

# WATER SANITATION AT POINT OF ENTRY

## ALWAYS REFER TO PRODUCT LABELS

Available actives	Concentration	pH of mixture	ORP	Exposure time
<b>Calcium hypochlorite</b> (Chlorine; Ca (ClO <sub>2</sub> ))	150 – 200 ppm <b>75 – 100 ppm free chlorine</b> (30 g / 100 ℓ of a 680 g/kg formulation)	6,5 – 7,5	> 800 mV	2 min (minimum)
<b>Chlorine dioxide</b> (ClO <sub>2</sub> )	Please consult with the supplier, differs for each system	5,0 – 7,5	≥ 670 mV	2 min (minimum)
<b>Plant based actives</b>	Please consult with the supplier, differs for each system	Variable	N/A	1-3 min
<b>Ozone (O<sub>3</sub>)</b>	Consult supplier	N/A	N/A	15 s
<b>Peracetic acid</b> (PAA)	140 - 420 ppm Higher ppm can lead to phytotoxicity 0,1 – 0,4%, depending on formulation	3,0 – 8,0	N/A	1-2 min

### Concentration Management

1. The use of an automatic dosing system is preferable.
2. Always dissolve granular chemicals in lukewarm water (35 – 40°C) before adding to the flume.
3. Maintain concentration and mixture parameters (e.g. pH) to keep products effective – measure every 1 hour.
4. Replace recirculating mixtures when dirty.

### Warnings and Important Information

1. Some sanitation (disinfectant) products are incompatible with fungicides or each other. Always check the compatibility before use.
2. Some sanitisers will dissipate after a period of time so concentration measurement and management is crucial.
3. The efficacy of a system is dependent on each unique packhouse, e.g. roof height, air flow, humidity, length of line, etc.
4. Pre-sort and remove decayed/injured fruit to reduce pressure on the system and prevent the spread of disease.

REVISED 2024

# PRE-PACKHOUSE DRENCH

## ALWAYS REFER TO PRODUCT LABELS

**General recommendation: Thiabendazole + Pyrimethanil + 2,4-D + Peracetic acid/Stabilized glutaraldehyde/Clove oil disinfectant**

1. The aim is to protect fruit from decay during storage and degreening.
2. Thiabendazole and pyrimethanil may be replaced with other fungicides provided they will not be applied again in the packhouse.
3. NB: ENSURE THAT FUNGICIDES FROM DIFFERENT FRAC GROUPS ARE SELECTED.

### Mixing protocol

1. Fill water tank to 80% capacity and start pump(s).
2. Pre-suspend fungicides individually in lukewarm water (35 – 40°C).
3. Order of mixing: SG – SC – EC – SL
4. Fill water tanks to full capacity.
5. Let the system run for 15 min before commencing treatment to facilitate thorough mixing.

### Operation

1. The drench system must deliver at least 500 ℓ drench mixture/bin/minute.
2. Exposure time must be 1 to 3 minutes.
3. Replace mixture after 150 bins (1 000 ℓ), or 200 bins (2 000 ℓ), or 300 bins (3 000 ℓ).
4. Mixtures can be sanitised with a registered and compatible sanitiser.
5. **Constant** agitation of mixture is necessary.

REVISED 2024

# FUNGICIDE BATH/ IN-LINE DRENCH

## ALWAYS REFER TO PRODUCT LABELS

### **General recommendation: Imazalil as sulphate + 2,4-D**

1. The aim is to offer the best possible decay control of green and blue mould.
2. Imazalil as a sulphate is pH sensitive. Residue loading will be effected by exposure time and temperature. Consult supplier or CRI for assistance as required.
3. Alternative fungicides may be used but beware of mixing and heating restrictions e.g. SC-formulations will settle and pyrimethanil will lead to increased residue loading and possible MRL exceedances at high temperatures, especially on lemons.

### **Mixing protocol**

1. Fill water tank to 80% capacity and start pump(s).
2. Pre-suspend fungicides individually in lukewarm water (35 – 40°C).
3. Order of mixing: SG – SC – EC – SL
4. Fill water tanks to full capacity.
5. Let the system run for 15 minutes before commencing treatment to facilitate thorough mixing.

NB: For IMZ sulphate, if initial pH of water > 7; adjust to pH 7 BEFORE addition of imazalil. The pH of the imazalil mixture should never exceed 6; adjust pH if needed.

