Additions to short courses

The Citrus Academy is excited to announce the addition of two new short courses in 2023. By Sive Silo

The Citrus Academy has been presenting short courses since 2017 and the courses have garnered a loyal following since then. The courses are held annually in citrus-growing regions, mostly from October to April. The Citrus Production short course was the first to be implemented, and the Export Supply Chain and Packing short courses followed in 2019.

The Citrus Economics short course is a two-day course designed to develop a better understanding of the economics behind citrus production and packing. The course covers the fundamentals and importance of economics, the background of the Southern Africa citrus industry, citrus fruit, value and supply chains, production, packing and logistics costs, profitability per citrus type, and data capturing, analysis and extrapolation.

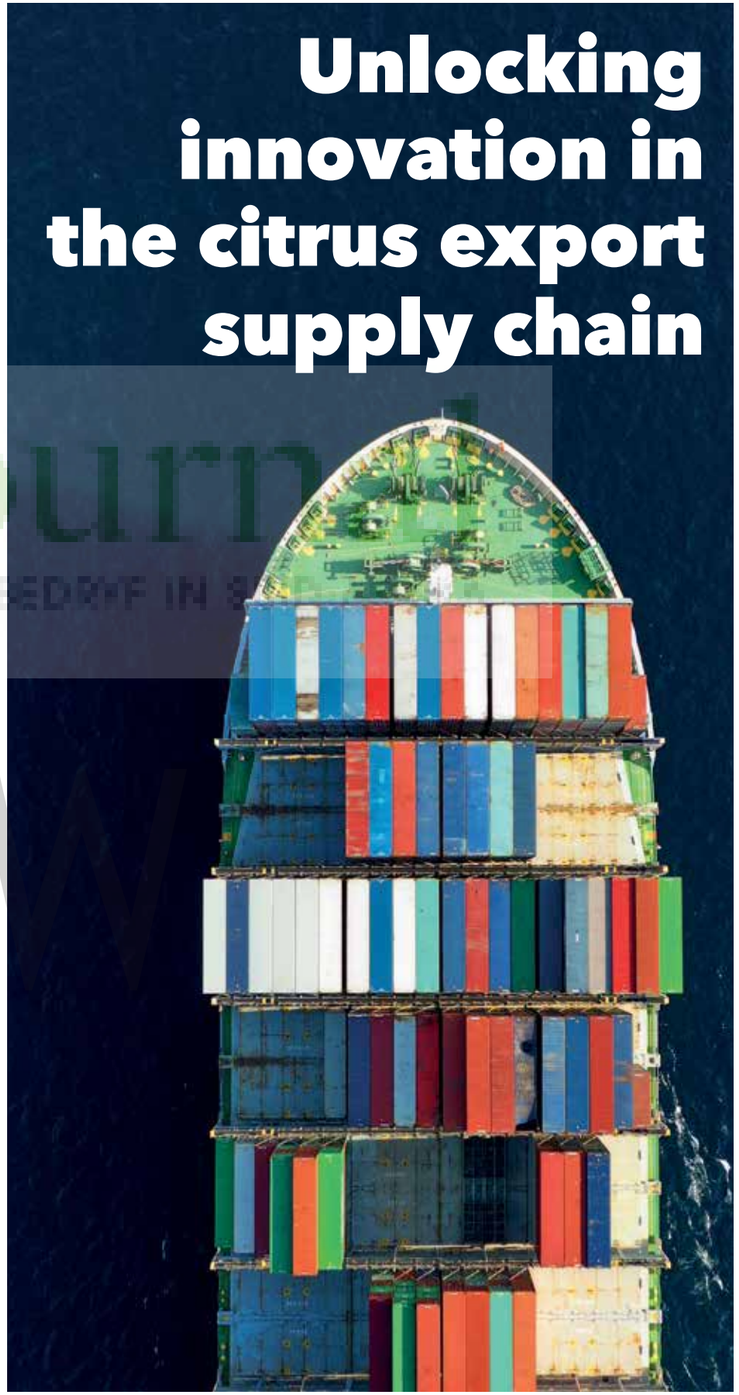
Louis von Broembsen facilitates the Citrus Economics short course. He has been a leading consultant in the citrus industry for many years, and has great insight into the economics of citrus production.

The Citrus Packhouse Quality Control short course provides learners with insight into the packhouse quality control processes, including sanitation, accreditation systems, fruit intake assessments, quality supervision, and quality control points. This course will be of particular benefit for those already working in packhouses, as well as those wishing to gain a better understanding of packhouse quality control processes.

