



A15C-S2 Carton, Packaging and Palletisation Update 2023

Catherine Savage, Dawid Groenewald and Tarl Berry
Citrus Research International (CRI)

The new A15C-S2 carton is now the only telescopic carton in which citrus fruit can be shipped to EU markets (since January 2022). This change of ventilation was introduced after an extensive study in 2021, which showed that the S2 carton significantly reduced the incidence of hotspots in refrigerated containers (see Cutting Edge 333 for more details). Refer to Cutting Edge No 364 for information relating to packaging use under the FMS (2023).

Since the introduction, **many of the problems with this carton are an accumulation of circumstances (e.g. longer cold chains) and not due to the design of the carton.**

Gluing

During the 2022 season, many packhouses initially observed challenges with gluing. However, reports indicate these issues have largely been resolved. **The following practices have further been recommended to improve gluing performance of the A15C-S2 carton.**

- Closer monitoring of the gluing process has netted the most significant results. This entails consistently monitoring/adjusting the nozzles during runs.
- It is recommended that packhouses minimise the assembly machine feeding gap for both inners and outers. This eliminates the 10 mm gap switching from outers to inners. However, cartons that are post-sealed still experience problems and solutions should be discussed with the sealing machine manufacturer.
- Usage of glue types with a higher drying temperature can significantly improve flap adherence, as the glue dries faster and there is less time for the flap to detach.
- Replacing the nozzle size (from 0.5 to 0.7 mm) and increasing the nozzle module number from 4 nozzles (2 dual nozzles) to 6 nozzles

(individual nozzles). This reduces the spray angle and thus improves the accuracy of the glue application. However, initial investments for these changes can be high and many packhouses are achieving satisfactory results using the previous recommendations.

Bulging

Bulging and 'round' cartons are currently a problem seen on packed pallet stacks. This problem is seen predominately on the larger-sized fruit counts, and packhouses are urged to **set their sizers to grade the correct fruit size.**

Packhouses are also encouraged to treat the cartons well. Many packers **will deliberately bulge out the outer component** to easily fit it over the packed inner. **This must be avoided.** Additionally, checks must be done when assembling the cartons to ensure that the cartons are not damaged.

Export cartons are currently manufactured with Virgin liners and Semi-chemical fluting, as specified in the Packaging Material Specifications and Palletisation Protocols document of the Packaging Working Group. If excessive bulging is seen, first ensure that the sizing of the fruit is correct. When creasing or tearing of the cartons is seen, the packhouse should contact their carton manufacturer. Packhouses are free to use any carton paper configuration they want, but only cartons made with Virgin liners and Semi-chemical fluting in a set configuration have **currently been proven** to withstand the citrus export chain.

Closed vent holes

It is vitally important that all the ventilation holes are open. Figure 1 is an example of ventilation holes not stripped. Packhouses should contact their manufacturer for them to check their equipment as the cutting die that cuts the holes may need to be serviced or replaced. It is also the packhouse's responsibility to ensure that the holes are stripped. **This is necessary for market access and is a non-negotiable practice.**

An additional problem is **poor alignment of vent holes** when the flaps are glued. Attention should be given to the assembling practice. Skew flaps lead to poor air flow and may be compromising the



strength of the carton walls due to incorrect alignment.

high rainfall and high humidity, so drying times could be much longer.



Figure 1: Blocked vent holes and cut-outs

Corner pieces

Corner pieces are crucial to maintain the integrity of the pallet stack. There are many cases seen where the corner pieces are no longer straight, but bent and buckled along the edge of the pallet stack (Figure 2). There are several possible reasons for this to occur and all should be checked at the packhouse and with the manufacturer:

1. Corner pieces do not comply with the Packaging Material Specifications and/or are manufactured with 100% recycled paper. **Recycled paper absorbs water** and thus does not maintain its integrity.
2. Cartons are not stacked neatly and corner pieces are forced around an untidy stack. **Cartons should be neat and straight** before the corner pieces are strapped on.
3. Corner pieces are not fully cured. Corner pieces need **5 days** from manufacture to **cure and dry completely**. Packhouses must order their corner pieces slightly in advance and store them out of their packaging to be properly dry before use. In many parts of the country there has been

