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HarvestSA

Securing South Africa's Food Resources

Resisting the drought

ISSN 2305-0551

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EDS NOTE

GREG PENFOLD
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The season of autumn traditionally carries strong cultural connotations of harvest time, but this year, as we move out of summer, there is little of that in the air. Instead, the dominant tone remains one of drought. Never before have the skies been so closely watched, with hopes and prayers directed to the heavens for the sake of rain. Of course, in 2016, sky-watchers can rely on the assistance of state-of-the-art technology for assisting in mapping the world and its climate, which plays such an influential role in their fortunes. This science is known as Earth Observation and is one of the disciplines in which South Africa's internationally acclaimed Agricultural Research Council (ARC) is involved. Find out more in this issue.

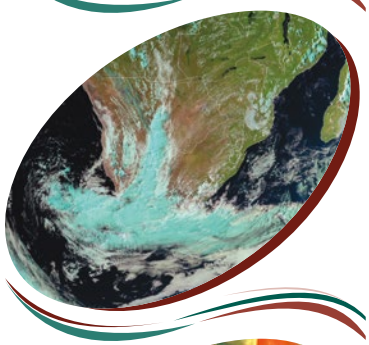
Another area where the ARC does invaluable research is that of cattle breeding, which has unfortunately been hit very hard by the drought. Production is declining and consumers are watching in disbelief as prices go through the roof. There is no good news in this area, but to keep abreast of developments, it is vital that you read the latest findings regarding the impact of drought on cattle in this issue.

Good news is present in other quarters, though, with viticulture receiving a boost from an innovative virus-busting project. Elsewhere, technology has come to the aid of the fisheries, with a promising new approach to small-scale fishing.

At the same time, the Department of Science and Technology has announced that it is scrutinising various pests that have arrived in our country, including varieties of fruit fly, the better to combat this scourge, which can play such havoc with the livelihoods of small farmers.

Add features on water conservation and urban farming, and you have in your hands a very well rounded issue of Harvest SA. Keep up the good work, and enjoy the read.

AGRICULTURAL RESEARCH COUNCIL
Soil, Climate and Water



The Agricultural Research Council (ARC) is a premier science institution that conducts research with partners, develops human capacity and fosters innovation to support and develop the agricultural sector. With its vision of *"Excellence in agricultural research and development"* the ARC focuses on national development priorities by conducting research and driving technology development and dissemination at eleven business units located throughout South Africa.

The ARC-Soil, Climate and Water, based in Pretoria, has a mandate to conduct research and development on the agricultural natural resources – soil, climate and water – and to promote their sustainable use and management. Under its four main focus areas or programmes, *viz.* **Soil Science**, **Water Science**, **Agrometeorology** and **Geoinformation Science**, the business unit offers the following research services and information products:

- Soil surveys and mapping
- Land suitability for agricultural production and other uses
- Implementation of Conservation Agriculture technologies
- Water conservation techniques, e.g. rainwater harvesting
- Chemical/physical analyses of soil, water, plant and other biological samples
- Climate monitoring, data provision and analyses
- Monthly Umlindi newsletter, including rainfall and vegetation condition assessment for drought early warning
- Assessment of the impact of Climate Change and variability on agriculture
- Geographical Information System and Remote Sensing (satellite and airborne) applications, e.g. land degradation and alien invasive plant monitoring
- Agricultural Decision Support Systems, e.g. crop estimation

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The best anti-virus

Vineyard investment delivers returns

A 30 to 40-year, multi-million rand project which has seen swathes of vineyards uprooted and replanted is beginning to bear fruit for a historic Helderberg wine estate.

Some 17 years ago Vergelegen in Somerset West began a hugely ambitious project to eradicate leaf-roll virus from the estate.

The disease is specific to grape vines and affects most vineyards in the country. While not a serious problem in 80% of white grape varietals, it is much more apparent in red, where it affects the quality and volume of the harvest. Eventually the vines become uneconomical and must be uprooted.

It is why the team at Vergelegen, led by irrepressible wine-maker André van Rensburg, and MD Don Tooth, took the seemingly radical decision in 1999 to begin replanting vineyards with virus-free vines.

They have worked closely with Professor Gerhard Pietersen of the Agricultural Research Council - Plant Protection Research Institute at the University of Pretoria.

"It was not a decision we took lightly," says Tooth. "But we have set our sights on

THE MAGNIFICENT VIRUS-FREE VINEYARDS

being recognised as one of the best wine producers in the world, so considered it an investment in the future quality of our wine."

Besides the replanting costs, the estate also had to buy in grapes to make up the shortfall after the vineyards had been uprooted.

Typically, Van Rensburg is unequivocal that the short-term pain will be more than offset by the long-term benefits.

"Quality wines are made in the vineyards, not the cellar, and wine produced from virus-free vines will continue to improve year after year. It is the only way to positively change South Africa's wine image internationally. For too long we've been regarded as cheap and cheerful when in fact top South African wine can hold its own with some of the best in the world."

The approach seems to be working in more ways than one. Today the virus is found on only a fraction of the new vineyards – 0.0000007%. When a vine is found to be infected, it is uprooted and those around it are treated.

Although it is still very early to begin assessing the results in terms of wine quality, there are some encouraging signs, with Vergelegen wines continuing to win

Vergelegen MD Don Tooth.

Bringing in the harvest at Vergelegen.

