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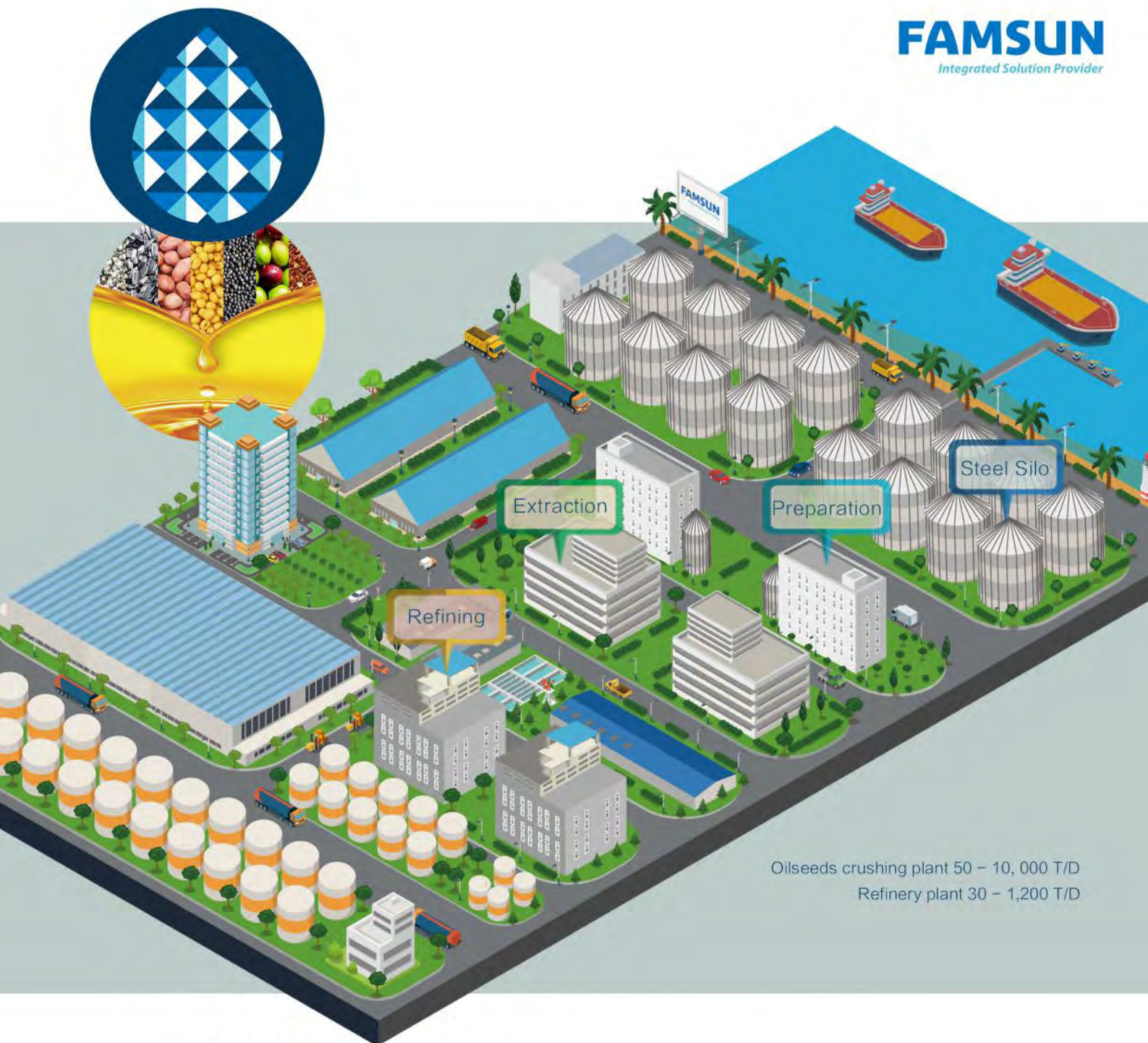
Sclerotinia sclerotiorum

Fall armyworm climate model



Glyphosate herbicide

Groundnut producer concerns



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We create plant value



Releasing new cultivars in a changing world

By Dr Daniel Ploper, EEAOC, Argentina, and Dr Francois Koekemoer, Sensako

Worldwide the genetic improvement of soya beans is a challenge that both private companies and official institutions continue to address in order to develop cultivars that meet current and future market demand.

It is essential to continue investing in research to release new cultivars adapted to a changing world characterised by climate change, a growing requirement for food, consumer expectations for improved nutritional quality and food safety, and public demand for sustainable production.

Development of new varieties

For the abovementioned reasons, processes that involve developing new soya bean varieties that meet all these requirements, should not be interrupted. Genetic improvement programmes involve great effort. These programmes include the hybridisation of selected parental lines and stabilisation of progeny, evaluating these new materials over time in different geographical and climatic environments, and the selection of the most adapted lines in terms of each location.

This laborious process culminates in the formal registration of new cultivars, followed by seed increase before being marketed and offered to farmers. Each new variety must be accompanied by a technological package of management practices that will allow it to express all its genetic potential. Aspects such as planting systems, row spacing, nutrition, irrigation, maturity group, seed production, pest management and production costs should be considered in soya bean production.

Furthermore, it is important to consider the entire production system in each field. This includes different crops and their

management over several cycles, with their interactions and effects.

South African genetics

Over the past decade, the Protein Research Foundation has been incorporating selected soya bean germplasm from different origins, especially Argentina. This has enabled the selection of cultivars adapted to different production areas and planting dates. We believe that germplasm currently being produced in South Africa has not been properly tested and thus the full yield potential of these varieties has not been exploited.

However, to qualitatively increase current capabilities, it is necessary to lay the foundations for new approaches in genetics and breeding, especially concerning the field of 'omics'. This field includes massive phenotypic, genotypic, metabolomic and proteomic approaches and provides a huge amount of data that must be analysed together.

It is also important to deepen the knowledge of the soya bean genome by not only considering public databases, but also by sequencing specific genotypes. CRISPR-Cas9 technology has emerged as one of the most promising methods that would allow genomes to be manipulated through genome editing. This will make it possible to modify specific target sequences to achieve the desired effects.

The way forward

Efficient and sustainable soya bean production will require improved agronomic management and cultivars with high yield potential and resistance or tolerance to biotic and abiotic stresses. The integration of conventional breeding with state-of-the-art biotechnologies,

such as the latest generation of phenomic and genomic approaches, is critical for the development of such cultivars.

Although the soya bean market, which currently stands at around 700 000ha, has grown significantly over the past decade, it is still small compared to Argentina, Brazil and the United States. More than 20 companies sell soya bean varieties in South Africa. This leads to a fragmented market with high levels of farm-saved seed and low profit margins on certified seed. In order to justify a soya bean breeding programme in South Africa, a market share of 40 to 50% is required to break even.

Therefore, 95% of all cultivars currently being produced in South Africa are foreign and are mostly licensed from Argentinean companies. One of the largest Brazilian soya bean breeding companies recently informed Sensako that it would not be supplying new germplasm to be tested in South Africa, because it will not be breeding varieties with Roundup Ready 1 (RR1) technology.

Therefore, it is critical that the end point royalty for soya bean continues successfully and that compliance for paying levies on farm-saved seed, remains above 90% in order to attract investment from international role-players for the newest seed technology.

If the economic situation in the South African soya bean market does not improve drastically soon, owners of new technology need to be incentivised to deregulate or commercialise these technologies for the South African market. 🌱

For more information, send an email to Dr Francois Koekemoer at francois.koekemoer@sensako.co.za.

The world is in turmoil

The novel coronavirus outbreak that started in Wuhan, China, at the end of December last year, has had major ramifications for global markets. The amount of fearmongering and fake news doing the rounds are concerning, and only time will tell whether it is warranted.

At the time of writing this article, only 2% of people that contracted the disease had succumbed to it. Compare this to the 9,6% mortality rate of the severe acute respiratory syndrome (SARS) virus in China in 2002/03.

To put things into perspective, below is a list of the worst pandemics in history:

- From 541 to 542AD the Plague of Justinian, which was caused by bubonic plague, killed 25 million people.
- From 1346 to 1353 the Black Death, which was caused by bubonic plague, killed 75 to 200 million people.
- From 1852 to 1860 the third cholera pandemic killed one million people.
- From 1889 to 1890 an influenza pandemic killed one million people.
- From 1910 to 1911 an outbreak of cholera killed 800 000 people.
- In 1918 an influenza pandemic killed 20 to 50 million people.
- From 1956 to 1958 an Asian influenza pandemic killed two million people.
- In 1968 another influenza pandemic killed one million people.
- From 2005 to 2012 HIV/AIDS-related complications killed 36 million people.
- From the end of 2019 to the time of writing this article, the novel coronavirus killed 1 369 people.

US and China reach a trade deal

On 13 December 2019, China and the United States (US) announced that the

two countries had reached a preliminary trade agreement that could directly result in some tariff relief. The deal was signed on 15 January this year. Some changes to the current technology and intellectual property structures and an increase in agricultural purchases from China, were agreed upon.

Soya bean farmers in the US have felt the impact of the trade war as purchases from China dropped dramatically. In fact, as a result of the trade war, exports of US soya beans to China is estimated to have dropped by 50% in the last year. However, the effects have not only been felt by the US and China; global economic growth has also been affected.

Palm oil growth to slow

The output of palm producers in Malaysia and Indonesia has decreased during the past year. Pressure from non-governmental organisations to reduce or halt palm plantings as a result of, among other things, concern for mass deforestation in Southeast Asia, has been immense. Low prices have also discouraged new plantings and have prompted producers to cut input costs, such as reducing the application of fertilisers. This, in turn, has lessened yields. Consequently, growth in palm oil output is expected to decrease within the next few years.

At the same time, we are expecting demand to grow, mainly due to an increased need for palm oil in the production of biodiesel. The resulting higher prices of palm oil due to the changes in palm oil supply and demand is likely to see a switch to competing oils and firm global oil prices in general.

Enjoy this edition of *Oilseeds Focus*.

Dr Erhard Briedenhann

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Pannar names salesperson of the year

During a conference held earlier this year, Francois Mellett was named Pannar's salesperson of the year for the 2019 season. He represents Pannar in Standerton and surrounding areas. The runner-up was Willem du Plessis, who is a sales representative in the Bethal area.

Francois and Willem were lauded for their professional service and rapport with customers, and for using their sales experience, technical knowledge and passion for Pannar to market the company's wide range of crops and cultivars to their customers. Pannar is immensely proud to have representatives of this calibre serving its valued customers. – *Press release, Pannar*



From the left is Francois Mellett, Pannar's salesperson of the year for the 2019 season, and runner-up Willem du Plessis.

Saai comments on Constitution amendment

The Southern African Agri Initiative (Saai), an organisation committed to protecting the interests of family farmers, submitted commentary on the amendment to section 25 of the *Constitution of the Republic of South Africa, 1996* (Act 108 of 1996 or the *Constitution*) that would allow for the expropriation of land without compensation.

It is also undertaking a strong international awareness campaign for 2020 on expropriation without compensation and farm murders. The first leg of the campaign comprised a visit to the Hungarian government and the Global Forum for Food and Agriculture held in Berlin, Germany.

The agricultural ministers of approximately 80 countries were present at the Global Forum where Dr Theo de Jager, chairperson of Saai's board of directors and president of the World Farmers Organisation, answered questions about the issue of expropriation in South Africa. – *Press release, Saai*

Low threat of desert locust invasion

The desert locust is one of the world's most notorious agricultural pests. According to the Food and Agriculture Organization (FAO) of the United Nations, the unusually wet weather in Ethiopia, Kenya and Somalia towards the end of 2019, contributed to a massive swarm outbreak, which resulted in an explosion of locusts that destroyed crops and threatened food security across the region.

However, there are no historical records of desert locust swarms invading Southern Africa, and the current threat to the region from these locust invasions is considered to be very low. That said, South Africa is prepared to manage or control such outbreaks with local expertise, pesticide stocks, spray aircraft and other measures.

The Agricultural Research Council (ARC) and the Department of Agriculture, Land Reform and Rural Development have considerable experience in the management of locust outbreaks based on previous incidents of red and brown locusts.

– *Press release, ARC Plant Health Protection*

Palm oil stocks drop as output growth slows

Growth in palm oil production will slow within the next few years, which will help to reduce stockpiles and boost prices. This is according to leading industry analyst James Fry, chairman of LMC International. Dry weather and reduced fertiliser use – a move adopted by some growers to save costs – have affected the output of top producers in Indonesia and Malaysia this year. According to Fry, it will continue to be a factor in the coming years.

"In addition, we have seen the repercussions from the relentless pressure from non-governmental organisations to stop oil palm planting. This is on top of the normal slowdown in new plantings that occurs at times when prices are low," says Fry. He believes Indonesia and Malaysia will see little growth in output in the next year and that there will likely be a supply deficit in the market as demand for biodiesel grows in both countries.

