



## AMBIENT / WARM LOADING OF CITRUS – 2021 SEASON

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### Introduction

The increasing volumes of citrus fruit exported from South Africa are currently outpacing capacity at precooling facilities. To mitigate the lack of available forced-air cooling facilities (FAC), an alternative cold-chain strategy, referred to as “ambient loading” or “warm loading”, has for many years been successfully used for citrus fruit. This practice implies that fruit are loaded warm, i.e., not pre-cooled, into a refrigerated container at the loading facility, after which it is cooled by the refrigerated container. This is not an ideal practice but can be used as an option if pre-cooling is not available and can result in a shorter time to market and less handling of fruit.

Ambient/warm loading of citrus fruit from South Africa can only be used for markets without a required disinfestation cold treatment. Citrus fruit exported to the EU must comply with the storage and shipping temperatures as specified in the Citrus Black Spot Risk Management System (CBS RMS) and Citrus False Codling Moth Risk Management System (Citrus FMS).

### Unification of ambient/warm loading specifications

Before the 2021 season, some contrasting rules as to the use of ambient/warm loading existed. To simplify rules regarding ambient/warm loading, the PPECB documents have been updated to allow the use of all “W-coded” for all citrus types (**Schedule 1 HP22, pp 9-10 and Ordinary Handling Protocol - HP01 – Handling Procedures for Citrus Fruit.**) to the UK, Russia, Canada, Middle East and some Far East countries.

### Guidelines for effective ambient/warm loading

Ambient/warm loading relies on the reefer containers’ refrigeration capacity to reduce the fruit temperature. A few critical aspects should be focused on to ensure effective cooling:

#### Time from packing to loading

- To reduce the risk of fruit quality deterioration (rind disorders and decay) it is imperative to load the fruit as soon as possible after palletisation.

- In general, this should not exceed a maximum of 10 days.
- Note that the CBS-RMS requirement of 6 days must be complied with for fruit destined for the EU.
- Please note that this practice could lead to a higher incidence of decay and rind disorders and quality issues if fruit outside the optimal harvest window is packed or suboptimal packhouse practices are used.

### Packaging

For details refer to the *CRI 2021 Packaging Material Specifications and Palletisation Protocols*

- Carton ventilation – For optimal results (decay/quality factors), only use well-ventilated cartons (6-7% ventilation).
- Securing sheets – use sheets that do not block ventilation holes and reduce vertical air movement.
- Pallet bases – Use the CRI pallet design to prevent unnecessary blockage of ventilation holes.
- Use of paper wrappers (except for display purposes) are not recommended.

### Container loading

It is permitted to load fruit ambient/warm if the pulp temperatures are <25°C. The following recommendations will improve cooling efficiency:

- Allow the pallets to reduce pulp temperature during a static cooling period in a cold room or overnight.
- Cooling efficiency will be improved if the initial fruit temperature is reduced.
- Load pallets of similar pulp temperature.
- It should be noted that warm loading fruit in a container and setting delivery air temperature at <4°C could lead to chilling injury.
- Install void plugs at the back of the container to cover the open T-bars.

### Set point recommendations

As per Schedule 1 HP22 carrying temperature from 0°C to 16°C is allowed for ambient/warm loaded fruit.

In general, the following temperatures would be recommended as carrying temperatures to the UK, Russia, Canada, Middle East and some Far East countries:

- Limes: >7°C
- Lemons: 4 – 7°C



- Satsuma mandarins: 4 – 10°C
- Clementines: 2 – 7°C
- Mandarins: 2 – 7°C
- Grapefruit:
  - Marsh: 4 – 10°C
  - Star Ruby: 2 – 10°C
- Navel oranges: 2 – 7°C
- Valencia oranges: 2 – 7°C



## WARMLAAI VAN SITRUS – 2021 SEISOEN

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### Inleiding

Die toename in volumes sitrusvrugte wat van Suid-Afrika uitgevoer word, oorskry tans die kapasiteit van beskikbare voorverkoelingsgeriewe. Om hierdie tekort aan beskikbaarheid van geforseerde verkoelingsaanlegte (FAC) te bestuur, word 'n alternatiewe koueketting strategie, "Ambient Loading" of "Warm Laai", al vir verskeie jare suksesvol vir sitrusvrugte gebruik. Hierdie praktyk impliseer dat vrugte warm d.w.s. geen vooraf verkoeling, in 'n verkoelde houer by 'n uitlaaipunt, gelaai word, waarna die vrugte in die houer verkoel word. Dit is nie die ideale praktyk nie, maar kan as 'n opsie gebruik word as voorverkoeling nie moontlik is nie en kan tot minder hantering van vrugte lei.

