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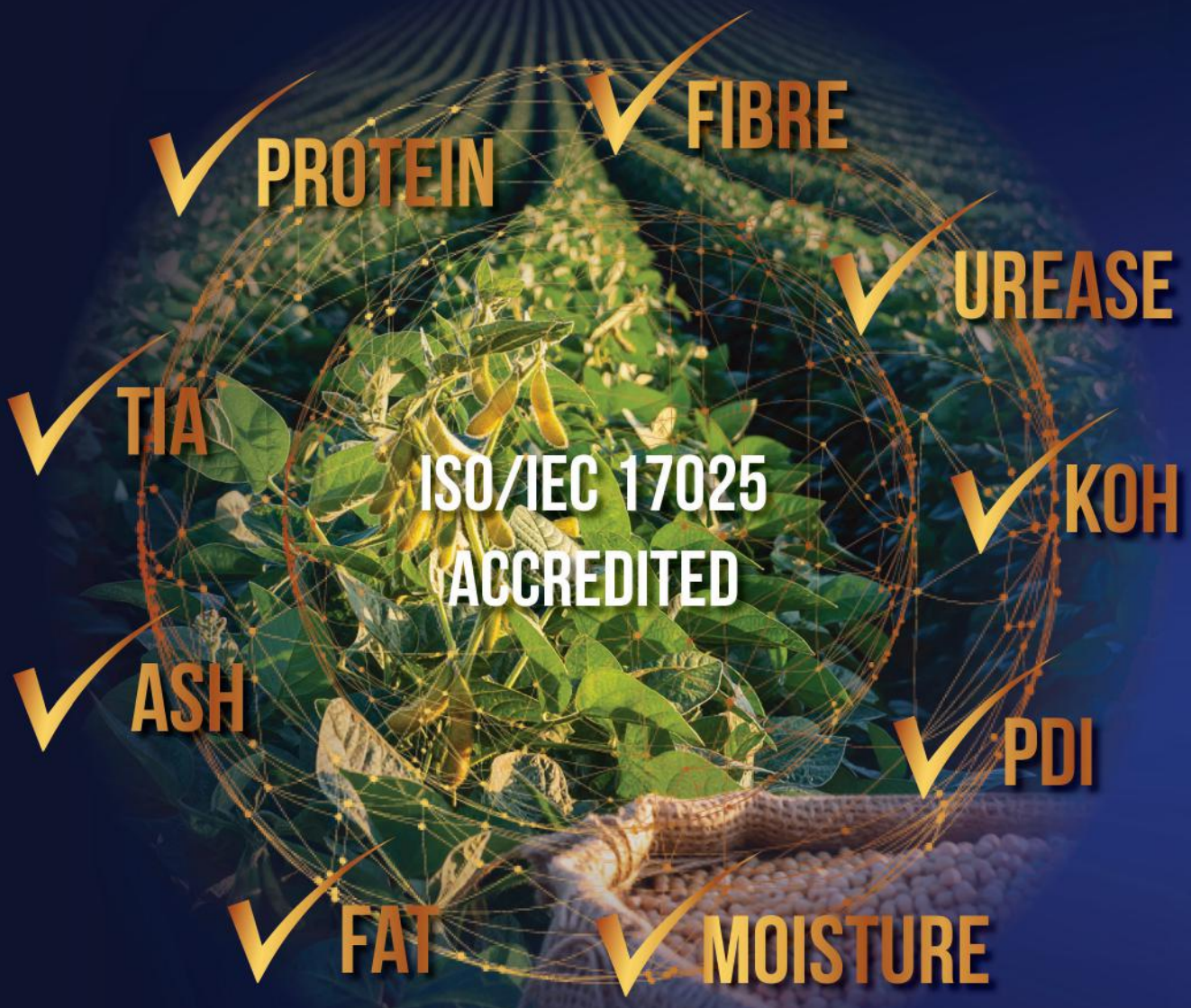

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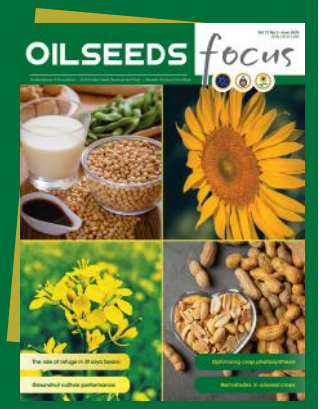

CONTENTS

Unlocking soya's potential in South Africa's nutrition landscape

By Dr Madeleine Nienaber and Prof Wilna Oldewage-Theron, University of the Free State

South Africa continues to face a complex nutrition landscape, characterised by the coexistence of undernutrition, micronutrient deficiencies, and rising rates of obesity and non-communicable diseases.

This double burden of malnutrition is well documented in national and global reports, highlighting the urgent need for affordable, nutrient-dense, and sustainable food solutions. Within this context, soya bean presents a compelling opportunity to contribute meaningfully to improved nutrition and health outcomes across the country.

Nutrition and health

Soya bean is widely recognised as a high-quality, plant-based protein source. It contains all essential amino acids required for human health and is considered comparable to animal-derived proteins in supporting growth and maintaining good health.

This is particularly important in South Africa, where access to animal protein is often limited by cost, especially in low-income households. Research indicates that plant-based proteins such as soya can effectively improve protein intake and nutritional adequacy when incorporated into staple diets. Thus, soya offers a cost-effective strategy to help bridge protein gaps in vulnerable populations.

Beyond protein, soya bean provides a dense nutritional profile, including dietary fibre, polyunsaturated fats, and key micronutrients such as iron, calcium, and potassium. Soya also contains bioactive compounds, particularly isoflavones, which are associated with a range of health benefits.

Evidence from systematic reviews suggests that soya consumption may contribute to modest reductions in low-density lipoprotein (LDL) cholesterol and improved cardiovascular health. Additionally, soya intake has been linked to a reduced risk of type 2 diabetes and certain cancers, particularly when consumed as part of a balanced diet. These attributes position soya as a functional food that not only addresses nutrient deficiencies but also supports long-term disease prevention.

> Strengthening the soya value chain also contributes to economic development through job creation and agro-processing, particularly in rural areas.

In the South African context, soya bean holds promise in addressing child nutrition and food insecurity. Soya-based products, including fortified soya milk, yoghurt and nuts, can be integrated effectively into school feeding programmes and community nutrition initiatives.

Evidence from paediatric nutrition studies shows that soya-based formulations can support normal growth and development, particularly in populations with limited access to animal protein. Their versatility allows incorporation into commonly consumed foods such as porridges, stews and baked products, improving both protein and micronutrient intake without altering dietary patterns.

Economy and sustainability

Affordability and accessibility remain key advantages of soya. Compared to animal protein sources, soya bean is relatively inexpensive to produce, can be cultivated locally at scale, and supports national food security while reducing reliance on imports. Strengthening the soya value chain also contributes to economic development through job creation and agro-processing, particularly in rural areas.

Sustainability further strengthens the case for soya. As a legume, it improves soil fertility through nitrogen fixation, reducing the need for synthetic fertilisers. From an environmental perspective, plant-based proteins such as soya are associated with lower greenhouse gas emissions as well as reduced land and water usage compared to livestock production. In a country increasingly affected by climate variability, promoting resilient and resource-efficient crops such as soya is essential for sustainable food systems.

Overcoming barriers

Despite these advantages, challenges remain. Consumer perceptions, limited awareness, and variability in product quality can influence the acceptance of soya-based foods. Cultural preferences and taste acceptance also play a role in dietary choices. Therefore, ongoing efforts in nutrition education, product innovation, and community engagement are essential to improve the uptake of soya foods.

Collaboration between researchers, industry stakeholders, and policymakers will be critical in unlocking the full potential of soya. Within the overall South African food system, soya bean presents a valuable strategic opportunity to improve nutrition, strengthen public health outcomes, and contribute to a more resilient and sustainable food system.

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El Niño: What lies ahead for South African agriculture

The strong El Niño developing this year brings hotter-than-average temperatures, an increased risk of heatwaves, and reduced rainfall to South Africa's summer crop regions. This weather pattern threatens optimal yields for soya bean and sunflower. Expected to persist from August through December, these above-normal temperatures may increase the chances of severe heatwaves and accelerate soil drying.

Rainfall in our summer rainfall areas is projected to drop considerably compared to recent wet years. Dry spells will stretch further apart, driving up evaporation rates and increasing the risk of veld fires. These dry, hot conditions are predicted to stress newly planted crops heading into 2027, particularly in the northern and northeastern regions of the country. Lower surplus production could curb traditional exports, potentially resulting in commodity prices moving away from export parity. Consequently, consumer food prices and consumer inflation could be affected.

On a positive note, current soil moisture levels are excellent, which should help mitigate some of the negative impacts. Furthermore, while the risk of agricultural drought remains high, major water systems such as the Vaal Dam are starting at relatively healthy levels, cushioning household water security.

The soya bean differential

The soya bean differential is a price adjustment used by the Johannesburg Stock Exchange (JSE) to account for transport costs as well as local supply and demand. After two years the JSE cancelled the multiple reference point (MRP) model.

While the market across the supply chain largely welcomed the change, Grain SA expressed strong disappointment with the decision. A single proposed reference point is in close proximity to Isando, well-situated near the main consumption area and very close to the centre of the production area.

Dr Erhard Briedenhann

Send us your contributions and suggestions to make *Oilseeds Focus* an enjoyable and valuable publication for the oilseeds industry. Contact Dr Briedenhann at erhardb@netactive.co.za for more information.

NEWS

China soya bean export deal

During the 2025/26 summer grain production season, South Africa was expected to yield a record soya bean crop forecast at 2,8 million tonnes. Despite initial challenges with port preferences and tight inland stocks, a multinational trading member of the South African Cereals and Oilseeds Trade Association (Sacota) managed to secure an export deal to China for approximately 200 000 tonnes of soya beans in November 2026. South Africa first exported soya beans to China in 2023, with three vessels totalling 147 000 tonnes. This will be the second transaction.

China is the world's largest importer of soya beans, importing approximately 100 to 110 million tonnes annually. This new deal will likely mean that closing soya bean stocks at the end of the season (February 2027) will now be much tighter. The National Agricultural Marketing Council (NAMC) predicted closing stocks of around 550 000 tonnes.

Taking this deal and possibly other smaller export transactions into account, closing stocks could drop to below 350 000 tonnes. With deep-sea container exports to Indonesia and Malaysia, as well as cross-border exports to Zimbabwe and Eswatini predicted to continue, estimated soya bean exports for the season could reach 510 000 tonnes. – *Sacota*

Sunflower cannot fully recover from drought

Sunflowers are unable to fully recover from drought, new research has found, contradicting previous findings on the plant's ability to reverse drought-induced failure of water-transporting tissues. As a plant dries, gas bubble blockages, or embolisms, can form in its water-transporting tissues. Previous studies concluded that sunflower could reverse these blockages through a process called refilling.

The new study showed that although sunflower appears to recover remarkably well from drought, the embolisms that accumulate in stems and leaves do not reverse after watering. "The strain of extracting water from dry soil can introduce air into the tissue responsible for moving water from the roots to leaves," said co-author Troy Ocheltree, an associate professor at Colorado State University. "Once this happens, the air blockage prevents the leaves from getting the water they need to grow and photosynthesise." – *Colorado State University*

El Niño poses great risk for Southern Africa

South Africa is closing a robust agricultural season with record harvests in grains and oilseeds, but the country's starting conditions are not uniformly shared across the continent. The greater part of the sub-Saharan African region may not have nearly as good starting conditions going into the upcoming production season.

We continue to see countries such as Zimbabwe, Botswana and Namibia, among others, importing grains from South Africa. These countries are importing at a time when they are also completing the 2025/26 production season and would ordinarily have had some domestic supplies. The imports illustrate that the domestic harvests are not sufficient for their annual needs. Therefore, it seems unlikely that they would have grain supplies to supplement their needs at the start of the 2026/27 season should it present a poor yield.

The only region where El Niño may generate a different set of conditions is East Africa. Ordinarily, when there is an El Niño, Southern Africa is mainly hard hit by drought, while the likes of Kenya may receive higher-than-normal rains. However, because Kenya is not a major grain producer, it seems unlikely that the country would utilise the favourable weather outlook to lift grain production and export to the needy areas of Southern Africa. In the 2015/16 harsh El Niño drought, maize imports to support the region came from Mexico. This may be the case again, depending on the severity of this expected El Niño and its impacts. – *Wandile Sihlobo, Agricultural Market Viewpoint*

Brazil to halt soya bean area expansion

Since the 2006/07 season, Brazil has recorded uninterrupted growth in its soya bean planted area. According to Rabobank, the 2025/26 crop brings this long expansion to an end, closing with approximately 49 million hectares planted and a record harvest of around 182 million tonnes. For 2026/27, the initial forecast is 178 million tonnes, reflecting a stabilisation of the planted area and an expectation that yields will return to levels closer to the historical average.

The change represents a turning point for a sector that established Brazil as the world's largest soya bean producer and exporter. More expensive fertilisers, falling international soya bean prices, the appreciation of the Brazilian real during part of the period, and a high-interest-rate environment have collectively reduced the economic incentives for expanding the planted area. "Producers have shifted their focus from expanding the planted area to preserving cash, managing risk, and optimising land use," said Marcela Marini, senior grains and oilseeds analyst at Rabobank. – *Food & AgriBusiness*

Raw groundnut imports raise biosecurity alarm

Queensland groundnut growers are calling for an urgent investigation after independent testing found imported groundnuts sold in Australia were capable of germination. The findings raise serious concerns that products labelled as roasted had in fact been sold raw. Raw groundnut cannot legally be imported into Australia without an official import permit and processing at an approved quarantine facility. By contrast, roasted and other processed products are not subject to the same level of biosecurity controls.

Federal member for Maranoa David Littleproud believes importers appear to be deliberately miscoding products on customs documentation to avoid biosecurity requirements, placing Australia's nearly 100-year-old groundnut industry at risk. Endorsing these concerns, groundnut grower Peter Howlett highlighted that countries such as Brazil carry peanut smut, a devastating soilborne disease currently not present in Australia, that can slash yields between 40 and 70%. – *Grain Central*

Euroseeds welcomes parliament soya vote

Euroseeds has welcomed the European Parliament's rejection of a proposed classification of soya bean oil as a high indirect land-use change (ILUC) risk feedstock. The ILUC framework looks at whether demand for a crop used in biofuels could indirectly push agricultural expansion into land with high carbon stocks, such as forests or wetlands. Under the Renewable Energy Directive, crops considered high ILUC risk face limits in how much they can contribute to renewable energy targets.

The proposed classification would have phased out soya bean oil as a biofuel feedstock by 2030, potentially weakening the economic viability of European-grown soya and making the region more dependent on imported protein meals. Industry groups warned that restricting biofuel uses would discourage investment in soya bean breeding and undermine Europe's domestic protein goals. – *SeedWorld*

India's edible oil imports surge by 34%

Edible oil shipments to India increased by 34% in July to a ten-month high of 1,49 million tonnes, compared to the previous month, according to a report by Knowledge and News Network. The increase was due to a rise in purchases of palm and soya bean oil by refiners to replenish stocks ahead of the upcoming festival season.

According to estimates by industry dealers, palm oil imports jumped 50% from June to reach a five-month high of 733 000 tonnes in July. Soya bean oil imports increased by 32% to 501 000 tonnes, the highest level in seven months, while sunflower oil shipments rose 4% to 253 000 tonnes. The increase in imports came amid declining domestic stocks following lower purchases in recent months, the report said. – *Oil & Fats International*

Record sunflower seed production expected

Global sunflower seed production in 2026/27 is expected to increase by 13%, reaching a new record of 62,7 million tonnes, according to United States Department of Agriculture data reported by Germany's Union for the Promotion of Plants and Protein (UFOP).

The key factor behind the rise is the expectation of larger harvests in Eastern Europe and the European Union (EU). With Russia, Ukraine and the EU accounting for around three quarters of global sunflower seed production, 2026/27 harvests in those key regions were expected to exceed those of the previous year, raising global production to a new record level. – *Oil & Fats International*

New soya bean dehulling facility in Ohio

Scoular, an employee-owned agribusiness in the United States, is investing in a soya bean dehuller at its Covington, Ohio, facility. The project leverages the site's existing cleaning and colour-sorting equipment to support the continued growth of its food and beverage customers. According to the company, the investment also creates additional opportunities for producers who supply identity-preserved, non-GMO, and organic soya beans. Scoular expects the Covington dehuller to be operational by mid-2027.

Global consumer demand for plant-based beverages continues to rise, with projected annual increases of nearly 14% through 2032, said Matt O'Hern, general manager at Scoular. Dehulled soya beans are used in a variety of plant-based foods and beverages, including soya milk. Manufacturers often prefer dehulled soya beans because of their higher protein concentration and faster water absorption. – *World Grain*

Recognising soya bean stem and root diseases to improve surveillance, diagnosis and management

By Lisa Rothmann, Dumolwenkosi Maposa, and Kwanele Sabela, University of the Free State

During the 2025/26 soya bean season, our research group surveyed 25 national soya bean cultivar trial sites established by the Agricultural Research Council-Grain Crops (ARC-Grain Crops). Sites were located in the Free State and Mpumalanga (six each), North West and KwaZulu-Natal (five each), Gauteng (two), and Limpopo and the Northern Cape (one each).

Each trial was assessed using a standardised Z-shaped walking pattern (*Figure 1*). Disease incidence – defined as the percentage of symptomatic plants – was recorded, and representative plants were collected for laboratory examination.

Figure 1: Representative layout of a national soya bean cultivar trial, with soya bean cultivars planted in separate blocks.

Differences in colour and maturity are visible, and disease assessments are conducted using a Z-shaped walking pattern across the trial.

Diseases and diagnosis

Across the surveyed sites, symptoms and signs associated with 12 disease or symptom categories were recorded: *Cercospora* leaf diseases, bacterial blight, bacterial pustule, downy mildew, *Septoria* brown spot, *Phyllosticta* leaf spot, *Alternaria* leaf spot, mustard leaf spot, *Sclerotinia* stem rot, southern blight, sudden death syndrome (SDS), and suspected virus infection.

Although some diseases have characteristic field features, others are difficult to distinguish. Symptoms are plant responses to infection, such as wilting, yellowing, or lesions, whereas signs are visible pathogen structures, which includes fungal growth, spores, and survival structures.

Field observations may support a preliminary diagnosis, but diseases such as bacterial blight and bacterial pustule can produce similar symptoms and are difficult to distinguish visually. Laboratory confirmation is therefore often necessary. Morphological methods examine fungal growth and diagnostic structures, while molecular methods analyse DNA or RNA to confirm pathogen identity.

This article focusses on soya bean stem and root diseases that are commonly confused in the field. Recognising their distinguishing symptoms and signs supports accurate diagnosis, early detection of emerging pathogens, and appropriate management decisions. Two disease comparisons will be explored: the first between *Sclerotinia* stem rot and southern blight, and the second between SDS and red crown rot.

In South Africa, SDS-like symptoms have been associated with *Fusarium brasiliense* and an additional *Fusarium* species currently undergoing further identification, whereas *F. virguliforme* is the principal species associated with the disease in the United States (US). Red crown rot has, to our knowledge, not yet been reported in South Africa, but it is included because its symptoms can closely resemble those of SDS.

Sclerotinia and southern blight

Sclerotinia stem rot (*Figure 2A*) was recorded at two survey locations, Hoopstad and Middelburg, with disease incidences of 2 and 34%, respectively. In contrast, southern blight (*Figure 2B*) was recorded at six locations – Bothaville, Leeudoringstad, Hoopstad, Lichtenburg, Schweizer-Reneke, and Warrenton – with incidences ranging from 2 to 72% and an average incidence of 37%.

Sclerotinia stem rot and southern blight are frequently confused because both can produce conspicuous white fungal growth on soya bean stems. However, the position of this growth helps distinguish them: *Sclerotinia* stem rot commonly develops around stem nodes, whereas southern blight is concentrated at the plant base and soil line. *Sclerotinia* stem rot, caused by the ascomycete *Sclerotinia sclerotiorum*, is prevalent in cool, moist environments and produces water-soaked lesions, white fluffy mycelia, and the infected tissue appears bleached in the later stages of the season.

Figure 2: *Sclerotinia* stem rot (A) is characterised by a bleached stem lesion with white mycelium and irregular black sclerotia. Southern blight (B) showing white mycelium at the stem base and numerous small, spherical sclerotia (inset) that mature from white to dark brown.

A defining sign is the production of large, irregular, coal-black sclerotia found on and inside the stem. Southern blight, in contrast, is caused by the basidiomycete *Agroathelia rolfsii*, which thrives in warmer environments than *S. sclerotiorum*, though it still prefers humid climates. It produces a dense mat of white mycelium at the plant base containing numerous small, spherical sclerotia that mature from tan to a dark reddish-brown.

While *S. sclerotiorum* can spread via airborne ascospores, southern blight primarily spreads through soil movement and mycelial growth. Accurately distinguishing between these diseases by examining the specific morphology and location of their sclerotia is essential, as it ensures that management strategies are tailored to the correct pathogen.

Management of both diseases combines crop rotation with non-susceptible species, sanitation, and limiting the movement of infested soil and plant debris. However, differences in pathogen biology require different priorities. For *Sclerotinia* stem rot, canopy management and correctly timed flowering-stage fungicide applications are important because infection is initiated by airborne ascospores. Registered active ingredients at the time of writing include procymidone and pyraclostrobin + epoxiconazole.

Southern blight spreads mainly through soilborne mycelium and sclerotia, making the removal of infected plants, restricted soil movement, and reduction of local inoculum more relevant. No fungicide could be confirmed as specifically registered for southern blight in soya bean in South Africa.

SDS is an emerging threat

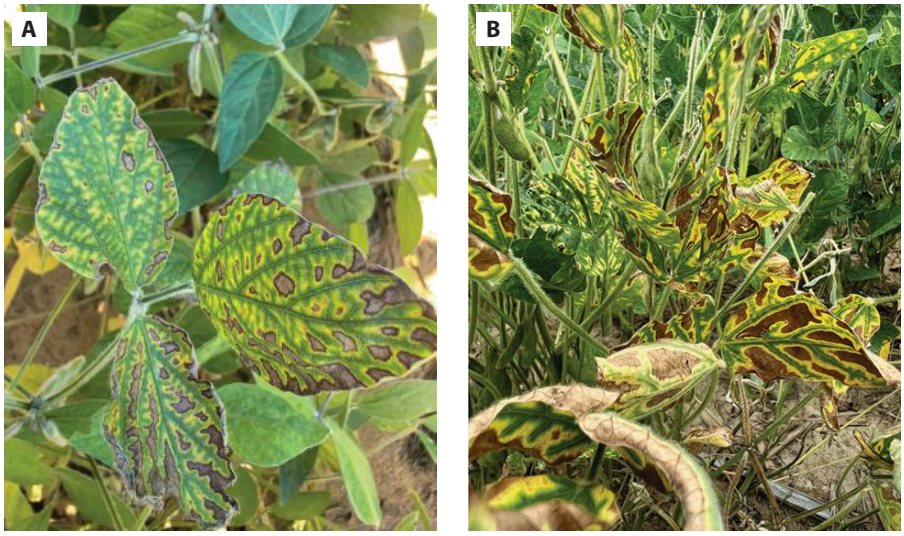
During our surveys, SDS-like symptoms (*Figure 3A*) were observed at seven survey locations – Bronkhorstspruit, Belfast, Bothaville, Clarens, Groblersdal, Kinross, and Leeudoringstad – with disease incidences ranging from 10 to 32% and an average of 23,4%. SDS is considered an emerging soya bean disease in South Africa. It was first detected during disease surveys conducted in the 2013/14 production season, and SDS-like symptoms have since been observed in several soya bean-producing provinces.