Environmentalists have blamed the cultivation of palm oil, which is used in everything from ice cream to lipstick, for mass deforestation in Southeast Asia and the endangerment of wildlife such as orangutans and pygmy elephants. – *Reuters*

Technology to diagnose soya bean stress

Iowa State University scientists are working towards a future in which farmers can use unmanned aircraft to spot, and even predict, disease and stress in their crops.

Dr Arti Singh, an assistant professor of agronomy, is leading a multi-disciplinary research team that recently received a three-year research grant from the United States Department of Agriculture's National Institute of Food and Agriculture to develop machine learning technology that could automate the ability of farmers to diagnose a range of major stresses in soya beans.

The technology will use cameras attached to unmanned aerial vehicles to gather bird's-eye images of soya bean fields. A computer application will automatically analyse the images and alert the farmer of troublesome spots.

"At its most basic, machine learning is simply training a machine to do something we do," Singh says. "When you want to teach a child what a car is, you show them one. To train computer algorithms, we show a large number of images of various soya bean stresses to identify, classify, quantify and predict stresses in the field." – www.news.iastate.edu

US and China sign trade agreement

In January this year, the United States (US) and China entered into what is being referred to as the first phase of a trade agreement. The agreement is designed to halt the very costly escalation of tension between the two countries.

The agriculture section of the 86-page document addresses structural barriers to trade and multiple non-tariff barriers to US agricultural and seafood products, including meat, poultry, seafood, rice, dairy, infant formula, horticultural products, animal feed, feed additives, pet food, and agricultural biotech products. It also supports an expansion of exports for US agricultural and seafood products.

China has agreed to purchase US agricultural products worth between \$40 and \$50 billion each year over the next two years. The country has also agreed to import grains, dried distillers grains and ethanol valued at a minimum of \$80 billion over the next two years.

Additionally, a facility registration process has been implemented that will help ease restrictions on US feed additives and premix product imports that have been in place since 2011. – www.world-grain.com

Santam and Sanlam support drought relief

Santam and Sanlam have together donated R3 million towards aid for farming communities. The donation, which was made to Agri SA, will assist commercial and emerging farmers currently affected by the devastating drought in large parts of South Africa. Agri SA co-ordinates relief efforts for farmers in the country.

The drought has hit the Northern and Eastern Cape particularly hard. According to Agri Northern Cape, it has affected 15 000 farms in the province and livestock has been reduced by as much as 50%. It is expected that the donation will help the Agri SA Drought Disaster Fund to acquire fodder, as well as humanitarian aid for farmers, farm workers and rural communities.

Agri SA calls on other corporate entities to join hands with Santam and Sanlam to strengthen the agricultural sector's efforts in overcoming the devastating impact of the continuous drought, ensuring food security, and bringing relief to those in need.

– Press release, Agri SA

Agriculture the answer to Eskom's woes

Agri SA has announced that it welcomes the attention paid to the Eskom crisis in president Cyril Ramaphosa's State of the Nation Address.

To help achieve the president's objectives, the organisation says it will exert pressure on the Department of Energy, Eskom and the National Energy Regulator to develop the necessary policy and products. It believes agriculture can provide the network with energy within 12 months after approval of project registrations to help alleviate the pressure on Eskom.

Agri SA has already developed a product in collaboration with top financial institutions that offers finance for installing solar systems.

– Press release, Agri SA

Astral honours poultry industry legend

Astral recently honoured poultry industry legend Cliff Saunders by naming its newest and biggest boardroom after him.

Saunders comes from a family of poultrymen and began his career in the table egg industry. The innovations and technology that he introduced transformed the poultry industry from one that was dominated by smallholder



Chris Schutte (left) and Cliff Saunders.

farmers to a fully fledged commercial industry that competes with global standards.

"Astral is privileged to honour Saunders, owing much of its successful history to a man that laid the foundation to a significant industry in our country's agricultural landscape," said Chris Schutte, CEO of Astral, during the naming ceremony.

– Ursula Human, AgriOrbit

Fall armyworm:

How a climate model can help

By Hannalene du Plessis and Johnnie van den Berg, North-West University

The fall armyworm (*Spodoptera frugiperda*), which originates from South America, is an invasive alien insect known for causing devastation in many a cropland. This tropical or subtropical pest is adapted to reproduce and survive in hot conditions, and was first reported in South Africa in 2017.

Researchers initially aimed at determining whether the climatic conditions in South Africa would be suitable for the permanent establishment of this invasive pest which, if indeed possible, would mean that the fall armyworm is a permanent pest that could be an annual problem for especially grain producers. Three years after its initial arrival in the country, research conducted at North-West University has shed much light on this pest and its invasion of croplands.

Monitoring the fall armyworm

Fall armyworms feed on a staggering 353 plant species. Initially, it was feared that the pest would not only cause severe damage to maize, but also to crops such as grain sorghum, soya beans, wheat, tobacco, sunflower and various vegetables. In America grasses such as kikuyu are also affected, which could lead to losses for livestock and dairy farmers.

The fall armyworm's presence is monitored using moth traps. The most common trap used in South Africa is a bucket that contains a synthetic

female fall armyworm pheromone. Male moths are attracted to the trap as a result of the pheromone and fall into the bucket, where a block of poison kills them.

Unfortunately, the pheromone not only attracts fall armyworm moths, but also false armyworm moths. When they are trapped in the bucket, moths lose most of the scales on their wings, making correct identification difficult. Consequently, farmers sometimes mistake false armyworm moths for fall armyworm moths.

Reaction to temperature

Insects are ectothermic, which means that their body temperature varies along with the ambient temperature. Cold is a limiting factor in the survival of the fall armyworm. The South

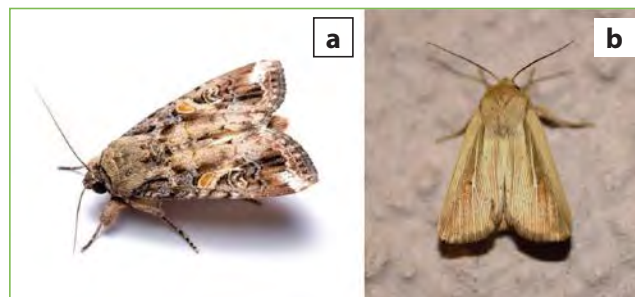


Fall armyworm larvae will always favour maize if given a choice of host plants.

African interior, which includes the main maize cultivation area, is too cold during the winter for the pest to survive. The survival of fall armyworms throughout the year is limited to the warmer northern parts of South Africa.

The research found that fall armyworm eggs only take two days to hatch at constant temperatures of between 30 and 32°C and that the larvae take ten to twelve days to develop into pupae. At a constant temperature of 18°C, the eggs take six to seven days to hatch, and the larvae develop within 28 to 37 days. The life cycle averages 71 days at 18°C and only 20 days at a temperature of 32°C.

From this it is clear how well the pest is adapted to survive and reproduce rapidly at high temperatures. Thus, more generations are completed during warmer times, which coincides with



(a) Fall armyworm moth (Photograph: Matt Bertone) and (b) false armyworm moth.

the crop-growing season. With each successive generation, moths that lay eggs emerge and populations grow.

The lower temperature limit at which they can survive determines whether these insects survive in a specific area. The temperature limit for the survival of eggs and larvae is 12°C. However, it should be considered that although night temperatures during winter frequently dip below 12°C for most areas in South Africa, day temperatures are significantly higher, and the average daily temperature may then lead to pest survival.

The total grain cultivation area in Southern Africa's climate is suitable for the survival and reproduction of this pest during the summer months.

The larvae and pupae are usually sheltered, which can also contribute to the fall armyworm's ability to survive moderate winters. If temperatures fall below the lower limit of survival and persist for a while, the pest will not be able to survive in such an area. Distinctions should therefore be made

between areas where the environmental conditions are always favourable for the fall armyworm to survive and areas to which these insects can migrate when the environmental conditions change, thus becoming favourable for survival and reproduction.

Wintering in South Africa

As part of the study, the CLIMEX software program was used to develop a model that predicts which areas the fall armyworm can survive in during the South African winter (permanent populations) and which areas the pest can spread to during favourable times (seasonal populations). The model was developed in collaboration with Prof Darren Kriticos of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, and it is based on the fall armyworm's response to climate variables (*Figure 1*).

The darker colours in *Figure 1* indicate greater suitability. EI describes the areas that are potentially suitable for permanent populations, and GI describes the areas suitable for survival and reproduction under favourable climatic conditions. The areas in which permanent populations can be found are indicated in the yellow to red index, while the green index indicates seasonal occurrence.

Areas that are unfavourable to the occurrence of the fall armyworm are indicated in white.

Figure 1 shows that permanent populations can settle in the north of Limpopo and along the KwaZulu-Natal South Coast and possibly parts of the Eastern Cape coast. The total grain cultivation area in Southern Africa's climate is suitable for the survival and reproduction of this pest during the summer months. If survival during moderate winters would occur in the grain cultivation area, a cold front with low temperatures could wipe out these populations.

In the case of the fall armyworm, the cold fronts that strike the Western Cape (with low temperatures and occasionally snow) during winter work to the

benefit of winter cereal producers. These low temperatures are not conducive to the fall armyworm's survival and reproduction, as it is a tropical or subtropical pest.

However, the fall armyworm appears to be wintering in a larger area than the model predicts, for example, in the area of Malelane and Mbombela. There is also much speculation about valleys in other areas in South Africa where average temperatures may be higher during winter than in surrounding areas. Further research currently refines the model to accommodate events such as climate change and areas where cold temperatures sporadically occur for short periods.

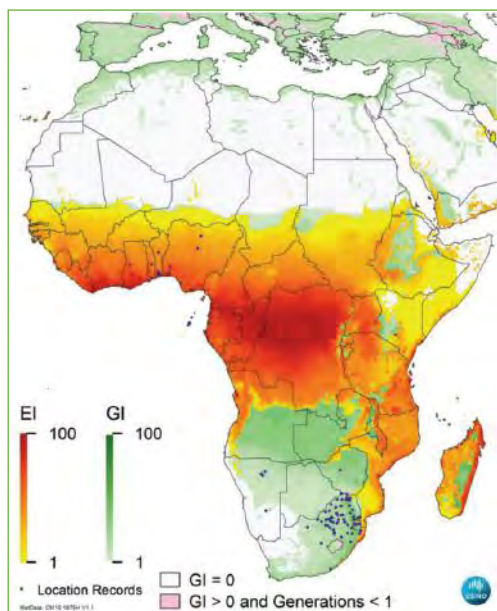
Host plants

Because the fall armyworm feeds on such a wide range of host plants, the larvae's preference for crops and grasses was investigated. This research confirmed that the pest prefers maize, although it also feeds on other crops such as grain sorghum, soya bean, sunflower, groundnuts and cotton. Surveys and research have shown that unlike in America, fodder crops and grasses are not under threat in South Africa. Larvae cannot survive on grasses such as *Brachiaria*, Napier and vetiver. This is good news for livestock farmers, as *Brachiaria* and Napier are planted as livestock feed. If the larvae are given a choice between maize and other host plants, maize is always their first choice.

Information is constantly added to the temperature model to refine it and make the predictions as accurate as possible. The response to temperature variables that may affect pest migration and spread is still being researched and the reporting of fall armyworm infestations or survival areas contributes to a more accurate model. 🌍

Producers who are aware of overwintering larvae in their production areas or experience sudden outbreaks during the season can phone Hannalene du Plessis on 018 285 3007 or Johnnie van den Berg on 018 299 2376. Alternatively, send an email to Hannalene.DuPlessis@nwu.ac.za.

Figure 1: Climate suitability for the fall armyworm in Africa modelled with CLIMEX software. (Source: CSIRO)



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The in-field life cycle of *Sclerotinia sclerotiorum*

By Lisa Rothmann and Marlese Meiring

Sclerotinia sclerotiorum is a yield-limiting fungal plant pathogen. It is present on every crop-producing continent and affects over 500 known susceptible host plants, including weeds. In South Africa, hosts include but are not limited to, cabbage, canola, cauliflower, dry bean, hubbard squash, soya bean, sunflower, pea and potato.

Some distinguishing features characterise the diseases caused by *S. sclerotiorum*. These features are a wilted appearance in the field (Figure 1: 4A), followed by white, cottony mycelia (Figure 1: 4C and 4D), a shredded appearance (Figure 1: 4E) and ultimately melanised mycelium, known as sclerotia (Figure 1: 6). These resting structures can be found within and on the

stems, as well as inside pods. Sclerotia are crucial to the life cycle of this pathogen because they are the pathogen's survival structures. They can survive for up to eight years in and on the soil (Figure 1: 1).

Two types of inoculum

This pathogen is complicated because the sclerotia afford it the opportunity to form two inoculum types, namely mycelia and ascospores. These germination pathways are induced under different environmental conditions. Carpogenic germination (Figure 1: 2B) usually occurs under lower temperatures than that of myceliogenic germination (Figure 1: 2A). However, both pathways prefer high relative humidity, moisture or leaf wetness.

