spore germination, inhibition of germ tube extension and the prevention of lesion expansion. The latter is due to the blocking of the lytic function of the infection hyphae. **Freshgard 400 has preventive and curative actions.** The product penetrates plant tissue rapidly.

## How to apply

**Dosage: 0,25%** (1.000 ppm pyrimethanil) for drench or dip treatment; **1%** (4.000 ppm pyrimethanil) for wax application.

### Remarks:

- **Drench or dip treatment:** apply **Freshgard 400** suspension (ambient or hot water) ensuring contact time with the fruit of at least 30 seconds. Use preferably ambient treatment on lemons (< 33 °C), since maximum residue limit will be exceeded with hot water treatment. Maintain the proper level of active ingredient during treatment, by topping up accordingly to analysis results.
- **Wax treatment:** apply **Freshgard 400** ensuring the product thoroughly wets the entire surface of the fruit. Apply at least 1,5 L/t of fungicidal solution. The fungicidal mixture must be perfectly homogenized before application, and the stirring must be kept constant throughout the application. Continuously check the spray nozzles to avoid any clogging that prevents a good result.

When applied immediately after harvest, regardless application system, it is very important to treat as soon as possible, not exceeding 16 hours.

## Excellent IPM and resistance management option

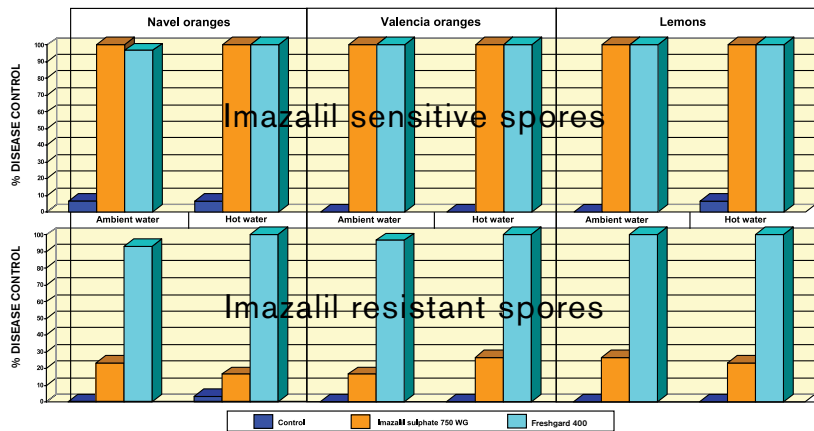
**Freshgard 400** is active against **Penicillium** strains resistant to imazalil, thiabendazole and guazatine. It is in FRAC-group 9, which has a different mode of action than the mentioned fungicides. **Freshgard 400 neither shows cross resistances** with these fungicides. Therefore, it is essential to introduce them in the resistance management strategy and in the Integrated Pest Management.

## MRL

MRLs are set for the most important export destinations (USA-10 ppm, EU-10 ppm and Codex-7 ppm).

## Efficacy data

The graphs on the right are a summary of some South African registration data conducted by **Citrus Research International (CRI)**. The graphs indicate the percentage inhibition of green mould (imazalil sensitive and resistant spores) inoculated fruit (Navel and Valencia oranges, as well as lemons) by various treatments in ambient (18 °C) and hot (30 °C) water.



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