Facilitated by Barry de Klerk, who is experienced in skills development in the citrus industry, this course is an excellent step towards a better understanding of the quality control processes required for taking up the role of quality control officer in a packhouse.

For the course schedule and to register, please visit citrusacademy.org.za/short_courses/.

Unlocking innovation in the citrus export supply chain



During this year's CRI postharvest pre-season workshops, a section was presented on the triple threat, regarding energy. By Mitchell Brooke

Since the exporting of citrus has a dual energy demand between the logistics chain and the cold chain, the demand on energy is very extensive and the relation to the triple threat is that much greater. Let's recap the triple energy threat.

PART 3

The "Importance of unlocking innovation in the citrus export supply chain" three-part series.

In recent years there has been a remarkable increase in innovation at farm and packhouse level.

The first threat that we see in relation to energy is the shift in consumer purchasing trends worldwide. South Africa has a very poor track record when it comes to carbon emissions, in relation to electricity generation. This is because more than 80% of electricity generation comes in the form of coal-fired power stations, as well as liquid fuel turbines used for peak power generation. Consumers are opting more for sustainable produce. And given the general energy emission output in SA, this may pose a threat to local production.

The second threat is that of energy supply. It is a well-documented fact that the South African electricity supply grid is under threat. Harvesting, production and cold storage have been severely affected by load shedding, which has become commonplace in recent years. Unless the national grid stabilises with the introduction of additional generating capacity, load shedding is bound to continue – for some time, at least.

The third energy threat is that of the cost of energy, (featured in the Feb/Mar 2023 edition of the *SA Fruit Journal*), where the cost impact in relation to energy was explored. The prices of diesel fuel, electricity and marine bunker fuel – the three main energy sources – have all shown significant increases in recent years. In the South African context, there is no immediate reprieve in sight with the local price of diesel fuel set to increase by as much as R1 per litre in March 2023 (apart from the annual general 8% increase in government levies). The National Energy Regulator of South Africa (NERSA) has approved an 18% and 12% increase in the cost of electricity for the FY 2023 and FY 2024 respectively. However, the cost of marine bunkers has decreased by as much as 50% during February 2023. The cost of sea freight should be adjusted downwards to account for this. Bearing in mind that the current cost of marine bunkers remains twice the level seen in 2020 and '21.

In summary, there is a fundamental need for the citrus export industry to begin a switch from traditional forms of energy. Where a complete switch is not possible, innovation will be required to ensure more efficient energy use – with more sustainable sources of electricity being paramount.

The need for innovation continues to grow alongside the demand for efficient supply chain management amidst the triple energy threat.

The industry needs seamless transportation of fruit across the globe, whilst maintaining the cold chain. But this presents a threat of energy dependency, which requires on-going innovation for longer-term sustainability. **Table 1** shows the typical supply chain, from harvesting to the sea voyage that transports citrus to international markets. These are the typical supply chain areas where citrus is transferred from one point to another and the general energy requirements in the form of electricity, diesel fuel and marine fuel. In each of the dominant stages energy usage is quite high.

Harvesting and production: In recent years there has been a remarkable increase in innovation at farm and packhouse level. Many farming enterprises have installed alternative energy sources such as solar, wind turbines as well as hydroelectric, advancements like automation and optic sizers on the rise in packhouses. These have all served to radically reduce electricity usage. However, there is a growing need for farming enterprises to adopt more sustainable energy sources by moving away from the dependency of Eskom and fossil fuel energy supplies. Many farming areas can also adopt a centralised approach to the energy supply in a specific area.

Transportation: a study conducted a number of years ago indicated that on average, citrus is transported for a distance of roughly 700 km from production sources to port for export. Some production areas are relatively close to ports (such as Kirkwood, which is a mere 100 km from Coega), whilst others lie in excess of 1 200 km from the closest port. Since a typical truck tractor combination uses roughly 500 ml of fuel every kilometre whist under load, the cost and consumption is therefore relative to the distance that the truck travels. When it comes to road transportation, there needs to be a heightened level of innovation that seeks to find solutions to maximize truck payloads whilst reducing consumption. During the 2022 season, a litre of diesel fuel in SA cost R26 on average. The outlook on the diesel price suggests the price of diesel fuel may not decrease in the short to medium term, compared to the diesel price of sub R15 p/ℓ before 2020. Though the current rail infrastructure in SA casts doubt on the future of this mode of transport, it is believed that rail transportation offers a much more cost effective and sustainable solution for citrus producers. The most valuable and sustainable approach to rail development in the citrus sector is to use rail transport between Gauteng and Durban, or Cape Town. A partnership with the automotive sector that imports components into Durban and Cape Town, for example, is required for a rail service to operate more sustainably and cost effectively. Refrigerated containers could be used to import automotive parts that could be railed to the automotive hub in Gauteng. These containers could then be prepared and used to transport citrus back to the ports for export. The CGA is excited to be working on this project as part of Vision 260.