The initiation of the stipes from sclerotia leads to the development of apothecia (Figure 1: 3), a mushroom-like structure, which looks much like a saucer. Ascospores, which are infection propagules, are forcibly discharged from apothecia when air pressure changes are observed within the canopy. Spores are then dispersed widely. Apothecia are frequently misidentified as the common bird's nest fungus, which belongs to the *Nidulariaceae* family (Figure 1: 2C).

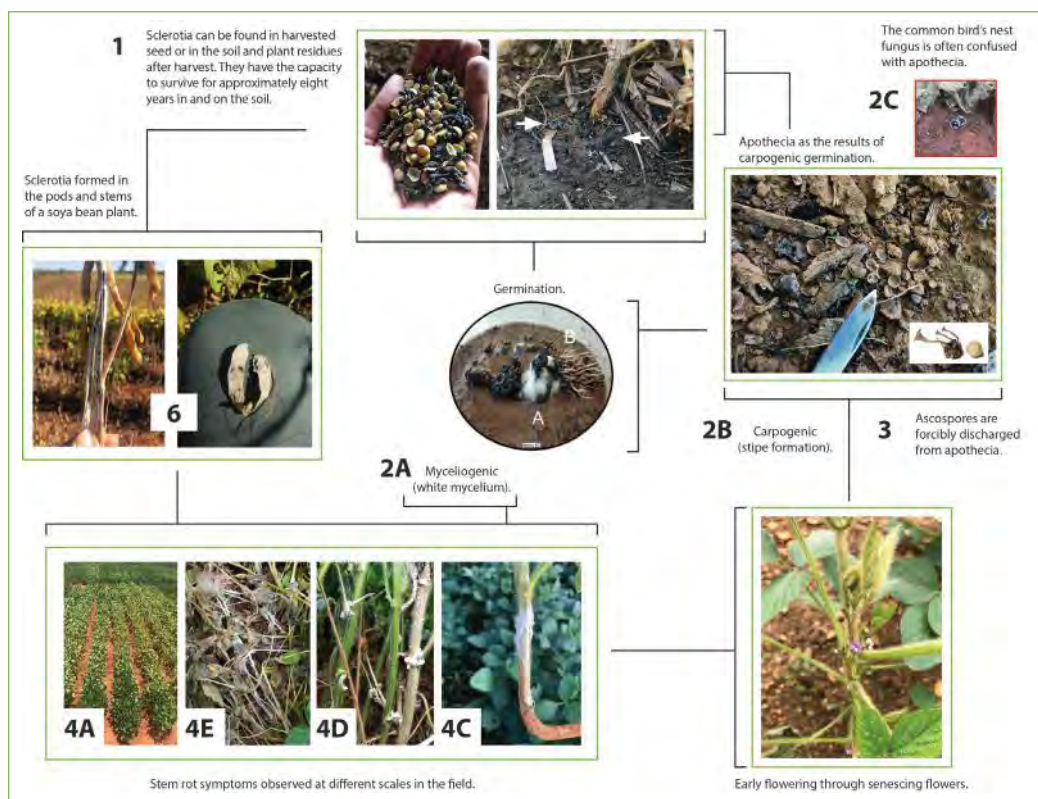
An integrated approach

As a result of the wide host range, pathogen biology and environmental dependence, the management of *Sclerotinia* diseases requires an integrated approach. The matter is further complicated by host crops' lack of conventional resistance to the pathogen.

Management strategies have thus relied on reducing the opportunity for the sclerotia to germinate, which limits the sclerotial population and disease initiation risk. Varying planting dates, crop rotations, population densities, tillage practices, biological and chemical control have all effected limited (and at times inconsistent) control of *Sclerotinia* diseases. Procymidone is the one registered active ingredient for controlling sclerotinia stem rot of soya bean in South Africa. 🌱

Photographs supplied by Lisa Rothmann and Marlese Meiring. For more information, contact Lisa Rothmann at info@sclerotinia.co.za, visit www.sclerotinia.co.za or follow the South African Sclerotinia Research Network on Facebook, Instagram and Twitter.

Figure 1: Soya bean stem rot caused by *Sclerotinia sclerotiorum*.





TRIAL-TOPPING **SUNFLOWERS** FOR STABLE HIGH-END YIELDS



2020/SUN/FW/06

Back to basics with sunflower agronomy

By Ursula Human

The agricultural industry has undergone rapid change and, thanks to technological developments, intelligent farming systems can now monitor many aspects of agronomy. However, according to a recent article by the international seed company Nuseed, the secret to improving the profitability and performance of sunflower crops lies in a return to the basic principles of agronomy.

Know your soil

Producers must know which crops were previously grown in a specific field. All crops that were previously grown will have had an impact on the soil's condition, structure and fertility. The pest and diseases that were previously present, as well as planting time and planting method, will also have affected the soil. No matter how busy producers are, examining the soil helps to gain useful insight into the land.

According to the Nuseed article, it is important to remember that a significant part of the plant is underground, and many above-ground issues can be traced to soil conditions. A spade is an essential piece of equipment for any agronomist, along with a soil thermometer, pH meter, sharp knife and a soil penetrometer. Since soil penetrometers are usually expensive, a meat skewer or similar tool can be used as an alternative. The aim is to get a 'feel' for any compaction issues.

Optimising yield

Regardless of the planting method used, some basic principles must be considered when looking to increase yield. All inputs must be of high quality, including seeds. Seeds with high genetic potential will perform better than those with inherently lower potential, regardless of the agronomical conditions.

The industry commonly relies on hybrid sunflowers that are herbicide tolerant. Hybrid seeds are the result of crossing two different varieties to combine their



beneficial qualities. These seeds perform well in most production systems, and each variety serves different needs.

The article emphasises plant density as another important factor for achieving optimum yield. An increase in plant density results in a yield increase. During planting, seeds need to be placed the correct distance apart in order to achieve the ideal plant density. This is known as in-row spacing and there are several ways to calculate it, the easiest of which is to calculate the length of one row and divide it by the target plant population.

Nuseed uses the following example to illustrate this calculation:

- The length of a 1ha row is one hectare expressed as 10 000m², divided by the width of one row.
- For example, $10\,000\text{m} \div 75\text{m} = 13,333\text{m}$.
- In this case, the length of 1ha row is 13,333m.
- Then divide the length of 1ha row by the target plant population.
- For example, $13,333\text{m} \div 60\,000 = 0,22\text{m}$ or 22cm.

This means that if you set up your planter to place seeds 22cm apart on 75cm row widths, you will achieve a plant population of 60 000 seeds per hectare.

Nutrition, pests and diseases

According to Nuseed, yield and oil quality depend on the nutrition

available in the soil. When fertiliser is applied to fields planted to sunflower, the soil should be tested to determine the availability of phosphorous and potassium. Consider the previous crop, soil type and the expected yield to determine the application rate of nitrogen. This element is important for optimum yields, but too much can reduce oil content and affect oil quality by reducing protein and oleic acid content. Avoid damaging sensitive sunflower seeds with fertiliser and limit the amount placed in close contact to the seed at planting.

The crop canopy's effective light interception also affects yield. This can be reduced by pests and foliar diseases, which reduces the canopy's photosynthetic ability. As leaves die from disease, they shrink and curl up, which means that much of the sunlight energy is wasted because it passes through the canopy.

Leaf area can also be reduced by pests that eat leaves. Consequently, the plants are exposed to potential secondary infections. The green leaf area can be maintained with well-timed sprays, and it is recommended that the upper leaves are sprayed until seed formation and filling ends. It is also necessary to monitor crops regularly for pests and diseases. 🌱

For more information and references, send an email to the author at ursula@plaasmedia.co.za.

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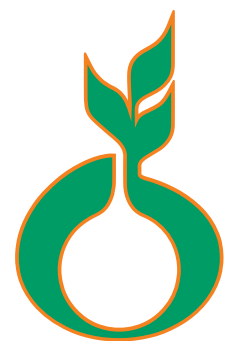
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Old school weed control

By the United Soybean Board

Over the past two decades, the convenience and effectiveness of post-emergence glyphosate applications led many farmers to abandon past approaches to weed control, which included using a variety of herbicide and tillage options. Increasing pressure from glyphosate-resistant weeds, such as Palmer amaranth, waterhemp, giant ragweed and kochia, has seen weed experts promote a return to more diverse practices, like those used by past generations of farmers.

Weed species respond differently to herbicides and tillage practices, so scouting and understanding which weeds are present sets the stage for farmers to develop a plan for eradicating the problem.

"Most older farmers who have a basic knowledge of all these other herbicides have retired," says North Dakota State University (NDSU) weed control specialist Richard Zollinger. "Many farmers today only know glyphosate, so we've got some training to do."

Tips for weed control

Diversifying your operation to combat herbicide-resistant weeds can seem overwhelming. NDSU weed scientists compiled a list of tips for managing weeds to reduce the likelihood of herbicide resistance on your farm:

- *Scout fields before and soon after herbicide applications:* Correctly identify weeds and use whatever means necessary to kill weeds that escape or germinate after chemical application.
- *Diversify crop sequences:* Crops with different lifecycles, such as winter crops, perennial crops and summer crops, offer different planting and harvest times,

more herbicide options and decreased risk of herbicide-resistant weeds.

- *Consider weed biology and ecology:* Consider tillage, crop sequence, soil fertility, planting date, crop competition, weed seed longevity and herbicide response as you build your weed management plan.
- *Use effective pre-emergence herbicides:* Apply effective pre-emergence herbicides at full rates and include multiple modes of action. Pre-herbicides reduce weed emergence and allow flexibility in the timing of post herbicide applications.
- *Use effective post-emergence herbicides:* Apply herbicides that include multiple modes of action in tank-mixes or sequential applications.
- *Use full herbicide rates:* Full rates kill weeds, and dead plants cannot produce resistant progeny. Reduced rates allow plants with low-level resistance to survive and produce offspring with higher levels of resistance.
- *Spray weeds when they are small:* Small weeds, those less than three inches tall, are generally more susceptible to herbicides than large weeds.
- *Practise zero tolerance:* Scout fields after row closure and kill uncontrolled weeds by pulling them out manually if necessary. Seed from escaped weeds will contribute to the weed seed bank.
- *Control weeds in field perimeters and non-crop areas:* Weeds surviving a partial herbicide dose on field borders can be a repository for the introduction of resistant weeds into a field. Control weeds in all areas of the field where crops are not growing, including field edges, fence lines and waterways.
- *Rotate herbicides with different modes of action:* Crop rotation can introduce herbicides with different modes of action to delay herbicide resistance.
- *Use good sanitation:* Clean tillage and harvest equipment to ensure weed seed will not be transported between fields.

- *Evaluate:* Review your weed management results at the end of each season and revise to improve weed control the following year.

Know your weeds

The abovementioned practices can help, but fighting herbicide resistance starts with farmers knowing what they are up against. Weed species respond differently to herbicides and tillage practices so scouting and understanding which weeds are present sets the stage for farmers to develop a plan for eradicating the problem.

Take Action is an industry-wide, US-based effort that helps agricultural organisations, agri-businesses and researchers to fight herbicide resistance. The Take Action website (www.iwilltakeaction.com) features resources to help farmers identify weeds while highlighting options for treating them.

When it comes to diverse practices farmers should employ, weed researchers are unanimous in their call for the use of herbicides with different sites of action and different chemistry. Many recommend starting with a pre-emergence residual herbicide, followed by a post-emergence herbicide with different chemical components. Increased tillage is also an option for controlling some weed species.

Adopt a diversified approach

Integrated weed management uses multiple strategies for controlling weed populations, but not all of them are realistic for all farmers. However, adopting even a few diverse practices can keep weeds off balance and give growers the upper hand in battling herbicide-resistant weeds.

Adopting a diversified approach requires more management than relying on a single post-emergence strategy. It could also add to costs, but it is an investment that farmers need to consider as part of their long-term plan. 🌱

This article was originally published on www.unitedsoybean.org.



Addressing the concerns of groundnut producers

By Adri Botha, chairperson, South African Groundnut Forum

The South African groundnut industry continues to face wide-ranging challenges as it is far from being immune to the impact of drought, local and international market forces and shifts in local production scenarios.

This small industry has nevertheless made substantial progress in recent years by addressing issues that could have major consequences for future sustainability and growth. This progress was made possible by adopting the proposed key indicators that were published in the first groundnut sustainability study, conducted by the Bureau for Food and Agricultural Policy (BFAP), in 2012.

Finding the industry's voice

Conflict of interest, a perceived or actual absence of transparency and a lack of understanding regarding the role and mandate of the South African Groundnut Forum (SAGF) limited the participation of key role-players. This participation is essential to facilitate competitiveness and co-ordination in the industry.

The abovementioned concerns were addressed by putting formal terms of reference in place. This guides members and informs external parties of the mandate, restrictions and most importantly, shared objectives of the greater groundnut value chain.

This message is spread at every possible opportunity to assure all affected parties that there is no risk of violation of the *Competition Amendment Act*, 2018

(*Act 18 of 2018 or the Competition Act*), as long as the rules are adhered to. The terms of reference document remains the only inclusive voice for the industry. It can only speak on the industry's behalf if all stakeholders actively participate.