### **Operation**

1. Measure concentrations at least twice daily if method is available, and amend or top-up according to supplier recommendations.
2. Renew mixture AT LEAST once a week, preferably daily; sanitise appropriately.
3. Mixtures used for more than one day can be pasteurised by heating to 60°C for 60 minutes (without fruit), and letting it cool down overnight before use.
4. Effective exposure periods must be adjusted considering pH, temperature and exposure time. These three variables determines residue loading.
5. The mixture temperature may range between 35 – 45°C. Mostly, for the bath, 35°C is ideal, while 45°C is suitable for the in-line drench.
6. For short exposure times, the use of heated imazalil mixtures is essential.
7. Optimum mixture temperature also depend on the cultivar and sensitivity of the specific fruit.
8. For soft citrus maximum pH 5 is recommended to prevent overloading of residues.

**REMEMBER TO RECORD THE TIME WHERE FRUIT IS IN CONTACT WITH THE CHEMICAL MIXTURE. APPLY pH AND TEMPERATURE ACCORDINGLY.**

REVISED 2024

# **WAX APPLICATION**

## **ALWAYS REFER TO PRODUCT LABELS**

### **General recommendation:**

1. The aim is to offer long term disease protection to maturing fruit during transport and storage.
2. Imazalil EC added in the wax offers a different action to that provided in the water application.
3. Thiabendazole offers protection against chilling injury and latent pathogens.
4. Fludioxonil can be used in the wax. It assists with sporulation control, especially when combined with TBZ.
5. If 2,4-D is required in the wax, ensure it is pre-mixed from the supplier.

### **Mixing Protocol**

1. Fill wax applicator tank with wax to 80% capacity.
2. Start mixer/agitator.
3. Premix each product separately in a small amount of lukewarm water ( $\pm 40^{\circ}\text{C}$ ) before adding it to wax.
4. Order of mixing: EC– SC– SL
5. Fill wax applicator tank to full capacity (100%).
6. Agitate for at least 15 min before use.
7. To prevent precipitation of certain formulations, mix continuously, agitator should be active 24 hours per day.
8. Keep the tank closed to prevent evaporation.

### **Operation**

- Apply wax as specified by supplier.
- Prevent wind from drying tunnels blowing onto the waxing unit.
- Ensure an even spread of wax on brushes (follow wax supplier recommendations).
- Brushes should always be moist with wax, but no visual foam should be formed.
- At the end of a packing day, wash brushes in hot water to remove wax.

**REVISED 2024**

**POSTHARVEST REGISTERED ACTIVES**

**HIGH-VOLUME WATER APPLICATION**

Active ingredient (formulation)	FRAC	Target	ppm
2,4 D Sodium Salt (25 SL)	PGR	Plant Growth Regulator (PGR). Prevents abscission of the calyx	250
Thiabendazole (500 SC)	1	Stem-end rot, Green and Blue mould	1000
Imazalil as sulphate (750 SG)	3	Green mould, Blue mould	500
Propiconazole (250 EC)	3	Sour rot, Green mould, Blue mould	600
Guazatine (210 SL)	M7	Sour rot, Green mould, Blue mould	1000
Pyrimethanil (400 SC)	9	Green mould, Blue mould	1000
Pyrimethanil Propiconazole (150 +120 EC)	9 3	Sour rot, Green mould, Blue mould	750 600
Azoxystrobin (250 SC)	11	Green mould, Blue mould, brown rot	1125
Fludioxonil (230 SC)	12	Green mould, Blue mould	600
Azoxystrobin Fludioxonil (240+240 SC)	11 12	Green mould, Blue mould	600 600
Imazalil Pyrimethanil (400 SC)	3 9	Green mould, Blue mould	500 500
Sani-D range	NC	GRAS chemical	
Peracetic acid	NC	Disinfectant	
DDAC (120 SL)	NC	Disinfectant	
Clove Oil 10 %	46	Disinfectant	

**ALWAYS REFER TO PRODUCT LABELS**

**REVISED 2024**

# POSTHARVEST REGISTERED ACTIVES

## WAX APPLICATION

Active ingredient (formulation)	FRAC	Target	<b>ALWAYS REFER TO PRODUCT LABELS</b>	ppm
2,4 D (25 SL)	PGR	Plant Growth Regulator Prevents abscission of the calyx		250
Fludioxonil (230 SC)	12	Green Mould, Blue Mould sporulation control		2300-4600
Thiabendazole (500 SC)	1	Stem-end Rot, Green and Blue Mould		4000
Imazalil (500 EC)	3	Green Mould, Blue Mould		2000 - 3000
Imazalil (GRAS + 300 EC)	3	Green Mould, Blue Mould		3000
Propiconazole (250 EC)	3	Green Mould, Blue Mould sporulation control		1800
Guazatine Formulated Waxes (3g/l)	M7	Sour Rot, Green Mould, Blue Mould		3000
Pyrimethanil (400 SC)	9	Green Mould, Blue Mould		4000

REVISED 2024