

OILSEEDS

focus

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



Soya beans • Sunflower • Canola • Groundnuts



Crop injury

Biotech crops

Peanut Forum feedback

Soya bean meal quality



Invitation to
attend the 2016

Canola Symposia

19 July 2016 : ABSA HALL, MEGAPARK, BREDASDORP
20 July 2016: KRONENBURG ESTATE, PAARL

Hosted by

The Protein Research Foundation.
The Oil and Protein seed Development Trust (OPOT).
The Oilseeds Advisory Committee (OAC).

The goal

To advance canola production in South Africa.

Practical information will be provided on:

- Stubble management, planting and fertiliser requirements for high yielding canola crops.
- Breeding high yielding canola cultivars
- International markets and canola market development
- Farming high yielding canola crops

International and local speakers include:

- *Dr John Kirkegaard, chief research scientist at CSIRO Agriculture, Canberra, Australia.*
- *Rob Wilson, canola market development manager and former canola breeder at DuPont Pioneer, Wagga Wagga, Australia.*
- *Prof Ferdi Meyer, director at the Bureau for Food and Agricultural Policy (BFAP), Pretoria, South Africa.*
- *Rick Horbury, Technical Advisor, Bayer CropScience, Western Australia*

Theme:

**"Growing a 5-ton
canola crop"**

Free online registration open on 16 May 2016:
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Any enquiries can be directed to Ansu Colditz
(e-mail ansu@millenniumtravel.co.za)



The beaten path for South African agriculture

By John Purchase, chief executive of the Agricultural Business Chamber

On 8 December 2015, the day before the infamous Nenegate debacle or so-called '9/12' moment, the Agricultural Business Chamber (Agbiz) released a press statement on its outlook for 2016. Agbiz warned of the critical crossroads South Africa has reached, and that 2016 may well be a defining year in terms of the nation's future. Little did we then realise how defining a year 2016 would prove to be, but with no clear outcome as yet.

The battle lines in South African politics have been drawn, both on an inter- and intra-political party basis, as we head towards municipal elections in August of this year. Normally second-tier government elections would not be termed defining of the local political power landscape, but these elections will be. Either way, they will impact greatly on the future of South African agriculture.

Linked

Politics and the economy are inextricably linked in the so-called political economy, as ratings agencies such

as Fitch, Standard & Poor's and Moody's are at pains to point out and remind us. At stake is an open, competitive market economy embracing strong inclusive economic growth and driven by the private sector and secure property rights, versus a system of state patronage, excessive government control and intervention, scant regard for property rights – under the banner of the ironically termed 'economic freedom'.

The choices are stark, especially within the ruling party where the outcomes may well be determined in our courts of law, including the Constitutional Court.

Agbiz believes that sanity and good reason will prevail, and people in top decision-making and influencing positions are increasingly recognising the choices to be made, and correctly identifying with those choices. Press freedom and the independence of the judiciary, including the Public Protector, are fundamental to our constitutional democracy, and we all have a role to play in upholding our *Constitution* and its very important *Bill of Rights*.

Hope despite the challenges

Against this uncertain background, South African agriculture and agribusiness have been ravaged by one of the most, if not the most, severe droughts in living memory, primarily due to a particularly severe El Niño occurrence in the Pacific Ocean.

Numerous farmers and agribusinesses have been adversely affected and will take years to recover from losses incurred, while some may not recover at all. However, there is certainly hope and light at the end of the tunnel.

South Africa, thanks to its largely open and competitive market system,

still possesses a resilient and robust agro-food system providing in the largely unacknowledged food security for the nation and all its people. It will yet again bounce back from another major setback.

Already the very late and significant plantings, of especially sunflower in the Free State and North West provinces, have escaped the first frost and will provide much-needed income and cash flow, as yields appear to be fairly good in general and prices are holding up due to the prevailing import parity scenario.

In addition, the El Niño phenomenon is rapidly waning and being replaced by a La Niña counter-reaction, which bodes well for good rains in the summer rainfall region of South Africa in the 2016/17 cropping season.

There is and will be significant production risk (low soil water levels) and price risk (a possible move from import to export parity pricing) in the new production season, and farmers will need to manage these risks proactively and timeously. Business plans in this regard will be essential when approaching the financiers for production loans.

Every crisis creates opportunity, and from there comes the old adage: 'Never waste a crisis.' Understanding the environment within which one is producing, what the risks and especially the opportunities are, and planning wisely and realistically are all essential for survival. A great advantage in our industry is that people must eat and demand therefore generally remains inelastic. Let us plan and prepare well for the next season!

For more information, contact Dr John Purchase on 012 807 6686. 



A volatile environment for the oilseeds industry

The effect of the drought has been evident in the drop of 27% in hectares planted to soya beans, with a predicated reduction of 53% in crop size resulting in the requirement of a stiff import programme currently estimated at 265 000 tons of soya beans.

Economic factors

The volatility in pricing, driven by a combination in crop size, global markets and exchange rate, has been dramatic. Soya bean prices were at a low of R4 575 in late May 2015, peaked at R7 800 in late January and settled again at R6 400 in early May 2016.

The large production in South America, despite the extreme wet conditions experienced in Argentina, has had a profound effect in assisting the buffering in the consumer price increases the industry would have experienced.

Sunflower seed has been affected in an entirely different manner with an increase of 25% of hectares from 2015, mainly due to the forced late planting. Poorer yield as a result of the drought can, however, be expected, resulting in merely an 8% increase in crop size. Significant requirements for imports are unlikely.

The recovery of the rand from a weekly low of R16,74 to a weekly high of R14,17 during 2016, has certainly added to the volatility in prices – the weak rand having supported high domestic prices.

Regulatory environment

The manner in which government has maintained the regulatory environment that the oilseed industry operated in under the drought conditions, can be commended.

The interference with quantitative restrictions on importation and exportation of agricultural products, such as has been experienced in Argentina over the last ten years, can have a dramatic effect on the sustainability and viability of industries. Fortunately for that country, after many years of suffering their new government is resolving this matter.

The current duty structure on soya beans and soya bean meal has been in place for a very long time, and it assists in price stability by allowing the ability to hedge and plan pricing into the future without the added doubt of duty structure changes. Volatility caused by the numerous other factors in the market is challenging enough to cope with.

How will the next year unfold?

The economy remains under pressure; buying power is stretched and the demand for basic staple food such as poultry is becoming more evident, as consumers feel the pinch on disposable income.

This takes place, while on the demand side we have to deal with the increased imports of poultry meat due to nationally structured trade agreements, which will automatically dampen demand for domestic animal feed and oilseed meals.

We remain positive that the country's economy will continue to grow, and that demand for protein food will pick up. South Africa's recent temporary escape from a junk status downgrade provides us with a slight amount of breathing space to put into action those commitments which have been undertaken.

Dr Erhard Briedenhan

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

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To subscribe

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Full programme for Canola Symposium

The annual Canola Symposium will be held on 19 July in Bredasdorp and on 20 July at Kronenburg in Paarl. This year's programme contains numerous excellent contributions by well-known specialists.

Speakers include Dr John Kirkegaard of the *Commonwealth Scientific and Industrial Research Organisation (CSIRO)* in Canberra, Australia, who will be addressing the subject 'Stubble management, planting and fertiliser requirements for high-yielding canola crops'. Rob Wilson of DuPont Pioneer in Australia will be discussing the breeding of high-yielding canola cultivars for 2020, while local economist, Prof Ferdi Meyer of the *Bureau for Food and Agricultural Policy (BFAP)*, will present an economic outlook of the industry. Another international speaker, also from Australia, is Rick Horbury of Bayer, who will discuss farming with high-yielding canola crops. There will also be an opportunity for general discussion on the various presentations and other industry issues. – *Press release*

See the advertisement elsewhere in this edition for registration details.

Bayer announces cash offer for Monsanto

German drug and chemicals group Bayer AG says it has made an offer to buy US seeds company Monsanto Co. for \$122 per share in cash, or a total value of \$62 billion including debt, to create the world's biggest agricultural supplier.

Bayer has said that the proposal made to Monsanto's management represented a 37% premium over the closing price of Monsanto shares on 9 May, before rumours of a planned bid emerged.

Monsanto disclosed that Bayer had made an unsolicited takeover offer for the group, triggering an investor backlash in which one of the German company's major shareholders called the move "arrogant empire-building".

Bayer says it planned to finance the deal with a combination of debt and equity, primarily via a rights offering. Equity would account for roughly a quarter of the deal value. – *www.reuters.com*

Oil traders leave Noble Group

Five oil product traders have resigned from Noble Group, Asia's largest commodity trader by revenue, some of whom are moving to rival trader, Glencore. Three of Noble's London-based gasoline traders are joining Glencore, according to sources. The status of two other traders is not immediately clear.

Noble had also subleased storage tanks in the key Amsterdam-Rotterdam-Antwerp area to another competitor, trading house Gunvor (GGL.UL), another source said. Noble, Glencore and Gunvor have declined to comment.

The shake-up came ahead of Noble reporting its first-quarter results. – *www.reuters.com*

SA oilseeds harvest to decrease

In 2016, the harvest of oilseeds in South Africa will decrease by 20%. SES experts predict a gross yield of soya beans in the sub-Saharan nation in 2016 at the level of 0,77 million tons, which is 27% less than last year's result.

The decline in oil production is due to reduced acreage under it at 22% per year to 0,54 million ha, due to the prolonged drought experienced in the country.

In turn, analysts voiced this indicator at a level of 0,74 million tons compared to 1,06 million tons a year earlier, since they believe that the SES-predicted yield of 14,4t/ha is too high.

According to a forecast of *Oil World*, the harvest of sunflower in the country could reach 0,62 million tons in 2016, 6% below last year's result due to a reduction in the yield of oilseeds to 10,1kg/ha.

It should be noted that the sown area under crop was increased by 7% per annum to a five-year high of 0,62 million hectares, compared to a reduction of areas under other crops. All in all, the production of oilseeds in South Africa is projected at 1,52 million tons (-0,4 million tons per year) for 2016. – *www.agro2b.ru*

Final figures of winter cereals released

At a meeting held on 12 May 2016, the South African Crop Estimates Liaison Committee (CELC) oversaw the process for the finalisation of the crop production figures of commercial wheat, malting barley and canola for 2015.

The estimated total production figures as released by the Crop Estimates Committee (CEC) were revised, using the published figures of the South African Grain Information Services (SAGIS) of actual deliveries as the basis for the calculations. The figures from the wheat utilisation survey to determine on-farm usage and retentions, which was conducted by the Department of Agriculture, Forestry and Fisheries (DAFF), were added to the SAGIS delivery figures to calculate the final crop production figures.

When comparing the final calculated crop figures with the numbers set by the CEC during February 2016, the size of the commercial wheat crop is now at 1,440 million tons, which is 17 015 tons or 1,17% less than the final crop estimate figure of 1,457 million tons. For malting barley, the recalculated crop size is 332 000 tons, which is 1 372 tons or 0,41% less than the final crop estimate figure of 333 373 tons. The final recalculated canola crop estimate figure is 93 000 tons, which is also lower (4 600 tons or 4,71%) than the final crop estimate figure of 97 600 tons. – *Press release*

Australia's OGTR authorises commercial release of GM canola

Australia's Office of the Gene Technology Regulator (OGTR) has issued a licence in response to application DIR 138 from Bayer Crop Science, authorising the commercial release of canola genetically modified (GM) for dual herbicide tolerance and to facilitate production of the GMOs. The release is authorised to take place throughout Australia.

The GM canola and products derived from it may enter general commerce, including use in human food and animal feed. Food Standards Australia New Zealand (FSANZ) has approved the use of food from material derived from this GM canola.

The decision to issue the licence was made after consultation on the Risk Assessment and Risk Management Plan (RARMP) with the public, state and territory governments, Australian government agencies, the minister for the environment, the Gene Technology Technical Advisory Committee and local councils, as required by the *Gene Technology Act*, 2000 and the corresponding state and territory legislation.

The final RARMP, as well as its summary, a set of questions and answers on this decision and a copy of the licence are all available online via the DIR 138 page of the OGTR website. – www.isaaa.org

US markets rattled

Markets in the United States (US) were rattled with talk of an expected interest rate hike and a favourable weather forecast this week. Big fund players cashed out of long positions, on fear that the US Federal Reserve could raise interest rates next month. A substantial amount of money in the market is using grain as a hedge against inflation and if interest rates go up, inflation goes down.

