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agbiz GRAIN QUARTERLY

A closer look at grain theft

Impact of PPI on storage tariffs

Hazards and risks of grain fumigation

Handling and storage of grain for export

Egypt expands its grain storage for stability

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Relationships are key in the value chain

By Tobias Doyer, CEO, Grain SA

When I started my career as a young agricultural economist, I studied the *Kassier Report*, which guided the deregulation of South Africa's marketing boards. Within a few years, many of the co-operatives converted to companies and grain industry role-players faced unfamiliar terrain. If the minister does not set the maize price, then who does? The invisible hand of the market felt both cold and foreign.

Is your co-operative, now turned company, an adversary or a partner? Under the guidance of my study leader, Prof Johan van Rooyen, we studied how actors in the agricultural industry responded to this new environment. He introduced the concept of supply chains (later known as value chains) as a lens for understanding our observations. We meticulously described the evolving business structures, practices and processes.

How did companies contract with each other? How did they agree on prices? How did they agree on product characteristics and quality? The most enduring concept that still resonates with me, introduced by Prof Peter Zuurbier from Wageningen University in the Netherlands, was the concept of competing in chains.

The value of the value chain

It is not about producers against producers and agribusinesses against agribusinesses. Instead, success hinges on the value chain participants who contribute the most value from the customer's perspective. Value chain partners collaborate and co-ordinate to enhance product attributes – considering factors such as time, place, form, and ownership. This represents the maximum price that the consumer is willing to pay, hence defining the value delivered by the chain.

The who, where, what and when, and in particular the distribution of economic benefits among value chain participants, all boil down to collaboration and co-ordination. In the early days, the focus was on supply chains – the logistical puzzle of getting grain from farm to market. However, as we delved deeper, we grasped the significance of value chains – the intricate web of relationships and processes that add value to our products.

> Today, we acknowledge that our success depends on the strength of these relationships and our ability to work together towards a common goal. Our ability to collaborate and co-ordinate in the South African grain value chain will determine our competitiveness and sustainability.

Advances and challenges

I stand amazed at the changes that occurred since I last worked in the agricultural industry. It is remarkable to think that just 15 years ago, when I transitioned from Agbiz to the insurance industry, WhatsApp did not exist. Since then, many things have changed – the adoption of precision farming continues to accelerate, as do information platforms, new biotechnology, the explosion of the soya bean industry, and a few new players among familiar faces. I expect the pace of change to increase, resulting in more innovation, connectedness and information exchange.

However, we are currently facing substantial challenges in product quality and grading due to current El Niño weather challenges. This is, however, not the only challenge we are facing. Logistics and infrastructure remain a significant challenge, especially in respect of grain handling. Inadequate road and rail networks, ports and logistics in general are causing inefficiencies and increased costs, eroding our competitiveness relative to international grain competitors.

Unfortunately, it is still more cost-effective to transport a tonne of grain from Argentina to Cape Town than from Randfontein to Cape Town. Current changes in global legislation and regulations pertaining to genetically modified organisms (GMOs) will impact the movement of grain among countries and trading partners. Grain SA is working tirelessly to secure increased market access for our products in support of our industry. I commend the close working relationship we have with Agbiz Grain in engaging with government to establish an efficient and supportive regulatory and compliance environment.

Tobias Doyer, CEO of Grain SA.

These are but a few of the myriad of challenges that we face as an industry. However, the one thing that stands out is the fact that collaborative and co-ordinated value chains are the foundation of competitiveness and thus the success of all participants. Grain SA appreciates our strong partnership with Agbiz Grain, and we are committed to contributing to a solid foundation on which our respective members can build competitive value chains that thrive and contribute to South Africa's success.

For more information, email Tobias Doyer at Tobias.Doyer@grainsa.co.za.

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Statutory levies awaiting approval

On 28 March and 9 April this year, the National Agricultural Marketing Council (NAMC) received a request from the Wheat Forum, asking for the minister of agriculture, land reform and rural development to, in terms of section 15 of the *Marketing of Agricultural Products Act, 1996 (Act 47 of 1996) (MAP Act)*, approve statutory levies (value-added tax excluded) for various winter cereal commodities, both produced and imported. These levies would be collected and administered by the South African Winter Cereal Industry Trust (SAWCIT) over a period of four years.

The purpose and objectives of this statutory measure are to provide financial support for winter cereal information, research and transformation functions. These functions have been identified as essential and are in the best interest of the winter cereal industry.

The request received unanimous support from the members of the Wheat Forum, based on the recommendation of the Wheat Forum Steering Committee. This support was on behalf of the directly affected groups within the winter cereal industry.

Previously, statutory levies were imposed on wheat, barley and oats (which expired in September 2020) to provide financial support for research projects and quality testing, to supply generic market information to all role-players, and to assist with the development of emerging producers of winter cereals in South Africa. The administration of these levies was carried out by the Winter Cereal Trust.

Since the inception of SAWCIT in 2020, the trust's primary source of income has been based on voluntary levies collected on wheat, barley and oats. – *Agbiz Grain*

Course welcomes first student group

Lizelle Jacobs, director of MindAlive, has been working with Agbiz Grain for the past six years to successfully develop and implement the newly registered Grain Depot Manager qualification. Agbiz Grain recently expressed its appreciation for the enormous task she has taken on in this regard. (Read our article on the course and its development in the February 2023 issue of *Agbiz Grain Quarterly*.)

Jacobs and a team of specialists from among Agbiz Grain's members, are currently finalising the question bank for the first group of students who will register for the External Integrated Summative Assessment exam by April 2026. Over the years, several of our members' staff and individuals serving the storage sector have been involved in the development of the Grain Depot Manager and Grain Grader courses.

We salute every contributor for their selfless contributions in this regard. Whether retired or still actively involved in the industry, each person's dedication has made it possible for 43 students, primarily Agbiz Grain members, to enrol in 2024. – *Agbiz Grain*

New BKB Grainco member on Agbiz Grain steering committee

Christie Engelbrecht was recently appointed as the new general manager of BKB Grainco. He holds a bachelor's degree in Accounting (B.Acc) and a bachelor of Accounting Honours degree (B.Acc Hons) from the University of the Free State. He is also a chartered accountant with membership from the South African Institute of Chartered Accountants, and has a master's in Business Administration from Stellenbosch University.

His experience includes serving as the financial manager of Orange River Cellars, as well as being the general manager of PakHouse Brands and AlphaAlfa. Christie will also be replacing his predecessor, Casper Schmidt, as BKB Grainco's representative on the Agbiz Grain steering committee. Casper is still with BKB, but in the post of general manager, Livestock and Properties. The committee would like to thank him for his contribution over the years, while welcoming Christie – we believe he will make a positive contribution to Agbiz Grain's service to its members and industry. – *Plaas Media*

Christie Engelbrecht, new general manager of BKB Grainco.

Agbiz Grain tests sampling probe

According to a Southern African Grain Laboratories (SAGL) study funded by Agbiz Grain, stakeholders in the industry use different sampling probes to collect representative portions of the consignment and assign the correct grade during arbitration.

However, the choice of sampler is not always based on an independent evaluation, which can lead to discrepancies in grading results. The Vac-A sampler was found to be the best at taking a representative sample from bulk grain and oilseed consignments and should be the probe of choice for dispute resolution.

In sampling environments without electricity, the single tube with an inner tube proved to be the best of the three handheld probes tested. The significant differences in performance between the probes tested, underscore the importance of using the most accurate sampling probe to resolve disputes.

Agbiz Grain members purchased 47 of the required samplers to test the tube in the field for different commodities, conditions and environments before making a final decision regarding the preferred tube to be used in dispute resolution. – *Agbiz Grain*

Inspection services challenged

Agbiz Grain has submitted comments on the Department of Agriculture, Land Reform and Rural Development's (DALRRD) proposed inspection services.

Agbiz Grain commented on DALRRD's *Standard Operating Procedure (SOP)*, the *Grain Inspection Checklist*, and *Financial Model and Inspection Fees*. The *SOP* confirmed that the party to be charged for a completed inspection is the 'owner' of the product, as required by the *Agricultural Product Standards Act, 1990 (Act 119 of 1990) (APS Act)*: "… the owner of the product in question shall pay the prescribed fees or the amount determined by the assignee …".

The *APS Act* allows the owner's product to be placed on the market for sale, on condition that the product complies. The owner of the inspected product must pay the inspection fee. There are several other important aspects of the *SOP* that Agbiz Grain has challenged, but it remains to be seen whether our comments have been accepted. Agbiz Grain has co-operated fully without disrupting the consultation process, but if our comments have not been considered, we are prepared to appeal. – *Agbiz Grain*

India's new grain storage plan

Indian prime minister, Narendra Modi, recently announced the world's largest grain storage plan in the co-operative sector and said it could potentially be a game-changer for the country, with positive ramifications for the domestic economy at large.

As far back as 1999, the World Bank found that India's post-harvest losses could feed one-third of the country's poor for almost a year. A 2015 government report found that the post-harvest loss in cereals was 4,65 to 5,99%. Similarly, a study by the National Bank for Agriculture and Rural Development (NABARD) in 2022 discovered a loss of 3,89 to 5,92% in cereals. However, the Dalwai Committee of 2017 observed that actual post-harvest losses are likely to be much higher, estimating overall losses in cereals as high as 44,6%. The losses are a result of deficiencies in the national post-harvest infrastructure as the country's storage capacity is considerably low.

The proposed scheme's focus on co-operatives is notable. Since a staggering 90% of Indian producers are small and marginal, many Indian producers find the existing post-harvest infrastructure inaccessible. Therefore, driven by the producers themselves, co-operatives appear to be an effective means to serve producers. The current announcement also reinforces the outlook of producer-centric agriculture.

Therefore, it is hoped that other segments of the post-harvest value chain will receive similar policy attention in a manner that converges different policies at both the planning and implementation levels. At least 700 lakh (hundred thousand) tonnes of storage capacity will be created over the next five years in the co-operative sector by constructing thousands of godowns (a type of warehouse in India) and other warehouses, Modi said. He also laid the foundation stone for an additional 500 primary agricultural credit societies across the country for the creation of godowns. – *Times of India and Hindustan Times*

Issues relating to maize grading regulations

In March 2024 the DALRRD rejected Agbiz Grain's application for a deviation to the published maize grading regulations. The organisation subsequently applied for a permanent change to the regulations before the start of the maize marketing year, which runs from 1 May to 30 April.

Agbiz Grain has identified deficiencies in parts of the text that can be better and more clearly stated. As it stands, it is impractical and out of context. (See our complete article elsewhere in this issue of *Agbiz Grain Quarterly*.) The request aims to improve the regulations, subject to the agreement of the relevant sectors and stakeholders. Should there be no objections to this application and all stakeholders agree, we have asked the DALRRD to then consider a permanent change to the regulations. – *Agbiz Grain*

Navigating El Niño's effects

Southern Africa's maize crops have been hit hard by El Niño-induced dryness and heatwaves. Zimbabwe, Zambia, and South Africa face losses, urging calls for international co-operation to ensure food security. The El Niño-induced dryness and heatwaves hit the Southern Africa region, resulting in roughly half of Zimbabwe and Zambia's maize crop failure.

South Africa's maize crop is also down by 20% year-on-year, with the harvest estimated at 13,2 million tonnes. If it materialises, it will still meet the domestic needs of about 12 million tonnes, leaving the country with a small export volume.

But this is a tough season requiring white maize imports for Zimbabwe and Zambia. Neighbouring small-scale producers such as Botswana, Lesotho and Namibia are also struggling and will require white maize imports. These countries will need white maize, not yellow maize, which is widely traded in the world market. – *Wandile Sihlobo, Agbiz*

Man trapped after part of grain silo collapsed

A man trapped underneath a grain silo was freed after a major rescue operation in Queensland's Central Highlands in Australia earlier this year. Bystanders and emergency services worked frantically with shovels and farming machinery to rescue the man.

A Queensland Ambulance Service spokesperson said the man, 34, had been working underneath the silo when the bottom collapsed and he was trapped by the metal sheet and 'drowning' in grain. It follows an incident about a year ago when a Baralaba producer survived falling into a silo, where he was trapped up to his neck in grain. – *ABC News*

Russia targets Ukrainian port, destroys grain stores

On 19 April, Russian troops hit the port of Pivdennyi in Ukraine's southern Odesa Oblast, destroying grain storage facilities and foodstuffs they contained, according to Ukrainian president,Volodymyr Zelenskyy, and other officials.

Later, the ministry of restoration stated that as a result of the attack on the port of Odesa, the Russian military destroyed agricultural products intended for Asia and Africa. Two terminals specialising in the transit of agricultural products were attacked. One of the terminals belongs to the globally known Singaporean company, Delta Wilmar, which has been operating in Ukraine since 2004 and also owns several agricultural processing plants. This amounts to over US$300 million in investments and nearly 1 000 jobs," the department said.

Since Russia withdrew from a UN-brokered deal that had guaranteed safe shipments of Ukrainian grain last summer, Ukraine's port infrastructure and its employees have suffered numerous attacks from Russian missiles and drones. – *Euromaidan Press*

Grain theft: A closer look

By Izak Hofmeyr, Plaas Media

Grain theft is a reality in South Africa and criminals use various resourceful methods to pilfer this commodity. The supply chain is particularly vulnerable when grain is transported. Without the necessary control measures, however, the risk can be equally significant at storage facilities, whether large commercial facilities or on-farm silos.

"Grain is a liquid commodity that is easy to sell in various forms. There is always a market for it, even for stolen grain, and a number of ways to sell it. Furthermore, grain's lack of inherent identity makes it difficult to verify ownership," says Marco Pretorius, financial director at AFGRI Grain Management. "Efforts to curb grain theft are contingent on good control measures taken by grain owners and storage operators. This includes electronic management systems, cameras, access control and weighbridge control."

He points out that grain theft occurs anywhere in the supply chain – from the farm on which grain can be harvested illegally, the hijacking of trucks and/or theft from trucks transporting grain between the farm and storage facility, to the illegal outloading of grain from storage facilities. Added to this is the internal theft of small quantities of grain from storage facilities.

Photograph courtesy of SSK.

Criminal tactics

"Grain theft at storage facilities is not only limited to outside people," he says. "A facility's own employees might be involved as well. Consequently, it is critical to implement effective control measures to curb any attempts. These measures need to be adapted and updated continually as thieves are always devising new methods to beat the system."