Locally, the disease has been associated with *F. brasiliense* and another *Fusarium* species that is still undergoing identification. These soilborne pathogens can persist in soil and crop residues, and may be moved between fields in infested soil carried on farm machinery, equipment, and vehicles. Although no local records of yield losses attributable to SDS have been documented, countries such as Brazil and the US, where SDS is well established, have reported yield losses of about 30 to 40% and up to 80%, respectively.

In the field, the characteristic foliar symptoms of SDS typically appear after flowering, around the mid-pod filling stage. Initial symptoms consist of small, circular to irregularly shaped chlorotic spots that develop between the leaf veins, giving the foliage a characteristic mottled appearance. As the disease progresses, these lesions enlarge and coalesce, causing extensive interveinal chlorosis (yellowing), followed by necrosis (cell death), and premature leaf drop, often with the petioles remaining attached (*Figure 3A*).

In addition to foliar symptoms, infected plants often show discoloured and decayed roots and lower stems (*Figure 4A*). When the roots and lower stem are split,

Figure 3: SDS-associated foliar symptoms showing characteristic interveinal chlorosis and necrosis with green veins (A). Red crown rot produces similar foliar symptoms (B). (Photographs: B Camiletti)



the cortical tissues may show brown-to-grey discolouration, while the pith generally remains white. Under moist conditions, blue fungal spore masses may occasionally develop on the outer surface of infected roots. The pathogens persist between growing seasons in soil and infected crop residue.

No soya bean cultivar provides complete resistance to SDS, and locally relevant information on cultivar responses remains limited. Furthermore, no fungicide could currently be confirmed as specifically registered for SDS control in soya bean in South Africa. Integrated disease management therefore relies on agronomic practices such as crop rotation, the use of certified disease-free seed, improved soil drainage, reduced soil compaction, and minimised movement of infested soil, all of which are essential for suppressing disease development and reducing yield losses.

Be vigilant of red crown rot

Red crown rot is a soilborne fungal disease caused by *Calonectria ilicicola*. One of the key features distinguishing it from SDS is the dark maroon to brick-red discolouration that develops at the base of the stem, immediately above the soil line, hence the name red crown rot. It is regarded as an emerging threat in the US, particularly in the Midwest, where its geographic distribution has expanded since 2017.

The disease causes extensive blackening and rotting of the root system; in severe cases, the lateral roots may be lost, leaving only a thin, 'pencil-like' taproot. Under severe epidemics or high disease pressure, reported yield losses can exceed 30%. These losses are associated with extensive root system destruction and premature defoliation, resulting from interveinal chlorosis that progresses to interveinal necrosis.

Disease development is favoured by warm, wet soil conditions during the first few weeks after soya bean emergence. Under warm, moist conditions later in the season, the pathogen may produce tiny, bright reddish-orange spherical fruiting structures, known as perithecia, on the lower stem. These structures facilitate secondary spread of the disease during the growing season and are the most prominent diagnostic sign used to distinguish red crown rot from look-alike diseases such as SDS. The pathogen can also survive in soil as microsclerotia for at least seven years, even in the absence of a susceptible host crop.

It is therefore important for producers, agronomists, and researchers to be familiar with these symptoms and signs so that unusual cases can be recognised, sampled, and investigated promptly. Through proactive disease surveillance, our research group is monitoring for emerging diseases in soya bean-producing regions, helping to support an appropriate response should red crown rot be detected in local fields.

Figure 4: SDS-associated root and crown plant showing root and crown symptoms (A); red crown rot characterised by reddish-brown crown lesions, extensive root rot and, under favourable conditions, the production of diagnostic reddish perithecia (B). (Photographs: N Kleczewski, S Geisler, and D Telenko)

Conclusion

Effective disease surveillance begins in the field and depends on producers, agronomists, extension officers, and crop consultants recognising unusual symptoms and collecting representative samples. A laboratory diagnosis is only as useful as the field observations and representative samples on which it is based.

Accurate diagnosis strengthens national disease surveillance by improving our ability to detect new or emerging diseases before they become widespread. At the farm level, it also supports more appropriate disease management decisions. Because several soya bean root and stem diseases produce similar symptoms, careful examination of symptoms and signs, together with laboratory confirmation, is essential for identifying the causal pathogen with confidence.

As soya bean production intensifies and new pathogens emerge globally, continued monitoring remains vital. Unusual or difficult-to-distinguish symptoms may provide an early warning but do not constitute a definitive diagnosis. Representative samples should therefore be submitted to recognised diagnostic laboratories. Linking field observations with laboratory confirmation supports early detection, strengthens surveillance and research, and guides appropriate management, thereby contributing to the long-term sustainability of soya bean production in South Africa.

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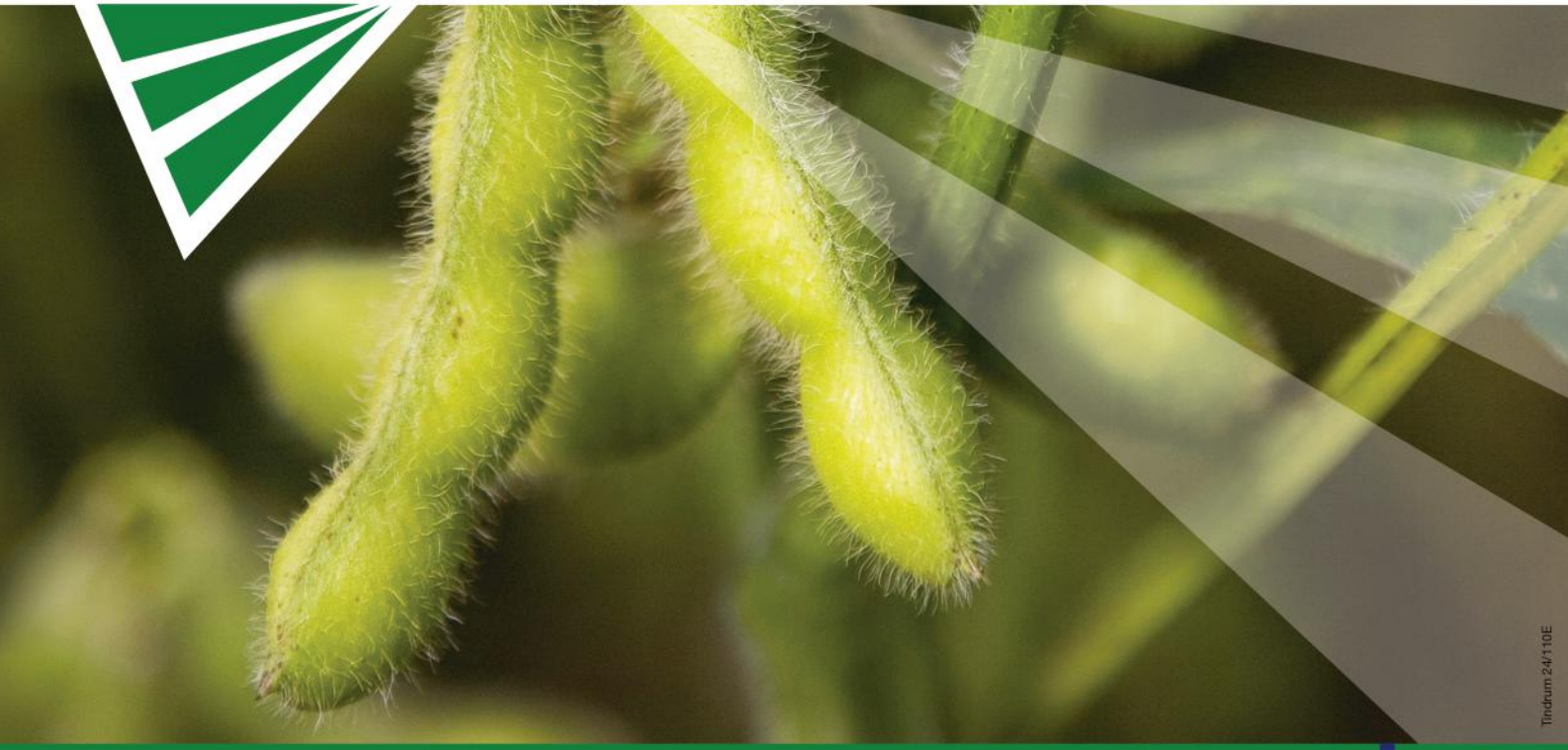

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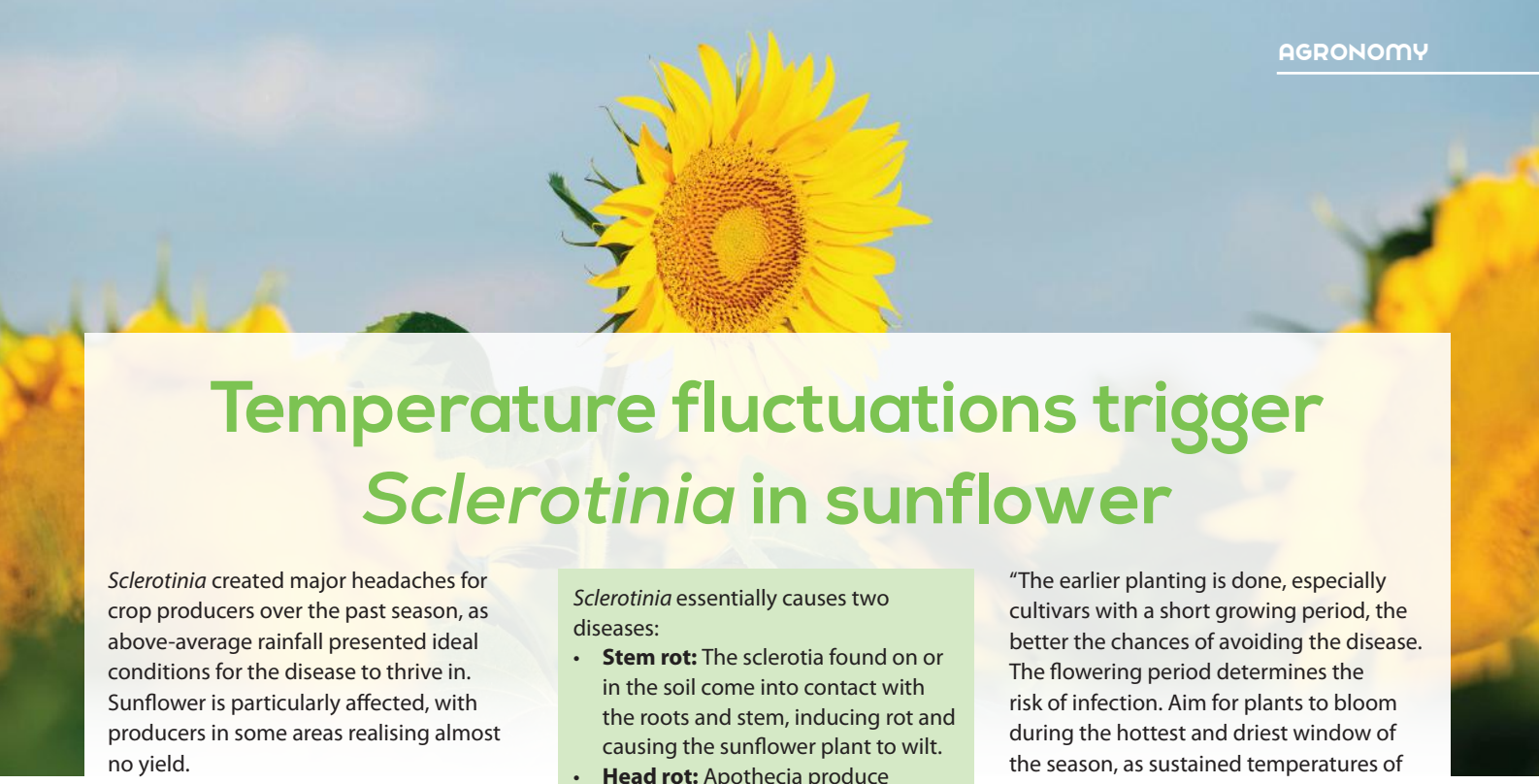

Temperature fluctuations trigger *Sclerotinia* in sunflower

Sclerotinia created major headaches for crop producers over the past season, as above-average rainfall presented ideal conditions for the disease to thrive in. Sunflower is particularly affected, with producers in some areas realising almost no yield.

Sclerotinia is caused by a soilborne fungus, *Sclerotinia sclerotiorum*, which under favourable conditions can infect a plant's roots, stem, and head. According to Charles Basson, portfolio and technical marketing manager for row crops at Syngenta South Africa, temperature fluctuations between warm days and cool nights not only cause crop stress but also play a major role in activating the *Sclerotinia* fungus lurking in the soil.

How this works

Day-to-night temperature fluctuations of 8°C or more activate the sclerotia (the fungus's survival structures) to germinate and produce apothecia. During periods of cool, wet, or humid weather, sclerotia germinate to form either fungal threads called hyphae or tiny, mushroom-like spore-producing structures called apothecia. Apothecia release millions of infectious spores over several days, which are dispersed primarily by wind, as well as by rain splashes and insects. These spores land on sunflower heads during flowering and early grain filling, causing head and stem rot.

When temperatures are more constant, the chances of the sclerotia pathogen being activated are lower. Instead, temperature fluctuations act as a biological alarm clock for the fungus. If the soil remains moist, it takes about a week for the mushroom-like structures to produce ascospores, which are then launched into the air to spread.

Sclerotinia essentially causes two diseases:

- **Stem rot:** The sclerotia found on or in the soil come into contact with the roots and stem, inducing rot and causing the sunflower plant to wilt.
- **Head rot:** Apothecia produce ascospores that travel through the air and infect sunflower heads when they land on them.

When is the risk highest?

Basson stresses the importance of understanding the disease triangle, or host-pathogen-environment interactions, as well as the factors driving disease establishment in the field. "A disease can only occur when all necessary factors overlap. All three elements – a susceptible host (sunflower plant), a pathogen (*Sclerotinia*), and suitable environmental conditions – must be present before the ascospores can cause damage," he explains.

The risk is highest when:

- Daytime temperatures drop below 27°C, with cool nights of 12 to 18°C.
- The humidity inside the sunflower fields is high (>95%).
- The soil is wet during flowering.
- Bloom time coincides with prolonged cloudy, damp weather.

What can you do?

"Since there is no single solution for *Sclerotinia*, we recommend that producers adopt additional management practices to spread their risk. The idea is to disturb the disease triangle as much as possible to reduce the chances of *Sclerotinia* infection," says Basson.

Adjust planting dates: Planting dates play a major role in managing infection. "The earlier planting is done, especially cultivars with a short growing period, the better the chances of avoiding the disease. The flowering period determines the risk of infection. Aim for plants to bloom during the hottest and driest window of the season, as sustained temperatures of more than 27°C naturally suppress the pathogen."

Sunflower is one of the summer crops least sensitive to planting dates, meaning it can be planted early with great success. "Syngenta trials on our research farm and commercial trials in Argentina show that *Sclerotinia* infection can be minimised when sunflower is planted earlier in the season."

Fungicide timing: If conditions favour disease development, it is advisable to apply fungicides during the R5 to R6 (early flowering) development stages for best protection.

Crop rotation: Avoid planting sunflower in the same field year after year, as sclerotia can survive in the soil for three to five years. Because *Sclerotinia* is one of the most difficult pathogens to control, an integrated management programme can help lower the risk. Plant resistant cultivars and rotate crops with non-host plants such as maize. Apply good weed control to eliminate alternative hosts. Also extend planting windows so that the risk of infection is spread.

Conclusion

Remember this important sum: Moisture + temperature fluctuation during flowering = highest risk. Monitor weather conditions during flowering, and act early if conditions become cool and wet.

Email Charles Basson at charles.basson@syngenta.com for more information.

Bridging research and practice:
Highlights from the 2026 AIS farmers' day

By Derick van Staden, Agronomy Info Services

The AIS team.

In 2016, representatives from Agro Centre and Agri Seed and Technology (AST) travelled to the United States to attend the Land O'Lakes Answer Plot programme. Following this visit, it became evident that South Africa would benefit from establishing a similar platform for producer-focussed trials. As a result, Agronomy Info Services (AIS) was founded as an independent, non-profit research organisation dedicated to conducting unbiased trials on behalf of input providers, with the ultimate goal of supporting producers. These trials are hosted on a farm near Delmas.

AIS operates on straightforward principles: The organisation is responsible for planting, maintaining, and managing all trials, with a primary focus on maize and soya bean. Each trial block is standardised at 40m by 64 rows, ensuring consistency across experiments. All categories of inputs are accommodated, including seed varieties, crop protection chemicals, fertilisers, and biological products.

The AIS annual farmers' day

To showcase these trials, AIS established an annual farmers' day, providing input companies with the opportunity to present their products directly to producers. Demonstrations and presentations are conducted in the field, with producers rotating between trial plots to attend structured sessions of roughly 25 minutes each. At the conclusion of each season, AIS compiles and shares trial data with input providers, enabling them to report results to producers in the following year.

The inaugural AIS farmers' day was held in 2017, with participation from a small group of producers and input companies. Since then, the event has been fixed to the first Wednesday of March annually.

This year's farmers' day took place on 4 March and attendance was capped at 350 producers and delegates, with participation from 19 input companies.

Producers were initially divided into 19 groups, starting at designated input booths. After the first session, groups rotated systematically to subsequent booths, and thereafter had the flexibility to attend sessions of their choice. Presentations were scheduled at specific intervals, and after seven rotations, the event concluded with a communal lunch. Input providers presented a range of key technical insights during the event.

1 Syngenta

Syngenta highlighted Eddus®, a pre-emergence herbicide for soya bean. The presentation focussed on the importance of early weed control to reduce competition, support crop development, increase yield potential, and manage herbicide resistance. Effective weed control is the foundation of a successful soya bean harvest.

2 Bayer

Bayer showcased its Water Quality Awareness Campaign and demonstrated the superior quality of its Roundup formulations. The engagement reinforced Bayer's commitment to innovation, product excellence, and stewardship, equipping producers with trusted solutions. Bayer also shared positive feedback on *Sclerotinia* control in soya bean from the 2024/25 season.

3 Nutrico

The Nutrico programme supports soya bean from establishment through pod filling by enhancing root development, nitrogen fixation, nutrient uptake, and stress tolerance. Micronutrients – including zinc, boron, molybdenum, cobalt, iron, and manganese – promote photosynthesis, flowering, pollination, and seed development. Additionally, biostimulants and beneficial microorganisms strengthen plant health, boosting yield and grain quality.

4 UFS and #SclerotiniaZA

The University of the Free State (UFS) and #SclerotiniaZA covered the life cycle and management of *Sclerotinia* stem rot in soya bean, focussing on cultivar responses observed in adjacent fields. Disease survey findings from sunflower and soya bean trials helped producers identify symptoms and signs.

5 UPL

UPL South Africa, a consistent AIS participant, demonstrated its biological products. This included Trykosist® (*Trichoderma harzianum*) to stimulate faster and longer root and plant growth, Maxi-N® (*Azospirillum brasilense*) to convert atmospheric nitrogen into a plant-available form, and Maxi-Soil®, a complex of five organisms designed to promote soil health. Throughout the demonstration, UPL emphasised its commitment to shaping sustainable agriculture.

6 United Seeds

United Seeds highlighted the impact of plant populations on yellow maize yields. Populations that are too low waste space, while too high a population causes competition. Correct populations ensure proper plant development, healthy cobs, and maximum profitability.

7 Philagro SA

Philagro SA presented EndoPrime® SC, a biological enhancer containing four species of endomycorrhizae. These fungi form symbiosis with roots, expanding absorption areas and improving access to water and nutrients.

8 Limagrain Field Seeds SA

Limagrain Field Seeds SA emphasised the importance of cultivar choice, noting that cheap cultivars may not suit specific fields. Examples included yellow maize LG31.664 – fast-drying, adaptable, strong standing ability; white maize LG31.753R – good ear cover, yield potential; soya bean LG60458R – adaptable, excellent pod height; sunflower Gandalf CLP – strong stems, Clearfield® Plus hybrid.

9 Elim Fertilisers

Elim Fertilisers explained that boron sources differ. BRANDT® Smart B boron esters improve foliar penetration, mobility, and efficiency. Superior tank-mix compatibility ensures stable spray mixtures, enhancing coverage, uptake, and performance.

10 Pioneer

Pioneer presented findings on cultivar sensitivity to populations (40 000 to 70 000) in the Highveld, combined with the effects of planting dates. Measurements included prolificacy, yield, disease tolerance, adaptability, and standability.

11 AgraForum SA

AgraForum SA introduced the OpTiFy™ Concept, combining crop monitoring with targeted interventions to alleviate abiotic stresses such as drought, nutrient deficiencies, and herbicide application. Technologies included LiQuiDo™ micronutrients, AnnGro® EW penetrant, ComCat® WP, AgraAlgen biostimulants, and CibuSil™ silicon technology.

12 Metson World

Metson World presented the experimental biological insecticide BT3, which combines three *Bacillus thuringiensis* organisms (*B. thuringiensis kurstaki, galleriae*, and *israelensis*). Benefits include suppression of larvae (*Lepidoptera, Coleoptera,* and *Diptera*), growth stimulation, and reduced input costs.

13 Lake Agriculture

Lake Agriculture, a South African seed company serving 22 African countries, delivers adaptable genetics with strong yield potential, drought tolerance, disease resistance, and performance across plant populations. The company is committed to advancing African agriculture.

14 Tessenderlo Kerley

Tessenderlo Kerley focussed on its Thio-Sul® and KTS® liquid thiosulphate fertilisers. The former, blended with UAN, was used as a maize top-dressing, while the latter provided potassium and sulphur. Positive field trial results from K-Leaf® foliar applications on soya bean were also presented.

15 MBFi

MBFi emphasised advancing biological technologies to boost crop productivity. The demonstration highlighted premium inoculant performance and the protection of active ingredients against resistance using Max 357®, an advanced water sequestrant and conditioner. MBFi aims to lead the biologicals and biostimulants market through science-driven innovation, setting standards for excellence and reliability.

16 InteliGro

InteliGro supports producers by way of plant nutrition, biostimulants, crop protection, seed, and precision farming. Their solution-driven focus promotes sustainable, profitable production through scientific advice, innovative products, and local expertise. InteliGro partners with producers to improve yield, soil health, and sustainability.

17 Eco Green Agriculture

Eco-Green Agriculture evaluated Nutri-Soil alongside biostimulants Thrust, N-Force, K-Force, Cal-Bor, and Moli-Bor on maize and soya bean. Results showed improved plant development, root growth, crop health, and yield. Integrated nutrition programmes demonstrated strong return on investment potential for producers.

18 Syngenta Seedcare

Syngenta Seedcare introduced Cruiser® Ultimate, a three-in-one soya bean seed treatment combining Celest® XL, Apron® XL, and Cruiser®. In partnership with Rizobacter, they also presented ATUVA® Bold *Rhizobium* inoculant, specifically suited for South African conditions to balance young plant care with *Rhizobium* for stronger crops.

