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Citrus Orchard Foreman Occupational Learning

Work Scenario Guide

A8: Logistics

Qualification:	110667 – Occupational Certificate: Orchard and Vineyard Foreman
Work Scenario:	A8: Logistics
Learning Area:	A: Take part in the business management of the farming operation
Scenario Description:	Your fruit needs to travel long distances, often across oceans, via multiple forms of transportation, to get from your farm to the customer. To ensure that this happens smoothly, you need to work with management to plan and coordinate these logistics.

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Contents

Alignment Information	4
Qualification	4
Modules	4
Learning Outcomes	5
Chapter 1 Logistics Basics	6
1. Introduction	6
2. Distribution Channels	6
3. Modes of Transport	7
3.1. Road	7
3.2. Rail	7
3.3. Sea	7
3.4. Air	8
4. Export Fruit Logistics	8
5. Domestic Fruit Logistics	8
6. Cooperative Distribution	8
7. Distribution Channel Budget	9
8. Distribution Contracts	9
9. Monitoring Distribution Channels	10
10. Documentation and Compliance	10
11. Traceability	10
12. Sustainability Practices	10
13. Infrastructure Limitations	10
Chapter 2 Supply Chains	12
1. Supply Chains	12
2. The Citrus Supply Chain	12
3. Supply Chain Success	13
4. Selecting Supply Chain Links	13
5. Integrated Supply Chain Management	14
6. The Cold Chain	14

Alignment Information

Qualification

The content of this learner guide is aligned to the following occupational qualification:

SAQA QUAL ID	Qualification Title			
110667	Occupational Certificate: Orchard and Vineyard Foreman			
Originator				
Development Quality Partner – AgriSETA				
Primary Or Delegated Quality Assurance Functionary			NQF Sub-Framework	
-			OQSF - Occupational Qualifications Sub-Framework	
QUALIFICATION TYPE		FIELD		SUBFIELD
Occupational Certificate		Field 01 - Agriculture and Nature Conservation		Primary Agriculture
Abet Band	Minimum Credits	Pre-2009 NQF Level	NQF Level	Qual Class
Undefined	147	Not Applicable	NQF Level 04	Regular-ELOAC

Modules

The content of this learner guide is aligned to the following modules of the occupational qualification above.

Module Code	Module Title	Level	Credits
Knowledge Modules			
611202-001-00-KM-01	Plant Structure and Physiology	4	5
611202-001-00-KM-02	Vineyard or Orchard Establishment	3	2
611202-001-00-KM-03	Vineyard or Orchard Manipulation Processes	3	8
611202-001-00-KM-04	Harvesting	3	4
611202-001-00-KM-05	Basic Principles of Plant Nutrition	4	4
611202-001-00-KM-06	Crop Protection	3	3
611202-001-00-KM-07	Assets in Horticultural Production	3	2
611202-001-00-KM-08	Farm Business Management and Farming Process Management	4	8
611202-001-00-KM-09	Human Resource Management and Processes	4	8
611202-001-00-KM-10	Overseeing Farming Resource Utilisation	4	8
Practical Skill Modules			
611202-001-00-PM-01	Organise, Allocate and Monitor Availability and Productive Use of Resources	4	5
611202-001-00-PM-2a	Set Team and Individual Performance Goals to Enhancing Team Performance	4	10
611202-001-00-PM-2b	Control Vineyard or Orchard Practices	4	10

611202-001-00-PM-03	Supply Accurate Daily Orchard or Vineyard and Production Information	4	10
Work Experience Modules			
611202-001-00-WM-01	Vineyard or Orchard Resource Optimisation	4	20
611202-001-00-WM-02	Skilled and Motivated Work Team Output	4	20
611202-001-00-WM-03	Daily Orchard or Vineyard and Production Information Availability	4	20

Learning Outcomes

The content of this learner guide is aligned to the following learning outcomes of the modules above.