The next aspect to pay attention to, explains Pretorius, is the relationship with transport contractors and the information shared with them. Criminals often falsify documents to gain access to grain consignments.

Identifying the crime

"The challenge faced by storage operators lies in identifying incoming grain that may have been stolen. Failing to do so could unwittingly link us to this crime."

Criminals have various options for disposing of stolen grain. Apart from storage facilities, they may take the grain directly to a mill or press, or to a facility that packages grain in smaller units for selling.

Criminals often operate in networks or syndicates, acting in co-operation with a possible buyer. These networks find ways to procure grain, including stealing it while it's being transported or at storage facilities. There is a risk that a buyer might unwittingly become involved in unlawful actions.

"Inventory control," he continues, "is fundamental to effective grain handling. If you have no idea what your stock levels look like, it is quite possible that someone might be stealing it right under your nose. 'To measure is to know' is a principle that remains relevant. It is also equally applicable in every link of the value chain – from the farm and transit of grain to the storage facility and the final end user."

Practical tips

Wimpie Nel, a retired South African Police Services (SAPS) Commercial Branch captain, has specialised in grain theft investigations for the past 15 years. His clients include companies such as AFGRI, BKB, South African Bulk Terminals in Durban, various market agents as well as insurance companies.

He agrees that there are various levels of grain fraud and theft of which the most common occurs in the transport link between the producer and buyer of grain.

"You do get market agents without integrity who buy grain from producers, only to sell it to third parties without paying the producer. Producers must choose their market agents carefully and do their due diligence when engaging with potential buyers. Typically, producers receive payment after the load has been delivered and its quality verified."

In a scenario where the producer enters into an agreement with a buyer and the producer uses his/her own transport contractor, the onus rests on the producer to verify the truck and driver's identity. "We've seen a sharp rise the past three years in cloned driver's licences and documentation for trucks. When trucks arrive to load grain, drivers present false documents, which are not always verified. It is the producer's responsibility to make sure that his/her grain is indeed collected by the correct truck and driver."

There are a number of ways to do this. Firstly, says Nel, the producer, when booking transport, must ensure the documentation he/she receives from the transport company is correct. This includes the truck's logbook, and the driver's identification and driver's licence. Then he/she should verify that the documentation received is indeed correct and that the transport company's insurance cover is up to date for the type of load the truck will be carrying.

"Grain theft syndicates sometimes steal documentation and change the details of the owner. This falsified documentation is then sent to the client. Always make sure the transport contractor appointed is legitimate."

Producers can verify details in a number of ways:

- First and foremost, verify the contractor's references.
- Secondly, a confirmation letter from the bank should be obtained to confirm the relevant bank account number.
- Thirdly, check the identity document and photo of the driver and make sure it matches when the person arrives to collect/offload the grain.

Producers need access to the tracking information of the designated truck. This allows them to link the truck to its registration number and monitor its location in real time.

Nel is currently testing a tracking device that producers can place in the load. This device will pinpoint the delivery location, aiding in recovering stolen goods.

Personal verification

"In many cases I verify the information supplied without the transport contractor being aware of it. If the load is very valuable, the producer could even install his/her own tracking device in the truck without the knowledge of the driver. This is especially useful in cases where trucks handle multiple loads. The producer can remove the tracking device at a later stage.

"Over time, after the first verification has been completed," says Nel, "the producer and transport contractor will build a personal relationship. Then it is only necessary to compare the truck's licence disc with the registration number and monitor tracking reports." (Nel invites producers to contact him, should they need assistance with the verification process.)

"Grain theft syndicates," he warns, "get a foot in the door when a regular transport contractor cannot, for some reason, handle a specific load and subcontract the job. Often, there is no due diligence and the subcontractor's details are not checked, and before you know it, false documents are used to load and transport your grain to some unknown destination.

"The dilemma with such a situation is that the transport contractor's insurance would likely reject any claim because of the deviation from the required protocols. The same applies to the producer's insurance due to the fact that the subcontractor's details were not verified."

The issue with hijackings

According to Nel, the hijacking of trucks transporting grain is a familiar threat. The producer must therefore ensure that from the moment the truck leaves his/her premises, it is tracked via the tracking reports.

"Most grain is stolen somewhere between the farm and storage facility. The driver could offload grain *en route*, or the truck could be hijacked. Identifying a specific batch of grain poses a challenge because it is impossible to trace it back to its origin. Producers must remain in control by tracking the truck until the grain is offloaded at the silo."

Of course, the grain theft syndicate needs to get rid of the load as soon as possible. "A folio number is required to offload grain at a silo. This includes, among others, the sender's bank details. Criminals collaborate with someone who has a folio number and money is deposited into that bank account. From there the funds are transferred to the thieves."

Theft at silos

"Theft at silos is another everyday issue," says Nel. This is where the work he does becomes important. "When theft at a silo is suspected, I conduct an audit of the processes at that specific facility, determine the risk and identify weak points in the process. I then identify ways to mitigate the risk or, hopefully, eliminate it altogether.

"Part of this task is identifying market access points where these stolen loads end up by ordering loads myself in collaboration with the SAPS Special Units and prosecutors. The objective is to close these access points, making it impossible for stolen grain to be dumped in the market.

"Always make sure," he reiterates, "that the documentation pertaining to the transportation of a specific load was sent from a verified email address. Criminals often clone email addresses, essentially hijacking the communication process (e.g. if the email address of the legitimate contractor is transport@tranport.co.za, the criminals might change it to tranport@transport.com – a small change that is easily missed).

"Make this process safer by attaching a unique one-time PIN (OTP) to every load. When the truck arrives on the farm, the driver should provide this unique OTP. If he cannot, he is most likely part of a theft syndicate."

For more information, contact Wimpie Nel on 083 339 9395 or at nelwimpie00@gmail.com, or Marco Pretorius at marco.pretorius@afgri.co.za.

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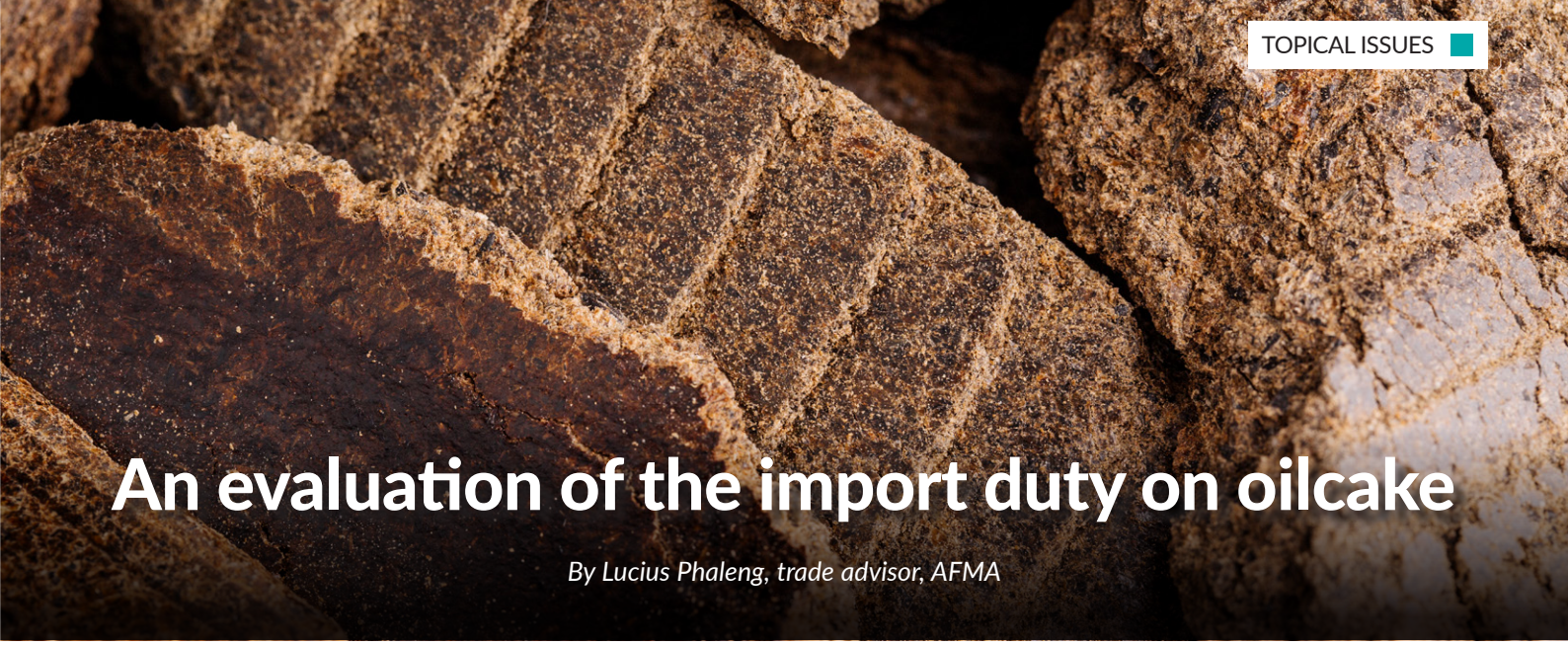

An evaluation of the import duty on oilcake

By Lucius Phaleng, trade advisor, AFMA

Oilcakes are the residual fractions left over after most of the oil has been extracted from seeds. These remains are rich in protein and serve as valuable feed for farm animals. As the demand for alternative protein sources in animal feed continues to grow, utilising oilseed byproducts has become a cost-effective and environmentally sustainable strategy.

Globally, oilcake production is projected to remain stable in 2023/24. Soya beans and sunflower seeds are likely to be favoured over rapeseed due to higher domestic production, ample global supply, and favourable crush margins. However, considering the anticipated decline in the livestock and dairy sectors, the overall usage of oilcake is expected to decrease.

Specifically, feed manufacturers' utilisation of oilcake is forecast to decrease by approximately 1% compared to the previous year. This decline is primarily attributed to reduced consumption of rapeseed meal, while soya bean and sunflower meals are expected to increase in use due to their greater availability.

Tariff implementation

Despite an annual crop of 113 550 tonnes during 2000/01, South Africa produced only 4 173 tons of oilcake. Due to limited production, coupled with its underdeveloped crushing capacity, South Africa became a net importer of oilseeds and oilcakes. Consequently, in 2000, the South African government implemented tariffs on imported oilcake as part of an effort to enhance local production and improve crushing capacity.

These tariffs were introduced to safeguard and support the local industry, aiming to stimulate domestic soya bean production and bolster the crushing sector. Notably, the existing tariff system has effectively fulfilled its objectives in bolstering local industry since South Africa has witnessed a significant increase in oilseed cultivation over the past decade, growing from 150 000 to 2,77 million tonnes in 2023.

This positive trend in oilseed cultivation is anticipated to persist in the 2023/24 marketing year, with projections indicating historically high levels of up to 1,2 million ha dedicated to soya bean cultivation along with an estimated production of 1,8 million tonnes.

Record export expected

However, due to local crushing near capacity and limited growth in domestic demand, South Africa may achieve a record export of oilseeds totalling 800 000 tonnes in the current marketing year. The situation has changed since the current tariff structure was implemented, as South Africa's domestic soya bean prices now align with export parity, indicating a surplus in local markets. It is expected that local soya bean prices will continue at export parity for the remainder of the season, largely influenced by international soya bean prices and the rand/dollar exchange rate.

Additionally, local product impact conditions and progress in soya bean exports are anticipated to impact local prices. The local price of soya oilcake is often determined through the component pricing mechanism, which is directly influenced by a 4,95% duty, leading to a rise in local prices. Presently, local soya bean oilcake is traded based on import parity pricing, and a decrease in the existing tariff structure would reduce the import parity price of soya oilcake by 4,95% based on the free-on-board price from Argentina, with similar implications for sunflower oilcake.

Review recommended

According to the International Trade Administration Commission (ITAC) of South Africa's report, number 324 of 2010, it was recommended that the tariff dispensation for oilcake be reviewed after three years. Additionally, the local soya bean crushing capacity can be improved to provide the industry with a window of opportunity for making the necessary investments to increase oilseed crushing capacity.

It has been 14 years since ITAC made the recommendation, and it is now the right time to assess the oilseed industry's situation and determine whether the current tariff structure still serves its purpose. Revising import tariffs could bolster the poultry sector by improving the cost of feed. However, the timing of reviewing oilcake import duties is critical and should be determined through careful consideration of various factors, such as market conditions, industry capacity and economic feasibility.

For enquiries, email Lucius Phaleng at trade@afma.co.za.

2024 GOSA symposium:
Progress requires stability

By Carin Venter, Plaas Media (Photographs: Infoworks)

During the 39th symposium of the Grain Handling Organisation of Southern Africa (GOSA) in Stellenbosch, emphasis was placed on the fact that South Africa's entire grain value chain has contributed to effectively dispatching exports for the 2022/23 marketing year.

The symposium and annual general meeting, held on 18 and 19 March this year, with Bessemer Africa as the main sponsor, hosted almost 70 agricultural companies and institutions representing the entire grain value chain. A highlight of this year's event was the positive feedback regarding progress in creating market stability along with the past season's positive export results. This was largely attributed to grain storers and handlers' key role in entering new yellow and white maize export markets, and expanding soya bean exports.

GOSA president, Hein Rehr, thanked GOSA's members for their assistance in facilitating the past season's exports. While the shipping of soya beans for 2022/23 totalled 277 504 tonnes, a total of 195 000 tonnes of South African white maize was exported to South Korea, Portugal and Honduras. White maize was also exported again to Mexico and, for the first time, a deep-sea export cargo was shipped to China.

Nuclear and hydrogen energy

Dr Wallace Vosloo, a corporate specialist in high voltage engineering, believes that hydrogen offers a long-term solution that will stave off a worldwide energy crisis. Speaking at the event, he referred to the impermanence of oil and coal reserves, as well as Eskom's tarnished reputation. He noted that South Africans must anticipate enduring load shedding for at least the next decade or more. Moreover, globally, resources such as oil, gas, coal, and some nuclear materials won't replenish within our lifetime.

He also delved into why hydrogen deserves research and adoption as a future energy source. "Every little bit of energy on the planet comes from the sun, which is fuelled by hydrogen, radiating high energy particles to Earth," he said. "The energy that is sourced by windfarms and solar cells is, for example, derived from the big nuclear generator in the sky, the sun. Imagine the possibilities if we harnessed these energy particles, driven by hydrogen, to generate electrons that will create electricity."