19 AST

AST presented results from its 2025 lower-density trials and discussed input cost reduction strategies for the challenging 2026/27 season. The break-even advantage of certified seed over farm-saved seed is about 200kg/ha for RR1 and 400kg/ha for Intacta RR2 Pro varieties. However, farm-saved seed carries major germination and quality risks. Using the best variety for your farm, applying effective seed treatments and quality inoculants, utilising lower seed densities with certified seed, and fertilising according to soil analysis are essential for achieving optimal yields.

Producers and industry stakeholders are invited to save the date for the 10th annual AIS farmers' day, which will take place on 3 March 2027.

For more information, email the author at derickv@agro.co.za

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Supporting crops under abiotic stress

By Dr Riaan Buitendag, chief executive officer, AgraForum SA

Abiotic stress is one of the greatest limitations to crop productivity worldwide. Unlike biotic stress, which is caused by pests and diseases, abiotic stress results from unfavourable environmental conditions such as drought, heat, cold, salinity, waterlogging, nutrient imbalance, excessive radiation, and chemical injury. While these stresses may occur individually, crops are often exposed to several stresses simultaneously (*Figure 1*).

Plants are not passive under stressful conditions. They activate complex defence mechanisms involving changes in water regulation, antioxidant activity, hormone signalling, gene expression, energy use and nutrient distribution. However, when stress is severe or prolonged, the plant's protective capacity may be overwhelmed. Photosynthesis declines, cell membranes become damaged, nutrient uptake is restricted, and reproductive development may be disrupted. The result is often lower yield, reduced quality and poor stress recovery.

Biostimulants and bioactive molecules offer an additional tool to support crops during these periods. They should not be regarded as replacements for sound agronomic practices, irrigation, fertilisation, or crop protection. Their value lies in improving the plant's ability to tolerate, adapt to, and recover from stressful conditions.

Biostimulants and crop resilience

One of the first responses to drought, heat and salinity is the production of reactive oxygen species (ROS). At controlled levels, these molecules act as signals. Under severe stress, however, they accumulate and cause oxidative damage to proteins, membranes and chlorophyll.

Certain biostimulants support the plant's natural antioxidant system. Compounds such as ascorbic acid, polyphenols, seaweed-derived molecules and some peptides may improve antioxidant activity and help maintain membrane stability. Other compounds assist with osmotic adjustment. Glycine betaine, proline and amino acids, for example, help cells retain water and maintain their structure when water availability is limited. This may support stomatal function, photosynthesis and recovery following stress.

Biostimulants may also influence plant signalling pathways. Molecules such as brassinosteroids and polyamines, act at very low concentrations and may help prepare the plant for future stress. This process is often described as crop priming. A primed plant may respond more rapidly and efficiently when stressful conditions develop.

Protein hydrolysates, free amino acids and bioactive peptides can support nitrogen metabolism, enzyme activity, root growth, and stress signalling. Their effectiveness depends not only on total amino acid content, but also on peptide size, amino acid profile, production method, and biological activity.

Seaweed extracts may support root development, nutrient uptake, and tolerance to drought, heat and salinity. Because seaweed products differ considerably in extraction methods and composition, their performance should be scientifically confirmed.

Silicon is another important stress-supporting element. Although it is not considered essential for all crops, plant-available silicon can strengthen plant tissues and improve tolerance to heat, salinity, lodging, and some forms of metal toxicity.

Optimum timing and dosage

Biostimulants generally perform best when applied before stress or during the early stages of stress development. Application after severe, irreversible damage has occurred may provide limited benefit. Critical application periods include establishment, rapid vegetative growth, flowering, fruit or grain set, and filling.

Biostimulants should be applied at the correct concentration; higher rates do not necessarily produce better results. Product stability, pH, water quality, tank-mix compatibility, penetration, and crop safety must therefore be carefully evaluated.

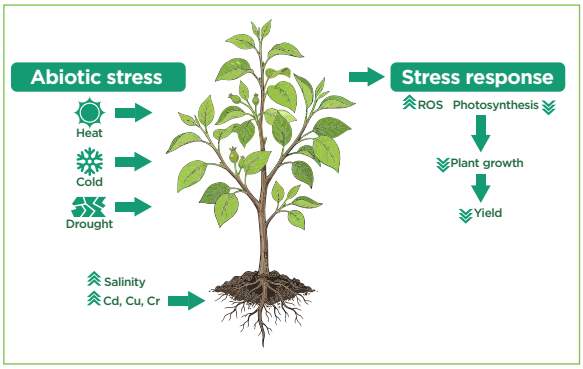
In oilseed crops such as sunflower, soya bean and canola, abiotic stress during flowering, pollination, seed set, and grain filling can substantially reduce both yield and quality aspects. Appropriately selected biostimulants may help maintain photosynthesis and reproductive development, especially under stress conditions, thereby supporting crop yield and quality aspects such as oil accumulation.

Conclusion

The future of crop stress management lies in combining field monitoring, plant stress diagnostics, and targeted interventions. When scientifically developed and correctly applied, biostimulants can become valuable components of an integrated strategy to protect crop productivity under increasingly variable environmental conditions.

For more information, send an email to admin@agraforum-sa.com

Figure 1: Abiotic stress and stress responses in crops (Godoy *et al.*, 2021).



Abiotic stress factors, such as heat, cold, drought, salinity, and the presence of heavy metals elicit stress responses in crops. Accumulation of ROS occurs, reducing photosynthetic activity, which ultimately lowers plant growth and thus crop yield

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NGRP 2026: From alignment to impact

By Alzena Gomes, communication and public relations officer, Grain SA

The 2026 annual meeting of the National Grain Research Platform (NGRP), hosted by Grain SA from 1 to 3 March at Future Africa, University of Pretoria, brought together producers, researchers, policymakers, and industry leaders.

The NGRP continues to position itself as a working platform where priorities are aligned, and direction is shaped. The message was clear from the outset: The future of South Africa's grain industry will not depend on excellence within individual spheres, but on how effectively research, industry, and policy are integrated.

Opening the platform, Grain SA chairperson Richard Krige challenged delegates to move beyond discussion towards coordination and implementation. He reminded attendees that in an industry defined by complexity, every decision, whether scientific or policy-driven, ultimately lands at the farmgate.

Pressure and productivity

Dr Tobias Doyer, chief executive officer of Grain SA, grounded the conversation in the realities facing producers. He highlighted the persistent decline in terms of trade, where input costs continue to rise faster than output prices. The result is a pressured industry where producers must produce more just to remain viable.

Research, in this context, is not theoretical but essential. Dr Doyer emphasised the need for integrated solutions across disciplines, from genetics and soil science to crop protection and precision agriculture. He also pointed to a critical gap: While knowledge and technology exist, adoption remains uneven. The challenge is not only to generate innovation, but to ensure that it is translated into practical, farm-level outcomes.

Economic realities

Providing a broader perspective, Prof Ferdi Meyer from the Bureau for Food and Agricultural Policy (BFAP) unpacked the economic forces shaping the grain industry. He highlighted the long-term trend of declining real commodity prices – a global reality driven by productivity gains and technological advancement. While South Africa has made significant strides in improving yields and closing the gap with international competitors, this progress has also intensified pressure on margins.

Prof Meyer described this dynamic as the 'technology treadmill', where continuous innovation is required to stay competitive. In this environment, the role of research becomes even more critical to increase productivity and sustain profitability.

From science to impact

The Department of Science, Technology and Innovation (DSTI) reinforced the importance of moving from research outputs to real-world impact. Through strategic partnerships and co-investment models, the department highlighted how collaboration is delivering progress in areas such as climate resilience, biosecurity, and crop improvement. However, a central challenge remains access and adoption.

The future of innovation, delegates heard, lies in ensuring that technologies are accessible, affordable, and practical – particularly for smallholder and developing producers – while leveraging digital tools to scale impact across the industry.

Policy and competitiveness

From a policy perspective, the National Department of Agriculture emphasised the need for alignment between research, innovation, and implementation. While South Africa's agricultural sector has shown resilience and export growth, future success will depend on how effectively technology is harnessed and localised. This includes strengthening biosecurity, improving regulatory frameworks, and expanding participation across the value chain.

Former minister of agriculture John Steenhuisen echoed these priorities, highlighting the complexity of the operating environment – from climate variability and pest pressures to volatile markets and global competition.
A key focus area was the governance of new breeding technologies, where science-based, enabling regulation is critical to maintaining competitiveness and attracting investment.

Innovation and perception

During discussions, attention turned to the role of communication and public understanding. Concerns were raised regarding the pace of technology adoption and the growing influence of misinformation in debates around biotechnology and crop protection.

Steenhuisen stressed the importance of stronger engagement from the scientific community, noting that credible, evidence-based communication is essential to building trust and supporting innovation and policy guidance. Researchers need to assist policymakers on scientific and public platforms to ensure efficiency. At the same time, the issue of fairness within the value chain was raised, particularly the imbalance between the risk carried by producers and the returns realised across the system.

A platform for coordination

In closing, Prof Danie Vermeulen, NGRP chairperson, highlighted the evolving role of the entity as a coordinating platform – one that brings together expertise and priorities in a structured manner. The goal, he noted, is not only to collaborate, but to do so more effectively by reducing duplication, aligning resources, and focussing on areas of greatest impact.

Across all sessions, one message stood out: South Africa's grain industry has the knowledge, capacity, and innovation required to succeed. NGRP 2026 made it clear that the next phase of progress will not be defined by new ideas alone, but by how effectively they are implemented where it matters most: on the farm.

This article was originally published in the April issue of *SA Graan/Grain*. For more information, *visit www.ngrp.co.za*

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For more information, visit *www.newholland.com/za* or contact Derrick Coetzee, product marketing specialist for harvesting and hay equipment, Southern Africa, at 082 524 7447.

SAGIS AGM: Demand for data is growing

By Nikilene Steenkamp, Plaas Media

The importance of reliable and independent market information for the grain and oilseed value chain was reinforced during the South African Grain Information Service's (SAGIS) 29th annual general meeting (AGM) held in Pretoria. The organisation reported strong industry participation, an unqualified audit outcome, and continued growth in information usage both locally and internationally.

Addressing attendees, outgoing SAGIS chairperson Zovuyo Ngejane said accurate data remained critical in an environment marked by global conflict, supply disruptions, rising costs, and ongoing uncertainty. "The value of accurate market data has never been more evident," said Ngejane, adding that reliable information supports informed decision-making, price stability, and food security. The AGM confirmed a leadership change, with Dr Erhard Briedenhann elected as chairperson of the SAGIS board and Ngejane taking up the role of vice-chairperson for the 2026/27 term.

Industry support and deliveries

Established in 1997 following the deregulation of South Africa's agricultural markets, SAGIS continues to provide grain and oilseed market information to industry participants, policymakers, processors, producers, researchers and traders. Its mandate is supported by statutory measures that require relevant market participants to register and submit information on grain and oilseed movements.

According to the annual report, SAGIS's objective is to provide reliable information through independent data collection, verification, processing, and publication, without making market projections or participating in grain trading activities. All users receive information simultaneously according to predetermined publication schedules. Ngejane told attendees that factual information is essential for business planning and food security.

SAGIS reported that 580 wholegrain and oilseed co-workers were registered at the end of February 2026, generating 1 217 monthly returns. Processors accounted for 74% of registered co-workers, followed by 16% traders, 6% storers, and 4% harbour silo owners. In addition, 895 product information co-workers submitted 934 monthly product returns relating to maize, wheat, and oilseed products. Compliance levels remained high: SAGIS received 99,6% of all potential returns during the reporting period, with 77,1% submitted by the required due date.

Management noted that significant effort was required to follow up on the roughly 22% outstanding submissions before publication deadlines.

The 2025/26 financial year saw strong growth in grain and oilseed deliveries. Total deliveries reached 22,37 million tonnes, an increase of 29,1% compared to the previous financial year. Maize, soya bean, sunflower seed, sorghum, canola, and groundnut all recorded year-on-year increases in deliveries, though wheat and barley deliveries declined slightly. Imports fell by 24,5% to 2,3 million tonnes, and exports declined 20% to 2,9 million tonnes. Potential monthly returns remained heavily concentrated in maize, which accounted for nearly 40% of all returns, followed by wheat, soya bean, sorghum, and sunflower seed.

Inspections and global demand

The SAGIS inspection function continued to play a key role in verifying information submitted by co-workers. During the reporting period, inspectors visited 795 premises across South Africa. Audits were conducted at 366 co-workers and 581 storage points, and approximately 8,15 million tonnes of grain and oilseeds were physically verified. Inspectors travelled about 80 000km during the year.

According to the AGM report, any mistakes or instances of non-compliance identified during inspections were corrected and had no material impact on information already published by SAGIS. Of the grain and oilseed stocks reported to SAGIS, 68,8% was stored in cement silos, followed by 12,8% in bunkers, 9% in steel silos, 7,4% in silo bags, and 1,9% in other storage facilities.

SAGIS recognised long service during its 29th annual general meeting. From the left are Bernard Schultz, general manager of SAGIS, Dr Erhard Briedenhann, newly elected SAGIS chairperson, Chris Schoonwinkel, who received a ten-year service award, and Zovuyo Ngejane, outgoing chairperson and newly elected vice-chairperson.

The AGM heard that the SAGIS website continues to attract local and international usage. Between July 2025 and February 2026, the website was accessed from 123 countries, with South Africa accounting for 84,88% of visits. Other users accessed the website from Brazil, the United States, Germany, Vietnam, Australia, India, and Russia.

During the eight-month period following the launch of the new website, 329 860 documents were downloaded. The homepage recorded 62 141 visits, while the conversion table and useful links pages were among the most frequently accessed resources.

SAGIS continues to publish a broad range of monthly and weekly grain and oilseed statistics, import and export data, producer deliveries, parity prices, tariff information, historic datasets, and market reports. Some historical datasets date back to 1936.

Finances and data value

Attendees were informed that SAGIS received an unqualified audit opinion for the 2025/26 financial year. The independent auditor concluded that the financial statements fairly presented the organisation's financial position and performance. Revenue increased to R21,8 million from the previous year's R20,7 million, and total assets increased to R19,6 million. Cash and cash equivalents rose to R18,3 million and retained income increased to R11,3 million.

An amount of R729 195 was allocated to replenish the capital reserve fund, which is intended for future replacement and upgrading of electronic equipment and software. According to the AGM presentation, SAGIS's information cost equated to 95 cents per tonne when measured against total local deliveries and imports handled during the year.

Guest speaker Dawie Maree, head of agriculture information and marketing at FNB South Africa, outlined a challenging global and domestic economic environment marked by geopolitical tensions, volatile oil markets, low economic growth, infrastructure constraints, rising input costs, and climate risks. While South Africa remains food secure and prospects for a large grain crop are positive, he warned that producers continue to face pressure from fertiliser, fuel, and other input costs.

He stressed that reliable, timely, and independent information is a prerequisite for a free-market system, helping producers, processors, financiers, and other stakeholders convert uncertainty into informed decisions.

Looking ahead

The AGM concluded with remarks from motivational speaker Christel Basson, who encouraged attendees to view trust, integrity, collaboration, and stewardship as the foundations on which agriculture continues to build its future. While her presentation focussed on personal and organisational growth rather than industry statistics, she praised SAGIS for its role in creating confidence through facts and reliable information.

As SAGIS approaches three decades of operation, the central message from the AGM was consistent: In an uncertain environment, the value of trusted agricultural information continues to grow.

For more information, send an email to info@sagis.org.za or visit *www.sagis.org.za*

Saving soya bean seed: Make the right choice for your farm

By Miekie Human and Kobus van Huyssteen, Sansor

Soya beans are self-pollinated, meaning that self-fertilisation occurs before flowers open, and that seed can be planted season after season. Hybrid crops such as maize are completely different, and the seed from hybrids should not be replanted. Deliberately cross-pollinating genetically distinct parent plants produces hybrid varieties that are superior to the parent plants in various respects due to hybrid vigour.

When hybrid seed is replanted, the next generation of plants loses the beneficial traits of the previous generation. Visually, plants are not uniform and very different in appearance to the original seed that was planted. Therefore, when retaining soya bean seed, several factors must be kept in mind.

1 Protected vs unprotected varieties

Plant breeders' rights (PBR) are a form of intellectual property protection aimed at incentivising innovation. This protection does not last indefinitely – field crops such as soya bean are protected for 25 years, after which the variety no longer has PBR. *Table 1* compares the actions allowed for protected and unprotected varieties.

2 Farm-saved seed vs brown-bagging

Farm-saved seed refers to seed retained for planting in subsequent seasons in line with all legal prescripts. In South Africa, brown-bagging refers to the illegal or non-compliant sale or exchange of farm-saved seed outside the official verification and legal framework.

Brown-bagged seed can be identified through the following practices:

- Cash or informal deals between producers.
- No invoices or official documentation.
- No variety or certification labels.
- Seed sold under the guise of animal feed.
- Seed advertised via social media or community groups.

3 Quality assurances

While farm-saved seed is retained by a producer from their own harvested soya bean crop to plant in the following season, certified seed is produced under a regulated quality assurance system by seed companies. Certified seed is tested prior to sale to ensure it meets standards for germination, physical purity and, in certain crops, seed health requirements.

Seed certification is voluntary in South Africa; however, seed sellers must still comply with the requirements as set out in the *Plant Improvement Act, 2018 (Act 11 of 2018)* (*PIA*) *Regulations* of 2025, even if the seed is not certified. Per *PIA Regulations* for soya bean, the minimum requirements are 70% germination, a maximum of 4% other matter, and no more than 0,1% other seeds.

For certified soya bean seed, additional quality parameters must be met, including field, planting, isolation, and inspection requirements. Physical standards for certifying soya bean seed require that the seed shall:

- Have a germination percentage of at least 70%.
- Contain at least 98% pure seed.
- Not contain more than 0,1% other seed, 0,2% seed of deviating plants, 2% other material.
- Not contain more than one seed of any restricted weed species, specifically: *Cuscuta* spp. (*dodder*), *Datura* spp. (thorn apple), *Solanum elaeagnifolium* Cav. (silverleaf bitter apple), and *Stipa* spp., excluding *S. dregeana* Steud and *S. capensis Thunb*. (serrated tussock, nasella).
- Not contain more than 0,2% sclerotia of *Sclerotinia sclerotiorum* in a 1 000g sample.

4 Conventional vs GM soya bean

The *Genetically Modified Organisms Act, 1997 (Act 15 of 1997)* (*GMO Act*) regulates all GMO-related activities in South Africa. Soya bean GM traits currently available in South Africa include herbicide tolerance and insect resistance.

When planting farm-saved seed, producers must carefully consider the provisions of the technology use agreement signed between the producer and company at the time of purchase. To ensure stewardship compliance, this

Table 1: Frequently asked questions relating to protected and unprotected plant varieties.

Question	Variety protected by PBR	Unprotected variety (no PBR)
Can I retain seed for planting in the next season?	Yes, subject to the conditions of the *Plant Breeders' Rights Act, 2018 (Act 12 of 2018)* and *Regulations*, as well as the *Technology Use Agreement* (GMO).	Yes.
Can I clean the seed on my farm?	Yes, but only if you have permission to retain the seed for planting, and solely for use on your own farm (i.e. you cannot clean seed for another producer).	Only for use on your own farm (i.e. you cannot clean seed for another producer).
Can I take retained seed for cleaning?	Yes, provided the cleaning facility is registered with the National Department of Agriculture (DoA). In addition, permission is needed from the PBR holder to clean, treat, store, sell, or advertise protected varieties.	Yes, provided the cleaning facility is registered with the DoA.
Can I advertise or sell my retained seed?	Only if a licensing agreement is in place and you are registered as a seed seller with the DoA. Unauthorised selling of seed is known as brown-bagging. Seed intended for planting may not be sold or advertised as 'feed' or 'grain'.	Only if you are registered as a seed seller with the DoA. Selling seed without a registered premises (seed seller) number constitutes illegal sale of seed.

agreement may require specific planting procedures or state that the seed may not be retained for replanting in subsequent seasons. The purpose of these provisions is to safeguard the technology and prevent loss of function of the traits. Case studies have been performed globally where poor stewardship practices contributed to loss of beneficial traits, such as insect resistance.

When retaining seed, ask the following questions: What was the seed quality at harvest? Was the crop affected by disease? Can the seed be cleaned? Has germination been tested? Is the variety still competitive? Can the seed be stored? Have all legal requirements been met?

In summary

South Africa is fortunate to have excellent seed laws that promote innovation while protecting the interests of producers and consumers alike. The decision to retain seed should be based on more than the purchase price of seed. Producers should consider seed quality, varietal performance, legal requirements, and long-term profitability. Whether choosing retained or certified seed, the goal remains the same: establishing a healthy crop capable of delivering the highest possible return.

For more information, send an email to Miekie Human at policy@sansor.co.za or visit *www.sansor.org/media-and-communications*

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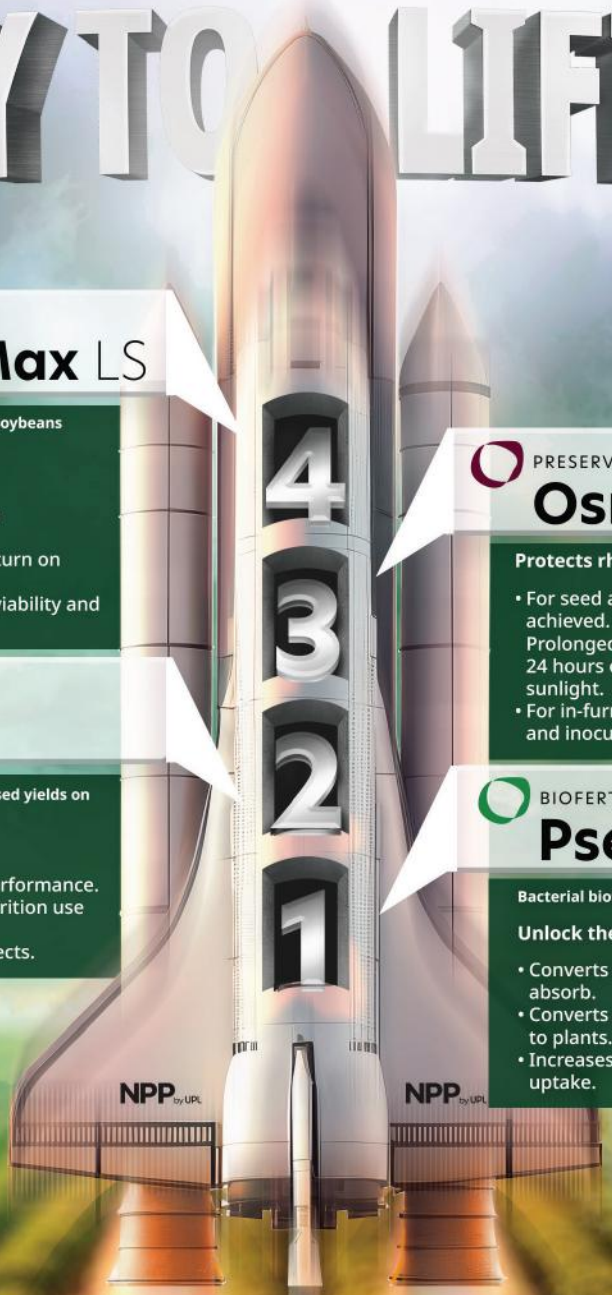

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Unlock free nitrogen... Naturally.