Warm laai van sitrusvrugte van Suid-Afrika kan slegs na markte gebruik word waar daar nie 'n vereiste vir 'n koue-sterilisering behandeling is nie. Sitrusvrugte wat na die EU uitgevoer word moet voldoen aan die opbergings en verskeping temperature soos in die Sitrus Swartvlek Risiko Bestuur Stelsel (CBS-RMS) en die Sitrus Valskodlingmot Mot Bestuurstelsel (Sitrus-FMS) gespesifiseer word.

### Vereenvoudig van spesifikasies ten opsigte van warm laai

Voor die 2021-seisoen het reëls oor die gebruik van warm laai mekaar weerspreek. Om hierdie reëls t.o.v. warm laai te vereenvoudig, is die PPECB-dokumente opgedateer om die gebruik van alle "W" – kodes vir alle sitrustipes (**Schedule 1 HP22, pp 9-10 en Ordinary Handling Protocol - HP01 – Handling Procedures for Citrus Fruit.**) na die VK, Rusland, Kanada, Midde Ooste en sommige lande in die Verre Ooste toe te laat.

### Aanbevelings vir effektiewe gebruik van warm laai

Warm laai is afhanklik van die verkoelingsvermoë van die houer om die vrugtemperatuur te verlaag. Dit is dus belangrik dat op kritieke aspekte te fokus om effektiewe verkoeling te verseker:

#### Tyd van pak tot laai

- Om goeie vrugkwaliteit te verseker (skildefekte en bederf), is dit noodsaaklik

om die vrugte so gou as moontlik na paletisering te laai.

- Oor die algemeen moet dit nie 'n maksimum van 10 dae oorskry nie.
- Let daarop dat die CBS-RMS vereiste van 'n maksimum van 6 dae vir vrugte wat vir die EU bestem is, nagekom moet word.
- Let daarop dat hierdie praktyk kan lei tot 'n hoër voorkoms van bederf, skildefekte en kwaliteits probleme veral as vrugte buite die optimale plukvenster gepak word of as sub-optimale pakhuispraktyke gebruik word.

### Verpakking

Vind besonderhede in die CRI 2021 Spesifikasies vir verpakkingsmateriaal en paletiseringsprotokolle.

- Karton-ventilasie – vir optimale resultate i.t.v. bederf en kwaliteit faktore, gebruik slegs goed geventileerde kartonne (6-7% ventilasie)
- "Securing sheets" – gebruik slegs tussenvelle wat nie die ventilasiegate blokkeer en vertikale ventilasie verminder nie.
- Paletbassis – Gebruik die CRI paletontwerp om onnodige blokkering van ventilasiegate te voorkom.
- Die gebruik van "paper wrappers" (behalwe vir vertoondoeleindes) word nie aanbeveel nie.

### Laai van houer

Dit word toegelaat om vrugte met pulptemperature wat laer as (<) 25°C warm te laai. Die volgende aanbevelings sal die verkoelingsvermoë verbeter:

- Laat die palette toe om pulptemperature te verminder gedurende 'n statiese verkiesingsproses in 'n koelkamer of oornag voor laai.
- Verkoelingseffektiwiteit sal verbeter indien die aanvanklike vrugtemperatuur verlaag word.
- Laai palette met dieselfde vrugpulptemperature.
- Let daarop dat vrugte wat warm in 'n houer gelaai word met 'n stelpunt loweringstemperatuur van 4 °C en laer tot koueskade kan lei.
- Installeer "void plugs" agter in die houer om die oop "T-bar" vloer te bedek.

### Stelpunt aanbevelings



Volgens Skedule 1 HP22 word verskepings-temperatuur van 0°C tot 16° C vir warm laai van vrugte toegelaat. Oor die algemeen sal die volgende temperatuur as verskepingstemperatuur na die VK, Rusland, Kanada, Midde Ooste en sommige lande in die Verre Ooste aanbeveel word:

- Lemmetjies: >7 °C
- Suurlemoene: 4 – 7 °C
- Satsuma mandaryne: 4 – 10 °C
- Clementines: 2 – 7 °C
- Mandaryne: 2 – 7 °C
- Pomelo's:
  - March: 4 – 10 °C
  - Star Ruby: 2 – 10 °C
- Nawels : 2 – 7 °C
- Valencias : 2 – 7°C