One litre of seawater contains more than 80 minerals and basic elements such as gold, platinum and uranium. Dr Vosloo elaborated: "Since water contains oxygen and hydrogen, we should ask ourselves why we are not using hydrogen as a fuel carrier. I think the answer is that most people are simply used to paying for safe and cheap electricity. The challenge, therefore, is how can we utilise the sun and sea, and generate the fuel we need to drive our vehicles, turbines and such. In the interim, we will have to live with nuclear, oil and gas."

Political and economic uncertainty

Prof Theo Venter, a political analyst from the University of Johannesburg, addressed several matters that have an impact on South Africa's agriculture, especially in the run-up to the 2024 general election. These included load shedding, state capture and institutional corruption, rising crime rates, infrastructure collapse, the

Despite several challenges associated with South Africa's economy, GOSA president, Hein Rehr, applauded the association's members for having successfully facilitated exports during the past season.

From the left are Dawie Maree from FNB Agriculture, one of this year's symposium speakers, Marco Pretorius from AFGRI and GOSA board member, and Cobus van der Merwe from The Match Exchange (MX).

From the left are Prof Theo Venter, well-known political analyst from the University of Johannesburg, Hein Rehr, GOSA president, Kallie Schoeman, managing director at Schoeman Boerdery, and Wessel Lemmer, Agbiz Grain general manager.

underperformance of the South African economy, a lack of business confidence, and civil unrest.

He also examined the evolution of electoral design from 1994 to 2024, saying the trust deficit between the government and the electorate has reached an all-time low. Opposition parties have sensed a crack in the 30-year reign of the ruling African National Congress (ANC).

During his talk, the chief economist of the Efficient Group, Dawie Roodt, focussed on the ANC's role in a dysfunctional economy. "We see the effect of their ruling in a whole range of divisions, such as the state-owned institutions, dysfunctional local authorities, and the debt burden," he said.

"What we need for economic stability is for the party or coalition government controlling South Africa after the upcoming election, to establish good economic policies along with the political will to implement it."

Dawie Maree, head of FNB Agriculture Marketing and Information, provided an economic perspective on the agricultural sector's progress. He said despite the agricultural sector showing progress in general, there are still risks that stem from the policy environment which can adversely affect the industry. However, sectoral efficiency in agriculture has increased. This can be ascribed to the adoption and utilisation of technology as an important and positive driver.

In the spotlight

The keynote speaker at this year's meeting was Dr Gustav Gous, an international inspirational speaker. In addition, three separate technical workshops were also presented and led by Prof Jan Havenga of Stellenbosch University, Japie Snyman of Olam Agri, and Johan van Rensburg of VKB.

Looking at the future of agrologistics, Prof Havenga elaborated on South Africa's current agrologistics demand, focussing on especially Transnet's role in this regard. His presentation provided a breakdown of tonnage moved in and outside of South Africa. Along with his co-researchers, their metholodogy included looking at 356 districts in South Africa, eight border posts, seven ocean ports and one airport. An in-depth article on this presentation will be published in the August issue of *Agbiz Grain Quarterly*.

General and board elections

At the annual general meeting which coincided with the symposium, Rinus Bezuidenhout of Bester Feeds was elected to the board, replacing Lukas Swarts from Ensign whose term came to an end.

Dr Wallace Vosloo gave an insightful presentation on the possibilities offered by hydrogen as a long-term solution to stave off a worldwide energy crisis.

Facilitating one of three technical workshops, Prof Jan Havenga from Stellenbosch University discussed agro-logistics, specifically the national freight demand and management, and Transnet's effect on the economy.

Hein Rehr from RehrCo was appointed as president, with Johan van Rensburg from VKB appointed as vice-president and Dries Dannhauser from Tiger Brands as treasurer. Dannhauser replaces Marco Pretorius from AFGRI who will continue to serve as a board member.

The remainder of the board consists of Ferdinand Meyer from Ronin, Michal Rehr from National Fumigants, Willem Strauss from Rand Merchant Bank, Stefan van Staden from AFGRI and Tom Terblanche from Grain Carriers.

For more information, contact Hein Rehr, president of GOSA, on 082 451 1569 or at hein@newachiever.net.

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The National Plant Protection Organisation (NPPO) of Egypt along with South African industry representatives visited the South African Bulk Terminal (SABT) at the Durban Harbour's Maydon Wharf. (Photograph: Sacota)

Egypt: Expanding grain storage for stability

By Susan Marais, Plaas Media

Egypt is significantly expanding its grain storage systems and actively seeking new grain suppliers. South Africa is one of the countries on their watchlist, but what does this mean for the local storage industry and grain sector as a whole?

For starters, it has led to the signing of an official approval letter allowing maize and soya bean exports from South Africa to Egypt. Dr Saad Moussa represented Egypt's Foreign Agricultural Relations and Central Administration of Plant Quarantine in signing the approval letter on 12 March this year, after an Egyptian delegation visited South Africa to engage in strategic meetings with the Department of Agriculture, Land Reform and Rural Development (DALRRD) and industry stakeholders. Various agricultural enterprises were also visited, the focus being on regulatory approvals for maize and soya bean exports to Egypt.

During the visit, Dr André van der Vyver, executive director of the South African Cereals and Oilseeds Trade Association (Sacota), emphasised Egypt's critical role as an export destination. Traditionally, the desert country imports eight to ten million tonnes of maize per annum, and four to five million tonnes of soya beans. However, this demand decreased in 2023. "Although South Africa's export ability in the current season is under strain, Egypt, as a new market, has great potential and, geographically, South Africa is well-positioned to compete in this market."

Mutual growth opportunities

According to Wandile Sihlobo, chief economist at Agbiz, South Africa should view this opportunity not as a threat to its own food security, but rather as a chance for expansion – the rationale behind this

Figure 1: Egypt's maize imports from 2021 to 2023 in million metric tonnes. (Source: NPPO of Egypt)

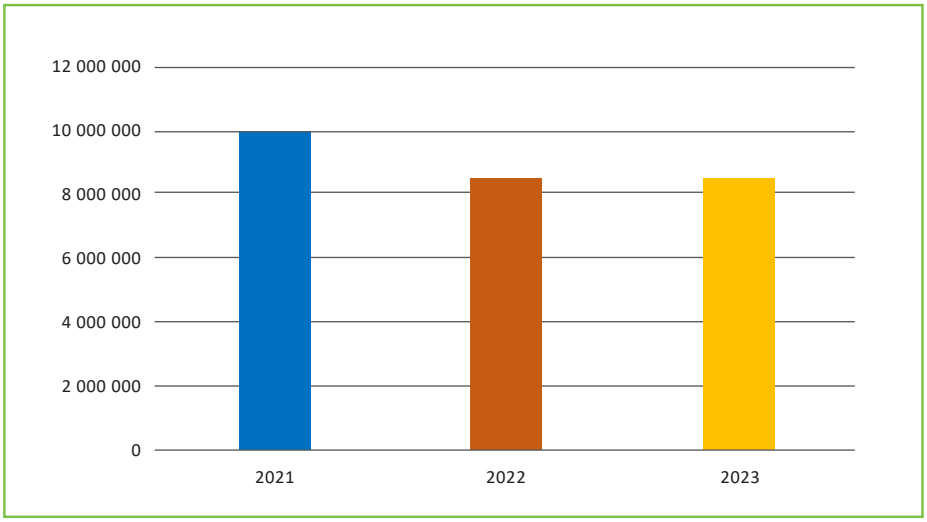
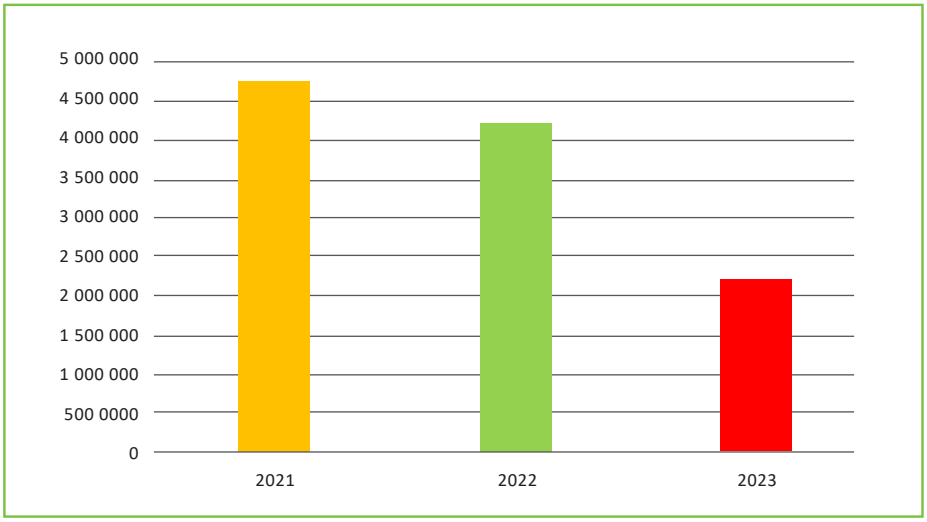


Figure 2: Egypt's soya bean imports from 2021 to 2023 in million metric tonnes. (Source: NPPO of Egypt)



is that a free-market system will self-regulate to restore equilibrium as grain is exported. "This does, however, underscore the importance of a functional supply and demand committee, which can ensure clarity and transparency in the market. As trade information – imports and exports – becomes available, the market readjusts to align itself."

Moreover, Sihlobo believes that greater access to Egyptian markets will enhance food security for Egypt and its northern neighbours. Simultaneously, it presents an excellent business opportunity for South Africa. Notably, the interactions between the Egyptian delegation and South Africa are not an isolated event. Rather, it forms part of Egypt's strategic plan to bolster food security for its population while also creating opportunities for exporting grains and milled products globally.

This is underlined by the fact that, during last year's BRICS summit held in Johannesburg, Egyptian prime minister, Mostafa Madbouly, announced the country's commitment to mitigating the impact of potential global food shortages by establishing a global centre for grain storage.

This commitment is not mere rhetoric; Egypt has already secured financial support. In June 2022, the World Bank approved a US$500 million loan to bolster Egypt's efforts in ensuring food security. A key pillar of this strategy involves maintaining a strategic reserve stored in new silos. Approximately 50 silos, with a combined storage capacity of around 1,5 million tonnes, will be established across 17 provinces.

Rising demand in the desert

Egypt has a population of some 111 million people, according to a census conducted in 2022. In 2019 the World Bank reported that 1,5% of Egyptians lived below the international poverty line of US$2,15 per day, while 17,6% fell below the benchmark of US$3,65 per day, which defines the lower middle class.

Egypt imports roughly 12,5 million metric tonnes of wheat annually and produces around ten million metric tonnes to feed its population. This is according to Islam Farahat Aboelela, a phytosanitary specialist who lectures at the University of Cairo and consults for the Food and Agriculture Organization of the United Nations. Aboelela also led the Egyptian delegation to South Africa.

"Current projections indicate that these production and import figures will increase by an extra six to eight million tonnes by 2030, which is why Egypt is starting to expand its storage capacity," Aboelela told *Agbiz Grain Quarterly*. The strategic location of Egyptian ports has sparked discussions with countries such as Russia and Argentina, the aim of which is to explore Egyptian ports' suitability as hubs for these countries' grain, with a further possibility of shipping it to the Middle East, Near East and eventually African countries.

"The World Bank and European Bank for Reconstruction and Development prioritise import efficiency and storage," Aboelela said. "And yes, I confirm Egypt has increased its storage capacity to be less reliant on the storage capacity of exporting countries and to have wheat readily available for its processing industries. Egypt is also one of the largest exporters of wheat flour."

Navigating opportunities

According to Heleen Viljoen, an economist at Grain SA, Egypt's silo infrastructure improvements will enhance the country's ability to store more grain inland.

Grain trade between South Africa and Egypt was virtually non-existent in the

past, with only exported small volumes of yellow maize to Egypt, she said.

Dr Van der Vyver said that over the past year, Sacota, its members and industry partners have collaborated with the DALRRD to facilitate maize and soya bean exports to Egypt. “The fact that the country’s only arable land is located along the Nile River, and given the large population they need to feed, it is great opportunity for South Africa.”

Despite the many challenges South Africa had to face the past growing season, Dr Van der Vyver said they remain hopeful that the country will be able to capitalise on the good relationship they have built, and export grains to Egypt.

“The expansion of Egyptian silo capacity is probably also a result of the Russia-Ukraine war, which is disrupting Egypt’s access to cheaper wheat produced by those two countries.

However, Dr Van der Vyver said: “Egypt will likely increase the importation of grain from South Africa for a limited period only. Once they reach their targets, importation could normalise.” Furthermore, Egypt’s foreign currency deficit and financing challenges make it heavily reliant on Western countries and restrict its freedom to import produce.

No threat detected

“The local industry need not perceive Egypt’s expansions as a threat,” Dr Van der Vyver emphasised. “Egypt produces around nine million tonnes of wheat and imports an additional 12 million tonnes. In contrast, South Africa imports only around 1,5 million tonnes of wheat, and the quality of the wheat we import differs from that of Egypt.”

Viljoen agreed and said while both Egypt and South Africa import wheat from Turkey, for example, the volume imported differs significantly. Egypt imports 40% of its wheat from Turkey, whereas South Africa sources only 2% of its wheat from the Middle Eastern country. “In other words, there is no direct competition between the two countries.”

Despite Egypt’s increasing demand for grains, the South African grain storage sector remains unaffected. Dr van der Vyver attributes this resilience to South Africa’s more open economy, which allows for unlimited foreign currency availability, even if it comes at a cost. Consequently, South Africa continues to import and export, with positive outcomes for the local storage industry.

However, Egypt’s situation is teaching us an important lesson, Dr Van der Vyver concluded. “It shows us we need to cherish our storage facilities, and our agricultural production and free-market capabilities, both import- and export-wise. We need to constantly reinvest in and upgrade our facilities. It also makes us realise what great lengths other countries will go to, often at great cost, to safeguard food security.”

For more information, email Wandile Sihlobo at wandile@agbiz.co.za, Dr Andre van der Vyver at andre.vandervyver@sacota.co.za or Heleen Viljoen at heleen@grainsa.co.za.