- Specifically developed and tested for South African conditions, ensuring reliable nodulation and yield.
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BIOFERTILIZER
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Bacterial biofertiliser for plant growth stimulation and increased yields on crops as indicated

Bioactive factory for increased crop yields.

- Enhances abiotic stress tolerance for consistent performance.
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- Engineered formulation deliver rapid, effective effects.

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Protects rhizobia bacteria against osmotic stress.

- For seed application: Mix with seed until even coverage is achieved. Plant as soon as seed is dry to the touch. Prolonged drying can kill the bacteria, ideally plant within 24 hours of treating. Keep treated seeds out of direct sunlight.
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UPL

The SACTA soya bean levy: Supporting innovation in a growing industry

By Andrew Bennett, chief executive officer, SACTA

South Africa's soya bean industry has undergone a remarkable transformation over the past decade. Production has expanded significantly, new markets have developed, and soya bean has become one of the country's most important summer crops. Behind this growth lies continuous investment in improved genetics, technology and research – investment that ensures South African producers remain competitive in a challenging production environment.

One of the mechanisms supporting this progress is the soya bean breeding and technology levy, administered by the South African Cultivar and Technology Agency (SACTA). Introduced in March 2019, the statutory levy was established to provide a sustainable funding model for plant breeding and technology development. It recognises a unique characteristic of the local soya bean industry: A proportion of the crop is planted using farm-saved seed.

This practice limits the income seed companies would traditionally receive through certified seed sales to reinvest in developing new cultivars. The levy helps bridge that gap by ensuring that breeding and technology programmes continue to receive the resources needed to develop improved soya bean varieties and introduce new technologies.

Delivering value to the industry

The success of any levy system depends on industry support, and the soya bean levy demonstrates that a well-managed, transparent system delivers real value. As production has increased, levy collections have grown accordingly. In 2025 alone, roughly R105 million was distributed to qualifying plant breeding and technology companies to support ongoing research and cultivar development.

Since SACTA was established in 2016, nearly R1 billion (R986 million) has been directed towards breeding and technology across the open-pollinated grain industries. This support has contributed to the registration of 214 new cultivars, including 130 soya bean varieties. Many contain the latest biotechnologies, giving producers access to improved genetics with higher yield potential, better disease resistance, and improved adaptation to South African growing conditions.

Plant breeding is not a short-term exercise. Developing a commercially successful soya bean cultivar can take a decade or more, requiring years of crossing, selection, field testing, and evaluation. Consistent funding is therefore essential if breeders are to continue delivering the genetic improvements that drive farm-level productivity.

The challenges soya bean producers face keep evolving. Variable rainfall, rising temperatures, new pest and disease pressures, and rising production costs all place greater emphasis on improved genetics. Modern breeding programmes now make extensive use of genomics, marker-assisted selection, and sophisticated data analysis to identify superior genetics faster than ever before.

Technologies such as gene editing, where permitted by regulation, offer exciting opportunities to accelerate the development of improved cultivars. These advances will play an important role in helping producers manage risk.

Accurate information matters

A successful levy system relies on accurate information from every participant in the value chain. Co-operatives, grain handlers, processors, and traders all play an essential role by accurately recording soya bean deliveries and submitting complete levy information to SACTA, underpinning the integrity of the entire system.

Accurate reporting ensures that levy collections reflect actual industry activity, that qualifying breeding and technology programmes receive the correct allocations, and that SACTA can provide transparent reporting to both industry stakeholders and the government.

Every tonne reported accurately contributes to future breeding and technology development. Conversely, incomplete or inaccurate reporting reduces the resources available for innovation that ultimately benefits the entire industry.

Beyond plant breeding

Although SACTA's primary responsibility is the administration of breeding and technology levies, the organisation's impact extends much further. Since its establishment, SACTA has allocated R283 million to enterprise development, supporting 681 farming enterprises across the summer and winter grain industries.

A further R14 million has been allocated to skills development, which has assisted 216 students, including 107 postgraduate (MSc and PhD) scholars. Additionally, more than R8 million has been directed towards socio-economic development initiatives that strengthen rural communities. These programmes complement SACTA's support for breeding by helping develop skilled people, stronger farming businesses, and a more inclusive grain sector.

Looking ahead

The soya bean levy is an example of what can be achieved through collective industry action. Providing support for plant breeding and technology ensures that South African producers benefit from the local adaptation of improved cultivars and modern technologies. Every accurately reported tonne and rand collected through the levy contributes to a stronger, more competitive local soya bean industry that is well positioned to meet the challenges and opportunities of the future.

Send an email to the author at andrew@sactalevy.co.za or visit *www.sactalevy.co.za* for more information.

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Financing that fits

Agriculture doesn't follow a monthly calendar. Cash flow is shaped by rainfall, harvests, markets, and the seasons. That's why financing should work with your business, not against it. With the John Deere Financial offer, qualifying customers can put a new 6M to work immediately while delaying their first annual payment until 2028.

The package includes four annual repayments over five years, helping repayments align more naturally with the realities of farming. Customers can also benefit from a VAT refund after four months, while deposits remain subject to credit approval. It's a financing solution designed to give your investment time to start working for you before repayments begin.

Invest in the season ahead

A tractor is more than just another machine on the farm. It is a partner through every season, helping you make the most of every opportunity the land presents. The right tractor increases productivity, supports your operation when timing matters most, and gives you confidence to take on the work ahead.

The John Deere 6M has earned its reputation by delivering dependable performance across a wide range of farming applications. Paired with financing that recognises the realities of agriculture, it gives producers the confidence to invest today while planning for tomorrow.

Make your move today

Opportunities don't wait, and neither should your business. If you've been considering upgrading your fleet or adding another reliable machine to your operation, now is the time to make it happen. The John Deere 6M promotion is available until 9 October 2026, subject to terms and conditions.

Speak to your nearest John Deere Financial financing specialist to discuss the solution best suited to your operation and to start your application. Put the John Deere 6M to work today. Give your business the power to perform now, with the flexibility to pay later.

John Deere Financial's credit and financing products are provided in collaboration with Absa Bank Limited, an authorised financial services provider and registered credit provider.

For more information, send an email to deere.africa@johndeere.com or visit *www.deere.africa/en/*

Application of NBTs to soya bean in Brazil

By Liliane Marcia Mertz-Henning, Sandra Maria Bellodi Cação, João Matheus Kafer, Rodrigo Thibes Hoshino, and Alexandre Lima Nepomuceno

New breeding technologies (NBTs) are a new generation of biotechnological tools that can introduce precise modifications to the genome or regulate gene expression. This accelerates the development of cultivars with improved agronomic traits.

The most prominent of these technologies is CRISPR-based genome editing. This introduces targeted changes to DNA sequences, and RNA interference (RNAi), which mediates post-transcriptional gene silencing. In soya bean, these technologies have been used to develop cultivars with enhanced nutritional quality and increased tolerance to biotic and abiotic stresses, as well as innovative crop protection strategies.

The advancement of these technologies in Brazil was facilitated by the publication of *Normative Resolution No 16* (*RN16*) on 15 January 2018 by the National Biosafety Technical Commission (CTNBio). This regulation established criteria for the case-by-case assessment of products developed using NBTs. It permits organisms that have been edited without stable integration of recombinant DNA to be classified as conventional (non-GMO) products instead of genetically modified organisms (GMOs). This reduces regulatory barriers and encourages innovation by public research institutions and private companies alike.

Private sector NBT development

CTNBio's regulatory framework has stimulated the development of diverse NBT-based technologies by Brazilian and multinational companies operating in the country. To date, over 100 technologies developed by public and private institutions have been evaluated.

Evolutta Agro Biotecnologia has developed a portfolio of sprayable dsRNA formulations that target caterpillars, Asian soya bean rust, phytophagous stink bugs, and whiteflies. Similarly, SEMPRE AgTech has developed RNAi-based products designed to silence genes essential for stink bug metabolism.

Bayer has developed an active ingredient for seed treatment that controls root-knot nematodes (*Meloidogyne incognita*) and soya bean cyst nematodes (*Heterodera glycines*). This illustrates the diversity of biotechnological approaches currently employed in Brazil (BRASIL, 2021a; 2021b; 2022a; 2022b; 2022c; 2022d; 2023).

In the field of genome editing, GDM Genética do Brasil has used the CRISPR system to generate soya bean lines with mutations in the RS2 gene to reduce seed raffinose content, and in RACK1 to enhance drought tolerance. Similarly, Bioheuris has developed soya bean plants with mutations in the ALS gene that confer tolerance to ALS-inhibiting herbicides.

Bayer (Monsanto do Brasil Ltda) has also developed two genome-edited soya bean events with improved plant architecture (CTNBio, 2025). All regulatory opinions issued by CTNBio have demonstrated that the final products are free of stable exogenous DNA and comply with national biosafety requirements. This allows these technologies to be classified as non-GMO products (BRASIL, 2021c; 2022e; 2022f).

Development of NBTs

Embrapa Soybean has invested heavily in developing and applying NBTs to promote agricultural innovation, providing more precise, rapid and sustainable solutions to production challenges. Several biotechnological approaches have been explored in this context. This includes RNAi, which enables highly specific post-transcriptional gene silencing, and CRISPR-based genome editing, which allows precise, targeted DNA modifications. The three studies presented here are the outcome of these institutional efforts and demonstrate the complementary use of these technologies.

One of the most notable studies involved the development of a topical dsRNA application system targeting the EPSPS gene of *Digitaria insularis*, a problematic herbicide-resistant weed species in Brazilian agriculture. Topical application of dsRNA reduced shoot dry biomass by 44%, decreased tiller number by 75%, and significantly suppressed expression of the target gene. This demonstrates the potential of RNAi technology as a sustainable alternative for managing herbicide-resistant weeds and reducing reliance on chemical herbicides (Cintra *et al.*, 2025).

Another important area of research focusses on using CRISPR technology to eliminate antinutritional factors in soya bean seeds. One study targeted the Le1 gene, which is responsible for producing soya bean agglutinin (SBA), a lectin that reduces the digestibility of nutrients in monogastric animals. Genome editing produced plants that did not accumulate lectins and exhibited a total loss of hemagglutinating activity, while maintaining key agronomic traits such as grain yield and thousand-seed weight (Kafer *et al.*, 2026).

A second study targeted the KTI1 and KTI3 genes, which encode the Kunitz trypsin inhibitor. This study successfully generated a stable biallelic KTI1 knockout event and edited KTI3 events, providing a promising basis for developing soya bean cultivars with improved digestibility and reduced heat processing requirements for animal feed production (Silva *et al.*, 2026).

Additionally, Embrapa Soybean has been developing CRISPR-based strategies to enhance drought tolerance. Two of these technologies – the low-lectin soya bean and the drought-tolerant soya bean – have undergone regulatory assessment by CTNBio and have been classified as non-GMO under *RN16* provisions (CTNBio, 2025).

For more information or references, send an email to liliane.henning@embrapa.br

LIVIN

SOYBEAN - LIQUID

SBP1

A liquid *Rhizobium* bacterial inoculant for enhanced nitrogen fixation in Soybeans

THE UNIQUE FORMULATION OF SBP1 OFFERS:

- A high concentration of *Bradyrhizobium japonicum* WB74 (2 x 10^9 CFU/g)
- Protective layer allows seeds to be treated up to 2 days before planting
- Natural sticking properties
- Superior plant health and yield
- Compatible with standard seed treatment equipment

SBP1 at work

SBP1 has been put to the test during many field trials, across various bioclimatic zones. While the number of nodules is important, the colour inside of the nodule is also of significance. **Nodules that are cut open and are red, pink, or orange inside are actively fixing N and are beneficial to the plant as shown here for Soybeans treated with SBP1.**

29 %	40	8 %
YIELD	**NODULE COUNT**	**NODULE SIZE**
increase compared to untreated control.	extra per plant, when planting 2 days after treatment.	increase compared to industry standard.

ALWAYS READ LABEL BEFORE USE / NOT CLASSIFIED IN TERMS OF GHS / HAZARD STATEMENT: None. / **ACTIVE INGREDIENT:** *Bradyrhizobium japonicum* 2.0 x 10^9 cfu/ml / Reg. No. L11643, Act 36 of 1947. **REGISTRATION HOLDER:** Nutrico SA (Pty) Ltd. (Co. Reg. No. 2003/008663/07) Cedar Lake Industrial Estate, 1 Harvest Place, Clayville, 1666, Gauteng, RSA

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The importance of inoculation technology

By Dr Anneli Heyns, Nutrico SA

In soya bean production, inoculation is often regarded as a standard planting practice. However, successful nodulation is not only about applying *Rhizobium* to seed. Inoculant technology must ensure that living bacteria survive storage, seed treatment, planting, and early root development long enough to form active, nitrogen-fixing nodules.

When selecting an inoculant, producers should consider key factors such as compatibility with seed-applied products and treatment systems, shelf life and storage stability, ease of handling and application, rhizobial strain specificity, and proven performance under local conditions.

A high-quality inoculant must deliver the correct rhizobial strain, support bacterial viability, and remain practical within technologically advanced commercial seed treatment systems. By combining the right inoculation technology with compatible seed-applied nutrition, nodulation quality improves nitrogen efficiency, early crop vigour, and long-term soya bean performance.

Why nodulation quality matters

Soya bean plants form a specialised relationship with *Bradyrhizobium japonicum*. Rhizobia attach to the root hairs, enter the root tissue, and stimulate nodule formation. Inside active nodules, rhizobia convert atmospheric nitrogen into ammonia, which the plant uses for growth, protein synthesis, and reproduction. Under favourable conditions, this symbiotic relationship can supply most of the soya bean crop's nitrogen requirement during the season.

The presence of nodules alone does not confirm effective nitrogen fixation. Nodule activity, position, and internal colour are important indicators of performance. Effective nodulation is usually associated with well-developed nodules near the crown and lateral roots, a pink to reddish internal colouration when dissected, and uniform crop growth. White or pale nodules may indicate immaturity or limited current activity, while green or brown nodules signal senescence or ineffective bacterial activity.

When nodulation fails

Nodulation failure can occur even when planting conditions appear suitable. Poor rhizobial survival on the seed, desiccation, UV exposure, acidic soils, compaction, drought stress, waterlogging, incompatible seed-applied chemistry, and low-viability inoculant formulations can all compromise nodulation quality.

When nodulation is poor, soya bean relies more heavily on soil nitrogen reserves. This can reduce early vigour, limit canopy development, increase yellowing, and affect pod set, yield, and grain protein accumulation. For this reason, inoculation success should be measured in the field rather than assumed at planting. Root inspections are commonly conducted from V3 to V5, once nodules are sufficiently developed to assess.

A stronger seed-zone programme

The seed zone is where germination, root initiation, *Rhizobium* survival, infection, and early nutrient uptake begin. Inoculation combined with seed-applied nutrition can support the young seedling during early development.

Molybdenum and cobalt nutrition support nodule function and stimulate the nitrogen fixation process. Phosphate-solubilising bacteria may help improve access to less available phosphorus fractions in the rhizosphere, supporting root activity and nutrient-use efficiency. Seaweed extracts can support early root development, seedling vigour, and physiological resilience during establishment stress.

Not every seed-applied product is suitable for use with living inoculants. A successful programme should consider application sequence, drying time, storage conditions, product compatibility, and the days between treatment and planting.

Livin® inoculation solutions

The Livin® range of biological inoculants supports soya bean establishment through technology designed to assist bacterial survival, root colonisation, and consistent early nodulation under recommended handling conditions.

The soya bean range contains *Bradyrhizobium japonicum* strain WB74, a strain widely used in South African soya bean inoculation systems. These products are not classified under the *Globally Harmonized System of Classification and Labelling of Chemicals* (GHS) and therefore have favourable environmental footprints.

The Livin® range includes:

- **SBP1** (Reg no L11643, *Act 36 of 1947*): An extended shelf-life liquid inoculant with sticking properties, developed for practical seed application and reliable handling.
- **SBP3** (Reg no L11809, *Act 36 of 1947*): A robust, peat-based powder inoculant that offers a proven inoculation format for growers who prefer a traditional carrier-based option.
- **SBP4** (Reg no L11808, *Act 36 of 1947*): A liquid inoculant featuring an extended shelf life, sticking properties, and up to 20 days of post-treatment stability when used according to product-specific recommendations and tested compatibility guidelines. This offers valuable flexibility during narrow planting windows.

The Livin® range brings together formulation science, practical handling, and field-focussed technical support to help producers move from inoculation to building strong root zones for long-term soya bean performance.

For more information, contact Nutrico at info@nutrico.co.za or 011 392 4072, or visit *www.nutrico.co.za*

MBFi
Leaders in Science. Partners in Growth.

NITROLOGY® RANGE Protecting the journey from inoculant to active nodule

By Nadine Loubser, head microbiologist, MBFi

Soya bean production places an exceptional demand on nitrogen. The crop needs it to build chlorophyll, enzymes and proteins, with demand rising during flowering, pod formation, and seed filling. Soya bean can meet this requirement through a coordinated partnership with *Bradyrhizobium* bacteria.

The Nitrology® range was developed around that partnership. It includes Nitro-liq®, Rizo-liq®, Signum®, Elite®, and Rizogen®, supported by Bio-Shield XT®. Rather than offering one inoculant for every situation, the range provides several levels of bacterial concentration, protection, and biological activation. This allows a grower or seed-treatment professional to select a solution that fits the planting window, seed-care programme, and expected environmental pressure.

Together, these options place living nitrogen technology within reach of both farm-scale and professional seed-treatment operations.

From atmospheric nitrogen to crop nutrition

Although atmospheric nitrogen is abundant, soya bean roots cannot use it directly. Fixation begins when compatible *Bradyrhizobium* cells recognise root signals and produce Nod factors. These initiate root-hair curling, infection threads, and nodules. Inside the nodules, bacteria convert nitrogen gas into ammonia for plant metabolism, while the plant supplies carbohydrates and protection.

Successful nodulation requires more than applying bacteria to seed. Viable cells must survive application, other seed treatments, the pre-planting interval, and entry into soil. They must then locate the emerging root and establish nodules before crop demand accelerates. Heat, drying, salinity, unsuitable pH, and chemical exposure can reduce their numbers or delay infection. Nitrology® addresses these risks through complementary formulation technologies.

Nitro-liq®: A practical starting point

Nitro-liq® is the straightforward liquid inoculant in the range. It delivers live *B. japonicum* to soya bean seed and suits growers who can inoculate close to planting. It is a practical, economical option where logistics are predictable and extended treated-seed storage is unnecessary.

Where Bio-Shield XT® forms part of the approved programme, the pre-planting interval can be extended in accordance with the registered directions. Nitro-liq® suits operations that need dependable inoculation without a long treatment window.

NITROLIQ® PLR PREMIUM

Nitro-liq® Soya bean, Reg No L8986, *Act 36 of 1947*,
Active ingredient: *Bradyrhizobium japonicum*, 2×10^9 CFU/ml

Rizo-liq®: Preparing rhizobia for osmotic stress

Rizo-liq® adds OSMO Protection® technology. A seed surface can be difficult for living bacteria: Water is limited, and drying is rapid. Similar osmotic pressure may continue after planting where soil moisture is inconsistent, or salinity is elevated.

OSMO Protection® helps *Bradyrhizobium* maintain hydration and membrane integrity during these transitions. The aim is to retain a useful population until the root becomes available. With Bio-Shield XT® and compatible treatments, Rizo-liq® supports pre-treatment for up to 21 days. This provides operational flexibility while protecting the biological investment on the seed.

RIZOLIQ® OSMO PROTECTION

Rizo-liq® Soya bean, Reg No L8738, *Act 36 of 1947*,
Active ingredient: *Bradyrhizobium japonicum*, $6{,}5 \times 10^9$ CFU/ml

Signum®: Strengthening the first conversation

Signum® combines OSMO Protection® with Signal Generation™ technology. It focusses on the biochemical dialogue preceding nodulation. Roots release flavonoids, *Bradyrhizobium* detects them, and nod genes direct Nod-factor production. Slow recognition leaves the bacteria exposed to soil stresses and competing microorganisms for longer.

Signal Generation™ supports earlier recognition between bacterium and root, helping nodulation start efficiently. This is valuable where pH, temperature, moisture, or salinity may disrupt signalling. Signum® combines bacterial protection with the communication needed to initiate symbiosis. With Bio-Shield XT® and compatible chemistry, it permits pre-treatment for up to 21 days.

Signum® Soya bean, Reg No L8988, *Act 36 of 1947*, Active ingredient: *Bradyrhizobium japonicum*, 6,5 × 10^9 CFU/ml

Rizogen®: Activating the colonisation phase

Rizogen® combines OSMO Protection® and EXO Activation® technology. EXO Activation® encourages extracellular polysaccharide formation – sugar-based materials surrounding cells that contribute to attachment, aggregation, and biofilms. These properties matter because rhizobia must remain associated with the seed and colonise the developing root surface.

By supporting this extracellular matrix, Rizogen® prepares bacteria for the journey into the rhizosphere. Attachment and colonisation improve opportunities for contact with root hairs, while OSMO Protection® supports resilience. With Bio-Shield XT®, pre-treatment is accommodated for up to 21 days under compatible, label-approved conditions. Rizogen® suits programmes valuing both survival and root-surface establishment.

Rizogen® Soya bean, Reg No L10801, *Act 36 of 1947*, Active ingredient: *Bradyrhizobium japonicum*, 6,5 × 10^9 CFU/ml

Elite®: Built for extended on-seed survival

Elite® is designed for systems requiring a longer interval between treatment and planting. Its Membrane Protection™ technology uses specialised stabilisers to shield *Bradyrhizobium* membranes from chemical, oxidative, and environmental stress. This matters because a cell may remain detectable on seed yet be unable to colonise roots or form nodules.

With Bio-Shield XT® and verified compatible treatments, Elite® supports on-seed survival for at least 45 days with common seed-treatment chemicals. This is relevant to professional facilities and supply chains where seed is prepared and distributed before planting. Elite® makes a longer logistical window manageable while maintaining the goal of viable bacteria at germination.

Elite® Soya bean, Reg No L8925, *Act 36 of 1947*, Active ingredient: *Bradyrhizobium japonicum*, 1 × 10^{10} CFU/ml

Bio-shield XT®: Protection after application

The bio-protector formulation protects bacteria before use; Bio-Shield XT® extends that protection after they reach the seed. Its Hydrolock® technology acts as a moisture-managing barrier and binding system. Hydrocolloid components retain water, reduce rapid dehydration and improve attachment of microbes to the seed surface. This is important because desiccation and poor adhesion can cause bacterial populations to decline before planting.

Match the technology to the farm

The value of Nitrology® lies in choice. A grower treating seed immediately before planting has different requirements from a commercial facility preparing seed weeks in advance. Dryland fields exposed to erratic moisture present different risks from well-managed irrigated soils. Chemical seed-treatment mixtures, application equipment, storage temperature, and seed-flow products further change the survival environment.

Product selection should therefore begin with four questions: How long will treated seed be stored? Which other products will come into contact with the bacteria? What environmental stress is expected at planting? Which technology best supports the desired biological outcome? Nitro-liq® provides an efficient entry point, Rizo-liq® adds osmotic resilience, Signum® supports molecular signalling, RizoGen® promotes extracellular protection and colonisation, Elite® addresses extended treatment intervals, and Bio-Shield XT® protects the applied microbes on seed.