The latest weather report (as on 20 May 2016) is non-threatening and should aid planting progress across the Midwest. The US *National Oceanic and Atmospheric Administration* (NOAA) also released its three-month summer forecast this week. The sunflower-growing region is expected to have normal to above-normal temperatures and normal precipitation in June, July and August.

Very dry conditions are prevalent across the production region at this time. Sunflower will fare well in these types of conditions due to its drought tolerance. Other crops may suffer, however. Therefore, weather will be a concern in the months ahead if this scenario plays out. Crushers are still offering 2016 new crop Act of God (AOG) NuSun and high-oleic sunflower contracts.

Another aspect to keep in mind is oil premiums that are paid on sunflower. Premiums are offered at crush plants on oil content above 40%, at a rate of 2% price premium for each 1% of oil above 40%. – www.sunflowerusa.com



São Paulo on track for higher peanut output

The peanut harvest in Brazil's São Paulo state is expected to reach 372 000 tons, or 23,9% more than in 2014/15. São Paulo is the largest peanut producer in the country, and accounts for approximately 90% of peanut harvest in Brazil. Total production in the country is expected to reach 414 000 tons in 2015/16, up by 19,4% from 351 900 tons last season. – *Vladimir Pekic, www.agra-net.com*



Monsanto may exit Argentina

Monsanto is re-evaluating the viability of continuing its biotech seed business in Argentina, as conflicts persist among the Argentine government, the country's farmers and the company over its royalty collection methods, while a continued devaluation of the country's currency poses an additional challenge, reports the *Wall Street Journal*.

In addition, Bloomberg reports that Monsanto may have to wait months before Argentina's Institute for Property Rights will complete the process for the company to fully patent its latest genetically modified (GM) soya bean technology in the country.

"The Monsanto issue is very distinctive, as Argentina still hasn't granted the company a patent for Intacta," Argentina's science and technology minister, Lino Baranao, told Bloomberg in a telephone interview. "A final decision must surface soon, but I am not sure this will happen for the 2015/16 crop. We have asked the Institute for Property Rights to speed up the process, but it may take months."

Aside from patenting difficulties, Monsanto is still dealing with problems regarding collecting royalties from Argentina's farmers on its previous generation of glyphosate-resistant seeds. Under the company's terms, farmers were required to pay royalties either upon the purchase or collection of their soya beans for export. However, farmers were reusing seeds from one crop season to the next, creating widespread bootlegging. – *Lynda Kiernan, www.oilseedandgrain.com*

With drought comes charcoal rot

Charcoal rot was first reported in South Africa when found on sunflower in 1969, but had already been detected on maize and sorghum by that time. The first incidence of this disease on soya beans was reported in 1982. Maize and sorghum are frequently planted in rotation with sunflower and soya beans.

Lately, reports of charcoal rot have been increasing in South Africa, especially in warmer parts of South Africa, such as Mpumalanga, the Free State and North West.

This begs the question, why, and the answer is twofold:

- Soya bean and sunflower production has expanded into warmer regions of the country.
- Rainfall is erratic and water is becoming a scarce resource in South Africa, limiting irrigation.

This poorly recognised disease may become more significant in future with the changing climatic conditions that often lead to extreme weather events such as droughts, such as the one currently affecting us. As with most diseases, it is best to follow an integrated disease management programme rather than focussing on a single solution.

Widespread disease

Charcoal rot is caused by the fungus *Macrophomina phaseolina* and is a widespread disease affecting various agricultural crops in South Africa – not only sunflower, soya bean, maize and sorghum, but also canola, cotton, tobacco, strawberries and certain vegetables to name but a few. This pathogen has a host range of more than 500 plant species.

Common symptoms of charcoal rot,

which is also known as summer wilt or dry weather wilt, include damping off, stunting, chlorosis, wilting and premature senescence where the dry leaves remain on the stems. Black microsclerotia are often found on the outside of the base of the stem, but are always present inside the stems and roots of infected hosts. The oil content and colour of sunflower seed may be altered, while seed composition and nitrogen fixation are influenced in soya beans.

Charcoal rot can cause losses of up to 90% in sunflower and 50% in soya bean when favourable conditions persist.

Information on charcoal rot in South Africa is limited, and this impedes the development of key disease management strategies. A research project on the integrated management of charcoal rot on soya bean and sunflower in the country is underway at the University of Pretoria (UP). It aims to investigate some of the characteristics of the disease in soya beans and sunflower.

Diseased soya bean, sunflower, maize and sorghum plants have been sampled from most of these production areas in South Africa. A countrywide survey will



Black microsclerotia visible on the outside of a soya bean stem and typical black streaks on the inside. (Photograph: E Jordaan)



Chlorosis and premature senescence of soya bean plants due to charcoal rot. (Photograph: www.plantmanagementnetwork.org)



Black microsclerotia visible on the inside of a sunflower stem. (Photograph: www.plantmanagementnetwork.org)

be conducted to determine soya bean and sunflower growers' perceptions of the disease, its occurrence and the control practices, if any, that are in place in order to provide a picture of how charcoal rot is affecting production in the country.

Maximum temperatures

Temperatures of 25 to 30°C and extended periods of dry weather are optimal for disease development. Most growing regions in South Africa reach these average maximum temperatures in summer. It is expected that average temperatures will increase by 2°C in future due to climate change, and that rainfall events will be fewer and more erratic. With the use of climate prediction models, attempts will be made to predict

the impact of these changing climatic conditions on disease development in future.

Although charcoal rot is a soil-borne disease, some evidence points to seed transmission.

The incidence of charcoal rot is almost always coupled with stressors on the host. Drought, nutrient stress, poor weed control and even reproductive stress on the plant due to flowering can result in disease, the symptoms of which are usually observed at post flowering. However, *M phaseolina* infects at an early stage of the plant life cycle, and if conditions are favourable it can result in seedlings damping off.

Although charcoal rot is a soil-borne disease, some evidence points to seed transmission. Due to the production

of microsclerotia, this pathogen can overwinter in the soil for years, especially where diseased plant residues are left in the field or incorporated into the soil during field preparation. Sclerotial germination is decreased by low soil C-N ratio and increased soil moisture, as well as increased crop canopy temperatures.

Yield reduction

In the proposed research at UP, the effect of drought on charcoal rot will be investigated and this will also give an indication of the yield reduction caused by the disease. Nitrogen fertilisation will also be evaluated to determine the effect of the nitrogen source used and the quantity of the chemical element added to the soil on disease development. Long- and short-term growers for sunflower and soya bean will be included in the nitrogen trials.

There is currently no reliable control method for charcoal rot. Crop rotation is limited because of the wide host range of *M phaseolina*. Fungicide treatment of the seeds has also proven to be

ineffective. Irrigation can be effective to a certain extent. However, water is a scarce and costly resource.

Control programmes include cultivation strategies such as planting dates (avoiding excessively high temperatures or drought during flowering stage), crop rotation (which can sometimes decrease inoculum depending on the crops in the rotation programme) and increasing planting density.

Charcoal rot can cause losses of up to 90% in sunflower and 50% in soya bean when favourable conditions persist. This disease is also not limited to these two crops. Subsequently, most rotation crops are also affected by charcoal rot.

It is important to develop an integrated disease management programme that is sustainable and economically feasible. Knowledge of the pathogen population, environmental conditions and cultural practices can contribute to building an effective disease management programme for charcoal rot. 🌱

» Voeding volgens plantontwikkeling »

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By Rona Beukes, senior statistician of crop estimates, Directorate Statistics and Economic Analysis, Department of Agriculture, Forestry and Fisheries

Soya bean vs maize production

Soya bean production is a significant and growing component of South Africa's agricultural economy. Large-scale production commenced during the late 1990s, after which the area planted to soya beans expanded rapidly.

Increasing yields, supported by a favourable agricultural policy environment backing the commercialisation and use of agricultural biotechnologies, has facilitated a smooth transition of commercial farmers from the production of traditional grains to soya bean. It has also enabled them to rotate soya beans with other grain crops in order to maximise profits. The increase in production can be ascribed to commercial farmers becoming cognisant of the benefits of soya bean in crop rotation systems with maize.

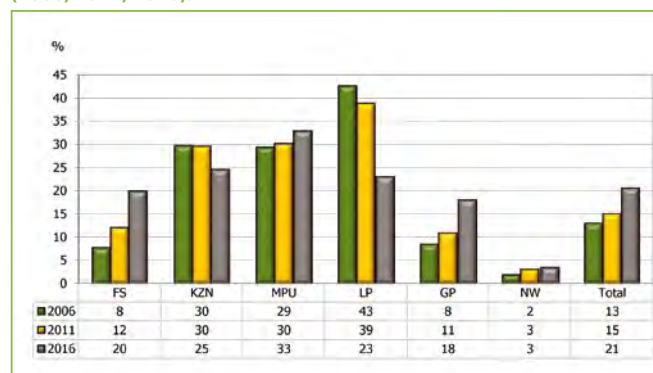
Plantings compared

When considering the period from 2006 to 2016, Mpumalanga is by far the largest producer (47%) of soya beans in South Africa in terms of area planted. The Free State is second (30%), while KwaZulu-Natal is third (9%).

This can mainly be ascribed to South African farmers using soya beans as a substitute for maize.

The relation between planted soya beans and maize has changed over time. As shown in *Figure 1*, the percentage of soya bean compared to maize hectares planted for the major producing provinces has shown some variation since 2006.

Figure 1: The ratio of soya bean to maize hectares planted for the major producing provinces (2006, 2011, 2016).



FS = Free State
KZN = KwaZulu-Natal
MPU = Mpumalanga
LP = Limpopo
GP = Gauteng
NW = North West

Major producing provinces

In the Free State, the percentage of soya bean hectares planted relative to maize hectares has increased from 8 to 20% between 2006 and 2016. This can mainly be ascribed to South African farmers using soya beans as a substitute for maize, as soya bean processing capacity has aggressively expanded in the last few years. From 2006 to 2016, soya bean planting in the Free State province has increased by 287%, from 45 000 to 174 000ha.

In KwaZulu-Natal, however, soya bean plantings declined in relation to maize plantings, from 30% in 2006 to 25% in 2016. Although the area planted to soya beans increased by 12% over this period, the expansion in maize plantings was much greater at 46%.

Mpumalanga soya bean plantings, relative to maize, increased from a ratio of 29:71 in 2006 to 33:69 in 2016, and now constitutes one-third of the traditionally maize hectares planted in this province. For Limpopo, soya bean plantings increased by 3 000ha (23%) during the period 2006 to 2016, whereas maize plantings, however, increased by 36 000ha (206%). Due to the huge increase in maize hectares planted, the ratio of soya beans to maize dropped from 43% in 2006 to 23% in 2016.

Increase recorded in Gauteng

Soya bean plantings in Gauteng increased by 254%, from 6 500ha in 2006 to 23 000ha in 2016. In comparison, maize plantings increased by 50%, from 70 000ha in 2006 to 105 000ha in 2016. Due to the huge increase in soya bean plantings, the relation between soya beans versus maize increased from 8:92 in 2006 to 18:82 in 2016.

Finally, for the North West province, the ratio of soya beans to maize has remained fairly unchanged during the period under review, i.e. from 2 to 3% against 97 to 98%. Out of all the main soya bean-producing provinces, the Western Cape, Northern Cape and Eastern Cape excluded, North West appears to be the one province which plants the smallest area of soya beans, that is to say 3 to 4%.

In terms of rainfall, Mpumalanga, KwaZulu-Natal and certain parts of Gauteng, the Free State and Eastern Cape are the most suitable for soya bean production. Moreover, since soya beans can also be rotated with maize, provinces such as the North West hold a greater potential for soya bean production. 🌱

Cultivar selection:

A key decision

Selecting the right soya bean cultivars is one of the most important decisions a farmer has to make during the planting season. It comes as no surprise that unadjusted cultivars produce yields of up to 20% less than the top producer in the national cultivar trials (Table 1).

With low profit margins in crop production being the order of the day, great losses can be suffered if the wrong cultivars are used. Bearing in mind that the best cultivar's yield can be up to 580kg/ha higher at a price of R4 500/ton, the loss can be as much as R2 610/ha. Therefore, the time spent on gathering information and data to make more informed decisions, is crucial and certainly not a waste of time.

