
Preface - Citrus Transportation Forum

Preamble

Before 1996 the activities of the cold chain and logistics was the responsibility of Outspan International. After deregulation there was no responsible body to coordinate these activities. To address the issue of Cold Chain functionalities, the Citrus Cold Chain Forum was established in 2007 and is convened by Hannes Bester of the CRI. During the 2010 CRI and CGA workshops, strong motivation was received by packhouse managers and growers that more emphasis is required in terms of transportation and handling of citrus products after the production and packaging phase. A motion was put forward to investigate issues pertaining to the transportation of citrus on the following levels:

- a. The transportation and handling of High Cube Pallets and the extent of damage to product.
- b. The delay of trucks in the Durban port during peak season.
- c. The resolution of weight limitations when transporting Reefer Containers from inland to port.
- d. The increased utilization of rail transportation by the citrus industry.

It was concluded that the CGA will formulate a 'Citrus Transportation Forum' working alongside the 'Citrus Cold Chain Forum' to investigate and analyse proposals for the resolution of these issues. The aim of this forum is to support pursuit of the global competitiveness of the southern African citrus industry, by enabling optimisation of the Transportation chain through the provision of a platform for coordinating relevant inputs from key affected parties. The functions of this forum are aimed to provide platforms for feedback from and interaction between the forum's membership groups, for technology transfer, for identification of research priorities, to identify activities to be conducted by the forum and its membership groups and to develop a set of guidelines in relation to identified transportation issues. Mitchell Brooke from the Citrus Growers Association will act as convener of the forum and involve key stakeholders for regional work groups and procure consulting firms to formulate study documents with the objective of addressing transport concerns. The forum will act on an open basis and participation is encouraged where a valuable contribution can be made. For inclusion in the below studies and work groups kindly direct an email to mitchell@cga.co.za

Problem Statements

Citrus products constitute four main commodity groups namely, Grapefruit, Lemons, Oranges and Soft Citrus destined for export markets. Citrus is predominantly packed in 15kg and 17kg cartons which are palletized at production point and transported long distances to port by means of road or rail transportation. Citrus is shipped from four key Southern African ports being Cape Town, Port Elizabeth, Durban and Maputo. There are two variations of how citrus is exported and depending on the export mode utilized as to how the fruit is transported before being loaded on a ship. For break-bulk shipping, citrus is transported either by road truck or in rail wagons stacking standard height pallets and transporting to port cold stores where the citrus is loaded break-bulk in ships from a designated fruit terminal. For container shipping, the majority of citrus is stacked as high cube pallets and road trucked to cold stores to be stuffed, or more recently the trend is for containers to be stuffed at packhouse and road trucked or railed direct to container terminals.

1. The transportation and handling of High Cube Pallets and the extent of damage to product.

Until recently the vast majority of citrus was shipped in Specialized Reefer Ships, therefore the trend was to stack cartons to a height not exceeding 2.1m due to the height limitations within the decks of the ships. The development of the integral high cube reefer container has attracted a higher volume of citrus exports where currently 70% of citrus is exported in containers. The high cube container permits cargo to a height of 2.4m being able to be stacked in the container; this permits an extra layer on top of standard height pallets to be loaded. High cube pallets are more frequently being stacked at packhouse and transported to cold stores to be stuffed in containers. Due to the extra weight of the high cube pallet, the pallets are loaded toward the centre of the load bed of a truck trailer so as to comply with the axle weight regulation. The truck loading pattern of high cube pallets has altered the placement of pallets on the load bed and as result the load is not secured to the front load guard. During transportation between packhouse and cold store the load is subjected to immense shifting and forward pressure when hard braking is applied, this creates an environment for the load to become unstable and shift on the load bed. In some cases the load collapses resulting in irreparable damage to the product. When a high cube pallet arrives at a cold store it undergoes numerous stress factors whilst in the storage period due to handling. Moisture develops within the carton whilst in the cold room and thus the integrity of the lower cartons are jeopardized and in most cases causing collapse. Squaring and bruising of fruit have been recorded as a result of this.

Guidelines:

1.1 To investigate the transportation of citrus high cube pallets being transported on road vehicles:

- 1.1.1 Benefit and risk analysis.
- 1.1.2 Insurance clauses.
- 1.1.3 Adoptive methods for load securing.
- 1.1.4 Effect of high cube transportation on carton stability.
- 1.1.5 Conclusion.

Process:

It is proposed to implement this project on a consultative basis where the outcome is received in study format.

1.2 To investigate the handling of citrus high cube pallets being handled at cold store level:

- 1.2.1 Benefit and risk analyses.
- 1.2.2 Cold chain effect on carton stability. (Time frame analyses)
- 1.2.3 Effect of high cube palletization on fruit quality. (Time frame analyses of various carton types)
- 1.2.4 Effect of high cube palletization on cold room racking configuration. (Weight proportions)
- 1.2.5 High cube palletization and the effectiveness of pallet base configuration. (Racking)
- 1.2.6 Arrange for the weighing of high cube pallets of Oranges, Lemons, Grapefruit and Soft Citrus packed in various types of cartons. (Refer CCCF Packaging Guide)
- 1.2.7 Conclusion.