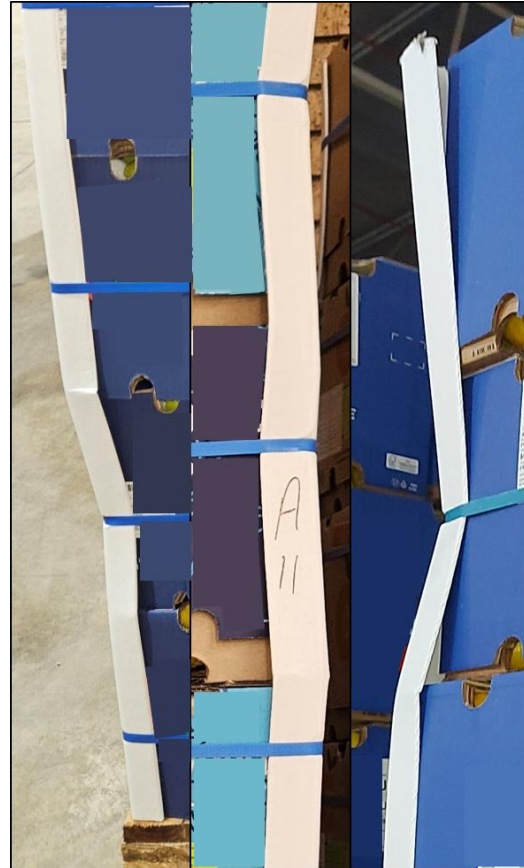


Figure 2: Bent and buckled corner pieces

Cold stores

It is well known that our cold stores currently struggle to cope with the volume of fruit that it must put through. Many packhouses are concerned about pallets being incorrectly stored and **possibly accumulating condensation on the cartons**. If a carton accumulates free water, the integrity of the paper will be reduced. This has been seen in **other fruit industries** where **no change to the packaging has been made**. Where possible, packhouses and other role players are encouraged to check up on their pallets and randomly placed temperature trackers can assist with this. The standard specifications for citrus cartons have been tested to withstand high humidity situations so if it is found that the cold stores are handling the cartons well but they are degrading, the composition materials of the carton must be checked with the manufacturer.



Packing material is an expensive component of the packaging of citrus and **cutting corners will not benefit individual packhouses or the southern African citrus industry** in the long run. Packaging material that is outside of the current recommended specifications can be used, but constitutes an agreement between packhouse and manufacturer, and at this stage CRI is unable to assist if any structural problems occur.

For enquiries, please contact Dawid Groenewald (dawid@cri.co.za) or Tarl Berry (tarl@sun.ac.za) or your local area extension officer.



A15C-S2 Karton, Verpakking en Palettisering 2023

Catherine Savage, Dawid Groenewald and Tarl Berry
Citrus Research International (CRI)

Die nuwe A15C-S2-karton is nou die enigste teleskopiese karton waarin sitrusvrugte na EU-markte gestuur kan word (sedert Januarie 2022). Hierdie verandering aan die ventilasie is ingestel na 'n uitgebreide studie in 2021, wat aangedui het dat die S2-karton die voorkoms van warm kolle in verkoelde houers aansienlik verminder het (sien Cutting Edge 333 vir meer besonderhede). Verwys na Cutting Edge No 364 vir inligting met betrekking tot gebruik van verpakking onder die FMS (2023).

