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On the cover

Potatoes are transforming agriculture by turning emerging farmers into commercial farmers. The Potatoes South Africa Seed Potato Growers Forum and Congress will be held on 17 and 18 September 2019 at the Tsogo Southern Sun Cape Sun Hotel in Cape Town.

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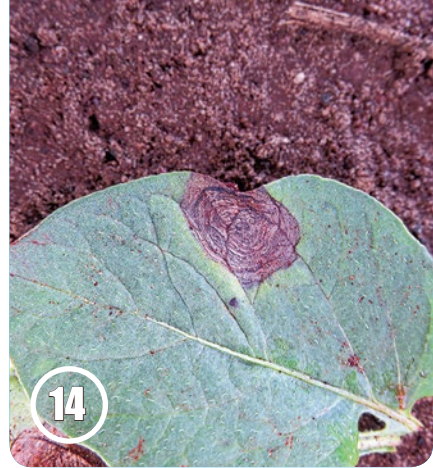
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Fore word



Prof. Andre Jooste
CEO Potatoes SA

The underground wonder that creates food security, jobs and economic advancement—the potato

The value of the primary potato industry in South Africa amounts to about R8 billion and the secondary industry about R25 billion. The size of the potato crop has moved just over 200 million 10kg bags sideways for several years. Since 2015, the crop size moves between 245 and 255 million bags sideways. The amount of hectares planted with potatoes in South Africa has been moving sideways over the last 10 years between 50 000 hectares and 54 000 hectares, which accounts for less than 1% of the land used for agricultural purposes but creates between 8% and 10% of jobs in the primary agricultural sector.

In many cases, labour wages are a key lifeline for the survival of smaller rural villages. The Free State plants about 33% (Eastern Free State 20% and the Western Free State 13%) of the total hectares under potatoes. The higher production coupled with hectares moving sideways implies that producers' average returns have improved over time. Over the past 20 years, the potato producer has managed to increase the average yield under irrigation and dryland production from 30 tons per hectare to 47.

One of the biggest challenges the potato producer faces is the ongoing increase in

production and marketing costs at a rate higher than inflation, while potato prices in real terms have moved more or less sideways over the past decade.

However, since 2015, there has been a rising trend in real potato prices, which, together with rising consumption, is beneficial to the potato industry.

Potatoes South Africa has deliberately invested in various models to quantify the impact of cost increases on the potato industry. This enables Potatoes South Africa to communicate the impact of, for example, administered costs such as fuel, labour and electricity on the potato industry to government institutions and organised agriculture.

Potatoes South Africa is committed to potato producers in South Africa and serving their best interests. The activities of Potatoes South Africa are the direct outcome of decisions by potato producers due to a system of regional meetings and committees on which potato producers serve.

The commitment of potato producers to be involved in operating activities and structures unlocks the value proposition of cohesion and co-operation to their own benefit. The benefits are competitive advantage through the optimal use of resources, a unified voice, credibility, creating a platform to give back to the broader community and visibility on industry issues.



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EDS NOTE



GREG PENFOLD
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Mentoring brings transformation

Consensus is beginning to emerge that for transformation in the agricultural sector to succeed, emerging farmers must be fast-tracked into commercial farmers and provided with the training, mentoring and support necessary to succeed on the competitive global stage. The history of transformation is littered with farms that have failed for want of appropriate skills and finances. Fortunately, the private and public sectors have learnt how to collaborate and their efforts are bearing fruit.

The potato industry is a leader in this regard. Recently it was reported in the media that former subsistence farmers in the OR Tambo District in the Eastern Cape have become commercial potato farmers and multiplied their production volumes thanks to a three-year mentorship and development

programme between Potatoes South Africa and Eastern Cape state entities.

Seven co-operatives each received R500 000 from the Eastern Cape Development Corporation, while training and market support were provided by the Ntinga OR Tambo Development Agency, Kei Fresh Produce Market and Potato SA. The farmers were also trained in book-keeping with the help of the then Department of Agriculture, Forestry and Fisheries contributed training in book-keeping. The farmers' ultimate aim is to produce potatoes for potato chips.

In parallel, Joburg Market is planning to help emerging farmers achieve the quality standards required to market their produce.

Such initiatives demonstrate that the "sweet spot" for South African agriculture is the gap between emerging and commercial farmers. It is fertile soil for investment, opportunity and growth.



POTATOES SOUTH AFRICA

SEED POTATO GROWERS' FORUM AND CONGRESS 2019

You are cordially invited to the Potatoes South Africa Seed Potato Growers Forum and Congress which will be held on 17 and 18 September 2019 at the Tsogo Southern Sun Cape Sun Hotel, 23 Strand Street, Cape Town, as well as the evening functions where the Bayer Seed Potato Grower 2019 and the Syngenta National Potato Farmer 2019 will be announced.

During the Forum the focus will be on **"Quality plant material as the foundation of a competitive potato industry"**. Speakers during the Forum include **Dr Leah Tsror** - Dep. of Plant Pathology, Gilat Center, Israel; EAPR Councilor. Title: **Black dot: An emerging soil-borne disease**; **Mr Kobus Steenekamp** - Commercial Operations Lead, Bayer. Title: **Shaping the future of agriculture**; **Dr Julian Jaftha** - Chief Director: Plant Production & Health, DALRRD. Title: **Regulatory frameworks supporting quality plant material: Domestic & International perspectives** and **Dr Peter VanderZaag** - Canadian Potato Farmer, Member of the Board of Directors: World Potato Congress Inc. Title: **Revolutionizing how we grow potatoes for the benefit of all**.

The theme for Congress links to that of the Forum, namely: **"Gearing up for a changing environment to ensure a sustainable potato industry"**. Speakers during the Congress include Keynote Speaker: **Lauren M. Scott** (Chief Marketing Officer of the Produce Marketing Association. Lauren has over 20 years of experience in the consumer products industry). Title: **From a Tiny Seed: Perpetual Advancements and Disruptive Changes in the Global Produce Industry**. Other speakers are **Dr Peter VanderZaag** (Canadian Potato Farmer; Member of the Board of Directors: World Potato Congress Inc; Visiting Professor at Joint Academy of Potato Sciences, Yunnan Normal University, China). Title: **Factors that impact on global and local sustainability in the potato industry** and **Dr Daniel Caldiz** (Global Director of Agronomy Research and Development for McCain Foods; Co-Editor of the Potato Research Journal). Title: **The future is now: Sustainable intensification in potato production**.

Association Business Events (ABE) has been appointed to help organise the Seed Potato Growers' Forum and Congress. Registration is available online at the following link: <http://www.abadmin.co.za/default2.php>.

Accommodation at negotiated rates can be booked at the following link: <https://be.synxis.com/?chain=24151&Group=POTATOES&arrive=2019-09-13&hotel=5321&rate=POTATOES>

For any logistic enquiries contact Association Business Events (ABE) at petrie@abevents.co.za or 074 051 3318.

We are excited to welcome you at this event!

Yours sincerely,

JF van der Merwe
CHAIRPERSON POTATOES SA



Tsogo Southern Sun Cape Sun Hotel
23 Strand Street, Cape Town CBD



A portal for produce

Historic Joburg Market adapts to a smart future

Joburg Market can trace its roots to the establishment of the fresh produce market at Market Square in central Johannesburg in 1887, where three thousand people congregated to trade in fresh produce. As the city grew, so did the trading of fresh produce, prompting the building of a new facility in Newtown in 1913. By this time,

Market had achieved an annual turnover of R1.5 million. The premises in Newtown became too small and by 1974 the market relocated to its current location in City Deep, where it operates on a commission market system. We spoke to CEO Ayanda Kanana to find out more about this thriving agricultural institution.

Joburg Market never sleeps. Apart from a window period for deliveries, closing Saturdays at 14h00pm and re-opening Sundays at 14h00pm for deliveries, it is open 24/7, with sales hours Monday to Saturday from 05h00am to 11h00 daily. "Joburg Market has a staff complement of 302 permanent and at least 100 contracted employees. Like most businesses, JM has specialised expertise

in finance, HR, marketing and communications, food safety, engineering, and so on," says Kanana.

Produce from 7283 local and foreign farmers finds its way to Joburg Market. "Anyone who wishes to send a producer, supplier / pack-house or speculator in their own capacity can send produce to the Joburg Market, provided they are registered on the sales processing system. Credentials and trading information are captured on the trading system and each delivery consignment is recorded against a unique producer code number. They also have to comply with basic food safety and traceability requirements and be aware of the enforcement of regulations regarding quality standards," explains Kanana.

Although there are no specific minimum or maximum volume restrictions per consignment, other factors do influence these elements, including available floor space and supply and demand. "High demand for a given commodity can determine volumes supplied or stored by an agent at any given time," says Kanana.

Producers can count on a fair deal: "The sales processing system is fully traceable and transparent and is monitored and controlled



Ayanda Kanana, CEO

in terms of price variances to ensure producers are treated fairly," says Kanana.

Convenience of use

To register with Joburg Market, new suppliers have the option of logging on to the market website on www.Joburgmarket.co.za and obtaining the different market agents' contact details who will in turn get in touch with the specific salesperson dealing with the specific commodities they are sending. The market agent then advises the supplier on different elements in terms of what, how and when to supply their goods.

"Most new suppliers contact Joburg Market first and are guided to the consignment control department where the registration process is explained telephonically or by



email. "Suppliers are however always advised to pay the market a visit to experience the processes hands-on. The consignment control staff accompany the new suppliers to the sales floors and explain the process step by step. There is a producer code information application form available which is then completed with the relevant information, and a unique producer code is created on the sales processing system which the supplier will use on each and every consignment sent to the Market for traceability purposes," Kanana explains.

Registration new producers takes no longer than five minutes. Suppliers visiting the Market for the first time can also immediately register at the gate entrance on arrival, although it is always advisable to first obtain an agent who will sell the produce on the producer's behalf as an agreement between the two parties has to be created on the system. Details required in the delivery note book after registration include: Product details, farmers' details, market agent details, salesmen details, consignment destination, and quality of produce e.g. class packaging size and weight. The consignment control department captures the data on the system and creates a barcode reference which the agent uses to generate a Goods Received Note Number on the sales floor. The SPS then creates a unique short sequence number which the agent uses to sell the goods on the system.

Producers are free to add value to their products. "Consumers of today value time as money, so farmers have an opportunity to add value to the product – floor ready, sliced and diced, ready to heat, ready to eat, etc., as well as smaller packing for smaller families," Kanana comments.

Small farmers can expect the same treatment as large-scale commercial farmers. "We provide the same level of services to all our farmers. We appreciate their differences, but our value proposition is the same," says Kanana. "We have over 23 000 buyers who purchase produce on a daily basis on the market, buying from R100 per month to over R50 million per month. Some buyers who purchase produce on the Market export to the SADC region."

Emerging farmers need not feel excluded as Joburg Market is there to cater for them with

assistance to help them up their commercial game. "We have a quality assurance department that conducts farm visits and hosts emerging farmers on the market. During the visit, information is shared regarding the requirements of the Agricultural Product Standard Act, Good Agricultural Practices (GAP) and best practices eg. packaging, transport, cold chain management, etc," says Kanana.

Conveniently located in the City Deep industrial area, Joburg Market has access to and from major highways so that farmers and buyers are able to move their products with relative ease.

Smart adaptation

The only constant in a changing world is change, and Joburg Market has faced its share of challenges in recent years. "A major challenge is that volumes have grown at a very low rate over the last 10 to 15 years. Other fresh produce channels such as direct sales from farmers to buyers have grown significantly. We have seen an increase in competition from the establishment and development of new markets. Increasing requirements from customers for compliance to food safety and HACCP standards are also challenging for some producers," says Kanana.

Despite these challenges, Kanana is proud of what Joburg Market has achieved: "We service over 7000 farmers and over 23 000 buyers on a daily basis. We make daily payments to market agents so that farmers can receive their sales proceeds on a daily basis. We have record sales of R752 million in one month. We enjoy a state-of-the-art

Centralized Trading System that manages all transactions and a SANAS accredited laboratory on site with qualified staff."

Since accepting the position of CEO in 2017, Kanana has overseen a strategic review to focus on creating efficiencies through a "smart market" approach – with spectacular results. "This approach is customer centric and aims to use technology as an enabler. We have also developed a precinct plan that will see the much-needed rejuvenation of the Joburg Market infrastructure. To date, the City of Johannesburg (CoJ) has allocated over R300 million in the term as a sign of commitment to the growth and economic prosperity of the Market. During the same period, the turnover of the Market has grown by almost a R1.1 billion. In the 2016/17 financial year, the turnover amounted to R6.8 billion. For the 2018/19 financial year, we are at a resounding R7.9 billion (unaudited). This is fundamental step and an affirmation of our adopted strategic direction.

Looking to the future, it is Kanana's intention for Joburg Market to strive to be a clean, safe and smart market through the fusion of technology, best practices, people and smart devices. "We are introducing smart systems and smart facilities to all our stakeholders. Capital investment in infrastructure will upgrade the facility to meet industry requirements. Investment in training and development of staff will develop capacity and expertise. We are also going to build a packhouse facility for emerging farmers to assist them with the regulatory, packing and logistic challenges they face as individuals," he concludes. ■





Wild spuds and the silence of the genes

The potato industry reflects on gene technology

Challenges that the potato producer will face in the future include the effect of climate change on yield, quality and pest control, sustainable and effective use of resources such as water and ground, provision of safe, healthy potatoes to the consumer and the need to provide consumers with potatoes that satisfy their preferences.

Cultivars developed for the future will play a critical important role in addressing the abovementioned challenges.

Cultivar development

Remarkable progress has been made with conventional potato cultivation since the first cross-pollination more than 100 years ago, especially in terms of yield. But despite the fact that genes for resistance to major diseases do occur in wild potato species, most potato cultivars are still not resistant to most diseases. The potato industry recently reflected on the potential of different techniques available for potato breeders. The technology currently available is given in Figure 1.

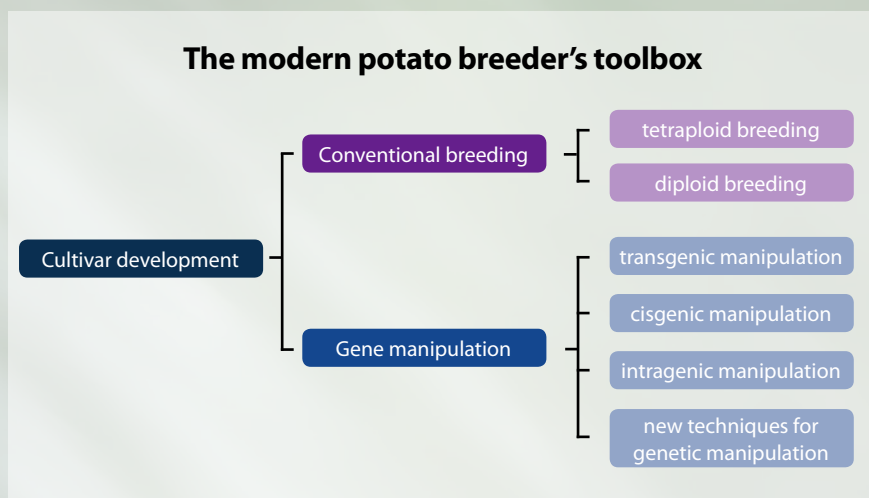


Figure 1

Conventional potato cultivation

It is speculated that 80% of all cultivars that existed in 1980 were developed from parents that survived the late blight epidemics of the 1800s. This has given rise to the restricted genetic basis of current breeding programs. The solution to expand the genetic basis would be to use some of the characteristics that exist in wild species. However, there is a restraint because the original breeders not

only survived the late blight epidemics, they were also all tetraploid, i.e. each cell contains four sets of chromosomes. Wild potato species, on the other hand, are diploid, i.e. each cell contains two sets of chromosomes. To incorporate the properties of diploid plants in commercial tetraploid plants, self-pollination of parent lines is required. However, there is a gene in potatoes that prevents self-pollination, so current commercial cultivars are

all tetraploid. The biggest challenge of cultivating tetraploid potatoes is surely the fact that for each characteristic in a plant, there are four genes. Adverse genes in hybrid seedlings often do not immediately appear. This means that a large number of new hybrid seedlings have to be evaluated for many years and under different conditions before they can be commercially planted. The fact that current cultivars are tetraploid also means that hybrids cannot be propagated with botanical seed. Vegetative propagation by daughter tubers means that tuber borne diseases can be spread through the seed potatoes.

