

Low-chem, No-chem & Organic Pack-lines



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Focus on EU & UK Markets

- ❑ EU & UK retailers introduced
 1. Limits on the number of actives
 2. Average residue thresholds (lower than EU/UK law)
- ❑ Only EU & UK care about low-chem & no-chem fruit
- ❑ EU & UK markets offer the most practical & established pathways for South African organic exports
- ❑ This is why the entire conversation about low-chem, no-chem & organic fruit all comes back to the EU and the UK.



What is low-chem, no-chem & organic

In the EU/UK the **citrus market** is fragmenting into three chemical-use categories

	LOW-CHEM	NO-CHEM	ORGANIC
Restriction	• Depends on retailer • Restriction of MRL's • Restriction on number of actives • Restrictions often include pre-harvest residues	• Zero synthetic postharvest fungicides • Pre-harvest residues allowed	• Produced & packed without synthetic fungicides • Certified organic law
Retailers	Tesco, Marks & Spencer (M&S), Waitrose, Lidl, ALDI, REWE, Edeka	Tesco, M&S, Waitrose	Tesco, M&S, Waitrose, Lidl, ALDI, REWE, Edeka, Ekoplaza

DISCLAIMER: Retailers are listed as examples only. For accurate & up-to-date information, please consult directly with exporters & clients.

SA's legal constraint

- ❑ South African export law (APS Act No. 119 of 1990)
 - <1.5% **decay** permitted at PPECB inspection
 - Sour rot & brown rot not allowed
- ❑ In practice:
 - 1 in 50 fruit with *Penicillium* -> inspect 100
 - 2 in 100 fruit with *Penicillium* - > reject the box -> Inspection escalated at consignment level
- ❑ Applies to all citrus types & all export destinations
 - Includes low-chem, no-chem & organic programmes
- ❑ Above this limit → consignment cannot be exported

Key drivers for feasibility

☐ Pest & disease pressure in your area

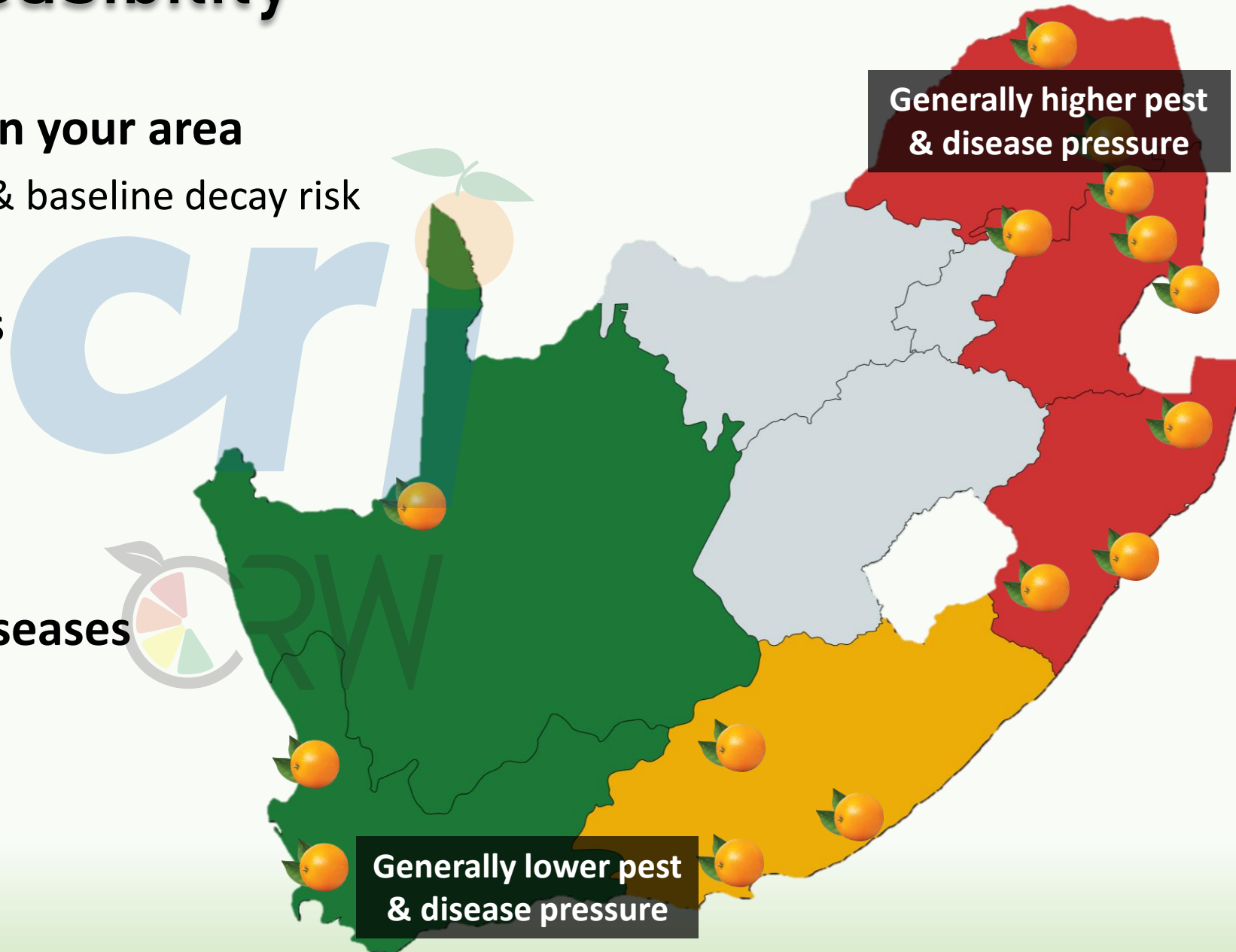
- Determines spray intensity & baseline decay risk