Mitigating challenges

After confirming that the industry could address wider strategies and goals through a functioning structure, the SAGF agreed on clear industry projects and key objectives, which are revised annually to ensure that role-players remain focused and guard against complacency.

Producer scepticism was, and still is, one of the major stumbling blocks with which the industry must contend, since addressing the other issues will not make a difference without the support and stability of this sector.

In a joint effort to address some of the concerns highlighted by producers, and with the support of certain selection facilities, Grain SA now reports import and export parity prices up to farm level. A two-year study conducted by the Perishable Products Export Control Board (PPECB), which is currently being evaluated in practice, also made updated producer stock grading guidelines available. These guidelines allow producers and selection facilities to better and more transparently evaluate quality and possible grading outcomes of bulk and higher moisture deliveries.

Progress has been made in establishing a closer working relationship between

the SAGF and the Agricultural Research Council (ARC) Grain Crops Institute in Potchefstroom in a bid to address real concerns surrounding cultivar, yield and breeding programmes.

Although private and even foreign initiatives are always welcome and would certainly boost the competitiveness of groundnuts, the ARC currently remains the prominent breeder of groundnuts in South Africa. Owing to unsure stability and continued development, the industry has to find ways in which to support and, where appropriate, guide the Grain Crop Institute to best meet the industry's needs.

Sharing information

To share these and other developments with primary producers, the SAGF, Grain SA and certain selection facilities embarked on a three-day roadshow in the Setlagole, Hartswater and Viljoenskroon areas during October 2019.

The main aim was to directly engage with groundnut producers and share with them information about the structures that are in place to represent them, groundnut-related projects that were undertaken or are still in progress, and specific information that is available to them when making production and contractual decisions.

In his presentation, Gerhard Keun, CEO of the Oil and Protein Seeds Development Trust (OPDT), explained the structures and operations of the Oilseeds Advisory Committee (OAC) and OPDT to producers.

Producers were assured that funding remains available for relevant projects

and research to support the sustainability of the groundnut industry in South Africa. I took the opportunity to explain the SAGF's role and mandate as the recognised voice of the industry. It was emphasised that this structure's success is directly linked to the participation and support of industry role-players. Personal and direct involvement is critical in an industry in which sector representation through associations or other groups is limited.

Luan van der Walt, an economist at Grain SA, explained the scope of current projects, available information, and the close collaboration between parties in the industry. He underlined the work Grain SA does on behalf of producers to ensure a transparent and fair production environment. He also highlighted that this cannot be done effectively in isolation from other sectors.

Producers used the opportunity to share their hopes for and concerns about the industry. As expected, the prolonged drought and the negative impact of late

rains on groundnut plantings were their main concerns.

Mapping the way forward

In the absence of a futures exchange structure for groundnuts and the boundaries set by the *Competition Act*, transparent price mechanisms remain a serious issue for producers. However, the hope is that the new approach to publishing parity prices will assist in addressing their concerns. Producers can now use a considerable amount of information or tools during negotiations with their buyers.

Since, along with price, yield prospects remain the most important factor when deciding which commodity to plant, producers were pleased to hear that plans are underway to work closer with the ARC in terms of future development, and that two promising cultivars are now becoming available for commercial planting. The ARC plans to register more cultivars soon. Nematodes, especially in the absence of Temik, the effect of wind erosion and other commodity-specific cost items

such as machinery, were listed as serious risk factors. In terms of price structures, a request was made for a study or evaluation of the pricing structure from farm to fork. The need for larger secondary sector engagement was noted, and the invitation for participation in the SAGF's activities was repeated as most of these companies are active members of the SAGF.

In summary

The only way to address mistrust and perception is to share information and consider other parties' concerns and circumstances. All role-players need to play their part; engaging with producers at grassroots level allowed the SAGF to better understand and address issues that are important for the survival of the groundnut industry. In view of the overall positive response and feedback, similar awareness-raising events will be undertaken in future. 🌱

For more information,
send an email to Adri Botha at
groundnutforum@opot.co.za.



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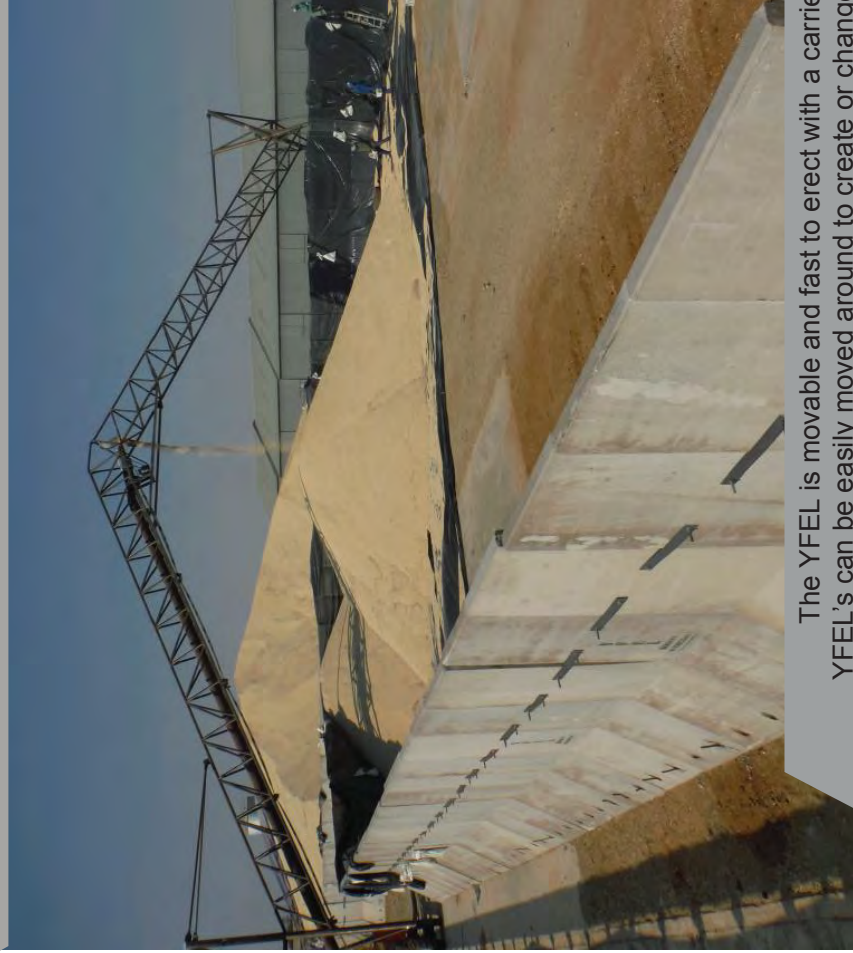
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Soya beans levy allows access to new cultivars and technology

By Gert Heyns, CEO, South African Cultivar and Technology Agency (SACTA)

In June 2018, the former minister of Agriculture, Forestry and Fisheries approved a statutory levy for the purpose of funding seed breeding and technology based on which seed companies can be compensated for their performance in the soya bean seed market.

The levy aims to assist with the funding of new variety development and to ensure that South Africa has access to state-of-the-art biotechnology. The funds are paid to seed and technology companies who are actively involved in breeding new varieties and who introduce current and advanced biotechnology. Compensation depends on each company's market share.

The impact of farm-saved seed

Since soya bean is a self-pollinating crop, approximately 80% of soya beans are produced from farm-saved seed. For this reason, seed and technology companies are hesitant to invest in new variety and technology development, as their return on investment is not guaranteed.

Based on the increase in planted hectares, soya bean production has significantly increased over the past five years, but the yield increase per hectare was marginal. Although successful soya bean production is the result of the interaction of various production inputs, the availability of suitable, high-potential varieties, in conjunction with current biotechnology, is a major contributor to increased and successful soya production.

The 2019/20 soya bean marketing season is the first in which the South African Cultivar and Technology Agency (SACTA) has imposed and collected the soya bean levy. The levy has been collected on 95% of all soya beans that were delivered during the season. This

percentage is expected to increase as producers are gradually pricing the soya beans that have already been delivered.

SACTA's analysis of the implementation of the levy system further reiterates the successful progress that has been made, now that there is an opportunity to incentivise seed and technology companies to develop new varieties and improved technology.

Progress in biotechnology

South African producers have not been able to access the progressive biotechnology available to countries such as Brazil, Argentina, Uruguay and the United States (US). Seed companies have been proactive and have already planted advanced deregulation trials within the past three years to ensure that the extensive technology gap between South Africa and other soya-producing countries is bridged as soon as possible.

Three significant seed companies are involved in the various stages of the deregulation trials with the aim of ensuring that local soya producers will be on par with their global peers within the next four years. The initial biotechnology traits that are expected to be deregulated in South Africa, are glyphosate- and insect-resistant traits. Seed could be available for planting as early as the 2021/22 production season.

In addition, various other companies have announced that the deregulation of traits such as glufosinate resistance, combinations of glyphosate and glufosinate resistance, as well as insect resistance will be conducted. These traits have a good chance of including drought and salinity resistance.

Genetic material availability

South Africa is fortunate to have local breeding programmes in which unique, adapted varieties can be developed and marketed. Although these programmes are local, they use genetic material that is licensed from companies abroad. The breeding and

technology levy motivates these companies to make their lines available for breeding purposes, which means that South African breeders now have access to the best material.

Companies that do not utilise local breeding programmes, introduce varieties that have been bred in countries such as Brazil, Argentina and the US. These varieties are thoroughly tested locally and once they are found to be suitable for local production, the rights to produce and market them are licensed in South Africa. However, the owners of the plant breeder's rights are reluctant to grant such rights if there is no reliable system ensuring a reasonable return on investment.

After the introduction of the breeding and technology levy system, many international companies have offered to supply genetic material to local breeders. However, it is important to note that most of the new-generation genetics available for breeding purposes, have already been converted to contain new biotechnology.

The new biotechnology will have to be deregulated in South Africa before the new genetic material can be incorporated into breeding programmes. This would not have been possible without the breeding and technology levy system.

The way forward

The levy's implementation on soya beans has proven to be successful for seed and biotechnology suppliers alike. The second season of the levy on soya beans runs from March 2020 until the end of February 2021. During 2020 an application for the continuation of the levy after 28 February 2021 will be submitted for consideration. The levy will form an integral part of financing the necessary research in the continuous development of new soya bean varieties. 🌱

For more information, send an email to gert@sactalevy.co.za or visit www.sactalevy.co.za.

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Glyphosate herbicide: Friend or foe?

By Prof Charlie Reinhardt

An article in the December 2019 issue of Oilseeds Focus discussed the merits and challenges facing glyphosate as a prime example of a mainstay herbicide for sustainable, profitable crop production.

Within approximately ten years after the launch of glyphosate-resistant (GR) crops in the seed market, reports of the alleged negative effects of the GR gene and/or glyphosate that is applied to GR crops emerged. During this time the former sole patent holder of GR crops, Monsanto, consistently refuted these claims. Since then, numerous independent scientists and academic institutions have conducted scientific studies on glyphosate and GR crops in order to determine the truth.

It is safe to say that no other xenobiotic (herbicide in this case) in the history of synthetic pesticides, which spans approximately 80 years, has attracted as much scrutiny as glyphosate and GR crop technology has over the past two decades.

Contradiction is rife

A substantive investigation was conducted through collaboration

between the Agricultural Research Service of the United States Department of Agriculture, the University of Mississippi, and Mississippi State University.

This field study conducted in 2013 and 2014, aimed to determine whether the transgene encoding for glyphosate resistance and/or applied glyphosate, impaired the nutrient element content – especially magnesium, manganese and iron – seed yield and amino acid content of GR soya beans.

There is consensus among those who are skilled in the art of weed management, that the greatest threat to the continued use of glyphosate is the evolution of herbicide resistance in more weed species.