External business review of the SAGL: An overview

By Wiana Louw, general manager, Southern African Grain Laboratory

The Southern African Grain Laboratory (SAGL) is an independent testing laboratory, created by the agricultural industry in 1997. Since its inception, the laboratory's mandate has been to provide reference testing services to the grain industry in Southern Africa, promoting the group interest of the industry.

The internationally competitive range of ISO/IEC 17025 accredited services relating to grain, oilseeds, and associated products is driven by the needs of the broader grain industry. The laboratory's core function is to conduct crop quality surveys on locally produced grain and oilseed commodities. These surveys are funded by the various commodity trusts. During the season, crop quality survey results are updated weekly on the SAGL website.

At the end of each production season, reports are published to provide stakeholders and interested parties with reliable information on which to base decisions. The capacity created to conduct these surveys is also used to provide testing, training, consultation, and calibration services to local and international customers.

Changes in the regulatory environment relating to the registration of plant protection products created an opportunity for the SAGL to expand the scope of services. Consequently, and as part of SAGL's diversification strategy to create additional income streams, the Crop Protection Division was established in 2017.

Why an independent review?

SAGL's financial performance over time has been sound and its financial history demonstrates the organisation's ability to be operationally sustainable. Funds generated are, however, inadequate to internally fund all capital (instrument) replacement requirements as a result of the broad scope of testing services provided to serve the needs of the industry.

SAGL's request to the various commodity trusts for assistance with the capital replacement plan, identified the need for an independent external review of SAGL's business model with the view of ensuring a long-term sustainable business model.

Scope of work

A task team, representing the trusts, compiled the terms of reference for the contract. The scope of work included a comprehensive assessment of the sustainability of the SAGL in respect of the different divisions. The business processes were to be evaluated to uncover areas of improvement and recommendations to be implemented. The contract was advertised and Paul Aucamp from Strategic Advisors was appointed to conduct the review.

To determine the needs of each industry, the review process included extensive consultation in the agricultural industry. Participating stakeholders expressed the view that the SAGL is a strategic asset. In a parallel process, ways of securing and improving the long-term financial sustainability of the SAGL were assessed – particularly its ability to replace its required laboratory instrumentation and equipment. The competitiveness of the SAGL, when compared to similar service providers, was also evaluated.

The key questions asked were:

- What should the SAGL's future business and revenue model be to enable timely funded capital replacements?
- What is the SAGL's value proposition to its market?

Process going forward

On completion of the review process, the key findings and recommendations as well as the final report were presented to the trusts. The report was then shared with the SAGL's board of directors for discussion.

The feedback from SAGL's board of directors will then be discussed among the members of the task team and the executive committee of the SAGL board.

The implementation phase will then commence. All recommendations are aligned with the SAGL's mission to keep abreast of technology and be internationally competitive as well as financially independent.

For more information, send an email to Wiana Louw at Wiana.Louw@sagl.co.za or visit *www.sagl.co.za.*

Handling and storage of grain for export

By Wessel Lemmer, general manager, Agbiz Grain

The export of grain and oilseeds is a collaborative effort among the relevant sectors. When dealing with importing countries and during bilateral negotiations to further exports, it is important to gain the trust of the importing country. One of South Africa's strengths, especially valued by importers, is surety regarding the handling and storage logistics within the exporting country for the volumes intended for export.

Grain handling and storage sector

The legacy of storage operators spans 114 years. The *Sentrale Agentskap vir Koöperatiewe Verenigings* was established in 1910 when a solution was sought to export surplus grain that could not be accommodated by the Johannesburg market.

In 1935 the *Uniegraan Koöperatiewe Maatskappy Beperk* was introduced and endured until 1998 when the Grain Silo Industry (Pty) Ltd was established. Agbiz Grain was introduced as part of Agbiz in 2014. The South African storage sector handles and stores yellow and white maize, sorghum, soya beans, sunflower seed, canola, wheat, barley and groundnuts. The average size of a silo complex is approximately 70 000 tonnes.

Agbiz Grain's members collectively handle and store 70% of grain and oilseeds produced in South Africa in 380 silos. Agbiz Grain represents the formal handling and storage sector that stores grain and oilseeds for commercial purposes. Our members do not include producers that handle and store grain and oilseeds on-farm for own use.

However, the majority of our members have producers as shareholders in their companies. Furthermore, our embers collectively own 98% of all the Johannesburg Stock Exchange (JSE) registered storage sites. Exporters should source stock from storage sites that are registered with the JSE.

Export management

We manage export protocols at a cost to comply with the exporter's specific food safety requirements concerning the producer's product delivered to our silos. From a handling and storage view our members can engage in the export trade in collaboration with traders between the silo and export ports on behalf of their shareholders and clients.

- Follow these links to view our rail network in South Africa as well as the location of Agbiz Grain members: Rail network: *www.agbizgrain.co.za/content/resources?page=storage-structures.*
- Our members can be accessed on our Agbiz Grain website: *www.agbizgrain.co.za/content/about-us?page=ag-members.*

Grain safety in storage

We guarantee the safe handling and storage of the export product. Our members underwrite the *Agbiz Grain Food Safety Conduct*. Agbiz Grain members are regulated by the *Agricultural Product Standards Act, 1990 (Act 119 of 1990)* or *APS Act*. The act facilitates trade by prescribing the sampling, classing and grading of commodities. We comply with the export requirements set by the Department of Agriculture, Land Reform and Rural Development (DALRRD).

The Perishable Products Export Control Board (PPECB), an assignee of the DALRRD, inspects our storage sites to ensure that they meet Hazard Analysis Critical Control Point (HACCP) requirements. Our members comply with the requirements for approved silos set by the JSE, and are inspected by the JSE and audited by the South African Grain Information Service (Sagis).

Agbiz Grain food safety conduct

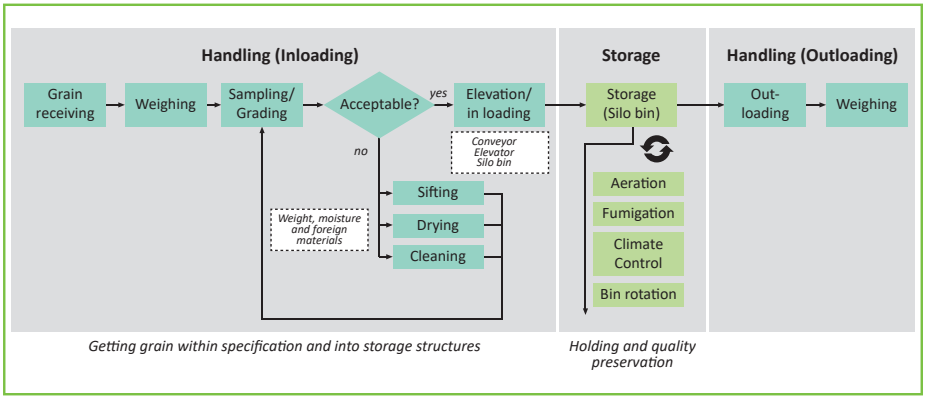
What is the conduct? The conduct explains how the storage operator and its activities are managed or directed. The client/producer declares that he/she has kept the required records and is legally compliant in terms of chemical product usage and application, prevention of contamination and that he/she is aware of and compliant with any additional legislation that may apply to a client/producer.

By signing the storage contract and/or submitting to the harvest rules of the storage operator, the client declares that the grain in storage has been produced in strict compliance with the *Fertilizers, Farm Feeds, Seeds and Remedies Act 36, 1947 (Act 36 of 1947)*. The client is also bound to the *Agbiz Grain Food Safety Conduct*. The declaration by the client is a formal and confident statement confirming that the grain and oilseeds delivered for storage to the storage operator have been produced in strict compliance with the *Act*.

The storage operator declares that it complies with the following South African legislation related to food safety:

- *Agricultural Product Standards Act, 1990 (Act 119 of 1990).*
- *Foodstuffs, Cosmetics, and Disinfectants Act, 1972 (Act 54 of 1972).*
- *Hazardous Substances Act, 1973 (Act 15 of 1973) or HAS.*

Figure 1: Handling and storage processes at a traditional concrete or steel silo.



The storage operator declares that food and animal feed safety and hygienic practices are applied during the handling and storage of whole grain and oilseeds, in a safe and hygienic environment, and in compliance with national grading regulations.

Confirmation by PPECB

The certificate issued by PPECB serves as confirmation that the storage operator complies with the following requirements for grain and oilseeds destined for the market:

- Food hygiene and food safety standards issued in accordance with section 4(3)(a)(ii) of the *APS Act*, and promulgated in notice R707 of 13 May 2005.
- Registration with the Department of Agriculture, Forestry and Fisheries as a food business operators (FBOs). Each site receives its own FBO number and certificate.
- Each registered establishment is allocated a unique FBO code and is audited on a three-year cycle by PPECB.
- That the FBO has been audited and includes all storage sites listed.

The *APS Act* and the PPECB

Agbiz Grain members comply with notice R707 of 2005, and APS Act standards regarding food hygiene and food safety of regulated products of plant origin intended for export as per section 4(3)(c).

The PPECB is an assignee of the DALRRD which audits Agbiz Grain members once every three years by focussing on:

- Critical control points (CCPs) e.g. iron particles (magnets detect particles, weighing and monitoring).
- Good manufacturing practices e.g. the moisture with maize in storage must be below 14%.

The PPECB can withdraw the certificate of compliance if a member does not comply following a quality control inspection by them. The PPECB inspects each consignment before export to comply with the *APS Act* (relevant grading regulations, e.g. maize grading regulations). A PPECB certificate can be obtained from our members.

Storage sector legislation

The following regulatory aspects apply to the storage sector:

- Legislation and amendments.
- Statutory measures and levies.
- Legislation applicable to the grain and oilseed industry.
- Food safety and food hygiene.
- Sagis.
- Dispensation.
- SHEQ legislation and regulations.
- Proficiency testing.
- Disputes and arbitration.

Visit *www.agbizgrain.co.za/content/legislation?page=important-publications* for more information.

JSE requirements for silos

See the detailed agricultural contract specifications of 2021, *Appendix A: Approved silos, Appendix B: JSE silo receipts and Appendix C: Requirements for Approved Storage Operators* concerning:

- Financial standing.
- Experience, expertise and equipment.
- Legal standing.
- Compliance with the rules of the JSE and terms of the Agricultural Derivatives Contract.
- Record-keeping, inspection and reporting.
- Further duties of the storage operator.
- Insurance.
- Handling procedures.
- Outloading conditions and procedures to access products represented by the JSE silo receipts.
- Appendix D: Requirements of Approved Silos.
- Appendix E to I.

Financial standing

The storage operator must be in good financial standing and credit, and must have an ongoing net financial worth as determined by the storage capacity of the storage operator.

JSE Sagis requirements

The storage operator must provide the JSE with a copy of all Sagis audit letters resulting from physical audits within seven days of receiving it. The letters will be used to assess the storage operator's ability to meet their storage obligations.

JSE insurance requirements

Storage operators must have current and adequate insurance policies in place with reputable insurers as determined by the JSE ensuring that the silo buildings, equipment and all commodities stored therein are comprehensively insured against the following minimum risks:

- Fires, earthquakes, earth tremors, malicious damage, storms, flooding, spontaneous combustion and explosions, lightning, terrorism, theft, and public violence.
- The storage operator must also have insurance in place to cover damages suffered as a result of fraud by its employees.

Table 1: Net financial worth required from storage operators (includes all registered delivery points).

Silo capacity in tonnes	Rand
≤ 20 000	20 000 000
20 001 to 40 000	40 000 000
40 001 to 150 000	60 000 000
150 001 to 300 000	120 000 000
300 001 to 600 000	240 000 000
600 001 to 1 200 000	480 000 000
1 200 001 ≥ 2 000 000	1 000 000 000

JSE silo requirements

The approved silo must have a minimum storage capacity of 10 000 metric tonnes (maize equivalent) and the necessary mechanical equipment in working order for the effective and expeditious inloading, storage and outloading of grain in bulk.

The property where the registered silo is situated must be owned by the storage operator or a minimum five-year lease of the property must be in place.

In conclusion

All Agbiz Grain members comply with the requirements of the *APS Act* and the *Agbiz Grain Food Safety Conduct*.

Make sure your storage partner:

- Is audited by the PPECB for HACCP purposes.
- Has an FBO code.
- Is certified by the PPECB for export.
- Has JSE registered storage sites that have to comply with the JSE requirements and are therefore audited by Sagis.

Our members can assist you with specific needs required by your export protocol and are also engaged in export trade.

For more information, contact Agbiz Grain at 012 807 5600 or email the author at wessel@agbizgrain.co.za.

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VKB and GWK: A merger of note

By Koos du Pisanie, Plaas Media

The merger of VKB and GWK is approaching the end of its first year of joint operation, and it is evident that this strategic decision was a sensible one for the role-players involved.

This newly formed group covers most of the country (all areas previously serviced by VKB, NTK and GWK), from Limpopo, Gauteng, Mpumalanga and the Free State to the Northern Cape, some parts of KwaZulu-Natal, the Eastern Cape and North West, and with an office in the Western Cape.

The merger was strategic, driven by their shared strength as agribusinesses. Before the merger, each company operated in different geographical regions within corresponding agricultural sectors. This included grain trading and procurement, grain processing into various products, retail outlets focussed on agriculture, and financial services for producers and affiliated organisations. The merger promises added benefits for their customers, clients and industry role-players, and will strengthen their role as a valuable link in the value chain.

Economies of scale

By merging their activities and projects, cost savings can be achieved through joint purchases, shared infrastructure, and streamlined processes. This allows the combined group to explore opportunities that can enhance their competitiveness in the market, enlarge their market share and support improved bargaining power, which ultimately means better prices.

The larger company can diversify in terms of products, services and geographic region. Diversification is a pillar of resilience during difficult times and is crucial, especially given agriculture's unpredictable nature.

Risk limitation

In today's economic landscape, risk limitation is vital. By spreading risk across the merged companies, the group aims to bolster their resistance to market fluctuations.

The agricultural sector has had to face several challenges the past few years, including devastating outbreaks of bird flu, persistent drought conditions in regions such as the Northern Cape, Limpopo, Free State and Mpumalanga, and continuous issues relating to loadshedding. In addition to these pressures, there are the ongoing issues at our ports that severely constrain imports and exports, the country's crumbling rail network, and last but certainly not the least, the cost-price squeeze that impacts producers' financial stability.