☐ EU / UK quarantine pests

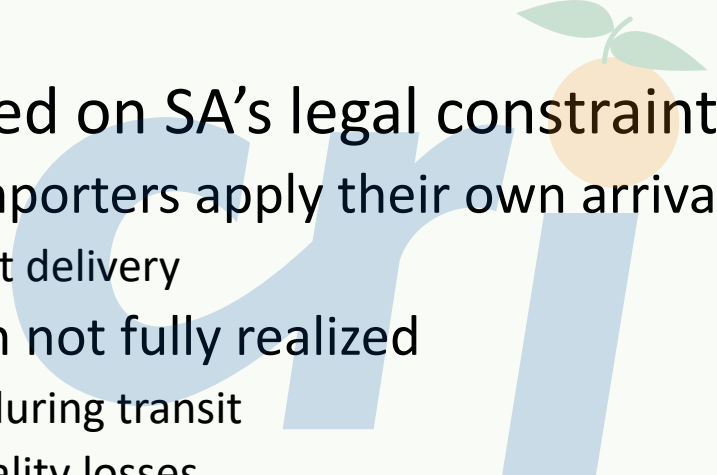
- Citrus Black Spot (CBS)
- False Codling Moth (FCM)
- Fruit Fly

☐ Other limiting pests & diseases

- Mealybug
- Thrips
- Red scale
- Alternaria brown spot
- etc.



Low-chem, no-chem & organic ≠ premiums

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- ❑ If it is feasible based on SA's legal constraint...
 - Many retailers & importers apply their own arrival quality specifications
 - Often $\pm 1\%$ decay at delivery
 - Premiums are often not fully realized
 - Higher decay risk during transit
 - More cosmetic quality losses
 - ❑ So why do it?
 - To remain competitive in residue-sensitive markets

Postharvest disease management

	LOW-CHEM	NO-CHEM	ORGANIC (EU/UK)
Fungicides (IMZ, TBZ, PYR, FLU & SOPP/OPP)	YES	NO	NO
Potassium sorbate (≤ 20 ppm)	YES Programme-dependent	YES Programme-dependent	NO
Clove oil	YES Programme-dependent	YES Programme-dependent	YES Certifier-approved
PAA & hydrogen peroxide	YES	YES	YES Certifier-approved
Chlorine	YES	YES	NO
Edible wax	YES	YES Programme-dependent	YES Programme-dependent Certifier-approved
Degreaser	YES Completely rinsed-off	YES Completely rinsed-off	YES Completely rinsed-off Certifier-approved

