Rudolph Strydom

Jan Landman

Surfaces to consider in sanitation

- **Packline surface** Treat daily with a registered, food-safe sanitising product. It is important that the product does not leave a residue and is quick and easy to use.
- **Fruit surface** Prioritise a fruit disinfectant treatment when entering the packhouse. Chlorine (Calcium Hypochloride) is the most popular active for this purpose. Strictly manage the chlorine concentration, pH and ORP. Alternatives such as liquid or powder PAA formulations can also be used. In the case of PAA there is no need to adjust the pH. However, the PAA concentration levels must be managed carefully, and fruit must be dried timeously (both are to prevent rind injury).
- **Floors and walls** are to be washed weekly with a registered soap and disinfectant product. In these areas, a product that leaves a residue (such as a QAC product) can be used. Use a registered soap before sanitation, as a dirty surface can't be sanitised. The areas to clean include the packhouse, degreening rooms, and cold rooms.
- **Degreening rooms and cold rooms** must to be washed and then – where possible – fumigated with a suitable product that can reach into all crevices. Avoid the risk of residue transfer; never fumigate when there is fruit in the room.
- **Orchard bins and picking bags** Wash and sanitise before re-use.

Sources of inoculum (spores)

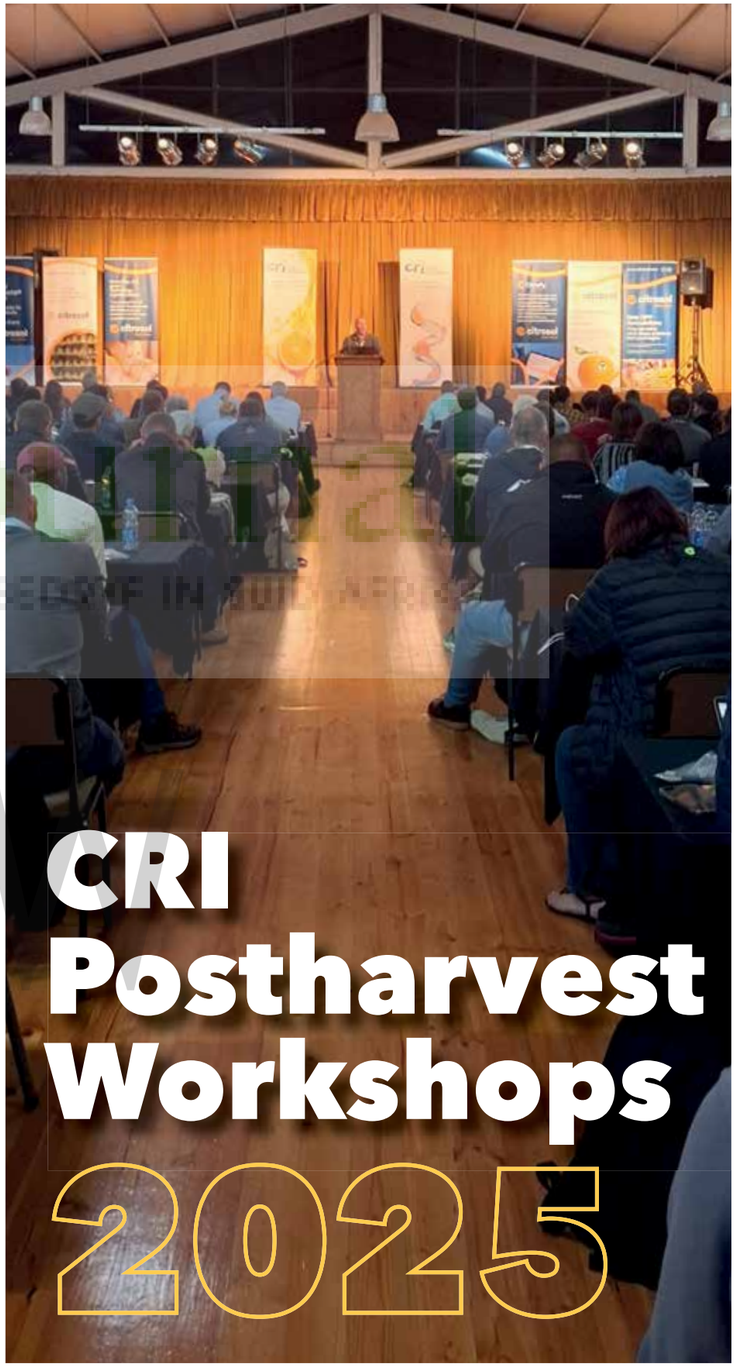
- **Orchard spores** naturally occur in the orchards. So, orchard sanitation is key, to reduce the inoculum load.
- **Post-degreening fruit** Degreening conditions are favourable for disease development and, unfortunately, some sporulating fruit are often tipped into the packhouse system.
- **Waste fruit** Do have a process in place to remove this fruit promptly. Keep the waste in sealed containers.
- Often **juicing fruit** treated with fungicides, lingers in the packhouse area until it's transported to the juicing plant. Therefore, decay on such fruit holds a resistance risk.
- **Small fruit** If not properly graded out, this fruit can fall between brushes, or gaps between units, and lie unseen on drip trays in the packhouse.
- **Retention samples** Shelf-life fruit has also been treated with fungicides and holds a similar resistance risk as juice fruit.

