

OILSEEDS

focus

Protein Research Foundation • Oil & Protein Seeds Development Trust • Oilseeds Advisory Committee



Soya beans • Sunflower • Canola • Groundnuts



Groundnut production

Drought resistance in canola seeds



Crop quality overviews

Trypsin inhibitors in soya bean meal



sojasaad sekuriteit

3 redes waarom APRON® PLUS Beans:

- Kombinasie van twee swamdoders vir dubbel-aksie opname en verspreiding
- Geskik vir alle grondtipes teen algemene saailingsiektes
- Groeikragtige saailinge lei tot sterk stand en optimale opbrengs

APRON® PLUS BEANS, wees saad slim.



LEES DIE ETIKET VIR VOLLE BESONDERHEDE

APRON® XL bevat mefenoksam (Wet nr. 36 van 1947, Reg. nr. L6837)

CELEST® XL bevat fludioksamil en mefenoxam (Wet nr. 36 van 1947, Reg. nr. L6353)

APRON® PLUS BEANS bestaan uit APRON® XL en CELEST® XL vir gebruik op sojabone en droë bone.

APRON® XL en CELEST® XL is geregistreerde handelsmerke van Syngenta Groep Maatskappy.

Syngenta Suid-Afrika (Edms) Bepker, Privaatsak 60, Halfway House, 1685. Tel: (011) 541 4000. www.syngenta.co.za SyngentaSA®

Syngenta Ag, 2000. Kopiereg van die dokument is voorbehou. Alle ongemagtigde vermeerdering word verbied.

Challenges

By Jannie de Villiers, CEO of Grain SA

facing the South African oilseeds producer

The greatest single risk for the grain and oilseeds farmers of South Africa has been identified as political uncertainty. This is despite the most severe drought since 1903. By analysing the risk, it has become clear that it is not our confidence in the *Constitution of the Republic of South Africa, 1996* (Act 108 of 1996) that concerns farmers, it is the fact that government keeps challenging the *Constitution* as if it is civil society's responsibility to prove them wrong.

The funds and time lost in the court process can surely be used much more sensibly. One should continue posing the question: Who benefits from the repetition of mistakes and the subsequent uncertainty?

Politicians are skilled at playing on the emotions of farmers. Our ability to turn a deaf ear, remain calm and stick to the verdicts of the courts, is the skill needed to take agriculture forward. An attitude of 'it is my turn to eat', does not create wealth in our nation and will increase poverty. We need to work the land, not the government! However, this is not our only challenge.

Macro level

The impact of slow economic growth and the downgrade of our investment status is certainly not the medicine needed by our high levels of unemployment. It will speed up the ever-growing urbanisation trend and put more pressure on the consumers of our products. Urbanisation is forecast to be at 70% in 2030. More people will rely on commercial farmers for 'pap en vleis'. Urbanisation is a friend of commercial farmers, but funds are required to drive the demand for our products.

Our inputs are mainly based on international prices and a favourable exchange rate is therefore crucial. Grain

prices also correlate with those of crude oil and it remains essential to monitor the trends in this regard.

Developments in the sector

My observation of the past twenty years of a deregulated market, is that farmers have adapted exceptionally well to the free market and especially new technologies. Economy of scale and the use of technology are the only way to sustainability. Many multinational input suppliers are astonished by South African farmers' ability to implement new technology.

The impact of slow economic growth and the downgrade of our investment status is certainly not the medicine needed by our high levels of unemployment.

What I have noticed this current season is that our grain and oilseed farmers' marketing skills in selling their products (as well as those of service providers) have not progressed to the same extent. Too many producers do not hedge their positions at planting, waiting until harvest and then trying to sell while complaining about low prices. We cannot simply blame the Johannesburg Stock Exchange (JSE) or other market participants for our current situation. A farmer has the responsibility to market his own crop.

Organised agriculture is developing a new model for research in future. Our research institutions and training facilities do not support our competitiveness

anymore. We need to find new ways to resolve these issues, as this will determine our competitiveness.

Another 'land reform' threat, especially in Mpumalanga, is mining. If South Africa loses approximately 400 000ha of maize production, we will end up with a maize shortage. This will push maize prices to import parity and will make a basic foodstuff such as maize meal and feed to the poultry, dairy and meat sectors very uncompetitive.

Farm level

The challenges at farm level are increasing by the day. Non-compliance with new legislation and regulations could bring farming operations to a halt. Labour matters have forever changed our way of farming. The relationship with his labourers as well as with compliance agencies such as the South African Revenue Service (SARS), will become a critical requirement for the skill set of a farmer.

Water availability, usage and management will also be of critical importance in the future, as no assistance can be expected from our government. Farmers should therefore keep abreast of developments in technology and improve the scale of their operations in a diverse way in order to become sustainable. Having a succession plan in place forms part of operating sustainably. Remaining connected to the younger generation is also of vital importance.

South Africa is undergoing a major transition, where the population is no longer divided between races but between right and wrong actions. We know that in the end good always seems to conquer evil. Let us keep the faith in these days of turbulence. It is advisable to focus on your own sustainability and profitability, and not to get too distracted by the political landscape. 🌱

Political turmoil will affect agriculture



Political turmoil continues to plague the country and agriculture will not escape. Free trade, working toward resource maximisation and adding growth to national income and wealth, largely remain in place. The question is, will its relevance fade?

We need to mentally gear ourselves for rising populism. The call for land redistribution without compensation from certain role-players, does create some anxiety. Land tenure is the cornerstone of our democracy. Certainty that the interest of the country and all its people will come first, is critical for the prosperity of all South Africans.

Policy consistency is key

Policy consistency is key to the prosperity of the agricultural industry, while the building of capacity in the state to support and stimulate agriculture, is important to growth particularly for new incumbents. The reduction in available funds for state functions is likely to incapacitate this initiative, even if there were good intentions.

The slow economic growth will in the long term continue to have a negative effect on buying power, while the weaker rand will increase the input costs for a variety of essential agricultural production items, including fertiliser and fuel.

The positive outlook for crop volumes in the country bodes well for the agricultural industry. South Africa, the largest producer of maize on the continent, is set to produce the largest maize crop in 36 years (14,54 million tons) and achieve the highest yield per hectare in its history. Predictions are for a maize crop that will be 87% larger than last year, when the crippling drought significantly restricted production.

Largest crop in SA history

The expected soya bean crop of 1,23 million tons, will be the largest in the history of South Africa and 66% larger than last year. This is a milestone in the history of soya bean production in this country and a result of the favourable soya bean prices, advantages of crop rotation and major efforts by various parties regarding the technology of production.

The sunflower crop of 853 470 tons is 19% larger than last year and one of the highest quantities produced over the last ten years, but still a way behind the 1,1 million tons of 1999.

Growth in canola production in the winter rainfall area has also been encouraging, with a crop of 105 460 tons. Although below the 121 000 tons achieved in 2014, it is an indication of how canola production is expanding year after year.

Dr Erhard Briedenhann

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

Published by: Plaas Publishing (Pty) Ltd
217 Clifton Ave, Lyttelton, Centurion, RSA
Private Bag X2010, Lyttelton, 0140, RSA
Tel: +27 12 664 4793 • www.veeplaas.co.za

Chief editor: Lynette Louw
+27 84 580 5120 • lynette@veeplaas.co.za

Sub-editor: Chris Jooste
+27 12 664 4793 • chris@veeplaas.co.za

Design & layout: Karien van Wyk
+27 12 664 4793 • karien@veeplaas.co.za

Advertising
Monique van der Walt
+27 71 893 3731 • monique@veeplaas.co.za

Karin Changuion-Duffy
+27 82 376 6396 • karin@veeplaas.co.za

Susan Steyn
+27 82 657 1262 • susan@veeplaas.co.za

Esmarie Moodie
+27 76 330 0745 • esmarie@veeplaas.co.za

Accounts: Marné Anderson
+27 72 639 1805 • accounts@veeplaas.co.za

Subscriptions: Rochelle Mabebe
+27 74 153 8380 • rochelle@veeplaas.co.za

Printed and bound by: United Litho
+27 11 402 0571

Oilseeds Focus, Plaas Publishing and its staff and contributors do not necessarily subscribe to the views expressed in this publication.

© Copyright: No portion of this magazine may be reproduced in any form without the written consent of the publishers.



Published on behalf of:
Protein Research Foundation
PO Box 1564, Rivonia 2128
Tel: 011 803 2579 • Fax 011 803 2287 / 086 634 8067
Enquiries: gkeun@proteinresearch.net

To subscribe

Oilseeds Focus is a magazine aimed at addressing issues that are relevant to the canola, soya bean, sunflower and peanut industries. To subscribe please contact Rochelle Mabebe at +27 74 153 8380 or email rochelle@veeplaas.co.za. Subscriptions are free.



6



10



18



36



CONTENTS

- 1 Preface
- 2 Editor's note
- 4 News

AGRONOMY

- 6 Seed treatments to control charcoal rot
- 10 SA groundnuts: The future looks bright
- 13 An exceptional soya bean yield

SEEDS

- 18 Development in crop genetics
- 20 Drought resistance of canola seedlings

CHEMICALS AND FERTILISER

- 22 Is biological control better?
- 24 Clethodim damage in canola

MARKETS

- 26 Sustainability in the spotlight
- 27 Stocks supported by Chinese demand
- 32 The SA peanut butter market

QUALITY

- 34 Sunflower crop quality overview
- 36 Effect of TIA on broiler performance
- 38 Soya bean crop quality overview



Largest volume of soya dispatched

Brazil's soya bean harvest is over, and in April 2017 Informa Economics increased its estimate for the country's 2016/17 soya bean production by two million tons from the previous one, to a record 113 million tons. From a trade perspective in April 2017, Brazil exported 10,4 million tons of soya bean, the biggest volume ever dispatched in a single calendar month. – *Wandile Sihlobo, Agbiz*

China sets another soya bean import record

Soya bean shipments to China, the world's largest buyer of the oilseed, set another monthly record in April at 8,02 million tons, according to data from the General Administration of Customs. Bean imports in April rose by 13% from a year ago, supported by strong demand from the soya meal industry. For three consecutive months in a row leading to April, China set a new monthly record, buying 27,54 million tons of soya beans in the first four months of 2017. – *Agra-Net*

Bunge acquires Argentine edible oil company

Bunge Southern Cone, an agribusiness and food company, has agreed to acquire all assets belonging to Aceitera Martinez SA – a family-run business that produces and packages edible oils, including soya bean and sunflower oils.

Assets involved in the deal include a production plant in San Jerónimo Sud that has three packaging lines and a processing capacity of approximately 20 000 tons per month, and which is located in close proximity to Bunge's existing refining centre.

The deal will support Bunge's ability to meet the growing demand for value-added products, while also expanding its portfolio and generating a more appropriate asset allocation.

This acquisition is the latest after a busy period for Bunge. In March, the company acquired Westfälische Lebensmittelwerke Lindemann GmbH & Co. KG – a German supplier of oils and fats, and completed the acquisition of Cargill's soya bean and rapeseed crush and refining plants, and its beans discharging operation in the Netherlands and France respectively.

Bunge also launched a joint venture with Bahri Dry Bulk Co., a subsidiary of the Bahri Group, the national shipping arm of the Kingdom of Saudi Arabia, in February of this year to establish an ocean freight supplier for dry bulk shipments in and out of the Middle East. – *Oilseedandgrain.com*

US accuses Argentina of biofuel 'dumping'

Soya bean oil futures increased by 3% after Washington accused Argentina and Indonesia of dumping in their \$1,5bn biodiesel exports to the United States (US). Soya bean oil futures for July touched 33,47 cents a pound in Chicago before easing back to 33,13 cents in late morning deals, a gain of 1,9% on the day.

The headway followed the release by the US International Trade Commission (ITC) that it had "made affirmative determinations" in its probe into dumping by Argentina and Indonesia on biodiesel, adding that further details of its findings would be revealed later.

"There is a reasonable indication that the US industry is

materially injured by way of biodiesel imports from Argentina and Indonesia that are allegedly subsidised and sold in the US at less than fair value," said the commission, which will now investigate potential tariffs.

The finding was welcomed by US biofuel producers, including Archer Daniels Midland, the ag trading giant, which stated it was "pleased to see that the ITC has taken the first step toward imposing countervailing and antidumping duties on biodiesel imported from Argentina and Indonesia.

"The facts clearly show that Argentina and Indonesia are engaging in unfair trade practices, and we are confident that duties will be imposed when the final decision is made." – *Oilseedandgrain.com*

Canada to plant record canola crop

In April, Agra-Net reported that the Canadian oilseed acreage is set to boom according to the latest acreage estimates available at that time by Statistics Canada. The agency pegged canola acreage at a record 22,387 million acres, a jump of 2,02 million acres over last year, in its Principal Field Crops Acreage Summary for 2017/18. – *Agra-Net*

Meet the New Voices in cereal research

Cereal Science and Technology SA (CST-SA) recently hosted the second New Voice Symposium at the Willows Country Lodge in Pretoria. The initiative is aimed at giving postdoctorate, PhD and master's students the opportunity to present their research in front of an audience to build their confidence.

Students presented research ranging across various spectrums of the cereal industry. The presentations included research on primary production, disease control, the testing of mycotoxins in storage facilities and processing methods that could improve the industry, among others.

Students that took part came from across South Africa and included representatives from Stellenbosch University, the University of the Free State (UFS) and the University of Pretoria. Travelling far to attend the New Voice Symposium was worth their while, because it gave them an opportunity to present their research in front of a new audience.

The audience included fellow students and experts in the field that helped create

a real symposium feel by posing questions to students which needed to be answered on the spot. Some of the professionals in the industry who were present included Mariana Purnell of Agbiz, Dr Angie van Biljon of the UFS, and Wiana Louw of the Southern African Grain Laboratory (SAGL), who also serves on the executive committee of the CST-SA.

Follow #NewVoiceProgram on @farmbizmag to read live tweets done at the function. – Ursula Human, Oilseeds Focus



The group of experts and students present at the New Voice Symposium.

The role of satellites in crop estimates

At a recent stakeholder involvement workshop held at the Grain Building in Pretoria, role-players provided feedback on the validation process using the satellite Sentinel 2 for agricultural purposes (Sen2Agri) in South Africa. The workshop elaborated on the application of the Sentinel 2 satellite, an €8 billion investment of the European Union and the European Space Agency and its application to crop estimates as well as the field validation process of the Agricultural Research Council (ARC) and its partners.

The workshop was attended by stakeholders in the industry, which included representatives from the ARC, the Department of Agriculture, Forestry and Fisheries and its Crop Estimates

Committee, Grain SA, Agbiz, the SAGL, the Animal Feed Manufacturers' Association and the Bureau for Food and Agricultural Policy, to name but a few.

Sen2Agri is a global system that makes data collected by the satellite open and free for everyone to use. The data can be used to determine crop estimates and crop growth progress. It was made freely available to anyone in an effort to promote international cooperation to make crop production projections more transparent.

The data, which consists mostly of images, can be downloaded online at www.scihub.copernicus.eu. The satellites work in pairs to capture high-resolution images on a regular basis. For South Africa, new information is made available every twelve days. Some of the data it collects includes weather trends such as the effects of El Niño on crop production. It can also monitor crop growth by measuring leaf area index.

The system for South Africa, validated by field surveys by end of June, will in particular be applied to the oilseeds, wheat, maize and barley industries. In future, data from Sen2Agri could contribute to more accurate crop estimates, long-term production planning, food policymaking, improved logistical planning and more accurate market planning for imports and exports. – Ursula Human, Oilseeds Focus



Stakeholders and speakers present at the Sen2Afgri workshop.



By Sebastian Reznikov, Gabriel R Vellicce, Victoria González,
Vicente de Lisi, Atilio P Castagnaro and L Daniel Ploper

Microsclerotia of the charcoal rot fungus on the lower portion of a soya bean stem. (Photograph: www.cropprotectionnetwork.org)

Seed treatments

to control charcoal rot in soya bean

Soya bean plants are susceptible to root and stem base rot caused by soil pathogens at all growth stages. One of these diseases is charcoal rot, caused by the polyphagous fungus *Macrophomina phaseolina* (Mp).

This pathogen infects a wide host range of nearly 500 species in more than 100 families around the world, including other important crops such as cotton, chickpea, maize and common beans. Morphologically, physiologically, genetically and pathogenically, the fungus varies widely, enabling it to adapt to different environmental conditions and hence become widely distributed geographically.

Soya bean seedlings affected by Mp develop reddish brown lesions on the hypocotyl, which becomes ash-grey and then turns black. The presence of small, black sclerotia in the cortical tissue confers the charcoal appearance that gives the disease its name. In addition to these symptoms and signs, mature plants develop chlorotic lesions on their leaves,

which then die but remain attached to the stem, and finally the plants die prematurely. A combination of water stress and high temperatures favours disease development.