A strong Nitrology® programme is ultimately measured below ground. Well-distributed nodules, particularly on the crown and primary root, should be assessed during early crop development. Cutting nodules open provides a simple indication of activity: a pink-to-red interior generally indicates functional leghemoglobin and active nitrogen fixation. Pale, green, or deteriorating nodules require closer investigation of inoculation, soil conditions, nutrition, disease pressure, and moisture.

For more information, send an email to Nadine Loubser at nadine@mbfi or visit *www.mbfi.co.za*

Soya bean crop safety: Managing in-furrow fertilisers, herbicides, and rhizobia inoculants

By Dr Charlie Reinhardt

The intention of in-furrow technology is to allow the precision placement of crop seeds, as well as the application of liquid fertilisers, pesticides, and biological products directly into the seed trench during planting. The primary aim is to boost and protect the crop at its most vulnerable growth stages: seed germination and seedling establishment.

Inadequate root nodule development of Bradyrhizobium japonicum inoculant on soya bean plants. In addition to adequate nodule numbers, the bacterial colonies in them must be active, which is indicated by the pink-red colour of dissected nodules.

However, this highly efficient approach of combining chemical and biological products in a single operation is not without risks to crop safety.

Reported negative impacts include seed and seedling burn from high salt concentrations, ammonia toxicity, toxic effects on seed inoculants (e.g. *Bradyrhizobium japonicum*), and adverse interactions among agrochemicals (fertiliser and pesticide) that either harm the crop or inoculant, and/or neutralise product efficacy. The focus here is on herbicides and fertilisers, but insecticides and fungicides are also implicated in adverse interactions in scientific literature.

The seed trench or plant furrow is a small but critical compartment of the soil environment. Physical soil properties within the planter furrow can either be conducive for early crop growth and development or restrict it to the extent that yield potential suffers.

Localised soil compaction in the planter furrow can at least temporarily affect soil moisture and temperature dynamics while physically restricting seedling emergence and early root development. The intensity of soil compaction varies depending on soil type, the moisture content of the soil being worked, and the implement type and its operation. Where localised compaction of this nature occurs, it creates a zone of concentration for chemical and biological products. This invites chemo-biological interactions that can harm the crop and/or reduce product efficacy.

Soya bean responses to herbicides

Herbicides are not only harmful to weeds, but they can also damage crop plants and reduce their yields, despite being registered for use on a specific crop. Even crops genetically engineered to withstand specific herbicides can at best be described as tolerant, rather than resistant. Herbicide resistance is therefore a relative concept, not an absolute one.

As with many annual crops, soya bean cultivars can vary in their sensitivity to certain herbicides. In the United States, university-generated ratings based on crop responses to herbicides provide estimates of injury potential for soya beans.

Most soya bean cultivars are not overly sensitive to any registered herbicide, but some may vary in their sensitivity to certain herbicides. For most herbicide-crop combinations, crop safety relies on the crop plant's ability to rapidly metabolise (degrade) the herbicide. Any factor that impedes this ability negates herbicide selectivity and increases the risk of crop damage.

Contributing human risk factors include herbicide overdosing, as well as the use of unregistered products and product mixtures. Environment-induced crop stress – such as cool, wet soil conditions shortly after planting, as well as the application of pre-emergence herbicides – often elicits herbicide damage, especially on light soils, where herbicides are readily available for uptake by plant roots.

Soil chemistry and efficacy

The impact of soil-applied herbicides on both weeds and crops is primarily determined by the amount and type of soil colloids (clay and organic particles smaller than one micron). These colloids adsorb or bind, temporarily at least, herbicide molecules that would otherwise be freely available for uptake by plant roots. Lighter soils with sandy or sandy loam textures therefore require less herbicide product per ha than heavier soils to achieve the same level of weed control.

Product labels for all soil-applied herbicides reflect this relative soil availability for root uptake in the recommended dosages, i.e. the lowest rates are specified for sandy soils, with dosages increasing alongside clay percentage. This relationship between herbicide activity and clay content is practical and effective in most cases due to the natural, strongly positive relationship between clay and soil organic matter. The humus fraction, which comprises the organic colloidal component of soil, is factually more important than clay colloids in the adsorption (binding) of herbicides and, hence, their weed control efficacy.

However, because soil organic matter content varies more widely than clay content, the label recommendations based solely on clay percentages work reasonably well until reduced-tillage practices increase the humus fraction. With clay content remaining stable and the humus fraction having increased appreciably, poorer weed control and its critical ramification of herbicide-resistant weeds will result.

Herbicides and fertilisers

The most sensitive period during which fertilisers pose a risk to the soya bean crop is during seed germination and seedling establishment. Salt concentration effects from fertilisers can hamper water uptake by seeds through osmotic effects; high salt levels in soil water reduce the water potential to such an extent that seeds cannot imbibe sufficient water for optimal germination.

High salt concentrations can also cause burn damage to both seeds and seedlings, especially when plant tissue comes into direct contact with fertiliser. This explains why best practice for fertiliser placement relative to seeds is at least 5cm to the side of and below the seed.

A further complicating factor is the concentrating effect exerted by soil compaction in the plant furrow, which applies to both fertiliser and herbicide. If the herbicide is not diluted by dispersal soon after application, its selectivity (safety) towards the crop may be compromised. Physiologically stressed crop plants suffering from either nutrient excess or deficiency have a reduced ability to metabolise herbicides rapidly enough to ensure selective action or crop safety.

A crusted soil surface slows seedling emergence, extending the duration of exposure to herbicides and increasing the risk of crop damage. Fertiliser-induced stress on the crop seedling that delays soya bean emergence causes the seedling to remain longer in the emergence stage, thus leaving the seedling exposed to soil-applied herbicides for longer than usual, which increases total herbicide uptake and the risk of crop damage.

Furthermore, rainfall or irrigation shortly after planting can trigger leaching and seed-furrow wash, activating furrow-applied fertilisers and bringing them into direct contact with seeds and seedlings. Overhead water can also wash surface-applied, pre-emergence herbicides down into the furrow soil, bringing them into direct contact with sensitive young roots and emerging shoots. Consequently, the interaction between fertilisers and herbicides in the furrow zone can increase the risk of sensitising the crop to herbicide damage at an early growth stage.

Protecting seed inoculants

Rhizobia – the collective name for *Rhizobium, Bradyrhizobium*, and similar beneficial soil bacteria – must be protected from harmful environmental conditions and toxic substances. Potentially harmful substances include pesticides (herbicides, fungicides, and insecticides) and fertilisers.

Only pesticide and fertiliser products registered under the *Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947)* for use in mixtures with rhizobia inoculums should be used, and always in strict accordance with product label instructions. Applying fertiliser products and mixtures that are not registered for use in combination with rhizobia inoculants poses a serious risk that, unfortunately, occurs far too frequently.

Direct contact between inoculated seed and fertiliser can kill rhizobia through desiccation and excessive acidity. Fertilisers such as superphosphate and related products are acidic and toxic to rhizobia when in solution and in direct contact with the inoculum.

Nitrogen (N) and phosphorus (P) are essential for plants' early and later growth as well as their development. An exogenous (from outside the plant) supply of N as a start-up dose during legume seedling development prior to nodulation has proven critical for optimum soya bean production. Rhizobia also require P to provide energy for nodule formation and N fixation.

Beyond promoting healthy crop and root growth, which provides ample infection sites for rhizobia, other benefits of P have been directly linked to specific mechanisms underpinning N fixation. While certain micronutrients essential to the crop (such as copper and zinc) can harm rhizobia, boron and molybdenum are reported to be beneficial.

Herbicide impact on rhizobia

In cases where an herbicide injures a legume crop, either directly at application or indirectly through phytotoxic soil residues from a previous crop, it generally reduces inoculant efficiency, as the optimal functioning of the inoculum relies on a healthy host plant. The risk of herbicide residue carry-over to sensitive crops is particularly high when dry spells follow application or on alkaline soils, both of which prolong herbicide persistence.

Herbicide residues and in-crop applications of herbicides belonging to HRAC group B (e.g. imidazolinones and sulfonylureas) are frequently linked to reduced growth, N fixation, and yields in legume crops. Strict adherence to label-recommended dosages and the safety (waiting) periods stipulated for sensitive follow-up crops is critical.

Herbicides reported in the scientific literature for reducing the N-fixing capacity of inoculants include imazethapyr, S-metolachlor, and diclosulam. Compared with insecticides and fungicides, herbicides are generally considered less toxic to rhizobia. Among them, glyphosate has been found to be the least damaging to rhizobia inoculants.

Dr Charlie Reinhardt is a former head of the Department of Plant Production and Soil Science at the University of Pretoria, and an independent consultant on weeds and herbicides. For references or more information, contact him at 083 442 3427 or dr.charlie.reinhardt@gmail.com

The liquid revolution in soil health

By At van Schalkwyk, World Focus Agri

Applied in suspension, World Focus Agri's microfine ground lime and gypsum not only offer ease of use, but considerably improve performance. With particle sizes ranging from five to 15 microns, this enhanced technology accelerates pH adjustment and ensures greater vertical movement through the soil profile.

Rather than affecting only the top 2,5cm, it corrects the pH to a depth of 7,5 to 16cm, allowing for better nutrient availability and microbiological activity throughout the root zone.

Timing and action

Thanks to its increased reaction rate, microfine lime and gypsum can be applied at any time during the growing season. Should an adjustment be required, monthly applications can be done throughout the growing season until levels are rectified. This is preferable to a single heavy application as it gives soil microbial populations time to transition to a higher pH regime.

Lime must be applied immediately after the growing season or crop removal, allowing sufficient time for it to react and restore the soil pH before the next season. The reaction time depends on the type of lime used. Liming materials vary greatly in their neutralising capacity due to variations in the percentage of calcium and/or magnesium. Materials with a high calcium carbonate equivalent (CCE), the percentage of usable lime in a product, neutralise soil acidity faster than those with a low CCE. Ultimately, average particle size plays a decisive role: the finer the material, the quicker the reaction.

Frequency of application

Soil with a low cation exchange capacity (CEC) needs less lime to correct the soil pH, but requires more frequent applications. Conversely, soil with a high CEC requires a large quantity of lime; however, due to its high buffering capacity, it can take years before a follow-up application is needed.

While fertilisers improve crop production, they also accelerate the depletion of essential nutrients from the soil. Lime is needed to replenish these nutrients, and can be applied in smaller, more frequent doses. Microfine lime and gypsum can form part of the annual fertilisation programme. In row crops, it can also be applied in the fertiliser band to neutralise acidification caused by the oxidation of applied nitrogen fertiliser.

Rely on World Focus Agri's microfine lime and gypsum products, Complex Calsus, CCM, and Complex Calsul. They are suitable for all crops and easily applied with a boom tractor or irrigation system.

Send an email to at@worldfocusagri.co.za or visit *www.worldfocusagri.co.za/home* for more information.

Agricultural Remedies Regulations: Important concepts

By Elriza Theron, strategic partnerships and operations manager, CropLife South Africa

The South African regulatory landscape for agricultural remedies is evolving. The *Regulations Relating to Agricultural Remedies* published in August 2023 under the *Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947*) (the *Act*) introduced several new concepts that shape how agricultural remedies are evaluated, monitored, and managed.

Worldwide, regulators recognise that agricultural remedies should be monitored throughout their commercial life cycle to ensure they meet modern safety, efficacy, and environmental standards. Several concepts introduced in the 2023 regulations reflect this trend.

Historically, even simple administrative amendments to product registrations often required lengthy regulatory processes. The 2023 regulations distinguish between administrative changes that have little or no impact on product safety or efficacy, and more significant amendments requiring full scientific evaluation. Examples include changes to company names, contact details, grammatical or artwork changes to labels, or other administrative particulars not affecting the product itself.

Although this may appear to be a technical matter, more efficient administration can improve product registration management, allowing regulatory resources to focus on scientific assessments directly affecting human and animal health, and the environment.

Adverse reaction reporting

An important addition is the formal introduction of adverse reaction reporting. This concept encourages systematic reporting of unexpected or unintended effects associated with agricultural remedies after they have entered the market, specifically regarding human health and the environment.

Rather than viewing these reports as evidence that a product is inherently unsafe, they form part of a continuous monitoring system designed to identify patterns that may warrant further scientific investigation. Many industries, including pharmaceuticals and veterinary medicines, have long relied on similar post-market surveillance systems.

Closely linked to it is the requirement to report potentially harmful or unacceptable effects. This helps regulators identify situations where changes have occurred in product specifications, expected residues on food, or where new scientific evidence has emerged regarding potential human health concerns not known at the time of registration.

The effectiveness of this system depends on accurate and timely information from all value chain role-players, including registration holders, distributors, crop advisers, and producers. High-quality reporting allows potential problems to be investigated timeously and helps maintain confidence in the regulatory system.

The new regulations also specify that "any person in control of an establishment that sells agricultural remedies shall provide safety instructions, training, and awareness to the distributors, advisors, and users of pesticides on safety instructions for human health and the environment". This places great responsibility on manufacturers and distributors to ensure these products are used with minimal risk.

Highly hazardous pesticides

A notable development is the introduction of 'substances of concern'. Together with 'restricted agricultural remedies', it forms the two classes of highly hazardous pesticides. A substance of concern is any substance with an inherent capacity to adversely affect humans, animals or the environment, that is present or produced in an agricultural remedy in sufficient concentration to present such a risk, and complies with certain hazard cut-off criteria.

These substances include active ingredients and formulations that meet the criteria of being a carcinogen, mutagen, or reproductive toxin – specifically CMR categories 1A and 1B under the *Globally Harmonised System of Labelling and Classification of Chemicals* (GHS). Category 1A refers to active ingredients and/or co-formulants that meet the criteria of a known human carcinogen, mutagen or reproductive toxin, largely based on human evidence. Category 1B refers to a presumed human carcinogen, mutagen or reproductive toxin, largely based on animal studies.

Most of these remedies have already been phased out. Since 1 June 2024, the registrar of the *Act* may no longer approve or renew registrations for remedies that fall within this class, except under exceptional circumstances. The regulations also introduced the fast-tracking of alternatives to substances of concern and low-risk agricultural remedies.

As innovation continues, a growing number of biological products, naturally derived substances, and other novel technologies, including low-toxicity chemistry,are becoming available to producers. However, low risk does not mean no risk. These products must still be used responsibly and according to their approved labels.

Looking ahead

The 2023 regulations marked an important step in the modernisation of South Africa's regulatory framework for agricultural remedies. However, the government is currently undertaking a broader review of the *Act*, with the intention of replacing legislation that has served South African agriculture for nearly eight decades. As this revision process progresses, additional changes can be expected that seek to align the country's regulatory system with international best practice.

For more information, send an email to elriza@croplife.co.za or visit *www.croplife.co.za*

Can canola offer a lower-cost alternative to soya bean meal for broilers?

By Milan Kandel

Replacing soya bean meal with canola meal and canola seed can lower broiler feed costs without affecting feed conversion ratio or nutrient digestibility. However, Australian research shows that higher inclusion rates reduce feed intake and weight gain, highlighting the need to balance economic benefits with bird performance.

Soya bean meal remains the main protein source in poultry diets worldwide, but rising costs and regional availability have encouraged interest in alternative ingredients. In Australia, canola meal and canola seed are widely available and could provide a cost-effective substitute, although concerns over antinutritional factors and lower energy density have limited their use.

Researchers at the University of Sydney investigated whether soya bean meal could be partially replaced with a combination of canola meal and canola seed in broiler diets from day one to 42 post-hatch. The study evaluated growth performance, carcass characteristics, nutrient utilisation and pellet quality in 450 Ross 308 broilers fed nine dietary treatments.

The diets were formulated to be isoenergetic and balanced for digestible amino acids, with canola inclusion levels ranging from 50g/kg to 300g/kg across the different feeding phases. All diets contained xylanase and phytase.

Higher inclusion reduced feed intake and growth

The researchers found that increasing canola inclusion consistently reduced feed intake and bodyweight gain throughout the trial. During the starter phase, birds fed 50g/kg canola performed similarly to those receiving the control diet. However, increasing the inclusion to 100g/kg reduced bodyweight by around 2%.

Across the entire 42-day study, the highest canola inclusion reduced feed intake by 6,9% and bodyweight gain by 7,1% compared with the control birds. Despite the reduction in growth, feed conversion ratio (FCR) was not significantly affected, indicating that birds remained equally efficient at converting the feed they consumed into bodyweight.

Carcass traits and digestibility maintained

Higher canola inclusion had no significant effect on carcass characteristics, including breast meat, leg yield, or abdominal fat deposition. Similarly, nutrient utilisation remained largely unchanged. Apparent metabolisable energy (AME) and nitrogen retention were not significantly affected by dietary treatment.

Although the AME energy ratio was lower in canola diets because of their higher oil and lower starch content, starch and protein digestibility coefficients were similar across all treatments. However, the rates at which starch and protein disappeared from the digestive tract were lower in diets containing higher levels of canola.

Soya bean meal remains the main protein source in poultry diets worldwide, but rising costs and regional availability have encouraged interest in alternative ingredients.

Pellet quality linked to lower intake

The researchers suggest that poorer pellet quality contributed to the decline in feed intake observed with higher canola inclusion. Pellet durability decreased as canola seed levels increased, while the higher fibre, glucosinolate and sulphur contents of the diets also appeared to reduce feed intake.

Lower feed costs, but longer production time

From an economic perspective, canola-based diets reduced feed costs per bird and per kg of live weight. Feed costs were approximately 5 to 7 cents lower per kg of live bodyweight than the control diet.

Although canola-based diets reduced feed costs per bird and by around 5 to 7 cents per kg of live weight, birds required nearly three additional days to reach 2,5kg, meaning producers would need to weigh lower feed costs against longer growing periods.

Practical implications

The findings suggest that canola meal and canola seed can partially replace soya bean meal in broiler diets without compromising feed conversion ratio, carcass yield, or nutrient digestibility. However, high inclusion levels reduce feed intake and growth performance. The researchers recommend limiting canola inclusion to no more than 50g/kg during the starter phase to avoid early growth depression.

They also suggest that enzyme supplementation, improved pellet quality and adjustments to dietary nutrient density could help overcome the intake limitations associated with higher canola inclusion. Future research will investigate these strategies further.

View original article on the *Poultry World/Food & AgriBusiness* website at *www.foodagribusiness.world/poultry/canola-in-broiler-diets-balancing-cost-and-performance.*
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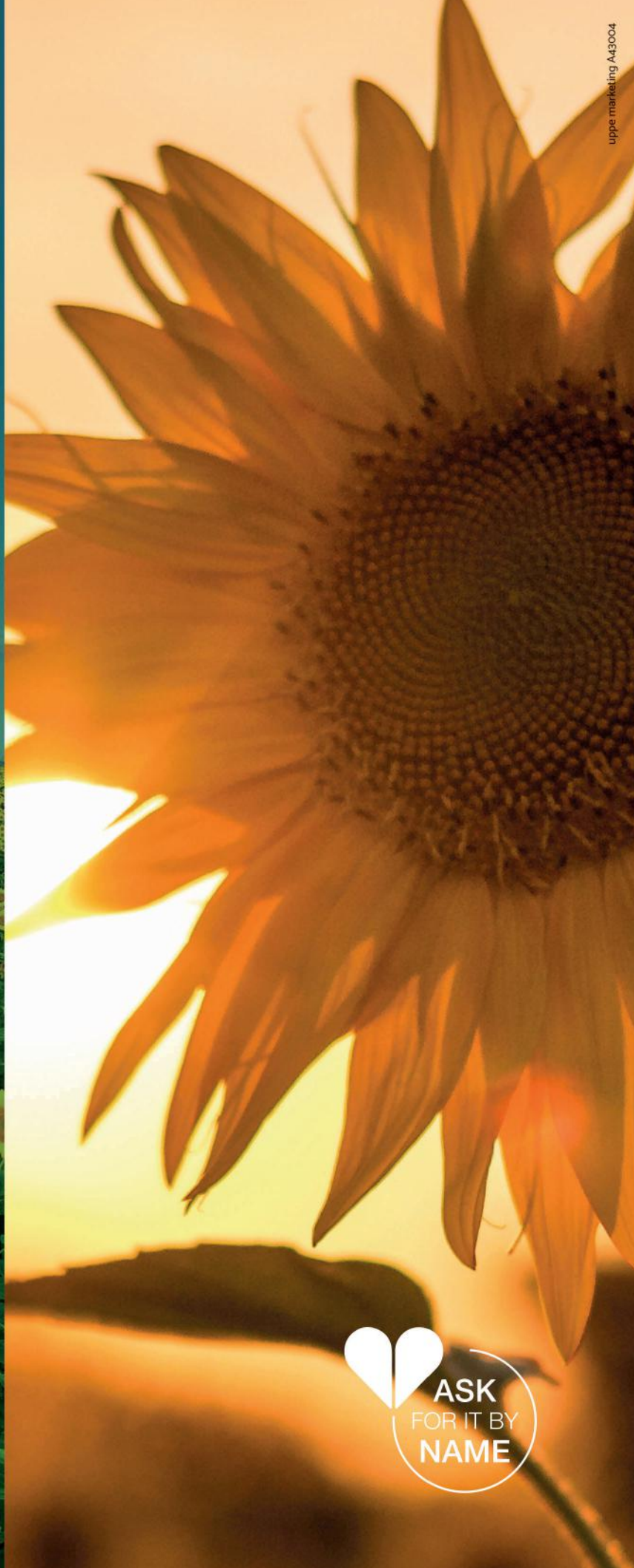

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Production of biodiesel from vegetable oils

By José María Cerveró, José Coca, and Susana Luque

Biodiesel is a liquid fuel produced from a variety of natural oils, such as vegetable oils, animal fats, or even waste cooking oils. It contains monoalkyl esters with hydrocarbon chains in the range of 14 to 22 carbon atoms, capable of combusting properly in conventional diesel engines (Vicente Crespo *et al.*, 2001).

Although most commonly used oils are soya bean, rapeseed, and palm or sunflower, biodiesel can be produced from more than 300 vegetable species, depending on their availability in the biodiesel production area. The use of waste cooking oils has the advantage that they are recycled, avoiding a significant environmental problem.

Depending on the feedstock, biodiesel has different names: rapeseed methyl ester (RME), soya bean/sunflower methyl ester (SME), palm methyl ester (PME), fatty acid methyl ester (FAME), generally referred to as vegetable or waste cooking oils.

Vegetable oils and animal fats are extracted and pressed to obtain the crude oil, which contains free fatty acids, phospholipids, sterols, water, strong odour compounds, and impurities. Even refined oils always contain a small amount of free fatty acids and water. This fact strongly affects the transesterification reaction when inorganic catalysts are employed.

Vegetable oils have a wide variety of fatty acid composition, depending on their source. Among the fatty acids, oleic acid is particularly stable to thermal oxidation, because it only contains one double bond in its molecular structure. Although most sunflower oils have about 20% oleic acid, hybrid varieties may reach 80%. This oil has been of special interest for the synthesis of esters used as biofuels and lubricants (Mittelbach, 1990; Dossat *et al.*, 1999; Dossat *et al.*, 2002).

Biodiesel typically contains up to 14 types of FAMEs. Their relative amounts greatly influence the properties of the resulting biodiesel. For example, a high content of saturated fatty acids in the raw feedstock (i.e. myristic, palmitic, stearic acids) raises turbidity and the cetane number, decreases NO_x emissions, and shows better stability. Furthermore, a high ratio of polyunsaturated fatty acids (i.e. linoleic or linolenic acids) has the opposite effect (Ma and Hanna, 1999).