Organic recommendation

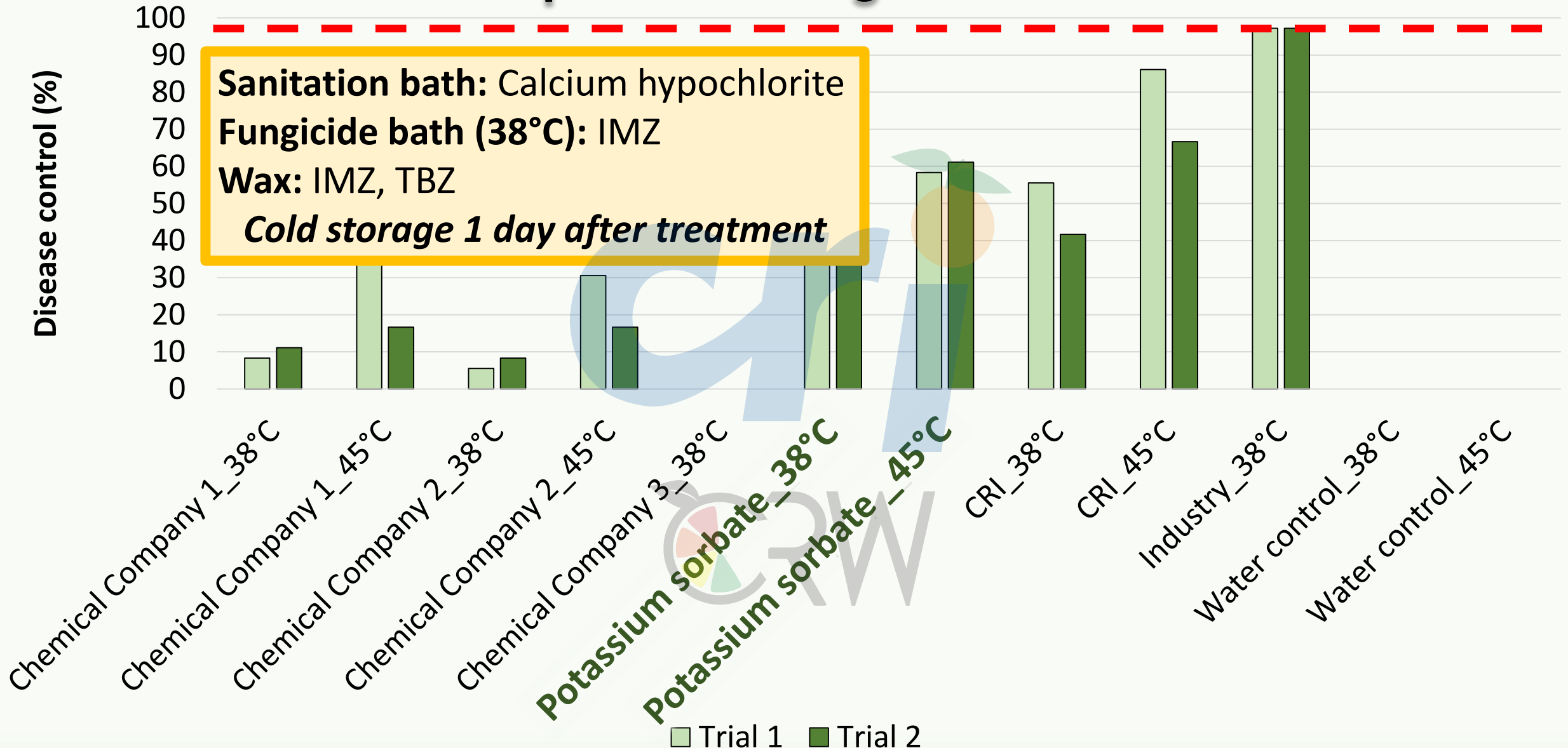
- ❑ Governed by **EU Regulation 2018/848 & 2021/1165** (UK mirrors these rules)
- ❑ “Organic” is a **legal claim**—cannot be used without certification
- ❑ Certification must be done through a recognised body:
 - EcoCert
 - CERES
 - Control Union
- ❑ Organic compliance covers the **entire chain**:
orchard → packhouse → storage → transport → importer
- ❑ Organic certification is **not permanent** — must be renewed yearly
- ❑ **Organic is bound by law; low-chem & no-chem are not**