The study found that glyphosate, the GR transgene, and field crop history (either long-term glyphosate usage or lack thereof) did not affect soya bean yield. The same factors had no consistent

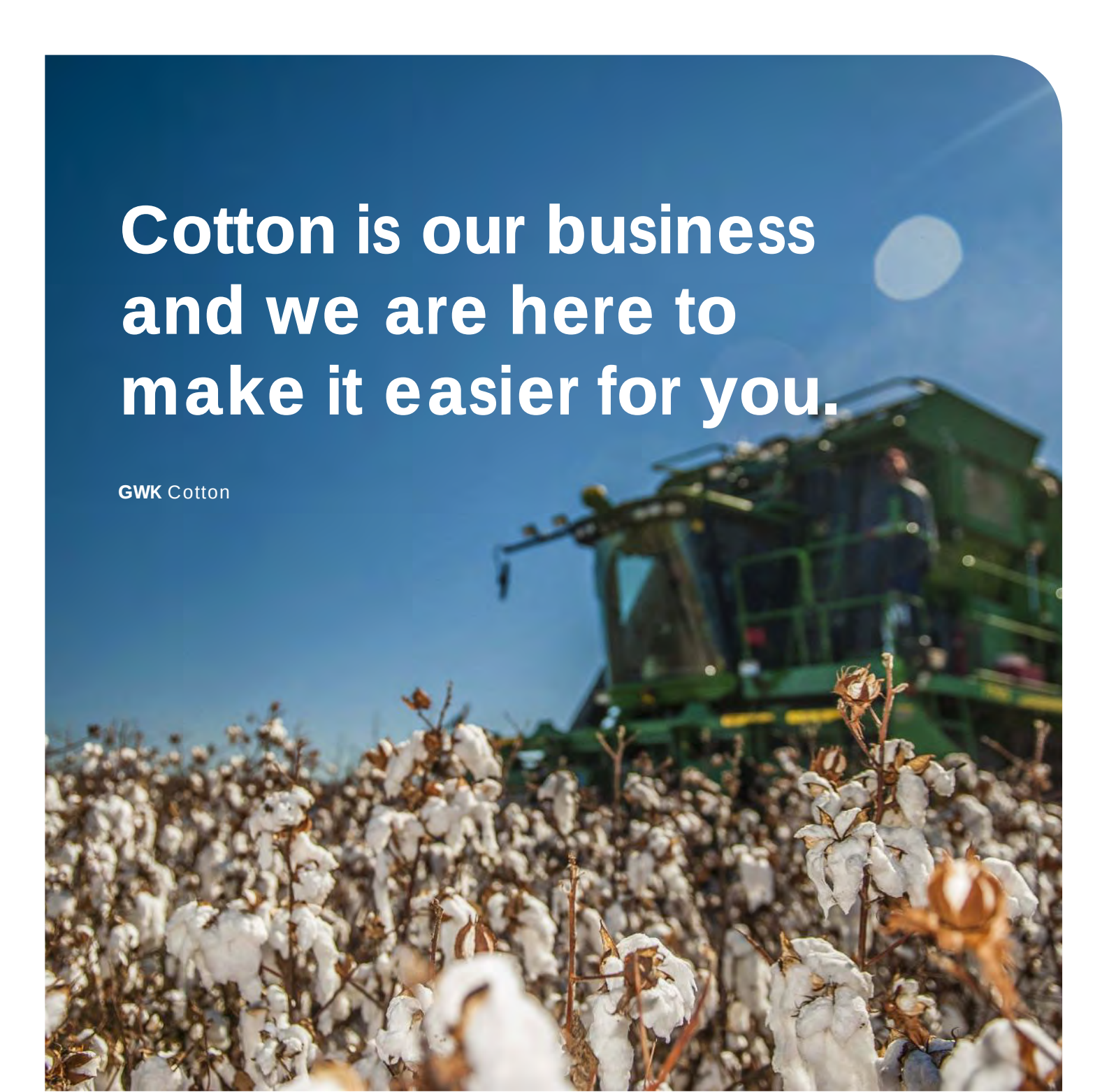
effects on the mineral content of leaves or harvested seed. The effect on mineral elements was small and variable between years and, hence, indicative of false positives. The amino acid composition of harvested seed was also not affected.

Earlier review findings

Five years earlier, a different research group produced a literature review on the effects the GR transgene and glyphosate have on mineral nutrition, disease incidence, and GR crop yield.

They concluded that:

- Although there are conflicting reports in literature, the majority of studies relating to the effects of glyphosate on nutrient element availability in GR crops report that mineral nutrition in GR crops is not affected by either the GR trait or by the application of glyphosate to GR crops.
- Most available data support the view that neither the GR transgene nor glyphosate use in GR crops, increase crop disease.
- The yield data of GR crops do not support the hypothesis that GR crops specifically cause substantive mineral nutrition or plant disease problems.



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The literature review confirmed that glyphosate increases the severity of disease on glyphosate-sensitive plants, which would mean there is a bonus in weed control with glyphosate.

A more recent study found that neither glyphosate nor the GR transgene affect disease susceptibility in GR crops, except in a few cases in which glyphosate reduces disease susceptibility in GR crops due to its herbicidal activity on certain fungal pathogens.

On the other hand

A review article reaches contrasting conclusions and makes the following admission: "We have endeavoured to select pertinent experimental studies that, taken together, build a consistent account of the principal ways in which glyphosate-based herbicide products may interfere with crops' disease resistance." This raises the question of whether bias might have been involved in the selection of literature.

Elsewhere in the article the following conclusion appears: "While we cannot conclude that the above impacts will occur in every case because environmental conditions, crop cultivars and individual farming practices will strongly influence outcomes, we can conclude that glyphosate-based herbicide products can cause significant

harm or impairment to the crops that they are employed to protect".

This is a strong standpoint with far-reaching consequences if it should be afforded credibility and if implemented in practice. Judgement on the validity of such conclusions is best left to the reader.

The future of glyphosate

More scientifically sound research by *bona fide* scientists is urgently required to expand knowledge of glyphosate's mode-of-action and GR crop technology. Improvements in this technology are ongoing and involve intensive and expensive research, but the efforts are bound to be rewarded because GR crops remain the most important GM technology in crop production.

Stephen Duke, a world-renowned specialist herbicide researcher, describes glyphosate as the 'once-in-a-century herbicide' and much evidence supports his statement. Some studies from the United States (US) support the importance of glyphosate for crop production. Glyphosate use in the US continued a linear increase after 2008 and reached a plateau in 2012, with no subsequent decrease by 2018.

This plateau in glyphosate usage is ascribed to both market saturation and the use of alternative herbicides due to the need for combating weed

resistance to glyphosate and many other herbicides. Much the same trends and practices involving glyphosate usage and GR crops exist in South Africa.

Counting the cost

In the modern world, humanity's food needs can only be met through sustainable, intensive agriculture; alternatively, a massive amount of land would have to be converted for agricultural use in order to meet this need. Judicious use of herbicides, preferably integrated with other weed control methods whenever practical, will continue to be an integral part of crop production technology for the foreseeable future.

More scientifically sound research by *bona fide* scientists is urgently required to expand knowledge of glyphosate's mode-of-action and GR crop technology.

Loss of glyphosate as a key component of this future will be too costly for farmers and consumers to bear. Robotic weeding and other new weed control technologies may add to or even replace certain herbicides in some high-value crops. However, when it comes to the majority of the world's staple food crops, herbicides are likely to remain the mainstay weed control method for many decades to come.

There is consensus among those who are skilled in the art of weed management, that the greatest threat to the continued use of glyphosate is the evolution of herbicide resistance in more weed species. The countermeasures for preventing and combating herbicide resistance are well-known and widely advocated, but these measures must be implemented at farm level to be effective. 🌱

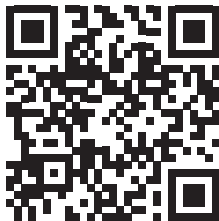
For more information and references, phone Prof Charlie Reinhardt on 083 442 3427 or send an email to dr.charlie.reinhardt@gmail.com.



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Harness plant energy efficiently

By World Focus Agri

The concept of mass and energy balance is not new. Any biological system, including the human body, depends on this balance. In crop cultivation, much energy and cost are put into providing for plants' needs in terms of mass balance; in other words, bringing the soil and/or growth medium into balance in terms of nutrients and other relevant aspects.

The question, however, is how can energy be managed efficiently in a plant? While all the nutrients in the soil may be balanced, the results are not always as expected – lush growth does not occur, pathogens gain a foothold, or harmful insects use the crops for reproduction. Consequently, the yield falls short of the crop's genetic potential.

The solution to this problem is efficient energy management in the plant and soil.

The effect of ETP

Some systems in nature, such as the effect of metabolites on soil life, enable plants to manage their energy optimally. The key to success lies in certain secondary metabolites that organisms secrete. Like urea and glomalin, epipolythiodioxopiperazines (ETP), an enzyme derived from *Trichoderma* fungi, is supposed to be freely available in nature.



Onion seed at Augrabies at 3ℓ/ha with a yield of 1,2tons/ha at 98% germination.

Effective plant energy management lies in ETP, which organisms return to the plant as metabolites in the symbiotic relationship when it is active in the rhizosphere.

It is sometimes difficult to get the rhizosphere in a commercial environment to function effectively so that the living organisms secrete enough ETP to achieve the desired effect. For this reason, ETP in the form of Gliogrow can be used as a foliar spray to obtain the desired results.

The effect of ETP on the plant is as follows:

- Increased root growth activity since the plant still wants to access the metabolite.
- Increased enzyme activation for the plant's metabolic management and nutrient uptake.
- Increase in the concentration of complex plant sugars or nutrients (degrees Brix).
- Increase in the concentration of abscisic acid and plant sap conduction.
- Increased photosynthetic activity.
- Balance between photosynthesis and respiration.

Additional benefits

If this effect of increased enzyme activation is used further along in the energy management and plant protection process, the following can be expected:

- By using ETP with an essential but difficult to absorb leaf element such as calcium (Ca), the effect can be exceptional. The combination of the increased enzyme activation and secondary metabolite-gelated Ca forms Ca-calmodulin (enzyme), which acts as a second messenger for the synthesis of 'protective' proteins.
- A similar effect can be obtained with the increased uptake of potassium (K) by the secondary metabolite-gelated K to keep the ripening enzyme concentrations constant. This ensures a more even ripening process.



Soya beans in Delmas receiving a second application of Gliogrow.

- Due to the above changes in plant metabolism, there is a significant increase in sugar, starch and amino acid production within the plant. These extremely favourable conditions result in improved flower and fruit formation and therefore increased yield and shelf life.

A further increase in plant energy can be achieved through the optimal management of applied nitrates in relation to ammonium in the plant. This can be accomplished by using the secondary metabolite gelation of Ca and K as an alternative to Ca nitrate and K nitrate. As a result, the plant has to reduce fewer nitrates to amines for the Krebs cycle, which is necessary to produce amino acids. The lower reduction rate results in reduced plant respiration, which results in the valuable complex plant sugars and available energy being retained.

Gliogrow is a natural product that leaves no residue after application and can be used effectively on any crop before the plant enters phases with high energy demands, such as initiation, cell division and fruit set. 🌱

For more information,
phone World Focus Agri on
082 452 8983 or send an email to
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Groundnut import tariffs: A perilous junction

By Adri Botha, chairperson, South African Groundnut Forum

Owing to various factors, including drought, high-yielding competitive crops and the absence of pricing mechanisms, the local groundnut industry finds itself at a perilous junction. This is a disheartening situation for those who continue to believe in this commodity and those who make a living in the various branches of this industry.

This has been a reality for some time, and despite many measures put in place during recent months and years, the industry has not yet been able to recover.

New challenges arise

In addition to the existing challenges this specialised industry faces, a new situation developed during the past three years. Insignificant peanut butter imports were first recorded during 2007, but never exceeded 1 000 tons per year up until 2016. This situation drastically changed during 2017, with an increase to 3 000 tons. This fast-growing trend continued in 2018 and 2019 (Figure 1).

During 2018, members of the South African Groundnut Forum (SAGF) raised concerns over the possible impact of this new development. The Oil and Protein Seeds Development Trust (OPDT) was requested to appoint the Bureau for Food and Agricultural Policy (BFAP) to compile an updated groundnut value chain report. This report aimed to support the industry with the latest unbiased information to better understand the underlying factors in recent changes and to inform decisions. It specifically focused on the trade competitiveness challenges brought on by inconsistent tariff applications.

The report, which was completed in 2019, states: "Local processors are

facing an import duty of 10% on imported groundnuts, yet peanut butter and roasted groundnut imports are landed virtually duty free. Peanut butter imports are rapidly increasing and consequently putting pressure on the local processing industry.

"The impact of peanut butter imports is exacerbated by the fact that local groundnut production collapsed from 57 000 tons in the 2017/18 production season, to a mere estimated 18 000 tons during the 2018/19 production season."

Tariff discrepancies

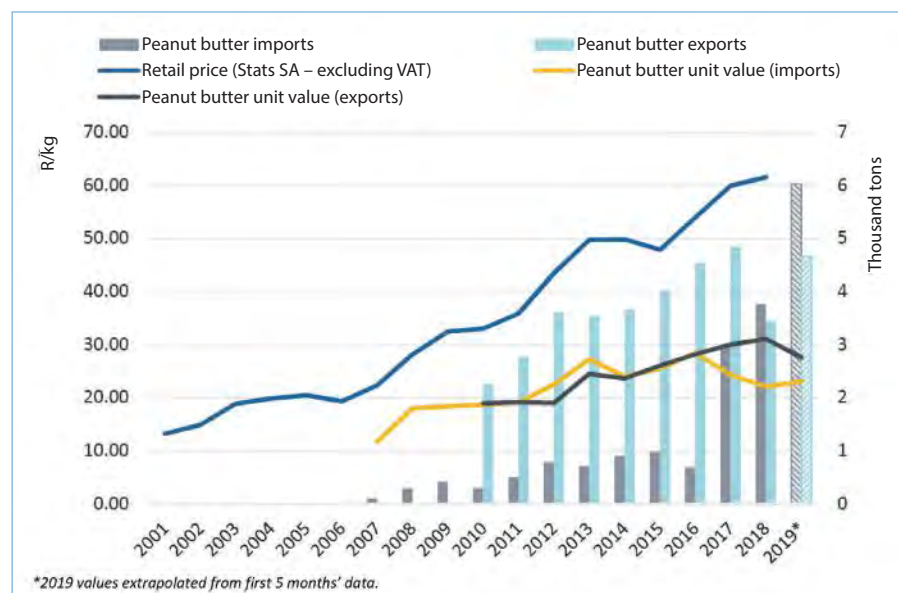
In cases where the competitiveness of an industry is challenged, tariffs may be implemented to protect local producers, processors, jobs and value-add. The raw groundnut seed and kernels (uncooked, whole or broken, shelled or in-shell, including blanched groundnuts) all trade under a tariff of 10%. However,

products derived from groundnuts, such as peanut butter and roasted peanuts, trade under a substantially lower estimated *ad valorem* tariff of only 0,03% and 1%, respectively. This tariff discrepancy creates an imbalance on local pricing and vulnerability brought on by cheaper imports.