If potatoes could be diploid it would be easier for breeders to exploit the properties of wild potato species than in a tetraploid breeding program. The possibility of cultivating diploid potatoes has received a major boost after researchers in Japan and the Netherlands have identified a plant in which the gene that prevents self-pollination does not exist. The University of Wageningen and a company named Solynta exploited the possibility and in 2017 the first diploid hybrids were introduced. Meanwhile, other breeding companies have also established diploid breeding programs. Full-fledged commercial cultivars are expected to be released in 5-10 years. See also: CHIPS Sep / Oct 2017 Seedlings or seed potatoes?

No commercial F1 hybrid cultivar has been released at this time. So, we can only speculate on how the innovation can affect the

potato industry. The hybrids are developed by conventional breeding techniques, similar to F1 maize cultivation. Vegetative propagation of potatoes is a well-established practice and it is unlikely that the practice will be completely replaced by seedling production. The fact that F1 hybrids are produced with botanical seed makes international trade safer than seed potatoes. The biggest advantage of F1 hybrid potatoes is that it will be easier for breeders to transfer untapped characteristics of wild potato species to commercial potato.

Gene manipulation

This technology involves changing a plant's genetic material through technological intervention by humans. The first genetic manipulation techniques involved transferring a gene from one organism to the recipient plant's genetic material through a bacterial cell. Since then, many new genetic manipulation techniques have been developed and applied. Cisgenic manipulation involves transferring a gene of a plant that is genetically compatible to the recipient. Intra-genetic manipulation involves changing the gene of a plant that is genetically compatible with a recipient plant, and then transferring it to the recipient plant. Genes are transmitted by a bacterial cell or, by a so-called gene gun. In all genetic manipulation techniques, man has no control over where a new gene is inserted in the genetic material of the recipient plant and it is also not known what the consequences may be.

Since the first genetically manipulated (GM) plants were release in the early 1990s, transgenic maize, soy and cotton are grown at 170 million he in 29 countries. Several genetically manipulated potatoes have also been

The European consumer determines to a large extent which genetically manipulated crops are planted on a large scale in the world

released in other parts of the world, but to our best knowledge none of these are produced commercially.

Genetically manipulated (GM) potatoes

NewLeaf™ from Monsanto was released in in the USA in 1995 and was resistant to the Colorado beetle and PLRV. The gene for resistance to the Colorado beetle was derived from the bacterium *Bacillus thuringiensis* (hence the name Bt potatoes). Farmers were eager to plant NewLeaf and after just four years more than 20 000 hectares were planted with NuLeaf! But after another two years, the area planted with NewLeaf dropped to zero. The reasons for this dramatic rejection of the cultivar were manifold, but included: the release of a new insecticide against the Colorado beetle and the public's requirement that genetically modified food should be handled completely separately from conventionally grown foods

Michigan State University and the Agricultural Research Council developed Bt-Spunta with resistance to potato moth and



Tubers of wild potatoes with characteristics to be exploited to face future challenges



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in 2010 applied for registration for exemption in South Africa. The Department of Agriculture, Forestry and Fisheries has rejected the application in spite of the fact that the application has met all the requirements from a technical point of view. At that stage, the South African potato industry felt that the industry was not yet ready for genetically modified potatoes. Almost 15 years later, Amflora from BASF Plant Science was released for industrial starch production in Europe. Although the safety of Amflora was thoroughly tested and proven, it still took 12 years for it to be approved for production in Europe. Still, the European public did not accept the product. As a result, BASF decided in 2012 to withdraw Amflora from Europe and concentrate on the release of Amflora in the Americas and Asia. Innate™ potatoes were developed by “RNAi gene silencing” technology to turn off (or silence) the gene responsible for browning of cut potatoes, thereby reducing food waste. Innate™ also has reduced levels of asparagine and reducing sugars that reduce the formation of acrylic amide. In the US and Canada, Innate was declared “safe and nutritious” by governments. McDonald’s, however, has declared that they will not use Innate potatoes due to pressure from the Food and Water Watch organization.

Social acceptance of genetically modified food

Currently, the European consumer determines to a large extent which genetically manipulated crops are planted on a large scale in the world. There is less resistance to crops intended for biofuel, animal feed or industrial purposes, hence GM maize, soy and cotton are planted on such a large scale. In contrast, GM is food that is eaten directly by humans, e.g. rice, wheat and potatoes, is not acceptable.

The European’s resistance to GM technology has an impact on world trade

GM crop regulation in the US is more flexible than in the EU, with the result that the US produces most GM crops. At the same time, large amounts of food are exported from the US to the EU. Changing the regulation of GM crops can therefore have a major impact on trade. A good example of this was in 2006 when small



quantities of GM rice were found in a commercial consignment from the US to Europe. In spite of the fact that the USDA and the US FDA found that GM rice has no human health or environmental impact, the entire consignment was not allowed in Europe. As a result, US rice prices fell immediately and globally. Also, the GM rice developer had to pay \$750m to farmers as compensation for losses

The opinion of the scientists

The sentiment regarding the safety of genetic manipulation varies from strong support to disapproval. Support is based on the potential benefits that technology can have on food production with increased nutritional value and reduced use of pesticides to feed the growing world population. Scientists rejecting the technology are concerned about the unintended, potentially negative effects of technology on the environment and human health over the long term. The concern is mainly based on the fact that man does not control where in the genome of the recipient plant, the new gene is established.

Regulation of GM crops in the European Union

On July 25, 2018, the European Union Court of Justice decided that all organisms developed by any form of genetic engineering should meet the same requirements as conventional transgenic plants, that traceability measures and techniques should be in

place and that all products containing GM ingredients should be labelled. Opponents of the GM technology’s relief were huge. The disappointed comment of the European Biotechnology Association EuropaBio, and other advocates of GM technology was: “In addition to affecting global agricultural trade, this judgment has significant consequences for EU innovation”.

Deciding on the local potato industry for gene technology

There are several reasons why the relatively small potato industry in South Africa can not invest in genetic manipulation techniques on the medium to long term:

- Gene technology is only part of a breeding program. The industry has already decided in 2011 not to invest in breeding programs because there are enough role players who have already been successfully involved in cultivar development.
- Genetically modified crops are unacceptable to our southern African trade partners and it is important that exports of both ware- and seed potatoes are expanded to our neighbouring countries.
- The industry recognizes the potential of F1 hybrid potatoes, especially to build genes for disease resistance in commercial potatoes. ■

*Dr Fienie Niederwieser,
Potatoes South Africa*

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Avoid yield loss now

Prevention is the only option when dealing with early blight

Early blight is caused by *Alternaria solani* and it is certain that it will infect your potatoes if preventative control measures are not taken. Early blight typically affects older plant tissue more severely than young tissue and usually only becomes a problem later in the season. However, in areas where potatoes are grown season after season the disease can cause problems earlier in the season.

The disease symptoms are angular dark brown to black lesions with concentric rings (see figure 1). Older lesions are surrounded by a yellow halo as the fungus produces toxins that move into the healthy cells that surround the infection and start killing off the tissue. Lesions usually start on the bottom older leaves and is spread upward in the plant. Early blight is a polycyclic disease which means it has many disease cycles during one season. A disease cycle is the period from infection, till new spores are formed and spread to infect again. Spores are spread primarily by water and wind.



Figure 1: Early blight lesion on potato leaf
(Photo: Adri Anthonissen, Syngenta)

Moisture and temperature are the main factors controlling infection and disease development. The minimum temperature for infection is around 10°C and the maximum higher than 35°C, however the optimum temperature for infection is from 20°C to 30°C. No infection can take place in the absence of free moisture or high humidity.

The time it takes from infection to the development of symptoms can vary as it is influenced by many factors such as the age and susceptibility of the plants, temperature and moisture availability. The severity of disease development is mostly dependent on moisture. The longer the period of leaf wetness, the more severe the disease development. Any stress on the plants, such as overcrowding and insufficient nutrition will lead to an increase in disease severity.

An integrated control strategy is necessary to best avoid yield losses due to early blight. The pathogen survives on crop residues in the soil and removing as much of the material as is practical, will reduce the

inoculum for the next season. Well-managed fertilization and irrigation schedules will be part of the disease control strategy, combined with an effective fungicide spray program.

When planning a fungicide spray program it is important to always alternate with fungicides containing active ingredients with different modes of action to avoid the development of resistance. Syngenta will soon be launching a new fungicide for control of early blight on potatoes and this will add another option to include into a fungicide program. More info to follow, watch the media!



Farmer's program



New Syngenta fungicide

Figure 2: Early blight control achieved by new Syngenta fungicide
(Photos: Adri Anthonissen, Syngenta). ■

Adri Anthonissen
Technical Lead: Disease Control, Syngenta



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Nitrate nitrogen (NO_3^-) and potassium (K^+) (38% K) are the two nutrient salts taken up in greatest quantities by crop and most other plants. Ultrasol® K Plus is packaged NO_3^- and K^+ . Uptake of K^+ in applying potassium nitrate (KNO_3) is observed to be most efficient compared with other K-fertilizers. This is ascribed to the NO_3^- combination. Ultrasol® K Plus is thus the preferred K-source, ensuring sufficiency of K uptake especially by high K requiring crops such as potato.

Repeated pivot applications of Ultrasol® K Plus from the time of tuberization in potato enables:

- ✓ **Genetic potential** attainment of tuber size and yield
- ✓ **Tolerance** to pest and disease attack
- ✓ **Tolerance** to water and other stresses
- ✓ Provision of **quality tubers**
- ✓ **Efficient movement** of sugars from leaves to tubers
- ✓ **Adequacy** of starch accumulation in tubers

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Balanced Nutrition of Potatoes

Potassium nitrate applications for potatoes

KNO₃ (potassium nitrate) contains 13% N and 38% K, is chloride free and is available as a 2mm-4mm prill (Qrop K^{***}) or as a water-soluble crystalline powder (Ultrason K Plus^{**}). Due to its high solubility, its purity and its compatibility with other fertilizers and pesticides, KNO₃ is most often used as a source of N and K for high value crops as foliar sprays, in fertigation, or as a bulk blend with other granular fertilizers.

Horticultural crops most suited to Ultrason K Plus applications are those that are sensitive to chloride, those producing high amounts of carbohydrates, those with regular top-dressing frequency, crops grown in sand, lower pH conditions and crops grown in cold climates.

Ultrason K Plus on potatoes*

The potato is a high value horticultural crop. Potatoes are heavy feeders of both nitrogen (N) and potassium (K). The amount of K removed by tubers alone is shown in figure 1.

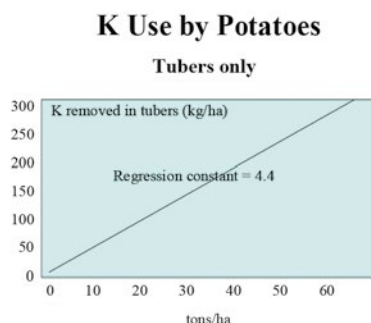


Figure 1

K removed by the whole plant is two thirds more to double that removed by the tuber alone. This means that 8-8.8 kg of K is removed per ton of potato crop. The plant must obtain this K either from the soil or from applied K.

Similarly, potatoes require a total of 4.5 kg of N per ton potato crop. Ultrason K Plus supplies both these important elements. Potatoes can benefit directly from Ultrason K Plus for the following reasons:

Acidification around the roots (rhizosphere)

The area immediately around the root zone of any plant is known as the rhizosphere (figure 2).

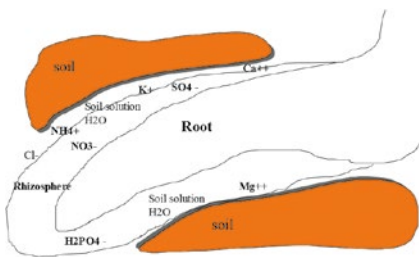


Figure 2: The Rhizosphere

The rhizosphere pH is directly affected by the uptake of elements from the soil solution. The form in which the nutrients are supplied to the plant determines the pH changes in the rhizosphere.

The magnitude of the pH change in this rhizosphere is dependent on the buffer capacity of the soil and the amount of fertilizer applied.

Potatoes grown on the low buffer soils of require large amounts of fertilizer. This can result in dramatic rhizosphere pH changes.

At starting pH of around pH 4.5, if ammonium-nitrogen is applied, then the pH of the rhizosphere can decrease to pH 3.0.

If nitrate-nitrogen is applied, the pH of the rhizosphere can increase to pH 6.0. The pH of the soil solution in direct contact with the roots can therefore be 1000x more acid when ammonium-instead of nitrate-nitrogen is used.

pH values of around pH 3.0 are not only directly toxic to plant roots, but also renders many other plant nutrients unavailable.

Competing cations

Ammonium-nitrogen is a cation, which competes directly with the uptake of other important cations such as potassium, calcium and magnesium. This cation competition leads to nutrient imbalances resulting in poor growth of plants.

In soilless culture, the amount of ammonium applied to plants is never allowed to exceed 20%. In hydroponics and gravel flow techniques, less than 5% ammonium is permitted in the nutrient solution purely to regulate the nutrient solution pH. The sandier a soil, the more the soil tends to a soilless or hydroponic type culture.

For potatoes grown in the sandy soils of the Western Cape, the maximum permissible ammonium should be 20% with lower values being more favourable for plant growth and tuber yield.

Nitrification

Nitrification is the process whereby applied ammonium is converted to nitrates, within the soil, by nitrifying bacteria.

On sandy soils (<5% clay) the nitrification process is non-existent and applied ammonium fertilizer remains in the ammonium form.

The nitrification process is also retarded in cold conditions (winter plantings). Nitrification also does not have time to take place in regular fertilizer applications (daily or weekly applications). In addition, the time that ammonium is in excess to nitrate (ratio basis) is detrimental to plant growth and yield, even if nitrification is taking place but not yet completed!

Energy conservation

Nitrate is converted into nitrogen compounds largely in the leaves of plants. The process is driven by light energy.

On the other hand, ammonium is converted to nitrogen compounds exclusively in roots. The energy used to drive this reaction

is from carbohydrates and sugars. An excess of ammonium nitrogen causes a depletion of carbohydrates, which results in reduced yield and quality.

Chloride and potato quality

Although sometimes conflicting, chloride-free fertilizer has been shown to increase dry matter content, starch content and specific gravity of tubers.

Chloride-free fertilizer is the preferred source for processing and chipping potatoes. Chloride-free fertilizer however appears to have no effect on potato yield as is often rumoured.

Yield increases are rather due to maximizing nitrates and minimizing ammonium by having the nitrate with the potassium (Ultrasol K Plus).

Balanced nutrition

Because Ultrasol K Plus contains nitrate, farmers can maximize the application of nitrates and minimize the application of ammonium, a situation that cannot be obtained by using either potassium chloride (KCL) or Potassium Sulphate (K₂SO₄).

Therefore, with Ultrasol K Plus, the potato is being supplied with two of its main nutritional elements in the correct form.

Using only potassium chloride (KCL) an excess of chloride is supplied with its detrimental effects. Using only potassium sulphate (K₂SO₄), supplies sulphate (SO₄) in unbalanced excess to the plants.

Summary

KNO₃ increases the pH in the rhizosphere, decreases cation competition, is chloride free, ensures balanced nutrition, maximizes carbohydrate production and does not rely on nitrification. KNO₃, therefore, benefits both yield and quality of potatoes when used under one or more of the following conditions:

- Acid soils
- Sandy soils
- High rates and regular fertilizer applications
- Cold conditions
- Chloride sensitive uses (chipping and processing)
- Any crop where maximum carbohydrate production is essential (Brix, Specific gravity). ■

Duncan Napier

Technical Manager SQM Africa

* All claims in this article can be substantiated with references which can be made available on request.

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LIMPOPOTATOES GO LARGE

Enterprise development is taking New Era farmers to the top

The core business purpose of Potatoes SA's (PSA) transformation drive is to identify and assist New Era Black potato producers to participate in mainstream agriculture. For the past 9 years PSA, through its Enterprise Development Programme, has been supporting

New Era farmers to ensure their development towards becoming fully-fledged commercial farmers. New Era Black potato producers from Limpopo have shown keen interest to participate in the Enterprise Development Programme, hence the majority of the participants are from this province. Since its inception, the Enterprise Development Programme assisted 48 farmers from all 16 potato production regions in South Africa. The hectares that has been supported are about 470 ha in total.