No-chem CRI Experiments: Methods

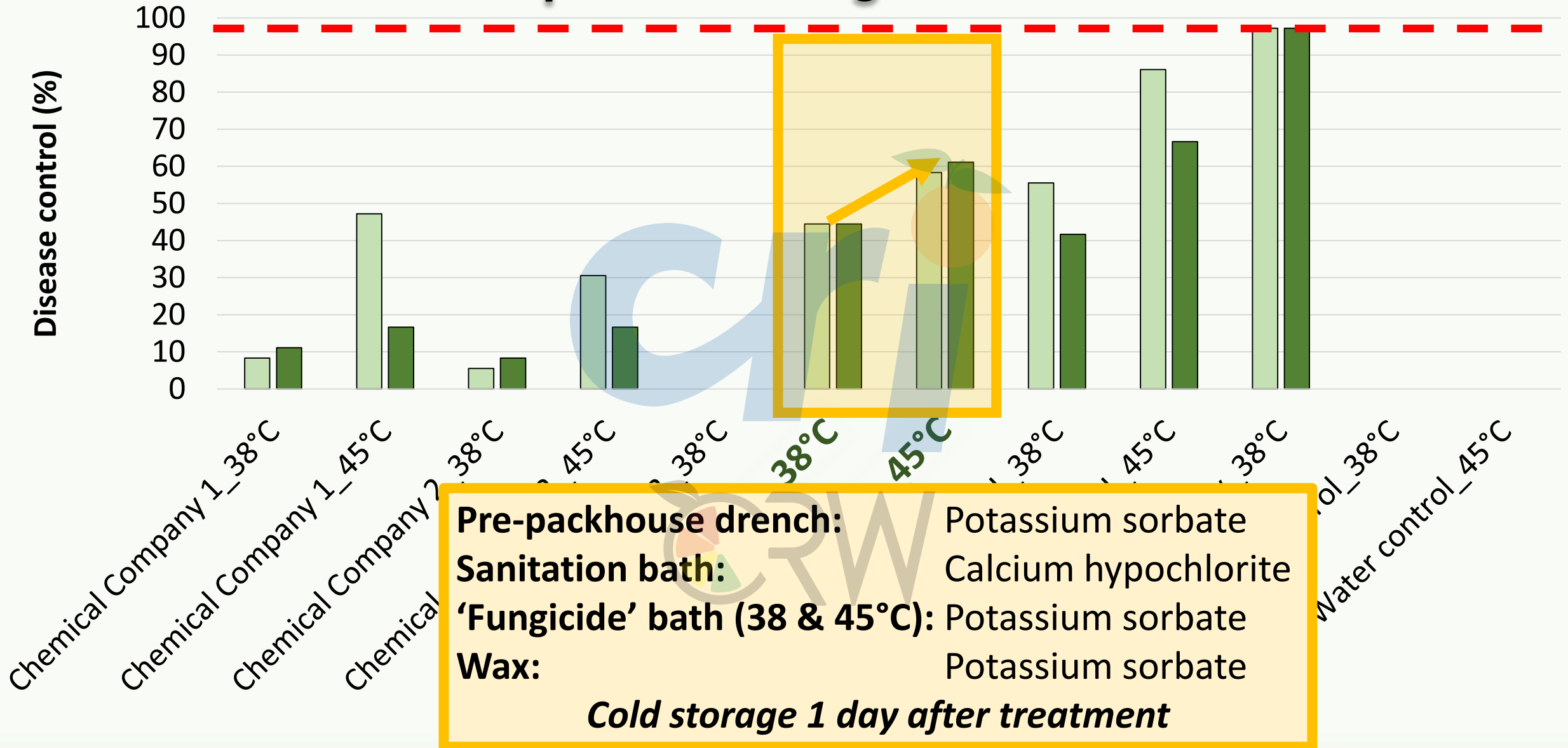
1. **Fruit type** = 'Valencia' oranges
2. **Wound** = 3.5 to 4.0-mm-long x 3-mm-in-diameter
3. **Inoculum:**
 - 1×10^6 spores/ml *P. digitatum*
 - 1×10^7 spores/ml *G. citri-aurantii*
4. **Pre-packhouse drench** = 18–20 hrs later (**curative**)
5. **Packline** = 24 hrs after pre-packhouse drench
6. **Cold storage** = 24 hrs after pack-line (26 days @ 1.5°C)
7. **Rating** = 14 days after cold storage