Cultivar variety

A farmer can choose from a large variety of soya bean cultivars on the market. The cultivar yield has improved by 1,2% per annum over the past 34 years. Table 1 provides helpful information to select the right package.

There is intense competition among seed companies, each aiming to sell the best quality product to the farmer. Companies carefully select their best cultivars. They use the most modern production and breeding techniques to supply the farmer with seed of the highest quality.

Table 1: The differences in average yield of the best compared to the worst performing cultivars in the national cultivar trials of 2013/2014.

	Cool areas	Moderate areas	Hot areas
Average yield (t/ha)	2,54	2,51	3,48
Highest yield cultivar (t/ha)	2,87	2,75	3,94
Lowest yield cultivar (t/ha)	2,21	2,21	3,27
Yield difference (t/ha)	0,66	0,54	0,67
Percentage difference	26%	22%	17%

Source: AS de Beer and N de Klerk, 2014, Soya Bean Cultivar Recommendations

The Agricultural Research Council's (ARC) national cultivar trials are the best starting point in the selection of a cultivar. If a cultivar fails to appear in these trials, it should preferably be avoided.

Production regions

South Africa is divided into three primary production regions, namely cool, moderate and hot. Unlike the rest of the world where soya bean production regions are determined by the relative distance from the equator, those in South Africa are determined by the area's height above sea level. The cool production regions are in

the eastern higher lying parts of the country, characterised by a shorter production season with moderate summer days and relatively higher rainfall.

In general, the production season of this moderate production region is longer, with warmer days and average rainfall. The hot production areas have a longer growing period with warmer days and less rainfall, and soya beans are mostly planted under irrigation. Every farmer should be aware of which one of the three production areas his land is located in, and what the production potential of the soil is. The wheat can thereby be separated from the chaff.

Seed companies conduct their independent research to identify the right cultivar for each region. This data can then be used to help with the decision. It is also vital to consider local comparative strip trials carried out by study groups and certain farmers. It is a risky option to only listen to the advice of a neighbour, because the current season will not always be the same as the previous one. If all the information is gathered and combined, three to five cultivars that can be used will stand out.

Table 2: Performance of growth class groups over 34 years in different South African production regions.

Growth class groups and regional combination average (t/ha) for 34 years (1978–2011)			
Growth class	Cool areas	Moderate areas	Hot areas
4–4,9	1,65 ^b	2,40 ^b	2,61 ^b
5–5,9	2,35 ^a	2,47 ^a	2,83 ^a
6–6,9	1,52 ^b	2,48 ^a	2,95 ^a
7+	1,98 ^b	2,31 ^c	2,91 ^a
LSD (95% accurate)	0,28	0,08	0,09

Where the alphanumerical symbol in a column corresponds, the difference in yield is not significant.

Source: AS de Beer and MA Prinsloo, 2013, The 'National Soya Bean Cultivar Trials in South Africa – 34 years Experiences and Progress' presentation.

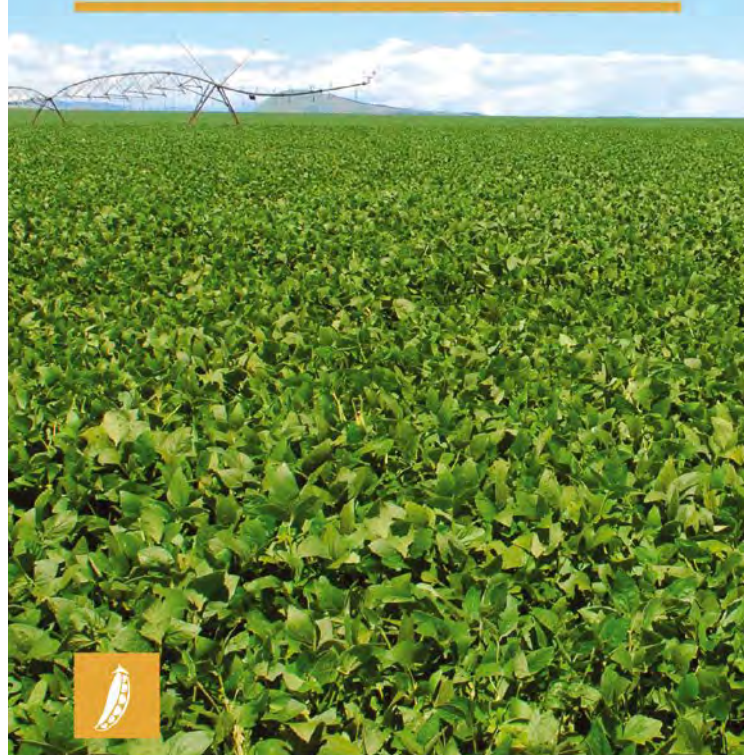
There is intense competition among seed companies, each aiming to sell the best quality product to the farmer.

Different growth classes

The next step is to make a decision regarding the different growth classes. It is good practice not 'to put all your eggs in one basket'. In order to spread one's risk, a compendium of different cultivars should preferably be planted. By firstly arranging the cultivars into different growth classes, the best of each class can be selected. By doing so, risk can be optimally managed.

In years when rain does not fall at the end of February and in March, the growth classes 4,5 to 5,5 will perform much better than the 5,5 to 7,5 classes. The opposite is true if good rains are received in the second half of the season. Over the long term, classes 5 and 6 offer the most consistent yield (Table 2), and most of the planting should consist of these growth classes. 🌱

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Biotech crops in South Africa:

Celebrating a milestone

The year 2015 marked the 20th anniversary (18 in South Africa) of the global production of genetically modified (GM) crops from 1996 to 2015. The first GM crop in the country, cotton, was planted in 1998. GM yellow maize followed in 2000, planted on only 3 000ha. In the 16 years from 2000 to 2015, nearly 20 million accumulated hectares of GM maize were grown in South Africa, yielding well over 50 million tons of grain.

Since then farmers' adoption of this new technology has escalated at an unprecedented rate. GM maize peaked from an initial 3 000ha to a record 2,36 million hectares in 2013. This makes biotechnology the fastest-growing crop technology in recent years, and South Africa ranks ninth as a global GM crop producer.

In 2015, the worst drought in 35 years took its toll on biotech crops in the country. The biotech land cultivated under GM crops decreased by 700 000ha (25%) from the intended 3 million hectares, to 2,3 million hectares (2,7 million in 2014).

Economic gain

GM maize was planted on 1,8 million hectares at an adoption rate of 90% (2,14 million in 2014). White maize accounted for 1,03 million hectares, 86% of the total white maize grown. Yellow maize at 0,96 million hectares was at 92% GM. GM soya beans were planted at a 95% adoption rate on 508 000ha (552 000

in 2014). The amount of biotech cotton planted was 12 000ha, 100% GM (8 000ha in 2014).

As a result of biotech crops, the economic gains for local farmers from 1998 to 2014 are estimated at US\$1,8 billion and US\$245 million in 2014 alone (Brooks & Barfoot). Dryland yields of maize before the advent of GM averaged 1,5t/ha. Today average yields are at 5t/ha for GM maize, representing an increase of 70%. The GM maize yield under irrigation varies from 12 to 20t/ha.

According to Wandile Sihlobo, economist at Grain SA, South Africa is likely to spend between R13 billion and R14 billion between May this year and April 2017 to import 3,8 million tons of maize in order to meet the shortfall experienced due to the drought.

It is interesting to note how much more maize the country would have had to import were it not for the advent of the latest biotechnologies brought about by genetically modified organisms (GMOs) and modern maize germplasms.

The 1991/92 season was the last drought South Africa experienced before the adoption of GM crops. In that year the average maize yield was 0,85t/ha. The 2014/15 and 2015/16 seasons have both been recorded as drought-stricken years. With the adoption of GM maize, the average yield today is estimated at 3,72t/ha.

If it were not for GM maize and our yield was still at 0,85t/ha, we would have produced only 1,65 million tons of maize.

In order to meet our local demand, we would have had to import 9,4 million tons instead of 3,8 million, at an estimated additional cost of R33 billion.

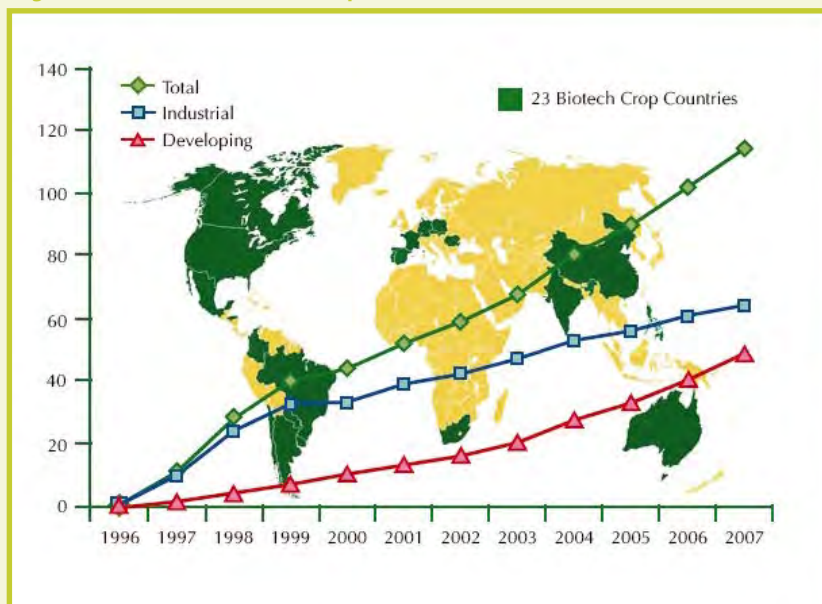
Drought-tolerant maize

The first Water-Efficient Maize for Africa (WEMA) Drought Tego™ WE 3127 conventional white maize hybrid was launched by the Agricultural Research Council (ARC) in the 2014/15 season for planting by smallholder farmers in five provinces. In Limpopo, yields increased from an average of 0,6 to 1,4t/ha. In the North West, four smallholders increased their yields from 1,5 to an average of 2t/ha. A biotechnological drought-tolerant maize hybrid is expected to be launched in 2017.

Tepsy Ntseane, a smallholder farmer and president of the African Farmers' Association of South Africa (Afasa) for the Gauteng province, planted 40ha of GM maize dryland and increased her yield from 2,3 conventional to 7t/ha.

Researchers at Purdue University in the United States (US) have calculated what the world would look like if GM crops were removed from agriculture in the US. Their conclusion was that maize yields could drop by 11,2 and soya bean yields by 5,2%. More dramatically, cotton yields could drop by 18,6%. To fill these voids, 250 000 acres of US forests, pastures and 2,7 million acres globally would need to be converted to cropland. In addition, commodity prices would rise drastically – maize by 28% and soya beans by 22.

Figure 1: Global area of biotech crops (million hectares, 1996–2007).



Increase of 12%, 12,3 million hectares between 2006 and 2007.
Source: Clive James, 2007

Adoption of GM crops in Africa is making good progress. Confined field testing of GM crops is currently underway in Burkina Faso, Cameroon, Egypt, Ghana, Malawi, Nigeria, Swaziland and Uganda. Biotech cotton is already being successfully grown in Burkina Faso and Sudan. In 2015, Sudan increased its biotech cotton by 30% to 120 000ha (90 000ha in 2014). Egypt has also produced some GM maize in the past, but is not planting at present.

Not a single incident

The safety of GM crops, including food and feed derived from it, is underscored by the millions of farmers worldwide who have planted these crops continuously for 20 years. Not a single incident of adverse effects to humans, animals or the environment, anywhere in the world, has been recorded. Yet, for the past 20 years anti-GMO activists continue claiming, without substantiated medical or scientific evidence, that GM crops are a threat to human and animal health and the environment.

One of the most critical campaigns, targeting glyphosate – the world's market leader herbicide for more than 40 years in 130 countries – claimed it to be "carcinogenic". However, the

European Food Safety Authority (EFSA) has rejected this claim outright, stating that: "Glyphosate is unlikely to pose a carcinogenic hazard to humans". Canada Health followed with a similar assurance, "that glyphosate does not pose a health risk to farmers and other occupations that handle the product". Scores of scientific institutions globally concurred.

The safety of GM crops, including food and feed derived from it, is underscored by the millions of farmers worldwide.