Sedert die bekendstelling van die nuwe karton, is **baie van die probleme met hierdie karton 'n sameloop van omstandighede (bv. langer kouekettings) en nie as gevolg van die ontwerp van die karton nie.**

Lym

Gedurende die 2022-seisoen het baie pakhuisse aanvanklik uitdagings met die lym van die kartonne waargeneem. Verslae dui egter daarop dat hierdie probleme grootliks opgelos is. **Die volgende praktyke is verder aanbeveel om die lym werkverrigting van die A15C-S2 te verbeter.**

- Nouer monitering van die lymproses het die belangrikste resultate opgelewer. Dit behels die konsekwente monitering/aanpassing van die spuitpunte tydens lopies.
- Dit word aanbeveel dat pakhuisse die voergaping van die monteermasjien vir beide binnestukke en buitestukke minimaliseer. Dit elimineer die 10 mm-oorskakeling van die gaping tussen buitestukke en binnestukke. Kartonne wat na verpakking gelym word, veroorsaak egter steeds probleme en oplossings moet met die vervaardiger van die seëlmasjien bespreek word.
- Gebruik van lymtipes met 'n hoër settemperatuur kan hegting van die flappe aansienlik verbeter, aangesien die lym vinniger droog word en daar minder tyd is vir die flappe om los te kom.
- Die vervanging van die spuitstuk-grootte (van 0,5 tot 0,7 mm) en die verhoging van die spuitstukeenheid nommer van 4 spuitstukke (2 dubbele spuitstukke) na 6 spuitstukke

(individuele spuitstukke). Dit verminder die spuithoek en verbeter dus die akkuraatheid van die lym toediening. Aanvanklik kan die kostes vir hierdie veranderinge hoog wees en baie pakhuisse behaal goeie resultate deur die bogenoemde aanbevelings te volg.

Uitbuiging (bulging)

Uitbuiging en “ronde” kartonne is tans 'n probleem wat op voltooide palette gesien word. Hierdie probleem word hoofsaaklik by die groter vrugtellings gesien en pakhuisse word versoek om hul groottegradeerders in te stel om die korrekte vruggrootte te gradeer.

Pakhuisse word ook aangemoedig om die kartonne versigtig te hanteer. Baie pakkers sal **doelbewus die buitestukke ooprek om dit maklik oor die gepakte binnestuk te pas. Dit moet vermy word.** Daarbenewens moet die opmaak van die kartonne deeglik gemonitor word om te verseker dat die kartonne nie beskadig word nie.

Uitvoerkartonne word tans vervaardig met “Virgin liners” en “Semi-chemical fluting” soos gespesifiseer in die “Verpakkingsmateriaal Spesifikasies en Palettiserings Protokolle” dokument van die Verpakkingswerkgroep. As oormatige uitbuiging gesien word, maak eers seker dat die grootte van die vrugte korrek is. Wanneer die kartonne knak of skeur, moet die pakhuisse hulle kartonvervaardiger kontak. Pakhuisse is vry om enige papierkombinasie te gebruik, maar daar is tot op hede bewys dat slegs kartonne wat met “Virgin liners” en “Semi-chemical fluting” met 'n vasgestelde papierkombinasie vervaardig is, werklik suksesvol is.

Geblokte ventilasiegate

Dit is uiters belangrik dat al die ventilasiegate oop is. Figuur 1 is 'n voorbeeld van ventilasiegate wat nie uitgedruk is nie. Pakhuisse moet hul vervaardiger kontak sodat hulle hul toerusting nagaan aangesien die snyblokke wat die gate sny dalk gediens of vervang moet word. Dit is ook die pakhuis se verantwoordelikheid om te verseker dat die gate oop/uitgedruk is. **Oop ventilasie gate is nodig vir marktoegang en dis nie onderhandelbaar nie.**

'n Bykomende probleem is swak belyning van ventilasie gate wanneer die flappe gelym word. Aandag moet gegee word aan die moniteringsproses. Skewe flappe lei tot swak lugvloei en kan die sterkte van die kartonne benadeel.