Process:

It is proposed to implement this project on a consultative basis where the outcome is received in study format.

2. The delay of trucks in the Durban port during peak season.

Since deregulation of the citrus industry there has been growth in citrus exports to above 90m cartons, most of the growth in volume has been from the northern citrus producing regions of which is predominantly exported from the Durban port. Durban exports roughly 55% of the citrus export volume compared to 20% through both

Cape Town and Port Elizabeth ports respectively, Maputo exports roughly 5% of citrus volume (2009 season). It has become common place that Durban port experiences severe congestion during peak season, this due to capacity shortages. The effect of congestion in Durban has an effect upstream as road trucks are not able to be off-load timorously and therefore create bottlenecks which take days to clear. The result of the congestion and bottlenecks in the Durban port has a significant impact for the industry, demurrage charges are billed back to the industry as well as creating a shortage of trucks that are able to service the industry at packhouse level. This similarly creates a shortage of trucks on the backhaul that are able to return to packhouses creating a backlog on the packhouse floor. It is estimated that during peak citrus season, approximately 250 – 300 trucks arrive in Durban daily during peak packing days. The arrival and sequencing of truck flows to the port of Durban is not managed on a systematic platform and therefore trucks are tendered to on a first come first serve basis. Trucks that arrive in the Durban port mainly arrive unannounced and proceed directly to the offloading facility where they wait to be serviced. As there are no appropriate facilities and parking areas the trucks are forced to wait on the roadside until they are serviced, there have been instances where trucks wait for 2 – 3 days before being serviced and transporters are being heavily fined. FPT Durban Terminal located in the harbour T-Jetty have in recent years adopted a truck stop facility where trucks are accumulated and serviced on a systematic basis. The basis for this facility is to restrict the arrival of trucks to the terminal preventing backlog and congestion issues at the same time directing trucks to procured facilities other than the terminal. Bottlenecks and congestion occur frequently in the Durban port and affect all citrus facilities ability to service trucks in a timorous manner. It is estimated to cost the industry millions in truck detention costs and has a significant effect on throughput efficiency, fruit quality and cold chain management of citrus products. Transportation costs in Southern Africa are at the highest levels and the inefficiency of truck throughput weights heavily on the industries ability to procure a reduction in transportation costs. Industries across all sectors locally and internationally have adopted a systematic approach to servicing road trucks, this to achieve better facilitation and increase throughput efficiency. Integrated information systems are utilized within the citrus industry from packhouse to cold store level, these systems have the functionality to manage and control truck arrival and consignment linking.

Guidelines:

- 2.1 To investigate and propose a solution for better facilitation of citrus road trucks in the greater Durban region:
 - 2.2.1 Analyse the cause and effect of truck bottlenecks in the Durban port.
 - 2.2.2 Analyse the current scenario of road truck facilitation.
 - 2.2.3 Ascertain the volume of truck arrival per day in the Durban port.
 - 2.2.4 Propose adoptive methods for better truck facilitation – a systematic approach.
 - 2.2.5 Identify the potential for utilization of information system integration. (Paltrack)
 - 2.2.6 Conclusions.

Process:

It is proposed to implement this project on a consultative basis where the outcome is received in study format. A logistics engineering firm will be procured to conduct the project which will be overseen by Paul Hardman and Mitchell Brooke.

3. The resolution of weight limitations when transporting Reefer Containers from inland to port.

There is an increased trend for the stuffing of Integral Reefer Containers at inland cold stores or at packhouse level. PPECB (Perishable Products Export Control Board) have issued a guideline that Reefer Containers are to be coupled to a power source within 6 hours of stuffing of the container at source. In the Eastern and Western Cape regions a large portion of containers are stuffed at inland cold stores located closer to the production areas, in most cases these containers can be transported to port container terminals within the stipulated time

frame. This implies that the need to use Genset¹ trailers are not required where containers can be stuffed and be plugged in at port within this time frame, the use of standard flat deck trailers can be used. When a container is packed further inland where the time frame for a container would exceed the 6 hour duration, there is a requirement for the container to be transported using a Genset trailer to ensure that the container stabilizes the temperature of the product. The Genset trailer has a diesel powered generator fixed to the underside of the flat deck trailer, the unit adds additional weight to the trailer. The combined weight of the Genset trailer and the weight of a Reefer Container fully loaded with certain varieties of citrus; is thought, in most cases to exceed the regulatory 9 tons per axle. Special market programmes require citrus to be pre-cooled in cold rooms at a set point of -0.5°C prior to loading containers and fruit must be maintained at that temperature for a period of the sea voyage. The requirement therefore necessitates that Genset trailers are used when transporting containers packed for special market programmes. This therefore suggests that certain varieties stuffed in containers for special market programmes when using Genset trailers are exceeding the regulatory 9 tons per axle. It has been reported that containers stuffed inland are more frequently being caught at weighbridges; the result is that pallets have to be removed from the container to remain within the required regulatory stipulation.