An outcry in the European Union (EU) to ban the product was rebutted by the EU parliament on 13 April, 2016, who voted that glyphosate should be authorised for the next seven years. Globally in 2012, glyphosate was used on 120 million hectares of GM and non-GM crops.

Latin America

Ten countries in Latin America grew biotech crops in that year. In 20 years, Argentina approved 20 GM crops.

European Union

Five EU nations planted 116 870ha GM crops. Spain led with 107 749ha in 2012. Spanish farmers reported an additional gross margin of €11 million for Bt maize in that year. Of the 28 EU countries, 19 have banned GM crops. They do not plant it, but import more than 33 million tons of soya beans from the US, Brazil and Argentina, which is 90% GM used in 7 000 food ingredients in addition to animal feed.

These nations are strongly food labelling-minded. Ironically, 10 million tourists from the EU visit the US annually, where 80% of the food is GM-derived, but they do not enquire regarding labelled menus when travelling.

Global plantings

Globally in 2015, some 18 million farmers in 28 countries planted 179,7 million hectares of GM crops (181,5 million in 2014). The 1% decrease was due to droughts in various regions and that major biotech countries, including South Africa, had reached saturated adoption in most GM crops.

However, strong growth is expected in developing countries. In 20 years, GM planted land grew from 1,7 million in 1996 to 179,7 million in 2015 globally. It is estimated that in these 28 nations, farmers have benefitted by the US\$150 billion derived from GM crops (Brooks & Barfoot).

Several new approvals for GM crops have been registered in the US, mainly in respect of fruit, potatoes and lucerne. The first GM animal has also been approved – a faster-growing salmon. It is expected to enter the food chain in 2018. Atlantic salmon normally takes three years to harvest on fish farms, compared to only 18 months, or half the time, for GM salmon.

Presentation by Andrew Bennett, chairman of the South African Agricultural Biotechnology Industry (ABI), at the annual ABI media conference held in Pretoria on Tuesday, 3 May 2016. For more information, contact Bennett on 082 316 2197 or 011 790 8213. 

Crop injury

due to various stress factor combinations

Soil-applied herbicides, which exert their herbicidal action on weeds following absorption by plant roots, exhibit considerable variation in respect of the period for which their residues can remain biologically active in soil.



A sunflower seedling of the 2015/16 season with injury symptoms that may have been caused by some or all of the following factors acting separately, or together, in various permutations: heat/sunlight/drought, soil-borne herbicide residues and herbicides applied in current season.

Ideally, a soil-applied herbicide should retain its herbicidal action for as long as possible within the season it was applied, but not for so long that there is risk for herbicide carry-over in soil to the following season. Soil-borne herbicide residues should have lost their biological activity, i.e. herbicidal potency, by the time a susceptible follow-up crop is established.

The period for which herbicides remain active in soil is referred to as 'herbicide persistence', also expressed as 'herbicide half-life'. It is measured in days, weeks or months and used for estimating the period of effective weed control, as well as for judging the time that must lapse following herbicide application in a crop before a different, susceptible follow-up crop can be established safely.

The time required to lapse before a follow-up crop – which is susceptible to soil-borne residues of herbicides applied in the preceding crop – can be planted safely, is termed 'waiting period'. Waiting periods are stipulated on the labels of products containing herbicides for which there is risk for carry-over to a following crop.

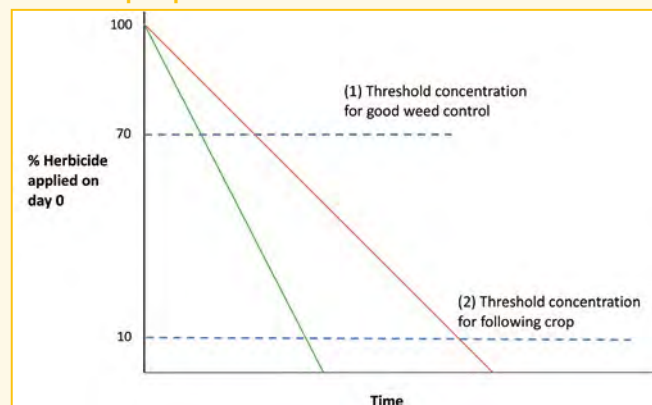
Variable herbicide loss rates

Waiting periods that are stipulated for a particular herbicide differ from crop to crop, because crops, just like weeds, can differ in their susceptibility to a herbicide. The time for which a herbicide retains its herbicidal activity in soil determines both the period of weed control efficacy and the waiting period

for safe establishment of the follow-up crop.

The hypothetical relationship between herbicide concentration in soil and the time for which effective weed control can be expected, and the relationship between herbicide concentration and 'waiting period', are depicted in Figure 1.

Figure 1: The influence of differential rates of herbicide dissipation on (1) duration of weed control and (2) safe period for establishing the follow-up crop.



Based on the theoretical rate of herbicide dissipation (loss) in soil shown by the graph (green line), any factor or factors that would cause a reduction in herbicide dissipation rate (red line) would lead to a longer period of effective weed control, which will be offset by the requirement of a longer waiting period in order to avoid the risk for soil-borne herbicide residues causing damage to the susceptible follow-up crop.

Factors with key roles in determining herbicide loss rates in soil, are the following:

- **Herbicide dosage:** Overdosing might increase the period of effective weed control during the season in which the herbicide is applied, but it could mean

that the safe waiting period applying to the follow-up crop no longer applies and should be extended. Underdosing will have directly opposite effects.

- **Excessive overhead water supply** (irrigation or rainfall) could shorten both the period of effective weed control and the required waiting period, provided that the excessive supply

of water through the process of leaching removes substantial amounts of soil-borne herbicide from the root zones of both weeds and follow-up crop.

- **High microbial activity in soil** is likely to boost herbicide loss rate, because most soil-applied herbicides are prone to breakdown (decomposition) by micro-organisms that feed on organic molecules, which includes virtually all synthetic herbicides. Soil properties

that promote the numbers and activity of micro-organisms are high organic matter content, moisture content, and pH levels that are neither acidic nor alkaline.

- Certain **herbicides** (e.g. the s-triazines such as atrazine and terbutylazine) are more sensitive to chemical breakdown than microbial decomposition. Since chemical reactions occur in water medium, drought conditions will likely have a retarding effect on the rate of chemical breakdown of s-triazine herbicides, very similar to reduced loss rates under drought conditions for herbicides that are prone to microbial breakdown, e.g. the triketone and related herbicides such as mesotrione, tembotrione and topramezone.

Prolonged periods of low soil moisture content, combined with low microbial activity, which typifies drought conditions, could lead to an unusually low rate of herbicide dissipation, and hence can cause herbicides to persist for unexpected long periods.

Influence of the drought

Exceptionally dry soil conditions and periodic excessive maximum temperatures, which prevailed across large parts of the maize production region in 2015/16, have characterised what has been called the "worst drought since 1901".

Low soil microbial activity, coupled with low chemical breakdown of herbicides in soil, could have contributed to increased herbicide persistence, and hence, higher residue carry-over in those areas worst affected by the drought. Under such exceptional conditions, the waiting periods stipulated on herbicide labels possibly did not provide adequate protection against carried-over herbicide residues on certain fields in certain areas.

Several cases of suspected herbicide damage to crops such as sunflower and

dry beans were reported earlier this year, and in most cases the perceived culprit was mesotrione, which was applied extensively in the preceding season on maize fields. Scant attention was given to the real possibility of atrazine and terbutylazine having carried over from where it is often used in maize to augment the weed control provided by mesotrione.

In 2015/16, blame that was levelled mainly at mesotrione included such nonsensical opinions as: "Coarser mesotrione molecules of generic products persist for longer than finer mesotrione ones of originally patented products."

In fact, a molecule of any type of matter is consistent in terms of both chemical composition and size, otherwise it cannot be called a molecule, nor can it exhibit the activity it was designed for. Soil persistence of mesotrione in generic products and in original patent products will be the same for similar dosages used under similar environmental conditions.

Waiting period

In a unique study on mesotrione carry-over conducted in South Africa, Allemann and Molomo (2016) concluded that the nine-month waiting period stipulated for dry beans on mesotrione product labels was adequate for averting crop injury following the herbicide's use in maize.

The possible contribution of herbicides, which was applied anew in 2015/16, to crop injury experienced in the current season cannot be ignored. Environmental conditions that are unfavourable to normal growth and development of summer crops – i.e. unusually high maximum temperatures, high-intensity sunlight and dry soil – have characterised both early and late plantings of crops grown in rotation with maize.

Such unfavourable environmental conditions could have caused direct crop injury, and/or may have predisposed those crops to herbicide damage, possibly not

only from herbicide residues carried over from the previous maize crop, but also due to those herbicides applied anew in the current crop – or perhaps due to both sets of herbicides acting together on the susceptible crop.

The combination of high maximum temperature, high light intensity, and dry soil probably caused direct damage to crops in the 2015/16 season. Additional exacerbating stress factors could have included herbicide residues carried over from the 2014/15 season, and/or herbicides applied anew in the current (2015/16) season.

Diagnosis of symptoms

Injury symptoms on crops which resemble others, cloud not only the separation of herbicide effects, but also thwarts the diagnosis of symptoms caused by herbicides and those associated with adverse climatic factors – drought and heat stress in particular.

For instance, molecules called 'active oxygen radicles' are the toxic by-products of drought and heat stress on the one hand, and the same oxidation agents responsible for the injury and death of plants that are susceptible to photosynthesis-inhibiting herbicides, e.g. atrazine and terbutylazine (Bagwat and Bhattacharjee, 2005; Smirnov, 2005; WSSA, 2014).

Therefore, visible injury symptoms on sunflower seedlings cannot simply be attributed to a particular stress factor – at least not without proper investigation.

This discussion represents a rather complex explanation of crop damage that has been experienced in certain regions in the current growth season. In an exceptional season characterised by unusual environmental conditions, oversimplified explanations will understandably fail to shed light on the challenges that were experienced, and unfortunately casts aspersions on herbicide products without which crop production will be impossible. 🌱



Weed resistance to herbicides is a research focus at the University of Pretoria, with Dr Charlie Reinhardt as project leader. To learn more, visit the website www.up.ac.za/sahri. Dr Reinhardt is an extraordinary professor of weed science at the University of Pretoria and dean of the Villa Academy. Contact him on 011 396 2233 or email creinhardt@villaacademy.co.za, or visit www.villaacademy.co.za for more information.

A favourable ratio

of crop to fertiliser prices for 2016

The current ratio of crop to fertiliser prices is favourable compared to the previous season and should support fertiliser demand in the 2016/17 planting season. Adriaan de Lange, chairman of the Fertiliser Association of Southern Africa (Fertasa), released his report at the 56th Annual Fertasa Congress 2016 held in Johannesburg. De Lange is the managing director of Omnia Fertilisers.

According to the report, the market for fertiliser products in 2016 will depend heavily on adequate rainfall. This will encourage farmers to be optimistic about farming and bodes well for the fertiliser industry. The average rainfall in 2015 measured only 403mm, compared to 544mm during the period from 2012 to 2014.

As a result of the El Niño impact in 2015, the fields of summer crops planted reduced from 4,1 million hectares in 2014 to 3,2 million in 2015, down by 22%. The amount of hectares planted with maize reduced by 27%. However, sunflower plantings increased by 20%, from 560 000 to 718 000ha. The average yield for all summer crops is predicted at 2,63t/ha, compared to 2,89t/ha in 2014 and 4,15t/ha during 2013.

Record-high maize prices

This, together with regional food production shortages, has driven the rand prices of maize to record highs. White maize, which is currently at R4 710/ton, is roughly R1 600 above the theoretical import parity price. Yellow maize is trading at import parity at roughly R1 084/

ton. These prices have reflected a 124% increase for white maize and 62% for yellow maize since January 2015. White maize is currently trading above the wheat price of R4 540/ton.

International fertiliser prices, according to De Lange, are weak due to overcapacity. Urea and potash prices have dropped by 39% since January 2015. The weakening of the rand has buffered the local market against the significant reduction in international prices. The global nitrogen price during 2016 will depend heavily on Chinese producers, where significant inventory levels are accumulating, as well as on the price of gas in the Ukraine.

