Citrus Packhouse

Module 9: Logistics

Learner Guide

P.O. Box 461, Hillcrest, 3650
(031) 765-3410

1st edition 2022

The content of this module is based on audio-visual material produced by the Citrus Academy.

Scripted by:
Jacomien de Klerk

Visual material production:
Sagritex (Pty) Ltd

Additional information sources:
Citrus Research International

Project coordinator:
Citrus Academy (Jacomien de Klerk)

Produced by

In collaboration with

With the support of

Contents

Introduction

The success of the citrus industry in southern Africa depends on reliable and efficient logistics. About 75% of the citrus produced in South Africa is exported as fresh fruit, generating 95% of the industry's income.

About half of the citrus exported from South Africa goes through the Durban port, with the rest distributed between Cape Town in the Western Cape, and Gqeberha and Ngqura in the Eastern Cape. From these ports, citrus fruit is shipped to more than thirty-five ports of destination across the globe. The ports of destination, to where the most citrus is shipped from southern Africa, are Rotterdam in the Netherlands, London Gateway in England, St Petersburg in Russia, Jebel Ali in the United Arab Emirates, and Shanghai in China.

The Citrus Growers' Association of Southern Africa

The Citrus Growers' Association of Southern Africa is funded by the citrus growers of South Africa, Zimbabwe and Eswatini. It plays a very important role in securing and retaining access to foreign markets for fruit from southern Africa. It represents citrus growers in trade negotiations with importing countries and undertakes research to support these negotiations.

The CGA also assist on a high level with logistics development, engaging stakeholders all along the logistics chain. The strategy around logistics development is adapted to the current situation and concerns of growers. It involves enabling greater use of rail transport, increasing port efficiency, investigating and enabling the use of alternative loading ports, monitoring the availability of cold storage infrastructure, and supporting the development of logistics IT and information systems.

Shipping Methods

Before we look at the chain of events that moves citrus fruit from Letsitele to London, or from the Sunday's River to Singapore, we need to understand the two methods used for shipping citrus to overseas markets.

The first method, which has been used for the longest time and is therefore known as conventional shipping, makes use of specialised reefer, or refrigeration, ships. Reefer ships have open decks into which loose pallets are loaded. Once they are closed, the deck chambers are cooled. The temperature and relative humidity in the chambers are monitored throughout the journey. This method is sometimes incorrectly called break-bulk shipping.

The second method is containerised shipping, which is the most popular mode of shipping for a wide variety of consumer goods. Since the beginning of the century, there has been a steady rise in shipping fresh fruit in containers. Containers have the benefit of being refrigerated individually, which means fruit inside them cools down faster, and the cold chain is maintained. They are also easier to handle at the port than loose goods, which results in lower port handling fees. In 2021, about 90% of the citrus fruit from southern Africa was exported in containers.

The Logistics Chain

The term "citrus value chain", also sometimes referred to as the "supply chain", means the entire chain of events from farm to the consumer's plate, including the primary production, packing and shipping of the fruit. In this module, we use the term "logistics chain" to refer to

the section of the value chain that takes the fruit from the packhouse door to the consumer's plate.

To move neatly packed, stacked and secured citrus fruit from the packhouse to the overseas consumer requires a long chain of events with many role players and moving parts. The logistics chain for one consignment of fruit can look very different from that for another consignment. It depends on where the fruit comes from, whether it will be shipped in reefer ships or containers, and to which market and what customer the fruit is heading. It is important to understand all the logistics chains for the fruit that is exported from your packhouse, and to be familiar with the events and role players involved in each link in the chains. The specifics of the logistics chain play an important role in how fruit is handled, packed, and palletised in the packhouse.

By way of illustration, this is a fairly typical – if highly simplified – logistics chain for fruit coming from an inland packhouse in South Africa: from the packhouse, fruit is transported by truck to a cold store, where fruit is consolidated into consignments for customers, loaded into refrigerated containers and then turned in to the port, where it is loaded on a ship. The ship then sails to the port of destination, where the pallets are unloaded and transported to where the fruit is sold to the consumer.