It's also encouraging that Transnet is well on its way to privatising its ports and rail networks, to kick-start a much-needed transformation in the rail space.

Cold storage: Cold room facilities vary depending on size and functionality. A typical port cold store facility would have a capacity of roughly 5 000 pallet spaces and be equipped with either an ammonia set-up or carbon dioxide. Either way, cold storage facilities use large amounts of energy during maximum loads. Most – if not all – facilities are dependent on a direct Eskom or municipal electricity supply. In terms of electricity consumption, cold storage facilities are potentially a hot topic when it comes to the triple energy threat.

What can be done to reduce this threat in terms of the electricity supply, cost and carbon emissions? Clearly, there is no easy answer. However, there are a number of topics on alternative cooling systems being developed, e.g. the magnetic cooling system that is rumoured to be very energy efficient.

Shipping terminal: In SA the majority of citrus exports take place by way of containers exported through the Transnet container terminals. The terminals operate with a mixed bag of machinery; some use electricity whilst most use diesel engines. If one considers the amount of machines used at a terminal, the energy usage in the form of electricity and diesel fuel must be quite extensive. Another component of terminal operations is the power supplied to the refrigerated containers, whilst stacked awaiting loading onto ships. This can be a mix of electricity supplied by Eskom or from diesel-powered generators. So, overall, the energy usage at the ports container terminals can be considered extensive and should be reviewed to find alternative energy sources, as well as innovative ways to reduce consumption.

Marine sea voyage: Ships that depart from SA transporting citrus to global markets travel very far distances and consume large quantities of marine bunker fuel. Refrigerated containers that are transported on these ships use power supplied by generators that use diesel fuel. The combination does present some very real challenges around how to reduce the triple energy threat. Newer generation refrigerated containers are known to use more sophisticated power units that are more energy efficient. When it comes to marine bunker fuel the only major development has been the International Maritime Organization (IMO), restricting the use of heavy marine fuels to marine fuels that have less SOx content. This development seeks to reduce carbon emissions. Further developments will be introduced in the near future that seek to reduce the speed at which vessels can travel, thus also reducing carbon emissions. Ultimately, there is no short-term solution that will have a massive impact on reducing carbon emissions to more sustainable levels. The most impactful of the triple energy threat in this specific area has been the rising cost of marine bunker fuel, as has been outlined in previous sections.

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In summary, reputedly, there are sufficient grounds to suggest that innovation along the supply chain is a must, to ensure the longer-term sustainability of the citrus export industry. Innovation needs to take into consideration aggressively addressing the triple energy threat (i.e. supply, cost and emissions). Perhaps it's time for an innovation hub to be established within the South African fruit export sector. After all, many challenges are shared throughout the sector.

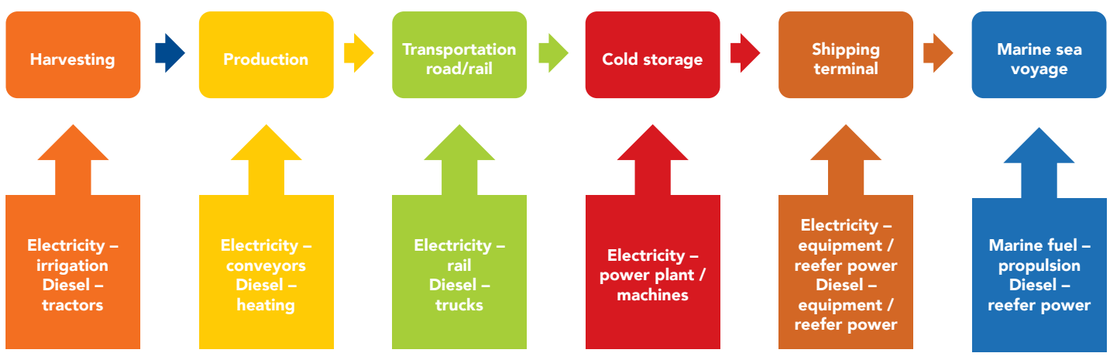

Table 1: Typical citrus export supply chain