Registration of products

De Lange once again emphasised the importance of the Fertasa code of conduct compliance system. "The purpose of the code is to create and monitor an ethical culture of compliance in the fertiliser industry, including manufacturing, packing, warehousing, distribution and retail. Products manufactured by producers certified by Fertasa's code of conduct comply with all legal requirements and are quality assured, promoting a culture of integrity and trust within the fertiliser industry."

The principles on which the proposed *Fertilisers and Feeds Bill* [B41-2012] will

be based have been submitted to the registrar. One of the main deviations from the original proposals was the need to continue with the registration of final fertiliser products. Only registered raw materials will be allowed in the formulation of final products. All imported products, including raw materials, intermediate and final products, should be subjected to inspection.

Fertasa proposed 20 corrections to the 2012 fertiliser regulations which were accepted by the registrar. Changes included regulations related to municipal compost, sewage sludge and farm manure destined for the garden and household market. The sale of these products will now be allowed in bulk if registered.

There is a backlog of eight to nine months in the registrar's office for the registration of products. However, the registrar has accepted an offer of assistance by Fertasa to overcome the technicalities. It should take approximately four months to deal with the backlog.

Monitoring scheme

Good progress has been made with the establishment of the Fertiliser Monitoring Scheme, which came to a standstill two years ago due to a lack of funds. With financial support from Sasol Agri Trust and the Department of Forestry and Fisheries



(DAFF) and inspector services from the registrar, agreement is expected to be reached in the near future. Omnia has also offered to perform the analyses at cost.

Fertasa awarded honorary membership to Prof Robin Barnard, who has been involved with the University of Pretoria for 40 years. He has also been appointed as technical adviser to Fertasa. Hans Lombard, of Hans Lombard Public Relations in Johannesburg, was awarded a gold medal for his contribution to agriculture over more than 40 years.

Henri Minnaar, director of agribusiness of the African Fertiliser and Agribusiness Partnership (AFAP), said the organisation collaborates with private business to establish more competitive and sustainable fertiliser markets in Africa, contributing to the Africa Green Revolution. In this programme, entrepreneurs and business leaders are introduced to organisations that have proven track records in enabling African smallholder farmers to source and utilise fertiliser.

AFAP seeks to provide, among others, the following:

- Guarantees for fertiliser distributors' credit.
- Financing assistance for importers and blenders.
- Financing assistance for fertiliser storage and distribution.

Its mission is to enhance crop production and rural incomes by increasing the access of smallholder farmers to less costly quality fertilisers, through the creation of medium-scale fertiliser and agribusiness enterprises as an alternative to traditional subsidy programmes. One of the main objectives is to remove regulatory barriers to trade and investment, in order to boost investor confidence in the African fertiliser and agribusiness industry.

Zambian fertiliser market

According to Jan Vermaak, MD of Omnia Fertilisers Africa, the domestic production of fertiliser in Zambia is limited. All fertiliser raw material and products are imported. Nitrogen Chemicals of Zambia (NCZ) produces all the Compound D for the Farmer Input Supply Programme (FISP).

During the 2015/16 cropping season,

roughly 220 000 tons of Compound D and urea were distributed among one million smallholder farmers. Fertiliser for the FISP is produced through a tender process from private traders and wholesalers. The private sector's role in Zambia involves the international procurement of fertiliser raw materials and final products. This includes co-ordination of import logistics, as well as the local sale and distribution of fertilisers. There exists limited local blending. Some companies, such as Omnia, provide technical and agronomic services.

The agricultural sector in Zambia accounts for approximately 20% of the gross domestic product (GDP). Employment is provided to more than 60% of the labour force, mainly smallholder farmers. Some 95% of smallholder farmers cultivate less than 5ha, predominantly for subsistence maize production.

Soil sustainability

Professor Martin Fey, extraordinary professor at the University of Pretoria, discussed soil sustainability and the market in Southern Africa. The rating of soil abundance in Southern Africa is reasonable. However, it is a far cry from the breadbasket regions of North and South America or the Ukraine, for instance. The dominant soils are generally shallow, often located on steeper slopes. Choice soils occur in limited areas, mostly in the eastern summer rainfall regions. Once properly fertilised and limed, this soil type performs well and are resilient.

Sustainable soil use and management do not simply refer to soil quality. There is a wider social engineering agenda involved. When proposing new projects, issues such as soil health, ecosystem services, food security and environmental resilience have to be considered.

He pointed out that in taking stock of soil resources as the fertiliser industry positions itself for future growth, the best options may be dismissed by planners who fail to address other measures of sustainability. If ecologically-sound land management and social equity are made prerequisites for development, it may lead to yet another tragic nightmare of

Soviet- or Chinese-style central planning.

The greatest limitation of agriculture is land tenure, more so seen in the Democratic Republic of the Congo (DRC). Zambia has implemented certain incentives to be offered for commercial farming. The country's climate, soils and other resources should eventually make it one of the most profitable farming regions globally.

Fertiliser markets in Africa

Dr Augustine Langyintuo of the World Bank Group discussed fertiliser markets in Africa. He noted that decreased yields are largely attributable to the minimal use of improved technologies such as fertilisers. Mineral fertiliser is a key component in integrated soil fertility management, for increased and sustainable crop productivity. The application of fertiliser on the continent remains as low as 11kg/ha, falling short of the suggested 50kg/ha of the Maputo Declaration on Agriculture and Food Security.

This figure is at 96kg/ha in South East Asia, 101kg/ha in South Asia and exceeds 145kg/ha in the developed world. The fertiliser market development in Africa is limited by, among others, lack of finance to produce fertiliser competitively. Commercial bank lending to agriculture merely averages 3% on the continent. Consequently, over 45% of rural farmers are excluded and are unable to purchase fertiliser.

Fertiliser production in Africa accounts for 3% of the global total, compelling entrepreneurs to import nearly all their fertiliser requirements at high cost. A ton of fertiliser can be shipped from the United States to Mombasa, Kenya, for about US\$50. Transporting this ton of fertiliser across a distance of 1 000km from Mombasa to Kampala in Uganda, costs between US\$80 and 90.

As a result of the low performance of agriculture, African governments spend between US\$30 billion and US\$50 billion annually to import food, thereby depriving the continent of its much-needed funds for infrastructure, social and economic development.

For more information, contact Hermien Wouda on 012 349 1450 or hermien@fertasa.co.za. 



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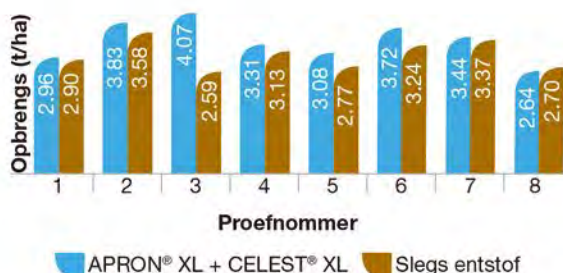
Apron® XL **Celest® XL**



Slegs entstof

Opbrengsresultate

- Sojabone gestroop 100 dae na plant om opbrengste te meet



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- 1 Swamdoder met sistemiese werking wat vinnig deur die saad opgeneem en versprei word
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Recent developments in soya protein products and **soya bean meal quality**

Soya beans are the miracle bean that has transformed global agriculture and become the main source of protein for animal feeds. The current soya bean meal (SBM) production of 220 million tons in 2015 makes up over 70% of oilseed meals used in the current annual world production of 980 million tons of animal feed in 2015.



As great a success as the soya bean has been, it has a number of anti-nutritive characteristics that still present challenges and opportunities to improve the value of SBM. It has to be considered that with the huge volume of SBM consumed globally, that a small improvement in quality will have a considerable impact on global nutrient availability.

Soya beans have developed different shapes, colours and sizes over many years. The specific ideal type of soya bean can be linked to the purposes for which it is required, some of which are high-protein and oil to crush for oil and animal feed, low phytate, high-oleic, large seeds for tofu and soya milk and small soya beans for natto production.

Oligosaccharides

Non-starch polysaccharides make up 20% of soya beans, and conventional soya beans contain approximately 4% oligosaccharides. Raffinose and stachyose are undesirable components and cause digestive disturbances in the intestine. Galacto-oligosaccharides (GOS) are indigestible but fermentable by microflora and reduce digestibility and performance in chicks and pigs. Low oligosaccharide soya beans can improve metabolisable energy by up to 9%.

SBM produced with high protein

and low oligosaccharide soya beans, are required at lower inclusion levels to deliver the same broiler performance due to higher nutrient content. TME values are significantly higher for low oligosaccharide SBM in poultry. Feed efficiency can be improved and amino acid (AA) digestibility is similar. It was found by the interdisciplinary plant group of the University of Missouri that it is possible to disrupt the activity of raffinose synthase to reduce the levels of raffinose and stachyose.

Sugars

Sugar concentration is influenced by processing. There is significant association between sugar-positive and oil content. Oil and sugar are negatively correlated to protein. It is possible to develop soya beans with low raffinose and stachyose and a higher sugar content.

Between 65 to 85% of raw soya bean protein is made up of beta-conglycinin and glycinin, which are the main storage proteins of soya bean.

A subunit of beta-conglycinin causes allergic response in the gut epithelia. Glycinin causes antibody formation. Antigens cause an allergic response in the gut and decrease digestive capacity of protein.

Phytic acid is a phosphorus containing acid which chelates with minerals. Its breakdown increases protein digestibility.

The degradation of phytate by the phytase enzyme increases phosphorus availability. Phytase producers are increasing the dosage advice to reduce the anti-nutritional factors (ANFs) of phytic acid with encouraging cost-effective responses.

Lectins

Lectins are glycoproteins that are resistant to proteolysis. They bind to the small intestine epithelium and cause disruption of the brush border and villi ulceration.

Increased endogeic nitrogen losses using lectin-free soya beans improved true metabolisable energy, as well as protein digestibility and feed conversion by 10%. Fortunately, heat treatment is effective and necessary in the inactivation of lectins.

There is a negative correlation between ADF and AA digestibility. If ADF rises from 4,8 to 11%, it can result in as much as a 6% decrease in AA digestibility.

Anti-nutritional factors

The various processes that can be used to reduce ANFs are heat treatment, solvent extraction, enzymatic degradation or fermentation.

It needs to be considered that heat treatment only affects heat-sensitive molecules such as trypsin inhibitors, but not heat stable ANFs such as oligosaccharides.

Table 1: Analytical characteristics of common types of soya products (as feed basis).

Product type	Unit	Soya bean seeds, raw	SBM	Enzyme-treated SPC	Alcohol-extracted SPC	SPI
Humidity	%	10–12	10–12	6–7	6–7	6–7
Crude protein	%	33–37	42–50	55–60	63–67	<85
Fat	%	17–20	0,9–3,5	2,5	0,5–3,0	0,1–1,5
Ash	%	4,5–5,5	4,5–6,5	6,2–6,8	4,8–6,0	2,0–3,5
Oligosaccharides	%	14	15	<1,0	<3,5	<0,4
Stachyose	%	4–4,5	4,5–5	<0,3	1–3	<0,2
Raffinose	%	0,8–1	1–1,5	<0,2	<0,2	<0,1
Verbascose	%	–	0,3–0,4	–	–	–
Trypsin inhibitors	mg/g	25–50	1,6–5,0	1–2	2–3	<1
Glycinin	mg/g	150–200	20–70	<0,01	<0,1	<0,01
B-conglycinin	mg/g	50–100	3–40	<0,01	<0,01	<0,005
Lectins	ppm	2 100–3 500	20–600	<1,0	<1,0	<1,0
Saponins	%	0,5	0,6	0	0	0
Phytic acid bound	%	0,38	0,42–0,49	0,6	0,6	–

Source: Van Eys, 2015

United Soya Bean Board

Soya bean products' quality can be improved through processing, but the quality of the soya bean itself plays an important role.

The United Soya Bean Board (USB) has embarked on a quality improvement programme. Their objectives are to accelerate the availability of advanced compositional traits and focus on the needs of meal and oil users. They aim to enhance demand for quality soya beans, increasing levels of selected essential AAs, improving balance and AA digestibility and reducing selected carbohydrates as well as improving phosphorus availability.

Aquaculture

Fishmeal is becoming an increasingly expensive variable supply due to a long-term decline in fishery resources. It contains the lowest fibre and highest protein levels.