Alternative control

Biological agents can provide an alternative to control certain plant diseases, especially when other methods such as chemicals are difficult to use. *Sclerotium rolfsii*, *Rhizoctonia solani*, and *Pythium* spp. were successfully controlled by using antagonistic microorganisms such as *Trichoderma* spp., *Penicillium* spp., *Aspergillus* spp. and some bacteria.

A talc-based formulation of *Trichoderma viride*, produced on a commercial scale, was widely used by farmers to treat seeds of sesame, groundnut, sunflower, chickpea and mung bean for the biocontrol of root rot disease caused by Mp.

Treating the seeds with *Trichoderma* spp. and *Gliocladium virens* and storing them was more advantageous than storing the formulation and treating the seeds just before planting. *Trichoderma harzianum* inhibited the in vitro linear growth and microsclerotia production of Mp.

To control fungal pathogens, chemical products are available for application of soil, seeds and/or foliage. Fungicide seed treatments are intended to control diseases that cause seed rot and damping-off before and after emergence. Thiram, fludioxonil and captan/pentachloronitrobenzene/thiabendazole, that were used to control *Sclerotinia sclerotiorum* in field trials, managed to reduce sclerotia formation in infected soya bean seed by 98%. Moreover, treatment of soya bean seeds with thiram reduced the incidence of *Phomopsis sojae* and increased seed germination.

No chemicals available

Currently, no chemicals are available to control charcoal rot in soya bean. Seed treatments may be helpful if soya bean seeds are infected with Mp, but there is no information on specific active ingredients effective against this pathogen. Among fungicides tested against Mp in infected cotton seeds, carbendazim, quintozene and benomyl enhanced plant emergence (PE) and disease control. Monceren®, pencycuron, carboxin 200, tolclofos-methyl, and Maximum AP also increased the percentage of surviving seedlings



A soya bean field being destroyed by charcoal rot. (Photograph: www.cropprotectionnetwork.org)

from Mp-infected seeds.

The efficacy of seed treatments with two biological products (*Trichoderma viride* or *Bacillus subtilis*) or one chemical treatment with thiophanate-methyl/pyraclostrobin with regard to PE, disease severity, Mp colony-forming units (CFUs), crop yield and 1 000-seed weight in two soya bean cultivars maturity group (MG) VIII were evaluated in the field to control Mp on two soya bean cultivars, NA8000 RG and Munasqa RR, in Tucumán, north-western Argentina.

Biological and chemical seed treatments have been shown to be effective to control Mp on various crops. For cotton, several fungicides were tested as seed treatments to determine their efficacy in controlling Mp infection. Monceren 250 FS and tolclfos-methyl were the best-performing fungicides in controlling Mp on cotton in the greenhouse. A reduction in the percentage of dead sesame plants

Charcoal rot can attack crops at any growth stage. (Photograph: www.lsuagcenter.com)



affected by Mp was found when seeds were treated with biological antagonists such as *Trichoderma* sp. and *Aspergillus* sp.

Lower disease severity

In NA8000 RG and Munasqa RR, treatments had a similar performance trend: the highest crop yield values were obtained with the pyraclostrobin/thiophanate-methyl mixture, followed by those obtained with *T. viride* and *B. subtilis*.

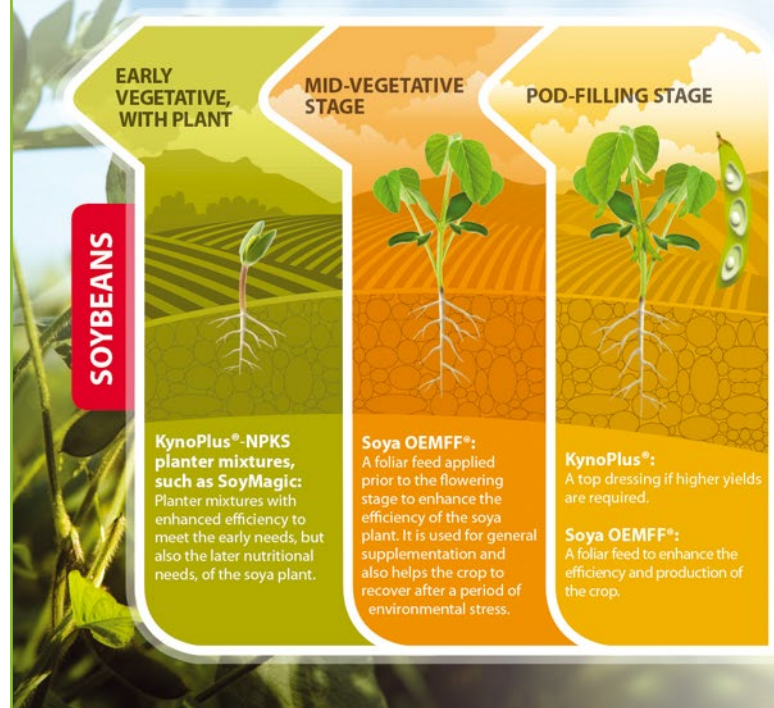
Similar yield increases were also observed: an increment of 100kg was obtained when applying chemical seed

treatments (propineb and dicarboximide) in sesame to control Mp, as compared with yield values obtained with the untreated control. Mp did infect Munasqa RR and NA8000 RG, but severity levels and CFU/g were higher in NA8000 RG in both seasons. The chemical and biological treatments resulted in lower disease severity and CFU/g values than in the inoculated control.

These results go along with lower disease incidence in eggplants treated with different *Trichoderma* sp. strains. Results from this study of chemical and biological seed treatments of soya bean to control charcoal rot will be useful to develop more efficient management strategies for this important disease.

References and the full article are available from the authors. Contact the Estación Experimental Agroindustrial Obispo Colombres (EEAOC) at email dt@eeaoc.org.ar for more information. 

» Nutrition according to plant development »



With Kynoch's innovative and tailor-made products, you can apply fertilizer according to the requirements and growth stages of your soya plant. In this way, Kynoch ensures that your **soya plants get what they need, when they need it most**. Furthermore, you have peace of mind, because you know, with Kynoch on your farm from the outset, you only get the best from your soya plants and can be assured of enhanced efficiency in quality and yield potential.

Kynoch – enhanced efficiency through innovation.



Farmisco (Pty) Ltd.
c/o Kynoch Fertilizer Reg. No. 2009/0092541/07
011 317 2000 | info@kynoch.co.za
www.kynoch.co.za

KynoPlus® is registered as fertilizer group 1 – Reg. No: K8024
Soya OEMFF® Reg. No: K8700.
(All products are registered under Act 36 of 1947.)

A growing investment in soil health



Contans[®] WG



- Contans is a biological fungicide for the control of Sclerotia in the soil.
- Safe for all follow-up crops
- Resistance management tool
- Reduces pressure on foliar applications
- Contans provides sustainable protection against sclerotinia.

Contans[®] Reg. No. L10157 (Act No. 36 of 1947). Contans[®] contains Coniothyrium minitans.
Contans[®] is a registered trademark of Bayer AG, Germany. Use strictly according to instructions on label.

Facebook: Bayer Crop Science Division Southern Africa Twitter: @bayer4cropssa

For more information visit our website at www.cropscience.bayer.co.za/www.bayer.co.za or download our App.

Bayer (Pty) Ltd. Reg. No. 1968/011192/07
27 Wrench Road, Isando, 1601. PO Box 143, Isando, 1600. Tel: +27 11 921 5002



Science For A Better Life

02/2017

By Jannie Bruwer, area sales manager, Bayer

Sclerotinia

stem rot in canola

Although numerous diseases could play a role in the economic viability of canola, it is vital to address the management practices of *Sclerotinia* control.

Sclerotinia stem rot is caused by the fungus *Sclerotinia sclerotiorum*. The fungus survives as sclerotia, either in the soil or in stubble on the soil surface.

The occurrence of sclerotia is more prominent under the following conditions:

- Rain of 25–50mm, 10 to 14 days prior to the beginning of flowering – thus wet conditions for at least 10 days on the soil surface in mid- to late winter. Temperatures of 11–15°C trigger the germination of sclerotia and result in spore release.
- Extended wet periods during flowering trigger petal infection.
- Extended wet periods during petal drop and the lodging of petals on stems lead to subsequent stem infection. Stem lesion development occurs in humid/wet conditions and temperatures between 20 and 25°C.

Moisture is key

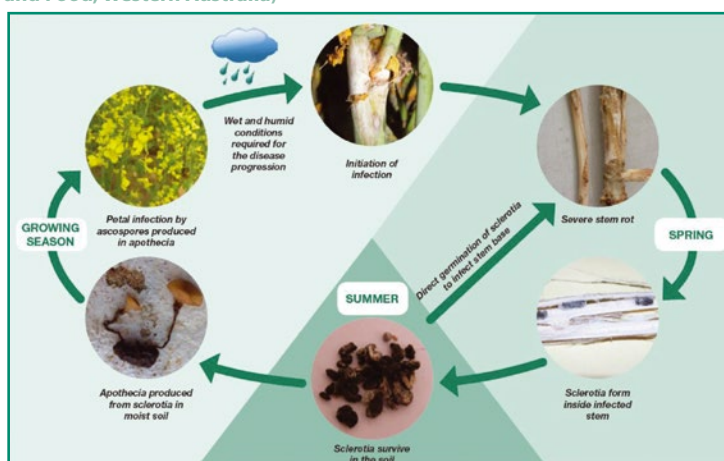
Moisture is the key factor in *Sclerotinia* infection. Good soil moisture, starting two weeks in advance and continuing throughout flowering, will greatly increase the risk of infection. Conversely, low rainfall and low humidity during these stages will significantly reduce the disease risk, and fungicide applications rarely prove to be beneficial under these conditions. Moisture can refer to rain, relative humidity in the 80s or morning dew.

After rain, it takes approximately 10 to 12 days for apothecia (tiny golf tee-shaped mushrooms) to release ascospores into the air. Wind spreads these spores onto nearby plants. Ascospores cannot infect plants directly, but they need dead tissue such as fallen petals on leaves and stems, covering the spores to create an ideal microclimate to continue their disease cycle.

Decaying petals provide ascospores with the energy to produce hyphae that release oxalic acid ($C_2H_2O_4$) and other infection agents, which the fungus needs to invade healthy plant tissue and infect the plant. Once inside the plant, the fungus grows up and down the stem, eventually cutting off moisture and nutrient flow and killing the plant. The life cycle of *Sclerotinia* can be seen in Figure 1.



Figure 1: *Sclerotinia* stem rot in canola. (Source: Department of Agriculture and Food, Western Australia)



Timing of spraying will be determined by climatic conditions. The optimum time to spray is between 20 to 30% flowering, but in certain years when the climatic conditions in early flowering are not favourable for the disease to develop, a later spray (not later than 50% flowering) may be more ideal.

Should conditions remain unfavourable for disease development (hot and dry) after 50% flowering, a fungicide application will be unwarranted. After 50% flowering, most of the flowers are on side branches. Therefore, little risk of petals landing on the main stem to cause economic damage exists.

A 10% change in flower percentage only takes three to four days. Thus, the timing of a spray is critical in controlling the disease.

Spray during flowering

It is essential that any fungicide application coincides with the peak flowering period. Fungicides prevent spores from growing on petals after petals have fallen onto leaves and stems and started to decay. It is easier to spray petals at the top of the canopy during peak flowering than after they have fallen, which is why living flowers are the target.

Spraying before 20% flowering is too early, because no petals have dropped and no pods have formed. At 30% flowering, petal drop has just begun. Most of the petals drop during 30% flowering. Therefore, spraying between 20 and 30% flowering ensures that many flowers have opened and the spray will cover petals before they drop.

Fungicides reduce the severity of infection but will not completely eliminate *Sclerotinia*, especially if conditions are favourable throughout flowering.

For more information, contact Jannie Bruwer on 082 806 8715 or email jannie.bruwer@bayer.com.

Groundnuts in South Africa:

The future looks bright

During the 2015/16 production year the groundnut industry in South Africa reached its lowest production figures since records were kept from 1936. Exporters and producers had to pull out all the stops to save the industry and to generate a return to become one of the world's best producers once again.

Alfonso Visser, owner of the Golden Peanut and Tree Nuts plant in Hartswater and one of the major groundnut producers in the country, says the main reason why the groundnut industry faced challenges was the El Niño climate phenomenon.

While it may seem as though producers lost interest in cultivating groundnuts, they didn't really stop producing. It was rather a matter of late rainfall that forced producers to skip planting over the past three years. During this period, the first rains came only between 20 and 28 December and by that time it was too late for groundnut plantings. In certain parts, producers elected to plant maize instead.

Visser also says that producers who had the opportunity to plant groundnuts in those three years, recorded their best profits ever. This year the harvest looks promising and the climate has played its part. Groundnut production is set to show better profits than most other crops this year.

In the 2015/16 production year, South African producers could only manage to plant 22 600ha and only 17 680 tons of groundnuts were harvested. This season South Africa received its first rains from mid-November to mid-December and many producers managed to plant the commodity again. Approximately 55 000ha were planted in the Free State, Limpopo, Northern Cape and the North West. Apart from rainfall at the right time, there is also a promising export market in Europe and Japan, which are all good signs for a profitable year.

Keen interest in planting

Adri Botha, chairperson of the Groundnut Forum of South Africa (SAGF), says groundnut production in the country, similar to many other crops, experienced hard times due to the drought, but when the opportunity presented itself, farmers showed keen interest in planting again.

Information from the South African Grain Information Service (SAGIS) indicates that an average of 48 720ha were planted over the past ten years and the average harvest during this time was 66 139 tons. The average over the last five years has declined, however. During this time, an average of 45 015ha was planted and the average harvest was 52 568 tons. In the past two years, groundnut production has declined even more.

As noted before, only 22 600ha were

planted during the 2015/16 production year and a mere 18 850 tons were harvested. The effect of this decrease in volumes is that South Africa failed to produce sufficient quantities of groundnuts for local consumption, with international buyers not receiving the regular volumes they are used to.

Botha believes that with a stable and adequate supply, this market will be regained easily enough, because South African exporters are renowned for quality and reliability under normal circumstances. Visser is also very optimistic regarding the export market. He says South Africa did not lose the international market. The supply did decrease, which negatively affected the export market, because international buyers turned to other more reliable sources. Despite this, South Africa still exports to Japan and Europe, with a focus on the higher-income sector of these countries.

Figure 1: South African groundnut production figures, 2006/07–2016/17.



The 2017 harvest looks promising and the climate has played its part in setting the table for better production and higher profits.

In addition to continued local cultivar development, the industry is also seeking international cultivar owners to submit seed to be included in the local Elite Cultivar Trials funded and managed via the Oilseeds Advisory Committee.



major portion of the menus relating to food projects for schools, prisons and non-profit organisations assisting the homeless, for instance, because it is affordable and high in protein. Lately however it has become too expensive for this purpose. Due to a decline in quality, this market has also shrunk. Therefore, the first challenge will be to increase local consumption again.

"The second challenge is identifying cultivars which will produce higher yields. Farming has become expensive, and producers have to find ways to cut down on input costs while still delivering higher returns. In the groundnut industry, we need access to cultivars that will deliver higher yields. This way we can cut on unit costs and deliver a more affordable product to the market," Visser says.

Exceptionally high yields

Botha adds that in addition to hope for continued local cultivar development, international cultivar owners are sought and invited to submit seed to be included in the local Elite Cultivar Trials funded and managed via the Oilseeds Advisory Committee (OAC). She says groundnut production has always been more profitable than any other competing crop, but is also more intensive and the necessary attention should be given to best practices in an effort to ensure that available cultivars reach their full potential. It is no secret that certain farmers will deliver exceptionally high yields with the existing available material.

Another of the challenges in the industry – for which excellent work has already been done – is introducing groundnut production as a high-income crop to emerging farmers. The focus and goal is to help these farmers become regular producers of quality products through courses and mentorship, ultimately giving them access to the larger and more formal market environment.

For any information on the groundnut industry in South Africa, contact Alfonso Visser on 082 948 2222 or 053 474 1345, or Adri Botha on 082 376 5940. 📞

New possibilities for business

There are new possibilities available for groundnut producers, but these will entail hard work, especially in respect of the export market. Botha says that due to a changing and declining supply, South Africa has lost some of its standing in recent years as a reliable export source for the international groundnut market in Europe and Japan. However, the markets are still there to be regained and expanded if the broader industry commits to the commodity and consistent supply of high-quality products.

Last year was one of the worst production years in South Africa, but exporters still managed to provide 36% or 2 317 tons, of the harvest to Japan, 32% to Mozambique, 12% to the Netherlands and 11% to Belgium.

"South African groundnuts are of a good quality and well known in the international market. Up until 1994, the country was known for its excellent quality and buyers didn't hesitate to use South African groundnuts directly in their production lines, without the need for more sorting or processing. Unfortunately, in the move from a single-channel

marketing structure via the Oilseeds Board as well as the challenges brought on by labour issues and adjustments needed on the technological side, primary producers started considering other commodities. In this process, South Africa lost the ability to retain its spot in the market along with many international buyers reluctantly forced to source products from alternative origins.