Agricultural industries, in response to these challenges, must optimise their operations. By doing so they can improve their service offering, customer/client support and value chain management.

Research and development

The merger supports research and development initiatives. The combined group's shared resources will accelerate innovation, ultimately delivering products and services that will benefit their customers/clients.

Agriculture often faces a gap in effective research. The merger presents an opportunity to invest in high-quality research that can contribute to the sustainability of agriculture through world-class products and services that can make a difference.

Employee benefits

The VKB and GWK merger brought together skilled employees, fostering the exchange of knowledge and expertise.

The combined business gave the assurance that no merger related layoffs would be made for 36 months from the effective date. Eligible employees will also share in the benefits of employee trusts. Furthermore, the companies believe that employees now have an even greater potential for career development and growth, as well as training and exposure to different roles within the company as part of one of South Africa's largest agricultural businesses.

Financial synergy

In terms of the financial outlook, mergers such as this bring with it pooled financial resources, reduced administrative costs, and optimal capital allocation that contribute to optimal financial performance. This positive impact is most pronounced when the integration process, which typically spans several years, is executed meticulously and judiciously.

This May, the group will be in operation for a year. Neil de Klerk, regional director of GWK, emphasises that a structured and comprehensive process is being followed under the guidance of the GWK/VKB integration committee. This committee collaborates closely with the executive leadership team of the group to steer the integration process.

Beyond the committee's input, the dedication of the group's employees is noteworthy. Not only do they embrace the changes they need to navigate daily, but they stay focussed on utilising opportunities at a professional, personal and business level.

However, they do recognise the need for diligent effort, caution, and directing attention to critical aspects to fully realise the merger's potential over time. While immediate fireworks are not expected, the group remains steadfast in its commitment to sustainability, growth and adding value for stakeholders in the long term. This is what truly matters and the reason for this merger.

The group will review and keep key stakeholders informed of progress made during the first year of joint operation, a milestone that will be reached at the end of May 2024.

For more information, visit *www.vkb.co.za* or *www.gwk.co.za*.

The impact of PPI on storage tariffs

By Wessel Lemmer, general manager, Agbiz Grain

Agbiz Grain acknowledges that the Johannesburg Stock Exchange (JSE) is shifting away from the producer price index (PPI) model. However, Agbiz Grain advocates for additional investigation and refinement of the basis calculation.

The JSE announced its intention to review the current base rate across all products in a recent *Market Notice* and invited parties to submit information before 7 May 2024 to assist in fulfilling regulatory responsibilities.

The JSE, according to the *Market Notice*, is obliged to ensure a fair, efficient and transparent market for the securities listed and traded on its exchange. Any uncertainty regarding the constituent elements affecting the value of these listed securities would conflict with the JSE's objectives and be detrimental to its purpose.

The cost of storage

The *Market Notice* explains that storage costs are an important factor in determining the value of commodities delivered to fulfil futures contracts. For this reason, the JSE contract specifications, with specific reference to the terms recorded on the JSE silo receipts, expressly state that storage costs have been paid up to a certain date. Market participants are free to negotiate and agree on storage fees they find appropriate, without JSE involvement or prescribed amounts that may be charged in respect of the storage of these commodities.

However, situations may arise where outstanding storage fees are payable by the holder of a JSE silo receipt that has been delivered in fulfilment of the short position holder's obligations in terms of a listed futures contract. The storage operator holds a lien over the commodity until these storage costs are settled, ensuring payment before the commodity owner can take delivery.

Importantly, the storage operator and the owner of the commodity are free to negotiate and agree on the amount of outstanding storage that must be paid.

The *Market Notice* explains, however, that storage operators must not be in a position to charge just any amount they deem fit, especially in light of the lien that they hold over the commodity pending the payment of the outstanding storage fees. It would be an anathema to a fair, efficient and transparent market in the commodity derivative securities traded and listed on the JSE if the storage operator can unilaterally determine the outstanding storage rate and/or if there is no certainty regarding the maximum amount of outstanding storage rate (JSE maximum storage rate) that may be charged.

Maximum rate

An apposite example is the maximum rate of interest prescribed in terms of the *Usury Act, 1968 (Act 73 of 1968)*. In banking, borrowers and banks may negotiate and agree on any interest rate they deem appropriate, but it may not exceed the statutory maximum rate. Likewise, the JSE sets a maximum rate of outstanding storage after carefully considering available facts and information. The rate is adjusted annually based on the producer price index (PPI) provided by Stats SA.

The JSE states in the *Market Notice* that last year, initiated an evaluation to ensure that the base rate used in calculating the JSE maximum storage rate reflects actual storage costs, and also to determine whether it is market-related. According to the JSE this is important, as factors and circumstances that have changed substantially could influence storage costs. Factors such as backup power supply (to mitigate load shedding) and additional fuel costs may impact expenses. The JSE maximum storage rate must reflect actual storage costs.

Comparison of JSE and WASR

During this assessment, the JSE considered the storage rates charged by storage operators. A weighted average

Table 1: JSE storage rate applicable to each product per marketing season referencing 2023 data. (Source: *JSE Market Notice*)

Registered product	JSE maximum storage rate	Weighted average storage rate
Maize (white and yellow)	R1,07 t/day	R1,15 t/day
Soya beans	R1,13 t/day	R1,16 t/day
Sunflower seeds	R2,15 t/day	R2,20 t/day
Wheat	R1,30 t/day	R1,39 t/day

Table 2: Comparison of JSE and CME storage rates in 2018. (Source: JSE, CME, SAGIS and Agbiz Grain calculations)

	Daily storage	Monthly storage	Price	Cost as a percentage of the price
CME	0,05c/bushell	US$1,97/t/month	US$ 154/t	1,28%
JSE	R0,76c/t	R22,80/t/month	R1 791/t	1,27%

Table 3: Comparison between JSE and CME storage rates in 2023. (Source: JSE, CME, SAGIS and Agbiz Grain calculations)

	Daily storage	Monthly storage	Price	Cost as a percentage of the price
CME	0,06c/bushell	US$2,33/t/month	US$208/t	1,12%
JSE	R1,07/t	R32,10/t/month	R3 603/t	0,89%
Required JSE daily storage rate to equal United States daily storage rate				
JSE	R1,34	R40,20/t/month	R3 603/t	1,12%

Figure 1: JSE versus CME storage cost as a percentage of the spot price for maize.

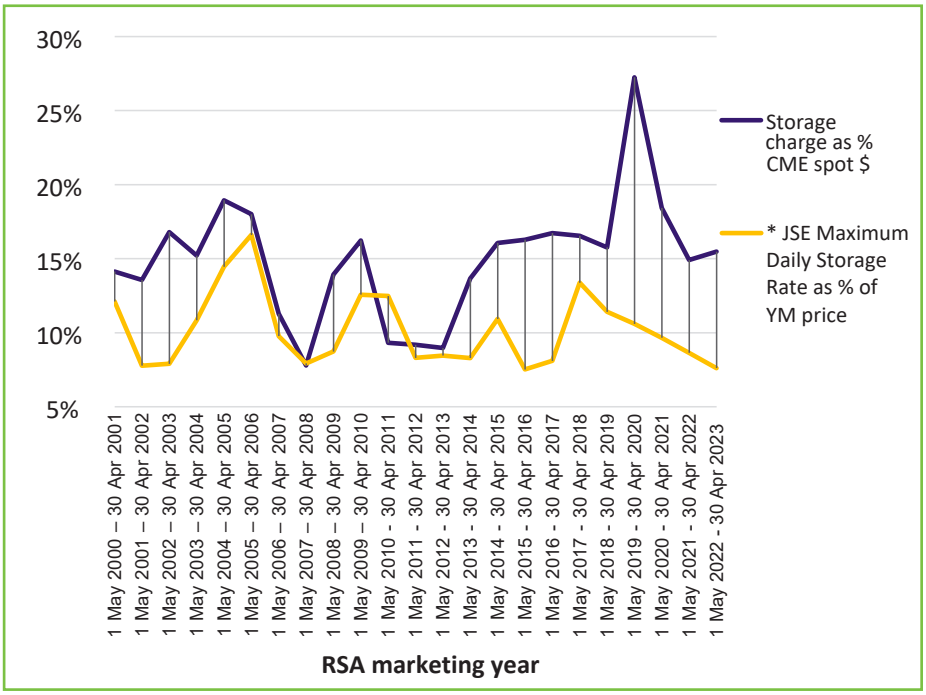
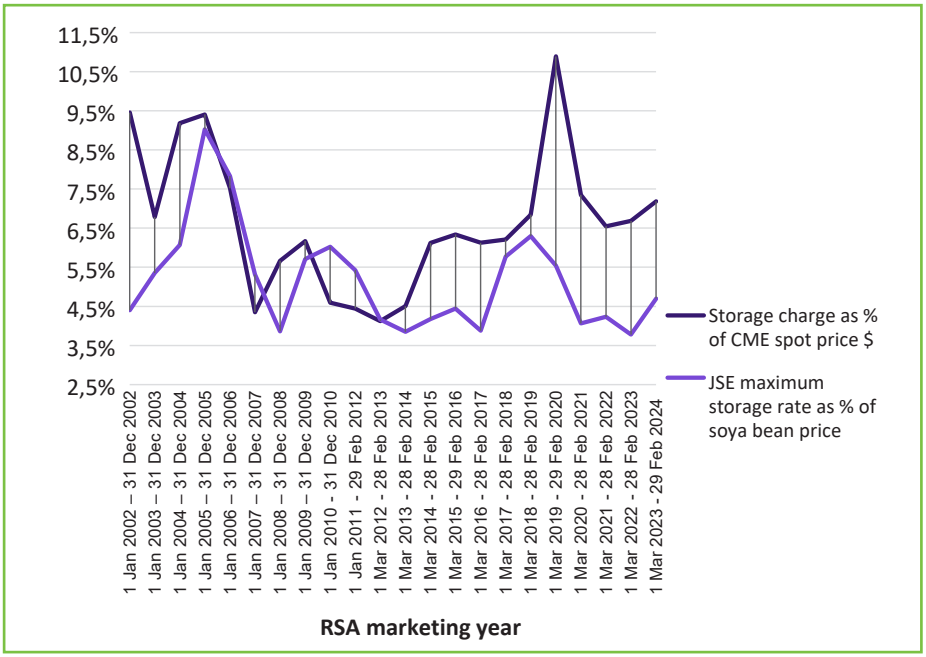


Figure 2: JSE versus CME storage cost as a percentage of the spot price for soya beans.



storage rate (WASR) based on registered JSE capacity per product was calculated. According to the *Market Notice* the results revealed that the JSE storage rates imposed are lower than the WASR, indicating that the JSE's maximum storage rate for outstanding storage does not align with the average rate applied by JSE storage operators.

Given that the current JSE storage rate is lower than the WASR, the JSE has decided to review the current base rate across all products. Interested parties were invited to provide the JSE with any facts and information that may assist it in exercising its regulatory responsibilities and to independently submit proposals on the JSE storage rates. Interested parties were requested to also provide the JSE with any supporting documents and facts to motivate their submissions and suggestions before 7 May 2024.

The Agbiz Grain perspective

Agbiz Grain appreciates the JSE's acknowledgement, as published in the *JSE Market Notice*. that significant changes in factors and circumstances impact storage costs. These changes include the installation of a backup power capacity and additional fuel costs. The JSE's maximum storage rate for outstanding storage must reflect actual storage costs.

Furthermore, Agbiz Grain believes that this is not the only reason to consider an adjustment, but that the use of the PPI of final manufactured goods should be further investigated to justify its use to adjust the JSE maximum storage rate annually. In the long term, the PPI of final manufactured goods may not adequately reflect the increase in the actual storage rates experienced by storage operators.

Reasons for further investigation

When comparing the long-term annual adjustments between the JSE maximum storage rate and the Chicago Mercantile Exchange (CME) storage rate, it becomes

evident that the CME daily storage rate is subject to a significantly higher rate of increase over time than the JSE storage rate.

The CME storage rate compared to the JSE maximum storage rate is consistently higher as a percentage of the commodity price (*Figure 1* and *2*).

The PPI of final manufactured goods is an index based on the final manufactured product. Handling and storage should be adjusted to a service-based index representing services and not the value of final manufactured goods in manufacturing. Services include electricity, fuel, water, construction, transport, storage, communication, finance, real estate, business services, and community and personal services.

The Department of Agriculture, Land Reform and Rural Development publishes an annual other services index in the *Abstract of Agricultural Statistics*, which reflects the cost of handling and storage services in agriculture, including storage (*Figure 3*).

The gross value of field crops increased significantly more than the JSE maximum storage rate. It is not only the cost of electricity and backup power that needs to be considered when adjusting the JSE maximum storage rate, but also the cost of insurance and financing of the stock being stored (*Figure 4*).

The JSE requires guarantees from JSE-registered storage operators in the event of default by a storage operator, but the annual JSE storage adjustment does not sufficiently cover the increase in insurance and financing costs.

Since 2019, the gross value of individual products and the on-farm fixed improvement index have increased significantly more than the JSE maximum storage rate.

Figure 3: Annual gross value added (industry indices) versus JSE maximum storage rate commodities index 2 000=100.