To ensure that the correct cultivation practices of potatoes are followed by the farmers, PSA has allocated a mentor to each farmer who will assist them throughout the whole production process of potatoes. The funds to support participating farmers come from the statutory levies paid on each bag of potatoes. The National Agricultural Marketing Council (NAMC), which monitors the administration and utilization of the levy, stipulates that 20% of the levy must be used towards transformation. The NAMC also provides guidelines on how to spend funds. Sixty percent of the funds must be allocated towards the Enterprise Development Programme.

The Enterprise Development Programme aims to assist in setting up, supporting and



Potato picker in Limpopo (photo: Philippus Jacobus Steyn)

growing a viable new commercial Black owned potato enterprise by:

- Developing an economic programme that is aimed at sustainable potato production by New Era producers in order to utilise available land and assist to the maximum benefit of an integrated production system.
- Developing New Era producers to grow and produce commercially in a sustainable way.

Originally, support provided to the participating farmers through the Enterprise Development programme was divided into four parts. The four parts exist of provision of seed, training, technical support and the industry exposure. Each farmer was supported for four years on a sliding scale basis (Y1=100%, Y2=75%, Y3=50%, Y4=25). The number of farmers to be taken in on the programme was determined by the availability of budget for each year.

Based on this support model farmers were experiencing several challenges. Access to finance to buy other inputs and machinery were the major challenges. To participate in the programme farmers were required to have their own funds to buy other inputs like fertilizers and chemicals. These challenges resulted in zero progress as the number of hectares did not increase.

This model was revised, and PSA adopted a new implementation process which include conducting a pre-feasibility study for identified farmers, conducting a business plan, identification of other industry partners to be linked with the farmers. Since PSA started to use the new implementation process, there has been a great improvement in the selection of farmers and linking them up with the input suppliers. The new strategy also allowed PSA not to limit the hectares to 5 ha per farmer but to look at the potential of each farmer and to match the resources available at the disposal of the farmer. By rewarding the farmers who are already participating in the programme and showing commitment, PSA enabled the farmers to plant more hectares.

The progress is now more visible because the number of hectares of potatoes planted

by New Era Black farmers is on the rise, as well as the tonnage harvested. There are participating farmers who already have the potential to farm commercially. Aldrin Lawrence, one of the participating farmers, is performing well in terms of tonnage yield. During the 2018 season he received an above average yield of 63.3 tons per hectare. Another promising farmer is Vuyani Kama in the Eastern Cape. He started with only 4ha and is now on 3ha, which is regarded as commercial level.

Phophi Raletjena was a participating farmer in the Limpopo province who has exited the Enterprise Development Programme

Participating farmers already have the potential to farm commercially

successfully and who is now farming commercially. He started on the programme eight years ago with only 5 ha of potatoes and other vegetables. Because of his commitment, PSA was encouraged to gradually increase his hectares from only 5ha to 33.4 ha when he exited the program.

He has a fully equipped packhouse at his farm. This has opened another market opportunity for Phophi as he can now send his potatoes to the fresh produce markets. Phophi is also assisting other fellow farmers by washing and sorting their potatoes if they want to send it to the market. He has created jobs for many, as he employs 16 permanent workers and about 72 seasonal workers.

Through his hard work Phophi managed to access a loan funding from AECI for a period of three years. He will be planting 48ha of potatoes in this coming season and he is aiming for a higher yield than in the 2018

season. Because of his dedication, Phophi was the first participant to be awarded with the Enterprise Development Farmer of the Year during the PSA Transformation Symposium 2018.

One of the most significant barriers for development in the potato industry is access to finance. It is for this reason that PSA decided to form partnerships with different stakeholders in the industry. Collaborating with partners to assist farmers has become a very important component of the Enterprise Development Programme. Cooperatives, such as VKB/NTK, provide co-funding to the farmers for the other inputs required. McCain plays an important role in terms of being an offtaker of the produce, especially where the farmers do not have access to washing and sorting facilities before sending the produce to the market. The majority of farmers who benefit from this partnership are from Limpopo province. Some of the Limpopo participants have formed a good relationship with the Mozambican markets to sell their produce. This is an excellent arrangement as the Mozambican markets come to the farm to collect and do not require washing and sorting. A partnership with AECI/Nulandis was created where they provide loans to a farmer after the farmer graduated from the Enterprise Development Programme and has reached commercial status.

PSA has launched its first Transformation Symposium 2013. This event takes place every second year alternating with the year the PSA Congress takes place. The goals for this event entail, amongst others, to bring all New Era potato producers, development stakeholders and community project leaders under one roof to discuss challenges, share ideas, and find solutions. In addition, the Symposium provides farmers with the opportunity to learn from one another, to show what PSA is doing in terms of transformation and to showcase success stories in potato farming development. Through this event, there are many opportunities for networking. Farmers get to obtain exposure and learn important lessons on how other farmers have achieved success. ■

Potatoes SA

Uniformity and control

Effective spraying in high-value crops

Controlling pest and disease in three-dimensional crop structures like potatoes is one of the determining factors in achieving a profitable season. The challenge lies in reaching the lowest parts of the foliage, at the bottom side of the leaves, in our quest to either prevent, or suppress damaging vectors.

In layman terms, we often speak about achieving good *coverage* on the target, implying that an *acceptable level of recovery* of the *active ingredient* must reach *all areas* of the plant with the best *uniformity* to support the best possible *control*.

That is a mouth full and a tall order! How do we achieve this?

Conventional boom sprayers

This technology makes use of the momentum (mass x velocity) of the droplet exiting from the nozzle tip to be projected to the target. A larger droplet size (more mass) at the same exit velocity will increase reach distance, and the same droplet size at a higher exit velocity (more pressure) will

also increase reach distance. In this physical momentum relationship lies the challenge: In nozzle technology this invariably means that the one is always at the inverse of the other, i.e. more pressure (exit velocity) will reduce droplet size (mass) and hence not increase the reach distance and vice versa.

Too large droplet sizes will cause early run off and loss of active, contaminating the soil, and too small droplet sizes will diffuse and drift away before reaching the target.

It is thus imperative, when doing pest and disease control to calibrate for a VMD of 250-300 micron (Medium) in a quest to find the best balance between the above. This means that a standard flat fan nozzle should be used between 2-4 Bar pressure, selecting the nozzle size according to the required litres/ha and ground speeds.

It is required to keep the nozzle at a constant 500mm above the target when using 500mm nozzle spacings.

Air assisted boom sprayers

The linear droplet path when exiting the nozzle on a conventional boom sprayer restricts the impaction point of the droplet

to the first target surface in line of travel. This puts a huge restriction on conventional sprayers to reach deeper into the canopy and makes it virtually impossible to deposit under leaf surfaces.

When air assistance is added, the air momentum becomes the carrier of the droplet, allowing the selection of smaller droplets, creating 8 x more droplets per volume sprayed when halving the droplet size, and these fine droplets follow the air stream into the canopy, the air movement moving the leaves, and the recovery of active ingredient much lower and on both sides of the leaves become possible.

An increase of recovery of active in the secluded areas of the canopy of up to 30% is possible when using air assistance correctly, calibrating at 80-150-micron VMD and adjusting the ground speed in relation to the canopy density and dimensions.

The ROVIC Air Assisted sprayer is available in 2 000 litre tank capacity with booms widths up to 18m. ■

Marius Ras (M.Eng, Pr Eng)
Marketing Director, Rovic Leers





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AGRICULTURAL RESEARCH COUNCIL

A HI-TECH APPROACH

Agricultural Research Council embraces new technologies

South Africa needs to sharpen its innovative edge and continue contributing to global agricultural scientific-technological advancement. For the ARC to continue to be at the forefront and compete on the global scale, there must be a greater investment in research and development, hence the organisation's decision to participate in the Swiss Blockchain Hackathon.

The ARC works tirelessly to improve agricultural economics and capacity development as well as conduct research in animal and crop sciences necessary for the development of appropriate agricultural engineering techniques for both small- and large-scale producers. The ARC's research and development project findings have been integral to the agricultural community's successes for over 100 years in South Africa.

Agriculture has the capacity to create jobs through harnessing opportunities in agribusiness entrepreneurship and innovations, including in ICT innovations, along the entire value chain. Digital innovation and the use of ICT will prove a masterstroke to unlock the agri-business to bridge the rural and urban divide. To achieve this the ARC understands the need to develop a comprehensive framework and action plans to deal with opportunities presented by the Fourth

Industrial Revolution (4IR) while mitigating the risks of the transition to the agricultural digital industrial revolution.

What is the motivation for the ARC participating at the Swiss Blockchain Hackathon?

4IR is characterised by a wide range of new technologies, which are combining digital and biological worlds, impacting all disciplines, economies, and industries, including the agricultural and related sectors. In line with that, there is a need for the ARC, as a custodian of agricultural research on behalf of the South African government, to safeguard food security for the future across the agricultural value chain using Internet of things (IoT), Artificial Intelligence (AI) and Distributed Ledger Technology (DLT), to mention a few.

What are the biggest challenges that the SA Agriculture and Food Sector is facing today?

The South African Agriculture and Food Sector is faced with challenges that include transparency and traceability related to sources and safety of foods in retail shelves. Consumers are increasingly demanding more information on the sources of their food, how the food has been produced, and issues relating to animal welfare and carbon footprint. The South African agri-food sector is faced with the

Consumers are increasingly demanding more information on the sources of their food, how the food has been produced, and issues relating to animal welfare and carbon footprint

challenge of increasing food production and the fact that the food should adhere to strict consumer tastes and preferences while being produced in an environmentally benign manner.

How does the ARC think Blockchain can help foster innovation to support and develop the agricultural sector?

Blockchain technology is based on three pillars, namely transparency, security, and authenticity. Therefore, it has the potential to reduce time delays, added costs, and human error that constrains transactions in supply chain management today. For the agriculture sector, Blockchain technology has the potential to improve transparency and provide a platform to digitise the flow of assets in the value chain between partners and in turn, deliver safe and quality produced food consistently.

What are the expectations of the #SBHACK19 and how can it help ARC to further its international cooperation and impact?

#SBHACK19 presents an opportunity for the ARC to collaborate with other global industry leaders in the agriculture and food sector to share ideas on how to address challenges and leverage opportunities presented by 4IR. The ARC will have more opportunities for joint technical solutions to be manifest into future models that will support the food and agriculture sector.

As the premier research institution, the ARC is committed to providing scientific knowledge and technical support and expertise to the agricultural sector as a whole. The ARC is also committed to supporting programmes of government through its training to alleviate poverty and hunger. ■

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A NEW ERA DAWNS

CornSorb™ is a giant leap for adjuvant technology

Adjuvants are substances that are used with crop protection products to enhance efficacy. Adjuvants are involved in numerous crucial processes that include one or more of the following:

- Rectification of poor spray water quality
- Droplet size optimization
- Retention and coverage of spray droplets
- Wetting and spreading of spray droplets
- Absorption of crop protection products.

The absorption process is extremely important because the South African weather conditions are often detrimental for effective uptake. The greatest challenges are normally low humidity and temperature extremes. The lower the humidity, the lower the absorption time of crop protection products, and the lower the efficacy will be. If there is a method to keep droplet deposits moist for longer and to keep them conducive for uptake, then more effective absorption will occur.

Humectants (moisturizers)

Humectants are chemicals that are formulated into certain adjuvant formulations. The



Winfield's Dr Todd Cardwell pictured with a sprayer table

function of humectants is to keep the spray droplet residuals moist for a longer period of time and to increase the chance for effective absorption of the crop protection product. Humectants have been used locally and internationally for years, but the issue is that not all humectants are effective candidates for certain crop protection products. Eight humectants were tested with glyphosate in research that was done in the USA. Seven out of the eight products had either no effect on glyphosate efficacy or some were even

antagonistic and decreased weed control! Only one humectant actually did its job.

The question arises why a product that keeps the droplet deposit moist and increases the absorption period of glyphosate can be antagonistic. The answer is that glyphosate and various other crop protection products may be enhanced by a moist deposit but may then be antagonized by the physical or chemical properties of the humectant. It is therefore crucial to do extended research to develop a new humectant.



CornSorb™ Technology makes a huge difference

Winfield United, one of the largest role players in the USA adjuvant industry, saw the need for a top-class humectant and subsequently developed the CornSorb™ technology. CornSorb™ technology is a mixture of a unique surfactant spreader and a humectant, both derived from sugar-based products. This technology caused a huge revolution in the ag-chem industry and has improved the efficacy of both glyphosate and glufosinate, in particular.

The first CornSorb™ -containing adjuvant on the USA market was Class Act NG. Class Act NG is a unique adjuvant that was developed specifically for herbicides like glyphosate and glufosinate. Villa has also developed, and registered Class Act NG in South Africa and the product will be available next season.

Why is the CornSorb™ technology is so effective?

As stated above, CornSorb™ consists of a sugar-based surfactant and a humectant. The first function of the surfactant is less droplet bounce and more retention. This specific surfactant is incredibly effective at this level and fewer droplets are negatively influenced by droplet bounce. The more droplets that are

retained, the more active ingredient that is available for absorption.

The second function of the surfactant is to increase droplet spreading. Spray droplets spread to cover a larger area on the leaf surface. However, too much spread is sometimes detrimental because there may be a dilution effect. Certain crop protection products like glyphosate are absorbed poorly from diluted spray droplets. The surfactant in CornSorb™ had to be developed in such a way that it had to spread optimally, therefore not too much or too little.

The third function of the surfactant is to facilitate the absorption process. The surfactant helps to hydrate the waxy layer on leaf surface to optimize absorption. The function of the humectant in CornSorb™ is to further increase the absorption process. Spray droplet deposits are kept moist for longer and this increases the absorption time. This is made possible by an extended drying time and the ability to absorb moisture from the environment. By doing this the absorption and efficacy of the crop protection product is enhanced even more.

Other applications of CornSorb™ technology

The CornSorb™ technology concept has been so successful with Class Act NG,

therefore Winfield United has also incorporated it into various other products. Some of the future Villa adjuvants will also contain this technology. We believe that CornSorb will be one of the main drivers of increased weed control in future.

Conclusion

When using an adjuvant that contains CornSorb™ technology, the droplets won't dry out as quickly. Wetter droplets allow the active ingredient to remain on the weed longer.

This in turn, drives more pesticide into the plant. CornSorb™ technology also reduces droplet surface tension to help the pesticide find more ways into the weed. A wetter droplet helps deliver faster weed control.

The environmental conditions in South Africa have always been the biggest enemy of crop protection products. Villa is incredibly excited about the CornSorb™ technology and the value that it brings to spray application. CornSorb™ has made a massive contribution in the USA and we believe its contribution to the South African adjuvant industry will be even greater. We wait in anticipation for Class Act NG, the first adjuvant with CornSorb™ Additive technology ■

Brian de Villiers, Villa Crop Protection



Building on trust

Getting produce from farm to fresh food aisle in the most efficient and innovative way possible

Supply-chain management in the fresh-produce industry needs to be efficient and innovative, working as it does, with precious cargo. Therefore, players within this space are finding innovative ways of balancing the three main challenges facing the sector: ensuring lower costs for businesses, sustainability for society and quality for the customer.

The power of pooling

Though balancing these three considerations is precarious, the sector has been highly adept at doing so. One of the ways they are managing it is by opting for a share and reuse model that enables growers to transport their product from the farm to the fresh food aisle, on a single shipping platform.

Shipping platforms most often used within the fresh food industry include foldable plastic bins, captive bulk bins and collapsible

crates that can now replace costly and ineffective carton boxes. Because these containers are reusable, they allow for significant cost savings, protect the cargo and also have a far smaller environmental impact.

A reusable plastic container is manufactured once, and it can make a myriad of trips over its lifespan, which most often lasts decades.

Growers often opt for bulk bins. As the name implies, these bins transport produce in bulk, while ensuring the highest integrity and food safety. Today, for instance, apples, or pears can be harvested directly into bulk bins. They are transported to the grower pack houses, where they can be decanted and washed and selected for export or the local market.

A foldable bulk bin, measuring 1m x 1.2m, can hold freshly harvested fruit, transport it to retailers and then function as a display platform. Then from the retailer, it can be folded

down and returned to CHEP, conditioned and be re-issued to the grower.

This type of solution drastically reduces the handling of fresh produce, which has a direct impact on the aesthetic appeal and lifespan of the produce. That makes a pooled shipping platform the ideal vessel to move fresh produce efficiently from the farm to the fresh food aisle.