"At the same time, Argentina rose as a worthy opponent in the global supply arena, making matters even more difficult for exporters. Still, the international demand on the back of global population growth, along with the marketability of groundnuts as an excellent source of nutrients and healthy oils, leaves the door wide open to us," Botha says.

Challenges for the future

Visser says groundnut production levels in South Africa have been so low in the past two to three years, that even the national market experienced a shortage. He believes that one of the challenges for the groundnut industry is achieving an increase in local consumption.

In the past, peanut butter formed a

MEETING ALL GROWER NEEDS ALL OF THE TIME



UniRam™

The ultimate PC solution for high value and permanent crops.

Wall thickness: 1.0 & 1.2mm

Flow Rates: 0.7, 1.0, 1.6, 2.3, 3.5l/h



DripNet PC™

Cost effective PC solution for permanent and multi-seasonal crops.

Wall thickness: 0.4 & 1.0mm

Flow Rates: 0.6, 1.0, 1.6, 2.0, 3.0, 3.8l/h



Aries™

Cost effective solution for permanent and multi-seasonal crops.

Wall thickness: 0.7, 0.8 & 1.0mm

Flow Rates: 1.0, 1.5, 2.0, 4.0l/h



Typhoon™ Plus

Effective medium term solution for multi-seasonal and seasonal crops.

Wall thickness: 0.31 & 0.38mm

Flow Rates: 1.0, 1.6l/h



Streamline™ Plus

Ideal solution for seasonal crops.

Wall thickness: 0.15 & 0.20mm

Flow Rates: 1.1, 1.6l/h



Tree crops



Vineyards



Multi-season crops



Vegetable & row crops



Greenhouse & structures



25 YEARS

IS GROWING MORE WITH LESS

By Andries Gouws

An exceptional soya bean yield

Spray applications are combined to prevent unnecessary cultivation.

Exceptional yields are possible with soya beans, provided that you correctly attend to every facet of the cultivation process. This year, a soya bean yield of up to 8t/ha filled the combine harvester to the brim on the farm Leeubank of Gerrit Roos near Wonderfontein in Mpumalanga.

Last year he was crowned champion soya bean producer (under irrigation) in the Weigh to Win™ National Yield Competition, when a block of two hectares he entered yielded an average of 5,236t/ha. This year, the harvester measured just over 8t/ha in certain parts of his irrigated fields. Roos says careful attention to small things in every aspect of the entire cultivation process makes the difference, because he manages everything in a precision farming system.

Every year Roos plants strip trials containing the soya bean cultivars of different seed enterprises. This allows them to determine which cultivars best suit the conditions on his farm. Roos plants approximately 1 000ha maize and 450ha soya beans. He also manages a livestock branch.

Maize and soya beans are planted in a crop rotation system, which means the fields are planted with soya beans every three years. When he joined the

enterprise, Roos planted soya bean trials and although maize sets

the tone as the primary crop, the soya beans have stood their ground, especially considering their hidden benefits. Since their first soya bean planting in 1992/93, they have doubled the average yield on dryland from 1,8 to 3,6t/ha. They also plant soya beans under centre pivot irrigation and 20ha with underground drip irrigation. These fields deliver an average yield of 4 and 4,25t/ha respectively.

Strip-till system

Ortman implements are used to strip-till the land. During last year's planting season a large section of the fields was too damp for these implements, and a broad-tilling implement (Fieldspan) was used, after which the soil was compacted with a roller. The advantage of this process is that germination takes place evenly and the soil is much more even, thus reducing wear and tear on the blades of the combine harvester's soya bean table and saves a lot of money.

In the strip-till system only the soil in which the seed will be planted, is

tilled to a depth of 280mm. Every year the strips are moved slightly to eventually utilise the entire land area. The fields consist mainly of Avalon soils, and care is taken to keep the soil pH level between 6 and 6,5.

Since 2000 they have been using a precision farming system with a diamond pattern (100m × 100m) where soil samples are taken and analysed annually. If the analyses indicate a shortage of lime or other nutrients, corrections are made continuously. Every third year, lime is applied across the board and fertilisers are applied throughout according to changing needs.

Roos says he has found that soya beans react most favourably to 'old' fertilisation. For this reason a mixture of 0:1:2 fertiliser at 200kg/ha is broadcast just after the maize, which is followed by soya beans that have been harvested. This leads to a reaction between the

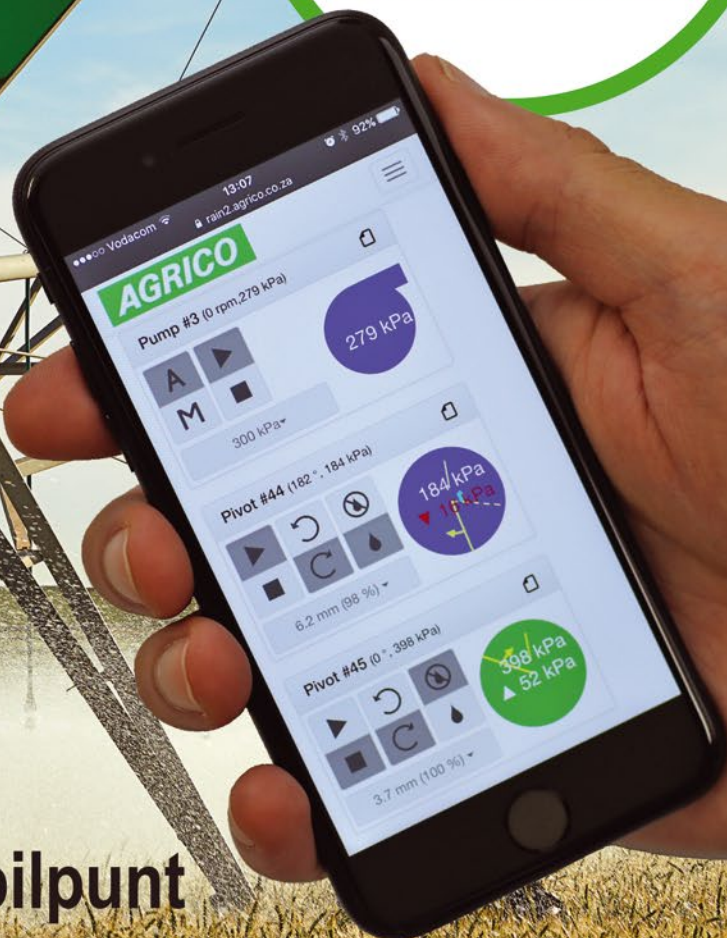


Gerrit Roos with his award as winner of the irrigation section of the Weigh to Win™ National Yield Competition.

AGRICO

Advanced paneel
GRATIS!
met
Internetbeheer.*

AGRICO



Bestel 'n nuwe **Agrico spilpunt**
met 'n **Premium** paneel en kry 'n opgradering.

***Gratis** subskripsie ingesluit vir die eerste **24** maande.

Kontak besonderhede: Alfred Andrag | c: 082 824 1214
t: 021 950 4111 | f: 021 950 4208 | alfred.andrag@agrico.co.za

Meer as 100 jaar diens

Verkope en diens met takke regoor Suidelike Afrika:

Belville | Bethlehem | Bloemfontein | Caledon | Ceres | Christiana | Cradock | Estcourt | George | Hartswater | Humansdorp | Kakamas | Kimberley | Kroonstad | Lichtenburg
Lusaka | Nelspruit | Nigel | Nylstroom | Ottosdal | Pietermaritzburg | Piketberg | Rawsonville | Schweizer-Reneke | Tzaneen | Upington | Vredendal | Wellington

crop residues, fertiliser and organisms in the soil, which in turn stimulates the earthworm numbers in the soil.

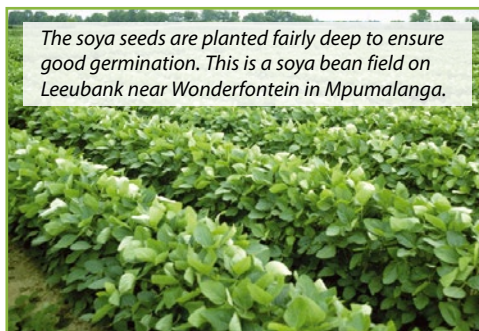
Roos plants cultivars that exhibit resistance to Roundup® herbicide. Upon planting herbicide is applied to the soil to postpone the first Roundup® application for as long as possible. Proven cultivars are planted, as are the best performers in every year's strip trials. The cultivars that grow upright are planted at approximately 300 000 plants per hectare, and the shrub-type cultivars at 260 000 to 280 000 plants per hectare in rows 90cm apart. The seeds are planted at a depth of between 4 and 5cm to ensure that there is sufficient moisture for even germination.

Fungal disease control

Around 40 days after planting, the first Roundup® application is done. Supplementary nutrients and fungicides are mixed into the herbicide to respectively lessen the shock and prevent counter fungal diseases from becoming an even greater problem. At approximately 60 days after planting, a copper spray is applied in support of the effort to control fungal diseases.

At the first flowering stage, a mixture of mono-ammonium phosphate (MAP) and diammonium phosphate (DAP), specialist fertiliser products for soya beans, are applied at 4 to 5kg/ha with a fungicide and some brown sugar (as agglutinant). Later, the cultivars with a long growth period receive another fungicide application. As soon as flowering time is over, they administer a last application of Roundup® to ensure that all weeds are eliminated.

Fungal diseases are becoming a major problem and especially *Sclerotinia* can harm the yield. Roos says his experience is that soya beans that are planted earlier, are not as severely plagued by these diseases. Producers traditionally plant soya beans after having planted maize. When using underground drip irrigation, fungal diseases are not such a big problem.



The soya seeds are planted fairly deep to ensure good germination. This is a soya bean field on Leeubank near Wonderfontein in Mpumalanga.

Drip irrigation

They installed the underground drip irrigation around a decade ago. The dripper lines are installed approximately 350mm below the ground, 200mm apart and the drippers in the lines 20mm apart. Every dripper has the capacity to apply two litres of water per hour.

The advantages of this irrigation system entail:

- That it uses 50 to 75% less water than a centre pivot.
- Irrigation can be done with precision.
- It keeps fungal diseases at bay.
- At least one less fungicide application is necessary.
- Fertiliser can be placed at the root zone.

The system also has its challenges, among others that the depth of cultivations over the pipes should be very accurate. The system must be installed in square or rectangular blocks,



This year, the combine harvester indicated a yield of just over 8t/ha on certain parts of the soya bean fields.

and the dripper lines can be 180 to 200m in length at most, to maintain the pressure for even application. Continuous maintenance is necessary and the system must be cleaned regularly to prevent the drippers from clogging.

Mice can also present a huge challenge. They would typically dig the pipes open and bite holes into them. For this reason, they have erected owl cages near the fields and planted poles with bails on the contours where owls can rest while they are hunting. Only environmentally friendly methods are used to control the mice.

The system is initially more expensive to install than a centre pivot, but in the long run (after about six years) it becomes the cheaper of the two.

Although soya beans can hold their own as a crop in a farming enterprise, its use as a rotation crop has numerous advantages. The nitrogen (N) deposits that soya beans leave behind in the soil, can lead to maize yields of at least 2t/ha higher than where soya beans were not planted the previous year.

Soya crop residues are also manna for sheep. The animals ingest the residues and pick up the kernels behind the harvester. The additional protein during mating ensures a higher lambing percentage, and in certain years there are between 10 and 15% more twins.

All soya beans are processed on farm into soya oil, soya oilcake containing 46% protein and 6% energy and full-fat soya oilcake with 37% protein and approximately 20% energy. Initially, the oil was pressed to use as fuel on the farm, but due to the huge increase in plant oil prices it is no longer a viable option. The oilcake is used in the cattle and sheep feedlots on the farm. Roos says they add value to everything that leaves the farm.

For more information, contact Gerrit Roos on 083 635 3873 or email glroos@gmail.com.

Jou opbrengsvooruitsigte *lyk* **SONNIG**

Saam met jou van
**DIE WOORD
"GO"**

PIONEER No. PH. 03



DIE SAAD VAN SUKSES

Goeie Ontkieming

Beter Groeikragtigheid

Beste Opbrengs

Tel: +27 12 683 5700 | www.rsa.pioneer.com

© 2016 PHIL.

Die DuPont Ovaal Logo is 'n geregistreerde handelsmerk van DuPont.

®, SM, TM Geregistreerde handelsmerke van Pioneer.



Twee medium tot lang groeiseisoen-sonneblomkultivars is vir droëlandverbouing in die westelike produksiegebiede beskikbaar.

Sonneblomkultivars

vir westelike produksiegebiede

Phb 65A70

Phb 65A70 is 'n nuwe sonneblomkultivar met hoë opbrengspotensiaal. Dit is 'n medium tot lang groeiseisoenkultivar en is geskik vir droëlandverbouing in die westelike produksiegebiede. Die kultivar se dae tot 50% blom is 65.

Dit presteer op alle grondtipes in 0,91m-rye en het 'n plantdatum van Oktober tot Desember. Die beste plantpopulasie is 35 000 tot 40 000 plante per hektaar.

Belangrike agronomiese eienskappe (uitstekend = 9; swak = 1)

Sekelnek	6
Opbrengspotensiaal	7
Planthoogte	175
Saadvulling	7
Eenvormigheid	6
Proteïenkonsentrasie	17,6
Oliekonsentrasie	42,8
Staanvermoë	8
Kruistipe	3W

Siekteverdraagsaamheid (verdraagsaam 9 – 7; matig 6 – 4; vatbaar 3 – 1)

Bruinroes	7
Witroes	6
Wortel- en stamsiekte	7

Kies Phb 65A70 vir goeie:

- Opbrengste en aanpasbaarheid.
- Groeiperiode en eenvormigheid.
- Goeie siektebestandheid.
- Weerstand teen omval.
- Bestand teen voëlskade.
- Pas in enige kultivarpakket.

P65LL02

P65LL02 is 'n sonneblomkultivar wat groot opbrengsverbetering toon van konsepgenetika. Dit is 'n medium tot lang groeiseisoen-kultivar en is geskik vir droëlandverbouing in die westelike produksiegebiede. Die kultivar se dae tot 50% blom is 68.

Dit presteer op alle grondtipes in 0,91 tot 1,5m-rye en het 'n plantdatum van Oktober tot Desember. Die beste plantpopulasie is 35 000 tot 40 000 plante per hektaar.

Belangrike agronomiese eienskappe (uitstekend = 9; swak = 1)

Sekelnek	6
Opbrengspotensiaal	8
Planthoogte	175
Saadvulling	7
Eenvormigheid	7
Staanvermoë	8
Kruistipe	3W

Siekteverdraagsaamheid (verdraagsaam 9 – 7; matig 6 – 4; vatbaar 3 – 1)

Bruinroes	7
Witroes	7
Wortel- en stamsiekte	7

Kies P65LL02 vir goeie:

- Opbrengste en aanpasbaarheid.
- Groeiperiode en eenvormigheid.
- Goeie siektebestandheid.
- Weerstand teen omval.
- Bestand teen voëlskade.
- Pas in enige kultivarpakket.

Vir meer inligting, kontak Philip Fourie, landboukundige van DuPont Pioneer by 082 909 3262 of philip.fourie@pioneer.com.

Development in crop genetics:

Disease, insect and herbicide tolerance

Technologies in agriculture, and in particular in maize production, continue to advance in leaps and bounds. It is interesting to examine how many disease-, insect- and herbicide-tolerant transgenic traits are registered globally across all agricultural crops. According to the Centre for Environmental Risk Assessment (CERA) database, some 206 traits are available in these categories (www.cera-gmc.org).

Nine virus-resistant traits are available across carnations, papaya, plum, squash, common beans and potatoes. There are 77 insect-resistant traits in maize, cotton, tomato, potato, soya beans and rice. There are 120 herbicide-resistant traits spread across cotton, maize, carnations, canola, soya bean, creeping bent grass, tobacco, common bean, flax, sugar beet, lucerne, rice, chicory and wheat.

Insect resistance and herbicide tolerance clearly dominate, and crops of focus are essentially maize (with 48 insect-resistant traits and 52 herbicide-tolerant traits), soya bean (with three insect-

resistant traits and 17 herbicide-tolerant traits), and cotton (with 20 insect-resistant traits and 20 herbicide-tolerant traits).

Some 92 million hectares of soya beans (83% of all soya beans), 24 million hectares of cotton (75% of all cotton) and 54 million hectares of maize (29% of all maize) are planted with traited varieties and hybrids globally.

DroughtGard™

DroughtGard™ is one of the new traits that holds much promise, especially in maize production regions in South Africa where rainfall is often low, uncertain or erratic. The trait in DroughtGard™ is the world's first drought-tolerant biotechnology trait for maize and is designed to help maize plants better tolerate drought stress and minimise the risk of failure in drought conditions, and was commercialised in the United States (US) in 2013.