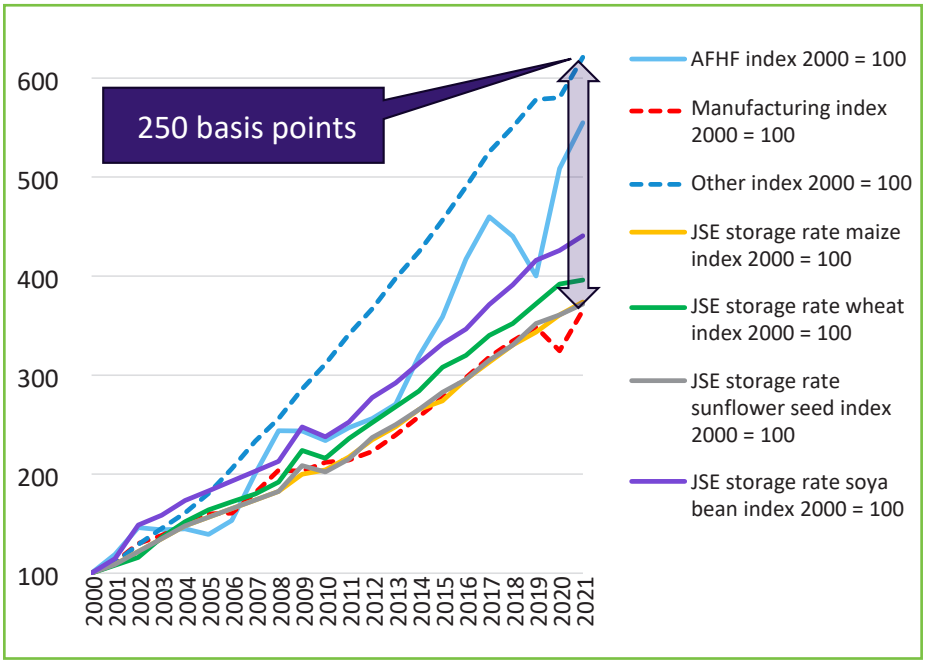
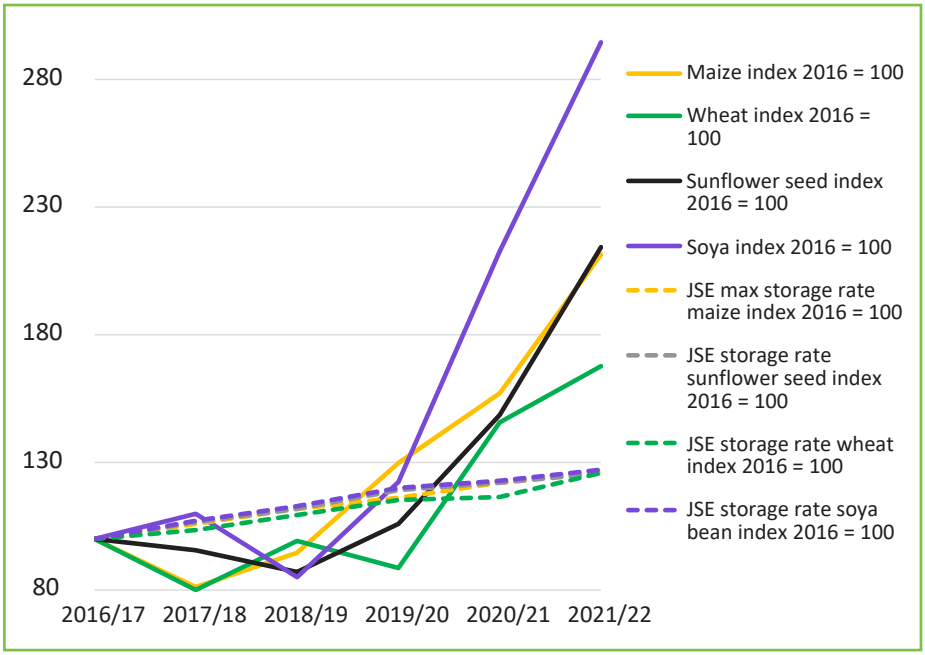


Figure 4: Gross value of individual product indices versus JSE maximum storage rate index.



The JSE maximum storage rate as a percentage of the underlying commodity trends lower over the long term (*Figure 5*) while the CME storage percentage of the underlying commodity trends higher.

In conclusion

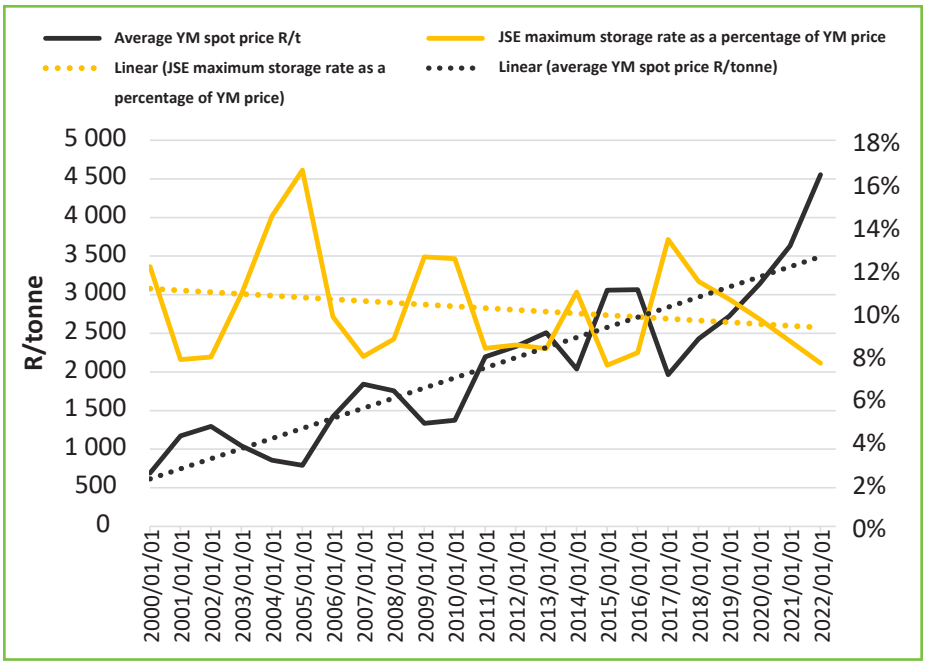
There is sufficient evidence to support an investigation into the applicability of using the PPI of final manufactured goods to adjust the JSE maximum storage rate annually and to motivate a correction in favour of the JSE storage rate.

The CME storage rate is consistently higher than the JSE's maximum storage rate as a percentage of the commodity price, while the JSE's storage rate follows a declining trend.

The PPI for final manufacturing goods is an index based on the final manufactured product. Handling and storage should be adjusted according to a service-based index. The other services Index published annually in the *Abstract of Agricultural Statistics* is 250 basis points higher than the PPI of final manufactured goods.

The JSE reviewed the base rate by the end of 2011 and adjusted the base rate by using the PPI of final manufactured goods.

Figure 5: Comparison of the average yellow maize (YM) spot price versus the JSE maximum storage rate as a percentage of the YM spot price (R/t).



The increase in the JSE storage rate compares unfavourably with the increase in the gross value of commodities that underlie insurance and finance.

Since 2019/20 the gross value index increased by:

- 600 basis points above the JSE storage rate index for maize.
- 300 basis points above the JSE storage rate index for wheat.
- 560 basis points above the JSE storage rate index for sunflower seed.
- 5 200 basis points above the JSE storage rate index for soya beans.

The gross value of individual products all increased since 2019 above the JSE storage rate (base year 2016/17). On-farm fixed improvements and machinery increased above PPI. The use of the PPI on final manufactured goods as the applicable indicator and the revision of the JSE base rate to annually adjust the JSE maximum storage rate is long overdue.

For more information and references, contact Wessel Lemmer at wessel@agbizgrain.co.za or visit *www.agbizgrain.co.za*.

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Hazards and risks of grain fumigation

By Dr Gerhard Verdoorn, CropLife South Africa

Various grain species and varieties form the staple food of most of the world's human and non-human population. Rice is probably number one, followed by wheat, then maize and then the rest such as sorghum, millet, and the like. Due to these crops being annual, harvesting is done over a short period, after which the grain is stored and released to the market locally or exported as the demand for it rises and subsides.

Any foodstuff that is stored in bulk, or even as processed grain in domestic households, attracts insect pests and often also fungal infections. Stored grain pests can have a devastating impact on the quality and volume of such grain and must be controlled, especially if the grain is destined for export markets.

Controlling stored grain pests is a specialised field of pest control and the greater the volume, the more specialised the treatment becomes. For a smallholder storing a few bags of grain for own use, it is possible to treat the bags with a deltamethrin/piperonyl butoxide spray to fend off undesired insect pests; it is also desirable to use this treatment in larger facilities such as cooperatives where grain is stored in large bags for retail sales.

When it comes to grain stored in silos – which may house as much as 8 000 tonnes of grain – spray treatment is hardly a feasible option and fumigation is about the only viable treatment protocol to remove stored grain pests. Regular checks are done by silo operators for reinfestation to ensure that stored grain remains pest free.

Pesticides and fumigants

Grain fumigants fall into two groups of chemicals: the phosphine generators – aluminium phosphide and magnesium phosphide – and sulphuryl fluoride. All these active ingredients are registered under various brands in South Africa for grain fumigation, but most are restricted for sale to and use only by registered pest control operators. The reason for this restriction is due to the high toxicity of the products for humans.

The reaction time depends on ambient temperature and atmospheric humidity. The warmer and more moist the atmosphere is, the quicker the reaction and the faster the rate of phosphine gas generation.

In silos where the temperature and humidity are both held in close check to preserve the grain, the release of phosphine gas is slow in the case of aluminium phosphide and slightly faster in the case of magnesium phosphide.

Both substances thus generate phosphine gas over time to kill stored grain insects highly effectively. The phosphine gas penetrates throughout the grain in the silo and it is therefore safe to assume that no insects will survive a well co-ordinated fumigation effort.

Aluminium phosphide tablets (left) and magnesium phosphide plates (right). Magnesium phosphide (Mg_3P_2) and aluminium phosphide (PH_3) react with atmospheric moisture to release phosphine gas (PH_3): $AlP + 3\ H_2O \rightarrow Al(OH)_3 + PH_3$.

Phosphine toxicity

Phosphine is highly toxic to insects and vertebrates such as humans. One of the misconceptions is that phosphine is

People conducting grain fumigation with phosphine generators who wear their respirator masks and full body cover, have nothing to be concerned about. A respirator mask is non-negotiable.

an organophosphate substance; that is incorrect as it acts differently to a typical organophosphate in a human body. Phosphine has a garlic odour and if its smell is present in an area where phosphine generators are present, one should leave the area immediately.

Another misconception is that it will trigger an immediate toxidrome (severe toxicity symptoms) in a person who inhales the fumes. That is not true. Despite phosphine being very toxic to humans it does not trigger an immediate response. What typically happens if a person inhales a small amount of phosphine gas over a short period is that he/she develops severe nausea and emesis (vomiting) three to four hours after inhalation, combined with disorientation, incoherent speaking, dizziness, and mild shivering.

This may continue for as long as four hours, and a mistake often made by medical professionals is to treat the person with atropine sulphate as for organophosphate poisoning. This treatment has no effect because as mentioned, phosphine is not an organophosphate insecticide.

In cases where people are exposed to prolonged inhalation of phosphine gas, the situation is much more dire and may be fatal. The toxicity of phosphine for inhalation is LC_{50} = 0,015mg/ℓ air over – that means a person inhaling air with that minute concentration of phosphine gas in the air may die within four to eight hours after inhalation. Phosphine is certainly not a gas one wants to be in contact with for any length of time.

The safety factor

People conducting grain fumigation with phosphine generators who are wearing their respirator masks and full body cover, have nothing to be concerned about. The chemical filters remove the phosphine from the breathable air and if they wear their chemically inert suits, the gas cannot penetrate it. However, if a person is foolish enough to not wear the protective clothing, the hazard becomes an immediate risk for the person with potentially fatal effects.

The question, though, is why such a highly hazardous substance is used to fumigate grain? Is it not a risk for food safety? Once again, the risk can be mitigated to zero if the phosphine generators are applied while wearing appropriate safety clothing, using the correct dosage and keeping strictly to the withholding period of 14 days after having applied the phosphine generators in the grain.

It does sound strange but look at the chemical reaction of phosphine with oxygen: $PH_3 + 3/2O_2 \rightarrow P2O_5 + H_2O$. Phosphine is therefore oxidised to non-toxic phosphorus pentoxide which reacts with water to form phosphoric acid (an inorganic acid used in some famous soft drinks).

Therefore, in summary: Phosphine gas is very toxic when inhaled, but in the silo it takes care of stored grain pests and oxidises and hydrates to become phosphoric acid. Risk factor if used correctly: NIL. Risk factor if used irresponsibly: VERY HIGH.

People who accidentally or wilfully swallow aluminium phosphide tablets stand no chance of survival. People who unknowingly inhale phosphine gas over a prolonged period stand no chance of survival simply because it is a neurotoxin that rapidly shuts down the central nervous system if inhaled in large volumes, putting the person in a coma with death awaiting them.

Yet, for grain fumigation, if used correctly following all precautions, there is hardly anything that beats the low risk posed by the product. The main issue is to keep the phosphine generators out of the hands of untrained and uninformed people because for them the risk is extreme. Only professional fumigators who are registered as pest control operators should be handling and using phosphine generators for grain fumigation.

Sulphuryl fluoride

Methyl bromide was widely used as a fumigant, but due to its classification as a Class 1 ozone-depleting chemical, is it rapidly disappearing from the market. Sulphuryl fluoride has taken its place and is rapidly replacing methyl bromide as a fumigant in structural and other / fumigation. It is a substance that demands much more skill and specialised equipment than the phosphine generators, and is only available to professional pest control operators who are registered as fumigators and have been certified by the manufacturers of the products acquired and applied.

It is much less toxic than phosphine with an LC_{50} value of 5,8mg/ℓ over four hours, but its use still demands the wearing of special personal protective equipment and using the dedicated application equipment required to apply it effectively and safely. It is only available in pressurised gas cylinders and not in any solid form like the phosphine generators.

The gas is odourless and if inhaled will cause respiratory irritation, pulmonary oedema, nausea, vomiting, seizures, and eventual death if a person is exposed to it over a prolonged period. It inhibits the

uptake of oxygen and can thus kill a person by suffocation. The gas is highly volatile just like the phosphine and has a lifespan of three hours to ten days depending on the conditions in which it was applied. The question arises again, as with the phosphine, is it safe to fumigate grain with sulphuryl fluoride?

How it kills insects is by oxygen deprivation (as with people who may be exposed to large quantities of it), but its volatility prevents it from really posing a risk to people who don't work with it directly. Sulphuryl fluoride breaks down into fluoride and sulphates, the latter of which is of no real health concern to people, but fluoride is.

There is a strong call for residue analysis of grains that were treated with sulphuryl fluoride due to the fluoride residues it leaves on the grain. A single treatment can hardly warrant any concerns, but if the grain is treated successively with it, the concentration of fluoride may breach the maximum residue limit in the grain.