Knowledge Topics	
Outcome Code	Module Title
KM-10-KT06	Logistics
IAC0601	Logistics are defined
IAC0602	The role of logistics in food production is outlined
IAC0603	The process of determining the logistics required is described and applied to specific situations
IAC0604	The continuous assessment of logistical effectiveness is discussed
IAC0605	The importance of responsiveness and accessibility is explained
IAC0606	The movement of labour is described in terms of its impact on logistics
IAC0607	The movement of product is described in terms of its impact on logistics
IAC0608	The movement of machinery is described in terms of its impact on logistics
IAC0609	The movement of consumables is described in terms of its impact on logistics
IAC0610	The movement of transport is described in terms of its impact on logistics
IAC0611	The impact of the availability of resources is explained
IAC0612	The impact of resources allocation to maximise production is described
IAC0613	The importance of the identification of required machines and estimation of consumable on logistical planning is discussed
IAC0614	The effect of bottlenecks and other constraints are described, and possible corrective actions are named
IAC0615	The importance of correct stock levels and availability on production processes are explained
Practical Skills	
PM-01-PS06	Determine the effect of the market requirements on production practices and planning
PA0602	Describe the packaging, promotions, logistics, distribution planned and the deviations

Chapter 1

Logistics Basics

learning outcomes

The content of this chapter is aimed at helping you to:

- Describe the basic principles of logistics.
- Select a distribution channel and mode of transportation for your fruit.

1. Introduction

definition

Logistics

Logistics can be defined a few different ways depending on context, but when we discuss logistics in terms of citrus farming, we are referring to the activities involved in transporting your fruit to your customers.

Logistics is an important part of managing a citrus operation, because understanding logistics is the only way to make sure that your fruit reaches the customer in the best condition possible. The logistics of citrus fruit involves many different activities that need to be carefully managed and coordinated, and each stage of the process needs careful planning to maintain the quality and freshness of your fruit.

2. Distribution Channels

definition

Distribution Channels

For fresh citrus specifically, the distribution channel refers to the way and means by which fruit is moved from the packhouse to the market.

Your choice of distribution channel will depend on where the market is located in relation to the packhouse, and on the requirements of the market. Commonly used distribution channels include wholesalers, distributors, sales representatives, sales forces and retailers.

As you know from the marketing material, fruit can either be sold on the domestic, processing, or export market. The different requirements of these markets for the manner in which fruit is packed plays an important role in your choice of distribution channel.

Fruit destined for the local wholesale market is usually packed either into jute or plastic packets, usually in 10kg or 5kg units, or into 15kg cartons. Cartons are stacked onto wooden pallets, referred to as palletisation, and transported by road or rail. Packets are either stacked directly into trucks or palletised for the journey to the market.

Export fruit is packed into cartons, most commonly 15kg, with dimensions that are configured for palletisation. Stacked pallets are either loaded onto vehicles or rail trucks, or

into shipping containers at the packhouse. These pallets are then usually sent to a harbour or logistics hub, before being shipped overseas.

Processing fruit is usually transported loose on the back of a truck, since maintaining fruit quality is not especially important, and it would not be cost effective to pack this fruit due to the low returns from selling to the processing market.

As you can now see, there are many different ways in which fresh citrus products leave the packhouse for their journey to the market. Growers, the packhouse, and other farm management will collaborate to decide which markets to serve, and ensure that their packaging is aligned with market requirements and is cost effectively utilised. The grower or packhouse then decide, alone or in consultation with the market agent or exporting company, how the product will be transported to the market.

In the case of exports, decisions also have to be taken about which logistics service provider and shipping company to use. The cost of transporting the product to the markets of choice in good condition depends on the efficiency and capability of the agencies used.

Deciding on which logistics service provider in the distribution channel to use depends on:

- The ability to provide the desired service
- The reputation of the service
- The cost of the service

3. Modes of Transport

As well as selecting a distribution channel, you also need to decide which mode of transport works best for your particular situation. There are a few modes of transport available to you, including road, rail, sea, or air; and each mode has its advantages and challenges.