Yield gain in hybrids with DroughtGard™ occurs because it slows down the growth of maize hybrids experiencing moisture stresses, such that existing soil moisture is saved for the

critical period of flowering, resulting in less kernel abortion, thus protecting the expected yield.

Nutritional quality traits

This is a more complicated segment to quantify, but traits such as low lignin (to enhance digestibility in livestock) in lucerne, non-browning apples, provitamin A and iron-enriched bananas, vitamins A-, B9- and C-enriched maize, high-content omega 3 fatty acid-enriched canola, beta carotene-enriched rice, and low-saturated/high-oleic fatty acid-enriched soya beans are but a few that are receiving attention currently (Agnès E Riccroch & Marie-Cécile Hénard-Damave, 2016).

CRISPR – a new gene-editing tool

Clustered regularly interspaced short palindromic repeats (CRISPR) is a naturally occurring ancient defence mechanism found in a wide range of bacteria, which evolved to protect them against viral infections. As far as back the 1980s, scientists observed a strange pattern in certain bacterial genomes. One deoxyribonucleic acid (DNA) sequence would be repeated continuously, with unique sequences in between the repeats.

Scientists realised the unique sequences in between the repeats matched the DNA of viruses – specifically viruses that prey on bacteria. CRISPR form part of the bacteria's immune system, keeping parts of the viral DNA of dangerous viruses so it can recognise and defend against such viruses the next time they attack. A second part of the defence mechanism is a set of enzymes called CRISPR-associated (Cas) proteins, which can precisely snip DNA and remove the DNA of invading viruses.

Using this precise gene-editing technology, CRISPR could one day

Canola is one of the GM crops that boasts herbicide-resistant traits.

hold the cure to a number of genetic diseases, although human genetic manipulation is still far from becoming routine. Furthermore, CRISPR could become a major force in ecology and conservation, especially when paired with other molecular biology tools. It could, for example, be used to introduce genes that slowly kill off mosquitos spreading malaria, or genes that slow down the growth of invasive species such as weeds.

Since its 2013 demonstration as a genome-editing tool in *Arabidopsis* and tobacco — two widely used laboratory plants — CRISPR has been tested on crops, including wheat, rice, soya beans, potatoes, sorghum, oranges and tomatoes. It is expected to be used widely in agricultural research applications, including boosting crop resistance to pests and reducing the toll of livestock diseases.

Precision agriculture and big data

Precision farming is not a new concept, and could be defined as “using every acre within its capability and treating it

according to its needs,” according to Hugh Hammond Bennett, widely considered to be the father of soil and water conservation, who was born in 1881 and died in 1961.

Precision agriculture could also be defined as “a management system that is information- and technology-based, is site specific and uses one or more of the following sources of data: soils, crops, nutrients, pests, moisture or yield, for optimum profitability, sustainability and protection of the environment”.

Nonetheless, with the increasing availability of data and tools to generate and interpret data rapidly and cost-effectively, it has become possible to do more in-depth analyses of increasingly smaller parts of a farmer's field. The



Some 92 million hectares of soya beans (83% of all soya beans), are planted with traited varieties and hybrids globally.

digitisation of this data has made precision farming possible.

With today's equipment that can collect information digitally, farmers have at their disposal huge quantities of data. The ability to use

data from multiple sources to build a 'digital' picture of a production field, enables today's growers to make quality decisions regarding hybrid choices, planting densities, fertilisation requirements etc.

Furthermore, they are able to do this for smaller and increasingly more precise areas in their fields. This leads to optimisation of productivity in each one of a grower's fields, which ultimately leads to a high level of sustainability and productivity. Development in maize genetics and production systems also plays an important role in providing greater food security. 🌱

Roundup
PowerMAX®
HERBICIDE

**Rely on successful
weed control ...**

With the correct combination of herbicides and Roundup Ready® Technology.

Successful weed control in **Roundup Ready®** maize, cotton and soya merely requires the perfect combination of the right products, such as Monsanto's **Roundup PowerMAX®** – part and parcel of an unsurpassable weed control programme for crops.

Roundup PowerMAX®:

- Is effective - on its own or in combination with other registered products!
- Guarantees crop safety!

Roundup PowerMAX® puts you in control.

011 790-8200 | www.monsanto.co.za

Clients are welcome to contact us on our client services number or e-mail address: 011 790-8200 or customer-care.sa@monsanto.com

Roundup PowerMAX® contains glyphosate 540 g/l. Caution. Reg. No. L7769 (Act No. 36 of 1947). Use herbicides safely. Always read the label and product information before use. Monsanto, Roundup Ready® and Roundup PowerMAX® are registered trademarks of Monsanto Technology LLC. Monsanto South Africa (Pty) Ltd, PO Box 69933, Bryanston, 2021.



upper marketing A16237

Drought resistance of canola seedlings

Drought resistance in crops is a crucial aspect of crop farming in the Western Cape. This article focuses on canola's reaction to drought and certain observations made in this regard in 2016.

Water consumption during the growth stages of canola (plant to harvest) shows a linear increase and reaches a peak during flowering, after which it decreases rapidly until physiological ripeness occurs (Canola Council of Canada, 2008).

Canola is most sensitive to moisture stress during the flowering stage and the early to mid-pod filling stage (Wan et al. 2009). However, it is also sensitive to drought during germination. Sufficient soil moisture during germination is necessary for rapid and even germination – hence a higher germination and establishment percentage. It also results in the establishment of stronger seedlings.

However, it has long been known that canola plants can handle water shortages well during drought conditions if these shortages occur after emergence, but only in the early stages of development. This statement could hardly be better proven than during 2016 in the Swartland and parts of the Overberg.

Extreme drought

At Langgewens a total of 37,8mm rain fell during the last ten days of April. Similar rainfall occurred in large parts of the Swartland and Overberg and was utilised to establish canola. During the next 39 days, however, it was extremely dry across the entire area and the rainfall figures at Langgewens, for example, was only 6,6mm.

Canola seedlings across the entire area were subjected to severe moisture stress during 2016, shortly after emergence. Since the remainder of the 2016 rainy season was normal and temperatures were fairly low in September (Figures 1, 2, 3 and 4), the canola miraculously recovered due to its drought resistance and the highest canola yields per hectare recorded in history were attained in the Western Cape, despite the initial dry period.

Figure 1: Monthly and annual rainfall at Langgewens for 2016 and long term.

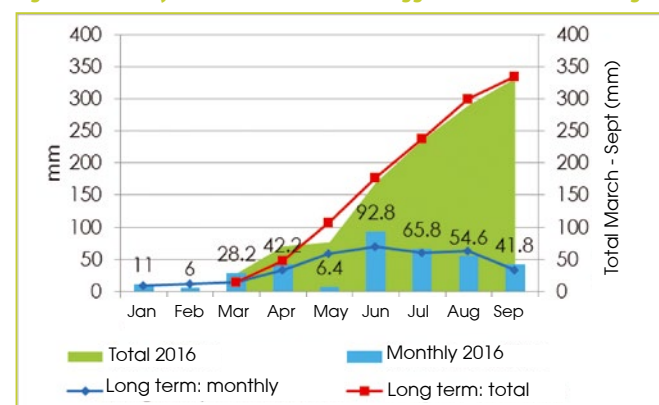


Figure 2: Monthly temperatures at Langgewens for 2016 and long term.

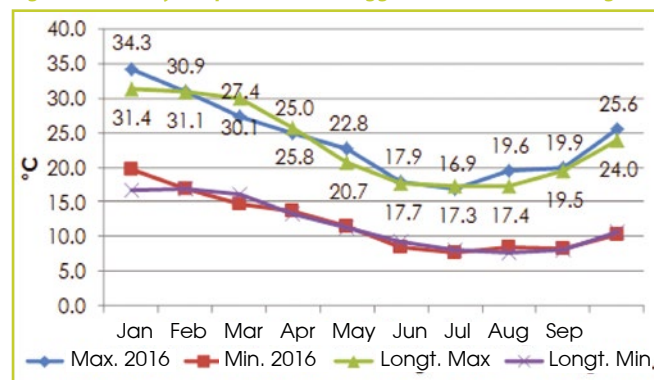


Figure 3: Monthly minimum and maximum temperatures at Tygerhoek for 2016 and long term.

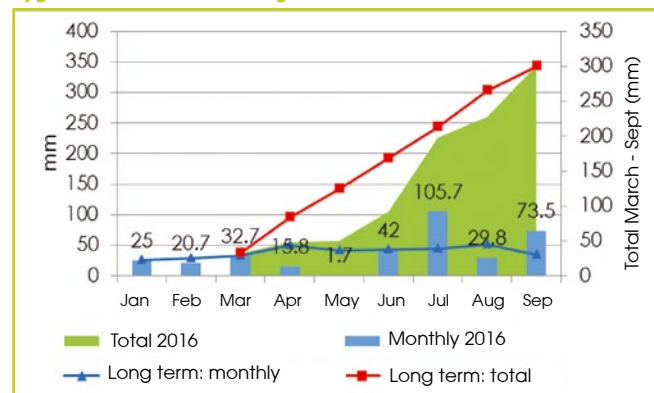
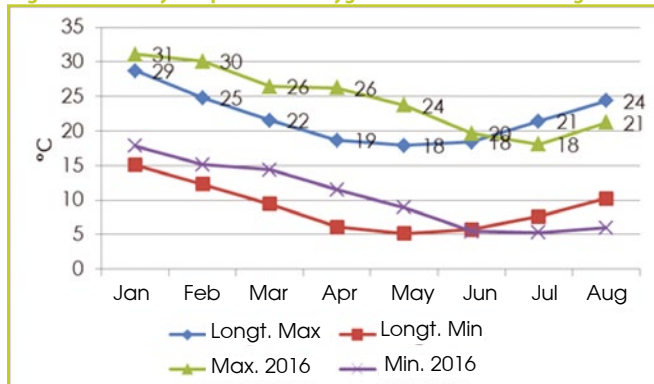


Figure 4: Monthly temperatures at Tygerhoek for 2016 and long term.



In the Swartland, no cultivar trials could previously yield more than 2,9t/ha. Two cultivar trials and a fungus treatment trial yielded an average of 3t/ha and more (Langgewens 3,7t/ha) in 2016. The drought resistance of canola is further illustrated by Photographs 1 and 2.



June



August

Photograph 1: A canola field in the Eendekuil area during the drought and after good follow-up rains in 2016.



June



July



August

Photograph 2: A canola field in the Swartland during the drought and after good follow-up rains in 2016. (Photographs supplied by J McDermott, E Burger and Philip van Schalkwyk)



2 June



12 August



1 November

Photograph 3: Eendekuil cultivar trial in 2016.

Photographs 1 and 2 illustrate the drought stress the plants were subjected to after germination in 2016. Although the plants were initially subjected to drought stress, the physiological development did not cease. This is a crucial aspect which caused clethodim damage in 2016, because applications were only possible around 46 days after the follow-up rain fell.

Sclerotinia effect on yield

Pictures in *Photograph 1* were taken on the farm De Brug in the Swartland. The cultivar was 44Y89 and the seed yield of the field was 1,98t/ha. *Sclerotinia* was a problem on this field and possibly reduced the yield potential.

The pictures in *Photograph 2* were taken in the Eendekuil area on a field where minimum tillage was applied. The field was planted with the cultivar Hyola 555 and the average yield on this farm (Baviaanskloof) was 1,85t/ha. The cultivar trial on the same field was planted on 10 May and established well. (*Photograph 3*). The average yield of the cultivar trial was 2,03t/ha and the yield of Hyola 555 was 2t/ha.

The canola plants in the Eendekuil trial took an average of 96 days until the flowering stage (50% of the plants with one flower). It took approximately 14 days longer than usual, but is attributed to the above-average temperatures in May, June and July 2016. All trials flowered later in 2016, which is characteristic of a hot growth season. The result of a longer growth season is that the crop forms more biomass, which increases yield potential if sufficient moisture and low temperatures are available late in the season, such as in 2016.

Conclusion

Canola can recover from a dry period shortly after establishment. It is, however, vital that canola is not planted in soil without sufficient moisture, as 20mm is regarded as effective rainfall (Arnon, 1992). The result of insufficient soil moisture is weak establishment and uneven germination, which are both detrimental to the harvesting process and yield.

The recommended planting date for canola in the Western Cape is from the beginning of April in the eastern parts of the Southern Cape until the end of April in the Swartland, provided that sufficient soil moisture is available.

For more information, contact the Directorate Plant Sciences, Western Cape Department of Agriculture on 021 808 5321 or email pietl@elsenburg.com. Sponsored by the Protein Research Foundation. Visit the website www.proteinresearch.net for newsletters and pamphlets. 🌱



Is biological control of weeds better than herbicides?

By Prof Charlie Reinhardt

Biological control (biocontrol for short), when applied in the broadest sense, involves the use of animals, insects, fungi or other microbes to feed upon, parasitise or otherwise interfere with a targeted pest species. Classical biocontrol targets a non-native pest (e.g. alien invasive weeds) for control by one or more species of biocontrol agents (e.g. insects, pathogens) from the pest's native range.

Classical biocontrol remains the most popular and successful approach for controlling alien invasive weed species the world over. Fundamental to the success of biocontrol as a practice, is the 100% host specificity required of biocontrol agents – an attribute that is supposed to protect against harmful effects on non-target species and ecosystems.

More readily accepted

Following several decades of intensive use of synthetic chemicals (herbicides, insecticides, fungicides, bactericides) for crop protection and other purposes, Harris (1991) points to public demand for a shift from chemical to biological control. However, several dilemmas are associated

with a change in emphasis from chemical to biocontrol – obstacles in the way of greater adoption of biocontrol range from scientific, legal, political to practical issues.

Therefore, biocontrol is essentially subjected to the same scrutiny as synthetic chemicals, except for the fact that the public, in particular consumers of farm products in developed countries, tends to more readily accept the employment of biocontrol practices for food production than they do chemical control practices.

Regulatory authorities responsible for the registration of agrochemical products, for pesticides in particular, are often perceived by the agrochemical industry to be guided more by public perception (politics) than by the real risks (exposure, toxicity) associated with the use of agrochemicals. Literature abounds with comparisons of the pros and cons of biocontrol compared to chemical control. When the authors are proponents of biocontrol, their approach is often to promote biocontrol as an adversarial or alternative measure in relation to the use of synthetic chemicals.

Undoubtedly, some supporters of the use of pesticides make the same

mistake, but fortunately the proponents of integrated pest management (IPM), in which all control practices are considered on an equal footing, still hold sway.

In order to avoid the quagmire of divergent and conflicting opinions, the present discussion will focus solely on salient facts as they apply in practice, with reference to examples of weed biocontrol in South Africa.

Apparent benefits

The benefits of successful control of an alien invasive weed in, for instance, the Kruger National Park through the release of this species' natural enemies, should be manifestly apparent. Safeguards against non-target harmful effects are vested in the standard procedures that candidate biocontrol agents imported from their natural habitats undergo exhaustive screening for efficacy and 100% host specificity under quarantine conditions.

The rationale for achieving success with biocontrol in natural environments is that non-target plant species, which dominate the plant community, i.e. indigenous vegetation, will take the invader(s) place. Similar logic applies to the control of aquatic alien invasive weeds (e.g. water lettuce, water hyacinth, Kariba weed), except that in this case the taking over by indigenous aquatic plants does not apply, due to the dearth of free-floating aquatic plants in South Africa.

In contrast, in crop production systems, the crop or desirable species is usually a single one that occurs at fixed density, whereas the weed spectrum on



Certain target weeds that have been successfully controlled biologically include the prickly pear, St John's wort and water lettuce.

a particular area can be diverse in terms of weed types and levels of infestation. In such a setting, selective biocontrol of one or even two weed species will hardly make a difference, since individuals of other species already present will simply take their place.

Economies of scale

However, in cases where a particularly noxious (herbicide-resistant, poisonous, extremely competitive, etc.) weed occurs in crop production, it might be practical to employ biocontrol. The basic problem with this kind of biocontrol is that economies of scale will dictate whether the product will have a large enough and sustainable market in order to warrant research and development (R&D) and registration costs.

One bioherbicide product that was discontinued in South Africa for the reason that the market was deemed too small is Hakattack®, which was a formulation containing spores of the fungus *Colletotrichum gloeosporioides* used for controlling the alien invader tree of Australian origin, silky or needle hakea (*Hakea sericea*) (Morris, 1982; 1983). The same fungus is registered in the United States (US) under the tradename LockDown® (Delta Farm Press, 2009) for the control of a rare legume weed species, *Aeschynomene virginica* (common names: curly indigo; northern jointvetch), which is particularly hard to control in rice with

synthetic herbicides. Other fungus-based bioherbicide products registered in the US (year 2000) were the products Smolder® and DeVine® for the control of the parasitic weed dodder (*Cuscuta* sp.).

I am unaware of any bioherbicide product currently registered in South Africa for weed control. In this country, there are several success stories on the biocontrol of alien invader weeds occurring in natural (e.g. conservation areas) or seminatural (e.g. game farms) habitats.