The real logistical challenge then becomes managing the movement and return of the containers to ensure optimum efficiency.

Today supply chain companies, like CHEP, are establishing service centres at the premises of large growers, centralising and aligning the management of produce and containers, to ensure efficiency and comprehensive tracking throughout.

The challenges of ensuring returns of containers across international borders, means that the reuse of plastic containers across export markets is still developing. However,



the system is well established in domestic retail markets.

A quality export market built on trust

South Africa is known as a significant global produce exporter. It is for instance, one of only a handful of countries that produces citrus without black spot, making our fruit highly sought after in European markets. Gold-standard supply chain management is necessary for the country to convert this advantage into export successes.

What truly distinguishes and benefits the local agriculture and fresh produce industry, is the high level of trust that exists between players.

Growers, distributors, import/exporters and retailers have built relationships that go back decades, and which are supported by collaboration and understanding. To this day, deals are sometimes struck on the strength of a handshake.

This underscores the need for industry-wide collaboration. Growers, customers, supply-chain providers and logistics firms must work hand in hand to meet the quality standards of the international markets, while not compromising on cost and sustainability.

Such collaboration is fostered by logistics operators that embed themselves in the communities they supply to. Supply chain managers negotiate with growers according to crop sizes, which is in turn affected by climate changes.

The value of industry bodies

When it comes to building trust and collaborating within the industry, it is worth recognising the value of an industry body such as the Produce Marketing Association (PMA). It provides the perfect networking platform for agriculture and fresh produce players, because it includes growers and retailers not just in sub-Saharan Africa, but

also around the globe. Its local country council includes senior leaders from across the industry, facilitating discussions around industry affairs, talent management and sustainability. It allows supply chain solutions providers, growers, distributors, exporters/importers and retailers to collaborate to find industry wide solutions and opportunities.

Finally, it's crucial that we close the loop and pass on these financial, efficiency and environmental savings to the customer. The entire process is for the customer—the most important trust relationship in the entire supply chain.

It's about getting produce from the farm to the fresh food aisle in the most cost-effective, efficient way, while minimising the impact on the environment—for everyone's benefit. We need to work together to achieve that. ■

*Gerhard Stander,
Agricultural Director at CHEP South Africa*



Feeding the nations

Freshmark goes the extra mile

Consumers across the African continent can enjoy top-quality food at the best prices, thanks to Freshmark, the fruit, vegetable and flower procurement and distribution arm of the Shoprite Group of companies. Africa's largest food retailer, the Shoprite Group is inextricably linked to Africa, contributing to the nurturing of stable economic development and social upliftment.

The Shoprite Group operates over 2 299 corporate stores in 15 countries, all integrated electronically in a central database and replenishment system. . From Cape Town to Accra and even the islands of the Indian Ocean, the Group carries out its primary business of retailing food to consumers of all income levels. The top priority is to provide all communities in Africa with food and household items at the lowest price in a world-class shopping environment.

Freshmark is a substantial business in its own right, supplying fresh produce not only to group stores within South Africa but also to most outlets elsewhere on the continent. In its thirty years of operation, the company has grown from a turnover of R165 million to R8 300 million. Freshmark is one of South Africa's largest buyers of fresh produce and also imports fruit and vegetables to ensure wide variety and continuity of traditionally seasonal fresh produce. In the past year, Freshmark handled 580 000 tons of fruit and vegetables alone.

"We go the extra mile to support local, and the majority of our produce comes directly from local producers with the focus on a 'freshness promise' to the customer. The practice of using returnable plastic crates also reduces transport and packaging costs and unnecessary product handling," says Freshmark general manager Dr Johan van Deventer.

"We go the extra mile to support local"

Freshmark operates its own distribution centre network, with state-of-the-art distribution centres in Centurion, Cape Town, Durban, Port Elizabeth, Bloemfontein and Polokwane. The company has negotiated growing programmes with some 450 large and small farmers in South Africa, as well as 354 suppliers in the 12 African countries it operates in. Freshmark sources speciality fruit, vegetables and flowers in the international market and plays a key role in equipping emerging



Dr Johan van Deventer, Freshmark general manager

farmers with the knowledge and skills they need to produce and meet international GLOBALG.A.P. standards.

"By opening stores across the continent, the Group is also assisting with the upliftment programmes of other countries in Africa, as we create both job and skills development opportunities. Shoprite currently provides employment to more than 17 313 locals in our non-South African operations," says Van Deventer.

Management is required to stay in touch with the latest international research on new and improved varieties, a number of which have been introduced to the market over the past two years. Compliance with food safety standards is ensured through regular auditing of all GLOBALG.A.P. accredited farmers.

With quality being of paramount importance, Freshmark has implemented a quality assurance programme built around quality and food safety standards. "These important principles are enforced in all distribution centres and at our producers. Produce is tested daily for any deviation from specified requirements, as well as microbiological activity and chemical residues," concludes Van Deventer. "In all the things we do it's only Madam Customer who has the final say and we are only as good as our last delivery to a store." ■



Freshmark is the Shoprite Group's fruit and vegetable procurement, buying and distribution arm and is a substantial business in its own right. Freshmark supplies fresh fruit and vegetables to the Group's stores within South Africa, and most of its outlets in other parts of the continent.

Currently one of the largest purchasers of fresh produce in Africa, Freshmark also imports fruit and vegetables when needed to ensure a wider variety and continuity of traditionally seasonal fresh produce.

The majority of the Group's fresh produce requirements are sourced directly from local producers with the focus on a fresh promise to the customer. Extensive effort goes into establishing a local network of suppliers and this objective is followed through across the continent as the Shoprite Group expands into Africa.



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The Foodinvest story

The Foodinvest Group has been established in the fruit industry since the 1950s. It all began when the Stoppa family started their fruit-production business in the Cuneo area of Northern Italy to ultimately form the corporate designation of Foodinvest Italia SpA in 1999. As the focus at that time was on the local distribution of fruit from Northern Italy to Italian and European markets, the business diversified to include importing product from the Southern Hemisphere to European markets, before going to supply markets outside of the European Union.

Foodinvest Italia's main business is the importation, production, packaging and distribution of fresh produce, pulses and dried fruit, with the aim of strengthening its position in the global fresh produce market, presenting itself as an ideal partner.

In the process of reaching this goal, foreign subsidiaries were created in The Netherlands, Chile and South Africa that ensured growth and greater control over the business's operations. New partnerships were also created in the domestic market, such as its merger with the "Ditta Gregorini" of Senigalia company, which specializes in fresh produce from Central and Southern Italy, and the addition of new market products, such as pulses and dried fruit.

Growth was also made possible thanks to partnerships consolidated over the years with many different production line players. Credit is also due to the group's extensive knowledge of different markets, which allows it to make the most of its products, as well as to careful research and meticulous quality control, both in terms of products and logistical services.

Today Foodinvest operates and trades in the EU, Russia, Africa and the Middle East and is expanding in Asia and the North American markets. As with the formation of Foodinvest Italia, the merger with Ditta Gregorini, which has been in the fresh produce industry in Southern Italy since 1925, was a calculated strategy.

Following market dynamics and changes, Gregorini specialized in the retail business, but in 2010 it opened a distribution platform in Verona, in order to better supply its clients located in Central and Eastern Europe.

Today, Gregorini has broadened its range with fresh and dried products from the Southern Hemisphere and is organic certified, offering a wide range of fresh and processed Italian organic products. Foodinvest Chile was established in 2009 with the aim of creating a direct link with Chilean agricultural production, thus providing commercial, logistical and financial support to growers and suppliers.



The subsidiary also deals with the Group's South American clientele, directly coordinating distribution both to other Group companies as well as to its own customers.

Last but not least, established in 2011, Foodinvest South Africa aims to build and strengthen suppliers and producer relationships in South Africa, including The Foodinvest Group and its customers.

In addition, Foodinvest SA provides a comprehensive package of support to South African growers (including sub-Saharan African producers and suppliers) for distribution of the company's products in Africa, Asia, the Middle East and members of The Foodinvest Group (Foodinvest Italia, Foodinvest Chile and Ditta Gregorini).

Foodinvest SA today manages a parallel structure, focusing not only on the export of perishables but also on the import and distribution of international fruit to local supermarkets and wholesale markets in South Africa. ■

Adriaan du Toit, Company Manager, Foodinvest South Africa
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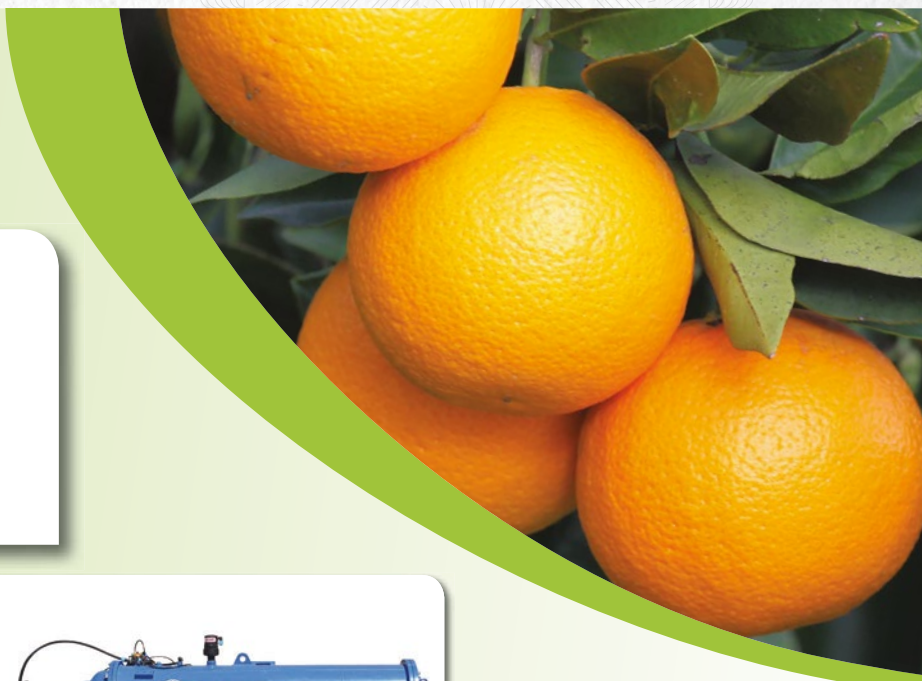


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An honour and duty to serve

Turnerland helps manufacture success

Turnerland was founded in 1994 with the dream and vision to help S.A. farmers achieve success. In the beginning the focus was only on potato farmers, but later onion farmers were also included.

Over the past 25 years farmers have been offered the ability to mechanize their farming operations and become less dependent on human labour.

Turnerland is the only manufacturer of potato planters and harvesters in Southern Africa. Turnerland remains committed to the continued innovation and development of the potato farming industry.

Processing facilities have also developed, making scale of economics the key to financial survival in South Africa. Our Kompak® bunker packing facility is the first and only of its kind in the world. Its patent description puts it best: A sizing arrangement on top of a storage arrangement and by gravity feeding and filling packing arrangement. With its optical sizers and electronic grading instruments mounted on the top it is truly a world class set of equipment. The ability to quickly and efficiently sort between multiple potato sizes is crucial in a country like South Africa where there are no fewer than 16 grade sizes.

Turnerland's potato planters are also very popular and are produced in a range of two-, three-, four- and six-row configurations. This wide range of planting configurations ensures that every potato farmer's needs are met without issue. Our two-row planter has no equal and is a top seller. Turnerland is the only manufacturer in the world that offers a two-row "min till" towed planter to its customers.

Turnerland's range of potato harvesters has a firmly anchored base given their tried and



tested "scissor gradient" patent. Compared to the other conventional potato harvesters available in South Africa our machine is without equal. Our TL 170 CWM harvester is proof of this unparalleled superiority in the unforgiving conditions of South Africa. Our single-row mass tank harvesters and double-row elevator towed models (TL 170 CEM/CES) compare favourably to imported potato harvesters in terms of technology and craftsmanship.

As far as tip trailers are concerned Turnerland leads the industry with our seven-ton capacity models. For conditions that would prove too challenging for other types we recommend our 10 ton model with air suspension.

Turnerland also produces a wide range of mass processing equipment which includes: chevron loaders, gooseneck loaders, spiral cleaners/sizers and many more. This wide range of available equipment ensures that the needs of any potato or onion farmer can be satisfied.

There have also been plenty of challenges for Turnerland over the past 25 years, but none as severe as the rising steel prices. The ever climbing costs of acquiring good

quality steel have put a stranglehold on the South African equipment manufacturing industry. Turnerland's continued survival is a testament to our ability to overcome these odds. Another challenge for us is farmers that refuse to support their local equipment manufacturers. By choosing to purchase machines produced overseas they undermine the development of the South African farming equipment industry. The stunted growth of local equipment manufacturers will be to the detriment of future generations that will face an ever more challenging economic situation in South Africa.

What does the future have in store for Turnerland? We are engaged daily in the research and development of exciting new projects. Our aim has always been and always will be to produce ever greater equipment to ensure that our trusted clients can improve their productivity and success. We do this amidst a hostile economic climate and uncertain future. For Turnerland it is an honour and a duty to serve the farmers of the African continent to the best of our ability. ■

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If you are in the market for a potato harvester, look no further than Allan potato harvesters, courtesy of Bestbier SA.

There are two sizes, determined by the width of the machine: 61 inch/1.55m and 69inch/1.75m. The machines are simple to operate with a very low running cost and extremely gentle and soft handling with minimum mechanical damage to potatoes. They have a high second-hand value. Reliable and backed up with good service, the harvesters can even be pulled by a 80-90kw tractor. Running costs have been calculated to as little as R250 per hectare.

The potato harvesters are manufactured in Canada by Allan and imported to South Africa by Bestbier SA in Bloemfontein. Allan has been in business for more than 60 years, Bestbier and Allan are family owned businesses.

Livebottom or belt trailers

Bestbier SA manufactures trailers in South Africa according to Allan's tried and tested design. Their primary role is to transport and offload potatoes very gently and with very little bruising. These multi-purpose trailers can also be used to cart grain or be changed into spreaders. They come in 8- or 10-ton tractor-drawn models. Bestbier also manufactures truck-drawn trailers.

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Light at the end of the tunnel

Citrus rail transport strategy gets the all go from Transnet

On Friday 14 June the CGA hosted a rail transport workshop in Tzaneen to present the Transnet Freight Rail (TFR) plans to put some serious traction on rail development for the citrus export industry in the coming years.

This project is being driven from Transnet group executive level and is being supported by different spheres within national government and even the office of the president. To highlight the importance of rail development for the northern production regions (KZN, Swaziland, Mpumalanga, Limpopo and Zimbabwe):

- Production forecast shows a potential growth of 20% to some 90 million (15kg Eqv) cartons by the 2022 season.
- Coupled to that, demand for an additional 400 road truck trips per week will be required during peak season to transport citrus to ports for export.
- Due to the forecast increase in Late Mandarin production, demand for refrigerated trucks will grossly outstrip supply in peak season.
- An additional 20,000 pallet cold store capacity will be required to sufficiently manage the peak seasons production output, this is not likely to materialize.
- The forecast shows the additional production will require a further 10 000 FEU reefer containers per season, this is deemed to be problematic to run the additional trucks into the Durban Container Terminal. Rail transport development for this region is deemed highly imperative to counteract a number of foreseeable challenges.

The short-term target is to rail 10 000 FEU containers from the hinterland production regions to the ports by 2022 (At present only about 1 500 reefer containers are being railed annually). To reach this target some serious commitment and effort is needed by all role players involved in the process.

Eight-point plan

An eight-point rail plan was highlighted by the CGA:

1. Investment in cold storage infrastructure aligned to rail sidings will be needed,

particularly to permit cold treatment shipments (preliminary studies show viability at Musina, Tzaneen, Marble Hall, Nelspruit and the new Tambo Springs rail terminal in south Gauteng). Investment to increase throughput capacity at Bela Bela and Tzaneen sidings (Transnet are considering a branch line concession for the Bela Bela to Marble Hall terminal) is needed. In addition, investment in 16 equipped reefer train sets will be required to achieve the volume target (An additional 2 reefer rail sets are imminent boosting the total to 6 sets).

2. Strong collaboration will be needed from producers, exporters, shipping lines, Transnet and rail service providers to make the project a success.
3. Shipping lines in particular will need to support the project by releasing containers to the hinterland for rail transport.
4. Pricing will be of particular importance to stimulate eagerness to convert to rail, of particular importance is a pricing subsidy to rail containers to Cape Town for

export (TFR have outlined a new wagon procurement and pricing policy for the fruit industry).