The decision of which mode of transport to use is based on various factors, such as destination, your location, distribution channel, cost, transit time, and the specific requirements of the fruit. Choosing the right mode of transport and coordinating logistics efficiently helps in minimizing delays and ensuring that your fruit arrives in good time and good quality at the destined market.

3.1. Road

Road transport offers flexibility and accessibility, especially for domestic markets. There can be difficulties involved in South Africa due to badly maintained road networks, or road networks that are still entirely dirt in the rural areas, which may complicate road transport.

3.2. Rail

Before the 1980s, a high proportion of citrus was transported from the interior of the country by rail. Today the situation is very different, with a much higher proportion being transported by road, simply as a result of competitive rates and service delivery requirements driving producer decisions.

Almost all cooperative packhouses and some independently run packhouses are located on rail sidings, in which case rail transport is the logical option. However, in many instances, poor rail services, as a result of unreliable capacity, time delays and uncompetitive tariffs, have resulted in road transport being more attractive.

3.3. Sea

Sea freight is virtually the only transport mode used to convey citrus from South Africa to its various export markets, including African markets other than those with

borders close to South Africa. Sea transport is cost-effective for long distances but can be prohibitively expensive for short journeys, such as to neighbouring countries, where rail or road may be more cost-effective. Sea freight does have its own drawbacks, as there can be holdups and long wait times at badly managed harbours, which can negatively impact the fruit quality.

3.4. Air

On rare occasions air freight is used for exports, but this is usually early in the season of a popular cultivar, for example seedless mandarins, when a producer and his export agent decide to be the first on a poorly supplied market. Under such circumstances, market prices may for a short period of a few days justify the very high cost of air freight.

4. Export Fruit Logistics

Export citrus usually has a long journey to reach its market, often crossing oceans and continents, and thus usually has to use a few different modes of transport. For example, your fruit may have to be picked, transported to your packhouse by trailer or truck, packed and treated, transported by truck to a local depot and then to a port, from there by ship to an overseas port, and from the overseas port to an overseas depot or market, again by truck.

As you can see, this is a complex process, often using multiple different service providers and modes of transport, based in different countries, all of which need to coordinate their movements carefully. It is very important that you work with a reliable export agent or logistics firm to ensure that your fruit is well taken care of, and the transport well-managed by respectable, reliable service providers.

5. Domestic Fruit Logistics

In the case of locally marketed fresh citrus, depending on the quantities of fruit involved, the proximity of rail stations, the location and nature of the market to which the fruit is being sent, and the price quoted, either road or rail is used. Since relatively small volumes of fruit are sent by any single producer to any specific market, road is the most commonly used transport mode.

6. Cooperative Distribution

definition

Citrus Cooperatives

A citrus cooperative is an organisation comprising a number of individual growers as its members.

A cooperative is formed to benefit from cost savings that collective supply and marketing of fruit can achieve. This benefit can take various forms, most of which relate to the increased bargaining power that cooperatives have when dealing with service providers compared to small, individual farmers.

In terms of the logistics and distribution, cooperatives have certain features that make them more or less attractive or suitable to individual growers, and you will have to decide with your farm owners and other management whether joining a cooperative is a good idea for you.

The members of a citrus cooperative usually include a number of individual growers located within a radius of some 50 kilometres from a central packhouse. These growers will often

grow a variety of cultivars under different conditions in different microclimates. As a group, the producers can offer the market sustained volumes of a range of cultivars over an extended period.

The cooperative pack and market their fruit under a shared brand name. To some individual producers, especially larger producers, this arrangement may not be ideal, as the individual identity and the quality of their specific fruit can be lost in the larger identity of the cooperative.

The management of the cooperative negotiates with distribution and logistics service providers on behalf of its members. Armed with the supply volumes of its members, the cooperative is able to negotiate from a position of strength and is usually able to get favourable contracts with export agents and importers.

One factor that can weaken the cooperative's bargaining power is the potential variability of the quality of fruit emanating from its range of producers. All cooperatives have strict quality management systems in place, but uneven quality is an inherent risk in a system where fruit is supplied from many individual producers.