There are many possible variations on this simplified illustration. For instance, pallets of fruit can be transported on tautliner trucks, or the pallets can already be loaded into containers at the packhouse. The cold store can be inland or close to the harbour. Pallets can be taken directly to the fresh produce terminal to be cooled in holding rooms. They can also be off-loaded at a cold store, where they are cooled before being loaded into containers. Fruit can be transported from the cold store by rail or truck. Pallets can be loaded on reefer ships, or they can be shipped in containers on container vessels. Once the fruit lands in the port of destination, there are many paths it can follow to the consumer's plate.

The Cold Chain

The cold chain refers to the section of the logistics chain from the point where fruit is cooled and remains under cooling until it reaches the customer. More precisely, the cold chain can be defined as the handling of citrus fruit through various stages of storage and transport under uninterrupted conditions at the optimum temperature and relative humidity.

Citrus fruit is cooled to slow its metabolism, to maintain its quality and shelf-life, to delay the onset of postharvest diseases, and as part of control measures for certain pests and diseases for some markets. Fruit should be cooled as soon as possible after being harvested, but once it is cooled, the cold chain must not be interrupted. This is critical, because if the fruit warms up again after being cooled, the rate of respiration increases, and the fruit deteriorates faster. It is better for fruit to rather enter the cold chain a little later, than for the cold chain to be interrupted.

However, certain types of citrus fruit are also vulnerable to cold damage when exposed to low temperatures for too long. Therefore, it is important to know the cooling regimes for the fruit packed at your packhouse. The cooling regime describes the optimum temperature and relative humidity conditions for each fruit type. The regimes result from intensive research and from bilateral agreements with importing countries, and they change from time to time.

Road Transport

The citrus industry is dependent on road transport for moving fruit from packhouses in citrus production regions to the ports. In some cases, fruit is also transported by road from

orchards to the packhouse after harvest. Road transport is a critical link in the logistics chain, and when there are disruptions during the citrus season, it causes major difficulty and even financial loss for the industry.

Disruptions are mostly due to factors outside the industry's control, such as infrastructure break-down, unrest or strikes in the transport sector, and there is not much individual growers or packhouses can do about such circumstances. The CGA, on behalf of citrus growers, engages various stakeholders when such circumstances occur, and assists with resolving the issues and normalising the situation as soon as possible.

Factors under the control of the grower and packhouse that can make a significant impact on the efficiency of road transport, include selecting a reputable transport provider with the necessary track record and capacity to provide an uninterrupted, quality service, ensuring that everyone involved is aware of the protocols for transporting the fruit safely, and ensuring that trucks are loaded properly at the packhouse.

Pallets of fruit bound for reefer vessel shipping are usually transported under ambient conditions on tautliner trucks. The consignment of pallets is consolidated in the dispatch area ready for loading. Before they are loaded, every second pallet can be wrapped in plastic sheeting. This helps to prevent chafing between cartons.

Trucks often travel long distances to the harbour, over roads that may not be in the best condition, and possibly through difficult weather conditions. The driver may have to brake sharply or take some other action that can cause the pallets to shift and even fall over. To prevent damage to the cartons and fruit, the load must be spread evenly over the truck axles, the pallets must be secured properly, and dunnage bags should be used if it is not a full load. After loading is complete, the truck sides are covered with canvas curtains to protect the pallets. The curtains must be tied down properly.

It is important that the packhouse logistics manager oversees truck loading. The logistics manager is responsible for the state in which the consignment arrives at its destination, and truck loading should never be left to the forklift operator and truck driver alone. Only once the logistics manager is satisfied with the loading, should the truck be allowed to leave the packhouse.

For pallets shipped in containers there are several options. Pallets can be loaded in containers at the packhouse, where they can either be pre-cooled before being loaded or loaded at ambient temperature and cooled inside the container while being transported. Alternatively, they can be transported to a cold store where they will be pre-cooled before being loaded.

A PPECB inspector is present while each container is loaded, to ensure the cold chain is maintained and the container integrity is compliant with best practice, and seals the container. If it was loaded at the packhouse or cold store, the container is transported by truck to the export terminal. While the container is being transported, it is plugged in and the fruit is cooled. As soon as the container is off-loaded at the port, it is plugged in again to maintain the cold chain.

Cold Stores

Traditionally, in the time before the growth in containerised shipping, all cold stores were in close proximity to the port. But now that containers are used for the bulk of citrus exports, it is more practical and sensible to locate cold stores closer to production areas or in areas outside the congestion around ports. Cold stores are privately-owned facilities which provide a service to the industry, by way of pre-cooling, cold storage, and container loading.