Classical biocontrol remains the most popular and successful approach for controlling alien invasive weed species the world over.

According to Moran et al. (2011), certain target weeds that have been successfully controlled biologically include the following species: several cactus species (e.g. the prickly pear, *Opuntia ficus-indica*), St John's wort (*Hypericum perforatum*), sesbania (*Sesbania punicea*), the aquatic weeds

water fern (*Azolla filiculoides*), kariba weed (*Salvinia molesta*) and water lettuce (*Pistia stratiotes*).

Continuing research

It should be borne in mind that eradication of these weeds has not been achieved, nor was it the aim. Consequently, they can occasionally be problematic in certain locations. Research by the Agricultural Research Council – Plant Protection Research Institute on these and many other targets for classical biocontrol is underway and continuous.

Cover crop or so-called 'smother crop' practices provide a type of non-classical biocontrol of weeds. By means of this practice, certain attributes of the crop are employed for weed suppression, and cover cropping is a key component of conservation agriculture.

Live crops and residual (dead) plant material are used to withhold light from weed seeds, thereby preventing or reducing germination. Biochemical compounds called allelochemicals, which are released from live and dead crop plants in the phenomenon of allelopathy, inhibit the germination, growth and development of weeds.

Although it is generally accepted that the use of synthetic herbicides will remain the mainstay of weed control programmes long into the future, it is imperative that we consider the alternative weed management options available. An integrated approach to weed management is crucial for sustainable crop production. In all instances, all the available weed control options deserve consideration in designing a weed management strategy that offers the best chance of contributing to maximise farmer profits and the achievement of optimal yields of safe and sufficient food. 🌱

Clethodim

damage in canola

By P Lombard, J Strauss and C Cummings, Directorate of Plant Sciences, Western Cape Department of Agriculture
(Source: Canola Focus, March 2017)

Evidence shows that canola is an ideal crop for crop rotation systems in the Western Cape. Not only does it offer the benefit of good returns, but it also provides the opportunity to control weeds with chemical agents from different groups. There are several herbicide options that can contribute to ryegrass control. Clethodim (cyclohexanedione) is also widely used under various brands for grass control in canola and especially on conventional cultivars.

Moisture strain

During the past 2016 season, clethodim damage occurred in various fields, varying from mild to severe. It was not only limited to certain farms and occurred across the Swartland and Southern Cape. The reason for the damage is mostly attributed to the dry month of May 2016.

It is important to understand canola's development, since its seedlings do not cease development during periods of drought. *Image 1* shows seedlings that underwent severe moisture strain five weeks after sowing. The plants had already formed five leaves. The problem is that herbicides do not function properly under such conditions. As a result, producers sprayed only clethodim for grass control after the rain in June.



Seedlings subjected to drought stress five weeks after planting, with severe clethodim damage visible on the insert.

Visible symptoms

Studies in Australia found that a late spray application and a double dose of clethodim during bud formation resulted in a yield loss of up to 55% (Zerner and Wheeler, 2013). The damage was between 0 and 15% at the recommended dosage. Up until the eight-leaf stage, no damage occurred when using the recommended dose, although damage did occur at the higher dosage. However, there were differences among cultivars, with some exhibiting no yield loss – a good reason to maintain the recommended dosage.

The symptoms are best visible when the plants flower. From a distance, the field appears to be less yellow in the areas where the damage occurred (*Image 2*). The flowers are deformed and in severe cases it appeared as if the flower buds had melted (*Image 3*).



Plants were less yellow where damage occurred.



Severely deformed flowers.

Poor pod formation occurred with severe damage. With less severe damage (plants in the middle of *Image 4*), the pods were deformed. *Image 4* depicts plants exhibiting conditions from zero to severe damage. They were derived from the same field as the plants in *Image 1*. Although the field did not exhibit any signs of damage, damage occurred where the sprayer turned and a consequently higher dosage was applied.

Plants with slight clethodim damage flowered over a longer period. (Later on, plants continued flowering to compensate.) For most seasons, the climate in the Western Cape is not favourable for pod development late in the growing season.

Recommendations made

The recommended sowing date of canola in the Western Cape province is from the beginning of April in the eastern parts of the Southern Cape to the end of April in the Swartland – provided that there is sufficient soil moisture. End of April and May is also a time when dry periods can occur and when weed control cannot be applied effectively.



Plants with no, slight and severe clethodim damage, from left to right.

It is crucial that clethodim is sprayed onto canola after the two-leaf stage, but before flower bud formation. (Note that at this stage no flower buds are visible). Effective pre-emergence weed control is essential, since the risk of clethodim spraying can become too high if late application becomes necessary. Any late application can be defined as the stage where the canola plant has already developed too far. This stage differs among cultivars.

Do not under any circumstances consider spraying clethodim and a fungicide together in a tank mixture. The result will be severe burn. When considering an early fungus spray (for instance for blackleg or white leafspot), first spray the fungicide and follow up seven to ten days later with the herbicide. It is important to adhere to the recommendations and dosage provided on the label at all times.

For more information, contact Piet Lombard at pietl@elsenburg.com.






Liquid-Lime

Tired of high lime cost?

Our Liquid-Lime is the answer!

Save now on transport, application, diesel and labor cost! This Liquid-Lime is the first and only one of its kind, in pure CaCO_3 form, available in Africa!

Breaking boundaries with nature...

Visit our website for more information

Telephone: +27 (0)21 872 0037
 Fax: +27 (0)86 299 4198
 E-mail: info@ecogreenagri.com
www.ecogreenagri.com



Crop applied with Liquid-Lime



Fertiliser industry

puts sustainability in the spotlight

By Izak Hofmeyr

The theme of the 57th congress of the Fertiliser Association of Southern Africa (Fertasa) in Durban was sustainability, with speakers focusing on sustainability of the fertiliser industry, water, soil, climate and agriculture.

Over the last few decades, high fertiliser prices have led to the establishment of many more fertiliser plants, which started putting pressure on prices as they came into production. Therefore, although there is a steady and constant growth in demand for fertilisers internationally, the supply remains larger than demand, something which constantly keeps pressure on

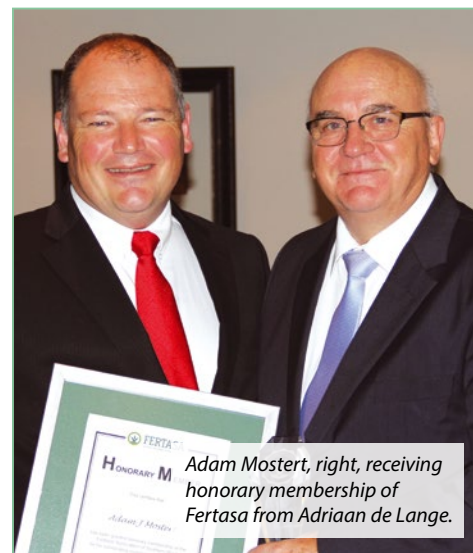
prices, noted Adriaan de Lange, Fertasa chairman, in his chairman's report.

Balancing priorities

Regarding the sustainability of the fertiliser industry in Africa, Paul Makepeace from the African Fertiliser and Agribusiness Partnership based in Kenya, pointed out that the need for distribution and supply of plant-available nutrients from areas of high concentration to those in need of food production and consumption, will continue as populations grow, urbanisation continues, incomes grow and the understanding of science grows. "Fertilisers as we know them," he said, "are likely to be around for a long time to come."

The main demand on water resources in South Africa will be from a growing population and demand for food, coupled with the multiplier effect of climate change on the increased scarcity of water. There will therefore be a pressing need to balance priorities. Agriculture remains crucial in terms of its ability to provide food and income to the rural poor. This was the opinion of Dr Sylvester Mpandeli, research manager of the Water Research Commission, with regard to the sustainability of water usage.

Prof Isaiah Wakindiki of the University of Venda painted a bleak picture of what



Adam Mostert, right, receiving honorary membership of Fertasa from Adriaan de Lange.

awaits humankind if the soil runs out – and it is fast in the process. "We have about 60 years of topsoil left! Soil loss is up to 40 times the rate of formation," he warned.

Prof Roland Schulze of the Centre for Water Resources Research at the University of KwaZulu-Natal suggested that we should recognise that climate change and the associated issues are real, and that coping strategies would have to be implemented urgently.

In the closing session, Prof Herman van Schalkwyk, CEO of Suidwes Landbou, discussed the sustainability of agriculture. For countries to reach long-term sustainability, he pointed out, they would have to become competitive.

Awards received

Fertasa awarded several members in various categories. Jane McPherson, manager of the Grain SA Farmer Development Programme, received the Training and Mentor Award in Small-scale Farming for 2017, while Schalk Grobbelaar, fertiliser consultant of Louis Trichardt, was nominated for the Silver Medal Extension Award.

The Gold Medal was awarded posthumously to Prof Willem Fölscher, previously of the University of Pretoria. His two grandsons, Willem Fölscher and Henk van Wyk, received the award on his behalf. Outgoing Fertasa CEO, Adam Mostert, was awarded honorary membership. 🌱



Adriaan de Lange, chairman of Fertasa, with Jane McPherson of Grain SA.



Arrie Janse van Vuuren, Willem Fölscher, Henk van Wyk and Adriaan de Lange.

By Dr Dirk Strydom

Large oilseed stocks

supported by Chinese demand



Table 1: World supply of the seven main oilseeds. (Source: Oil world)

Global supply and demand (million tons)			
	Forecast 2016/17	2015/16	2014/15
Opening stocks	93,1	97,2	77,5
Production	546,4	501,9	521,7
Total supplies	639,5	599,1	599,2
Disappearance	528,9	506	502
Ending stocks	110,6	93,1	97,2
Stocks/usage (%)	20,9	18,4	19,4

The global oilseeds supply is expected to reach a record level of 546,4 million tons for the seven main oilseeds. This high supply means that the production surplus will be at 111 million tons. The world supply of soya beans is ample and global production is estimated to reach a new high of 345,4 million tons, 33,6 million tons higher than last year's production levels. It is expected that production in the northern hemisphere will reach 161 million tons and the southern hemisphere 184 million tons.

Global soya markets

The estimated soya bean crops in the United States (US) and Brazil have reached levels of 117,2 million tons and 111,5 million tons respectively. Global traders expect that the Argentine crop will likely be below potential at around 55 million tons, mainly due to detrimental weather conditions during the season.

The global trade in soya beans is increasing, with China being the main destination. More than 80% of the anticipated growth in world soya bean imports is destined for that country. In the last decade, growth in terms of imports to China has created additional demand and supported prices. The largest contributor to this increase in demand within the Asian nation, is the substitution of dried distiller's grain with solubles (DDGS) with soya meal.

Global soya bean crushing is estimated to reach levels of approximately 282,4 million tons, which is roughly 10,9 million tons higher than the previous year's figures. In the medium term, the rest of the world's focus will mainly be on US soya bean, with unfavourable weather conditions in certain states possibly slowing down the planting progress.

Table 2: World soya bean supply and demand. (Source: Oil world)

Global supply and demand (million tons)			
	Forecast 2016/17	2015/16	2014/15
Opening stocks	80,23	83,98	62,76
Production	345,4	311,75	320
N. hemisphere*	161,38	145,09	146,89
S. hemisphere**	184,02	166,66	173,11
Total supply	425,63	395,73	382,76
Crush (Sept/Aug)	282,4	271,54	257,33
Other use	46,09	43,96	41,45
Ending stocks	97,14	80,23	83,98
Stocks/usage (%)	29,6	25,4	28,1

*EU/Russia and Ukraine/Canada/US/China/India

**Argentina/Brazil/Paraguay

Sunflower figures

The world sunflower seed production forecast is estimated at a record of 48,3 million tons. This is 5,3 million tons higher than the previous high in the 2015/16 season. International traders expected the global crushing of sunflower seed to decline to 18,8 million tons for the period from April to September.

The crushing of sunflower seed in Black Sea countries is projected to slow down somewhat over the next six months, but it is likely to be offset by more crushing in other regions such as Argentina, the European Union (EU) and on the local front. The world sunflower seed balance is expected to be significantly less in the second half of this season than at the same time last year, as a result of the consumption from Ukraine and Russia.

World production is, however, still expected to exceed demand during this season. Assuming normal weather conditions this year, a large crop may be seen in Black Sea countries, as sunflower seed is one of the most viable crops for producers in the Ukraine and Russia with its low production cost and adaptability to harsh weather conditions.

Table 3: World sunflower seed supply and demand. (Source: Oil world)

Global supply and demand (million tons)			
	Forecast 2016/17	2015/16	2014/15
Opening stocks	3,27	3,07	2,94
Production	48,28	42,85	41,33
Total supplies	51,55	45,92	44,27
Ending stocks	3,57	3,27	3,07
Stocks/usage (%)	7,4	7,7	7,5

Canola prices

Canola prices have appreciated due to weather and crop concerns in the EU and Canada, which account for approximately 63% of the world supply. In Canada, the canola futures appreciated more sharply than prices in the EU. Snowfall and wet fields are currently delaying the spring plantings of canola, which could make it challenging to complete this year's large plant intentions.

In Canada, the leading canola producer, it is expected that production will be at 19,4 million tons, which is higher than the previous year. However, with higher export and crushing figures, the ending stock is 700 000 tons lower than the previous season.

The world supply of soya beans is ample and global production is estimated to reach a new high of 345,4 million tons.

Groundnut crop

The Argentine groundnut crop is likely to reach record levels of one million tons (shelled) this season, provided that major losses due to excessive rainfall or frost can be avoided during completion of the harvesting in the short term. The Argentine crop for the year is expected to increase by 20 to 25% compared to the previous production season.

Table 4: Canola supply and demand. (Source: Oil world)

Canadian supply and demand (million tons)			
	Forecast 2016/17	2015/16	2014/15
Opening stocks	2,02	2,54	0,59
Production	19,4	18,38	16,41
Imports	0,08	0,1	0,08
Exports	10,65	10,3	9,14
Crushing	9,16	8,32	7,36
Other use	0,39	0,38	0,26
Ending stocks	1,3	2,02	2,54

Global prices of the majority of oilseeds decreased by small margins on a year-on-year (y/y) basis. However, groundnut prices increased by 42%, which was mainly due to production constraints. International traders are of the view that global groundnut prices are likely to come under some pressure in the near future if the expected crop size is confirmed. If expected production realises in the northern hemisphere and vegetable oil production recovers, it can be expected that oilseed prices will be under pressure.

Table 5: Main oilseed products (US\$/ton and R/ton). (Sources: Grain SA and Oil world)

Product	Apr 2017	Apr 2016	% change
Soya beans (US CIF Rotterdam)	388	396	-2
Soya beans (Brazil)	388	396	-2
Sunflower seed (EU)	400	427	-6
Groundnuts (US 40/50)	1 650	1 163	42
Palm oil (Malaysia)	681	707	-4
Soya bean oil (US)	737	758	-3
Sunflower oil (Arg)	720	771	-7
Soya meal (Arg)	352	355	-1
Fishmeal (Peru)	1 250	1 408	-11
Rand/dollar	13,44	14,6	-8
Sunflower seed	4 610	6 455	-29
Derived sunflower	5 233	6 126	-15
Soya beans	4 945	5 734	-14
Derived soya beans	5 749	6 317	-9
Soil canola	5 543	6 030	-8

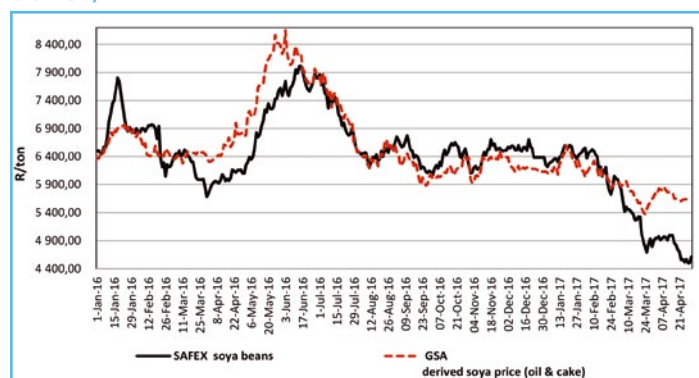
Local production

The local production of soya beans is also favourable, with the National Crop Estimates Committee (NCEC) expecting a production of 1 233 130 million tons of soya beans (742 000 – 2016), 853 470 tons of sunflower seed (755 000 – 2016) and 86 600 tons of groundnuts (17 680 – 2016).

In the NCEC's first intentions-to-plant report for winter grains, the canola plantings for the season are expected to be 32,21% more than last year's. The estimated area for the season is 90 000ha, while last year's area planted was 68 075ha. The prices on the local market followed normal seasonal trends, with prices under pressure at harvesting time due to larger supplies within the market.

The soya bean crop fared better than most expectations, which led to increased pressure on prices. This means that prices move below derived prices, increasing the crushing margins of processors (*Figures 1 and 2*). Soya beans should therefore remain under pressure in the short term, and will most probably recover in the second half of the year closer to derived prices.