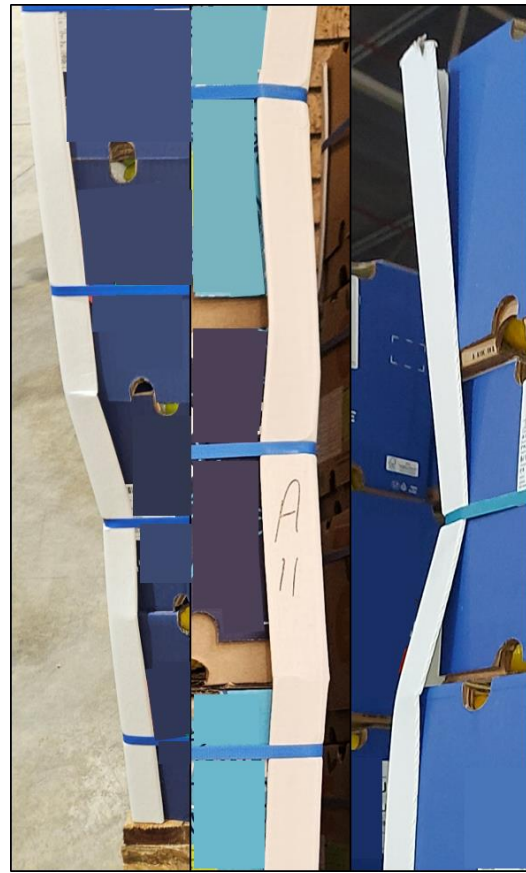


Figuur 1: Ventilasiëgate wat nie uitgedruk is nie

Hoekstukke

Hoekstukke is van kardinale belang om die integriteit van die voltooide palet te handhaaf. Daar is baie gevalle waar die hoekstukke nie meer reguit is nie, maar om die hoeke van die palet gebuig is (Figuur 2). Daar is verskeie moontlike redes waarom dit voorkom en al die hoekstukke moet by die pakhuis, saam met die vervaardiger, nagegaan word:

1. Hoekstukke voldoen nie aan die pakmateriaal spesifikasies nie en/of word met 100% herwinde papier vervaardig. **Herwinde papier absorbeer water** en behou dus nie sy integriteit nie.
2. Kartonne word nie netjies gepalettiseer nie en hoekstukke word om 'n slordige palet forseer. Kartonne moet **netjies en reguit wees** voordat die hoekstukke opgesit en met plastiese bande vasgemaak word.
3. Hoekstukke is nie heeltemal uitgedroog nie. Hoekstukke benodig **5 dae** vanaf vervaardiging om heeltemal te set en droog te word. Pakhuise moet hul hoekstukke vroegtydig bestel en buite hul verpakking stoor om behoorlik droog te wees voor gebruik. In baie dele van die land was daar hoë reënval en hoë humiditeit, dus kan droogtye baie langer wees.



Figuur 2: Gebuigde en swak hoekstukke

Koelkamers

Dit is welbekend dat ons koelkamers tans sukkel om die huidige volume vrugte te hanteer. Baie pakhuis is bekommerd oor palette wat verkeerd gestoor word **en moontlik kondensasie op die kartonne veroorsaak**. As 'n karton die hoë vog absorbeer, sal die integriteit van die papier verminder word. Dit word **gesien in ander vrugtebedrywe waar geen verandering aan die verpakking gemaak is nie**. Waar moontlik, word pakhuis en ander rolspelers aangemoedig om hul palette na te gaan en geplaasde temperatuurmonitors kan hiermee help. Die standaard spesifikasies vir sitruskartonne is getoets om hoë-humiditeit situasies te weerstaan. As daar gevind word dat die koelkamers die kartonne goed hanteer, maar die kartonne is swak, moet die papierkombinasie van die karton met die vervaardiger nagegaan word.

Pakmateriaal is 'n duur komponent in die verpakking van sitrus. Om kortpad te vat, sal op die lang termyn, nie die individuele pakhuis of die suider-Afrikaanse sitrusbedryf bevoordeel nie. Verpakkingsmateriaal wat buite die aanbevole spesifikasies is, kan gebruik word, maar dit



word gedoen op eie risiko. Op hierdie stadium is CRI nie in staat om te help indien enige strukturele probleme voorkom nie.

Vir navrae, kontak asseblief vir Dawid Groenewald (dawid@cri.co.za) of Tarl Berry (tarl@sun.ac.za) of jou plaaslike areavorligter.