

Compliance in shipping grapefruit to South Korea

THE DEMANDS ON TEAM SA

Challenges around grapefruit exports to South Korea feature prominently in the CGA's pursuit of market potential and long-term growth values.

By **Albert Coetzee**

South Korean non-tariff measures (NTMs) incur substantial compliance costs for SA's grapefruit exports. What would a quantitative deep dive show, when seeking to determine the scope of compliance cost linked to these NTMs?

On 1 June 2025, the Citrus Growers' Association (CGA) of Southern Africa appointed Sameera Ebrahim as data and reporting analyst. This reflects the CGA's efforts to create visibility and alignment between all stakeholders in the citrus industry, to navigate the objectives of Vision 260. Largely, these efforts will include predictive modelling to determine issues like market potential and long-term growth values.

In her master's thesis at Stellenbosch University, Ebrahim explored the challenges posed by South Korea's stringent NTMs on grapefruit exports. Titled, "The South African Grapefruit Industry: A Financial Analysis of Compliance and Market Diversion in Response to South Korea's Non-Tariff Measures", the study uncovers the high stakes of meeting these regulations and the prohibitive cost of failing to do so.

In the 2022 season, under the guidance of Drs Cecilia Punt and Kandas Cloete, an



Albert Coetzee



Sameera Ebrahim

Excel-based decision-making model was developed to quantify the financial burdens of complying with South Korea's NTMs, like phytosanitary standards, pest controls, and cold treatment protocols. While these measures aim to protect human, animal and plant health, they do often act as trade barriers, raising costs and risking market exclusion for exporting countries like SA.

This work aligns with the National Development Plan (NDP) 2030, which pushes for export-led growth to increase GDP and reduce unemployment. As Ebrahim found,

"Export-led economic growth can arise due to direct links between agricultural exports and agriculture's share of gross domestic product." Unfortunately, South Korea's NTMs make it difficult to achieve this goal, demanding rigorous compliance that stretches the resources of the South African value chain.

Her decision-making model illustrates the value of future-focussed predictive modelling to ensure data-driven intelligence for the citrus industry.

Compliance: a carton-by-carton breakdown

Table 1 indicates the difference in Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) between targeting general markets vs. South Korea, assuming compliance in both cases. Although additional costs for inspections to export to South Korea are relatively low, the delivery at terminal (DAT) price is much higher, leading to an EBITDA of R60.50 per 17 kg carton. This exceeds the price point for exports to other markets (on average).

The high price of non-compliance: losses and diversion strategies

Targeting South Korea for export without the ability to comply, presents significantly higher financial risks. Ebrahim's thesis presents five rejection scenarios, ranging from orchard inspections in SA to port arrivals in South Korea (**Table 2**). When non-compliance with South Korea's restrictions is detected early, fruit can be rerouted to other markets. At this point, the main loss is not additional expenses, but the loss of greater income, because prices in other markets are lower than South Korea's. If rejection of the fruit occurs later, the financial loss is compounded by additional transport costs or in the case of fruit dumping, complete loss of income after all expenses have been incurred.

A rejected shipment at a South African port leads to a loss of R16.66 per carton, compared to the anticipated R65.80 EBITDA, as the fruit must be redirected to lower-priced markets. Additionally, total costs may rise to R267.56

per carton due to the need for extra handling. A significant issue arises from rejections at South Korean ports, where costs escalate to R293.63 per carton. This reduces EBITDA to R33.98 per carton, resulting in a net loss of R99.79 per carton compared to the baseline. If pests like fruit flies are detected, the affected fruit must be destroyed, causing an alarming EBITDA loss of R280.22 per carton. In 2022, a total of 95 065 cartons were rejected across the industry, leading to an overall EBITDA loss of R1.74 million.

The model clearly shows that if an exporter is aware that not all restrictions of the South Korean market had been adhered to, it is best to target another general market from the onset. Otherwise, costs of diverting to other markets or dumping will lead to significant losses.

This decision-making model helps exporters by guiding them in redirecting rejected consignments to minimise losses. It considers factors like the rejection location, reason (e.g., pests, markings, cold chain failures), fruit age, trade agreements and market prices. For instance, if mealybugs result in rejection, the fruit can be redirected to markets where they are not considered phytosanitary pests.

Ebrahim's thesis draws on literature showing NTMs' dual role: protecting health while creating barriers. Developing countries with limited resources are the hardest hit by this conundrum, echoing concerns about aspects of the WTO's SPS Agreement.

Compliance yields higher earnings, non-compliance hampers producers, and diversion can contain losses under certain conditions. The findings confirm this: Successful exports in 2022 generated R26.6 million in EBITDA for 404 797 cartons, versus significant losses that go beyond financial reductions for rejected fruit.

The model offers actionable advice. For government and policymakers, it conducts risk assessments for market closures, provides subsidies for compliance, negotiates trade deals, and modernises production unit code (PUC) systems. It also promotes processed

Table 1. Cost, income, and EBITDA of grapefruit exports to other markets vs. South Korea (R per 17 kg carton)

Stage	Other markets	South Korea	Difference
On-farm production costs	45.79	45.79	0.00
Packing, transport, insurance and port costs	189.30	189.77	0.47
Inspections and levies	10.49	27.64	17.15
Total DAT cost	245.58	263.20	17.62
DAT Price	250.90	329.02	78.12
EBITDA	5.32	65.82	60.50

Table 2. Impact of non-compliance on EBITDA (R per 17 kg carton)

Location of rejection	Direct cost (farm to DAT)	DAT Price	EBITDA ¹	Cost of non-compliance ²
Baseline (compliant)	263.22	329.02	65.8	
Scenario 1: Farm	252.81	250.9	-1.91	67.72
Scenario 2: Packhouse	254.2	250.9	-3.3	69.11
Scenario 3: South African port	267.56	250.9	-16.66	82.46
Scenario 4: South Korean port (diversion to the general market)	293.63	259.65	-33.98	99.79
Scenario 5: South Korean port (dump fruit)	280.22	-	-280.22	346.02

¹EBITDA = DAT price - Direct cost

²Cost of non-compliance = Baseline EBITDA - Scenario EBITDA

South Korean non-tariff measures incur substantial compliance costs for SA's grapefruit exports.

citrus to diversify and boost domestic demand, and it cushions against fluctuations.

Producers and exporters should invest in staff training, stay abreast of trends, and use this decision-making model. Organisational learning and research and development can innovate compliance methods while reducing costs.

Researchers are urged to gather primary data for precise costs, analyse all special markets, and conduct comparative studies.

This thesis provides two valuable insights. As global NTMs tighten, compliance isn't optional, it's essential for sustaining export-led growth. Additionally, by quantifying risks

and offering a decision-making model, the study empowers stakeholders to mitigate losses and diversify markets.

In an era of trade disputes and environmental pressures, SA's grapefruit exporters must balance innovation with adherence. The industry ranks second globally in exports, but without strategic interventions, special markets like South Korea could slip away.