Oleic and linoleic acids are the main fatty acids in sunflower oil, both with a 19-carbon atom chain, oleic acid with one double bond and linoleic acid with two. Typically, linoleic acid is about 80% of the free fatty acid content, though some varieties have around 70% oleic acid.

Biodiesel can be obtained by transesterification of fatty acids, either with methanol or ethanol. Ethanol, being even more expensive than methanol, can be obtained from renewable resources, and the resulting biodiesel is a fully renewable fuel.

The synthetic path for ethylic esters of fatty acids is very similar to the one for methyl esters. Glycerol removal is, in principle, easier to carry out, but vigorous stirring is needed. Ethanol purity is essential with respect to its water content, since water occurrence in the reaction medium decreases selectivity (Peterson, 1996). Potassium hydroxide is the most suitable catalyst in this process (Shaw *et al.*, 1991).

Biodiesel versus petroleum diesel

Biodiesel and petroleum diesel have similar viscosities. The combustion enthalpy of biodiesel is slightly lower, but its cetane number is higher and so is its flash point.

Emissions

Most of the emissions produced by fossil fuels are higher than those generated by biodiesel. Biodiesel does not generate SO_2 emissions; its combustion is more effective

Table 1: Comparison between emission levels of biodiesel (pure or mixed) and fossil fuel in automotive engines.

Emission (kg/100km)	Biodiesel 100%	Biodiesel 30%	Diesel
CO	0,37	0,43	0,46
Hydrocarbons	0,03	0,04	0,04
NO_x	2,73	3,37	3,64
Particulate matter	0,62	1,48	1,85
CO_2	0,87	3,53	4,67
SO_2	0	1,14	1,62

because of its higher oxygen content, and particulate matter and CO emissions are lower (Scragg *et al.*, 2003). Emissions of hydrocarbon compounds are also reduced by biodiesel, but NO_x become higher (Canakci, 2007). Biodiesel emits 4,7% more CO_2 than petroleum diesel, but most of it is captured by plants during the growth stage, and therefore its contribution to the greenhouse effect is negligible.

Biodiesel also has better lubricating properties, extending engine life, and reducing noise levels (Lapuerta *et al.*, 2005). Since it has good solvent properties, the motor piping is kept clean from cinder. The drawback is that natural rubber sleeves (still used in old engines) are dissolved by biodiesel, but this can be easily avoided, as these parts are made today of synthetic rubber.

Work in engines

Biodiesel shows similar thermal efficiency to diesel fuel, but has a higher fuel consumption because of its lower energy content. Exhaust gas temperature is often lower than for diesel, which means that the combustion of biodiesel starts earlier and has a longer expansion period. The start of fuel injection occurs earlier in biodiesel than with diesel fuel, because of their different physicochemical properties. The ignition delay period is also shorter in the case of biodiesel (Canakci, 2007).

Toxicity

The high-octane number of the oxygenated compounds present in biodiesel does not require the addition of antiknock compounds. Therefore, emissions derived from polycyclic aromatic hydrocarbons (PAHs) and their nitroderivatives (NAPHs) are reduced. PAHs are reduced by 85%, except benzo-anthracene, which is only reduced by 50%. Also, NAPHs (2-nitrofluorene and 1-nitropyrene) are drastically reduced by 90% (Sharp, 1998).

Biodegradability

Tests carried out at the University of Idaho have shown that degradation of biodiesel in an aqueous solution was 95% in 28 days, a period which is similar to that of sugar. For the same period, only 40% of petroleum diesel was degraded. Petroleum diesel is composed of a mixture of alkenes, branched alkenes, cycloalkenes, and aromatic hydrocarbons. A wide range of micro-organisms can degrade alkenes, but aromatic compounds are more difficult to degrade (Zhang *et al.*, 1998). Moreover, since petroleum diesel contains less oxygen than biodiesel, it is less biologically active.

It has been demonstrated that mixtures of biodiesel and petroleum diesel accelerate biodegradability. The rate of biodegradation of a B20 mixture (20% of biodiesel and 80% of fossil fuel) is twice that of the fossil fuel (Tyson, 2001).

Drawbacks

Biodiesel has some drawbacks that must be considered. Its melting point (equivalent to CFPP of a petroleum fuel) varies from 0 to -5 °C, which is slightly high and may result in low fluidity in cold environments (Foglia *et al.*, 1997).

The pour point (point at which the fuel stops fluidisation) depends strongly on the composition of the biodiesel mixture. Saturated fatty acid methyl esters crystallise at a higher temperature than unsaturated ones. Depending on the raw material, biodiesel contains different ratios of saturated/unsaturated esters. A possible approach to solving this problem is by adding additives to the biodiesel (e.g., butyl oleate). Biodiesel can also be produced with secondary or branched alcohols. These compounds destroy the ester chain order, decreasing the melting point and the pour point (Salis *et al.*, 2005).

At present, biodiesel production is produced at relatively small scale and with limited logistics; it is still not economically competitive with petroleum diesel, and relies on tax benefits and subsidies. However, optimisation studies along with appropriate logistics may lead to a cost-competitive product.

Biodiesel production processes

Three kinds of processes have been studied to produce biodiesel from vegetable oils and waste cooking oils.

1 Pyrolysis

Pyrolysis consists of the application of thermal energy in the presence of oxygen or air to produce a chemical modification. The thermal decomposition of triglycerides yields alkanes, alkenes, alkadienes, aromatic compounds, and carboxylic acids. Because of the wide variety of reaction pathways, different reaction products are obtained. Although the products are chemically similar to petroleum diesel, oxygen removal during thermal cracking reduces some of the environmental benefits of these renewable oils (Ma and Hanna, 1999).

2 Emulsification

Microemulsions have been prepared with solvents such as methanol, ethanol, and 1-butanol to lower the high viscosity of biodiesel. These microemulsions are isotropic, clear, and thermodynamically stable dispersions of oil, water and a surfactant; a cosurfactant is often dispersed, using amphiphilic compounds. This process yields a fuel with lower viscosity, but injection into engines is less efficient, and coarse deposition and incomplete combustion are generated (Tsai and Chang, 1993; Isono *et al.*, 1995).

3 Transesterification

The transesterification process, so-called alcoholysis, is the displacement of an alcohol in the ester molecule by another alcohol, as in a hydrolysis reaction, using alcohol instead of water. Suitable alcohols are methanol, ethanol, propanol, butanol and amyl alcohol. Methanol is the most commonly used, because of its low cost and good physicochemical properties.

Transesterification of oils thus reduces the viscosity of triglycerides, and improves the physical properties of the final product (cetane number, injection efficiency), resulting in a better fuel. Fatty acid methyl esters obtained by transesterification can be employed directly, and with similar energy efficiency as petroleum diesel. Recently, studies on transesterification in supercritical media have also been carried out (Demirbas, 2003; Madras *et al.*, 2004).

Transesterification involves several reversible consecutive reactions (Schwab *et al.*, 1987). A triglyceride is transformed successively into diglyceride, monoglyceride and, finally, glycerol. One mole of ester is released in each step. Kinetic mechanisms vary, depending on the oil/alcohol molar ratio. For instance, a pseudo-first order reaction mechanism has been suggested for sunflower oil, with an oil/alcohol molar ratio of 30:1, while a second order kinetics mechanism has been suggested for the same oil when a 6:1 oil/alcohol molar ratio is employed (Freedman *et al.*, 1986).

Acid transesterification

Transesterification of triglycerides is catalysed by inorganic acids, such as sulphuric, phosphoric, hydrochloric, and sulphonated organic acids. This catalytic process produces high conversions, at a slow rate, and more than a day is needed to reach complete conversion. An excess of alcohol increases the conversion, but makes glycerol recovery more complicated. Hence, optimisation is required to find the best relationship between alcohol and the raw material. This process is, however, the most appropriate for triglycerides with a high content in free fatty acids and water.

Acid-catalysed transesterification starts by mixing the oil directly with the acidified alcohol, so that separation and transesterification occur in a single step, with the alcohol acting both as solvent and as esterification reagent. Sunflower oil transesterification with acidified methanol yields fatty acid methyl esters with higher conversion than that obtained in the alkaline process (Harrington and D'Arcy-Evans, 1985a; Harrington and D'Arcy-Evans, 1985b).

The proposed reaction mechanism consists of the protonation of the carbonyl oxygen group by the acid that, in the presence of an alcohol, generates the corresponding fatty acid ester (Meher *et al.*, 2006). Reaction kinetics are typically expected to follow a pseudo-first order model when excess alcohol is present to shift the equilibrium. *In-situ* transesterifications, where the simultaneous extraction of neutral lipids and bran is produced, have also been proposed for soya bean oil (Kildrian *et al.*, 1996) and rice bran oil (Özgül and Türkay, 1993; Lai *et al.*, 2005).

Alkali-catalysed transesterification

Alternative catalysts for triglycerides transesterification to biodiesel are alkaline hydroxides, such as sodium and potassium hydroxide. Reactions of methanol or ethanol with a number of vegetable oils, crude or refined or even waste cooking oils have been performed using hydroxides as catalysts. At present, the industrial biodiesel synthesis is being carried out using these alkaline catalysts, since reaction rates are much higher (even 4 000 times) than for acid catalysis. Better efficiencies are obtained if the alkoxide is formed before transesterification.

The reaction mechanism has three main steps. The first step involves an attack on the ester by the alkoxide ion to form a tetrahedral intermediate. The reaction between this intermediate and an alcohol molecule generates an alkoxide in the second step. In the last step, esters and diglycerides are produced. The reaction proceeds similarly with the diglyceride and the monoglyceride, liberating three ester molecules and glycerol (Meher *et al.*, 2006; Vicente *et al.*, 2001).

Parameters in transesterification

The transesterification reaction involves some critical parameters which strongly influence the final yield (Marchetti *et al.*, 2007).

Water activity: In alkali-catalysed transesterifications, both fatty acids and alcohols have to be anhydrous, because water displaces the equilibrium reaction towards saponification, generating soap and reducing the final yield, consuming catalyst and increasing the viscosity and gel formation, which results in a more difficult glycerol separation (Freedman *et al.*, 1984).

Free fatty acid content: Several studies have revealed that to achieve high conversions, the maximum free fatty acid content must be at most 0,5% (Ma *et al.*, 1998; Bradshaw and Meuly, 1944; Feuge and Grose; 1949). This parameter is less critical than the water content. Free fatty acids reduce the yield since they consume the alkali catalyst, because they take part in the neutralisation reaction (Turck, 2002; Meher *et al.*, 2006).

Ethyl ester synthesis presents additional difficulties due to the formation of emulsions during the ethanolysis. Both methanol and ethanol are partially immiscible with the oil (ethanol being more soluble than methanol); therefore, vigorous stirring is needed to enhance mass transfer. In the case of methanolysis, the emulsion breaks easily to form a heavy glycerol layer and a light ester layer. In ethanolysis, this emulsion is more stable.

Oil/alcohol molar ratio: The reaction stoichiometry involves three moles of alcohol for each mole of triglyceride reacted to obtain three moles of ester and one mol of glycerol. Being an equilibrium reaction, an alcohol excess displaces the reaction to ester formation and higher conversions are reached.

Nevertheless, a large excess of alcohol makes glycerol separation difficult due to the increasing solubility of glycerol in the alcohol. Moreover, when the glycerol is kept in the solution, it displaces the equilibrium to the left-hand side, decreasing the ester yield. Nevertheless, yield and optimum rate depend on the oil used. For example, soya bean, sunflower, peanut and cotton seed oils have an optimum ratio of 6:1 (Krisnangkura and Simamaharnnop, 1992). This ratio is used at industrial scale to obtain high yields, almost 98%.

Ethyl ester synthesis presents additional difficulties because of the formation of emulsions during the ethanolysis reaction. Both methanol and ethanol are partially immiscible in the oil (methanol being more insoluble than ethanol). Therefore, vigorous stirring is employed to enhance mass transfer. In the case of methanolysis, the emulsion breaks easily to form a heavy glycerol layer and a light ester layer. In ethanolysis, this emulsion is more stable.

Finally, the ***type of catalyst*** is a key factor. Generally, alkaline catalysts lead to much faster rates than acid catalysts, and hence they are the most often used, except if free fatty acid content is high. Sodium methoxide is more effective than sodium hydroxide, since the reaction between NaOH and the alcohol generates a small amount of water, which decreases catalytic efficiency (Hartman, 1956). These catalysts have the drawback of being more expensive and more difficult to handle (Vicente *et al.*, 2004).

Product profile also depends greatly on the raw material and the catalyst. For example, tallow and waste cooking oils produce fuel with better ignition properties if amines (diethylamine) are used instead of sodium methoxide. However, because of the low cost of sodium methoxide, it is most commonly employed.

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A39314/OF

Record production and processing with limited exports for South African soya bean

By Juan-Pierre Kotzé and Dr André van der Vyver, Sacota

South Africa's soya bean industry is once again on course for a record-breaking season. According to the Crop Estimates Committee's July production estimate, the country is expected to harvest 3,04 million tonnes of soya bean, surpassing last season's record crop of 2,8 million tonnes by more than 240 000 tonnes (8,7%). This increase stems from both a 5% expansion in planted hectares (from 1,15 million to 1,21 million) and improved average yields across the country – up from 2,43t/ha last season to an expected 2,51t/ha this year.

At first glance, another record crop, combined with already comfortable carry-over stocks, appeared to position South Africa for another successful soya bean export season alongside a substantial maize export programme. However, a combination of strong crushing demand, firm local prices, and changing international market dynamics has made the prospect of a large soya bean (and maize) export season unattainable at this stage.

Domestic stocks and processing

The market entered the current marketing season on 1 March this year, with opening stocks of about 286 000 tonnes, according to the South African Grain Information Service (SAGIS). This translates to roughly 1,5 months' stock, which is generally regarded as a good opening balance.

The latest projections by the National Agricultural Marketing Council (NAMC) suggested that ending stocks could reach 570 000 tonnes, representing record carry-over stocks for soya bean. While these stock levels are expected to decline as the season progresses, largely due to stronger-than-anticipated domestic processing demand, South Africa is still likely to conclude the season with carry-over stocks of around 470 000 tonnes.

The country has recorded record monthly processing volumes, with 623 590 tonnes of soya bean processed during the first quarter (March to May) of the season – approximately 139 000 tonnes more than during the same period last year. At the current pace, annual crushing for this season could reach roughly 2,5 million tonnes, establishing another record for the industry.

The drastic growth in soya bean production over the past few years has led to increased crushing capacity and, therefore, increased soya bean meal availability. Where South Africa previously imported soya bean and soya bean meal, the market has shifted: Local soya bean meal is now produced in excess and sold at a discount to the southern parts of the country, which were traditionally serviced by imported meal.

This increased processing capacity has also supported exports of value-added products. During the first quarter of the current season, South Africa exported soya bean meal equivalent to roughly 37 000 tonnes of soya bean to Mauritius and Vietnam, along with a further 35 000 tonnes to African destinations.

At the same time, whole soya bean exports for 2026/27 are expected to remain focussed on regional markets, with approximately 300 000 tonnes likely to be exported to neighbouring countries such as Zimbabwe and Eswatini. Additionally, around 25 000 tonnes of soya bean have already reached niche markets in South-East Asia (including Malaysia and Indonesia) via smaller container shipments.

Price dynamics and trade outlook

Increased volatility and prices in the local market mean that the trade outlook is continuously changing. Earlier this year, meal was discounted at around R1 800 to R2 000/tonne in the local market, enough to prevent any meal imports into the Cape. With the increase in soya bean prices, crush margins narrowed, and meal discounts shrank to approximately R700 to R800/tonne. This has opened an opportunity for meal to be imported into the Cape again. The arrival of the first vessel in September will mark the first soya bean meal imports in over a year.

Figure 1: Total soya bean processed for commercial use in the first quarter (March to May) of each year.

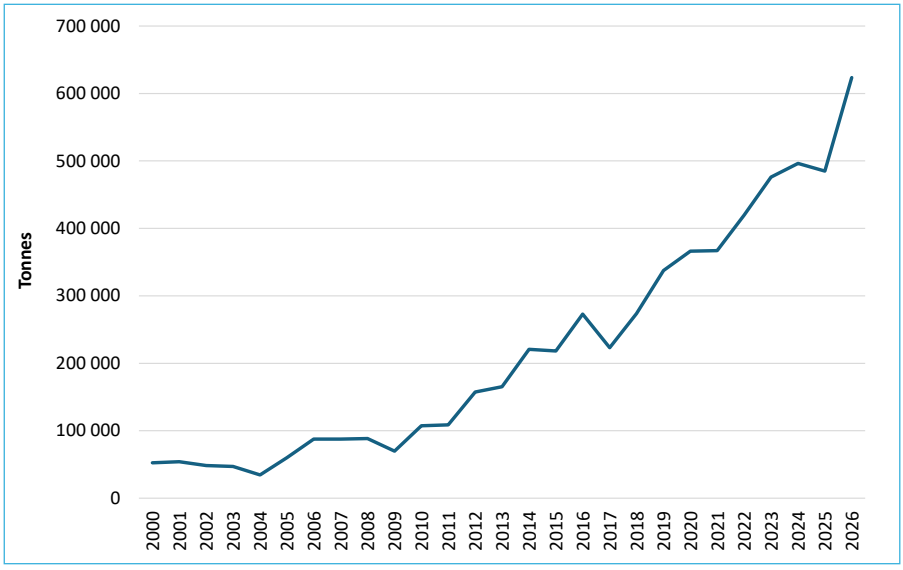
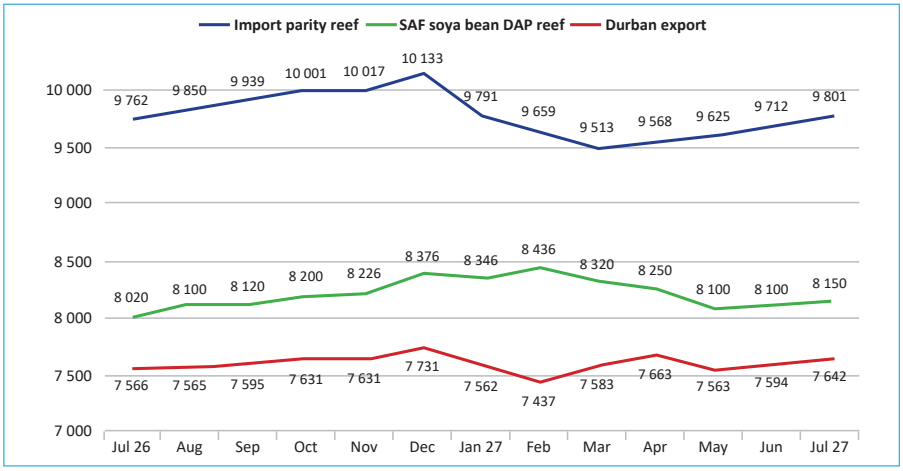


Figure 2: Monthly forward basis: SAF soya bean vs exports vs imports. (Source: Chester Africa)



The large-scale deep-sea export programme that many market participants anticipated following another record crop has simply not developed. This comes despite several countries recently opening their markets to South African soya bean and even soya bean meal. The reason lies in the relationship between local soya bean prices and export parity.

Local soya bean prices on the Johannesburg Stock Exchange (JSE) market have remained firm throughout the season and are trading at about US$20/tonne or more above export parity for the remainder of the year. This effectively prices South African soya bean out of the international market, allowing major exporters such as Brazil, the United States, and Argentina to remain more competitive in the importing destinations.

Under normal circumstances, record production and comfortable stock levels place downward pressure on local prices, encouraging exports as the market seeks to reduce surplus supplies. This season, however, various factors have prevented the South African market prices from declining sufficiently, including increased domestic processing, lower international soya bean prices, and a stronger rand relative to the US dollar.

Fear of the widely discussed Super El Niño also plays a role in supporting local prices. The result is an unusual market dynamic where South Africa has ample supplies, yet domestic prices remain strong enough to discourage deep-sea exports.

Looking ahead, the outlook remains constructive for the industry. Domestic crushing is expected to remain robust, regional exports should continue steadily, and South Africa will retain comfortable carry-over stocks heading into the next season. However, unless local prices weaken relative to export parity or international market conditions change, substantial deep-sea soya bean exports are unlikely to materialise before the next (sizeable) crop is planted.

Attention will shift towards the 2026/27 planting season, where weather pattern developments could become the next major driver of market sentiment. The market is already displaying signs of this. Should weather risks begin to threaten production prospects, soya bean prices could receive additional support.

MRP model of the JSE cancelled

Alongside production and processing developments, the soya bean industry has also seen an important trading announcement. On 20 July 2026, the JSE published its decision to revert to a single reference point model for calculating soya bean location differentials, following the completion and review of a two-year pilot of the multiple reference point (MRP) model.

The JSE has proposed changing the primary soya bean reference point from Randfontein to Driefontein 87-Ir in Germiston. According to the exchange, this point offers a more representative midpoint for key soya bean processing hubs in Gauteng, particularly Isando and Boksburg. The public comment period on this change closed on 14 August 2026.

The decision followed extensive engagement with industry stakeholders as well as a detailed assessment of the model's performance. As part of this review process, the South African Cereals and Oilseeds Trade Association (Sacota) submitted feedback to the JSE following a survey among its members. Sacota welcomed the decision, as member feedback identified practical shortcomings in the MRP model, including its reliance on historical supply and demand data in a rapidly changing market where crushing capacity, stock levels, regional demand, and export opportunities can fluctuate.

The JSE's review reached similar conclusions, highlighting the model's reliance on historical data, difficulties in obtaining reliable and auditable crushing information, inconsistent operational assumptions, and transparency concerns. Reverting to a single reference point model aims to promote greater fairness, efficiency, pricing integrity, and transparency in the soya bean futures market.

Review of grading regulations

Another important industry development that may influence the soya bean sector in the medium term is the review of South Africa's soya bean and sunflower grading regulations. On 8 July 2026, the Oilseeds Advisory Committee convened its first official discussions on updating the grading regulations for both crops.

Although the review process is still in its early stages, discussions are focussed on moisture content, oil content (particularly for sunflower seed), protein content (particularly for soya bean), and other grading standards that are critical for domestic and international trading. It is important that South Africa's grading standards are aligned with international standards, especially given an increased dependency on imports and exports.

The 2026 season illustrates the ongoing evolution of South Africa's soya bean industry. Record production has been matched by record domestic processing, while soya bean exports played a smaller role than many initially expected.