Take note that fluoride is an essential element for people (think dental health), but too much of a good thing is never good. That is why the grain storage industry in South Africa monitors grain for pesticide and other chemical residues meticulously to ensure that grain quality and safety are of the highest order.

Risks for individuals

The risk for people spraying bagged grain with deltamethrin/piperonyl butoxide is extremely low because of the very low toxicity of the product. However, it does not mean the person should not wear personal protective clothing. CropLife SA is adamant that personal protective clothing is a must for any application of any pesticide. When it comes to sulphuryl fluoride, the individual has no chance of laying hands on the product due to the restriction of it to professional pest control operators only.

Many phosphine generators are still available to individuals who are not registered as pest control operators (for now), and these individuals and their workers must ensure they wear protective clothing and respirator masks when working with it.

There have been many serious poisoning incidents, as well as many deaths due to irresponsible and reckless use of phosphine generators, which drew attention from the regulatory authorities. There is a very real possibility that all phosphine generators will be restricted to professional pest control operators only in the near future, so if you are a person doing your own grain fumigation, get onto a pest control operator course for grain fumigation and have yourself registered as professional pest control operator. Courses are offered by the Pest Control Industry Training Academy. Visit www.pcita.org.za for more information.

Always wear personal protective equipment because it is much cheaper than hospitalisation in the case of poisoning. Check the CropLife SA website for resources about personal protective equipment.

For more information, phone Dr Gerhard Verdoorn on 082 446 8946 or email gerhard@croplife.co.za.

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Performance of a superamphiphobic self-cleaning passive sub-ambient daytime radiative cooling coating on grain and oil storage structures

By Yuanzhu Cai, Zihan Zhang, Zhuo Yang, Zhi Fang, Shuping Chen, Xiaolong Zhang, Wen Li, Yinghua Zhang, Hongqiang Zhang, Zhipeng Sun, Yangang Zhang, Yanwen Li, Lianhua Liu, Weidong Zhang and Xiao Xue

The thermal performance of novel exterior coating material for commonly used grain structures was investigated. Grain structures included a concrete squat silo. The exterior coating provided excellent moisture runoff and solar reflectance properties and is best described as a superamphiphobic self-cleaning passive sub-ambient daytime radiative cooling (SSC-PSDRC) coating.

The coating exhibited a remarkable sub-ambient daytime cooling effect in various structures in different climatic regions. Compared with the roof surface temperatures of a cool white-coated concrete grain silo, those of the PSDRC-coated top surfaces could be reduced by 37°C.

Consequently, the interior temperature of the wheat pile in the PSDRC grain silo was 10°C lower than that in the control squat silo.

Impact of the PSDRC coating

The coating showed impressive superamphiphobic self-cleaning capabilities and super ageing resistance. The wide applications of the coating would have far-reaching, global implications for maintaining grain, particularly in subtropical climates.

Low-temperature grain storage is one of the most important measures for ensuring the quality of stored grains. It can inhibit respiration, extend storage time, prevent insect infestations and mould growth, and maintain physiological properties.

Mechanical cooling technologies, including ventilators and vapour compression refrigerators, are employed to cool stored grain below 14 or 15°C. Cost-effective mechanical ventilators alone did not reduce grain temperature to the desired value during the sweltering summer and autumn months.

Moreover, ventilation with dry and cold air may compromise the grain quality. Although an electrically powered vapour compression refrigeration system can effectively cool the grain temperature to a preset temperature, the cooling process involves cooling and dehumidifying ambient air to avoid condensation of moisture in the grain mass, and subsequently reheating the air to an appropriate temperature before entering the headspace, inevitably consuming large amounts of electricity.

PSDRC cooling

Because solar radiation has a significant impact on grain temperature and moisture

Typical grain silos in Chongqing Municipality, China. (a) Overhead view of the silos without the SSC-PSDRC coating; (b) groundview of the silos with and without the SSC-PSDRC coating; (c) bird's-eye view of the partial roof surface painted with the SSC-PSDRC coating; (d) interior view of the silo while installing the thermistor to measure interior temperatures of the wheat piles.

content, passive sub-ambient daytime radiative cooling (PSDRC) coatings with solar reflectances of more than 0,94, and sufficiently high emissivity values can be employed to significantly reduce the surface temperature of storage warehouses and further decrease the grain temperature via heat conduction and convection.

Since the first successful observation of passive radiative cooling below the ambient air temperature under direct sunlight, various materials with white colour have been developed to enhance PSDRC. Unfortunately, owing to the build-up of dust and grime, water-soluble and oily contaminants, the high solar reflectance of white surfaces exposed to the outdoor environment might attenuate over time to lose the sub-ambient cooling effect under direct sunlight. It is imperative to impart self-cleaning capabilities to these radiative cooling surfaces.

Superhydrophobic surfaces have widely been used for self-cleaning or water-harvesting purposes. Still, superhydrophobic surfaces are inclined to be contaminated by oil, whose low surface free energy (SFE) might destroy the air chamber in the surface texture and make the surface transform from the Cassie-Baxter model to the Wenzel model, resulting in the loss of superamphiphobicity. Therefore, superamphiphobic coatings with both superhydrophobicity and superamphiphobicity have aroused extensive research interest in recent years.

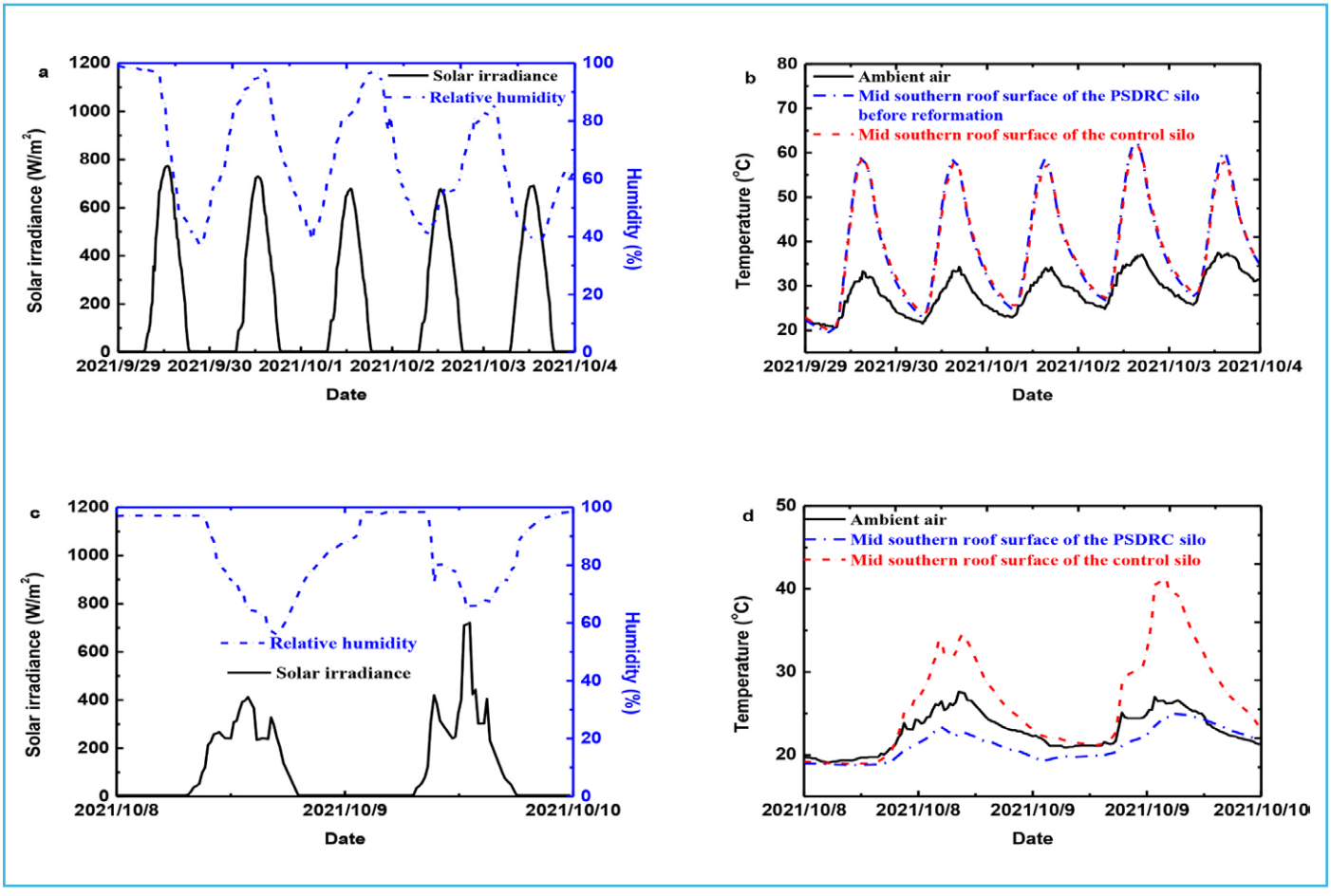
Studies

In a previous study, the SSC-PSDRC coating was applied to a concrete-based model of squat silo. The height and diameter of the cylinder part were 1,5 and 1m, respectively, and the height of the cone was 0,2m. The coating reduced the top surface temperature of the model to an equilibrium temperature below that of the ambient air by 6,4°C. The differences between the maximum top surface and silo interior temperatures of the PSDRC and control cool-white models were 9,8 and 4,8°C, respectively.

The influence of sunlight

Inspired by the prominent sub-ambient cooling effect of the superamphiphobic PSDRC coating over the model silo under direct sunlight, the product was applied to a large squat silo (H/D = 29/15), in different regions, and performed field tests. In this study, field tests were performed and the sub-ambient cooling effect of the PSDRC coating under direct

Figure 1: Weather and temperature data for grain silos in Chongqing during 2021: (a) solar irradiance and relative humidity from 28 September to 3 October 2021; (b) ambient air and mid-southern roof surface temperatures before the sub-ambient cooling reformation during the aforementioned testing period; (c) solar irradiance and relative humidity from 8 October to 9 October 2021; (d) ambient air and mid-southern roof surface temperatures with and without the SSC-PSDRC coating.



sunlight over different storage structures is presented.

The surface, headspace air, grain interior, and oil interior temperatures of the PSDRC and control squat silos are compared. Furthermore, the super-dirt-resistant and aging-resistant properties of the SSC-PSDRC coating are discussed in detail.

Results

Figure 1 shows weather and temperature data for grain silos before and after the application of the SSC-PSDRC coating. On four sunny days with moderate relative humidity, before the application of the PSDRC coating (*Figure 1a*), the middle-southern roof surface temperatures of the PSDRC and control silos were nearly identical and well above the ambient air temperature (*Figure 1b*), indicating that they were comparable.

On two rainy and cloudy days, immediately after one silo was painted with the SSC-PSDRC coating (*Figure 1c*), the middle-southern roof surface temperature of the PSDRC silo drastically fell below the ambient air temperature day and night, whereas that of the control silo was still considerably higher than the ambient air temperature during the day (*Figure 1d*).

During the test period from 3 to 8 December 2021, the strongest solar irradiance was 476,9W/m^2 and when relative humidity was high. However, after the SSC-PSDRC coating was applied, the sub-ambient daytime cooling effect under direct sunlight of the middle-southern roof surface and the middle-western roof surface was fairly prominent. After six months, the daytime middle-southern roof surface temperature of the SSC-PSDRC silo was noticeably lower than the ambient air temperature and substantially lower than that of the control silo.

Conclusions

SSC-PSDRC coating products of different colours were practically applied to large grain silos. The coatings exhibited prominent sub-ambient cooling effects under direct sunlight over different structures. When applied to large grain silos in hot and humid Chongqing, the maximum sub-ambient temperature reduction was 6,6°C and the difference in the temperatures of the PSDRC and control roof surfaces was up to 37,1°C. Consequently, the wheat pile interior temperature was decreased by 10,1°C, relative to that of the control squat silo.

Applications

Owing to the superamphiphobic self-cleaning topcoat, the PSDRC coating exhibited excellent non-wettability to water. Furthermore, after five-cycle dirt-resistant tests, the solar reflectance of the SSC-PSDRC coating decreased by only 0,51%, whereas that of the PSDRC coating was reduced by 43%. In addition, after 1 000 hours of accelerated ageing tests, the appearance of the SSC-PSDRC coating remained as good as the initial state, and after 2 000 hours of accelerated ageing tests, the solar reflectance of the SSC-PSDRC coating was reduced by 2% ± 0,5% on an average.

The article was condensed for publication in *Agbiz Grain Quarterly*. To read the full article, visit *www.doi.org/10.1016/j.heliyon.2023.e14599* or email Weidong Zhang at zwdpt@sohu.com or Xiao Xue at xuexiao-1989@163.com.

Don't miss the 2024 Agbiz Congress

Emerging from the Covid pandemic in 2020, expectations for a prolonged period of global stability were quickly shattered as the reality of a war in the Black Sea region set in. We have since seen increased conflict around the world, leading to shifts in the geopolitical environment. This has prompted countries to re-examine measures that disrupt global trade, such as export and pricing controls that disrupt global supply chains. Likewise, the global community is battling to contain key plant and animal diseases while the threat of climate change looms.

However, business must go on and businesses must adapt to the changing global landscape. To reinforce Charles Darwin's theory: It is not the strongest of the species that survives, but the ones that are most adaptable to change.

With this as background, the theme of the 2024 Agbiz Congress deliberately acknowledges the changing global landscape, shifting the focus towards sustaining growth in this uncertain environment. We will start the congress off with a networking golf day on 5 June before delving deeper into the challenges the agricultural sector faces and a way to overcome them.

A relevant congress

On day one attendees can look forward to expert speakers who will share their insights on how to mitigate and adapt to the challenges posed by geopolitical, climatic, and social instability. There will be parallel panel discussions on trade risks, emerging narratives that impact agricultural policies, and opportunities in agro-processing.

On day two we will unpack environmental, social, and corporate governance and how to create value beyond compliance. The congress will end on a positive note with a panel discussion on finding opportunities in this uncertain environment by speaking to role-players who still see value in investing in South Africa. In line with the Agbiz culture, the congress aims to find solutions that will drive the sector towards prosperity.

For more information, visit *www.agbiz.co.za* or send an email to Liezl Esterhuizen at liezl@agbiz.co.za.