To reach this target some serious commitment and effort is needed by all role players involved in the process

5. The railing of import reefer containers to the hinterland will add to reduce the cost of railing citrus to ports and will permit

reefer containers to be made available in the hinterland (CGA are in process of consulting major meat importers and DAFF on this aspect).

6. Integration between Transnet Freight Rail and Transnet Port Terminals will be essential to ensure the operational efficiency of reefer rail service is fully optimized.
7. Security of the containers to protect the reefer trains and containers cabling and all risks that could destabilize the project must be given attention.
8. Operational guarantees will be required by Transnet and rail service providers to mitigate against rail obstructions in the event that such occurs.

Jan Louis Pretorius, CGA director for Letsitele aptly concluded the workshop by stating that it is indeed encouraging to know that the light at the end of the tunnel is in fact a train. ■

Justin Chadwick,
CEO Citrus Growers Association

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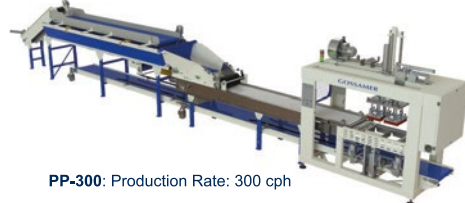
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Staying on top

Emerging agri-tech is finding a home with savvy SA farmers

High-tech agri solutions aren't new. However, farmers pushing tech into their fields is a new phenomenon, particularly in South Africa's smaller scale operations where lower volumes have curtailed returns on what could have been fairly substantial investments in the past.

However, the tech is now more commoditised than ever and the lessons from the early adopters in big business and large agri have filtered down into pragmatic solutions. They're more suited to South Africa's rigorous conditions, even those in smaller scale commercial operations.

And that's why the agri-tech market is poised to explode. The pundits reckon it'll be worth \$13 to \$14 billion by 2023, topping \$18

billion just two years later. Farmers are probably the poorest paid in the entire agriculture supply chain, which makes it understandable they're keener than ever to maximise yields, slash labour demands and costs, pump up returns per hectare, and boost produce quality. All the while they are also dealing with stiffer competition, demanding regulations, and climatic factors such as water stresses.

In the past, high-tech has often meant high costs and there hasn't always been any guarantee of reliable returns. Many farmers have burned their fingers on genetically modified seed permutations that promised higher yields. Others haven't managed to realise the right returns on automated equipment including GPS-guided tractors, drones, and other sophisticated equipment.

Those were—and often still are—ground-breaking new offerings. And farmers face

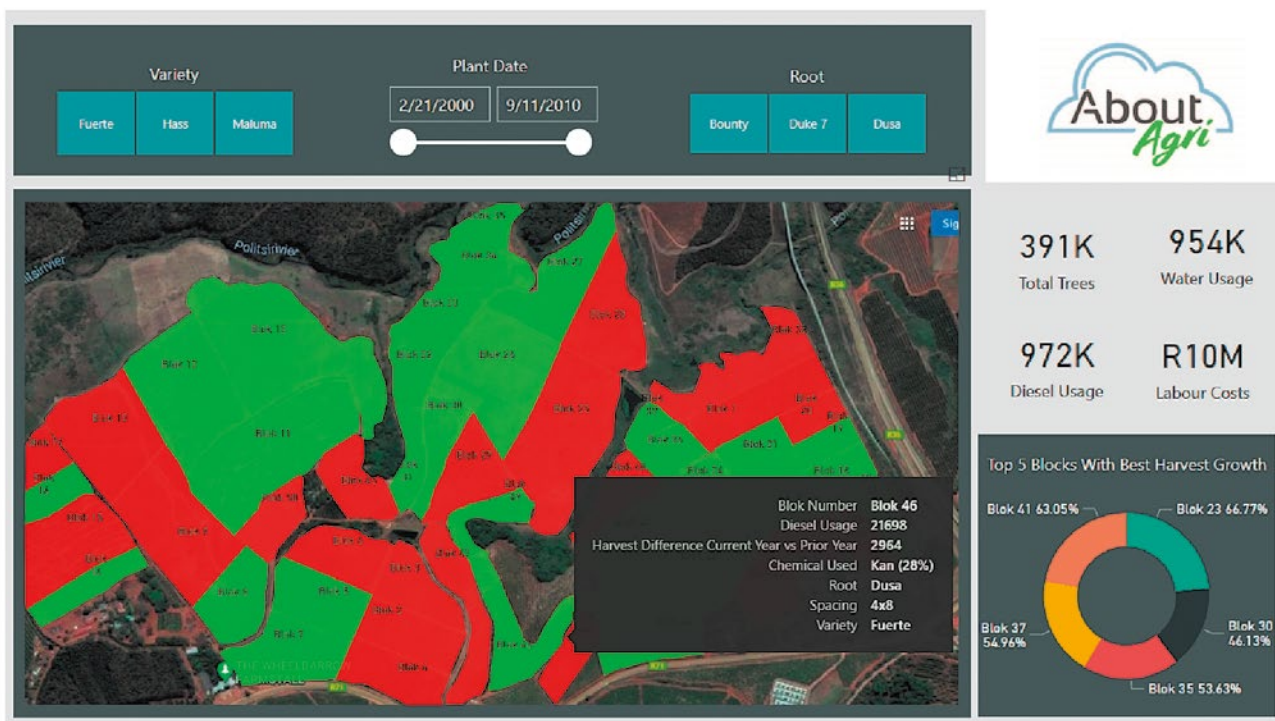
enough risks without artificially ramping up the stakes. Smaller scale operations also don't always have the fat to trial by error what amounts to other organisations' profit margins.

All of these reasons and more amount to why farming is one of the last industries to adopt the growing wave of technology solutions emerging from the era of digitalisation or the fourth Industrial Revolution (4IR).

Now, though, higher-margin, smaller-scale farming operations are beginning to see returns on specific technology investments.

Avocados: a case study

Avos are a prime example. It can take around six years to prepare an avo orchard and the fruit is particularly sensitive to water stresses. But it's highly prized by consumers for its low-cholesterol protein, carbohydrates,



vitamins, and minerals, and popularised by millennials, which is why the price has risen from around R9,60 per kilo in 2008 to over R22 in 2017. Top retailers want R35 a kilo in mid-2019, and it costs anywhere up to R10 per kilo to grow, depending on the efficiencies of specific farms.

Avocados are a competitive market. The price of Spanish avos in 2018 dropped to one-third that of 2017 when South African and Peruvian avos hit European markets. Researchers expect Europeans will eat 590 000 tons of avos in 2019. South Africa is producing more than 100 000 tons.

Managing water is particularly important to farming avocados. Planting on ridge lines to reduce run-off, drip irrigation, and other methods are all used to extend the season, reduce the cost per kilo, and increase yields per hectare. Many farmers are managing to get 10-month seasons.

Choosing a solution

To stay on top of an avo operation means having the right information at your fingertips.

You could go in for drones and stuff, high tech that costs a bundle, or you could go for something that gives you the info you need to make a success of your fields, without the huge outlay and the need for trained, delicate employees.

Internet of Things (IoT) devices that automatically feed a wealth of data, like diesel consumed, water used, seeds dropped, fertiliser sprayed, labour hours accumulated, additives added, and more, can become

expensive and difficult to maintain without the right expertise and outlay. They don't necessarily yet translate well into the South African environment.

Agri-drones are undeniably sexy and which farmer wouldn't want a few? But they're expensive. Drones alone are going for \$1 500 to \$25 000. The entire solution, including software and controllers, will set you back more.

Those in the know say a decent fixed-wing setup, which is the most efficient, comes in at about \$12 000 but it can't do survey-grade missions because they fly too fast for the camera resolutions.

Plus, farming drones are considered commercial operations, which means they require licenced operators, which adds to the complexity and cost. For interest's sake, at the top end of the spectrum you get a 45-minute loiter time with easily-swappable cameras that provide infra-red, LiDar for 3D maps, visual, and other sensors.

Other tech-pushers want farmers to invest in apps that seem cheap enough, offering to connect farmers direct to restaurants, hotels, and retailers to sell their produce. That's another great idea but the reality is that there aren't enough people on both sides of the equation to give those systems the volumes they need to be successful.

Microbial alternatives to synthetic fertilisers and alternative seeds are not entirely emerging technology and they've proven historically risky.

But a growing number of farmers are using proven high-tech, which puts them a step ahead of many of their competitors, which

they can get for the price of a small family car and cheaper than a well-used 2011 John Deere 5105M.

Analytics dashboards are showing farmers the kinds of information they need to know, quickly, and visually. They also let farmers change what's displayed, how the information is combined, so that they can quickly determine a range of factors.

They can, for example, compare the yields of specific crops in field A between certain years, simultaneously showing the amount of water used to irrigate, the labour used to ultimately harvest, and the diesel consumed.

Or they can compare different fields, a variety of crops, market prices, achieved prices, additives and their costs, or a range of information that ultimately helps ramp up yields and returns per hectare.

It's tech that doesn't touch the soil but provides the data farmers need to make smart decisions, quickly.

It gets automatically upgraded because it's in the cloud. They don't need special hardware like servers and firewalls for security because of its cloud model. Or they can choose to run it on their premises if they don't have good Internet connections or the Internet costs are too high.

The real benefit of dashboard analytics is that they manipulate the information quickly so you can see it any way you like. No need to have an accountant or an IT expert on hand drawing up all the different scenarios you can imagine.

And, with the growing use of machine learning and artificial intelligence (AI) these



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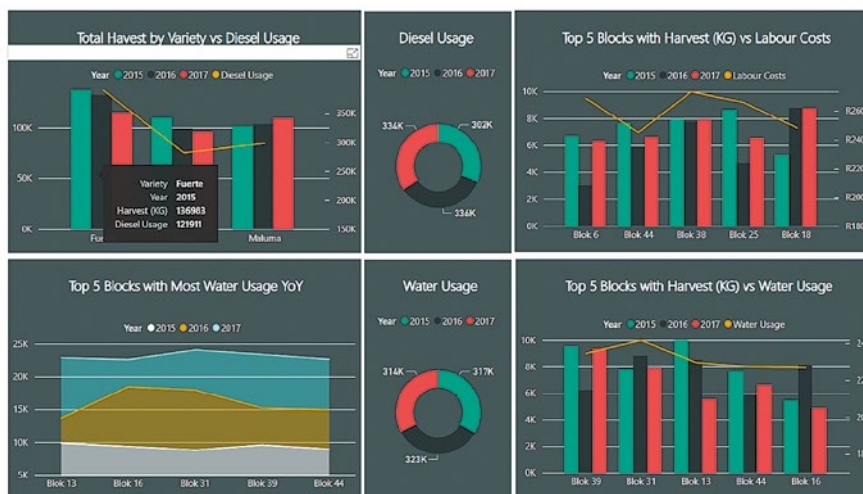
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systems will only become smarter and faster at showing farmers what's important. Farmers won't need to overhaul their IT systems every time that happens either, again thanks to the cloud model.

Every change will happen on the other end of the Internet link. Farmers will just reap the rewards.

Modern, smart dashboard analytics have paved the path to practical agri-tech that's long proven itself in the business world and is now making its mark on South African farms. ■

Gerrit Olivier, CEO About IT



By 2024, over 2-million farms and 36-million cattle will be connected. A new report by ABI Research unveils the opportunity for the Internet of Things (IoT) within the agricultural market, specifically connected agriculture in field crops, tree crops, and livestock. For field and tree crops, the primary driver for the introduction of connectivity and the IoT is not only to irrigate sufficiently but also to limit excess water application for usage efficiency and to align with government regulation. For livestock, it is about collecting data relating to the health of the animals, including birthing activities, as well as knowledge of their whereabouts. Across all agriculture sectors, the benefits are improved yields, a higher quality product, and greater insight for farmers to more efficiently manage their operations.

"Hi-tech systems involving drones are sometimes referenced when discussing the future of farming, but a drone's primary function is to provide high-level aerial imagery, including strategic analysis of large areas to provide analytics on indices like chlorophyll content. While this is useful, it is time-consuming and can lack granular information. Ground-based sensor-based systems are more insightful and cost-effective for focusing solely on monitoring soil under the crops and animal behavior. This is exactly the information farmers need to map out their plan of action to secure the optimum yield," explains Harriet Sumnall, Research Analyst at ABI Research.

The technologies that will power IoT in connected agriculture will heavily rely on gateways and low-power wide area products. LoRa is increasing finding preference in supplier solutions, particularly for sensor-to-node connections. The cost of connected agriculture system depends upon the number of sensors, with vendor pricing strategies ranging from a single upfront fee and an inclusive subscription to a data management platform (as with Sensoterra), to a zero upfront cost but a data subscription-only model (as with CropX). The former may be preferable for large farms, and the latter better for smaller ones.

"The reasons for adopting IoT in agriculture are universal – cost reduction, improved productivity, and better profit margins – but the specific prompts in terms of readiness to adopt can be more pragmatic and localized. For example, in North America, the political climate

is proving challenging for the immigrant workforce required by the agricultural sector, and more automation could make up for this lack of manual labor. And, in Europe, farmers are notably younger than elsewhere in the world and are more naturally receptive to adopting new technology. In general, however, there is a lack of education among farmers about the benefits of connected agriculture. This is a vital issue that vendors must continue to be active in remedying if Agricultural IoT is to succeed," Sumnall concluded.





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Nature's Gift

The future of farming lies in harnessing the power of “living” fertilisers

The exponential growth in world population, coupled with challenges linked to global warming, has motivated the search for environmentally-friendly, cost-effective and sustainable farming approaches. A radical shift in the present farming system has been widely suggested to improve crop yields with minimal negative environmental impact. This shift revolves around reduced application of inorganic fertilisers, pesticides and herbicides.

The misuse of inorganic agricultural ameliorants has led to low soil fertility and inefficient management of many South African soils. It has become imperative to consider soil fertility as a major factor which affects crop productivity.

Unfortunately, inorganic fertilisers used for major integrated nutrient management are unsustainable, causing soil degradation and environmental pollution. Additionally, most inorganic agricultural ameliorants used in South Africa are unaffordable due to the high cost of importation.

Therefore, South African farmers may only realise their maximum potential if a more sustainable, low-cost and efficient integrated nutrient management system is adopted. The question remains: how will we feed the predicted global population of 9.6 billion people by 2050? One solution is by harnessing the potential of “nature's gift” –the microscopic organisms that form intimate relationships with plants.

A stigma is often attached to micro-organisms such as bacteria, fungi and viruses due to their association with plant and animal

diseases; however, their beneficial role in healthy agroecosystems cannot be over-emphasised. Soil micro-organisms play a key role in the decomposition of organic matter, thereby making nutrients available to plants.

Furthermore, micro-organisms have been shown to convey an array of additional benefits to plants such as heat and drought tolerance, remediation of toxic compounds in agroecosystems, as well as conveying resistance to various plant diseases and pests.

The multitude of benefits associated with the interaction between plants and micro-organisms has motivated the search for strategies to increase the number of beneficial micro-organisms in agroecosystems. This has been achieved through the development of biofertilisers.

Biofertilisers are biological products containing individual or a consortium of



beneficial living micro-organisms which enhance crop growth and productivity when applied to the plant surface, seeds or the soil. Biofertilisers may be composed of micro-organisms such as endomycorrhizal or ectomycorrhizal fungi, bacteria, cyanobacteria as well as algae. The biological constituents of any biofertiliser are determined by the ability of the micro-organisms to contribute to plant growth and productivity, plant defences and

protection, as well as their tolerance to biotic and abiotic stresses.