Guidelines:

3.1 To investigate the weight limitations of Reefer Containers loaded with citrus:

- 3.1.1 Overview of the transportation regulation and axle weight testing process.
- 3.1.2 Overview of the loading capacity of Reefer containers and Genset trailers.
- 3.1.3 Arrange for the weight testing per axle of road vehicles transporting containers stuffed with Oranges, Lemons and Grapefruit packed in A15C and T64 type cartons when loaded on a standard trailer.
- 3.1.4 Arrange for the weight testing per axle of road vehicles transporting containers stuffed with Soft Citrus packed in various display type cartons when loaded on a standard trailer
- 3.1.5 Arrange for the weight testing per axle of road vehicles transporting containers stuffed with Oranges, Lemons and Grapefruit packed in A15C and T64 type cartons when loaded on a Genset trailer.
- 3.1.6 Arrange for the weight testing per axle of road vehicles transporting containers stuffed with Soft Citrus packed in various display type cartons when loaded on a Genset trailer.
- 3.1.7 Conclusions

Process:

It is proposed to implement this project on a consultative basis where the outcome is received in study format.

4. The increased utilization of rail transportation by the citrus industry.

Historically rail was extensively used for the transporting of citrus products from packhouse to port predominantly loaded in 'O' type wagons loaded with break-bulk cargo. Rail utilization has decreased substantially where only 5% of citrus was transported by rail during the 2009 season. There are four main reasons for the decreased use of rail transportation being,

- a. General utilization of rail transportation has decreased in South Africa and in so doing rail has become somewhat inefficient. Citrus rail wagons are delayed beyond an acceptable level in transit and therefore most packhouses have abandoned rail utilization for road transport.
- b. New packhouses and cold storage facilities that have been built in recent years have not taken rail into account and therefore were not built on rail lines. Accessibility to rail is now limited to a small minority of packhouses.
- c. The increase of stacking high cube pallets could not be transported by rail until recently, therefore most citrus is transported by road.
- d. The cost of rail compared to road transport is in most cases higher than road transportation.

¹ A Genset trailer is a range extending device for use with electric refrigerated containers consisting of an internal combustion engine and an electrical generator fixed to the underside of the trailer bed (collectively called a Genset trailer).

- i. Annual rail siding safety audit is costly.
- ii. Insurance costs are higher for rail transport.
- iii. Freight rail rates are more expensive than road transport.

It has been identified that new international developments of rail transportation has offered benefits for global industries. Intermodal transportation has been widely adopted by industries to increase the efficiency and effectiveness of rail transport at the same time reducing the cost of transportation and handling. Intermodal solutions have been adopted within fruit sectors globally and South Africa has adopted a similar approach; although on a very small scale. The Southern African fruit industry has the ability to be the global leaders of intermodal transportation amongst global competition. Global demand for Greener Supply Chains is fast becoming a necessity by international markets. It has been identified that South Africa's vast rail network offers the ability to decrease carbon emissions by utilizing rail transportation. International trends have abandoned branch lines and have adopted intermodal options on main lines to increase efficiency. A similar approach to rail transportation should be the South African approach to rail transportation. It has been identified that high volume citrus production areas are short term strategic areas to increase rail utilization by adopting inland fruit hubs which can be utilized for loading rail on three levels:

- a. Dispersion siding for the stuffing of containers direct at packhouse.
- b. Consolidation point for fruit to be stuffed in containers inland.
- c. Intermodal ambient road to rail containers from packhouse to port cold stores.

(Pre-cooling facilities can be developed at these hubs should the demand dictate such)

More information pertaining to these methods can be found on the cga website www.cga.co.za

Areas where inland rail hubs can be developed for the adoption of the aforementioned methods are:

- a. Polokwane / Tzaneen / Letsitele: inland hub for production areas of Zimbabwe, Northern and Central Limpopo.
- b. Malelane / Komatipoort: inland hub for production areas of Hoedspruit, Central and Eastern Mpumalanga (Lowveld – Nelspruit district, Karino, Malelane and Komatipoort) and Northern Swaziland.
- c. Sunland: inland hub for Sundays River Valley (Eastern Cape)
- d. Eendekuil: inland hub for Citrusdal (Western Cape)

It was proposed that regional rail work groups be established in each of the above regions where growers, packhouse managers, exporters and stakeholders can undertake a viability and feasibility process. The facilitation of these work groups will be convened by the CGA under the CTF (Citrus Transportation Forum).

Guideline:

4.1 Establish rail work groups in each of the identified regions for the implementation of inland fruit hubs:

- 4.1.1 Zimbabwe, Northern and Central Limpopo region.
- 4.1.2 Hoedspruit, Central and Eastern Mpumalanga and Northern Swaziland region.
- 4.1.3 The Sundays River region.
- 4.1.4 The Citrusdal region.

Process:

The CGA will coordinate interested stakeholders with the inclusion of Transnet Freight Rail.

- a. The CGA will meet with TFR in April 2010 to discuss rail issues and obtain commitment to be involved in regional rail work groups.
- b. An invitation will be distributed to the greater citrus industry with the inclusion of rail and road stakeholders.
- c. The CGA will convene the regional intermodal fruit hub viability and feasibility studies to be conducted including benefit and risk assessment.