For more information, contact Juan-Pierre Kotzé at info@sacota.co.za or 076 814 5888 or Dr André van der Vyver at andre.vandervyver@sacota.co.za

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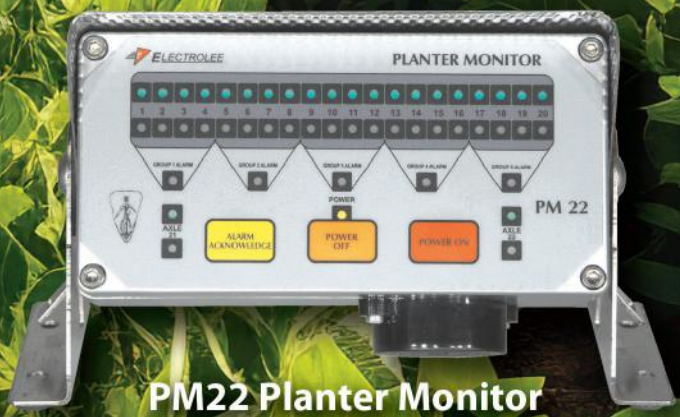

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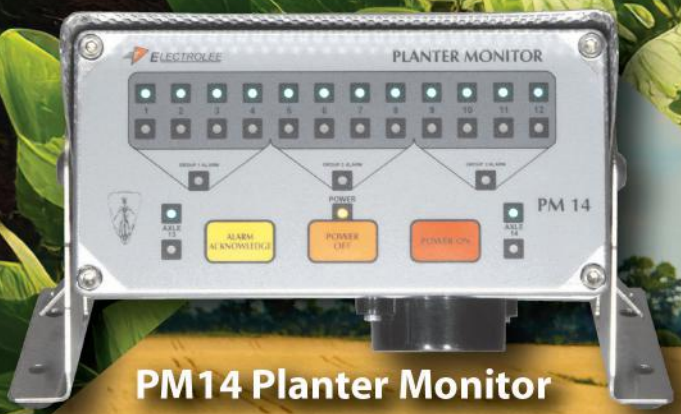

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3 YEAR GUARANTEE

Can policy be more price-supportive than demand?

By Gerhard Burger, junior agricultural economist, Grain SA

South Africa's oilseed industry has become accustomed to price determination through the fundamentals of supply and demand. While this remains the most accurate representation of a product's price, the 2026 season, with its challenges, has offered a different type of price support.

A policy-driven price floor

International plant-based oil, or vegetable oil, has moved sharply this year. According to the Food and Agriculture Organization's (FAO) vegetable oil index, it has gained 6% in a single month to reach its highest level since July 2022. This increase did not stem from significant growth in demand. Rather, it is a product of policy and biofuel mandates.

In Indonesia, biodiesel blends are shifting from B40 to B50. Previously, diesel was required to contain at least 40% biodiesel and 60% conventional fossil fuel, but the requirement has been raised to a 50/50 split. In the United States (US), renewable volume obligations, which were annual biofuel blending quotas, have been raised. Even Brazil's mandates are pulling in the same direction.

Each of these decisions impacts the fixed share of the vegetable oil pool going to fuel feedstocks, providing some price support rather than reflecting a direct shift in supply and demand factors. That distinction matters more than it might seem. Food demand for vegetable oil is elastic and cyclical: It responds to income growth, population, and substitution towards cheaper oils when prices rise.

Biofuel mandates, by contrast, are more inelastic. A blending target becomes a requirement rather than a preference, meaning that as soon as it is legislated, that volume of oil is withdrawn from the trade pool regardless of price. This effectively generates demand that would not have occurred due to natural shifts in the market such as population growth or consumer trends.

Implications for South Africa

The international market is largely a free market where the highest bidder sets the price, meaning South Africa cannot set global prices. Local market prices are largely determined by import and export parity. When prices rise towards import parity, it signals scarcity and draws in a supply response. This mechanism is well understood, and it applies equally whether a global price move originates from a drought in the Black Sea region or a blending mandate in Jakarta.

The current cycle looks set to raise both the import and export parity bands against which South African producers set their prices. Forecasts predicting 10 to 20% higher vegetable oil prices in 2026 are largely credited to mandate changes.

For South African sunflower and soya bean producers, who are currently producing at record volumes, a larger share of the crop clears through export and crush margins rather than food-grade domestic sales. Consequently, a policy-driven lift in global oil values shows up more directly as farmgate benefit than it would in a market reliant on imports.

Policy versus demand-based growth

Policy is not a true substitute for demand; it is a form of demand that has been made deliberately rigid. What makes it a more reliable price supporter than organic consumption growth is precisely that rigidity. Traditional food demand growth is slow, diffuse, and easily offset by substitution or income shocks.

A blending mandate is concentrated, fast, and doesn't respond to price at all. That is what gives it outsized power to move a global price index in a single month, something rarely achieved by underlying food consumption trends alone.

The risk mirrors the strength: Policy-driven price support can be withdrawn as abruptly as it was introduced. A blending target can be revised downward through the same regulatory process that created it – something organic demand growth, by its gradual nature, cannot do.

Food and feed demand

For South African producers currently benefiting from strong support, a more relevant question might not be whether policy influences prices more than demand, but how much of the current price strength is driven by stable food and feed demand, as opposed to volume that relies on mandates and could change with a single policy announcement.

Unlike Indonesia or the US, South Africa has no domestic biofuel blending mandate of its own. Local producers are exposed to this price support purely as price-takers, and oilseed prices are largely determined via import and export parity rather than local demand alone. The situation is particularly risky because the global price support relies on mandates that can be reversed elsewhere, and South Africa lacks its own domestic policy tools to mitigate the negative impact should those supports be lifted.

The question of how much of today's price is structural versus policy-contingent abroad is arguably the single most important number a South African oilseed producer or trader can have right now.

For more information, send an email to Gerhard Burger at GerhardB@grainsa.co.za

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Why South African producers are planting sunflower earlier than usual

By Lourens Uys, oilseeds trader, Bester Feed & Grain

Across the Free State, North West, Mpumalanga and parts of Limpopo, sunflower producers are planting earlier than traditional planting windows allow. Driven by climatic, agronomic and economic factors, early planting has become an important risk-management strategy for maintaining profitable production. This shift towards earlier planting dates among South African sunflower producers can be attributed to nine reasons.

1 Optimal rainfall and planting

Earlier spring rains and improved soil moisture are allowing producers to plant as soon as conditions become favourable, rather than wait for traditional planting dates. This promotes faster emergence, stronger root development, improved germination, and better crop establishment.

2 Avoiding heat stress

Flowering is the most sensitive stage of sunflower production. Temperatures exceeding 32 to 35°C can reduce pollination, seed set, oil content, and final yield. Earlier planting shifts both flowering and grain-filling into cooler conditions, reducing heat stress. Yield losses from severe heat stress can range from 10 to 30% or more.

3 Better use of soil moisture

Good soil moisture reserves allow crops to establish deeper root systems before hot weather arrives. This improves drought tolerance, particularly in drier regions such as the Western Free State and North West.

4 Climate change adaptation

As temperatures rise, rainfall becomes more unpredictable. Earlier planting helps align crop development with favourable rainfall patterns, reducing weather-related risk, and improving production stability.

5 More reliable yields

Earlier-planted sunflower fields often exhibit more consistent emergence, better head filling, and greater yield stability. While it may not always produce the highest yields, it generally delivers more reliable returns.

6 Low insect and disease pressure

By planting earlier, crops avoid peak pest populations during their vulnerable growth stages. This reduces insect damage, disease pressure, crop protection costs, and potential yield losses.

7 Greater operational efficiency

Earlier planting helps spread the workload across maize, soya bean and sunflower crops, improving machinery and labour efficiency while preventing bottlenecks during planting.

8 Stronger economic returns

Strong demand from local crushers, rising vegetable oil requirements, crop rotation benefits, and lower input costs have made sunflower more attractive. Earlier planting increases the likelihood of achieving profitable, consistent yields.

9 Earlier harvesting

An earlier planting date leads to a quicker harvest, minimising the risk of late-season weather damage and improving cashflow.

Lourens Uys.

It allows for earlier deliveries to crushers and storage facilities, offers access to stronger February and March prices, and streamlines planning for subsequent farming operations.

Specialisation

Earlier sunflower planting is primarily about reducing production risk. Given our changing rainfall patterns, rising temperatures and heightened climate variability, producers are now prioritising stable, profitable yields over occasional peak yields. For many South African producers, planting earlier has proven to be one of the most effective strategies for achieving that goal.

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World oilseeds markets: Brazil soya bean crushing set to rise

Issued by the United States Department of Agriculture's Foreign Agricultural Service

Brazil's soya bean crushing is forecast at 65 million tonnes in 2026/27 (October to September), up 3,5 million tonnes from 2025/26. This surge continues an expansion that has averaged 5% growth over the last decade. A record crop and investments in crushing facilities, intended to supply rising demand for soya bean oil and meal, are the primary drivers of the expansion.

While nearly two-thirds of Brazil's crop is exported and processed abroad, growth in domestic processing has kept pace with production. According to data from the Brazilian Association of Vegetable Oil Industries (Abiove), total active crushing capacity is estimated at 77 million tonnes in 2025, having risen by nearly 30% since 2020.

Several new crushing facilities are expected to begin operations across Brazil in 2026 and 2027, partly to satisfy growing demand for feedstocks for the production of biodiesel. Brazil's biodiesel blend mandate increased from B14 to B15 in mid-2025, and future steps toward B20 are planned under the country's *Fuel the Future law*.

Soya bean oil comprises nearly three-quarters of the fats and oils used to produce biodiesel in Brazil. Industrial consumption of soya bean oil, which includes biofuel use, is forecast to increase by 300 000 tonnes to 7,3 million tonnes in 2026/27.

Global soya bean meal demand is the other major driver of Brazil's crushing growth. Exports of soya bean meal are expected to reach a record 26,9 million tonnes in 2026/27, up 1,9 million from 2025/26. Brazil is the world's second-largest exporter of soya bean meal after Argentina, and over half of its soya bean meal production is exported.

In 2026/27, global import demand for soya bean meal is forecast to rise by 4%, led by strong growth for the European Union (EU), Indonesia, Vietnam, Mexico, and Thailand. Brazil remains dependent on whole soya bean trade to dispose of its crop, but the rapid development of domestic crush has opened additional demand segments domestically and internationally.

Overview 2026/27

Global oilseeds production was raised in July with higher Russia sunflower seed and rapeseed, and United States (US) soya bean, despite lower Ukraine sunflower seed and Russia soya bean. Oilseed trade is increased with higher US and Brazil soya bean along with Russia sunflower seed and rapeseed, which are not offset by lower Canada rapeseed and Russia soya bean.

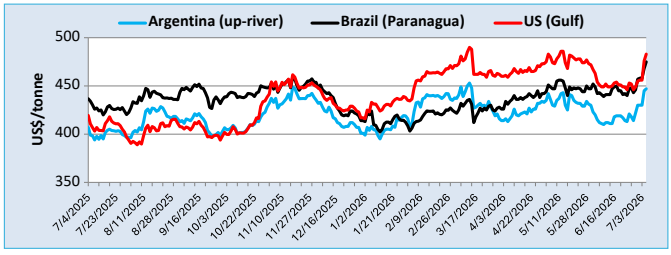
Global crush is raised on China soya bean and Russia sunflower seed. Global carryout is lowered on reduced stocks of Brazil soya bean and Canada rapeseed. Global protein meal trade is raised slightly on US soya bean meal, which is not offset by lower Ukraine sunflower seed meal. Global vegetable oil trade is raised on China soya bean oil exports. Global vegetable oil carryout is higher on India soya bean oil. The projected US season-average farm price for soya bean is unchanged at US$11,40 per bushel.

Overview 2025/26

Global oilseed production is raised slightly on higher South Africa and Canada soya bean production, offsetting lower production for Brazil cottonseed. Global oilseed trade is raised on higher Canada rapeseed, EU sunflower seed, and US soya bean. Global oilseed crush is up on higher China soya bean and EU rapeseed crush. Global oilseed carryout is lowered on Canada rapeseed and US soya bean stocks.

Global oilseed meal trade is raised on higher US soya bean meal. Global vegetable oil production is raised on higher EU rapeseed oil and China soya bean oil. Global vegetable oil trade is raised on higher China soya bean oil as well as Kazakhstan and Turkey sunflower seed oil. Global vegetable oil carryout is raised on higher India soya bean oil and EU rapeseed oil stocks. The projected US season-average farm price for soya bean is unchanged at US$10,40 per bushel.

Figure 1: Soya bean export prices. (Source: International Grains Council)



All prices are free on board (FOB): US Gulf, Argentina up-river, and Brazil Paranagua.

Export prices

US soya bean export prices (*Figure 1*) rallied in July on news of China soya bean purchases and early-season weather concerns in the country. US prices lifted South American origins as well. Soya bean meal prices for major producers rallied slightly, following soya bean. US soya bean oil prices appreciated alongside the rise in petroleum prices. This rebound follows a sharp decline since June, which also tracked petroleum prices.

South American soya bean oil prices also settled lower with strong crush and lower petroleum prices, falling below highs seen in May. Palm oil prices were largely flat as the market weighs the effect of Indonesia's B50 mandate and the impact of El Niño against lower petroleum prices.

For more information and the full July 2026 report, visit *www.fas.usda.gov*

A long-awaited adjustment for South Africa's peanut butter value chain

By Adri Botha, chairperson, SA Groundnut Forum

The publication of a 20% import tariff on peanut butter brings to a close a lengthy industry process aimed at correcting an imbalance in the groundnut value chain. The measure offers an opportunity to strengthen local production and processing, but its success will also depend on how responsibly the industry responds.

On 24 July 2026, finance minister Enoch Godongwana formally amended South Africa's customs tariff on imported peanut butter, increasing the general rate of duty from 0,99c/kg to 20% *ad valorem*. The amendment applies to smooth peanut butter in retail packaging, other peanut butter in retail packaging, and other products classified as peanut butter under the relevant tariff subheadings.

A long-awaited resolution

For stakeholders in the South African groundnut industry value chain, the publication represents the conclusion of a process that began several years ago. It follows concerns raised within the South African Groundnut Forum (SAGF) over the long-term sustainability of the domestic value chain and an uneven playing field regarding imported peanut butter.

The original application was submitted by the RCL Group during the 2020/21 period, requesting that the duty be increased to 25%. Industry role-players – including producers, processors, and manufacturers – were ever present throughout, with numerous submissions and reports generated by the industry and Forum during the past few years.

At the heart of the application was a basic tariff imbalance. Imported raw groundnuts attracted a duty of 10%, while imported roasted groundnuts and finished peanut butter were subject to a nominal duty of only 0,99c/kg – the equivalent of an *ad valorem* rate of approximately 0,025%.

In practical terms, the tariff structure offered considerably less protection to the locally manufactured finished product than to the raw material used in its production. This created an incentive to import finished peanut butter rather than source, process, and manufacture the product locally.

The broader value chain

SAGF had previously commissioned the Bureau for Food and Agricultural Policy (BFAP) to examine the competitiveness of the groundnut value chain. The 2019 study found that a tariff of roughly 23% would be required on packaged peanut butter imports to bring imported products into closer alignment with local production costs.

Based on this work, members of the Forum supported an increase in the peanut butter duty to between 21 and 25%, together with an adjustment to the duty on roasted groundnuts. The roasted groundnut application was subsequently withdrawn after the applicant ceased its roasted groundnut operations, also citing the prolonged uncertainty surrounding the outcome of the application. The peanut butter application, however, continued through a lengthy investigation and review process.

Following the International Trade Administration Commission's (ITAC) initial investigation, the former minister of trade, industry and competition requested further consideration of several issues. These included the possible effect of a tariff on consumer prices (particularly for low-income households), the availability of domestic manufacturing capacity, the level of competition in the market, and the wider consequences for the groundnut value chain. An updated application was submitted in December 2024, allowing ITAC to consider more recent market, production, and cost information.

ITAC's findings

In line with industry submissions, ITAC's investigation acknowledged that peanut butter holds a particularly important place in the South African food market and is regarded as a staple food product, confirmed by its inclusion in household food basket surveys and the industry's lobbying for zero-rated VAT status. It accounts for approximately half of the spreads market (excluding margarine) and remains an accessible, relatively affordable source of protein for many households.

The commission therefore had to balance two legitimate interests: the need to support local agricultural and manufacturing capacity, and the need to protect consumers from unnecessary price increases. The evidence pointed to increasing pressure on domestic manufacturers. Peanut butter production, local and regional sales volumes, profitability, and capacity utilisation all declined over the investigation period. At the same time,

producers faced rising raw material, labour, and operating costs, as well as persistent price disadvantages when compared with imported products.

According to the ITAC report, the Southern African Customs Union (SACU) peanut butter import volumes increased by an average of 15% over the period reviewed. India accounted for roughly 95% of imported peanut butter volumes during 2024, which saw a substantial increase in imports to the region. ITAC found that local manufacturers retain sufficient installed capacity to step up production to meet increased demand, and the relevance of peanut butter to the upstream agricultural industry should not be underestimated.

Approximately 55% of commercially consumed groundnuts are used in peanut butter production. A sustainable domestic manufacturing sector therefore provides an important market for locally produced groundnuts and supports activity throughout the chain, from seed and farming to handling, processing, manufacturing, packaging, transport, and retail.

A measured outcome

ITAC did not approve the full 25% increase requested by the applicant. Its assessment found that a duty at that level could place undue pressure on vulnerable households. Instead, the commission recommended a rate of 20%, describing this as a more appropriate balance between supporting domestic manufacturing, encouraging local value addition, and maintaining consumer affordability.

The decision gives effect to a general duty of 20%, with a corresponding rate of 20% for imports from Mercosur countries (Argentina, Brazil, Paraguay, and Uruguay) and 8% under the African Continental Free Trade Agreement. Existing preferential arrangements mean that qualifying imports from the European Union, United Kingdom, European Free Trade Association, and the Southern African Development Community remain free of duty.

The tariff should therefore not be viewed as a barrier to all imports. It is a targeted adjustment to the general tariff structure, intended to address the price disadvantage faced by local manufacturers when competing with low-priced finished imports from the main supplying countries.

The next step

ITAC and SAGF agree that a tariff on the finished product cannot on its own resolve all the challenges faced by the local industry. South Africa's groundnut crop varies considerably between seasons, and local manufacturers may, for the foreseeable future, need to import raw groundnuts to supplement domestic supply or obtain particular grades and specifications. Those raw groundnut imports currently attract a duty of 10%, adding to manufacturers' input costs.

ITAC has therefore decided to initiate a separate investigation into a possible temporary rebate on imported groundnuts used by qualifying processors. Such a rebate could allow manufacturers to import supplementary raw material without paying the full duty, subject to appropriate conditions and administrative controls.

The combination of a higher duty on imported finished peanut butter and targeted relief on raw material imports could help correct the inverted tariff structure. It could also improve manufacturing competitiveness while continuing to recognise and prioritise locally produced groundnuts as the preferred foundation of the value chain.

A shared responsibility

The publication of the tariff is a positive development for the South African groundnut industry. It creates an opportunity for producers, processors, and manufacturers to rebuild volumes, improve capacity utilisation, invest in the sector, and strengthen local procurement.

However, the adjustment should also be applied responsibly. The tariff was not introduced to enable unjustified price increases or reduce competitive discipline in the market. Peanut butter is an important food product, particularly for households seeking an affordable source of nutrition. Local manufacturers and retailers will therefore need to remain mindful of affordability when reviewing their costing and pricing models.

For primary producers, the measure will only deliver lasting value if it contributes to a more predictable demand, improved confidence in the crop, and continued investment in production, cultivar development, quality systems, and market expansion.

After a process extending over several years, the industry now has a more appropriate tariff framework for finished peanut butter. The challenge is to convert that policy adjustment into sustainable growth across the entire value chain – from the farm to the consumer's table.

For more information, send an email to the author at groundnutforum@opot.co.za or visit *www.opot.co.za*

Evidence of health benefits of canola oil

By Lin Lin, Hanja Allemekinders, Angela Dansby, Lisa Campbell, Shaunda Durance-Tod, Alvin Berger, and Peter JH Jones

Canola oil-based diets have been shown to reduce plasma cholesterol levels compared with diets containing higher levels of saturated fatty acids. Previous reviews have focussed on the health effects of individual components of canola oil. Here, the objective is to address the health effects of intact canola oil, as this has immediate practical implications for consumers, nutritionists, and others deciding which oil to consume or recommend.

Canola is a bright yellow-flowering plant belonging to the Brassicaceae family. This family includes three different species: *Brassica napus*, *B. rapa*, and *B. juncea*. Originally from the Mediterranean area and Northern Europe, *B. napus* is commonly known as rapeseed. Rapeseed was identified in 2 000 BC as a high-erucic acid crop, containing >40% erucic acid in the oil.

Due to concerns over erucic acid content stemming from animal studies, high-erucic acid rapeseed oil used to be produced in North America solely in small quantities for industrial, non-food use. In 1976, however, Canadian scientists were able to improve the quality of previous rapeseed cultivars through traditional plant breeding, which led to the development of commercially consumable canola cultivars.

Over the past 40 years, canola has become one of the most important oilseed crops worldwide. Today, canola oil is the third-largest vegetable oil by volume after palm and soya bean oil. Canola oil is characterised by the following: low level (7%) of saturated fatty acids (SFAs); substantial amounts of monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids (PUFAs), including 61% oleic acid, 21% linoleic acid, and 11% alpha-linolenic acid (ALA) 2,10; plant sterols (0,53 to 0,97%); and tocopherols (700 to 1 200 ppm) – all of which have data indicating they are cardioprotective substances.

Circulating lipid profiles

Gulesserian *et al*. compared baseline and endpoint serum cholesterol levels after five months during which children and adolescents with familial hypercholesterolaemia received dietary counselling and were instructed to replace as many visible fats as possible with canola oil. Data revealed significant reductions in total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and triacylglycerol (TAG) levels in the participants. It should be noted, however, that participants were also instructed to

eat high quantities of fruits and vegetables and include a weekly fish meal in their diet. Thus, it cannot be concluded that canola oil alone was responsible for the favourable changes observed.

In 29 studies, the effects of canola oil on circulatory cholesterol levels were examined over intervention periods ranging from 2,5 to eight weeks, and effects were seen in most of these short-term studies. These studies indicate that canola oil has the potential to help consumers meet dietary fat recommendations and can be included in a diet designed to regulate serum cholesterol levels to improve hypercholesterolaemia.

Canola oil versus SFAs

SFAs are found in animal fat and dairy products, as well as certain vegetable oils, including coconut and palm oils. Typical Western diets are high in SFAs. A high amount of dietary SFAs may increase TC and LDL-C levels, thus increasing the risk of developing cardiovascular disease. Efforts to substitute SFAs have typically relied on replacing animal fat and dairy products with liquid vegetable oils high in MUFAs and PUFAs.

Five studies compared canola oil-based diets with typical Western diets, providing evidence that canola oil can reduce TC levels by an average of 12,2% (range 6,7 to 20,1%). Diets based on canola oil showed positive effects on TC levels regardless of the type of canola oil used compared to a typical Western diet. Although several studies defined their baseline diets as high in SFAs (>10% SFAs) or as Western diets (>30% total fat), some investigations failed to evaluate participants' diets before intervention. These studies therefore referred to participants' consumption patterns as their 'habitual diets'.

A few reports examined the effects of canola oil interventions on TC levels compared with habitual diets. Miettinen and Vanhanen, Nydahl *et al*., Stricker *et al*., Corboy *et al*., and Junker *et al*. showed that canola oil-based diets significantly lowered TC levels. However, two studies by Seppänen-Laakso *et al*. compared canola oil-based margarine with butter and margarine in participants' habitual diets and failed to show statistically significant differences between the two diets. Overall, clinical studies have shown that, compared with high-SFA or typical Western diets, canola oil-based diets may reduce TC concentrations in healthy or hyper-cholesterolaemic individuals.

In general, SFA consumption is associated with elevated LDL-C levels. Replacing SFAs with MUFAs can reduce circulatory cholesterol levels, especially LDL-C, and may decrease the risk of atherosclerosis and coronary heart disease (CHD). Replacing 5% of SFAs with oleic acid may reduce CHD risk by as much as 20 to 40% through suppression of LDL-C levels.