Transnet's draft *Network Statement* published for public comments

By Theo Boshoff, CEO of Agbiz

On 19 March this year, the Department of Transport published Transnet's draft *Network Statement* for public comments. The publication of the statement is a significant step towards implementing the *Freight Logistics Roadmap* adopted by Cabinet in November last year. The *Roadmap* seeks to unbundle Transnet Freight Rail into autonomous entities, namely an infrastructure manager that owns and maintains the rail network, a rolling stock leasing company that owns Transnet's fleet of locomotives and wagons, and the operating division which will compete with private sector companies on an even playing field.

The *Network Statement* is a vital cog in this process as it sets out the manner in which slots would be allocated, the conditions that must be adhered to, and the fees that operators will pay to run their trains on the network. The mere fact that the *Network Statement* sets out a single set of rules for the private sector and Transnet is overwhelmingly positive, as it levels the playing field for competition. As always, the devil is in the details and initial proposals for network access fees may undermine the process if not reconsidered.

Cost of rail versus road

Let me preface the argument with the following proviso: Agbiz has no qualms with the allocation of slots and the other conditions. These are overwhelmingly positive and pro-competition. Unfortunately, cost is the overriding consideration as it is the only real benefit that rail transport offers over road transport. This is not unique to South Africa. Globally, agri-food supply chains have adopted the 'just in time' principle. Companies demand smaller quantities from suppliers to be delivered with greater flexibility and urgency. This way, a processor can significantly reduce their own storage costs and risks.

In South Africa, this shift was even more pronounced as we moved from a centrally regulated marketing system dominated by marketing boards, towards a supply chain dominated by market-orientated traders. For the supplier who needs to adapt to these demands, road transport offers significantly more flexibility as small quantities can be delivered where and when the processor wants it. Rail does not offer this flexibility. Even in regions where freight rail still operates efficiently, such as Brazil, Great Britain and the European Union, road transport outcompetes rail for short-distance haulage due to its flexibility.

The opposite is true for long-distance haulage as rail is significantly cheaper. If we want to achieve a shift from road back to rail in South Africa, rail must be cheaper than road. From the proposed methodology, it is not clear whether any party, Transnet or private, will be able to compete with road transport.

Fees and infrastructure

The *Network Statement* proposes a fee of R19,79/gross tonne km. This figure was calculated based on the fees that the infrastructure manager would require to maintain Transnet's total regulated asset base for rail and associated infrastructure. In other words, a party who operates on the rail network will not simply pay for the infrastructure it uses, but instead contribute towards the maintenance of our entire rail network and associated infrastructure.

The thing is, not all of Transnet's infrastructure is usable. The *Network Statement* itself classifies 8 899km of the 21 232km network as the 'B network', which is essentially non-functioning. As to the fee calculation, it is not clear whether the fee only accounts for maintenance of the functioning lines or actually seeks to raise the funds required to rehabilitate the B network. To use a comparable example: Toll fees are ringfenced and used to fund the highways where tolls are levied. Imagine how expensive toll roads would be if they also had to fund the rehabilitation of our entire road network.

The premise that the total cost for rehabilitating and maintaining our rail network must come from its users, is also problematic. This is often referred to as the 'user pays principle', which has become a government catchphrase. However, it fails to acknowledge the public interest argument in favour of government subsidies for rail maintenance and rehabilitation.

Toll roads aside, our road network is funded through allocations from the national fiscus to local and provincial government. By neglecting state support for rail, it places an undue burden on our roads and threatens the safety of those using our roads. From an economic point of view, it also places a greater financial burden on provinces and municipalities to maintain roads that may not have been designed to carry the number of heavy vehicles on our roads today.

A final thought

Our own consultations with agribusinesses around the country clearly show that they see the benefit of rail transport for long-haul transport and will do their part to decongest our roads. However, there must be a reliable rail service and this will only be achieved if the network access fee allows private companies to offer a cost-competitive service on rail. If the price is not right, our road to rail ambitions may be dead in the water.

For more information, email the author at theo@agbiz.co.za.

Photograph courtesy of AFGRI.

Maize grading regulations: Agbiz Grain applies for amendments

By Wessel Lemmer, general manager, Agbiz Grain

Agbiz Grain has applied for an amendment to the maize grading regulations published on 16 February and the correction notice on 1 March 2024. An amendment is necessary before the start of the maize marketing year which runs from 1 May to 30 April.

Unfortunately, the Department of Agriculture, Land Reform and Rural Development (DALRRD) did not consider the amendments submitted by Agbiz Grain in 2022 and 2023 for the marketing year spanning 1 May 2024 to 30 April 2025. Consequently, Agbiz Grain has submitted a repeat application for an amendment.

Background: Legal principles

Regulations are a form of subordinate legislation. Whatever is contained in regulations must fall within the limits or boundaries set out in the primary legislation. Legal drafting needs to be precise, accurate and clear – not overly broad or ambiguous.

Regulations involve the exercising of a power granted in terms of legislation and as such often entail administrative actions that must comply with the requirements of the *Promotion of Administrative Justice Act, 2000 (Act 3 of 2000)* which requires fair consultative processes in decision-making, the decision-maker being accountable for justifying his/her decisions, and providing reasons for such decision when requested to do so.

Aim and importance of the application

Agbiz Grain has noted defects in sections of the text that can be better put and more clearly stated. As it stands, it is impractical and not in line with the context. The request aims to improve the regulations, subject to agreement by the relevant sectors and stakeholders. The application addresses general concerns.

Stakeholders must comply with the law and published regulations. Currently, the definition and regulations cannot be used as the context dictates without breaking the law. The moment stakeholders fail to follow the regulations they are breaking the law. We believe that the regulations in this application may have been defectively or incorrectly published.

We therefore called on the DALRRD to open this application for stakeholder consultation. Should there be no objections to this application and all stakeholders agree, DALRRD was asked to consider a permanent change to the regulations.

Changes to be considered

The following changes were submitted for consideration:

***Omit "all matter" in the definition*:** The definition in subsection 1(a)(e) states: "all matter that can pass through the 6,35mm round-hole sieve." The definition is incorrect because it includes stones below the sieve. Paragraph (e) should read: 'that can pass through the 6,35mm round-hole sieve'.

***Explanation*:** The phrase "all matter" is incorrectly included in this paragraph and should be omitted. The Afrikaans version of the 2009 maize grading regulations reads: "*mieliepitte of stukkies mieliepitte wat deur die 6,35mm-rondegatsif kan gaan*". The correct Afrikaans version of the 2009 maize grading regulation did not include "all matter".

The inclusion of "all matter" is also in contravention of subsection 7(f). The paragraph allows one gram of stones below the sieve. It is therefore wrong to include "all matter" below the sieve in the definition because section 7(f) reads: "shall contain not more than one gram of stones, which can pass through the 6,35mm round-hole sieve, per 10kg."

Furthermore, paragraph 17 (c) reads: "The percentage of defective maize kernels in a consignment of maize shall be determined as follows: (c) Determine the mass of the defective maize kernels and pieces of maize kernels that has passed through the sieve and express it as a percentage of the mass of the working sample."

The use of the phrase "all matter that can pass through the 6,35mm round-hole sieve" incorrectly includes the allowable limit of one gram of stones as defective maize kernels. Stones are not maize or pieces of maize kernels.

***Include 'stones above the sieve' in the definition*:** In the published regulation the definition of foreign matter reads: "all matter other than maize, excluding, animal filth, coal, glass, metal, plastic, and or stones."

The definition in the 2024 regulations does not allow for one gram of stones (as foreign matter) which can pass through the 6,35mm round-hole sieve. The phrase 'stones above the sieve' should be added at the end of the sentence in the definition to read as follows: 'all matter other than maize, excluding, animal filth, coal, glass, metal, plastic, and or stones above the sieve'.

***Explanation*:** Why should stones above the sieve be included in the definition at the end of the sentence? The definition of foreign matter contradicts section 7 if we do not include the phrase 'stones above the sieve'. According to section 7(f), one gram of stones is allowed below the sieve. Therefore, stones as part of the foreign matter above and below the sieve should be distinguished.

Subsections 7(e) and (f) make the distinction and the definition should be aligned with these subsections.

- 7 (e): shall be free from stones which cannot pass through the 6,35mm round-hole sieve, per 10kg.
- 7 (f): shall contain not more than one gram of stones, which can pass through the 6,35mm round-hole sieve, per 10kg.

***Correct the definition of "frost-damaged kernels"*:** The definition of frost-damaged maize kernels in the published 2024 regulations is as follows but is incorrect: "means maize kernels that are damaged by frost characterised by two or more of the following:

- A dull brown discolouration from the connecting tip; and/or
- An underdeveloped endosperm in relation to the germ; and/or
- The pericarp is blistered or flaked."

Subsection (a) of the definition must include: and are characterised further by one of the following in paragraph (b) and or paragraph (c) to be properly understood. It should therefore read: means maize kernels that are damaged by frost characterised by two or more of the following:

- A dull brown discolouration from the connecting tip and is characterised further by one of the signs in paragraph (b) and or paragraph (c).
- An underdeveloped endosperm in relation to the germ.
- The pericarp is blistered or flaked.

***Explanation*:** The primary characteristic of frost-damaged kernels is their dull brown discolouration starting from the connecting tip. Additionally, they may exhibit one or both of the secondary characteristics listed in paragraph (b) and/or (c). It is important to note that this brown discolouration should not be mistaken for coffee-stained maize kernels. Coffee-stained maize kernels do not occur on the connecting tip.

***Remove unnecessary additions*:** The strikethrough in the text of subsection 18 indicates unnecessary additions to the 2024 regulations. "The moisture content of a consignment of maize may be determined according to any suitable method provided that the results thus obtained are in accordance with the maximum permissible deviation (±0,3%) for a Class 1 moisture meter as detailed in ISO 7700/1 ~~1994~~ based on the results of the 72 hours, 103°C oven dried method (AACC Method 44/15A/~~1981~~)."

***Explanation*:** By removing 1994 and 1981, the latest ISO 7700/1 and AAC Method 44/15A documents are applicable.

Amendments to the table: Standards for grades of class white maize and class yellow maize; correct reference to paragraph: Deviation five reads: "Defective maize kernels that cannot pass through the 6,35mm round-hole sieve [*Regulation 17 (e)*" should instead read: 'Defective maize kernels that cannot pass through the 6,35mm round-hole sieve [*Regulation 17 (d)*'.

***Explanation*:** Paragraphs (d) and (e) of the 2009 regulations have been merged into one paragraph in the 2024 regulations. As a result, the reference to the paragraphs has changed. The paragraph numbers need to be adjusted accordingly to refer to the correct paragraph.

***"*No specifications" should read '*Not applicable'*:** The listed deviations marked with (*) do not apply to the respective classes of maize. It should be specified as not applicable.

***Explanation*:** "No specifications" is the wrong phrase and implies that anything that is not relevant is acceptable.

In conclusion

Agbiz Grain has applied to the DALRRD to consider an amendment to the regulations published for the 2024 maize marketing year, which runs from 1 May to 30 April. If there are no objections and all stakeholders agree, Agbiz Grain requests the DALRRD to consider a permanent change to the regulations. This request comes after the rejection of Agbiz Grain's application for a deviation from the regulations for the marketing year spanning 1 May 2024 to 30 April 2025.

As a result, the proposed change will not be implemented until the 1 May 2026 to 30 April 2027 marketing year as it is a lengthy process to apply for a permanent change compared to a short-term deviation, which was requested for the period from 1 May 2024 to 30 April 2025. The DALRRD did not receive support for a temporary deviation.

For more information, send an email to Wessel Lemmer at wessel@agbizgrain.co.za or visit *www.agbizgrain.co.za*.

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Points to ponder

By Jannie de Villiers

What is the state of your heart?

Ahead of Easter I listened to Miserere mei, Deus (Have mercy on me, O God) numerous times. It is an acapella choir piece composed around 1638 by the Italian composer, Gregorio Allegri, and based on Psalm 51. It was composed for the exclusive use of the Sistine Chapel during Holy Week and has an amazing history. It is quite a long piece, but the constant chanting of the men in the choir and the music echoed my emotions during Easter.

Although the Latin words eluded my understanding, the emotions they stirred up led me to some deep soul searching. What are the words or concepts that I, too, repeatedly call to God today?

> "I want to encourage you to consider your chanting before God."

This season, I imagine people in the agricultural sector fervently calling to God for rain. The picture of a producer and his family gathered around the dinner table calling on God's mercy to bring relief to the dry conditions, comes to mind. The bent-down posture of a mother alone in the back of her house chanting and crying before God, pleading for a troubled child is another image that comes to mind.

The chanting of a terminally ill person is also something that I can easily associate with this song. In many a prayer today, in our instant world, people often demand an immediate answer or response from God. No repetition. No gentle reminder. Just an answer. It is similar to sending a WhatsApp message to God, sitting back, waiting for Him to read it, and urging Him to reply immediately.

Check your attitude

While the Bible encourages us to present our desires and needs before God, this sacred choral work underscores the significance of our attitude when making these requests. The chanting of the *Miserere* is not about the things we need – it is a constant call upon God to have mercy on us, to redeem us from our sins, and to renew our spirit so that we may live in His presence.

Psalm 51 forms the basis of the words of the *Miserere* and in verse 17 we read: "The sacrifices of God are a broken and contrite heart." We so often strive to earn God's approval or blessings, but that is not what He asks. I can envision the multitude of prayers offered each day by many South Africans pleading for God's mercy. South Africa and its people are not in a good place. We are all hoping for a turnaround, and a better place that we can live in and call home.

I want to encourage you to consider your chanting before God. What are the things you keep on seeking? Are they solely focussed on your personal needs or is it a call on God to have mercy on you, your family, your business, and our country? If you look around you there are many things that break your heart, but does your broken heart lead you to a place of reliance on God and a spirit of restoration?

Heart of hearts

Towards the conclusion of the *Miserere*, the words assure us that those with a contrite and broken heart will once again find joy by opening their lips and mouths to sing praises to our good God. I have come to realise that I need to chant more fervently for mercy concerning the state of my own soul before chanting about my personal needs.

King David, the author of Psalm 51, earned the reputation of being a man after God's own heart. He was a broken man when he wrote this Psalm and confessed his wrongdoings before God. Through His mercy and righteousness, David was restored. God still called him a man after His own heart, because of his broken and contrite heart.

For enquiries, send an email to Jannie de Villiers at jannie@devilliersfamily.co.za.

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