BFAP found that it is currently 10% more expensive to produce peanut butter locally than it is to import pre-packed peanut butter, which effectively outcompetes locally produced products. As peanut butter imports increase, the processing demand for locally produced sundry-quality and split grade groundnuts will decrease, which will have an adverse effect on farmer stock prices estimated at between 4 and 8%.

This could relate to a decrease of gross margins for groundnut production of between 13 and 14% as the farmer stock price is derived from

Figure 1: Peanut butter trade and prices. (Source: BFAP)



a combination of the various quality or grade prices making up the total crop. Should the sundry and split markets change, price stability will increasingly rely on other markets, such as local edible and exports of choice grade.

South African export markets are under pressure due to the instability of supply over recent years. As far as price is concerned, the markets are not keen to keep supporting a premium price if continuous and stable delivery cannot be maintained, even while South Africa remains a key origin of the Spanish-type variety.

Far-reaching consequences

In a worst-case scenario where local peanut butter processing can no longer remain feasible, BFAP predicts a loss of R283 million in the peanut butter industry and over 3 000 job losses, which will affect an estimated 12 600 dependants. Since the preparation of groundnuts destined for processing in the larger cities is predominantly done in rural areas, many of the 3 000 jobs that will be lost belong to people who have very few alternative employment options.

According to the BFAP report, the industry discussed the possibility of a tariff adjustment to compensate for the competitive disadvantage that is currently evident in the peanut butter sector. The report suggested a calculated tariff to reach a local production cost of 22% (*ad valorem* basis) on all peanut butter harmonised system (HS) codes.



(Photograph: istockphoto.com/ 898312966)

Although roasted groundnut imports have not increased in recent years, it was deemed necessary to address the large disparity in tariffs across all groundnuts and derived products HS codes. At this stage it is reportedly 11,39% more expensive to produce roasted groundnuts locally than it is to import it.

The way forward

After presentation of the BFAP report at the last SAGF meeting of 2019 and further industry consultation, a consensus was reached to request the International Trade Administration Commission of South Africa (ITAC) to investigate and consider adjusting the import tariff on all peanut butter tariff codes to 25% and that of roasted groundnuts to 20%.

As a matter of interest, the World Trade Organization (WTO) tariff for both these products is 70%. This tariff represents the negotiated maximum

tariff level for all members of the WTO. Since these applications are specialised and technical in nature, it was further decided to appoint trade law specialists to facilitate these applications on behalf of the industry. Partial funding has been obtained from the Oilseeds Advisory Committee and the OPDT, with industry role-players contributing approximately half the cost themselves.

At this stage it is reportedly 11,39% more expensive to produce roasted groundnuts locally than it is to import it.

During times in which clear and widely beneficial action and direction are critical for this industry, it is heartening to experience how individual needs and interest can give way to action towards the long-term stability of the total supply chain and benefit of the South African consumer and workforce. The ITAC applications are underway, and it is expected that it will be issued for consideration and investigation soon. The SAGF will continue to update industry and other interested parties on the progress of this critical process. 🌱

For more information, send an email to Adri Botha at groundnutforum@opot.co.za.



Coronavirus causes distortion in the oilseeds market

By Dr Dirk Strydom, Grain SA

The outbreak of the novel coronavirus has given rise to market concerns in China, the world's largest consumer of oilseeds and oilseeds products. This came as logistical constraints start emerging and large cities slow down. The question is whether this will be a short-term consequence, or whether the effect will persist.

Soya beans

The international soya bean market also came under pressure at the beginning of February this year following the outbreak of the novel coronavirus in China. Although provisional trade agreements had been signed between the United States (US) and China, the Chinese market had not yet purchased significant quantities of US soya beans at the time of writing this article.

The processing of soya beans in the US reached new record levels between October and December 2019, which helped diminish large carry-over stocks in the US. There is currently a high demand for soya bean oil and meal in the international market, which supports the processing of soya beans in the US.

Soya bean production conditions in South America are reported to be favourable. Although the beginning of the season was challenging and plantings were delayed, good rain during January favoured production conditions in Argentina.

Soya bean exports from the five largest exporting countries decreased seasonally during January 2020 and were lower than the total exports of January 2019.

Another major focus is the South American market. Despite the difficult planting conditions in Brazil, the expectation is that Brazil will have a good soya bean crop this season; its total production is estimated

at 125 million tons. Brazilian soya bean exports also picked up, with total February exports estimated at between 6 and 7 million tons. This is significantly higher than the 5,27 million tons exported during February 2019.

Sunflower seed

In Russia, sunflower seed processing reached a record 12,5 million tons during 2019. This is approximately 2 million

tons more than last season's processing. The sharp increase in the volume of sunflower seed processed in the country during 2019 can be attributed to good production, as well as the high worldwide demand for sunflower oil and meal.

In the Ukraine, total oilseeds processing reached approximately 18 million tons during 2019, of which approximately 86% was sunflower seed.

Table 1: South African soya bean scenarios based on planted hectares.
(Source: Grain SA)

	2020/21	2020/21	2020/21
Marketing year	Scenario 1	Scenario 2	Scenario 3
Area planted	757 000ha	757 000ha	757 000ha
Yield	1,48tons/ha	1,84tons/ha	2,3tons/ha
Scenario estimate	1,12 million tons	1,39 million tons	1,74 million tons
Commercial supply			
Opening stocks (1 March)	285 000 tons	285 000 tons	285 000 tons
Commercial deliveries	1,09 million tons	1,36 million tons	1,71 million tons
Imports	0	0	0
Surplus			
Total commercial supply	1,37 million tons	1,65 million tons	1,99 million tons
Commercial demand			
Commercial consumption			
Food	25 000 tons	25 000 tons	25 000 tons
Feed (Full-fat soya)	200 000 tons	200 000 tons	200 000 tons
Crushed for oil and oilcake	1,1 million tons	1,2 million tons	1,3 million tons
Total	1,32 million tons	1,43 million tons	1,53 million tons
Other consumption	9 000 tons	9 000 tons	9 000 tons
Total South African soya bean demand	1,33 million tons	1,43 million tons	1,53 million tons
Exports	4 000 tons	4 000 tons	4 000 tons
Total commercial demand	1,34 million tons	1,44 million tons	1,54 million tons
Carry-out (28 February)	37 000 tons	210 000 tons	458 000 tons
Pipeline requirements	166 000 tons	178 000 tons	191 000 tons
Surplus above pipeline	-128 000 tons	32 000 tons	268 000 tons
Carry-out as a % of total commercial demand	3%	15%	30%

It is expected that Turkey's sunflower seed imports could increase sharply between February and June with the discount on the import levy in effect. Most of the sunflower seed is expected to be imported from Russia.

Imports of sunflower oil into Ethiopia almost tripled to 149 000 tons in 2019 due to the decline in palm oil imports to that country. There is an international shortage of palm oil, which has strongly supported the palm oil price. Sunflower seed oil is cheaper than other vegetable oils, which explains the imports shift from palm oil to sunflower seed oil.

Canola and groundnuts

In Canada, canola plantings have remained mostly unchanged for the season. A build-up of supply due to lower exports has put the Canadian canola market under pressure for some time. Canada-China trade disputes hampered Canadian canola exports this past season and canola supply began to build up. At the end of December 2019, Canada's canola stocks stood at 14,3 million tons.

Although the available stocks for the season are lower than the previous season's 14,6 million, it is still high given

that all of Canada's canola had not been harvested at the time of writing this article. Short-term weather conditions will still largely determine the success of plantings.

Groundnut exports from Senegal to China reached a record level of 94 000 tons during December 2019, leaving the exporter concerned that China would buy most of its supply. This led to the Senegalese government placing a ban on groundnut exports in order to maintain domestic stocks and prevent too many groundnuts from being exported, leaving domestic processors without stock.

India's groundnut oil exports reached a new high of 11 000 tons during December 2019, with most of the exports destined for China.

China's groundnut oil imports increased by 52% during 2019, most of which were from South America and Africa. China's groundnut and groundnut product imports have increased sharply over the past two to three months, supporting international groundnut prices.

Local market

During the 2019 season the increase in demand depleted high carry-over stocks. Early in 2020 the National Agricultural Marketing Council's Supply and Demand Estimates Committee estimated the closing stock level at 285 586 tons. At an average

processed quantity of 117 500 tons per month, this represents available stock levels for 2,4 months, which is almost half the stocks of the previous season.

According to the Crop Estimates Committee (CEC) report of preliminary area planted, a total of 757 000ha of soya beans were planted for the current season. This is 1,5% more than the intention to plant. However, the question is what the effect on the local supply and demand will be. *Table 1* reflects three possible scenarios in the South African soya bean industry. Scenario 1 is based on a low-yield average, scenario 2 on a four-year average and scenario 3 on high yield.

Within the average scenario, the stock-to-usage ratio is at 15% with a 2010 carry-out stock level, which is lower than the expected levels for the 2019/20 marketing season. Based on market reviews and surveys, crop expectations are similar to that of scenario 2.

In terms of prices, with the high demand and the decrease in stocks, local soya bean prices moved from closer to export parity levels towards derived prices. This represents a year-on-year increase of 25% up to a level of R5 977/ton.

According to the CEC's preliminary area planted, 551 500ha of sunflower seed was planted for the season. This is 2,4% more than the intention to plant. In terms of groundnuts, 37 100ha were planted for the season, which is 85% more than last season's plantings, but 23% less than the intention to plant. This was mainly due to late summer rains, which prevented some areas from planting.

All the oilseeds mentioned will be somewhat constrained in terms of sufficiently supplying the local market. 🌱

Figure 1: Soya bean import and export parity prices. (Source: Grain SA)

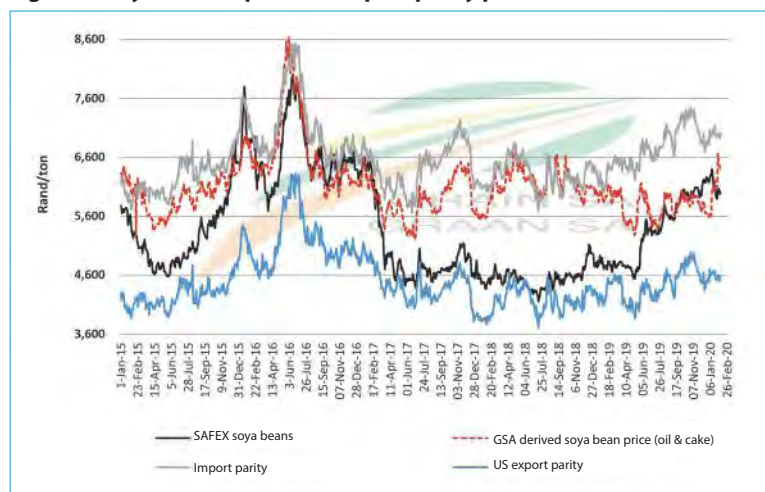
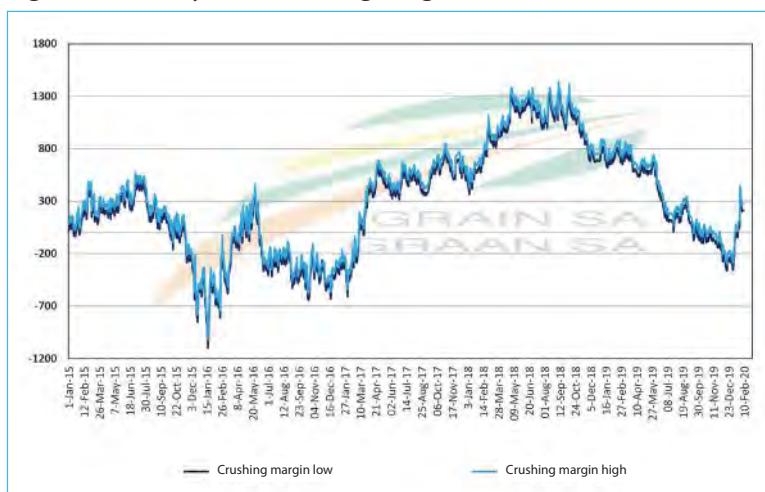


Figure 2: Local soya bean crushing margin. (Source: Grain SA)



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Challenging times ahead for Argentina's soya bean crushers

By Dayane Stringhini, S&P Global

Argentina has been facing economic problems for some time and has accrued much debt with the International Monetary Fund. Many citizens expect the government to seek a way to raise cash soon.