7. Distribution Channel Budget

Most costs associated with the production and packing of citrus are fixed, though there are some variable costs that you, growers and packhouses have some control over, such as agro-chemicals, communications and labour. Aside from these, logistics often provides an area to save significant costs.

Since there are various distribution options and logistics service providers from which to choose, the price of logistics can vary hugely. It is therefore important that you compare prices for the various stages of the distribution chain and use this information to create a distribution channel budget.

The distribution budget serves as the financial part of the distribution and logistics plan and is a useful tool for comparing different options. Logistics agencies or export agents may be able to assist you in 'shopping around' for different distribution channels, modes of transport, or service providers, to get the best deal possible.

While it is always great to save money, it is important that you do not automatically go for the cheapest option, as you want to ensure that your fruit is still treated with care, and that the service providers you are working with are reputable and provide a good service.

As with all parts of citrus production, it is usually best to spend a bit more to get a high-quality service or good that gives you the best returns on your fruit, rather than trying to save money and ending up with damaged fruit that is unfit for sale.

8. Distribution Contracts

Once you have chosen your mode of transport and logistics service provider, it is important for you to create or enter into a contract or service-level agreement. In this agreement, the required service delivery standards should be clearly described, and if there are any problems, the contract will help you deal with them.

The actual service delivery is measured and monitored against this agreement, and payments are made accordingly. To ensure on-going compliance by the service provider, it is important that you monitor the job they are doing closely so that service delivery problems can immediately be brought to the attention of the service provider and appropriate action taken.

9. Monitoring Distribution Channels

As you know, citrus is a perishable product with a limited shelf-life. Once the fruit has been produced, harvested and packed, time and temperature become the crucial parameters determining its quality and condition during and after the transport and distribution process.

You can see from this that the standard of service provided by transport contractors can have a significant effect on the quality and condition of your fruit reaching the market. The best way of measuring the efficiency of transport and distribution contractors is to talk to the markets receiving your fruit at the final destination, and to ensure that the final condition and quality of the fruit they are receiving is where it should be.

If you are unhappy with the service provider's work, you need to either bring it to their attention and insist they improve their service, or switch to another service provider. A few seasons of late or missed shipments are enough to ruin your farm's reputation.

10. Documentation and Compliance

Accurate documentation is crucial in logistics. As we mentioned, your fruit is sometimes travelling through multiple countries, and to keep track of it, it is vital that records and documents are well-kept. This includes maintaining records of harvest dates, packing lists, temperature logs, and transportation details.

Many markets require compliance with stringent regulations to let your fruit in, and recordkeeping is the backbone of this compliance. By implementing digital recordkeeping systems, you can enhance the efficiency and accuracy of documentation, reducing the risk of errors and delays.

11. Traceability

Proper documentation also helps in traceability, enabling quick response to any quality issues or recalls. Traceability refers to systems that allow you to track your fruit, from the supermarket overseas, all the way back to the orchard it was grown in. Traceability is discussed in greater detail in the fruit quality module.

12. Sustainability Practices

Another important consideration of logistics (and farming in general) is sustainability. By incorporating sustainable practices into your logistics, you help reduce the environmental impact of your operations, and enhance the industry's reputation. Developing and promoting these sustainable logistics practices also help in meeting the growing consumer demand for environmentally responsible products.

These sustainable practices include:

- Optimizing transportation routes
- Reducing packaging waste and using eco-friendly packaging
- Using renewable energy sources

13. Infrastructure Limitations

Unfortunately, in South Africa, our infrastructure (roads, rails, facilities, etc.) are sometimes in poor condition. Potholes, dirt roads, lack of cold storage facilities, poorly managed harbours, and a variety of other infra-structure related issues can complicate the logistics process.