High-density lipoproteins (HDL-C) assist in eliminating excess cholesterol. Higher HDL-C levels have been associated with a lower risk of CHD, while low HDL-C levels are considered an independent risk factor for CHD. Therefore, increasing HDL-C is important in the prevention and treatment of CHD.

TAGs are the most common form of fat in the human gastrointestinal tract and represent the main constituents of vegetable oils and animal fats. Excessive intake of dietary fats, especially SFAs, results in increased circulating TAG concentrations. High-carbohydrate diets, particularly those containing foods high in simple sugars, also contribute significantly to high circulatory TAG levels. Therefore, instead of replacing SFAs with carbohydrates, limiting total fat intake and choosing MUFAs and PUFAs over SFAs are considered more effective strategies for reducing circulating TAG levels.

While 21 of 27 short-term studies were unable to show statistically significant changes in TAG levels between canola oil- and high-SFA/Western-type diets, four studies did show a reduction on a canola oil-based diet and one showed an increase. Iggman *et al*. concluded that replacing dairy fat with canola oil within a high-fat diet improved TAG levels in participants. Another three studies supported the conclusion of Iggman *et al*., showing a reduction in TAG levels by an average of 15,8% following consumption of a canola oil-based diet. However, two studies showed an increase in TAG levels in participants on a canola oil diet compared with the high-SFA baseline diet.

Comparing various oils

Six studies examined the consumption of canola oil versus high-PUFA oils. In four of these studies, sunflower oil was selected as one of the control oils. No significant differences were observed between canola and sunflower oils in the extent of TC reduction compared to the baseline, resulting in the conclusion that sunflower oil may improve TC concentrations as well as canola oil. Three studies selected olive oil as the control against canola oil. Results showed reductions in TC concentrations of 12,2, 14, and 11,6% following the consumption of canola oil compared to olive oil.

Interestingly, the reductions in LDL-C levels achieved with canola oil were similar when compared with maize and sunflower oils or an oil blend of flaxseed and high-oleic canola oils. However, three studies showed a higher reduction of LDL-C concentrations with canola oil-based diets compared with diets using olive oil. Truswell and Choudhury indicated that oils high in MUFAs do not all have the same effect on plasma cholesterol because, in their study, olive oil was associated with higher TC and LDL-C levels compared with canola or high-oleic sunflower oils. This finding suggests that canola oil may have more beneficial effects on LDL-C regulation than olive oil.

From the results of the existing 31 studies, it can be concluded that replacing SFAs with canola oil in Western-type or high-fat diets is beneficial for decreasing TC and LDL, and maintaining normal TAG levels. Despite canola oil showing a protective effect in some studies, the results of studies comparing canola oil with other vegetable oils (e.g., MUFA- or PUFA-rich) are less consistent. For example, not only did canola oil reduce baseline TC and LDL levels, but sunflower oil also appeared to be advantageous in regulating lipid profiles, while olive oil appeared less efficient compared with sunflower oil or canola oil. However, the number of such studies appears to be too small to allow conclusions to be drawn, particularly in light of differences in study design, sample size, or baseline status.

LDL oxidation

Many physiological factors beyond lipid levels are associated with CHD risk, including biomarkers of platelet formation, coagulation, inflammation, and lipid peroxidation. Oxidised LDL may be a risk factor for CHD by promoting atherogenesis and butylated hydroxytoluene. Several factors are associated with the

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susceptibility of LDL-C to oxidative modification, including dietary fatty acid composition. For example, dietary PUFA content in lipoproteins tends to increase the sensitivity of these particles to oxidative damage, while dietary MUFA content results in LDL-C particles that are less prone to oxidation. Furthermore, the quantity and density of LDL-C particles may influence their susceptibility to oxidation. Due to these considerations, many studies have analysed the effects of different dietary oils on their potential to oxidise LDL-C.

Although studies examining the effects of conventional canola oil-based diets on lipid peroxidation and the susceptibility of LDL-C to oxidation failed to show significant effects, some studies suggested that replacing SFAs with vegetable oils may affect the susceptibility of LDL to oxidation *in vitro*. However, there was considerable disparity in the *in vivo* lipid peroxidation data. Other work may indicate a potential role for canola oil, which contains 61% oleic acid, in the regulation of LDL-C oxidisability.

Canola oil and energy metabolism

Not all dietary fats undergo equivalent partitioning for energy expenditure, and some may exhibit satiety-promoting actions. To help individuals maintain normal body weight and prevent obesity, studies have examined food intake, satiety, body weight, body mass index, and body composition following the consumption of different types of oils. Furthermore, dietary fatty acid composition plays an important role in metabolism and gene expression. Some studies have explored the possible actions of oleic acid-rich oils, such as olive and canola oils, given older data suggesting preferential partitioning of oleic acid for oxidation versus retention in body storage compartments.

Unfortunately, substantial limitations exist in some studies that have attempted to explore the effects of different dietary fats on energy expenditure and body composition. In most studies, the levels of food and energy consumed by study volunteers were adjusted to avoid weight changes during the feeding period. As such, the risk of bias within these studies should be considered, because any weight changes during the diet periods cannot be used to explain the efficiency of canola oil in energy metabolism.

Glycaemic effects

Evidence has shown that SFA intake is linked to insulin resistance, obesity, and metabolic syndrome. In a review by Gillingham *et al*. on the health benefits of MUFAs, it was concluded that MUFAs are capable of favourably modulating insulin sensitivity and glycaemic control when substituted for SFAs. Many dietary intervention studies have tested the effects of replacing SFAs with MUFAs or PUFAs on insulin sensitivity. However, many factors beyond dietary fatty acid composition may influence glucose tolerance and insulin sensitivity.

Only a few studies have reported the effects of canola oil-based diets on glucose and insulin levels compared with other vegetable oil-based diets, mixed oil-based diets, or protein-rich diets. Results failed to show consistency in the effects of canola oil on insulin sensitivity and glucose tolerance. To fill the important gap in knowledge regarding the effects of canola oil on risk factors for type 2 diabetes, researchers continue to explore the effects of diet on glycaemic control, fasting blood glucose, and insulin sensitivity to promote healthy food choices for the public.

Canola oil and cancer risk

The association between lipid intake and various cancers has been understudied, particularly in humans. While no human clinical trials specific to canola oil and cancer have been performed to date, *in vitro* and *in vivo* animal data exist. Jiang *et al*. pointed out that omega-3 fatty acids are toxic to tumour cells, but omega-6 fatty acids, such as linolenic acid, enhance carcinogenesis and tumour cell growth. Nevertheless, in a systematic review by Hooper *et al*. no consistent effects of omega-3 fatty acids on the incidence of cancer were identified.

Over the past few decades, investigations into the protective effects of dietary fat quality, particularly omega-3 fats, on common cancers, including breast, colon, and prostate cancers, have not focussed exclusively on fish oil. Plant-based oils such as canola oil, which is a good source (11%) of ALA, have also been examined for their potential to modulate cancer cell growth and death. Protective effects of canola oil, compared with maize oil, against breast and colon cancers have been reported in various cell and animal studies; however, more research is required to provide definitive direction in this area.

Wang *et al*. designed a human case-control study, which determined that total fat intake was positively associated with breast cancer risk when adjustments were made for age, race/ethnicity, and total energy intake. Also, compared to women cooking only with olive or canola oil, those using only vegetable or maize oil had a 30% higher risk of developing breast cancer. The overarching objective of these studies was to examine the association between dietary fat intake, cooking oil use, and breast cancer risk in a population-based, multi-ethnic, case-controlled environment.

Among the fat components estimated from the food frequency questionnaires, including SFAs and oleic and linoleic acids, oleic acid was more strongly associated with breast cancer than linoleic acid, whereas SFA intake showed no association with breast cancer risk. To conclude, studies exploring linkages between canola oil consumption and cancer risk modification remain equivocal.

Conclusion

After 15 years of continuing research on canola oil since the latest review by Dupont *et al*., evidence shows a number of potential health benefits of canola oil consumption. Canola oil can now be regarded as one of the healthiest edible vegetable oils in terms of its biological functions and its ability to aid in reducing disease-related risk factors and improving health. Current research is expected to provide more complete evidence to support the health-promoting effects of canola oil when consumed at levels consistent with dietary guidelines.

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PRF stakeholder engagement: Collaboration and innovation

By Nikilene Steenkamp, Plaas Media

Exports, innovation, climate resilience, and collaboration were among the key themes discussed during the Protein Research Foundation (PRF) stakeholder engagement in July. The event brought together representatives from industry, academia, and government to reflect on the growth of South Africa's soya bean and canola industries and discuss priorities for the future.

The discussions highlighted how research, technology transfer, and cooperation across the value chain have contributed to industry growth over several decades. Speakers also explored the challenges and opportunities that lie ahead, including export growth, changing market conditions, biotechnology, food security, and climate change.

Industry reflects on progress

Opening the event, PRF chairperson Andries Theron reflected on the foundation's history and the growth of South Africa's protein crop industries. He noted that the PRF's original goal of achieving self-sufficiency in protein for animal feed had been reached. However, he stressed that maintaining this success would require continued effort and collaboration.

Ferdi Meyer, managing director at the Bureau for Food and Agricultural Policy (BFAP) and professor at Stellenbosch University, revisited a 2009 industry scenario-planning exercise. At the time, stakeholders were exploring ways to expand local soya bean production and reduce reliance on imports. Prof Meyer said the progress the industry has made shows what can be achieved through coordinated action across the sector. The next growth phase is in the export market.

Several speakers described the soya bean industry's growth as one of South Africa's major success stories, pointing to the contribution made by producers, researchers, agribusiness, and industry organisations.

Focus shifts to export markets

A recurring message during the engagement was that future growth will depend on exports. Prof Meyer said the domestic market alone will not absorb future increases in production. Stakeholders discussed the need for improved efficiency across the value chain. Infrastructure, logistics, and market access were identified as important factors in supporting growth.

Discussions also explored opportunities linked to processing and value addition. Participants highlighted the role of vegetable oils, biofuels, and other value-added products in strengthening the sector's long-term prospects.

Research and innovation

Dr Erhard Briedenhann, chief executive officer of Management Investment and Distribution Services CC (MIDS) and vice-president of the PRF, outlined the foundation's support for research in agronomy, cultivar development, disease management, and production efficiency.

"All the research that we've funded and done over the years would not have the required impact without technology transfer," said Dr Briedenhann. He noted that research played an important role in the adoption and development of soya bean and canola production in South Africa. The PRF continues to support postgraduate students in research fields through bursaries, which remain an important tool for development.

As speakers discussed the importance of conservation agriculture, improved genetics, and management practices to help producers adapt to changing conditions, climate-related research was also highlighted.

Ben Durham, chief director of Bio-innovations at the Department of Science and Innovation, presented the government's perspective on the bioeconomy and agricultural innovation. He said innovation will play an important role in agricultural competitiveness and called for regulatory systems that allow

During the PRF stakeholder engagement, speakers took questions from attendees. From the left are Gerhard Keun of OPDT, Andries Theron, chairperson of the PRF, Prof Ferdi Meyer of BFAP, and Dr Erhard Briedenhann, vice-chairperson of the PRF.

The PRF thanked and recognised two industry statisticians. From the left are Dr Erhard Briedenhann, vice-chairperson of the PRF, Rona Beukes and Marda Scheepers, senior statisticians at the Department of Agriculture's Directorate: Statistics and Economic Analysis, and Andries Theron, chairperson of the PRF.

South Africa to take advantage of new breeding technologies.

While the industry's success is the result of a collective effort rather than the work of a single organisation, Theron encouraged stakeholders to continue working together as the sector faces a new phase of development.

Gerhard Keun, chief executive officer of the Oil and Protein Seeds Development Trust (OPDT), outlined how the PRF operates through groups and committees, and how the value-chain structure helps identify industry needs and research priorities.

Industry contributors recognised

The engagement concluded with recognition of two long-serving contributors to agricultural statistics. Rona Beukes and Marda Scheepers, senior statisticians at the Department of Agriculture's Directorate: Statistics and Economic Analysis, were acknowledged for their contribution to agricultural statistics and crop estimates.

Stakeholders were encouraged to continue building on the progress already achieved. While much attention was given to the growth of the soya bean and canola industries, discussions also highlighted broader opportunities linked to innovation, food security, climate resilience, value addition, and stronger collaboration across the agricultural sector.

Send an email to pns@proteinresearch.net or visit *www.proteinresearch.net* for more information.

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How data is strengthening outcomes for South African producers

By Marion Delport, manager data science, BFAP

Over the past three decades, South Africa has invested an estimated R100 billion in transforming its agricultural sector. Through grants, land reform programmes, and industry-led initiatives, the objective has remained clear: to address historical barriers and establish a more inclusive and equitable agricultural value chain.

Despite investment, the measurable impact at farm level has often been difficult to determine. While funding has continued to be deployed, outcomes have frequently been obscured by fragmented and inconsistent data.

Why data disorder stalls progress

This data challenge is more than an operational issue; it represents a systemic constraint on growth and progress. Monitoring has too often depended on non-standardised data and once-off assessments to evaluate the performance of transformation initiatives. When information is collected in isolation, it becomes difficult to answer a fundamental question for the sector: whether these interventions are delivering the intended results.

Without a clear and continuous view of farm-level productivity and profitability, stakeholders have limited evidence on which to base strategic decisions. This lack of visibility conceals implementation challenges, obscures the commercialisation pathway of emerging producers, and makes it difficult to identify where future investment will deliver the greatest impact.

Monitoring and evaluation

To address this challenge, the industry must strengthen the way progress is measured. The Bureau for Food and Agricultural Policy (BFAP) supports this transition by moving beyond fragmented reporting towards a more integrated approach. For more than a decade, BFAP has developed a monitoring and evaluation (M&E) framework that converts disconnected information into a coherent understanding of agricultural transformation.

A central component of this approach is the Integrated Value Information System (IVIS), a centralised, web-based system that converts fragmented data into actionable insights for decision-making. Rather than placing additional reporting demands on producers through overlapping requests for similar information, IVIS streamlines the process. By standardising data requirements and consolidating reporting, it provides stakeholders with a timely view of producer profiles, financial support, and operational performance.

The oilseed case study

The value of this integrated approach is evident in recent work by the Oilseed Advisory Committee (OAC). By implementing the BFAP framework, the OAC has strengthened its ability to move from assumption-based reporting towards evidence-based decision-making.

The OAC now has a better understanding of the producers it supports, including productivity metrics and distribution by province, gender, and age. This provides a stronger basis for assessing community-level impact within rural economies.

In addition, the committee can monitor seasonal performance over time. This enables the identification of producers with the potential to transition into more commercial operations, while highlighting those who require targeted technical support to improve productivity (yields). By using data to reduce the risk associated with loan financing and to improve soil correction practices, the OAC is shifting from expenditure-based support towards investment in verified outcomes.

The transition from data disorder to decision clarity extends beyond technology; it is fundamentally about accountability, transparency, and sustainable growth. By ensuring that every investment is tracked, measured, and optimised, South Africa can move agricultural transformation beyond policy intent and towards a more measurable, commercially viable reality for producers.

For more information, contact the author at 083 731 9698 or Marion@bfap.co.za

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Just and equitable compensation in the event of expropriation

By Hans-Jurie Moolman, Moolman & Pienaar Incorporated

Sections 25(2) and 25(3) of the *Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)* stipulate that just and equitable compensation must be paid when the state expropriates property for a public purpose or in the public interest. These sections have long been controversial, and discussions regarding their interpretation and application are likely to continue for years to come.

Case law and public debate

It is important to remain informed about how courts interpret and apply these provisions. Case law and the passage of time often reveal the real reasons for the tension underlying public debates on expropriation and compensation.

This was evident in the recent judgment of the Supreme Court of Appeal (the Court of Appeal) in *NAD Property Income Fund (Pty) Ltd vs Sanral (710/2024)*. The matter concerned the determination of just and equitable compensation payable to the owner following the expropriation of property by the minister of transport on 25 July 2016 at Sanral's request. The expropriation was done in accordance with applicable legislation, including the *Expropriation Act 63, 1975* (the 'old' *Expropriation Act*).

The case involved conflicting expert evidence presented by valuers. Given these differences, together with other considerations the Supreme Court of Appeal regarded as material, the matter was referred back to the High Court for the hearing of further evidence. Despite this referral, it raised additional criticism that could influence future case law.

Criticism of the court's approach

The criticism centred on the High Court's treatment of the constitutionally prescribed factors contained in section 25(3) of the *Constitution*, which provides that the following factors must be considered when determining just and equitable compensation:

a) The current use of the property.
b) The history of the acquisition and use of the property.
c) The market value of the property.
d) The extent of direct state investment and subsidy in the acquisition and beneficial capital improvement of the property.
e) The purpose of the expropriation.

The role of market value

In the judgment, the criticism was based on the High Court's ruling that market value is no longer the primary consideration when determining just and equitable compensation under the *Constitution,* but merely one of several relevant factors. According to the High Court, the weight given to it depends on the facts of each case, and the ultimate determination of compensation remains a discretionary assessment by the court.

However, in the judgment, it was pointed out that the High Court failed to reference the leading authority and majority judgment of the Constitutional Court (the Land Court) in *Du Toit vs Minister of Transport 2006 (1) SA 297 (CC)*.

According to the Court of Appeal, the Land Court found that determining just and equitable compensation constitutes a two-stage approach:

- First, consider what compensation is payable under the *Expropriation Act*.
- Then consider if that amount is just and equitable under section 25(3) of the *Constitution.*

The Supreme court held that the prevailing law and correct interpretation of section 25(3) of the *Constitution* is not what was held in the minority judgment of the Constitutional Court in the Du Toit matter, where the two-stage approach was criticised because it would "continue to privilege market value at the expense of other considerations relevant to justice and equity which are expressly advocated by the *Constitution*". The two stage was confirmed by the Supreme Court of Appeal. It was explicitly held that the majority judgment did "not render the market value of the property 'no longer a core consideration'" when determining just and equitable compensation in terms of section 25(3) of the *Constitution*.

Implications for future case law

The Court of Appeal further held that a court's determination of just and equitable compensation under section 25(3) must be grounded in objective facts, rather than the discretionary power of the courts, as the High Court had found. The consideration of each factor under section 25(3) (where relevant) must be backed by evidence and not a discretionary assessment by the court.

The judgment of the Court of Appeal is significant, particularly in the context of the passage of time. It appears that public debates on fair and equitable compensation and expropriation may at times have overshadowed the well-established and important case law of the Constitutional Court (dating back to 2006). Fortunately, the case law has corrected this, thereby providing clearer guidance for the future.

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Four agricultural labour law myths

By Hannes Latsky, training and compliance manager, LWO Employers Organisation

Misconceptions about labour law are common and often perceived as legally correct. In the agricultural sector, these myths can become deeply entrenched, leading employers and employees alike to believe that certain workplace practices are permissible when they are not. When employers rely on incorrect assumptions rather than the law itself, they unintentionally expose their businesses to unnecessary legal and operational risks.

In this article, we highlight four common labour law myths in the agricultural sector and the legal truths behind them.

Myth #1

An employer and his/her employees can agree on terms and conditions of employment even if they do not comply with labour legislation.

Truth

While employers and employees generally enjoy considerable freedom to enter into contracts, any terms and conditions of employment must at least comply with the minimum requirements set out in the various labour laws in South Africa.

The main laws that regulate the terms and conditions of employment in the agricultural sector are *Sectoral Determination 13 (SD13)*, gazetted under the *Basic Conditions of Employment Act, 1997 (Act 75 of 1997)* or *BCEA*, as amended. Employers are cautioned that any provision in an employment agreement that is inconsistent with or contrary to applicable legislation is unlawful. Employers and employees may, however, agree to terms that are more favourable to the employee than those prescribed by law.

Myth #2

An employee can be dismissed immediately for serious workplace misconduct, such as theft or dishonesty.

Truth

An employee cannot be dismissed before a disciplinary hearing has been conducted. Every employee must be given a fair opportunity to present his/her side of the case during a disciplinary hearing. Labour law requires that an employee's dismissal be both substantively and procedurally fair. Therefore, even if the substantive reason for dismissing an employee is fair, the employer must still follow the correct disciplinary procedure. This means an employee cannot be dismissed without a disciplinary hearing being held in the case of misconduct.

If an employer dismisses an employee without following the proper procedure, the dismissal will be considered unfair. This can have serious consequences for the employer in proceedings before the Commission for Conciliation, Mediation and Arbitration (CCMA).

Myth #3

A farmworker can be fined when he/she has committed an alleged workplace offence.

Truth

This is a very serious yet common misconception in the agriculture sector that puts employers at risk. Currently, fines against farmworkers are strictly prohibited in South African law. Clause 7(3) of *SD13* clearly states: An employer may not levy a fine against a farmworker.

Myth #4

Domestic workers on the farm are not paid the same wage as general farmworkers.

Truth

Under South African labour law, domestic workers employed on farms are currently classified as farmworkers in accordance with *SD13* and must therefore be remunerated accordingly. This position is further confirmed by the updated schedules to the *National Minimum Wage Act, 2018 (Act 9 of 2018)*. As a result, domestic workers employed on farms must be paid at the same minimum wage rate as other farmworkers, namely R30,23 per ordinary hour worked, effective 1 March 2026.

In today's increasingly regulated labour environment, employers cannot afford to make assumptions when managing employees. Practices that may seem commonplace or widely accepted are not always legally permissible, and mistakes can prove costly when disputes arise.

To mitigate risk and ensure compliance, employers should regularly review their employment contracts, disciplinary codes, workplace policies, and procedures to ensure they align with current labour legislation. Obtaining specialist labour law advice can help protect the business, minimise risk, and foster sound employment relationships in the workplace.

The LWO Employers Organisation assists employers to comply with labour law, and to use it to their advantage to protect their businesses. As a registered employers' organisation with the Department of Employment and Labour, the LWO has the right to represent members at the Commission for Conciliation, Mediation and Arbitration (CCMA). Take note that this article is not legal advice – consult one of our legal advisors about any specific legal problem or matter. For more information, send an email to info@lwo.co.za or visit *www.lwo.co.za*

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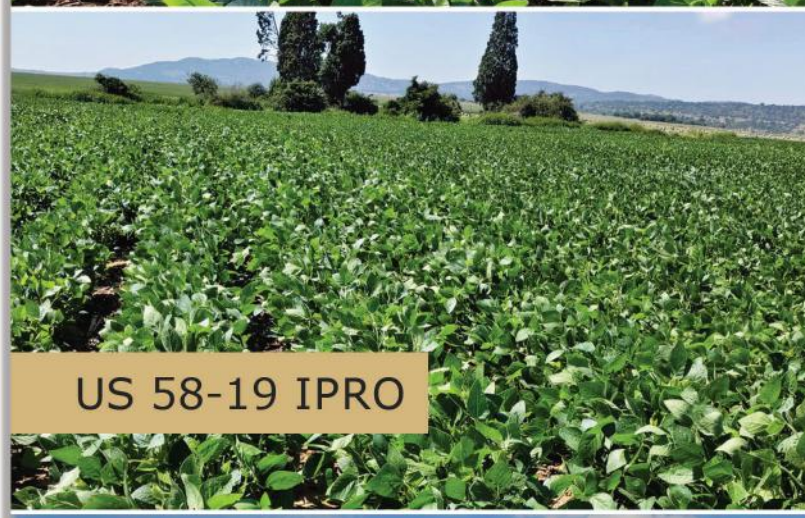

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