Biofertilisers improve plant nutrition through biological nitrogen fixation, nutrient solubilisation, sequestration of plant micro-nutrients and production of plant growth promoting substances (e.g. plant hormones). They protect plants by competing with plant pathogens in the soil as well as by priming the plant's innate immune system to resist pests and microbial pathogens. Biofertilisers

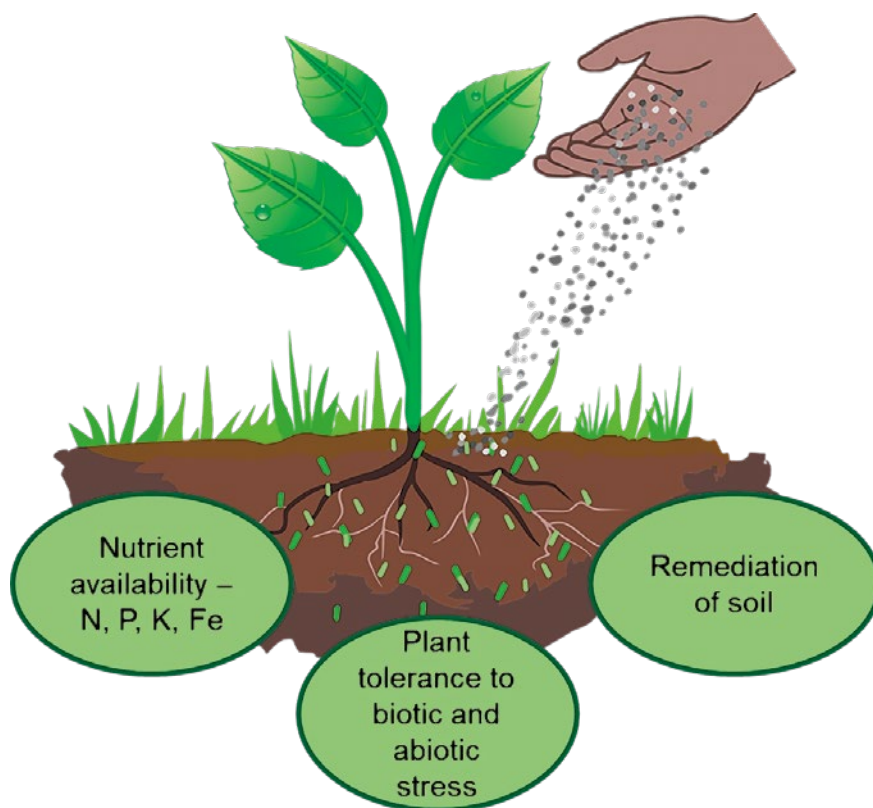
composed of mycorrhizal fungi and nitrogen-fixing bacteria have also been shown to help plants overcome drought and salt stress.

In addition to their role in plant growth, survival and protection, biofertilisers may also contribute to soil fertility and remediation of pollutants in the soil. There are numerous additional benefits associated with the use of biofertilisers such as their cost-effectiveness (they are generally cheaper than inorganic fertilisers), the fact that they occur naturally and their eco-friendliness. With their multitude of applications and benefits, biofertilisers have great potential to improve crop yields and soil fertility in South Africa and globally.

The Microbiology and Environmental Biotechnology Research Group at the Agricultural Research Council - Soil, Climate and Water is currently undertaking research on the feasibility of using biofertilisers in bioremediation of contaminated soil and for the promotion of plant growth. This study is funded by the National Research Foundation and is aimed at determining the potential of rhizospheric micro-organisms to restore the fertility and health of severely disturbed stockpiled soils from opencast coal mines.

In conclusion, substituting inorganic agricultural ameliorants with biofertilisers will not only increase the productivity and profitability of farmers, but will ultimately build a robust agricultural economy in South Africa with fewer environmental challenges. ■

Dr. Ashira Roopnarain
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Lovely in the Langkloof

Historical Louvaine combines the best of agriculture and tourism

When the Jonkers of Schoonberg in the Langkloof purchased the neighbouring farm of Louvain, they inherited a fully functioning tourism operation called Louvain Guest Farm. We spoke to Morné Jonker to find out how agritourism fits into the farming business and they are taking Louvain to the next level.

The Jonkers have been farming on Schoonberg since 1992. The original Schoonberg farm, which also incorporated Louvain back in the 1800s, was split in two at the turn of the 20th century; the owner of the eastern part, Raubenbeimer, named it Louvain after a Belgian town he saw during the First World War that reminded him of home. By the 1980s, Louvain had passed

on to the Bester family, who built up a very successful hospitality business with a strong emphasis on weddings centred on the church of St John in the Wilderness.

"We've been farming in the valley for the last 25 years, since the early 1980s, and we've always had a very good relationship with our neighbours," says Jonker. "When the Bester family decided to put it up for sale at the end of 2017, it was an easy decision to purchase it. We also purchased the section of Ezeljagt below our farm. When we bought Louvain we merged our farming operation with a large farmer to the north and we are now shareholders in the new company, Langkloof Plase, owned by the Schoeman and Jonker families. We have pooled our lands in a cluster of ten farms covering a total of 19000 hectares, of which Louvain covers about 2 000 hectares. Some 80% of the purchase of Louvain was for the land to farm cereals—we

sow barley and oats—and we also farm with about 8 000 head of sheep, 2 000 head of cattle, and 10 000 head of ostriches."

Although the Jonkers' main focus was the agricultural land, by purchasing Louvain, they automatically inherited the established guest farm; so they decided to renovate.

"The entire Louvain Guest Farm with all its buildings has been renovated in its totality. Each guest house we broke down and built over with brand new tiles, furnishings, roofs—all that remained of the old facilities was the foundations and the walls. The new conference and wedding facility is nearly complete. The onset of the renovation began in June 2018. We've been at it for 12 months and we're ready to go. We've been receiving guests since January," says Jonker.

The Langkloof region is steeped in history, which Jonker relates with evident enjoyment: "The old Schoonberg farm, now Louvain,



was well known in the early 1800s as the gateway to the Voortrekker Pass which went from Louvain in a southerly direction over the Outeniqua Mountains down into Hoekwil and Wilderness. It was an exit route from the Langkloof. First hunters, then farmers in their ox-wagons and horse-drawn vehicles would enter the Langkloof from the coastal side via the Attekwas or Cradock passes and then exit the Langkloof along the Voortrekker Pass.

"Louvain served as a farmstead where travellers would refresh their oxen and horses. In those times, everything revolved around the animals – horses were sold, stabled or purchased and the travellers would move on. So Louvain was an important trading post in the early 1800s. Because Schoonberg, now Louvain, became famous as a traveller's stop-off, it also became known to Bishop Robert Grey, the first Anglican Bishop of Cape Town, who befriended Bertie Richardson, the successful farmer of Schoonberg at the time, and through persuasion then purchased a few morgen of property. The church still has a separate title deed today.

"And Bishop Grey commenced building an Anglican church, St John the Baptist in the Wilderness, also known as the Schoonberg Church. It was specifically built for the local farm labourers and until today, 160 years later, 1854, that church still belongs to the Anglican Diocese, managed and funded by

the Church of England, and the congregation remains the farm workers."

Weddings take place at the church, which is rented from the congregation for the purpose, and the weddings and receptions are held at Louvain Guest Farm. "Weddings and wedding receptions are a fundamental part of our annual budget and turnover," Jonker adds. "We have thus decided to build a brand-new venue and reception facility for these weddings and we will be launching this venue in September 2019."

Louvain Guest Farm enjoys a great deal of return business. Thanks to the enviable reputation built up by former owner Nico Bester, the farm has become a very popular destination for 4x4 enthusiasts, hikers, cyclists, trail runners, bird watchers, freshwater fishermen, book clubs, photographic societies, and heritage groups that come to visit the church for historical purposes.

The trails are particularly popular: "We do quite a lot of different cycling routes and are planning new 4x4 routes in the area," says Jonker.

Apart from these activities, special arrangements can be made for aerial photographic flights. At present, Louvain Guest Farm can accommodate 60 people in five different places on Louvain, namely the Dairy, the Homestead, Fiel's House, the Stables, and the camping facilities.

"We have appointed a manageress, Karen Tomlinson, who is responsible for all our accommodation and an assistant, Michael Wood, who is responsible for all our bookings, activities and online media," says Jonker. "As a co-owner, I have taken the responsibility to assist with the marketing of our facilities. I am a networker and I enjoy marketing. So once our conference facility/wedding venue has been completed in September, we will be aggressively marketing Louvain as a mid-week conference facility for banking groups, insurance companies, agriculture companies and so forth who have already indicated their keen interest in using our facilities in the mid-week, as well as weddings on weekends. The conference facility will seat over 220 people, we are installing a state-of-the-art kitchen, and we will have two bars. It's literally 100 yards from the church so for convenience the wedding service and reception will be right next door."

On the tourism side of things, Jonker acts as a link between guests and the farm, with all its history.

"My specific involvement as host has mostly been to inform and entertain, when I would meet up with the groups and before dinner tell our guests about the history of Louvain, the valley, the George area, the old Raubenheimer family that's very well known in the town -- how the farm was developed



over the years and how it links with the agriculture in the Langkloof. It's a very popular topic with the guests, especially the more senior and affluent clients."

For Jonker, Louvain Guest Farm's unique selling point is its history. Jumping on fads and trends is not his style: "We've made a conscious decision not to be very trendy, which makes us very unique. We focus on what Louvain Guest Farm has stood for over the years as a wedding venue and outdoor space where people enjoy the outdoor experience and the challenging topography. Cycling is a definite trend but we're not making it our focus. That said, we do host two or three cycling events a year, which we inherited, and have decided to expand the cycling routes with single and longer tracks along the mountains."

A particularly popular hiking at Louvain Guest Farm features a visit to one of the schools that were set up to ensure job security for young mothers. "Years ago we started a very successful programme with pre-school children aged 2-6, and now in collaboration with the Department of Education we successfully fund three such schools on different farms. This gives young mothers the peace of mind that they can focus on their work in the knowledge that their children are being taken good care of," says Jonker.

"They find it most heart-warming and interesting to visit the schools and see what we are doing with the teachers and young children. It opens up a huge conversation with our guests, who, coming from the city, often have very little insight into what the farmers put back into the community. Many of our guests actually donate funds generously," comments Jonker.

Growing agritourism, like agriculture, is not something that happens overnight. "I've got many friends in the agriculture sector, I've got many friends in the tourism sector, and I have as many friends in the combined agritourism sector.

What I have seen is that very few farmers suddenly decide to go over into tourism. Most of it happens by coincidence: a farmer has an extra house on the farm, renovates it and sees that friends, family and guests start frequenting the place and expands from there. I haven't really met anyone who has switched over from farming to tourism completely. But what has happened is that the Klein Karoo has really become a tourism destination, with tourism growth around the Cango Caves, the ostrich and crocodile farms, the meerkats and so on. Tourism has expanded so much that the Klein Karoo has gone from 1 000 to 4 000 beds in the last ten years."

Jonker attributes this growth to the weakening of the rand and the knock-on effect of tourism in the Western Cape, which has been growing 15-20% annually. "Both the Garden Route and the Little Karoo, which is the gateway to Addo, has benefited exponentially from that growth," adds Jonker.

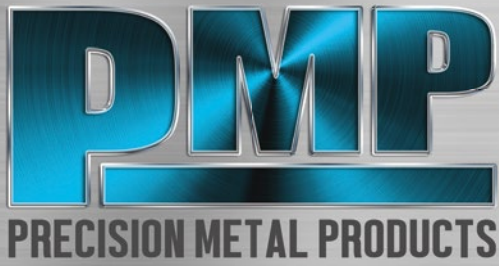
Advertising and social media have very little to do with Louvain's success. "We do have a few online bookings but 80% of our bookings are from the historical reputation that Louvain has already established. The new wedding venue has also been attracting advance bookings."

Time will tell if Louvain's agritourism revenue will grow to contribute more than its current share of total revenue. "The agritourism side certainly will expand but so will our farming business. Tourism is very risky, the political climate is on red alert, and if the government makes wrong decisions and Eskom, for example, shuts down, tourism will shut down totally. We cannot bet on tourism too much because it's a very risky sector to be in," concludes Jonker. ■

Greg Penfold

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Solidarity and co-operation

Spreading risk across the supply chain

In the course of time, it becomes clear that agriculture is exposed to many negative influences that affect its sustainability. TAU SA's economic sustainability committee has appraised the current situation and decided to hold a conference to which the role-players in the value chain are all invited. If the lack of security and certainty over land tenure are added to the current economic pressures, it becomes difficult for farmers to keep their heads above water or keep a positive attitude.

TAU SA has sent an open invitation to various value-chain role-players whose continued existence depends on productive farmers staying in production. If the primary farmers founder, the ripple effect will be incalculable.

Today South Africa is afflicted with tremendous unemployment and poverty growing every year. Policy uncertainty and security problems are scaring investors away. For as long as this is the case, the pressure points will not be addressed. The focus should be on the economic growth that South Africa so desperately needs. Unfortunately, current government policy, statements, legislation and proposed legislation are having precisely the opposite effect.

At some point we have to be honest about the facts and stop pursuing failed policies. The economy is unforgiving: failure to observe economic prescriptions will result in the downfall of individuals, institutions and the land itself. Government has already shown its unwillingness to support the commercial sector in times of crisis. We as farmers must understand that we ourselves are entirely responsible for our economic stability.

Since October 2018, TAU SA has begun engaging role-players in the value chain in order to enlighten them as to the pressure that farmers are under and emphasise that unless something is done, there will be increasing risk of the primary commercial



farmers will incur such heavy losses that input providers and food processors could also feel the pinch. Efforts should be made to spread the risk more equitably so that the primary producers do not bear the brunt of the risk. The cotton industry has managed to get the value chain to join hands and ensure that the source of everybody's livelihood, namely the primary producer, stays in production. Every commodity organisation should analyse how they can keep the source that supplies the commodity for their specific industry in production as well as possible. Profitability is essential to ensure that a business will still be there next year.

As the final link in the value chain, the consumer also plays an important role. It is high time that better bridges were built between farmers and consumers. TAU SA's Pretoria Farmers' Market is an example of where farmers can provide fresh produce directly to consumers.

Primary producers are the only role-players in the entire value chain that are price takers, with the result that farmers also undergo the greatest concentration of risk. Since the value chain depends on productive, profitable farmers, it is time for the value chain to cast a fresh eye on everybody's role and responsibility in keeping agriculture alive.

A former minister of agriculture once said they didn't need commercial farmers' food because they would import it—a level of short-sightedness that defies belief. The

contribution of farmers is not limited to providing food but extends to keeping the rural community alive. Just think about their financial contribution in terms of providing work. Some 650 000 workers earning R3150 a month amounts to R2 047 500 000 or R2 billion a month.

Primary producers also need to examine how they individually run their farms. In many cases, production units have marginal economy of scale – any deviation caused by hail, drought, low prices or disease could land the farmer in a cash-flow dilemma very quickly. Farmers must weigh up the benefits of collaboration, which can be done in many ways. When a group of farmers restructure themselves into a single business identity like a co-op, they have so much more leverage in terms of procurement and marketing. Equipment can be shared. It's time for farmers to think seriously about their future on an almost marginal farm as opposed to running a mega-farm in conjunction with others. Without going into details, bigger businesses have certain advantages such as the capacity to improve security, leverage finance and overcome disaster. It becomes possible for farmers not to have to leave their farms in the case of financial setbacks. Farmers interested in the details of the various scenarios being modelled are welcome to contact TAU SA. ■

Bennie van Zyl, General Manager. TAU SA



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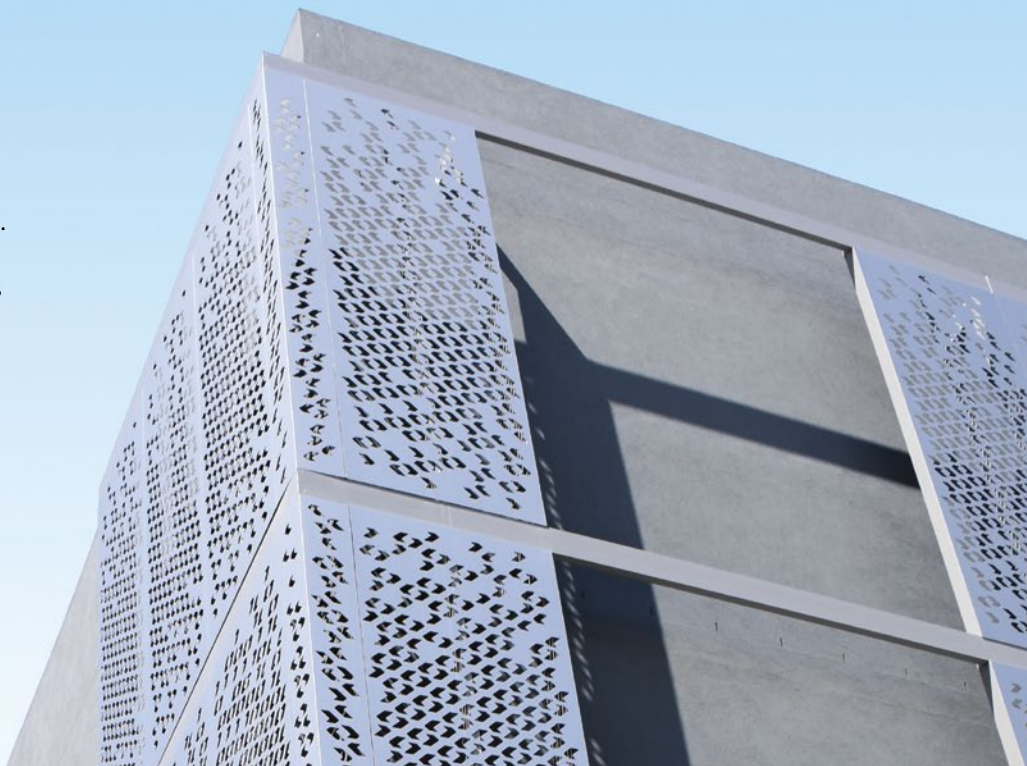


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TOUGH CUSTOMERS

Goat farming gives rural families a livelihood

Msinga is often thought of as a tough place. Forced removals under apartheid, and the cruelties of the migrant labour system have left their mark here. Bone dry in winter, its harsh landscape is characterised by boulders, red dust and ravines rutted by soil erosion.