If possible, your farm and others in the area may decide to invest in the local infrastructure to enhance logistics efficiency, such as by improving your local roads. Collaborating with

government agencies like the local municipality and private firms who own land in the area to develop and upgrade infrastructure helps in overcoming these challenges.

summary

Chapter 1 – Logistics Basics

- For citrus, distribution channels refer to how citrus is moved from packhouse to market.
- The choice of distribution channel depends on the market location and the requirements of the market, particularly with regard to packaging.
- Logistics service providers and shipping agents are used to distribute export fruit. The choice of service and service provider depends on the ability to deliver the desired service, the reputation of the service and provider, and the cost of the service.
- The choice of transport mode is made mainly on the grounds of cost, but also on the grounds of practicality, reliability, reputation, and the general standard of service delivery.
- Various modes of transport such as road transport, rail transport and shipping, are used for different legs of the distribution channel.
- A cooperative is an organisation that comprises a number of individual growers.
- The advantages of cooperative marketing and distribution include increased bargaining power because of larger volumes and the ability to supply the market with a wider range of cultivars over an extended period.
- A factor that makes cooperatives unattractive to certain growers is the loss of individual branding, while the variability in quality from different growers may weaken the cooperative's quality image.
- Growers and packhouses can exercise control over distribution costs.
- A distribution budget is useful for comparing the costs of various distribution options.
- The performance of service providers is measured against service-level agreements.
- The efficiency of transport and distribution contractors can be measured against the condition of the product on arrival at its destination, and whether the product was delivered within the agreed timeframe.
- Accurate documentation and effective recordkeeping are the backbone of exporting citrus.
- Sustainable logistics practices include optimizing transportation routes, reducing packaging waste and using eco-friendly packaging, and using renewable energy sources.
- South Africa's infrastructure can be in poor condition, but you can sometimes remedy this by improving local infrastructure with other producers or local government.

assessment activities

- ✓ **Activity P1:** Complete this activity to test your knowledge of the basics of logistics.

Chapter 2

Supply Chains

learning outcomes

The content of this chapter is aimed at helping you to:

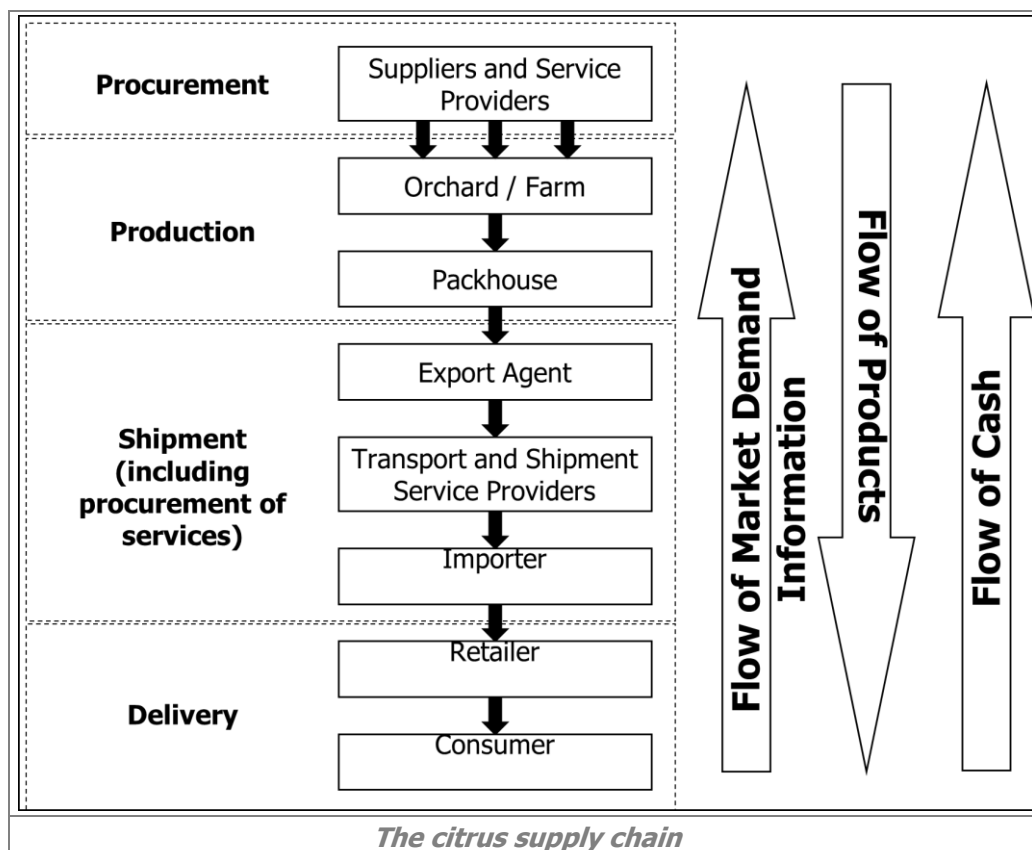
- Describe the components of a supply chain.
- Manage citrus supply chains.