Recommendations for reduced risk of infection or resistance development

- Treat all harvested fruit within 12–18 hours. Most fungicides cannot control infections that are older than a day.
- Drench fruit with fungicide protection on Friday afternoon. Don't wait until Monday.
- Degreen fruit for the absolute minimum period.
- Exceedence of the packline volume limit can cause accelerated agitation and movement of the fruit. This will result in bruising and injuries, and will reduce the efficacy of sanitation and fungicide treatment. Spread the fruit out for optimal treatment.
- Risks related to rushing fruit through the various control points:
  - Chlorine treatment: poor disinfection, spores surviving.
  - Fungicide dip tank: loading sub-optimal residue, poor infection control.
  - Wax applicator: poor wax deposition on the fruit; sub-optimal residue loading, poor moisture retention, negative impact on quality.
- Limit the time from harvest to packing and the eventual introduction to the cold chain.

Advice for managing retention fruit

- Have a dedicated task manager.
- Evaluate fruit daily, noting decayed fruit on the carton, then remove or isolated it. Plus:
  - Immediately place infected/discarded fruit in a tightly sealed plastic bag to reduce the risk of releasing inoculum (spores) into the packhouse atmosphere.
  - Green mould sporulation inhibition is a very important criterion to note. Loss of sporulation inhibition indicates either fungicide resistance or poor application. Prevent spore spread by keeping fruit that exhibit sporulation inhibition – white mycelium with few to no green spores – in sealed transparent plastic bags and incubating it for another week for assessment.
  - After the sporulation inhibition rating the bagged fruit must be destroyed (with the bag) well away from citrus orchards and packhouses, to prevent spores from entering any production area.
- Do not keep fruit for longer than the shipping period. Ideally, the retention room should be some distance away from the clean area and completely enclosed with controlled access. Clean and treat this room with a suitable soap and sanitiser at least once a month.



Delegates had waited 12 months for this key industry event

Once again, the annual regional CRI Postharvest Workshops were a resounding success.
By Rudolph Strydom

This year, the regional CRI Postharvest Workshops had a packed venue at each of the six locations visited across the country during January and February. A total of 1 200 delegates attended, representing a wide range of sectors within the citrus industry, from packhouse managers and staff to exporters and agrochemical representatives.

Notably, there's a rise in attendance by the young demographic. This and the overall upward growth trajectory of the citrus industry of Southern Africa make for a promising future.

There's a rise in attendance by the young demographic.

Among the numerous speakers were researchers and experts from various fields, who presented valuable information on market access, export logistics, disease control, and packhouse process optimisation. This year, Citrosol was the main sponsor with various other platinum, gold, silver, and bronze sponsors who also contributed.

SESSIONS

1 Covered everything related to the broader citrus industry and some of the national and global factors that impact it. An area representative provided an overview of the 2024 packing and export season, followed by the main sponsor, who discussed some of the products and services they offer. This was followed by presentations on current market access requirements and ways to decrease packing costs and expenses by improving farm and

Well-targeted presentations were met with rapt attention

packhouse efficiency. The Citrus Growers' Association (CGA) was well represented, with topics like:

- **current and future modifications to existing chemical active maximum residue levels (MRLs)**
- **newly-required pest control operator (PCO) license**
- **necessity of standardising carton pack codes and considerations towards the carbon footprint of an individual operation.**
- **logistics for the 2024 export season, including impediments to existing export corridors and reasons for lower export carton volumes; and promising rail transportation prospects.**

2 Focused on how different processes and packline treatments can be improved. A strong emphasis on sanitation, from the orchard to the packhouse, marked the opening theme of this session.

Pathogen spore load must be controlled and limited from the orchard to the packhouse through thorough, stringent sanitation practices.

Accurate record-keeping and management of pH and temperature for each packhouse water system and specific chemicals were discussed, to ensure effective disease control, residue loading, and risk reduction regarding decay or MRL exceedance.

Resistance development in pathogen populations can cause a devastating ripple effect. Practical methods were shared on how to prevent or manage resistance, if already detected in the packhouse.

Growers' automatic dosing systems Valuable information was presented on how to ensure that growers' automatic dosing systems are working as intended, and that chemical dosing is accurate.

Wax bed optimisation in each component was emphasised, for sufficient wax application and effective long-term protective control of fruit.

Rind disorders and decay came under the spotlight and it was highlighted that certain types of decay are already noticeable on the trees. A discussion followed on how these can be prevented by monitoring certain climatic conditions, and through closer collaboration between the farm and packhouse.

3 The second day of the workshops started with presentations on precooling and the factors that influence this process as well as observations made in export containers.

Moisture accumulation in containers reduces the integrity of the pallet and cartons and must be kept to a minimum. Methods to improve airflow and cooling in transit were also explored.

Pallet loading Simple yet essential measures were provided that ensure that pallets are loaded properly onto trucks to minimise carton and fruit damage. Issues that arose due to incorrect palletisation practices were shown and how these could be avoided by following the CRI packaging guidelines.

Citrus rind disorders Methods to determine and differentiate between the different citrus rind disorders were discussed.

Currently registered fumigation ("air sanitation") options available for packhouse use were highlighted.

4 The final session mostly consisted of topics on postharvest disease prevention and management.

Sour rot disease control The most recent research results were discussed.

Fludioxonil and azoxystrobin Through trial results, a case was made for their effectiveness and viability as imazalil substitutes for green mould control. If imazalil resistance is detected, then these actives can be recommended.

The probable cause (high humidity, old fruit, and ineffective chemical treatment) and the solution to limiting storage mould and Cladosporium on mandarins during storage and export were presented.

Packhouse chemical titrations General considerations to keep in mind were listed, to ensure accuracy of active concentration measurements and chemical top-ups.

The workshop concluded with a discussion on how the chemical drench system can be improved and maintained.

Valuable, practical information was provided to attending industry role-players, which will undoubtedly improve packhouse operations for the 2025 packing season.

cri Growers Hub

cri citrus research international