One of the ways in which the country can accomplish this is through export taxes, which have already increased from 25 to 30% for the soya complex as of 14 December last year. On 21 December 2019, Congress approved a bill allowing taxes to increase to 33% for the complex, with the backing of Alberto Fernández, who won the presidential election in October last year.

Political context

When Mauricio Macri became president in 2015, Argentinians expected the economy to turn around. However, their expectations were not met, and they were dissatisfied by the time his

term ended. In 2019 voters turned to Fernández, whose vice-president, Cristina Kirchner, was Macri's predecessor as president. During Kirchner's presidency, the increase in export taxes left its mark on the agricultural market and, when Fernández won the presidential election, many were sure he would support a higher export tax.

Soya bean crush margins were not great during 2019, and there were times when margins were negative. Despite these circumstances, the April to October crush of 2019 was the second largest in the past five years and the continuation of the trade dispute between the United States and China throughout 2019 increased soya bean prices in South America.

On the other hand, there was no real demand for crushing products, which meant that margins were compressed. In the past, soya bean meal and oil

enjoyed lower export taxes than that of unprocessed soya beans, which helped crushing facilities in the country. So far, the prospects of this happening are not good considering the increase in taxes, which will not aid crush margins.

Vicentin's troubles

Another main theme of the year ahead is the financial situation of crushing giant Vicentin. The company faced financial stress at the beginning of December last year, right before the government

shift, and it is unclear how and when this will be resolved.

Several news portals reported that Vicentin's debt amounts to \$350 million and that the company does not have the means to escape the burden. The crushing giant has sold some of its shares in the Renova facility to Glencore, its partner in the venture. It now owns only 33,33% as opposed to the 50% it previously owned. This deal was negotiated before Vicentin's problems became known.

If the challenges persist, the company might not be able to crush soya beans this year which, according to sources, would affect the crush figures for 2020. According to a soya meal broker in Argentina, the company crushes 6 to 7 million tons of beans a year. "Crushing will not be reduced by that amount, as other crushers will increase their rate," the broker said. "It might decrease a little, though not by that much."

Weather factors

Weather conditions until harvest season will also play an important role in 2020's forecast. Dry weather delayed soya bean seeding for the 2019/20 crop, and some regions face soil moisture stress. "The Buenos Aires region needs rain for the crop to develop well," a source in Argentina said.

According to the United States Department of Agriculture's December 2019 *World Agricultural Supply and Demand Estimates* report, Argentina's 2019/20 soya bean crop production was forecast at 53 million tons, which is 2,3 million tons lower than the 2018/19 crop. 🌱

For more information, send an email to the author at dayane.stringhini@spglobal.com.



(Photograph: United Soybean Board)

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FT-NIR

The remarkable benefits of soya bean oil

By John Staughton (BASc, BFA)

The health benefits of soya bean oil include its ability to improve heart health, lower cholesterol, improve the immune system, reduce cognitive disorders, prevent osteoporosis, and improve growth, while also boosting eye and skin health.

What is soya bean oil?

Soya bean oil is a vegetable oil that is extracted from soya beans, which are scientifically known as *Glycine max*. It is one of the most widely used vegetable oils in the world, possibly because soya beans are some of the most widely cultivated and utilised plants, particularly in recent decades. Soya bean is native to East Asia and is considered a legume; however, despite its limited origin, it is highly prized for its edibility. Most soya bean oil is refined, blended, and sometimes hydrogenated and it can be categorised into different levels and strengths, depending on the desired application.

Soya bean oil is considered healthier than most other vegetable oils due to the presence of a good variety of essential fatty acids, which the body needs in order to remain healthy. Soya bean oil also contains several plant sterols, which can have a wide variety of health benefits for people who regularly include soya bean oil in their diet. The vitamin and mineral content of soya bean is what gives this delicious and widely useful legume its fame.

Controls cholesterol levels

Soya bean oil can decrease your chances of getting atherosclerosis and other heart conditions such as heart attacks and strokes. As mentioned above, the good balance of fatty acids contained in soya bean oil means that the body can get the important and

necessary fatty acids, including those that regulate cholesterol levels.

Omega-3 fatty acids can reduce dangerous cholesterol levels and counteract the negative types. Furthermore, other fatty acids such as stearic acid, palmitic acid, and oleic acid are also found in balanced quantities. The fatty acid composition of soya bean oil, as well as the powerful plant sterols, such as β -sitosterol, can actually cause a reduction in cholesterol storage in the gut by 10 to 15% – not what you would normally expect to hear from a ‘fatty’ acid.

Another important function of vitamin K is its osteotropic potential, which means that it can stimulate the regrowth or promote the healing of bones. While this is often associated with calcium, vitamin K (of which soya beans have plenty) can also stimulate bone development in a very positive way. Therefore, make sure you switch to soya bean oil if you want to prevent conditions such as osteoporosis, which is often a natural result of the ageing process.

Improves vision

Omega-3 fatty acids, which make up approximately 7% of the total fatty acid content in soya bean oil, help to protect cell membranes. This includes the very fragile and dangerous areas of the skin and eyes, both of which are common entry points for bacteria and other foreign material. These acids also promote better vision by acting as antioxidants and neutralising free radicals that can cause macular degeneration and cataracts.

Skincare

The high vitamin E content in soya bean oil also acts as a powerful antioxidant while similarly protecting the skin from damage



caused by free radicals. Vitamin E is directly associated with improving the appearance of blemishes, reducing acne scarring, protecting the skin against sunburn, and stimulating the regrowth of new skin cells to promote healing. Vitamin E is also associated with general antioxidant activity in the rest of the body, which boosts the immune system and helps to eliminate free radicals that cause conditions such as cancer, premature ageing, cognitive disorders, and heart diseases.

A word of caution

Remember, it may be a healthier form of vegetable oil, but it is still somewhat high in omega-6 fatty acids. Although ‘essential’, it is still a problem if it is not evenly balanced. There are still calories involved. Furthermore, soya beans are closely related to peanuts, so with the increasing numbers of peanut allergies around the world, be careful with soya bean oil. Aside from that, enjoy and happy cooking! 🌱

This article was originally published on www.organicfacts.net.



Examining agriculture's role in labour-intensive growth

By Dr Frikkie Maré, Department of Agricultural Economics, University of the Free State

The year 2020 is well away and although one hopes that each year will be better than the previous one, these hopes do not always materialise. Last year certainly had a few highlights, but it was also clear that all was not always well in South African agriculture.

It is easy to fixate on everything that went wrong in the country last year. Some regions experienced devastating drought, foot-and-mouth disease once again left its mark on livestock production, red meat prices declined, and the summer crop was characterised by grading problems. In addition, the economy is struggling to recover, the political scene continues to create more questions than answers, and state-owned enterprises persist in demonstrating disappointing performances.

Every so often things go wrong in life and there is nothing that can prevent it. Nevertheless it is important to have

a plan to get back on track. The saying 'n Boer maak 'n plan (a farmer makes a plan) is generally true and is proven in practice – visit any farm and you will know. The question is, however, whether the government has a plan for all the challenges South African farmers have to face.

A plan to tackle problems

The National Treasury published a plan in the form of an economic discussion paper, *Economic transformation, inclusive growth, and competitiveness: Towards an economic strategy for South Africans*, in August. This paper is the result of three colloquiums during which academics from South African universities and Harvard, economists, government, the South African Reserve Bank and producers shared their ideas.

The paper highlights South Africa's key economic challenges and states that the way forward lies in an immediate focus on policies that will realise South Africa's

potential growth. The policy suggestions are categorised into five main sections:

- Modernising network industries.
- Lowering barriers to entry and addressing distorted patterns of ownership through increased competition and small business growth.
- Prioritising labour-intensive growth: the role of agriculture and services.
- Implementing focused and flexible industrial and trade policy.
- Promoting export competitiveness and harnessing regional growth opportunities.

Since its publication, the paper has been both criticised and praised. Some called it 'incoherent' and 'unreliable', while others praised it for proposing 'much-needed economic reforms'. And while it makes some controversial statements, such as selling coal-fired power stations, the paper also proposes other structural reforms to boost South Africa's struggling economic growth.

Most of the comments in the mainstream media focused on selling state-owned assets and ideas for economic transformation. However, the paper also mentions agriculture – these suggestions should be considered to determine their possible impact on the sector.

Agriculture's role in the plan

The paper discusses agriculture as a sector that could promote labour-intensive growth. It also states that an enabling environment for investment in agriculture should be created.

The role of agriculture in job creation is not a new one; it was also stipulated in the *National Development Plan* a few years ago. The paper's discussion of agriculture's role in creating an enabling environment for investment in agriculture is surprising, as the topic conflicts with the proposed policy of expropriation without compensation.

According to the paper, agriculture is ideal for creating labour opportunities due to its rural linkages, its ability to absorb less skilled labour, large multipliers due to extensive links with the rest of the economy, globally competitive labour productivity, and its importance for export-led growth. Although I cannot agree with all these statements, some of them do ring true. That said, employment in agriculture continues to decline.

Proposals to boost agricultural production and promote agrarian transformation are

based on innovative joint ventures with the private sector. The importance of the private sector, including commercial farmers, agribusinesses and organised agriculture, is highlighted repeatedly and can, according to the paper, improve access to finance, expand small-scale farming and provide access to markets.

The paper also addresses land reform, with all its challenges. Interestingly, it states that private property rights must be maintained: "To mitigate the uncertainty that may be generated by a comprehensive approach to land reform, it must be managed in a manner that is transparent, consultative, and within a broad framework to ensure that factors critical to ongoing investment in agriculture and food security, such as the security of private property rights, are respected throughout the reform process".

Enabling investment and growth

In terms of creating an enabling environment for investment, which I think should be built on strong private property rights, some positive suggestions are also made. While I cannot discuss all of them, the most important ones for me include innovative financing solutions for farmers (subsidised interest rate loans), adequate and affordable agricultural insurance (government-subsidised insurance

products) and the enhancement of trade promotion, market access and access to water for irrigation (new water schemes).

In terms of agricultural and trade policy it is interesting to note that while the government considered the processing of agricultural products and the export of these products as an important aspect for growth for many years, the export of processed products is reconsidered here against that of raw products.

Agricultural growth and exports should therefore be focused on products with the highest value and fastest growth rate in response to the international market's demand, whether these products are processed or not.

The plan surmises that in many cases the technology, research and development, packaging, disease control and logistics that go into exporting fresh produce, surpass that of manufacturing and exporting a processed product. Agricultural growth and exports should therefore be focused on products with the highest value and fastest growth rate in response to the international market's demand, whether these products are processed or not.

A closing thought

All things considered, the agricultural sections of the paper seem quite positive. Although some of its statements can be contentious and the implementation of such plans can be tricky, there is at least a plan with which I can mostly agree.

South Africa is in desperate need of economic growth, and any workable solutions should be taken advantage of. The plan relies heavily on the involvement of the private sector, which begs the question whether stakeholders are willing to get involved when assistance is needed. There are many successful stories of joint ventures with the private sector – now might be a good time to build on them. 🌱

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Precision farming for improved soil health

By Dr WA Lombard, Department of Agricultural Economics, University of the Free State

The Fourth Industrial Revolution is well underway and is characterised by the fading boundaries between the physical, digital and biological world. It is further characterised by advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), genetic engineering and three-dimensional (3D) printers, among others. In our changing world new technologies are also being developed for the agricultural sector, which will enable this industry to improve production.

Are livestock farms geared?

Livestock farmers have not fallen behind, and precision farming is a reality on many livestock farms. The technology that is utilised incorporates, among other things, the collection of advanced information. It monitors the use of certain resources and controls certain production processes with precision. By using electronic data collection, processing and utilisation, precision farming offers producers the opportunity to improve animal productivity, reduce costs and promote animal welfare.

International studies illustrate the customised precision farming system developed for Australian beef cattle branches. The development of the system was based on the elements of the so-called Hazard Analysis Critical Control Point (HACCP) method and can also be used for other livestock enterprises.

The principles on which this system is based include:

- Identifying those aspects that have an impact on productivity, profitability or sustainability. In this

instance aspects are considered that may impede the branch's sustainability if not applied correctly. The number of aspects involved must be manageable, as it needs to be applied consistently throughout. As an example, there are only 29 processes that are included in an entire beef cattle branch system and which are considered critical for maximising profit and sustainability.

- Identifying variables in each critical process to ensure that it is successfully completed.
- Predicting which corrective action will be cost effective if the information collected indicates that the branch is not functioning within specified parameters during a specific process. As the corrective steps that will apply when parameters are exceeded are specified in advance, the situation is less stressful for the branch manager.
- Specifying standard operating procedures for each branch and each of the critical processes in advance. This will ensure that these processes remain within the specified parameters under normal circumstances.
- Providing resources to measure these critical processes, interpret the data and determine which corrective steps to take. This is critical as it will form part of consumers' acceptance of the technology.