No-chem CRI experiment: green mould control



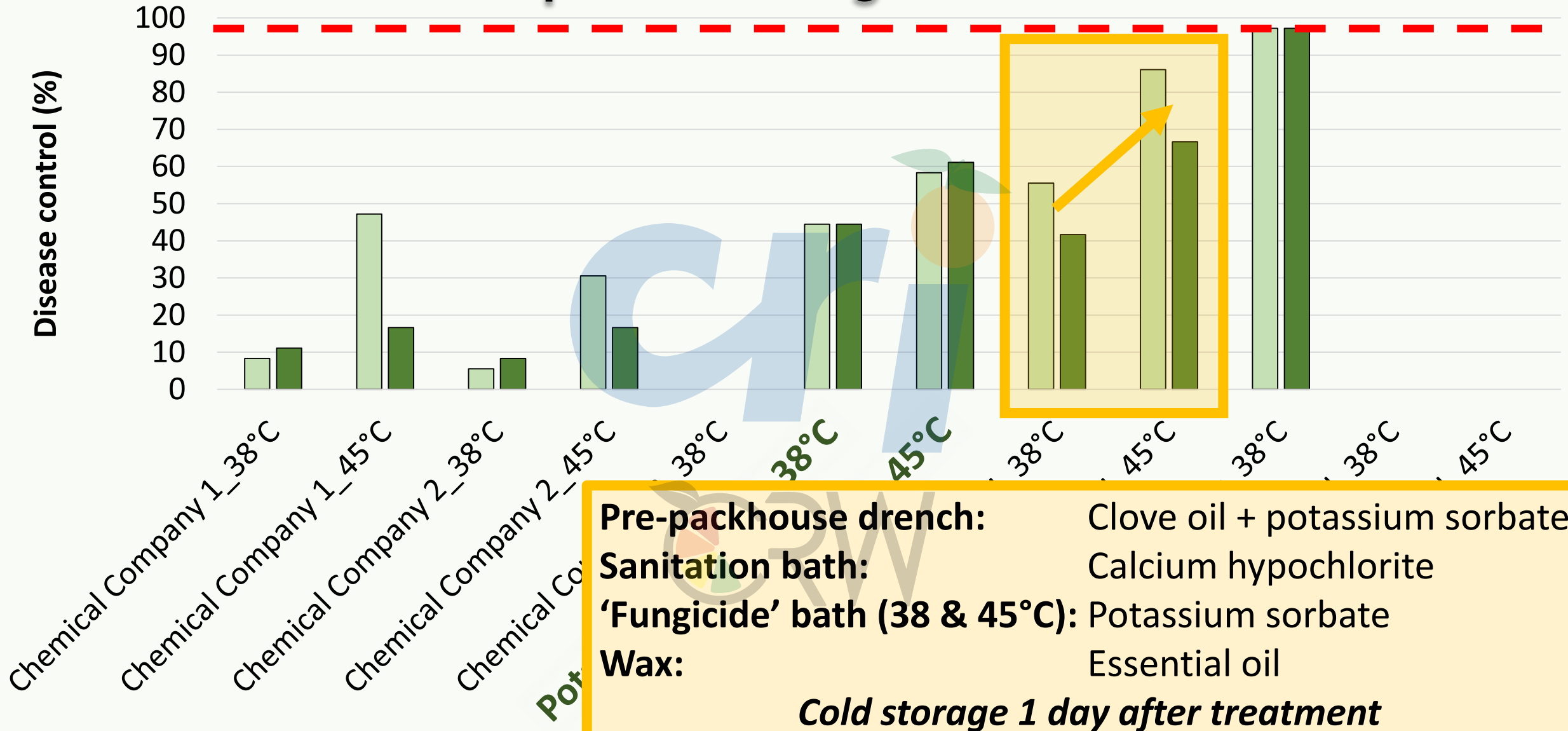
Note: The observed effect is based on two trials conducted under specific conditions & requires further investigation;
All actives mentioned are from registered products readily available to the citrus industry