Cellulose in soya bean hulls is not digestible to fish and will degrade pellet quality and water stability of finished feed. Removal of 5% indigestible fibre and ash from non-dehulled SBM increases digestible energy by more than 150kcal/kg.

Due to its processing method, SBM has lost significant oligosaccharides and antigens. It can successfully replace fishmeal and animal protein in pig weaner diets. (Zoot and Stein, 2013).

Enzymes

Protease can improve the nutritive value of commercial solvent-extracted SBM. Protease isolated from different species determines the improved performance of the SBM (Ghazi, 2002 and 2003). A combination of protease and phytase additively improves the performance of maize soya diets (Aureli et al., 2015). Mono component protease has been shown to improve ileal digestibility of SBM in commercial laying hens (Angel et al., 2015).

It has been demonstrated that proteases can degrade Kunitz and

Bowman-Birk inhibitors as well as lectin. Protease can degrade protein in SBMs with various levels of anti-nutritional factors. Improvement is greater for less digestible sources (Nasser-Odetallah, 2015).

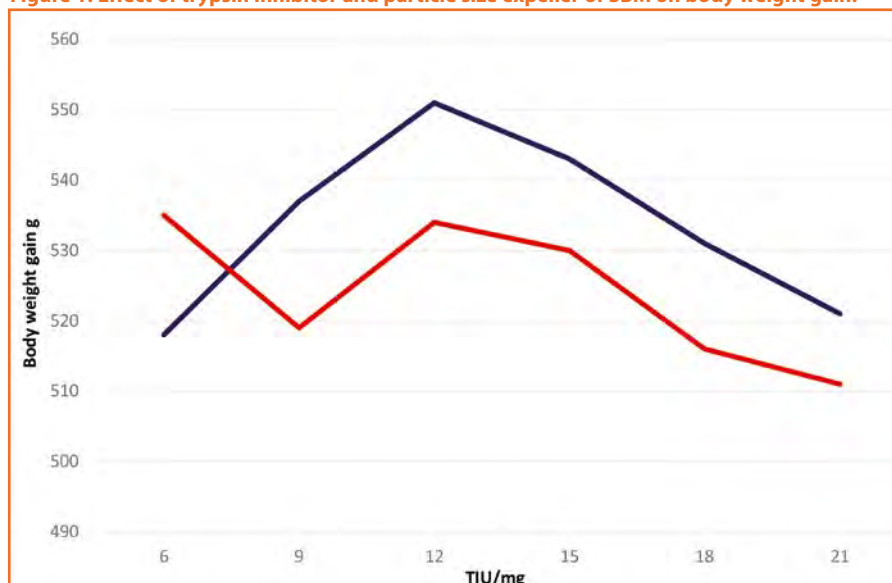
Potential effects are reduced challenge to the pancreas, better access to sulphur AAs, less stress on intestinal epithelial tissue and improved feed conversion.

Including by-products

Hulls, gums and soapstock reduce the nutritive value and consequent animal performance when using resultant meal (Bruce et al., 2006). Previous studies have indicated that particle size can influence gizzard development and retention time of feed (Ferket, 2000) and digestion could be improved (Bjerrum, 2005).

Recent research conducted with expeller soya bean found significant effects of particle size on broiler performance. Particle size had a similar magnitude of response in body weight gain (BWG) as a significant change in trypsin inhibitor activity (Figure 1).

Figure 1: Effect of trypsin inhibitor and particle size expeller of SBM on body weight gain.



Source: Pacheco, et al. (2014)

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Pellets available from Zinchem



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- Potato **B4498**
- Vegetable **B4500**

2-5mm round pellets with the following nutrient information:

	Reg. no.	Zn%	Cu%	Mn%	Fe%	Mo%	B%	Total %
Grain Crops, Oil & Protein Seeds	B4501	22.4	0.6	1.7	2.6	–	1.3	28.6
Potato – Foliar Application	B4498	8.0	1.1	2.0	2.6	0.4	5.9	20.0
Vegetable Crops – Soil Application	B4500	9.9	1.0	5.6	2.0	1.2	2.2	21.9

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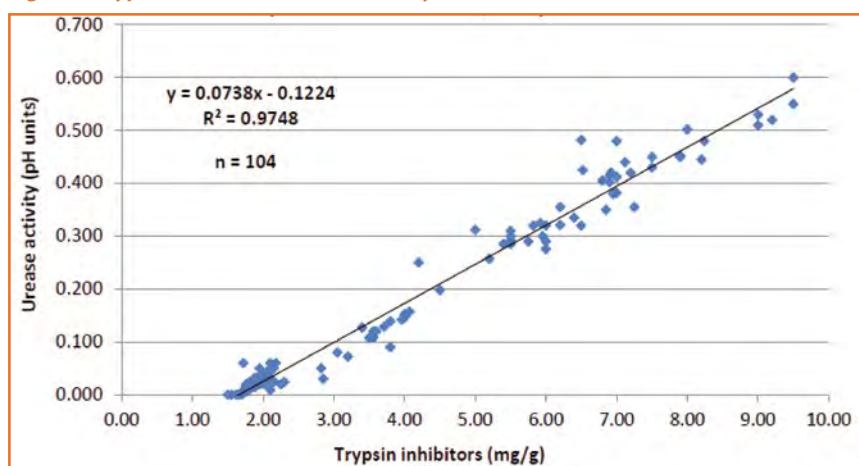
Trypsin inhibitor activity

Trypsin inhibitors block endogenous proteases trypsin and chymotrypsin, and reduce protein digestion and increase endogenous losses. The effects of trypsin inhibitor activity (TIA) are more pronounced in young animals. Older animals are capable of compensation for the loss of trypsin activity by enlarging the pancreas.

Although TIA is extremely important, it should be considered that, according to Kakade et al. (1974), 60% of growth inhibition of raw soya beans can be ascribed to anti-nutritive factors other than trypsin inhibitors. Among them are lipase inhibitors, goitrogens and haemagglutinins.

Ruiz and Belalcázar (2002) and Ruiz (2012) concluded from poultry performance in various South American countries that to avoid rapid food passage, TIA should be lower than 3,5mg/g. However, lower TIA levels improved bird performance, and optimal levels would be below a level of 2,5mg/g TIA. This should correspond to a urease index below a maximum of 0,05 (Figure 2).

Figure 2: Trypsin inhibitors vs urease activity.



Source: Belalcázar and Otdóla, 2012

When interpreting trial results and data on TIA responses, the two main different testing methodologies and units of expression should be considered, as currently there is no statistical conversion factor between these methodologies. They are the American Oil Chemists' Society (AOCS) method 2011b with the trypsin inhibitor units (TIU/g), mainly used in the United States (US), versus ISO 2001, mainly used in the countries other than the US, expressed in mg/g trypsin inhibitor. The AOCS method delivers results with higher readings than the ISO 2001 method.

Ileal amino acid digestibility

Ileal digestibility of AAs was found to be lower for deliveries into Europe of Argentine versus US and Brazilian meal, despite no significant difference in TIA content of the meals.

Data suggested that the tested Argentine meals were processed under more severe conditions than the US or Brazilian ones, resulting in lower TIA content, but also a higher incidence of the Maillard reaction. This was consistent with lower potassium hydroxide (KOH) solubility values observed for Argentine meals.

KOH solubility was the best predictor of ileal digestibility of crude protein and lysine (Lys). The study emphasised the differences in nutritive value among commercial sources of SBM. A higher crude protein content has a positive effect on AA digestibility (Frikha et al., 2012).

There is a fine line between under- and over-processing. Care must be taken to sufficiently heat the SBM, but heat damage affects AA digestibility. NIR methodology could be used to detect

over-processing effect on AA digestibility (HI). Supplementation of AAs can restore performance of over-processed SBM (Wiltafsky, 2013).

Protein dispensability index

Protein dispensability index (PDI) has been widely used in the food industry for over 30 years. This test will further distinguish the quality of SBM that is considered of high quality, based on already acceptable urease KOH and TIA.

Heat treatment only affects heat-sensitive molecules such as trypsin inhibitors.

Globally there are crushing plants that market 'high-performance' SBMs with PDI values of 30 to 50%, low urease values, pH below 0,05 and KOH above 90%.

Geographic location of soya bean production has the most significant effect on soya bean nutrient content, followed by soya bean variety. Management and analysis of soya beans at intake, as well as processing conditions, are critical to deal with soya bean variation, particularly in South Africa where soya beans are sourced from varying climatic regions.

Broiler growth studies conducted at the University of Pietermaritzburg to 21 days of age indicate that, although not at a statistically significant level, there is a numerically large difference in growth of SBM from various processing origins. The growth difference between local SBM s was 70g at 21 days.

Trypsin inhibitor levels (TIU/g) were five times higher in some domestic meals versus the lowest, which had comparable TIA to imported Argentine SBM. Trial data also suggests that if the best quality South African SBM replaces its Argentine counterpart used in this trial which is of a typical imported consignment, bird performance is equal or superior. 🌱

Weather and demand shifts lead to volatile international prices

By mid-May 2016, the southern hemisphere had started harvesting with mixed feelings regarding the yields obtained, while the northern hemisphere started to plant new crops. The southern hemisphere currently has a few concerns in terms of production figures, which means that the market is constantly evaluating the northern hemisphere to provide more certainty in terms of trade.

Some of the uncertainties which are currently creating volatility in the oilseeds market, include the following:

Argentina recently experienced floods, a state of affairs which caused delays in harvesting, but also resulted in some crop damage. The expected losses due to crop damage are estimated at 7 million tons and is currently directly affecting global supply prospects.

Palm oil supply was in trouble early in 2016, creating an additional demand for oilseeds, and more specifically soya beans. Palm oil supply is at an all-time low, and prospects for the next quarter are not looking good. The increase in demand has resulted in a shift in foreign demand and an increased focus on United States (US) production and stock levels.

More soya beans

During mid-May the US had already planted 23% of the planned plantings. The five-year average for the same period is 16%. Due to the increase in demand and the favourable price position of soya beans, international traders are expecting more plantings of US soya beans than originally planned. The price ratio between maize and soya beans increased from 1,9 in November 2015 to 2,4 by mid-May.

Figure 1: US maize and soya price ratios.



Source: CME

In terms of sunflower, the planting for the new season is in good progress and slightly larger volumes are expected. However, this is still highly dependent on weather conditions. According to the United States Department of Agriculture (USDA), the expected global production figure is 41,9 million tons relevant to a five-year average of 38,81 million tons.

However, the increase in global oilseed demand has resulted in a 1,3 million ton ending stock against a five-year average of 2,57 million tons.

Table 1: Key oilseeds prices (US\$/ton and R/ton).

Product	4 May 2016	Apr 2015	% change
Soya beans (US CIF Rotterdam)	415	395	5
Soya beans (Brazil)	434	409	6
Sunflower seed (EU)	420	426	-1
Groundnuts (US 40/50)	1 175	1 300	-10
Palm oil (Malaysia)	690	610	13
Soya oil (US)	721	724	0
Sunflower oil (Arg)	785	786	0
Soya meal (Arg)	399	392	2
Fishmeal (Peru)	1 390	1 660	-16
Rand/\$	15,08	12,03	25

Source: Reserve Bank and Oil World

Although most of the oilseed stocks have increased in the past year, the increase in demand supported prices from a global perspective. This means that it would be

crucial to monitor demand in the next few months. Price changes will not only occur within commodities, but cross-commodity evaluations will be essential.

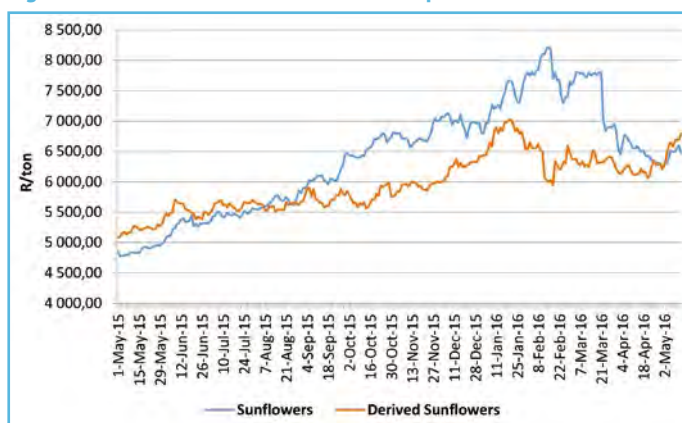
The local market

On the local market, the Crop Estimates Committee (CEC) estimated in its fourth report that South Africa will produce 694 550 tons of soya beans, 730 000 tons of sunflower and 33 550 tons of groundnuts. The Free State is expected to produce only half of its previous crop of 156 000 tons. The new production season's intentions to plant will be determined by the weather, but external factors such as financing and production costs will also play a key role.