Benefits of the HACCP-based system

Where precision farming is already integrated with traceability, role-players in the livestock industry have noted the following benefits:

- Livestock feed manufacturers and input suppliers can improve the composition of their products if they

have access to abattoir statistics in which livestock feed profiles on a farm have been considered.

- Producers can use this type of system to identify the right feed or feed supplier. They can also optimise feed intake or consumption of their livestock by basing it on the results of other producers who are using the technology.
- Abattoirs and feedlots, in collaboration with producers, can use the system to produce more animals or realise certain weight or conformation requirements.
- Reliable industry-specific information can be used to influence decision-makers as well as the direction in which an industry is moving.

Extensive livestock farming

The precision technology developed for extensive livestock branches works mostly with radio frequency identification (RFID) systems, which help producers keep more accurate records. Intensive industries also use technology that can help identify and treat sick animals timeously. These systems work by using cameras.

As far as soil health is concerned, producers who manage their grazing efficiently may already (knowingly or unknowingly) be engaging in some form of precision farming.

Producers often express their concerns or are wary of applying high-productivity management systems in their farming operations. This concern is often related



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to the risk of financial losses due to the unpredictability of the environment, market-related factors, or damage to infrastructure such as the soil and grazing on a farm. Although it seems as though technology that addresses soil and soil health management on livestock farms is in short supply, it remains extremely important.

All life comes from the soil

There is a lot we can learn about soil health and the role it plays in livestock farming from Burke Teichert, an American livestock consultant. According to him, most cattle farmers put their livestock first, followed by grass, while their soil receives the least attention. He suggests a reversal in the way we think and our approach to grazing management. Soil must come first, as all life comes from the soil.

Although it seems as though technology that addresses soil and soil health management on livestock farms is in short supply, it remains extremely important.

Livestock is an important role-player which can either improve or damage soil, but many producers do not really give much thought to their approach. Livestock simply graze as and when needed. He also believes most producers are unaware that they are overgrazing the veld as they do not actually know what overgrazing entails.

Grazing is usually managed to benefit livestock, and at times the grass, while little attention is paid to the soil and its health. Many farmers are ignorant to the fact that livestock can be used to improve the soil's organic matter content, increase water infiltration rate, improve water-holding capacity or enhance nutrient circulation. If these aspects are incorporated, the grassland will be far more productive.

Livestock as an aid

Livestock must be valued for more than just their end value; they must be seen

as a useful aid for soil improvement, which in turn leads to improved grazing. Short periods of grazing followed by a period during which grazed plants can recover fully before being grazed again, as well as the animal waste deposited on the soil surface or the spreading of manure and urine over the grazing, are important elements in soil improvement.

The judicious use of herbicides and pesticides is also vital, as poison does not only damage the target organism. Although the nett effect is good, the unplanned consequences are often overlooked by the unskilled or uninterested eye.

Teichert also lists other factors that may affect soil health, including the predator-prey ratio and the effect of poison on organisms that promote the circulation of nutrients in soil. His opinion in a nutshell: Instead of managing for what we do not want, we must manage for what we want. What we want is healthy soil with a lot of biodiversity above and below the soil surface.

Make it part of management

While livestock must be managed for their end value (on market day), this must be done within context. If your soil's improvement and conservation does not form part of the first aspects considered when drafting your farm's strategic management plan, it is likely to be left behind.

Your farming approach must be adaptable in order to optimise good grass and grazing management. This may mean that important events such as calving, mating or weaning will not occur on the same piece of land every year, but that the result will still be good. Those involved in on-farm livestock management understand that nature



is partial to a little chaos. Livestock management must complement grass management and grass management must be in line with soil health and soil improvement goals.

In conclusion

The technological livestock systems currently focusing on profitability, input costs and sustainability are largely aimed at intensive production systems for species such as pigs and layers. However, we can expect to see new developments soon, even for extensive livestock producers. Intensive livestock systems are aimed at managing productivity per animal. This point of view could possibly be adapted to focus on productivity per hectare or per large stock unit (LSU), so that it makes sense to the extensive farmer.

As far as soil health is concerned, producers who manage their grazing efficiently may already (knowingly or unknowingly) be engaging in some form of precision farming. Allowing grazing to recover after it has been grazed, allows for important processes to take place. The management system used may need to be assessed by an expert in the field on a regular basis and the carrying capacity adjusted based on weather conditions. This may well be refined by new technology in the future. 🌱

For more information and references, send an email to Dr WA Lombard at LombardWA@ufs.ac.za.

Ruling in prominent case influences land reform

By Clarissa Pienaar, Moolman & Pienaar Incorporated

The case of *Land Access Movement of South Africa and Others v Chairperson of the National Council of Provinces and Others* (CCT40/15) [2016] ZACC 22 (28 July 2016), also known as LAMOSA1, had a significant impact on restitution claims submitted in terms of the *Restitution of Land Rights Amendment Act, 2014* (Act 15 of 2014, or the *Amendment Act*).

The *Amendment Act* was declared unconstitutional in the LAMOSA1 case. LAMOSA1 did not, however, rescind the submission of new claims. In terms of the order granted in LAMOSA1, claims submitted from 1 July 2014 to 28 July 2016 ('new claims') will remain in force. Nevertheless, the Constitutional Court granted an interdict against the processing of new claims by the Commission on Restitution of Land Rights (the Commission).

The interdict granted in LAMOSA1 prohibited the Commission from processing new claims pending the enactment of a new *Amendment Act*, which reopens the 'new claims' submitted. Alternatively, this is pending the finalisation of 'old claims' submitted in terms of the *Restitution of Land Rights Act, 1994* (Act 22 of 1994, or the *Restitution Act*).

Amended legislation

In LAMOSA1 the Constitutional Court ordered Parliament to enact a new *Amendment Act* within 24 months from 28 July 2016 (on or before 28 July 2018) to regulate the imposition of restitution claims.

If Parliament failed to enact a new amendment, the Land Claims

Commissioner, and/or anyone with a direct interest in the order could approach the Constitutional Court within two months after the stated 24 months had expired to obtain an appropriate order regarding the handling and settlement of new and outstanding claims.

The period for the enactment of the new *Amendment Act* expired after Parliament failed to enact the *Amendment Act* within the prescribed period.

Extension of prescribed period

On 30 July 2018 (two days after the 24 months granted in LAMOSA1 had expired), Parliament approached the Constitutional Court in the matter of *Speaker of the National Assembly and Another v Land Access Movement of South Africa and Others* (CCT40/15) [2019] ZACC 10 (LAMOSA2) with an application to extend the prescribed period by another eight months (until 29 March 2019).

The Constitutional Court needed to determine whether the period could be extended and, if possible, if it would be fair. The defendants in the LAMOSA2 case argued that the previous order was final and that the court, therefore, could not grant an extension.

The Constitutional Court ruled that Parliament, in all likelihood, would be unable to finalise the process of enacting the new *Amendment Act* within eight months. Therefore, it would not be in the public interest to hurry the process.

Handling of 'new claims'

The Constitutional Court found that it was not in the interest of justice to grant Parliament an extension, and the

application failed. The Constitutional Court, however, still had to issue a fair order relating to 'new claims' and how it should be handled in future.

It is noteworthy that the Commission (which in terms of the order in LAMOSA1 was obliged to approach the court after the 24-month period had expired) subjected itself to the court's decision rather than requesting a court order regarding the handling of new claims in its own capacity.

On the contrary, the Commission filed a report at the Constitutional Court detailing its progress in dealing with old claims.

Progress report

In short, the following was evident from the Commission's filed report:

- On 31 March 2018, 5 757 old claims had not yet been handled and processed.
- A total of 4 601 of these outstanding old claims were in the fourth phase, where settlement negotiations take place. If these claims were not settled, they would have to be referred to the Land Claims Court for adjudication.
- During the period from 1 April 2016 to 31 March 2018, the Commission settled a total of 1 654 claims amounting to R5 billion.
- A total of 163 383 new claims had been received but had not yet been processed.

Criticism of the report

The LAMOSA1 defendants criticised the report for several reasons. They argued that the Commission only provided information up to 31 March 2018 and failed to provide reasons as to why the report did not contain the latest information.

According to the defendants, at the time of hearing LAMOSA1, there were a total of 8 257 claims not outstanding and/or not processed. On 31 March 2018 there was a total of 5 757 old outstanding claims, 1 131 of which were still in the evaluation and categorisation phase.

The Commission allegedly failed to handle the 17 000 to 20 000 claims that were settled, but not yet concluded, as the court orders were not implemented.

The Commission failed to provide a timeframe for the settlement of old claims. Assuming the remaining old claims are handled at the same rate as during the period from 1 April 2016 to 31 March 2018, the task will take seven years to complete.

Finalising old claims

According to a report compiled by the High Level Panel on Assessment

of Key Legislation and Acceleration of Fundamental Change, it will take 35 to 43 years to finalise all outstanding claims.

The court emphasised that, since it is still uncertain when Parliament will enact the new *Amendment Act*, it would be unfair to prohibit the processing of claims indefinitely.

Subject to the enactment of legislation by Parliament that may stipulate otherwise, the ruling stated that the Commission is prohibited from handling and processing new claims until the following (whichever comes first) occurs:

- The Commission settles all old claims or refers them to the Land Claims Court for adjudication.
- The Land Claims Court, at the request of any interested party, grants permission to the Commission to start processing new claims.

- Before the aforementioned points occur, the Land Claims Court may not consider or adjudicate new claims during proceedings for the restoration of land rights in respect of old claims. New claimants can only be admitted before the Land Claims Court as interested parties if their participation can contribute to the maintenance or rejection of the old claim, or to any other admissible issue.

The Commission is clearly prohibited from handling new claims until old claims have been settled or referred to the Land Claims Court for adjudication. Thus it seems as though no new claims will be dealt with in the near future. 📍

For enquiries, contact Clarissa Pienaar on 018 297 8799 or send an email to clarissap@mmlaw.co.za or hj@mmlaw.co.za.

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This is how people can help conserve insects

By Engela Duvenage, Faculty of AgriSciences, Stellenbosch University

For humanity's sake, people need to change their attitudes towards insects. They are essential for our well-being. They pollinate a third of our crops and help make healthy, living soil. We must protect them better and learn from ideas that have already been developed in South Africa and elsewhere to conserve them. So says Stellenbosch University insect expert Prof Michael Samways, lead author of a new review paper in the scientific journal *Biological Conservation*.

"We will never be able to conserve every insect population or even every species. That said, real, practical possibilities exist from across the world on how we can avoid further insect population loss and species extinction," says Prof Samways, one of the

founding fathers of the discipline of insect conservation.

Improved regulation and prevention of environmental risks, and greater recognition of protected areas alongside agro-ecology are also key.

"Protected areas can be extended outside proclaimed borders using large-scale ecological networks of interconnected conservation corridors, which has so far been highly effective for insect conservation in South Africa," adds Prof Samways, who is also author of a new book, *Insect Conservation: a Global Synthesis*.

Engaging civil society

Transforming global agricultural and forestry practices into more expansive, sustainable ones, in line with species co-existence, and mitigating climate change are also part of the solution.

"Above all, communicating with, and engaging civil society and policy-makers, is essential for the future and mutual well-being of both people and insects," he notes. "While small groups of people can action insect conservation locally, collective consciousness and a globally co-ordinated effort for species inventorying, monitoring and conservation is required for large-scale recovery."

He says that, with the possible exception of concerns over the loss of bees and pollination services, people do not value the role that insects play in nature and their usefulness enough. "Luckily, civil society is increasingly becoming aware of the precipitous decline in insects and its severe consequences for planetary survival," says Prof Samways.

"This is where insect icons such as butterflies, dragonflies and bees, popular media, natural history clubs, education,

and citizen scientist activities can all play a major role," he adds.

Prof Samways believes such efforts are especially important in urban and peri-urban environments, where there is an overall major disconnect with nature, yet the greatest concentration of people. "In rural settings there is also great opportunity for better education, especially of the young and impressionable, who often actually educate their parents in matters of 'our future' and 'small lives matter,'" he notes.

The new paper, titled *Solutions for humanity on how to conserve insects*. It was compiled in tandem with another recent paper in *Biological Conservation* titled *Scientists' warning to humanity on insect extinctions*.

The latter discusses the perils insects face, and how humanity is pushing many ecosystems beyond recovery. This includes habitat loss, pollution, harmful agricultural practices, invasive species, climate change, overexploitation and extinction of dependent species. These all contribute to unquantified and unquantifiable insect extinctions. This could, among others, have a severe impact on food security, waste removal from the environment, and pest control.

Both papers were compiled by 30 scientists from around the world who are involved in the study and conservation of insects. Among them are other Stellenbosch University academics: Prof James Pryke and Drs René Gaigher and Carlien Vorster of the Department of Conservation Ecology and Entomology, and Dr John Simaika of the Department of Soil Science. 🌱

For for information and references, send an email to Prof Michael Samways at samways@sun.ac.za.



Using insect icons such as dragonflies and bees can help fuel the public's awareness about the important role insects play in the livelihood of people. (Photograph: John Simaika)

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