1. Supply Chains

Supply chains exist in production, manufacturing, and service organisations, and they are principally concerned with the flow of products and information between members of the supply chain, usually different firms with different responsibilities and functions.

The citrus supply chain is a series of distinct activities that take place in order to take the product from orchard to market, and can best be thought of as a way of breaking down the logistics process into a series of steps (links in a chain), and combining this with information about cash flow and information. Effective understanding and management of a supply chain is vital to managing a citrus farm properly. Today's information-driven, integrated supply chains can enable you to reduce costs, add product value, extend resources, accelerate time to market, and retain customers.

2. The Citrus Supply Chain



As seen in the image above, the citrus supply chain comprises the following key processes:

- **Orchard to Packhouse** – Production, transport from orchard to packhouse; packing; product inspection; inspection of transport vehicles
- **Packhouse to Depot or Port** – Rail or road transport contractor; monitoring during loading of container, truck, or rail wagon; monitoring during off-loading; documentation; cold store; depot registration
- **Vessel Loading and Shipment** – Vessel and container inspection; calibration and carrying instruction; monitoring during loading; temperature and time protocol management during shipment
- **Distribution to Market** – Discharge (offloading); processing of protocol data; inspection; loading into cold stores at port terminal; loading out of port terminal into inland transport; re-inspection on arrival at retailer or depot; positioning for sale

In citrus the most critical function of the supply chain is to ensure that the quality and safety of the fruit is maintained at all times. This is achieved by maintaining strict transit time and temperature protocols for your specific cultivar. Every link in the supply chain must be conducted reliably and cost effectively.

3. Supply Chain Success

To ensure that fruit quality and safety is maintained, there are a number of critical steps that you can take to ensure success that are relevant to the citrus supply chain. These steps are applicable regardless of which market you send your fruit to, although higher-paying, quality-conscious markets (such as export markets) will carry a greater cost for supply chain failures.

The best ways you can ensure success in the citrus supply chain are:

- Appointing reputable service providers, including (inspectors, transporters, logistics firms, packaging and container suppliers, and shipping agents)
- Keeping detailed fruit quality and logistics records
- Hiring reliable employees, both on-farm and further down the supply chain
- Handling and caring for your fruit properly during production, packing, and loading
- Adhering to time and temperature protocols and industry guidelines
- Supplying reliable, relevant information to every other member of the supply chain

As you know, different export markets have different requirements, and every producer's supply chain will look different. You must therefore keep in mind that the specific steps you need to follow to manage your specific supply chain may differ from those above. To find out what you need to do, talk with the service providers, export agents, other producers in your area, and industry bodies for advice.

4. Selecting Supply Chain Links

We have already discussed the process of selecting a distribution channel and modes of transport, and these decisions will influence, for a large part, the firms and service providers that make up your supply chain. However, it is best that we discuss briefly what to look for in service providers, so that you can build the strongest supply chain possible.

Firstly, supply chain service providers deal with large volumes of fruit supplied by many different growers. Thus, it is generally a good idea to ask more established growers in your area about the specific service providers they work with, and which to avoid. This will give you a good starting point to start selecting providers.