In terms of supply and demand, the soya beans stock is considerably lower, and the increase in crushing capacity also increases demand. This means that imports will increase in order to satisfy demand. The big question remains to be answered: What will be imported, processed soya meal or soya beans? All of this depends on global soya meal and soya oil prices, which have a direct impact on the margins.

It is crucial to evaluate the derived prices on the local market and the crushing margins. The soya bean price is currently below the derived price, meaning that there is still scope for some price increases, even though it is limited. Sunflowers have almost reached the derived price. The crushing margin as at mid-May was close to a zero basis, which indicates that price movement on the physical market is limited due to a lengthy period of negative margins.

Figure 3: Sunflowers and derived sunflower prices.



Source: SAFEX and Grain SA

Figure 4: Crushing margins of soya beans.



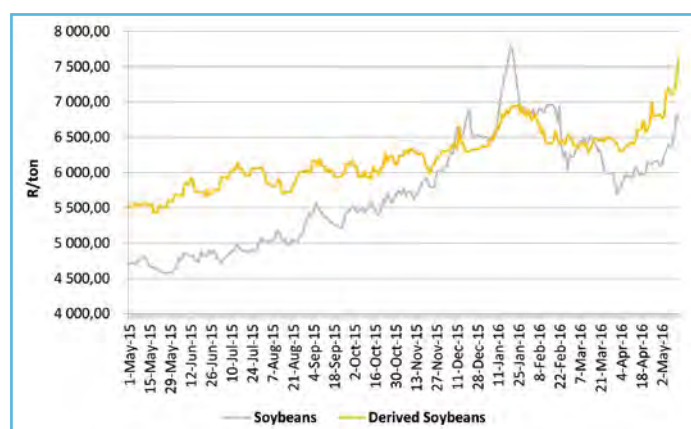
Source: Grain SA

Table 2: Local oilseeds prices.

Crop	12 May 2016	1 May 2015	% change
Sunflower	6 470	4 850	33
Derived sunflower	6 795	5 081	34
Soya beans	6 747	4 693	44
Derived soya bean	7 632	5 517	3w8
Soil canola	4 850	4 300	13

Source: SAFEX and GrainSA

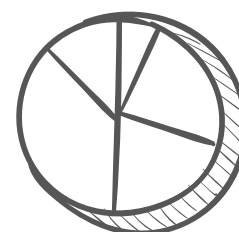
Figure 2: Soya bean and derived soya bean prices.



Source: SAFEX and Grain SA

In terms of current prices, the drought has resulted in favourable prices with sharp increases on a year-on-year basis. This price support was also partially due to the weakening of the rand.

The South African currency weakened by 25% on a year-on-year basis due to factors such as slow economic growth, lack in business confidence and the political climate.



In a nutshell

Various demand shifts are taking place in the international market and low palm oil stock levels have created an additional demand for oilseeds, which will have a price support effect. It will be of critical importance to monitor these demand shifts in the near future.

The demand for local oilseeds is still very high, but the prices are also at good levels. Given the margins and derived prices, there is limited room for price movement and it remains vital to evaluate the exchange rate, since this is one of the factors that can have an enormous effect on price movement. It will also be important to evaluate the sentiment regarding new planting intentions and maize/soya bean price ratios for the remaining six months of the year.

Protein, fats and fibre:

All found in peanuts!



Protein, fats and fibre are the major components that make up peanuts. The good news is that these components are all the healthy aspects when it comes to peanuts. The protein is plant based, the fat is unsaturated and fibre is the main type of complex carbohydrate found in peanuts. It makes sense that these three healthy components come together in peanuts, bearing in mind all that is known about the benefits of eating groundnuts especially when one considers chronic disease and weight management.

Peanuts have been recognised as a protein source, since peanut butter became a sought-after commodity at the time of World War II when meat was not readily available. A one ounce serving, roughly about a handful, is considered to be an excellent source of protein by the Food and Drug Administration (FDA) of the United States (US), and adds seven grams to your diet. Peanuts are actually a legume and have more protein than any other nut, with

levels comparable to or better than a serving of beans.

Since the protein in peanuts is plant based, it contains additional components that have positive health benefits such as fibre and unique bioactives, unlike in the case of animal protein. Peanuts are high in arginine (Arg) and amino acid (AA), which is one of the building blocks of protein. This AA is a precursor to nitric oxide (NO), a compound that expands one's blood vessels. It has been thought to help in decreasing blood pressure.

In fact, in a study titled the *Optimal Macronutrient Intake Trial for Heart Health (OmniHeart)* (Appel, 2005), three diets were compared to determine the effects on blood pressure as well as the optimal diet pattern for reducing the risk of cardiovascular disease (Swain, 2008).

The first diet was based on the Dietary Approaches to Stop Hypertension (DASH) diet, which emphasises carbohydrates. The second contained a higher fat level from healthy unsaturated fats. The third diet had higher protein levels, over half of which were from plant sources, including peanuts and peanut butter.

The study showed that in addition to the benefits of substituting healthy fat for carbohydrates in the DASH diet, substituting healthy protein also further reduced blood pressure and the risk of heart disease.

Adding peanuts to your diet is a way to add healthy protein. Along with that you will be adding key nutrients and bioactives such as Arg that can contribute to improving your blood pressure, decreasing chronic disease risk and to promoting longevity.

When one considers healthy fats, peanuts, peanut butter and peanut oil come to mind. That is because at least half of the fat in peanuts represents heart-healthy, monounsaturated fat, the kind found in olive oil and avocados. Additionally, over 30% is polyunsaturated fat – another good fat which is key in a healthy diet.

For the first time, a key recommendation documented in dietary guidelines is to consider a protein package that brings good fats along with it by putting emphasis on eating more plant-based proteins such as peanuts, since they contain healthy monounsaturated and polyunsaturated fats and other essential nutrients. It is thrilling to realise that peanuts are a food recommended for health – and one which tastes great too!

At Pennsylvania State University, a human study was conducted that fed diets including peanuts and peanut butter or peanut oil as sources of high monounsaturated fat to subjects, and compared this diet to a lowfat one higher in carbohydrates, an olive oil diet also high in monounsaturated fat and a traditional American diet high in saturated fat.

Olive oil diet

Compared to the American diet, subjects following the high monounsaturated fat peanut diets lowered their total cholesterol by 11% and bad low-density lipoprotein (LDL) cholesterol by 14%, while their good high-density lipoprotein (HDL) cholesterol was maintained (Kris-Etherton, 1999). The benefits of the peanut diets on cholesterol were comparable to the olive oil diet. In addition, the peanut diets reduced triglycerides (TGs), whereas they were increased in the lowfat diet.

Emerging data clearly indicates that the amount and type of fat we eat can impact our health in various ways (Kris-Etherton, 2002; Harris, 2009). Choosing

peanuts, peanut butter, and peanut oil as part of one's diet will help to absorb more healthy fats, the type best for heart health.

Harmful fats

Simply stated, knowing that peanuts are high in healthy fats tells us that they are low in the so-called 'bad fats' – the ones science has found which may not be as favourable to our health. Saturated fat is found most often in animal products, whereas trans-unsaturated fatty acids (trans fat) originates from the processing of partially hydrogenated oils.

When bad fats are substituted with healthy ones, our risk of cardiovascular disease can be reduced.

Peanuts, peanut butter and peanut oil are all low in saturated fat. Peanuts and their oil naturally do not contain any trans fat, and although a small amount of partially hydrogenated fat is used as a stabiliser to make peanut butter creamier, a US Department of Agriculture study tested eleven commercial brands of peanut butter and found that in all of these, levels of trans fat were not detectable (Sanders, 2001).

In fact, the amount of trans fat in peanut butter with 2% stabiliser is 156 times less than what is required to reach the 0g trans fat cutoff on food labels (Sanders, 2001). Major US-based health organisations such as the American Heart Association (AHA) and the Institute of Medicine (IOM) also recommend keeping saturated fat low and trans fat as low as possible in one's diet.

Scientific studies have shown that when bad fats in a diet are substituted with healthy ones, our risk of cardiovascular disease can be reduced (Hu, 1997). The risk of other types of chronic disease as well as inflammation in the body may also be improved by such

healthier choices. Peanuts, peanut butter and peanut oil are natural options that can help us abide by these guidelines and to add more healthy fats to one's diet. Since peanuts are a plant food, they also do not contain cholesterol.

Fibre content

When one considers fibre, fruits, vegetables and whole grains come to mind. However, did you know that a serving of peanuts is also a good source of fibre, according to the FDA? Fibre is a healthy carbohydrate and ingesting it provides various benefits to our health. Fibre is also commonly known for its ability to regulate the digestive system.

It adds bulk to our diets, helping us to feel full, and can slow down the absorption of certain foods so that blood sugar levels are better controlled and maintained. Studies have shown that diets high in fibre can also contribute to lower total and bad LDL cholesterol and a reduced risk of heart disease.

Over a third of the carbohydrates found in peanuts is fibre. This may contribute to the fact that peanuts have a low glycaemic index (GI) and glycaemic load (GL) (Foster-Powell, 2002). On a 100-point scale, the GI of peanuts is 14, and its GL is one. What this means is that when these nuts are consumed, the fluctuations in our blood sugar and subsequent insulin levels are less significant than with foods that can make our blood sugar rise and fall rapidly such as when ingesting certain refined grains or sugar beverages, for instance.

These guidelines highlight fibre as one of the main nutrients lacking in the typical American diet. Consuming more plant-based protein sources, such as peanuts and peanut butter can help one remain fuller longer. America's comfort food can bring more than just feelings of contentment. Fibre, in addition to the number of other nutrients found in peanuts, is improving our health with each handful.

For more information, visit the Peanut Institute's website
www.peanut-institute.org





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amongst our 600 farmers - jobs are being created and communities
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www.soill.co.za



Southern Oil

a company at the forefront of agricultural advancement



B-well – a new brand of healthier oil.

In 1993 Southern Oil (Pty) Ltd revolutionised agriculture in the Western Cape by further developing and permanently establishing canola as a crop in South Africa. The objective was to process locally grown GMO free canola seeds and to stimulate the growth of a revolutionary new product in the SA market place.

What began as an ambitious enterprise development project with the aim of creating jobs, has grown from strength to strength and today SOILL is a leader in the ever growing canola oil market. Ever since opening its doors in 1996, SOILL's goal was to provide farmers with an alternate income stream. SOILL's modern extraction plant and impressive oil refinery is located in Swellendam in the Western Cape.

Sustainable agriculture

SOILL works closely with a network of over 600 farmers through a dedicated agricultural team. SOILL has formed great relationships with the farmers which continue to grow.

Sustainable and ethical agriculture is at the core of Southern Oil's company vision. By developing and implementing a programme that drives sustainable agriculture, SOILL has positioned itself as a company at the pinnacle of positive and forward thinking change in the agricultural sector.

SOILL's involvement with and impact on their farmers are broad and include the following areas:

- Direct involvement with the decision making process. This service can range from cultivar evaluations, planning of harvest timelines to advising the farmers on how to treat the plants for optimal health.
- Keep farmers up to date with the

latest technology and trends via articles and newsletters.

- Study groups in key areas aid farmers to really gain insight into the specific challenges for their region and how to overcome these challenges.
- Farmers are guided to implement sustainable agriculture techniques and strategies that cater for their specific needs and challenges.

expansions have translated to a factory that can crush upwards of 500t per day of canola and similar seed types.