No-chem CRI experiment: green mould control



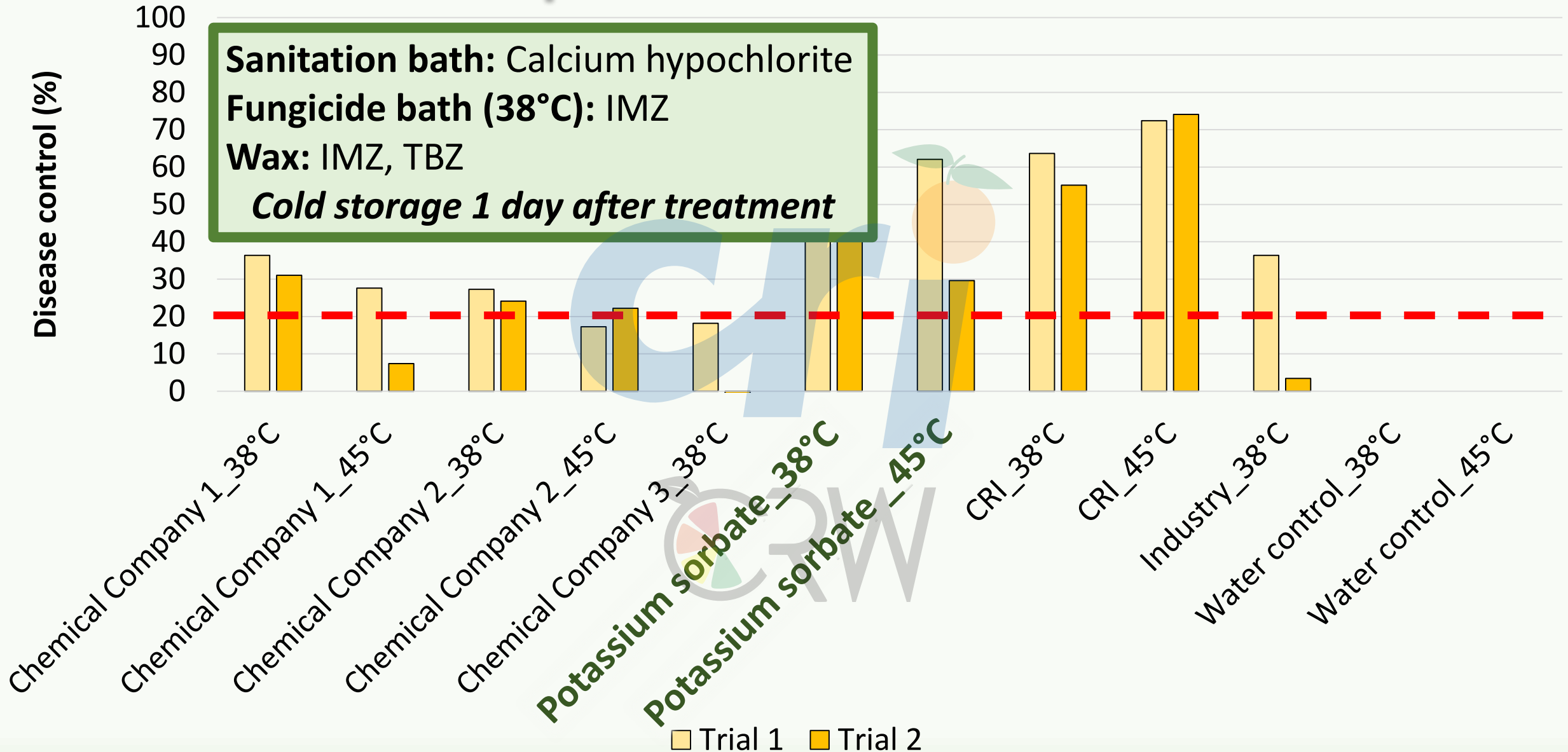
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No-chem CRI experiment: green mould control