Figure 1: Safex soya bean prices and the derived soya bean price. (Source: Grain SA)



Soya bean prices are sensitive to the exchange rate in times of a balanced supply and demand. However, in terms of a macroeconomic environment, the exchange rate is extremely volatile and sensitive to political instability. From Figure 3, it is clear that soya bean prices follow the exchange rate, with the exception of times when supply and demand are not in balance. In the previous season, this was due to limited available supply and in 2017 it is as a result of large supplies.

Over the next six months, it will be crucial to monitor the exchange rate and use the high volatile movements to the advantage of buyers and sellers, depending on the direction of such movement. 🌱

Figure 2: Crushing margins of soya beans. (Source: Grain SA)

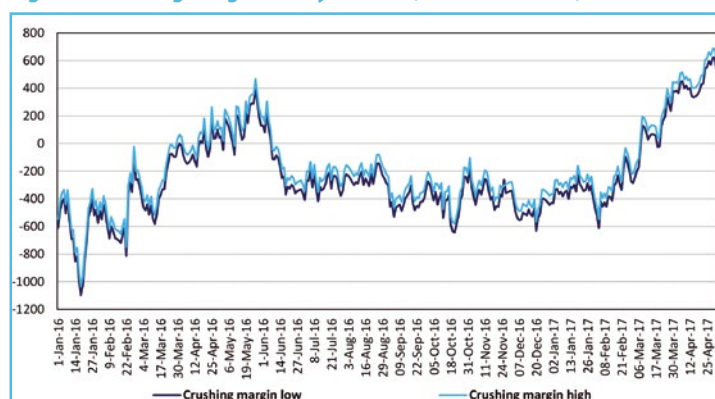
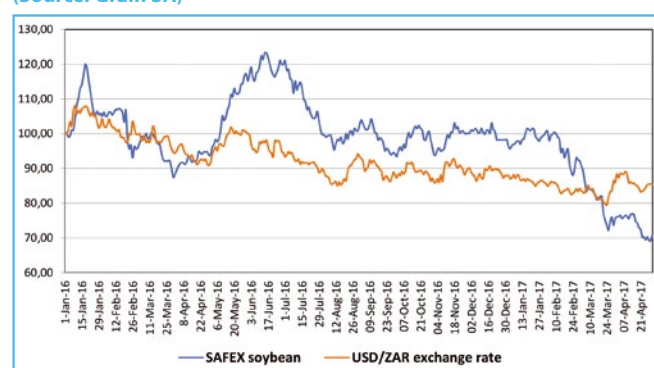


Figure 3: Soya bean price and rand-dollar exchange rate. (Source: Grain SA)



PANNAR's Versatile Sunflower Package

PERFORMANCE, STABILITY AND ADAPTIBILITY FOR RESULTS IN YOUR POCKET

Yield probability (%)

YIELD POTENTIAL (T/HA) 2015/2016						
Cultivar	1.0	1.5	2.0	2.5	3.0	3.5
PAN 7080	57	68	76	83	87	90
PAN 7098	72	68	63	58	52	47
PAN 7100	66	62	56	50	44	40
PAN 7102CLP	73	74	72	72	68	67
PAN 7160CLP	62	70	76	82	84	87

YIELD POTENTIAL (T/HA) 2014/2015 AND 2015/2016						
Cultivar	1.0	1.5	2.0	2.5	3.0	3.5
PAN 7080	72	75	78	80	82	83
PAN 7098	82	83	82	82	80	80
PAN 7102CLP	72	75	77	79	81	82

CLEARFIELD®, CLEARFIELD® PLUS and EURO-LIGHTNING® are the registered trademarks of BASF.

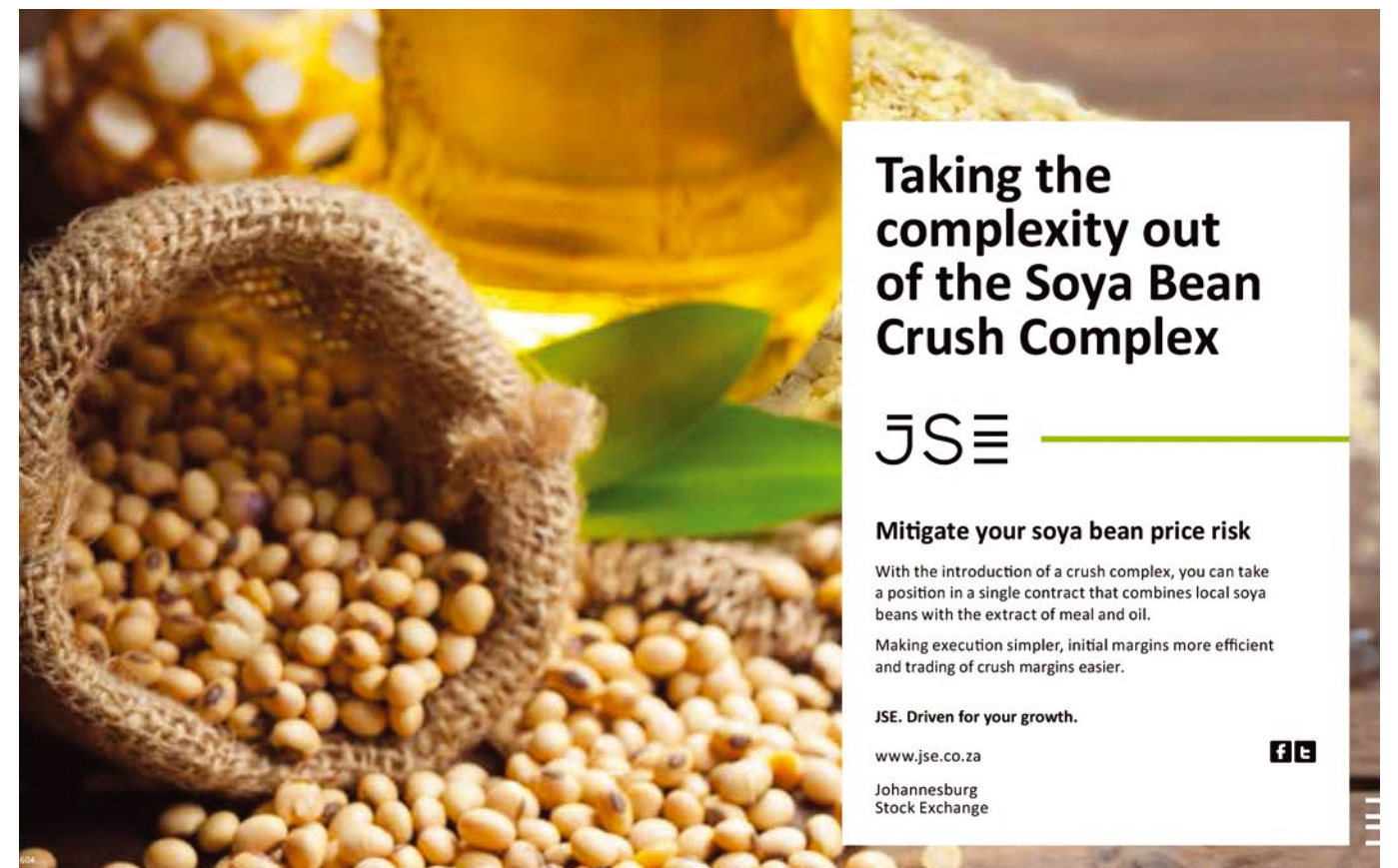


PANNAR Sunflower Package

	SINGLE CROSS	THREE WAY CROSS
Conventional	PAN 7080	PAN 7057 PAN 7098 PAN 7100
Clearfield® Production System	PAN 7102CLP PAN 7156CLP	PAN 7160CLP
High Oleic Acid	PAN 7158HO	

PANNAR maintains an outstanding performance record in the ARC national trials. For the past two years PANNAR has delivered six out of the top ten sunflower hybrids in the ARC national trials.

PANNAR
Together we farm
for the future®



Taking the complexity out of the Soya Bean Crush Complex

JSE

Mitigate your soya bean price risk

With the introduction of a crush complex, you can take a position in a single contract that combines local soya beans with the extract of meal and oil.

Making execution simpler, initial margins more efficient and trading of crush margins easier.

JSE. Driven for your growth.

www.jse.co.za

Johannesburg
Stock Exchange



Farmwise offers a comprehensive brokerage service with a diverse client base which includes producers, consumers and speculators from a wide geographical area.

This enables us to keep an 'ear to the ground' at all times. We have a low client to broker ratio, which ensures prompt and efficient service.

The company has developed an internet based trading system that enables our clients to monitor the market in real time, as well as placing electronic orders.

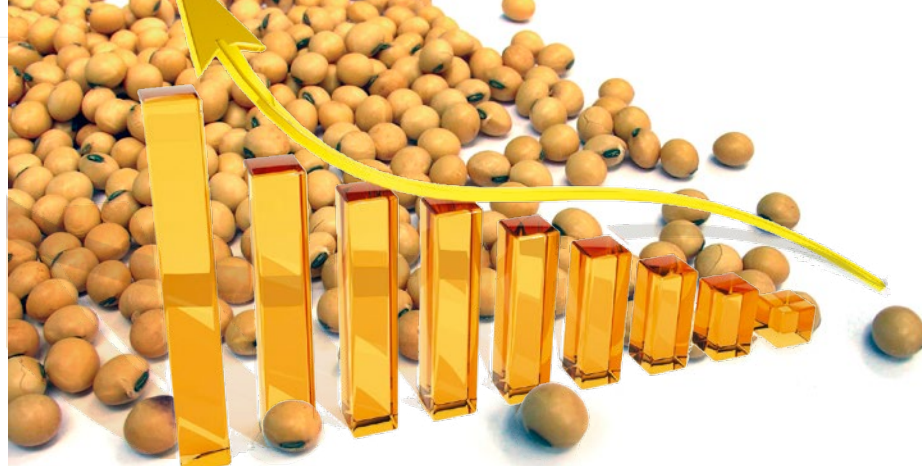
Farmwise was one of the founding members of the AMD Division of SAFEX, so we have stood the test of time.

T +27 11787-3666
info@farmwise.co.za
PO Box 3660, Randburg, 2125
www.farmwise.co.za

Farmwise
grains

Specialised services offered by Farmwise:

- **Trading on the South African Futures Exchange (SAFEX)**
We have a highly skilled team of professionals that provide market-based solutions to all participants.
- **Currency futures trading**
Farmwise is a member of the Yield-X division of the JSE. Allow us to hedge your currency risk.
- **Spot trading**
This market encompasses a wide variety of feed grains and other specialty products. To ensure successful trading in this environment in-depth knowledge of the marketplace, the counter parties involved and the risks inherent to these activities are required.
- **In-silo grain financing** provides our clients the financial flexibility to make considered marketing decisions. Cash flow constraints should not force a market participant into a marketing decision and Farmwise provides the where withal to ensure this.
- **Regular workshops and in-house training**, ensures that staff and clients remain on the cutting edge of all new developments in the marketplace.



Soya bean crush complex

– the right product at the right time

South Africa's soya bean production has been a great success story over the past decade, with a ramp-up in production reaching one million tons. Over the same period, the country's soya bean crushing capacity has also seen a significant increase.

For this reason, soya bean crushers and commodity traders have expressed significant interest in the ability to trade the entire crush complex. This crush complex includes local soya beans and relies on the Chicago Mercantile Exchange (CME) meal and oil as a proxy for global prices.

Key component

The complex, a key component in the soya bean market, is what is known as the 'crush' spread. Soya beans are processed into two products, namely soya bean meal (SBM) and soya bean oil. The crush spread is the difference between the combined value of the products and the value of the soya beans.

It is a measurement of the profit margin for soya bean processors. The soya bean processor will be interested in the crush spread as part of its hedging strategy, and the speculator will look at the crush spread for trading opportunities.

Although we have the individual contracts listed, the challenge today is the initial margin efficiency to wrap all three

as a single product in the desired ratios. For instance, when crushing 100 tons of beans, this will result in 74 tons of meal and 17 tons of oil, with 9 tons as wastage.

Separate contract

Therefore, a crush spread can be calculated as the price of SBM (R/t) multiplied by 74%, plus the price of soya bean oil (R/t) multiplied by 17%,

less the price of soya beans (R/t). The current clearing solution does not allow for this and therefore it necessitated the introduction of a separate contract that will trade the complex, wrapped up as a single product.

Figure 1 represents a time series of the crush margin, supporting the urgency for a price risk management tool such as a futures contract.

Figure 1: Soya bean crush margin.



The Johannesburg Stock Exchange (JSE) soya bean crush complex is an easily accessible hedging tool for the crusher, while traders are also able to participate in the movements of this crush complex. This product is not unique to the JSE, as globally the CME Group offers it not only for their local soya beans but also links it with the Dalian Commodity Exchange in China.

JSE

For more information, visit the JSE website: www.jse.co.za.



By Dr Charl van der Merwe, Tiger Brands

The peanut butter market in South Africa

Between 20 000 and 25 000 tons of peanuts were used annually for the manufacturing of peanut butter between 2006 and 2013 in South Africa. This volume includes splits and 80/100s.

The peanut butter segment is an important one in the groundnut market of the country. The prospects for this market segment are promising.

Socio-economic factors

The demand for a product is influenced by the financial status of the consumer and the socio-economic factors in the country. The percentage of citizens who passed matric increased by 27% between 2010 and 2014 (Figure 1). The number of people with a monthly income of between R5 000 and R20 000 increased from 44 to 63% (Figure 2) between 2001 and 2015.

Figure 1: Education levels.

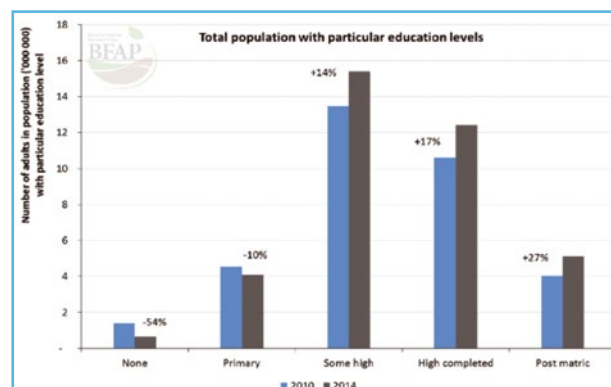
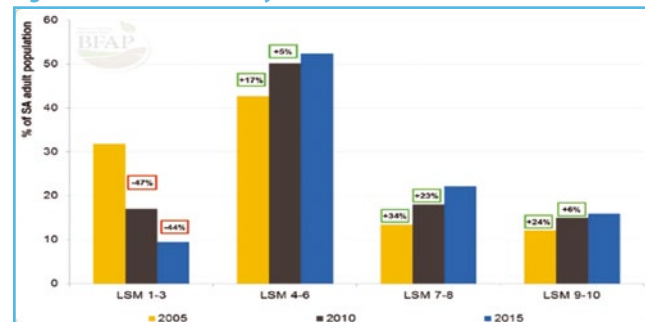


Figure 2: Household income. (Source BFAP)

Total population average monthly household income:	2009	2015
	Share of adult population:	
R1 - R799	5.7%	1.7%
R800 - R1 399	17.1%	5.4%
R1 400 - R2 499	14.6%	8.4%
R2 500 - R4 999	19.0%	21.2%
R5 000 - R7 999	13.8%	18.9%
R8 000 - R10 999	10.2%	12.0%
R11 000 - R19 999	10.3%	14.4%
R20 000+	9.3%	18.7%
	56%	37%
	44%	63%

The increase in household income and the decrease in unemployment from 41% in 2001 to 24% in 2015, equate to an increase in the number of people in the middle to upper classes as indicated in Figure 3.

Figure 3: LSM class mobility.



The upper middle and upper classes have steadily grown between 2005 and 2010 according to the information presented in Figure 3. This is significant because according to the information in Table 1, peanut butter forms part of the diet of the middle and upper classes.

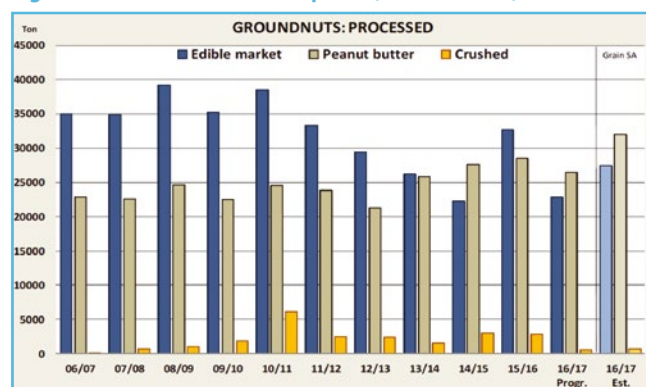


Table 1: Food choices. (Source: BFAP)

	Population	Poorest 30%	Lower middle class	Upper middle class	Wealthiest 20%
Animal protein foods (continued)	• Eggs • Canned pilchards • Polony • Fresh/frozen/chilled fish • Pork	• Beef sausage • Polony	• Canned pilchards • Polony • Mutton and lamb	• Mutton and lamb • Canned pilchards • Polony • Fresh/frozen/chilled fish	• Eggs • Pork • Fresh/frozen/chilled fish • Polony • Viennas • Canned pilchards
Fats, oils	• Edible oils (e.g. cooking oils) • Margarine • Peanut butter	• Edible oils (e.g. cooking oils) • Margarine	• Edible oils (e.g. cooking oils) • Margarine	• Edible oils (e.g. cooking oils) • Margarine • Peanut butter	• Edible oils (e.g. cooking oils) • Margarine • Peanut butter • Butter

Peanut butter is included in the diets of the upper middle and upper classes. An increase in the number of people in the middle class, can equate to an increase in peanut butter consumption. Local peanut butter consumption over a twelve-year period is indicated in Figure 4.