Typically, consignments of fruit are transported to cold stores in tautliner trucks. The fruit is pre-cooled, then stored under cooling at the cold store, until being dispatched to overseas markets. After being loaded, the containers are transported to the port, also by road. Many cold stores have plans in place to develop rail transport for taking containers to the port, which will do much to alleviate pressure on the road system.

Port Services

All seven ports in South Africa are key national assets, owned by Transnet. The Transnet National Port Authority (TNPA) provides the main port infrastructure, including vessel tracking, harbour pilot, tug boat, pollution control, fire and rescue, and berthing services. Transnet Port Terminals (TPT) operates the container and multi-purpose vessel terminals in each port.

Container ships can berth at the container terminal or at the multi-purpose terminal, while specialised reefer vessels berth at general cargo quays which are leased by private companies from TNPA. In Durban, FPT and MFT lease quays where they have fruit port terminals and where specialised reefer vessels are loaded. Both companies have quayside cold stores to receive and consolidate cargo, and load containers, and from where they also load specialised reefer vessels. FPT also leases terminals in Cape Town and Gqeberha, where they can load specialised reefer vessels.

Loaded containers are turned in to the port terminal where container ships berth. This is called the export stacks. The stack for a vessel opens three days before the vessel arrives, to allow cargo to accumulate before its arrival. The containers are plugged in while they are in the stacks to maintain the cold chain, and monitored four times a day to ensure they are functioning.

The export terminal is a customs-controlled area. Containers may not be removed from the port without a SARS customs release. The terminal operator charges a terminal handling charge, or THC, for moving the containers off the trucks, into the stacks, and onto the vessel.

Shipping

These are the major shipping routes from South Africa. There are slight variations and refinements on this simplified illustration. For instance, ships leaving Durban and sailing up the east coast of Africa will often stop at other ports along the coast as well, enabling exports to the rest of Africa. But the illustration shows clearly how South African citrus fruit is distributed around the world.

There are several shipping lines that serve South Africa. The choice of shipping line is often limited by practicalities, such as availability, the routes serviced by the line, and the types of vessels favoured by the shipping line. Costs also play a major role in this decision, although it is a highly competitive market, particular in terms of container shipping.

Logistics Documentation

Exporting fresh citrus requires thorough planning and attention to detail for every consignment. This is especially true for export documentation. If documents are missing, incomplete or incorrect, the consignment will definitely be delayed, compromising fruit quality, and may even be rejected. This can easily be avoided by knowing what is required and paying attention to the detail.

Some of the documents are the responsibility of the grower or the packhouse, some the export agent, some the logistics agent, and some the shipping line, but all play a vital role in the export process. Ultimately, it is the grower that stands to lose the most if there are delays or rejections due to documentation issues.

Export documentation requirements also change from time to time, and it is important to stay on top of the latest developments. Typically, the documentation required includes:

- Export Certificate
- Export Addendum
- Phytosanitary Certificate
- Customs Invoice
- Loading Instruction
- Export Notification
- Booking Confirmation
- Certificate of Origin
- Customs Declaration
- SARS SAD500, SAD507
- Cargo Dues Order
- Packing List
- Sea Waybill

Conclusion

Understanding the links in the logistics chain and, particularly, the cold chain for the fruit packed in your packhouse, is critical to successfully exporting citrus fruit and getting the best returns. There is much more to be said about the export supply chain, and we strongly recommend that you look at the Citrus Export Supply Chain short course, available from the Citrus Academy. We further recommend that you download and consult the Export Manual for the South African Fruit Industry, which is produced by the Fresh Produce Exporters' Forum.

Citrus Research International's Postharvest Technical Forum and Packaging Working Group is another handy source of information and advice on the requirements for citrus exports, and in particular about cold chain management.

We have now come to end of this series on Citrus Packhouses. We hope that you enjoyed learning more about citrus packhouse and postharvest supply chain operations, and that you found value in it. To learn more, please visit the Citrus Academy website, at citrusacademy.org.za. For useful resources, please visit the Citrus Resource Warehouse, at crw.org.za, where you will also find the Citrus Packhouse Best Practice Handbook.