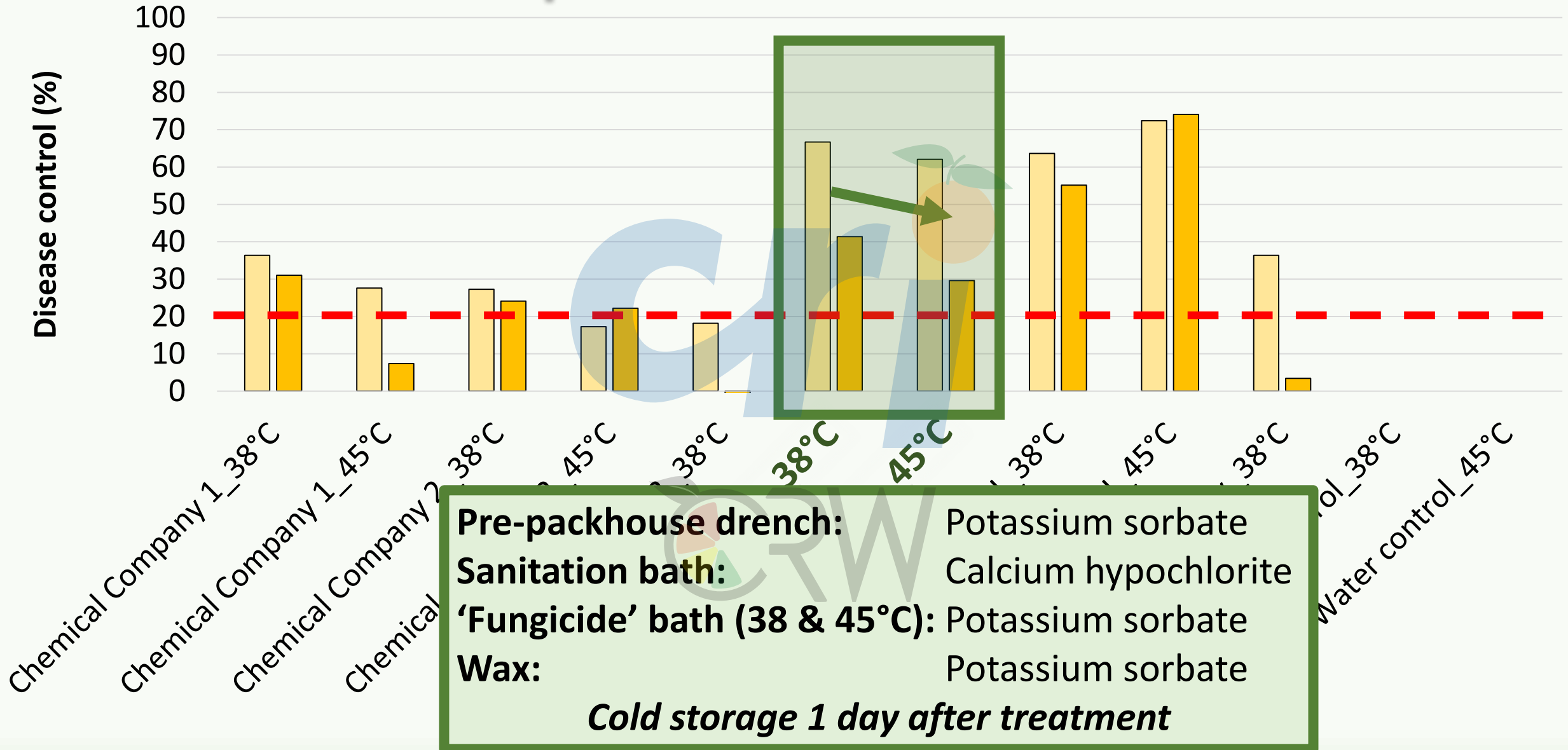
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No-chem CRI experiment: sour rot control



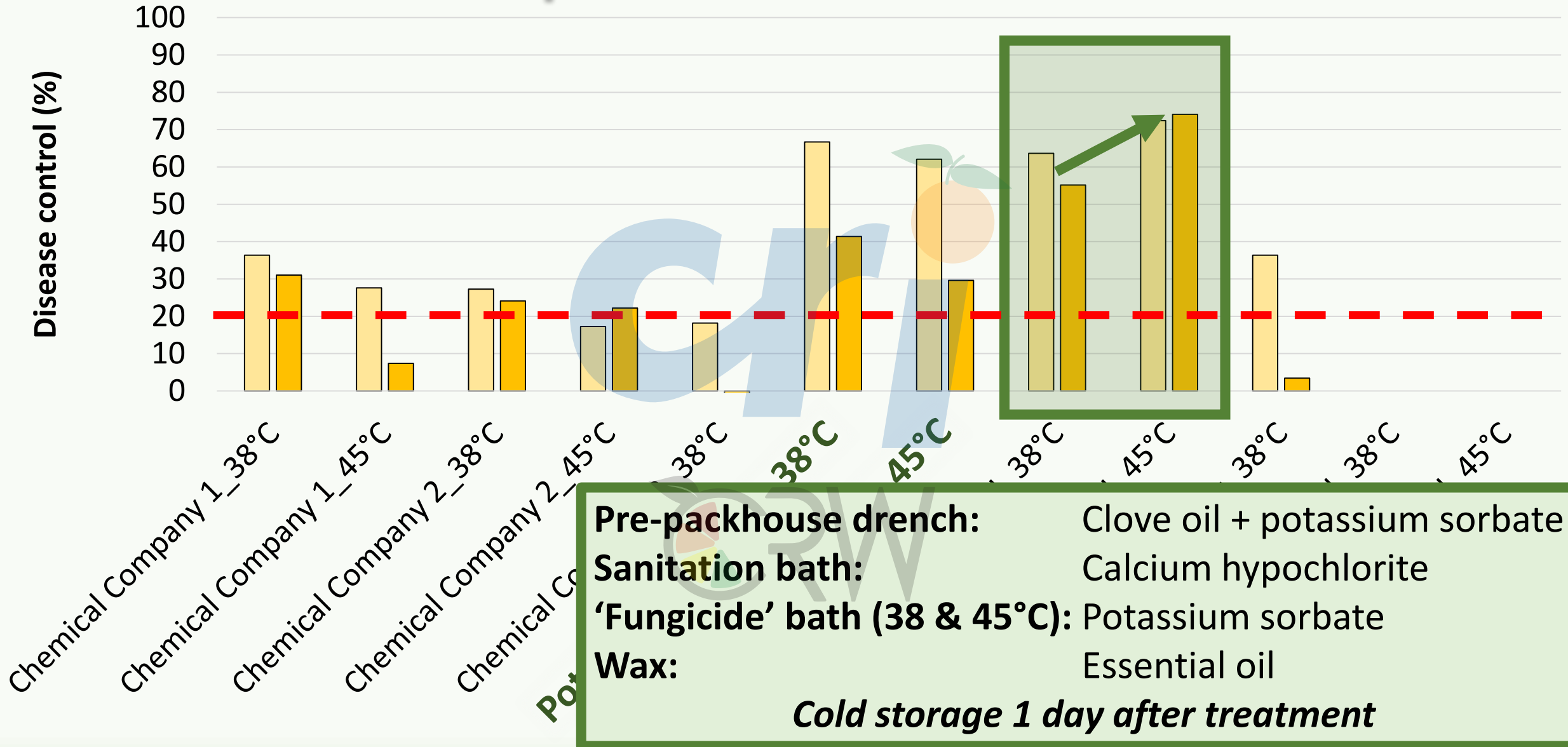
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No-chem CRI experiment: sour rot control