For all service providers, the following factors are generally a good test to decide whether or not they should be worked with:

- Employees with technical qualifications and good product knowledge
- Applicable experience in your area and thorough knowledge of export standards
- Availability during the periods when you need them
- Competency and a good relationship record with other farmers
- High-quality, effective data collection and recordkeeping capabilities
- Good communication
- Professional conduct and impeccable safety record
- Competitive rates
- Fair contract terms

Certain regulatory aspects of the supply chain are assigned by various government departments to certain agencies, such as the Perishable Products Export Control Board (PPECB). These include fruit quality inspections to ensure compliance with the importing country's minimum standards and certification of vessels prior to shipment. For these mandatory services, the PPECB has to be used by law.

5. Integrated Supply Chain Management

Though supply chains are often 'fragmented', in the sense that different links are managed by different service providers, there are companies that provide an integrated supply chain service. If you work with one of these companies, you will be quoted on a full range of logistical services offered by the company and can decide which of these to use.

These integrated supply chain companies can be fantastic, as they can manage all aspects of logistics, from your packhouse all the way to the market. Also, they often already have established relationships with service providers, which can save you a lot of time and money that you would otherwise have spent shopping around yourself.

These firms also offer the benefit of working with retailers so that their demand chain (the reverse of a supply chain) and your supply chain can be 'combined', so that every pallet load can be tracked by both the retailer and you all the way along its route. Further, the best of these companies have high quality information systems, and can supply both you and the retailer purchasing your fruit with accurate, real-time information about your shipments.

After all, both you and the retailer want your fruit to reach its destination on time, in good condition and at the lowest cost. In practice, this can be difficult because of the overwhelming complexity of the business and the inability of individual growers or retailers to coordinate their demand/supply chains effectively. Integrated supply chain management firms can help solve this problem.

6. The Cold Chain

A vital aspect of exporting citrus fruit is that, as well as the journey forming a value chain (see the Enterprise Establishment module) and a supply chain, it is also a cold chain. By this, we mean that export citrus is cooled during transport. This is done to maintain the quality of the fruit, to slow down the ripening process and rate of respiration, and to stop or slow down the development of postharvest diseases.

Once your citrus is cooled, whether that is in pre-cooling facilities at the packhouse or when it reaches the harbour, the cold chain must not be broken. This means that, once cooled, the citrus must not be allowed to become warm again until it reaches its final destination on an

overseas supermarket shelf. Breaking this cold chain is the quickest way of breaking the value chain, and can lead to serious losses and damage to your farm's reputation.

The cold chain is maintained using refrigerated trucks, containers, and storage facilities that are capable of maintaining the required temperature and humidity levels. Regular monitoring and recording of temperature data help in ensuring that the cold chain is not broken.

Good service providers will maintain this cold chain for you, but it is still good practice to monitor the temperature, using thermometers in containers that feed real time data to you throughout the entire journey. Shipping service providers are required to meet the protocol requirements as stipulated in the contracts, and these sensors are used to measure their performance.

summary

Chapter 2 – Supply Chains

- The supply chain consists of procurement (suppliers and service providers), production (farm and packhouse), shipment (export agent, transport and shipment service providers, and importer) and delivery (retailer and supermarket).
- In citrus, the most critical function of the supply chain is to ensure that the quality and safety of the product is maintained at all times.
- The success factors in the supply chain are the appointment of appropriate service providers, fruit quality records, reliable employees, appropriate handling of product, adherence to time and temperature protocols, and reliable, relevant information.
- Integrated supply chain management firms can handle the entire logistics process for you and save you significant amounts of money.
- Ideally, the retailers' demand chain and your supply chain must be integrated so that a pallet load can be tracked by both parties all the way along its route.
- The citrus export process is a cold chain as well as a value and supply chain.
- Fruit is cooled maintain the quality of the fruit.
- Fruit must be kept cool throughout the entire journey, or you can suffer significant losses.

assessment activities

- ✓ **Activity P2:** Complete this activity to test your knowledge of supply chains.
- ✓ **Activity F1:** Complete this activity to test your knowledge of the entire module.