Figure 4: Peanut butter consumption. (Source: SAGIS)



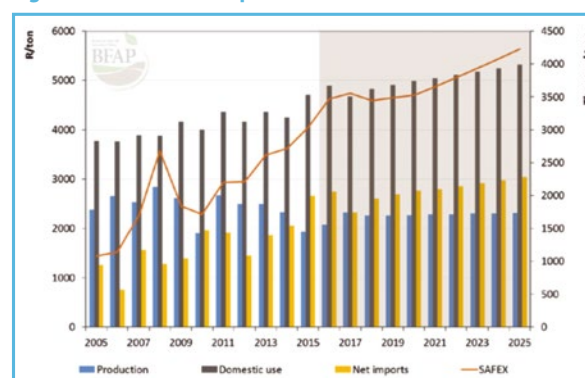
Health and markets

More than 25 000 tons of groundnuts were used for the manufacturing of peanut butter in 2013. It is projected that more than 30 000 tons of groundnuts will be used for peanut butter in 2017.

Groundnut consumption is supported by the socio-economic factors as discussed above and by a focus on a healthy diet. According to *Men's Health* magazine, groundnuts are a good source of protein. The vitamin E helps to protect cells and the magnesium (Mg) in groundnuts assists with metabolic activity.

Peanut butter consumption is also influenced by wheat consumption. Local wheat consumption is indicated in Figure 5. The information indicates a steady growth in wheat consumption due to the growing middle class in South Africa.

Figure 5: Wheat consumption.



Groundnut consumption is also influenced by the price of groundnuts, and normal levels of supply and demand will influence the price. Price movements since 2000 are indicated in Figure 6.

Figure 6: Groundnut prices.



International groundnut prices increased during 2016, as a result of the rain during harvesting in Argentina and the higher demand from China. The possibility exists that prices will decrease if the demand and supply situation returns to normal levels. Lower prices can support the demand for groundnuts and peanut butter.

Conclusion

Growth in the middle and upper classes in South Africa and higher household incomes over the past few years have boosted the peanut butter market in the country. The peanut market has grown by approximately 14% since 2010. Socio-economic factors and the international prices will influence growth in the peanut market in the future.

The percentage of local groundnuts used for peanut butter manufacturing increased from 41% between 2011 and 2013 to 51% between 2014 and 2016, compared to 60% in the United States (US).

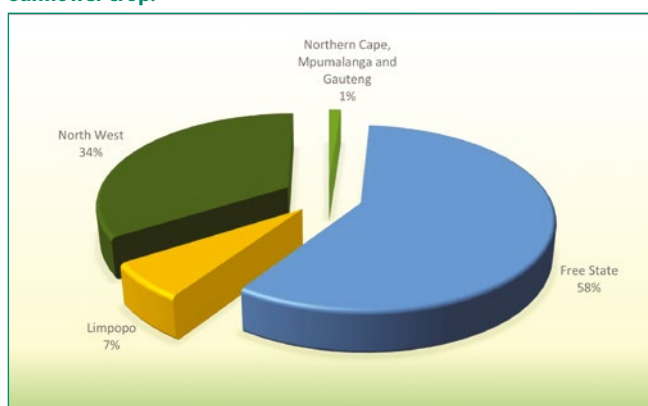
Sunflower crop quality overview:

2015/16 production season

The deep root system of a sunflower enables the plant to perform better than other crops during dry seasons, making sunflower seed production very suitable amid South African climatic conditions. As a result, sunflower seed production exceeded soya bean production this season for the first time since the 2010/11 season.

The final commercial sunflower crop figure of the 2015/16 season is 755 000 tons. This figure represents an increase of almost 14% (92 000 tons) compared to the 2014/15 season. The major sunflower-producing provinces, Free State and North West, contributed 92% of the total crop (Figure 1).

Figure 1: Provincial contribution to the production of the 2015/16 sunflower crop.



The area utilised for sunflower production increased by almost 25%, from 576 000ha in the previous season to 718 500ha this season. Due to the drought conditions, production only increased by 14% as the yield decreased from 1,15 to 1,05t/ha.

Annual improvements

Global sunflower seed production for the 2015/16 season stands at

42 465 million tons, with the Ukraine and Russia contributing 51% to this total. The forecast for the 2016/17 season is 47 397 million tons, according to figures published in the 2016 *US Sunflower Crop Quality Report* compiled by the United States (US) National Sunflower Association (NSA).

According to the Bureau for Food and Agricultural Policy's *BFAP Baseline Agricultural Outlook 2016–2025*, the sunflower area is expected to decline in 2017 to around 2015 levels, assuming normal rainfall patterns, before stabilising at approximately 560 000ha by 2025. An average production increase of 1,4% per annum is expected to result

in a production of 820 000 tons by 2025, driven by average annual improvements in yield of close to 3% in the same year.

During the 2016 harvesting season, a representative sample of each delivery of sunflower at the various silos was taken according to the prescribed grading regulations. A total of 176 composite

sunflower samples, representing the different production regions, were analysed for quality and the results published in the fourth annual *South African Sunflower Crop Quality Report 2015/16 Season*.

Of the 176 samples analysed for the purpose of this survey, 78% (138) were graded as Grade FH1 and 38 of the samples were downgraded to class other

sunflower seed (COSF). The percentage of FH1 samples showed a decrease compared to the 86 and 82% of the 2014/15 and 2013/14 seasons respectively. This decreasing trend could not be attributed to any single grading deviation.

Collective deviations

The majority of samples were downgraded as a result of the percentage of either the screenings, foreign matter or the collective deviations, or a combination of these exceeding the maximum permissible deviations of 4 and 6% respectively. The presence of poisonous seeds (*Datura* sp.) exceeding the maximum permissible number, one per 1 000g, was also a contributing factor.

Gauteng, represented by two samples, reported the highest weighted average percentage screenings of 3,60%, followed by the North West (N = 80) and Free State (N = 80) with 2,80 and 2,01% respectively. Limpopo (seven samples) reported the lowest average percentage screenings of 1,09%. The weighted national average was 2,34% compared to the 2,05% of the previous season. The maximum permissible deviation according to the grading regulations is 4%.

Sclerotia of *Sclerotinia sclerotiorum* was observed on 18 of the samples (10%), compared to the nine and eleven of the previous two seasons respectively. Fourteen of these samples originated in the North West and three in the Free State. The highest percentage (1,80%) was present on a sample from Mpumalanga. This is however still well below the maximum allowable level of 4%. Weighted average levels ranged from 0% for Gauteng and Limpopo, 0,03% in the Free State and 0,04% in North West

to 0,26% in Mpumalanga. The national average of 0,04% was equal to the previous season.

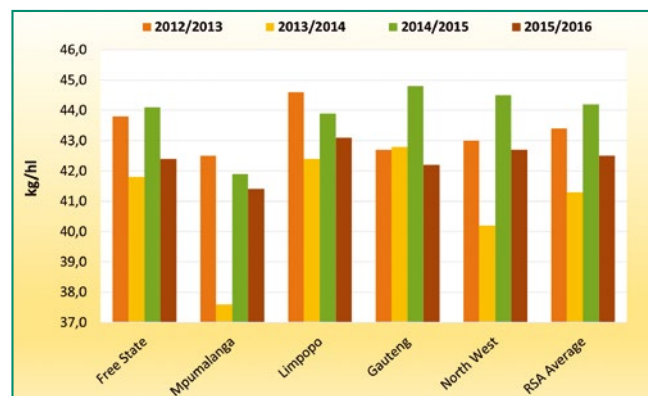
Foreign matter

The highest weighted percentage foreign matter (1,77%) was reported for the seven samples from Mpumalanga. The Free State and North West averaged 1,61 and 1,23% respectively. The lowest average percentage was found in Limpopo, namely 1,01%. The national average of 1,41% was the highest of the last three seasons.

Test weight, providing a measure of the bulk density of grain and oilseeds, does not form part of the grading regulations for sunflower seed in South Africa. An approximation of the test weight of these crop samples was done by determining the g/1ℓ filling weight of each sample using the Kern 222 apparatus.

The test weight was then extrapolated by means of formulas obtained from the 'Test Weight Conversion Chart for Sunflower Seed, Oil' of the Canadian Grain Commission (CGC). The weighted average this season was 42,5kg/hℓ. Individual values ranged from 35,0 to 48,1kg/hℓ. Last season's values ranged from 34 to 50,5kg/hℓ and averaged 44,2kg/hℓ (Figure 2).

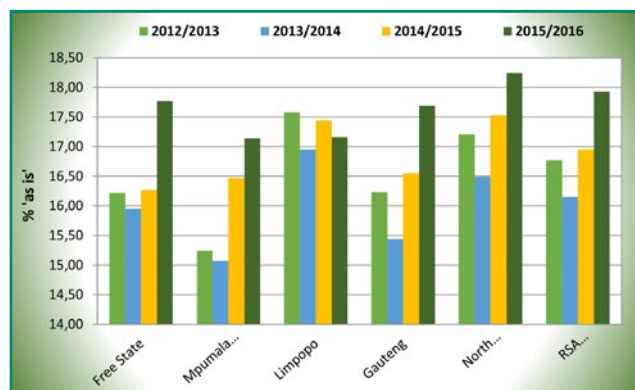
Figure 2: Comparison of the test weight per province over four seasons.



Nutritional component

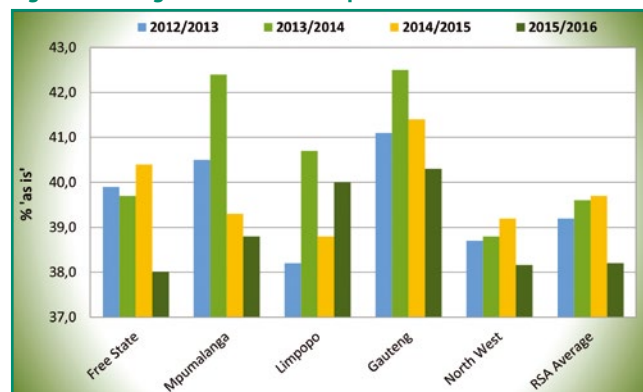
The nutritional component analyses of crude protein, crude fat, crude fibre and ash are reported as a percentage (g/100g) on an as-received or as-is basis. The weighted average crude protein content this season was 17,93%, almost one percent higher than the previous season and the highest average value since the start of this survey in 2012/13. The North West had the highest weighted average crude protein content of 18,24%, and Mpumalanga the lowest with 17,14%. The Free State's crude protein content averaged 17,77% (Figure 3).

Figure 3: Average crude protein content per season.



The weighted average crude fat percentage of 38,2% was the lowest of the last four seasons and 1,5% lower than the previous season. Gauteng had the highest weighted average crude fat content of 40,3%. The lowest average fat content was observed in the Free State (38,0%). North West and Mpumalanga averaged 38,2 and 38,8% respectively (Figure 4).

Figure 4: Average crude fat content per season.



The weighted average percentage crude fibre increased slightly from 20% in the previous season to 20,3% this season. Average values varied between 19,2% in Gauteng to 20,9% in Mpumalanga. The weighted average ash content is slightly higher with 2,59% than last season's 2,55%. The provincial averages ranged from 2,49% in Mpumalanga to 2,69% in Limpopo.

The results of this survey are available on the Southern African Grain Laboratory NPC (SAGL) website www.sagl.co.za. Hard copy reports are distributed to directly affected groups and interested parties. The report is also available for download in PDF format. With gratitude to the Oil and Protein Seeds Development Trust (OPDT) for financial support of these annual surveys and to the members of Agbiz Grain for providing the crop samples. 🌻

Trypsin inhibitor activity in soya bean meal and its effect on broiler performance

Growth depression effects on poultry due to antinutritional factors present in soya beans, have been well documented for over 50 years. Trypsin inhibitors are the primary antinutritional factor in soya bean meal (SBM), which is a globulin-type protein. Trypsin inhibitors inhibit the conversion of zymogens to active proteases of trypsin and chymotrypsin. In addition to their detrimental effects on proteolytic action, trypsin inhibitors dramatically affect the size of the pancreases and amount of trypsinogen produced.

The requirement to heat treat soya beans has been understood for nearly a century. The pH rise was adopted as the common method of determining adequate heat. A change in pH above 0,2 pH units is considered underheated. Animal feed manufacturers in Brazil use 0,3 pH units as the upper limit of SBM processing.

It has been established that a pH unit change of zero is not an adequate measure of overprocessing, but that if it is between zero and 0,05, the SBM

has been adequately processed. This is a level considered ideal and should be strived toward. It must be noted that heat treatment of SBM only destroys those antinutritive factors that are heat-labile.

High correlation expected

As recently as 2001, standardised tests were established for trypsin inhibitor analyses. The correlation between trypsin inhibitors and urease activity is expected to be high. Urease activity is still the methodology of choice for measuring the acceptable estimation of the trypsin inhibitor content in SBM.

It is unclear what the optimum residual concentration of trypsin inhibitors should be. Work published as far back as 1991 shows a linear response between bird performance, body weight gain (BWG) and feed conversion, and levels of trypsin inhibitor activity (TIA) (mg/g) in soya bean in the ration. There still seems to be considerable uncertainty regarding these levels. As recently as 2014, Pacheco et al. showed optimal bird performances at TIA of 6,7mg/g rather than the lowest value of 3,6, which was also fed as a treatment.

Response of performance to TIA did not appear linear in this trial. Ruiz (2012) observed that if feed contained high levels of SBM with a TIA of more than 3,5mg/g or urease activity above 0,06 pH units, rapid feed passage outbreaks could occur (observation not a trial), detrimentally affecting bird performance.

Genetic potential

TIA tests are expensive and time-consuming, with a repeatability standard deviation of 0,27 (Sueiro, 2015). Considering the correlation found by Belalcazar and Otalora (2012) as quoted by Riaz (2012) ($0,0738x - 0,1224$ with an $R^2 = 0,9748$), it has been proposed that the urease index should continue to be used in conjunction with TIA – a more rapid test for underprocessing, but a figure as low as zero is not an indication of overprocessing.

The genetic potential of the modern-day broiler has resulted in broilers being slaughtered at an earlier age each year, also resulting in a continuous improvement in gain-to-feed ratio. Diets have become more nutrient-dense, since high-density diets not only achieve maximum performance but have become synonymous with optimal performance.

Globally, soya bean processing has improved with the consequential improvement in SBM quality. The measurement of SBM quality is extremely complex and starts with proximate analysis, higher protein levels obviously still being the major economic value driver of SBM. The ratio of amino acids to protein also differs depending on the source of SBM – the main influence on this being the composition of the soya bean used in processing.

Digestibility of nutrients is critical



and affected by many criteria other than heat-sensitive antinutritive factors, such as levels of lectins, mannans, raffinose and stachyose. Lower fibre levels have therefore been required.

The nutrient profile differs among the various sources of SBM. Higher protein not only increases the quantity of essential amino acids, but there is solid evidence that amino acid digestibility improves as the protein content of the SBM increases.

Conclusion: SBM quality is determined by many other factors other than TIA level. The global industry still considers urease index as the appropriate measurement for underprocessing. Levels have been driven down to below 0,1 urease index to ensure sufficient processing. SBM with a higher TIA may have significantly higher digestible amino acid levels, irrespective of TIA value.

Testing methods

The international standard method for the determination of soya products is ISO 14902, when compared to the American Association of Cereal Chemists (AACC) standard AACC 22-40.01 as modified by Hamerstrand in 1981 and expressed as mg of inhibited trypsin per gram of sample. TIA values according to ISO 14902 result in significantly lower values than the previously mentioned method. These methods are not directly comparable (Sueiro et al. 2015). The particle size of samples during analysis was found critical.

Conclusion: The testing method needs to be clearly stated and understood when TIA levels vs performance is quoted. Particle size is of critical importance.

Overprocessing

TIA unfortunately does not measure overprocessing of SBM and is something which is of definite concern. There is compelling evidence that overprocessed SBM would lead to reduced broiler performance (Wiltafsky, 2013). The lower the TIA, the higher is the risk of overprocessing and reduced amino acid availability.