Sitting on a grass mat in the neatly swept yard of her Msinga homestead, an 85-year-old grandmother recalled the best day of her life.

In the shade of an acacia tree in April, it was still a sweltering 30°C. MaMchunu Ngtheni Yengwa took a deep breath, sighed slowly and smiled. The best day of her life was when a government minister visited her home.

Yengwa is the matriarch of a family of three children and five grandchildren. They live in rondavels in Ncunjane, deep in the boulder-strewn mountains on a plateau 880m above sea level overlooking the Nomoya Valley and Tugela River.

Her home is a source of pride. One of the six rondavels is spruced up for guests.

While it has no running water and a pit latrine, it is posh by local standards, with a polished cow dung floor, a bed, a small table with two chairs and a wardrobe.

At night, a single light bulb dimly illuminates a bucket and an enamel wash basin



and a glass display cabinet housing the special crockery.

Cows vs goats

The minister came to honour the goat farming project in which Yengwa and 3 400 other farmers take part. Her herd of 50 is part of a pilot project that could double KwaZulu-Natal's annual R4 billion goat industry and help millions of subsistence farmers stay above the breadline.

The plan is a bit counterintuitive. It only works on a small scale.

Indigenous Msinga goats are cheaper to purchase than cows, reproduce faster, are

hardier and need less medicine. Goats are also integral to Zulu culture. Any slaughter, be it to mourn a death, honour an ancestor or celebrate a marriage, birth, new job or engagement involves a goat.

Gugu Mbatha is the manager of the Mdukatshani Rural Development Project. She says Zulu men traditionally make decisions about livestock. But about 70% of Msinga's men work in Johannesburg or Durban, which makes managing the herd difficult as women have to call their menfolk for the go-ahead to sell or slaughter a cow.

During a drought, cows perish quicker than goats. And it takes longer and is more

expensive to re-established a herd of cows, whereas women can farm goats without the input of men. A cow reaches maturity in six years and can be sold for R15 000. A goat matures in a year and fetches R1 000.

Widow's way out

A year after Yengwa's husband died, she bought two goats and her herd has sustained her family. "I am so well because of these goats. My son had seven cows, but they died in the drought. The goats survived better. I met Makhonya and he gave me the knowledge about medicine, dipping and feeding."



Makhonya is Mbatha's colleague and the director of Mdukatshani where Rauri Alcock also works. Alcock was raised on the banks of the nearby Tugela River where his parents, Neil and Creina, started radical development work in the 1960s.

Every year, Yengwa spends about R1 000 on medicine and feed. But she makes about R4 000 a month selling her goats. The herd increased by 20 last year.

Goats aren't invulnerable. In winter, kids die, either from the cold or because the scarcity of water and food at this time of year makes them more susceptible to disease. But born in spring, they generally develop fast enough to survive the following winter. Their diet is 75% browsing the leaves of acacia thorn trees, with the balance made up of sweetveld grasses.

Women and youth

Mbatha says what started out as a project to empower women has extended to unemployed youth. She and her colleagues reduced kid mortality by 60% by training 280 youngsters (with the assistance of the Department of Agriculture and veterinary supply companies) to become community animal health workers.

They visit goat farmers like Yengwa to advise on treatment, sell them medicine and publicise goat auctions. "The workers are paid by the farmers. They make a small mark-up on the medicines they sell," says Mbatha, who has lived in Msinga most her life.

The rise in goat production has seen profound social changes, empowering youth and women in a patriarchal society.

"Normally we meet under a tree and the goat farmers share their experiences. Before the goats, women hardly made decisions. Now they are emerging with confidence. Of course, people had goats before, but we helped farmers keep more kids alive, by dealing with tick-borne disease and making feed blocks to supplement the diet in winter. It gets dry here, very dry. The trees are bare and there is no grass. The stress kills the kids if they are not ready."

Societal benefits

Mbatha and Alcock employ eight people, among them Thokozani Xulu, whose job includes extending the supply of veterinary

medicines to trading stores. Interventions like the feed licks, compact blocks of molasses and protein, have made a big impact. And improvements to people's lives have reduced the potential for the conflicts that used to fester in impoverished Msinga.

Xulu says the last serious faction fight was in 2003. "Those days were terrible," he says, lowering his head. "Every man had to be part of the war. If you didn't have a gun, they would get you a gun and make you fight."

The grim-faced Mchunu brothers who live a few kilometres from Yengwa are three of nine siblings whose mother also started raising goats after her husband died.

Mvezelwa, 36, is the eldest brother and left a job in Krugersdorp when the factory he worked in closed down. "The job opportunities were small, so I came home." His stern look softens as he strokes a kid.

Then Mvezelwa gruffly orders his brothers, Lucky and Nkosinathi, to attend to tasks associated with their 200-strong herd. "Cows take too long to grow. Goats are quick. I feel very well that I am not relying on anyone for a job. When I was in Johannesburg, I didn't realise the money factory was at home with the goats."

Project expansion

Mbatha says about 5 000 people have taken part in the goat project in the nine years it has been running. And the Department of Agriculture and the European Union have committed R70 million to extend the pilot programme in Msinga to four more districts. This should create 7 000 farmers, 600 jobs for the youth and R100 million in goat sales.

Alcock has spent his life in Msinga and successfully increased poultry production through the use of vaccinations a few years ago. He realised that chickens don't provide an income for women-headed households, but saw that women who amassed enough chickens sold them to buy goats.

"Goats have huge potential," he says, but adds that there is no silver bullet for the millions of subsistence farmers in South Africa.

He and Mbatha work with scientists to research and improve the goat industry. They have done dip tank censuses, but say there is a dearth of data in this area. What they did observe was how the 2014-2015 drought knocked cow herds by 20%, but

goat production rose by 64% in the same period.

Alcock says the South African goat population is 7.8 million and small-scale black farmers own 5.8 million of these. And yet South Africa still imports 1 million goats from Namibia every year.

Idiosyncrasies and benefits

Goats aren't as commercially viable as other livestock and aren't suited to big numbers in fenced fields. The saturation point for a goat herd is 200 (100 adults and 100 kids). Thereafter, it has to be split or it will swamp the environment.

Goats are fascinating creatures. They self-herd and are led by alpha females. They wander into the bush without shepherds in the morning and return on their own at dusk. The carrying capacity (the area needed to support a herd) of a 100-adult goats is a feeding corridor 6km long and 2km wide.

Kids need to be kept in the kraal for the first three months so they can be weaned off their mother's milk and aren't weakened by walking.

Interestingly, ecologists are now celebrating goats as a tool to stem bush encroachment on indigenous Savanna grasslands. In a nutshell, thorn trees are thriving on increased carbon dioxide and crowding out the grass that allows biodiversity to thrive. But goat browsing keeps the thorn trees in check.

Alcock is not one for hyperbole but says there is a potential revolution in goats. "Rural youth don't want to be farmers, but the only way out for many is servicing goat farmers as community animal health workers or trading. "And farmers need help. They don't change easily."

Rural problems need pragmatic solutions. "What people have in their backyard is the best to work with. Goats don't involve government systems, a local councillor or a tenderpreneur."

Yengwa doesn't need any convincing. "The minister came here with Makhonya and Gugu. I was very proud. I will never forget that day," she says, covering her face and shy smile with her hand. "Yes, it seems to me that I am special." ■

Greg Ardé

This article first appeared at newframe.com

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CONCENTRATE ON FATTENING

Practical advice on the economical finishing of lambs



Although it is important for sheep feedlots to produce affordable lamb, profitability remains key. However, the sheep farmer is in the fortunate position that lamb does not compete directly with white meat, as it is already mostly regarded as a niche market product, where the consumer is also less price sensitive.

At the same time, it is also predicted that the world population will need more than twice the amount of food in the next two decades, food which will have to be produced on two-thirds of the existing agricultural land. The same trend can be expected in South Africa and will stimulate an increased demand for mutton. It therefore creates an opportunity for sheep farmers who finish their lambs themselves before marketing their product. Sheep farmers who want to finish lambs profitably should focus on utilising the scientific tools at their disposal, but should also apply fresh and innovative thinking to achieve the optimal price for their products.

There are many other factors that should be taken into account and that can directly contribute to improved profitability of finishing. One of the most important of these factors is ration quality.

Ration quality determines cost per kg mass increase

The quality of the ration used in the feedlot impacts greatly on both the animals' performance and the profitability of the enterprise. The efficacy of growth and feed conversion is mainly determined by the energy content ingested by the animal, usually in the form of molasses and grain. The feed lot ration should therefore contain as much grain as possible without causing metabolic disorders such as bloat and acidosis. Finishing rations should contain a high energy content, as energy determines the growth rate by dictating the rate at which other food ingredients are utilised in the metabolic processes. Energy content can account for as much as 70% of a finishing ration, which means farmers who want to limit feed costs often make the mistake of lowering the energy content. A lower energy content leads to poorer growth and ultimately to an increase in feed costs per kg meat produced. These costs can increase by as much as 25 to 30%.

Other grains and byproducts such as sorghum, wheat, barley and wheat bran can also be used in feedlot rations to lower feed costs. Consult your Molatek representative for optimal ration formulation with these raw materials.

However, there are also other nutrients, especially proteins, minerals and vitamins that should be supplemented. Molatek Sheep Fattening Concentrate is well balanced in terms of protein, bypass protein, minerals and vitamins, while an ionophore enables the farmer to maximise the use of farm-produced grains and roughage.

Inclusion of Molatek Molasses Meal in feedlot rations to enhance the efficiency of digestion

The combination of sugar (molasses) and starch (grain) creates a synergistic effect that enhances feed utilisation. In other words, the animals need less feed to gain one kilogram in weight, thereby resulting in improved feedlot profitability. To utilise this advantage the feedlot ration should contain a molasses level of at least 10–12%.

Table 1: Complete feedlot diets for sheep with molatek sheep fattening concentrate

TABLE 1: COMPLETE FEEDLOT DIETS FOR SHEEP WITH MOLATEK SHEEP FATTENING CONCENTRATE

MIXING INSTRUCTION		STARTER DIET 1	STARTER DIET 2	FINISHING DIET 1	FINISHING DIET 2
SHEEP FATTENING CONCENTRATE	kg	200	200	200	200
MOLASSES MEAL	kg	40	40	40	40
MAIZE MEAL	kg	510	560	610	410
SMALL GRAINS	kg	****	****	****	200
LUCERNE	kg	250	100	150	****
ROUGHAGE	kg	****	100	0	150
TOTAL	kg	1000	1000	1000	1000

This feed contains anionic salts to prevent bladder stones and an ionophore to prevent acidosis and improve feed conversion rate and growth.

Correct adaptation is crucial:

- Day 1-2: Limit the complete diet to 1.5% of body weight per animal per day plus ad lib hay/roughage.
- Day 3-4: Limit the complete diet to 2.0% of body weight per animal per day plus ad lib hay/roughage.
- Day 5-6: Limit the complete diet to 2.5% of body weight per animal per day plus ad lib hay/roughage.
- Day 7-8: Limit the complete diet to 3.0% of body weight per animal per day plus ad lib hay/roughage.
- Day 9-10: Limit the complete diet to 3.5% of body weight per animal per day plus ad lib hay/roughage.

If animals are completely adapted and show no signs of acidosis, the full diet can be fed ad lib after day 10. Take note:

- Grind roughage with 12 mm sieve to ensure sufficient intake and mixing.
- Maize can be partially or completely replaced with barley or hominy chop, but the addition of wheat and oats should be limited to 20%. The growth rate of lambs fed hominy chop instead of maize in the ration is poorer.
- Palatable lucerne as a source of roughage for young lambs ensures the best results. At least 50% of the roughage component should be from a palatable source.

Practical tips:

- Feedlots should preferably be on a slope to promote drainage and the prevention of problems such as foot rot.
- In open paddocks, a space of 1,5 m² to 2,5 m² per sheep is required.
- Sufficient shade in feedlots is important as metabolic processes cause high body temperatures. If the animal has to inhale warm air, it cannot cool sufficiently, which can result in lower feed intake and poorer performance. Shade of at least 0,5 m² per sheep must be provided over the feeding troughs and away from the feeding troughs on the opposite side of the paddock. If there is only shade over the feeding troughs, the sheep will crowd round the troughs, which will limit access for other animals. This will also increase the chances of the feed being contaminated with manure and urine.

Shade must also be provided in an east-west direction to best utilise the available shade.

- Feeding troughs must be designed and placed in such a way that sheep cannot climb onto the trough. This will prevent them from

A growing world population represents an opportunity for sheep farmers who finish their lambs themselves before marketing their product

urinating or excreting faeces onto the feed. The troughs must also be placed such that the feed cannot get wet. Although trough space of 100 mm per sheep is adequate, space of up to 200 mm is more beneficial, especially during the adaptation period.

- Self feeders should not be placed in a feedlot as workers may add too much feed to the feeders at a time. Better results are achieved if animals are fed three times per day in open troughs.
- The sheep must also always have access to sufficient clean, cool drinking water. Water troughs should not be too big, so as to prevent unnecessary spillage during cleaning - spillage creates ideal breeding conditions for fly larvae and coccidiosis. The drinking troughs should be situated as far away as possible from the feeding troughs to prevent feed from contaminating the water. Contaminated water quickly becomes acidic and the animals may refuse to drink. ■

*Dr Vlok Ferreira,
National Technical Manager Ruminants
RCL Foods*



Safeguarding productivity

Lubricants protect your tractors and equipment

The agricultural sector plays a vital role in the South African economy. The value of the agricultural production in South Africa has increased by 4.7% in the period 2017/18 and contributed 2.2% to the overall GDP. This contribution is a significant provider for employment and a major earner of foreign exchange. That's why Engen lubricants are designed to protect your equipment, which is probably your most important asset to operate efficiently and durably.

There are multiple reasons for tractor equipment failure. One of the most common is

inferior and inadequate lubrication, making tractors vulnerable to oxidation, wear, brake chatter, erosion, corrosion and the effects of cold temperatures. Quality lubricants with advanced additive packages are available to help farmers prevent these conditions, protecting equipment, improving performance and extending tractor life. With proper maintenance, the average working life of a tractor is about 15 years.

Selecting the best tractor fluid is an important decision, as they are not all created equally. Some fluids are on the market with low-performing additive packages that can result in mechanical problems that lead to increased downtime and shorter equipment life. The discounted price is attractive to some

buyers, but the long-term maintenance and repair costs attributed to substandard lubricants can significantly outweigh that initial lower cost. Quality tractor fluids are higher in price, but they are the preferred choice for engaged farmers who recognise the benefits quality fluids provide.

Protection: Engen lubricants have what it takes

High-performance tractor fluids contain the right chemical additive packages to effectively protect gears, clutches and pumps by providing oxidation resistance, anti-wear protection, water tolerance and enhanced performance in temperature extremes and harsh conditions. Here is a checklist that addresses the differences between high-quality and budget-priced fluids.

Oxidation

Oxidation causes the formation of sludge deposits and the thickening of fluids, reducing performance and shortening the life of any tractor. Oxidation protection provided by the additives in high-performance tractor hydraulic fluids keep parts cleaner. Eliminating sludge means better overall performance, gear protection and reduced brake noise. And, clean fluids don't have to be replaced as often.