Quality is king

SOILL is committed to producing a product of consistent high quality which is safe for human consumption. This is achieved through the implementation and maintenance of a food safety and quality system that sets

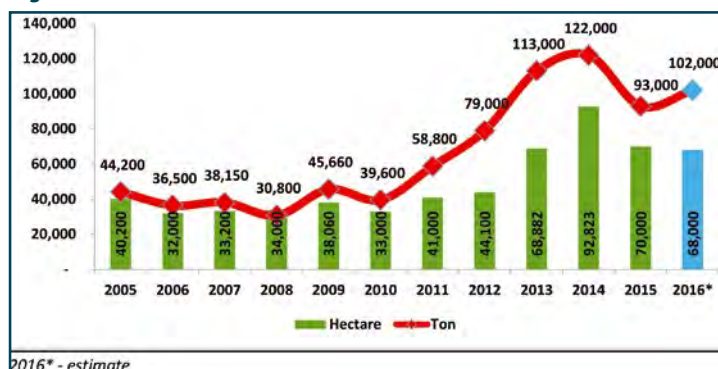
the need of the customer first and is based on the creation of a culture, attitude and organisation that stands for high quality. By conforming to both statutory and regulatory

requirements as well as food safety requirements from customers, SOILL adheres to the FSSC 22000 System as a method for minimising the entry of food hazards into the food supply in order to protect human health.

SOILL has produced a wide range of canola based products which retails under the brand "B-well". The product range includes: Canola Oil; Canola & Olive Oil Blend; Cooking & Baking Sprays; Original Tangy & Creamy Gourmet Mayonnaise; Grapeseed Oil; Omega 3 Cooking Oil; Chef Catering Oil.

B-well products are available in Pick & Pay, Spar and Food Lovers Market and all reputable retail stores.

Figure 1: Growth over time.



Since 2008 the canola industry has increased dramatically in hectares as well as tonnage produced. Canola fits in perfectly in the grain producing areas of the Western Cape and is a valuable rotational crop as well as a cash crop in its own right. Effective management is the key to a high yielding canola crop.

The South African industry is still relatively young. Yields will continue to increase as new knowledge is gained. SOILL is committed to the local industry with two agriculturalists available in the Southern Cape and Swartland area.

Continuous analyses and improvement of the production process at SOILL has moulded a manufacturing process able to supply the volumes and quality expected by local and international customers. Critical equipment upgrades and

For more information, visit the websites:
www.soill.co.za or www.bwellfoods.co.za

The International Peanut Forum:

Feedback and insights

The 2016 International Peanut Forum was recently held in Madrid, Spain. This biennial event, which is organised by the American Peanut Council (APC), creates an opportunity for international role-players – ranging from primary producer level to processors, traders, consumer representatives, technical services, researchers and equipment suppliers – to meet, discuss and trade information on a wide scope of topics relevant to the groundnut industry every second year.

This year's forum covered matters relating to nutrition and allergies, the genome project, exciting new applications and product releases, the environmental impact of groundnut production and use, social media marketing and an overview of the international supply and demand factors playing a role in the current market arena.

The South African groundnut industry was represented by Adri Botha, chairperson of the SA Groundnut Forum, and Corné Louw, senior economist at Grain SA. The main objectives or prospective benefits of attendance were:

- Gaining updated and relevant global information on a broad spectrum that is not otherwise accessible to local industry role-players – especially the smaller entities that, to a large extent, represent the basis and potential growth of the industry.
- The opportunity to get a 'first-hand feel' for where South Africa finds itself on the international groundnut arena.

- Possibly gaining some insight which could support and assist in a turnaround strategy for the industry.
- Official representation by an industry representative body (SAGF/OAC/OPDT) of the industry. Due to dwindling production, South Africa is currently not viewed as one of the larger players, but by sending delegates, the aim was to demonstrate – especially as far as markets in Europe are concerned – that the South African peanut industry remains relevant.
- Identification of potential speakers or international specialists which could be invited to South Africa in future.
- Identification of possible topics to be highlighted in planned industry days.
- Exposure to new technology not necessarily marketed to South Africa.

According to the registration list, the South African representatives constituted two of the less than ten African attendees. As could be expected, the largest number of registrations came from the United States (US), Argentina and China, with



various European Union (EU) importing countries also being well represented.

Latest nutrition research

The Peanut Institute is a US-based non-profit organisation that supports nutrition research and develops educational programmes to encourage healthy lifestyles which include peanuts and peanut products. Patricia Kearney, programme director, presented an informative overview of recent international studies that focus on the positive health benefits of groundnuts which have been published in various well-respected medical journals across the globe. The detail and volume of information is substantial and would be better served in follow-up articles.

However, in short, the *New England*

Journal of Medicine (NEJM) has published the study 'Association of nut consumption with total and cause-specific mortality'. Among the vast findings of this study, it has been reported that by eating nuts – including peanuts – on a daily basis, the risk of death by any cause may be reduced by as much as 20%.

The study was conducted over 30 years, with the support of 120 000 participants. It was further found that by consuming a relatively small amount of nuts twice a week, the risk of death by any cause may be reduced by 12% and specifically for heart- (-24%), respiratory- (-16%), infection- (-32%) and kidney-related (-48%) causes.

According to another study conducted at the Vanderbilt University in Nashville, Tennessee, which was published in the *Journal of the American Medical Association (JAMA)*, peanuts, peanut butter and nuts have been proved to prolong life.

Risk of diabetes

This year the World Health Organisation (WHO) will focus on the risk of diabetes – a disease which has grown into epidemic proportions globally. The hope and call is to find ways of better treatment and prevention in place or support of medicinal treatments. A Harvard study conducted over 22 years, including 206 000 participants, shows that plant (not animal) protein lowers the risk of Type 2 diabetes by 9%. According to the study, plant proteins that carry this benefit include whole grain, legumes, peanuts, peanut butter and some others.

A five-year study on a group of 12-year-olds showed that peanuts and peanut butter may hold the key to preventing obesity. Replacing four snacks per week with peanut or peanut butter-based options significantly improved their average body mass index (BMI).

By encouraging people to consume more peanuts, the responsibility to manage food safety throughout the supply chain – including the control of aflatoxin contamination – is now more important than ever.

Improving traits without GMO

Dr Steve Brown, executive director of the Peanut Foundation in the US, managed to

bring the intricate and highly specialised world of genomics and biotechnology within reach of the average delegate. The vision of the peanut genome initiative is to guide the effective development of trait enhancement technologies, disease management systems, genomic resources, and agronomic germplasm for profitable peanut production.

Dr Brown outlined the basics of genome and gene studies, and that what this project is achieving should not be confused with genetic engineering. A vast majority of organisms have already somehow been modified by humans over time, for instance dairy cows, without genetically modified organism (GMO) intervention.

Promotion of the high protein content of products provides the opportunity for peanuts as an ingredient.

The peanuts cultivated today have also been domesticated over centuries, and are very different from the two natural wild species, which simply did not exhibit the traits we are looking for, and, therefore, breeding has led us to better suited varieties. The focus of the genome programme is to find the specific gene pattern or code linked to a particular trait – or in other words, mapping genes to traits.

Through marker-assisted selection, growing tests are to a large extent replaced by testing the deoxyribonucleic acid (DNA) code and identifying traits without long and expensive trials – therefore, a breeder toolbox to find the desired traits. The question that comes to mind now is where South Africa fits into this picture.

Peanut allergy research

Specialising in children's allergies and asthma at the Allergy Diagnostic and Clinical Research Unit of the Red Cross Children's Hospital and the University

of Cape Town, Dr George du Toit, who is also currently a consultant in children's allergies at the Evelina London Children's Hospital and an honorary senior lecturer at King's College London, shed some light on a study he is involved in.

The study, 'Effect of avoidance of peanut consumption', which was published in the *NEJM*, focusses on the effect of early introduction to at-risk children and the subsequent effect on peanut allergy. The study has been conducted over many years, following the children from birth. It has been found that the introduction of 2g of peanuts or peanut products per week is most beneficial in limiting or even preventing later allergies.

New product launches

New products containing peanut show a consistent growth in the EU, according to Edward Bergen, a trends and innovation consultant from Mintel UK. He is of the opinion that for some time consumers were confused over nuts – whether they are healthy or not.

However, lately the benefits of nuts, and particularly peanuts, have been widely promoted, and peanuts are increasingly finding their way into various kinds of meals and products. Promotion of the high protein content of products provides the opportunity for peanuts as an ingredient, and for products such as dry powder peanuts, to become readily available in the health food sector in particular.

Trendy and speciality tastes are on the rise, and peanut butter is no longer only available in smooth or crunchy varieties. Options such as chili or salted caramel peanut butters are presented on shelves. In the same trend, snacking flavours are becoming more adventurous, unusual and exotic. Descriptions and brand names are becoming more specific and authentic through origin-based marketing.

Peanut milk is being considered as an alternative to dairy or other nut-based 'milks', such as almond milk. With beer- and spirit-inspired products, such as Jim Bean Honey Bacon and Guinness Gourmet Peanuts, finding their way to consumers, the humble peanut seems to be undergoing a major makeover.

The greater message is that snacking can be better for one's health if the right choices are made. There is large growth potential due to legitimate product claims referring to healthier, high-protein, satiety and energy boost.

Environmental impact

Population growth will be the driver for change. In 2050, between 8 and 11 billion people will populate the earth, and in the next 30 years we need to find food to feed an additional two billion people. Agriculture is responsible for 70% of the global water usage, and crops and pastures occupy roughly 40% of our land surface. Considering these facts and the available surface areas, there is not much room for further expansion and we will have to consider other measures.

According to Dr James McCarthy from the University of Arkansas, crop science remains a key aspect, and disease and pest resistance in crops are of paramount importance, as producing food needs to remain sustainable for farmers. However, producing food should be ecologically sound, and we cannot continue producing food at any and all cost. Peanuts are well positioned as a possible solution for food supply, not only on nutritional merit but also due to the multiple benefits thereof in a rotational crop programme.

A full lifecycle impact assessment study quantifies the inputs and outputs, in order to determine the environmental impact of a certain product from production through to final consumption. A study conducted on peanut butter yielded some interesting and positive results – for instance, a total carbon footprint of only 2,77kg CO₂e/kg of peanut butter, of which the highest values were attributed to electricity and transportation costs in the secondary and tertiary sectors.

Recently, yields have increased in

Argentina, China and the US. Dr McCarthy is of the opinion that if yields can be increased in the rest of the top ten production countries, we should be getting much closer to our goal of filling the food gap.

Social media marketing

Regardless of the Facebook, Twitter and Instagram accounts most of us have on our cellphones and tablets, many are still amazed by the ever-increasing role social media is playing in our daily lives – especially the scope of direct, real-time marketing via these platforms to a broader, global and interconnected audience.

Charlotte Hamill, joint managing director at Born Social, a London-based marketing and advertising company, gave an entertaining and eye-opening presentation on the importance of understanding social media and the role it plays in today's business world.

Social media has levelled the playing field, providing small brands with the same opportunities as larger, better funded brands. One has to find the most relevant platform for a product to reach the right portion of the 2,3 billion people globally active on some sort of social media platform.

According to Hamill, the fundamentals of any social media programme are strategy, content and community. "Define your objectives, message and market. Decide on quality versus quantity postings and never forget the human factor. Find and maintain a connection by adding value for the reader," she said.

Supply and demand

The audience was not left with any impression of major changes in the overall global supply and demand position. The large production countries, the US, China, Argentina and India, remain well positioned

with the natural fluctuations of agricultural production that will remain integral in analysing any one season. Cultivars with shorter growing periods, high oleic content and increasing yields remain at the forefront of these nations' research and development agendas.

At the time of the event, Argentina (where plantings had been slightly down from the previous season) was experiencing high rainfall across main production areas, which could potentially have some effect on the crop during this time of harvest. They are currently awaiting the result on the yield.

The representative from Brazil reported that their harvest is progressing well and that quality seems better than the previous season. In his view, increased prices might entice farmers to increase 2016 plantings by between 10 and 20%.

Similarly, in China lower maize prices might make peanut production more attractive to farmers, and an increase of 5 to 10% in plantings is a possibility. India experienced two challenging seasons and exports from this country is down. According to their delegate, plantings depend on the monsoon, but that an increase of 10 to 15% may be feasible.

From the US it was reported that a yield of 2t/acre is common and that no other commodity poses real competition for peanuts. There is, however, some concern over storage infrastructure next year, and it was further noted that no changes in the *US Farm Bill* is expected.

Regarding imports, it was reported that the confectionary and chocolate markets are still growing in the US as well as the EU, where, depending on the country, a 3 to 5% growth per annum is experienced. In China the edible market still takes a backseat to oil remaining in high demand. However, consumption is growing annually in that country. 🌱





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*Acetochlor 900 EC: Net vir gebruik op grondbone.

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