Conclusion: TIA is not a measure of overprocessing, but has become a key criterion with regard to SBM quality. Lower TIA is a higher risk of overprocessing.

Broiler performance and TIA

In studies conducted on SBM of various origins, it has been found that United States (US) SBM with a TIU/mg of 2,52 (urease 0,08) versus that of Argentina with a TIU/mg of 1,98 (urease 0,007) exhibited a better crude protein (CP) digestibility and an 88% lysine (Lys) and 88% methionine (Met) digestibility, versus Argentina at 86% digestibility.

The lower potassium hydroxide (KOH) level of 78% for Argentine SBM tended to overprocessing, which could have resulted in lower amino acid digestibility (Ravindran 2014). US SBM consistently resulted in better broiler performance due to its protein quality, despite higher TIA levels.

Gous (2016) replaced Argentine (Molinos) SBM with a TIA of 1,28, with South African SBM with a TIA of 3,04. Although not statistically significant, the South African SBM had a numerically better feed conversion of 0,05 and superior BWG of 45g at slaughter for Ross broilers.

This could be ascribed to the higher protein content and quality of our local SBM, and clearly corroborates what has been experienced commercially that high-quality South African SBM not only performs as well as Argentine-imported meal in broiler rations, but can demand a premium due to its higher digestible nutrient content.

Conclusion: There is no trial work in the literature which demonstrates that a difference of one TIA mg/g will have any significant effect on broiler performance at low levels of TIA. Such trial work still needs to be done. Contrary to this significant difference in broiler performance, it has been found between SBMs with the same TIA levels.

Particle size

In the US, Pacheco (2014) concluded that when using expeller SBM there was not a linear response in bird performance to TIA. A curvilinear response for both feed conversion and BWG was experienced. The particle size of the SBM had a greater effect on bird performance than the TIA.

Conclusion: Particle size of SBM could have as significant an effect on broiler performance as TIA. Broiler performance response to TIA is not necessarily linear.

Enzymes

There is compelling evidence that the use of various enzymes – mainly protease, pectinase and phytase – could positively influence the negative effects of antinutritive factors in SBM, further complicating the correlation between TIA and bird performance (Stefanello, 2012), (Aureli, 2013) and (Faruk, 2013).

Conclusion: Enzyme inclusion and their combinations could have a significant effect on TIA level, which will affect broiler performance.

Uniformity

Uniformity of SBM is considered globally and by the local feed industry to be an important criterion. At the beginning of soya bean volume crushing in South Africa, it presented a challenge due to the restricted continuity of processing. This aspect has been improved considerably, so much so that major end users of certain locally produced material are starting to report subtle differences between Argentine- and South African-produced SBM uniformity.

Conclusion: High-quality South African SBM, if produced in large consistent volumes, can obtain the uniformity experienced by Argentine suppliers.

TIA in full-fat and expeller SBM

It can be confirmed that laboratories testing TIA are very comfortable to analyse for TIA in soya bean, full-fat soya, expeller SBM and solvent-extracted SBM. TIA tends to be higher in full-fat and expeller SBM, but they can confirm this is not due to the TIA test but the fact that trypsin inhibitor content of these raw materials is generally higher than solvent-extracted SBM, due to the fact that they have not been heat-treated to the extent that solvent-extracted SBMs are. Despite this, they can still deliver good broiler performance to the same extent that moderately higher TIA SBMs can.

Conclusion: TIA analysis can be performed equally well on soya beans, full-fat soya, expeller oilcake and solvent-extracted meal. TIA limits are applicable to all soya bean protein sources. 🌱

Soya bean crop quality overview:

2015/16 season

The extreme drought conditions experienced this past season has led to an approximately 27% (184 500ha) decline in the local soya bean production area. Yield was also negatively impacted, with the average national yield decreasing from 1,56t/ha in 2014/15 to 1,47t/ha. The result was an almost 31% (328 000 tons) decline in the commercial soya bean crop compared to the previous season.

Sunflower production surpassed soya bean production for the first time since the 2010/11 season. The major soya bean producing provinces, contributing 75% of the total crop, were Mpumalanga and the Free State. Numbers reflected in *Figure 1*, were obtained from the National Crop Estimates Committee (NCEC).

Figure 1: Tonnage and area utilised for soya bean production since the 2005/06 season.



According to the Bureau for Food and Agricultural Policy's *BFAP Baseline Agricultural Outlook 2016–2025*, a high demand for soya beans arising from expanded crushing capacity is expected to cause a sharp increase in area utilised for soya bean production in 2017.



Assuming normal rainfall patterns, production is expected to recover to more than 900 000 tons this year.

Global production

An estimated 312,81 million tons of soya beans were produced during the 2015/16 season, according to the *World Agricultural Supply and Demand Estimates (WASDE)* report (WASDE-563). The United States

contributed 34%, Brazil 31% and Argentina 18% to this total. Global soya bean production during the 2016/17 season is projected to be 340,79 million tons. Soya beans account for more than half of the world's oilseed production.

During the 2016 harvesting season, a representative sample of each delivery of soya beans at the various silos was taken according to the prescribed grading regulations. A total of 143 composite soya bean samples, representing the different production regions, were analysed for quality and the results published in the

fifth annual *South African Soya Bean Crop Quality Report 2015/16 Season*.

Quality results summary

Of the 143 samples analysed for the purpose of this survey, 89% (127) were graded as Grade SB1 and 16 of the samples were downgraded to class other soya beans (COSB). During the previous two seasons, 87% (2014/15) and 88% (2013/14) of the samples were graded SB1.

The majority of the samples were downgraded as a result of either the presence of poisonous seeds exceeding the maximum permissible number of either one per 1 000g or seven per 1 000g, or as a result of the percentage other grain and/or foreign matter exceeding the maximum permissible deviations of 0,5% and 5% respectively.

According to the South African soya bean grading regulations, the determination of the percentage wet pods in a consignment must be performed based on a working sample of at least 10kg of soya beans from a representative sample of the consignment. Due to practical considerations, the samples received at the Southern African Grain Laboratory (SAGL) NPC from the grain storage companies, are typically ± 5 kg.

Pods were found in twelve of the 143

samples graded. All of these pods were green upon receipt at the SAGL, but not wet according to the definition. The percentage of these pods in the samples ranged from 0,05 to 0,50% based on a working sample size of at least 200g.

The national average percentage of foreign matter has increased over the last five seasons, reaching its highest level this season, increasing from 0,34% in 2011/12 to 0,82% during the last season and to 0,85% now. The samples from North West had the highest weighted average percentage, namely 1,62%. The percentage in the rest of the samples ranged from 0,26 in the Northern Cape to 0,91 in Mpumalanga.

Presence of sclerotia

The number of samples containing sclerotia increased from 20 in the previous season to 36 this season. The highest percentages of sclerotia observed (0,76 and 0,64%) were on samples from Mpumalanga, followed by a sample from North West with 0,60%. These percentages are, however, still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0,04% compared to the 0,01% of the previous season.

North West (eight samples) reported the highest weighted average percentage soya beans and parts of soya beans above the 1,8mm slotted sieve which pass through the 4,75mm round-hole sieve, namely 1,56%, and the sample from the Northern Cape the lowest at 0,40%. Mpumalanga, with the highest number of samples (91), reported an average of 0,90%. The Free State averaged 1,03% (23 samples). The national weighted average percentage decreased from 1,81% the previous season to 0,92% this season.

The lowest weighted average percentage of defective soya beans on the 4,75mm sieve, were observed on the samples from Mpumalanga, namely 1,46%. The Northern Cape reported the highest percentage of 4,94, followed by North West and KwaZulu-Natal with

Soya beans are the main oilseed crop produced in South Africa, driven mainly by the demand for protein feed in the animal feed industry.



3,99 and 3,34 respectively. The national weighted average increased slightly from 1,95% last season to 2,02% this season.

An estimated 95% of the area planted to soya beans in South Africa consists of genetically modified crops.

The national weighted average percentage soiled soya beans of 2,06% is the highest since this survey started in the 2011/12 season, when the average was 1,60%. The average was 0,77% last season. Average weighted percentages per province ranged from 1,28 in the Northern Cape to 4,46 in Limpopo.

Soiled soya beans

Although the number of samples containing soiled soya beans as well as the average percentage soiled soya beans per sample increased significantly, none of the percentages were above the maximum permissible deviation of 10% according to the grading regulations. Last season one sample

from Mpumalanga exceeded this limit.

Test weight, providing a measure of the bulk density of grain and oilseeds, does not form part of the grading regulations for soya beans in South Africa. An approximation of the test weight of these crop

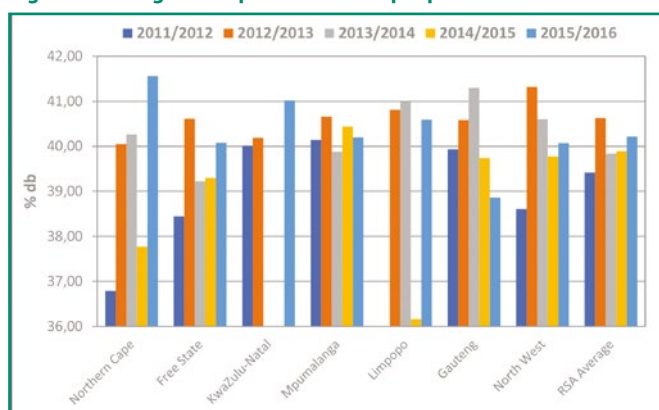
samples was done by determining the g/1ℓ filling weight of each sample using the Kern 222 apparatus.

The test weight was then extrapolated by means of formulas obtained from the 'Test Weight Conversion Chart for Soya Bean' of the Canadian Grain Commission (CGC). The weighted average this season was 70,9kg/hℓ. Individual values ranged from 64,9 to 73kg/hℓ. Last season's values ranged from 63,3 to 78,2kg/hℓ and also averaged 70,9kg/hℓ.

Soya beans are the main oilseed crop produced in South Africa, driven mainly by the demand for protein feed in the animal feed industry. The nutritional component analyses, namely crude protein, crude fat, crude fibre and ash are reported on a dry basis (DB) (moisture-free basis).

The weighted average crude protein content this season was 40,22%, slightly higher than the 39,89 and 39,84% of the previous two seasons. The sample from the Northern Cape had the highest weighted average crude protein content of 41,56%, while Gauteng reported the lowest average, that of 38,86% (Figure 2).

Figure 2: Average crude protein content per province over five seasons.



Crude fat percentage

The weighted average crude fat percentage of 19,4% compared very well with the 19,3% in 2014/15. The samples from KwaZulu-Natal had the highest weighted average crude fat content of 20,6%. The lowest average fat content was observed in Mpumalanga with 19,1% (Figure 3).

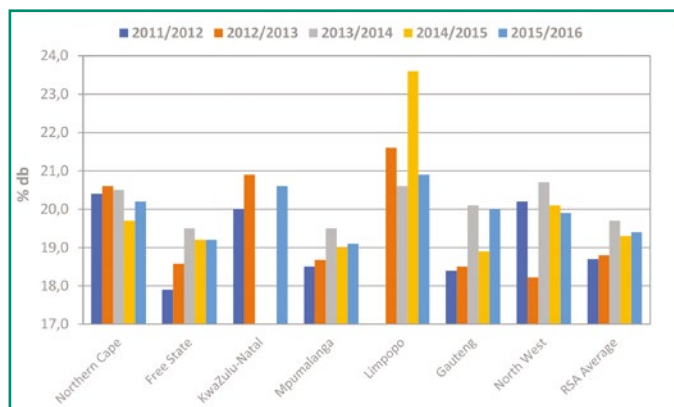
weighted average of 7,3% was higher this season than in the previous one, when the average was 6,4%. A small variation of only 0,05% is observed with regard to the national weighted average ash content



GM-crops. These soya beans have tolerance to herbicides (chemical products used to destroy weeds, but not the crop plants).

Worldwide, GM soya beans occupy 80% of the area planted to this crop.

Figure 3: Average crude fat content per province over five seasons.



The weighted average percentage crude fibre varied from 6,2% in Limpopo to 7,6% in the Northern Cape. The national

South Africa are genetically modified (GM). An estimated 95% of the area planted to soya beans in South Africa consists of

over the five seasons that this survey has been conducted. This season, the average ash content was 4,61%. Samples from the Northern Cape and Limpopo tend to show higher ash contents over seasons.

The majority of soya beans produced/grown in

Fifteen (10%) of the crop samples were screened by means of the EnviroLogix QuickComb Kit for bulk soya beans, to quantitatively determine the presence of the CP4 EPSPS trait (Roundup Ready®). All the samples tested positive.

The results of this survey are available on the SAGL website www.sagl.co.za. Hard copy reports are distributed to directly affected groups and interested parties. The report is also available for download in PDF format. With gratitude to the Oil and Protein Seeds Development Trust (OPDT) for financial support of these annual surveys and to the members of Agbiz Grain for providing the crop samples. 🌱

PANNAR's Versatile Sunflower Package

PERFORMANCE, STABILITY AND ADAPTIBILITY FOR RESULTS IN YOUR POCKET

Yield probability (%)

YIELD POTENTIAL (T/HA) 2015/2016						
Cultivar	1.0	1.5	2.0	2.5	3.0	3.5
PAN 7080	57	68	76	83	87	90
PAN 7098	72	68	63	58	52	47
PAN 7100	66	62	56	50	44	40
PAN 7102CLP	73	74	72	72	68	67
PAN 7160CLP	62	70	76	82	84	87

YIELD POTENTIAL (T/HA) 2014/2015 AND 2015/2016						
Cultivar	1.0	1.5	2.0	2.5	3.0	3.5
PAN 7080	72	75	78	80	82	83
PAN 7098	82	83	82	82	80	80
PAN 7102CLP	72	75	77	79	81	82

CLEARFIELD®, CLEARFIELD® PLUS and EURO-LIGHTNING® are the registered trademarks of BASF.



PANNAR Sunflower Package

	SINGLE CROSS	THREE WAY CROSS
Conventional	PAN 7080	PAN 7057 PAN 7098 PAN 7100
Clearfield® Production System	PAN 7102CLP PAN 7156CLP	PAN 7160CLP
High Oleic Acid	PAN 7158HO	

PANNAR maintains an **outstanding performance** record in the ARC national trials. For the past two years PANNAR has delivered **six out of the top ten sunflower hybrids** in the ARC national trials.

PANNAR
Together we farm
for the future®

SENSAKO SOYA • SOJA

Proudly introducing **Sensako's Sensational Soya (SSS)**:
Met trots stel **Sensako** hulle **Sensasionele Sojabone (SSS)** bekend:

SOYBEAN



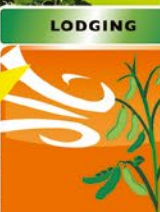
SOJABONE

YIELD POTENTIAL

OPBRENGS POTENSIAAL

POD HEIGHT

PEUL HOOGTE

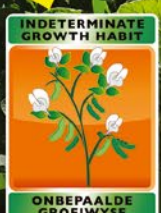
LODGING

OMVAL

SHATTERING

OORSPRING

MATURITY GROUP

VOLWASSENHEID

INDETERMINATE GROWTH HABIT

ONBEPAALDE GROEIWYSE





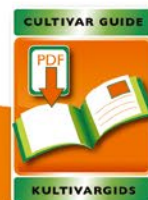
- Proven performance in yield potential, yield stability, lodging tolerance, pod height and shattering resistance.
- Uitstaande prestasie in opbrengspotensiaal, opbrengsstabiliteit, omvalweerstand, peulhoogte en oopspringweerstand.
- Look out for the Sensako demonstration trials in 2015/16.
- Besoek die Sensako demonstrasie persele in die 2015/16 - seisoen.
- Available commercially from 2016
- Kommersieël beskikbaar vanaf 2016
- SSS 6560 Tuc
- SSS 5755 Tuc
- SSS 4945 Tuc
- SSS 5052 Tuc
- SSS 5449 Tuc

Ons noem dit 'die SENSAKO effek'
Vordering deur navorsing

- For more information please contact us or refer to the Sensako cultivar guide or www.sensako.co.za
- Vir verdere inligting kontak Sensako of verwys na die nuutste Kultivargids of www.sensako.co.za

Bethlehem Tel: +27 (0) 58 303 4690
Napier Tel: +27 (0) 28 423 3313

www.sensako.co.za



Once **ANALYZED**, it can be **MANAGED**

The foundation of successful farming

NviroTek Laboratories is an independent world-class analytical facility for Agriculture. We offer analyses of soils, leaves, fertilizer, lime, growth – media, water, forages, compost and feeds.

A national courier service deliver samples to our laboratory where a wide variety of tests are performed. The best equipment and techniques available have been utilised to meet international standards for quality and turnaround time.

Formal associations are in place with several prominent International Agricultural laboratories to ensure that services offered are in line with the latest developments.

 **012 252 7588**

Fax : 086 243 4281 / 086 243 4280



NviroTek
Labs

Lab data gives direction

www.nviroteklabs.co.za