Excessive wear

High-performance fluids provide a dual excessive-wear protection system for gears, bearings and the soft, yellow metals in hydraulic pumps. Without the right additives, a lubricant's load-carrying, anti-wear



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The conference will be welcoming high-level Government and private sector delegations from Angola. The relevant South African Government departments will also be represented at Ministerial level. Exciting business and investment opportunities in Angola will be announced at the event.



This exciting high-level conference should prove to be the perfect base from which to launch cross-border economic and social relations in the agricultural and eco-tourism sectors of both countries since it is intended to attract major role-players in this area. Intended as a noteworthy networking platform, it will not only promote and facilitate foreign private investment for agri-business and eco-tourism projects as well as future business relationships between Angola and South Africa, but it may inadvertently become a gateway event for access to other markets in the Southern African Development Community (SADC)



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Contact: Venesia Fowler
venesia@capemedia.co.za**



and extreme pressure characteristics fail and result in severe ridging, visible wear and scoring on gear parts.

Corrosion

Water is harmful to tractor seals, valves and the yellow metal components in pumps and valves. High-quality tractor fluids prevent the water contamination that results in corrosion and erosion, which often leads to sluggish tractor performance and potential hydraulic pump failure. Water mixed with lower quality tractor fluids forms a corrosive mixture that erodes the yellow metal on hydraulic pumps, causing scratches on the pump's brass piston shoes.

Engen's high-performing tractor fluids with additives provide high water tolerance, enabling the fluid to protect parts from corrosion and erosion in the presence of water, optimising tractor performance and reliability.

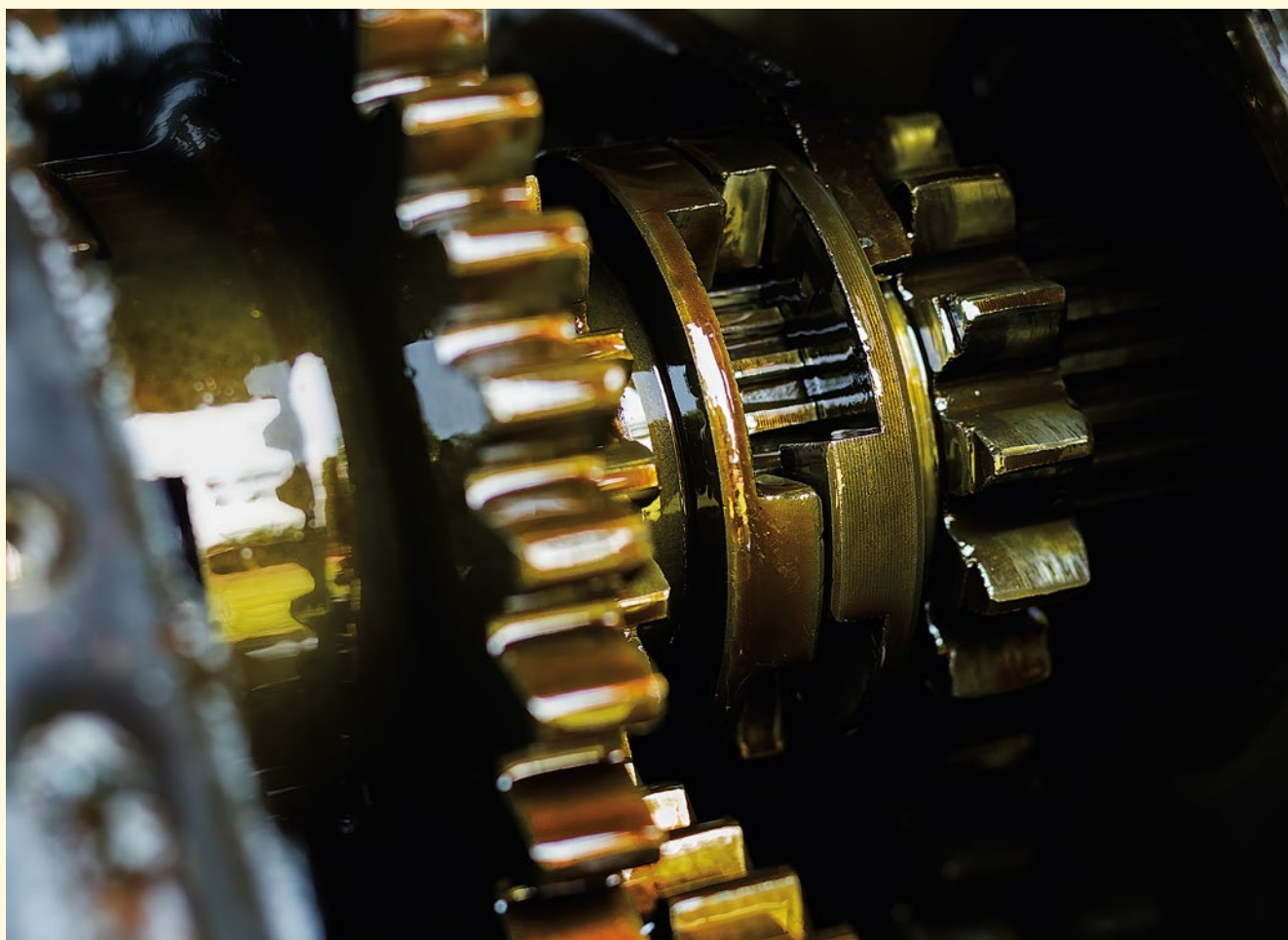
Brake chatter

Lower-quality fluids do not interact with friction materials as effectively as premium oils with chemical additive packages.

Lack of friction protection causes a screeching noise in wet brakes and reduces brake performance. High-performance

fluids improve braking capacity and prevent brake chatter. ■

For more information on tractor fluids, contact the Engen Lubricants Technical Department via telephone on 08000 36436 EXT 5 or email: csctechnical@engenoil.com



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Harvest highlights

Insight, product news and innovation

Accelerating African agriculture Agri giants partner to drive growth

John Deere and Corteva Agriscience have signed a memorandum of understanding (MoU) aimed at accelerating Africa's agricultural sector and enriching the lives of farmers across the continent.

The agreement officially establishes and consolidates the existing relationship between John Deere and Corteva, formally coordinating collaboration opportunities in sales and marketing across Africa.

"Following the recent John Deere refreshed positioning in Sub-Saharan Africa, we are now going beyond mechanisation. Achieving higher levels of production in Sub-Saharan Africa requires cooperation across the agriculture value chain. To this end, this partnership will see John Deere and Corteva identify collaboration opportunities across Africa that combine mechanisation with the latest developments in crop science. This partnership is expected to provide African farmers with comprehensive solutions to endemic challenges through new crop management technologies and products," says Taylor.

The agreement includes precision farming as well as finance opportunities with John Deere Financial. It will also include technology collaboration via John Deere 'Hello Tractor' technology development programme operating in selected African markets. Significantly for Africa, "the agreement also covers small- and new-age farming technologies including the adaptation of local seed varieties," adds Taylor.

Bajwa believes that this partnership will deliver new initiatives as part of farmer-first solutions that maximise the potential of every hectare, enabling African farmers to get the most out of every season. "Since we have collaborated with the farmer in mind, we are confident that this partnership will build a better future for generations to come," says Bajwa.

"By supplying farmers with cutting edge mechanisation, technology and the latest in crop science, John Deere is playing an active role in driving Africa's green revolution, increasing domestic food security and expanding Africa's relevance to global agricultural supply chains," concludes Taylor.



The new Mini Sigma has arrived Introducing a new standard in water filtration

The Mini Sigma is innovative, automatic and self-cleaning. Add lightweight and durable with maximum installation flexibility to the list of benefits!

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- Amiad's unique suction-scanner cleaning technology
- Modular design with various installation configurations
- Polymeric filter – corrosion free
- Low water and energy consumption
- Compact design and small footprint
- Easy installation and low maintenance
- Ideal for many landscape and agricultural irrigation applications
- Amiad's innovative and user-friendly ADI-P electronic controller, operated by a mobile app for advanced monitoring capabilities

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Eco-friendly pesticides on the up

Stringent EU regulations create growth opportunities

Farmers have begun to adopt the recommended practices issued by regional regulatory bodies regarding the use of crop protection chemicals (pesticides) to meet the growing demand for food safety in developed and developing nations. The use of alternative crop protection measures and implementation of best practices have become a priority, and, in turn, have enhanced efficiency in agricultural income. The €55.38 billion market is expected to grow to €76.21 billion by 2023 with the synthetic and biopesticides product segments accounting for 90.2% and 9.8% of the revenue, respectively, in 2018. However, with greater adoption of residue-free pesticides, the biopesticides segment is likely to generate 17.7% of the revenue by 2023. This is according to Frost & Sullivan's recent analysis, Global Crop Protection Market, Forecast to 2023.

As biopesticides are assessed under the same regulations as synthetic substances in the EU, there is a need for new provisions and guidelines to facilitate their registration. The market is also challenged by concerns of short shelf life, high cost, and easy degradation. Successful vendors will look to address these issues and tap further growth opportunities by:

- Developing innovative biopesticides that use living microorganisms and plant extracts with complex modes of action and multiple classes. They help improve durability.
- Offering efficient, innovative, and eco-friendly solutions, as the crop protection market is governed by rigid regulations.
- Delivering integrated products and services, including crop nutrition management and optimization.
- Creating novel biopesticides that address customer needs such as long shelf life and new modes of action.
- Improving marketing channels and distribution networks in emerging nations for better visibility. Adopting a public-private sector approach to manufacturing and selling eco-friendly biopesticides as alternatives to synthetic pesticides.

Reaching out at PMA-Fresh Connections

A word from WSP

WSP is excited to have the opportunity to exhibit at the PMA-Fresh Connections: Southern African conference and trade show this year – as the only trade show to host the entire fresh produce supply chain we are excited to connect with leading companies and to open up new business opportunities.

WSP is one of the world's leading engineering professional services consulting firms. We are a multidisciplinary, international team that focuses on technical excellence and client service.

Our Africa team of refrigeration specialists have extensive project experience throughout South Africa, Africa and the United Kingdom as well as Europe and the Middle East across the food and beverage, retail and mining sectors.

We are experts in the agri-business sector and are the trusted refrigeration consultant for a number of leading agribusinesses in Southern Africa. We excel at both large- and small-scale refrigeration facilities including fresh and frozen distribution facilities, conditioned pack houses, steri rooms, cold storage, banana and avocado ripening rooms, winery cooling, controlled atmosphere rooms and post-harvest cooling facilities.

We produce top quality facilities that will ensure your cold storage chain is maintained to the highest standards, ensuring that your world class products remain fresh for longer. Whatever your challenge we are the team to provide the best refrigeration solution.

Daniel Green

HOD: Industrial Commercial, WSP in Africa



Can you protect your future?

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I trust my business.

I can make the right choices

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Tried and tested

Focus on DEFOR by Neopak

Neopak leads the way with innovative, cost-effective solutions for market-specific requirements. As an agricultural customer, you will enjoy a close relationship with hands-on consultation, ensuring the most appropriate packaging for your supply chain.

Product research and development is world-class. Well-established, refined processes apply stress testing at every stage, from idea generation and formulation to prototype testing. Solutions cover all local produce markets, as well as citrus, deciduous and subtropical fruit trading. Our punnet trays and cartons are purpose-designed. Open tops offer better product visibility, double-end stacking lugs improve carton stacking and triangular corners bolster stacking strength. The DEFOR system is renowned for rigid stacking strength. Uniquely patented stacking lugs support and protect the export fruit, delivering it in the same condition it was packed.

The design offers a lighter board than conventional open top style boxes. Not prone to base sag, DEFOR is ideal for place packs or jumble pack fruit. Conveniently, the box performs excellently on automatic place packing lines and is available with the state-of-the-art Neotechnik machine range.

All produce types are treated for their own characteristics and requirements. This includes complete cold chain trials and analyses. Appropriate transport and stacking protocols are shared with you, ensuring you get the very best out of your packaging.

Shipments to major markets are consistently tracked and monitored with a view to improve quality control for future deliveries.

Neopak maintains active associations with the leading representative bodies in agriculture, across all market segments. It is an important value-add, staying relevant to the industry network as a whole.



Pigs will fly

Price of pork jumps 30%

Pig producers realised a more than 30% increase in pork prices in early June when prices went from R19.00 p/kg to more than R25 p/kg on the weekly Trigga Exchange online platform.

The price increase came on the back of an outbreak of African Swine Flu (ASF) – harmless to humans, but fatal to pigs – in China, Mongolia, Vietnam and Cambodia. This resulted in up to a third of the pig population being culled, creating a global shortage of pork and the import parity of pork into South Africa.

Trigga Exchange's Walter Frey says the Trigga Exchange online platform enables South African farmers to immediately respond to the effects of supply and demand with import parity pricing being one of the drivers ensuring that local prices represent international pricing. The platform is the first of its kind, creating a more fluid and democratised market place that connects buyers and sellers of pork seamlessly for a fair exchange.

"While the take-up was initially slow, Trigga Exchange has gained significant momentum as a younger generation of farmers adopt the new technology. We have also continued to listen to industry players and have been open to revise the platform over the past two years," he adds.

From a democratisation of the industry point of view, the model also allows emerging farmers to gain access to the market.

Frey believes in making money with purpose and disrupting industries. "In April alone, we sold 15 379 pigs on Trigga Exchange and currently have 33 active farmers and 36 active buyers on the platform. This online disruption – much like Uber – is dramatically changing the traditional way of marketing pigs," he says.

The latest disruption is the introduction of forward contract selling pigs, providing pig producers with a greater degree of certainty. Effectively pig producers will now be able to forward sell and fix the selling price of pigs as they currently do with maize and soya.

"What we want to do is ensure that the price our platform realises is representative of a willing buyer/willing seller of physical pigs. We want to provide a transparent marketplace where all buyers and all sellers can interact to determine a fair exchange," adds Frey.

Barend Vorster of Molare Piggery is ecstatic about the recent increase in prices. "We decided to start using the platform with a limited amount of pigs. Our idea was to test it over a 12-month cycle. We were impressed with the fair and transparent nature of the platform's pricing mechanism."





It's our business to know yours.

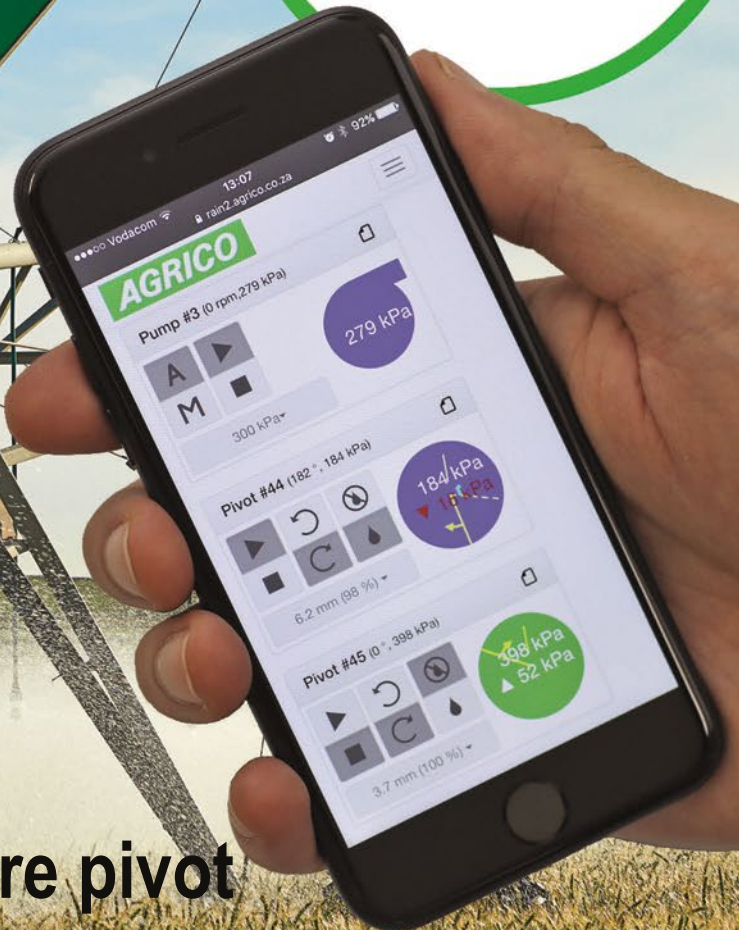
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