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No-chem CRI experiment: sour rot control



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No-chem recommendation

!! TEST FIRST BEFORE IMPLEMENTATION !!
Assess Rinds & Stem-ends (drying)



No-chem recommendation

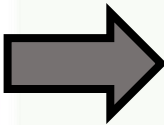
!! TEST FIRST BEFORE IMPLEMENTATION !!
Assess Rinds & Stem-ends (drying)

Pre-packhouse drench



Potassium sorbate
OR
Clove oil (depends)

Inhibits disease
development

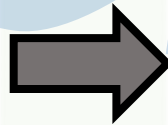


Sanitation
bath



Chlorine-
OR
PAA-based

Kills spores &
human pathogens

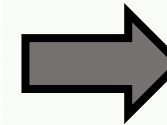


'Fungicide' bath
2nd sanitation bath



Potassium sorbate
@45°C (depends on fruit)

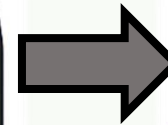
Inhibits disease development due to unfavourable conditions, &
may lead to death of spores & fungi



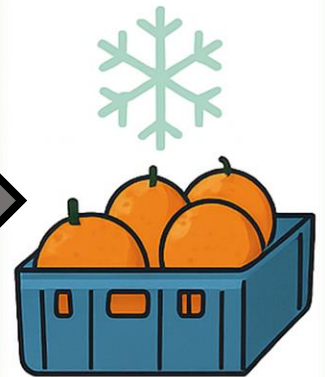
Wax



Potassium sorbate



Cold storage



Low-chem recommendation depends on retailer

Keep pack-line as conventional as possible & consider effective residue loading

	SA MRL	EU & UK MRL	MAX EXPORT MRL	EFFECTIVE RESIDUE LOADING
Azoxystrobin	10.0	15.0	10.0	0.4-1.5 ppm (depends: fruit type & app.)
Clove oil	None published	Exempt	Exempt	Active counted depending on programme
Fludioxonil	10.0	10.0	10.0	0.8-1.5 ppm (depends: fruit type & app.)
Imazalil	5.0	4.0 (oranges & grapefruit) 5.0 (lemons, limes & mandarins)	4.0 (oranges & grapefruit) 5.0 (lemons, limes & mandarins)	2 ppm
Potassium sorbate	None published	20.0	20.0	Active counted depending on programme
Pyrimethanil	10.0	8.0	8.0	1-2 ppm (depends: fruit type, tempt & app.)
Thiabendazole	6.0	7.0	6.0	1 ppm

Take-home message

Should we attempt low-chem / no-chem / organic?

1. What is the **region** and its fungal pressure?
2. What is the **citrus type**?
3. What is the **harvest window** (early vs late)?
4. Do we have the **technical ability** to run clean pack-lines?
5. Can we meet **decay constraints**?
6. Can exporters guarantee **price protection**?
7. Do we have **organic certification & OSP** (if organic)?