Vergelegen winemaker Andre van Rensburg.

champion trophies. Seven international gold medals were won last year alone, from the AWC Vienna (the world's biggest wine competition), the San Francisco International Wine Show, the International Wine Challenge and the Lyon International Competition in France.

In the meantime the work continues, continuously testing the vineyards and waging war on the mealybugs which spread the virus. Initially this meant using insecticide to get rapid results, but increasingly Vergelegen's alien-clearing programme is providing natural solutions.

The programme, believed to be the largest private conservation undertaking in South Africa, will see 2200 hectares of land cleared of invasive vegetation. Some 2000 hectares has already been cleared, and as the indigenous fynbos returns, it attracts increasing numbers of birds and insects.

Amongst them are an abundance of ladybirds, one of the most effective predators of mealybugs. Birds and other predatory insects also eat other pests that prey on the vines. In attracting these predators, the fynbos and buchu growing near the vineyards act as a kind of natural pesticide, limiting the need to use chemical applications for mealybug control.

Van Rensburg recognises that it will be probably be his successors who will really benefit from his foresight.

"There aren't enough old vineyards in the country, which is a problem because the quality of the fruit gets better over time. My successors should be able to make wine from vineyards that are 40-60 years old, ensuring that Vergelegen will still be producing quality wines well into the future."

See www.vergelegen.co.za

Judy Bryant

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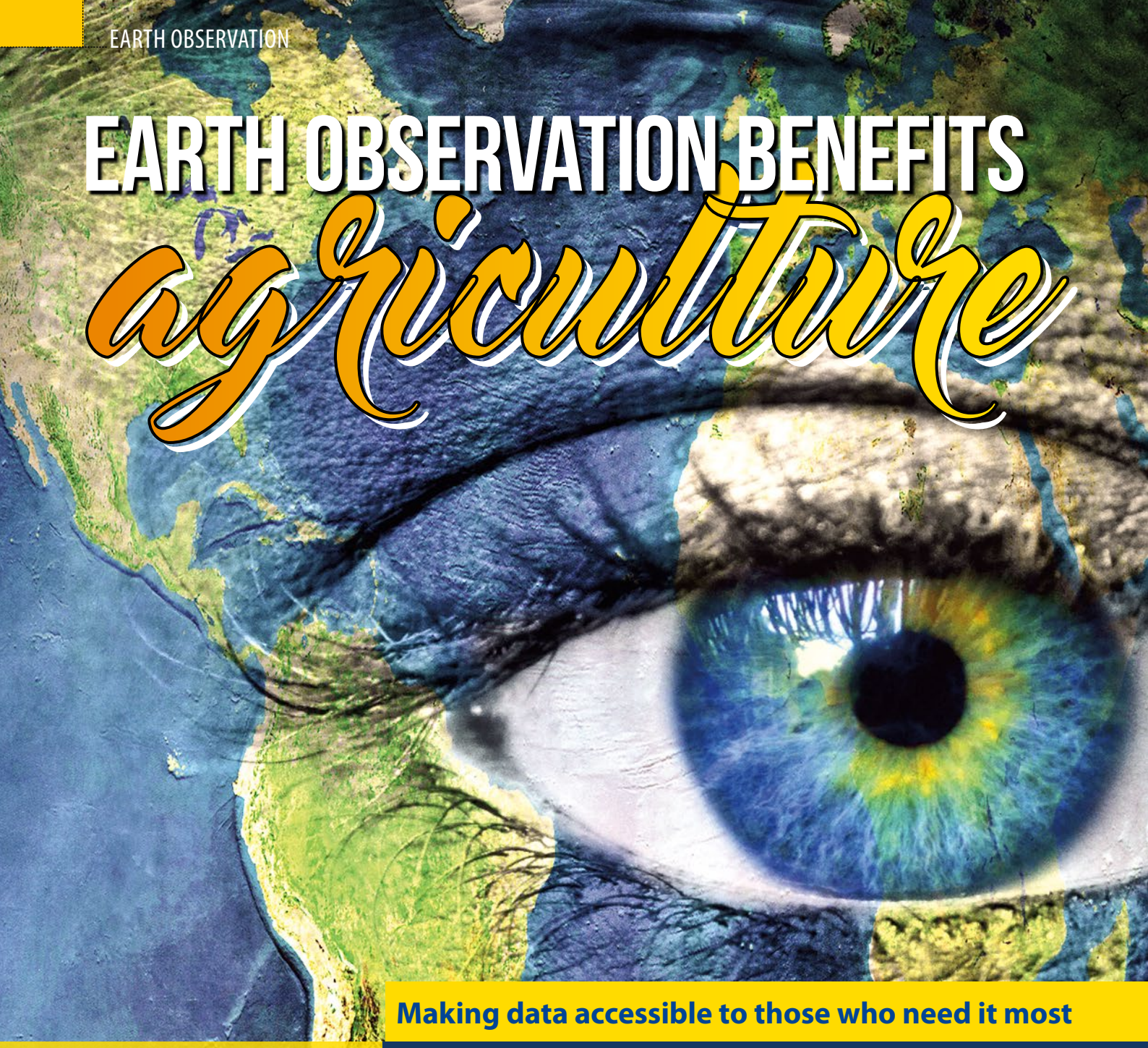


Making data accessible to those who need it most

Sustainable food production, the foundation of quality life and the output of agriculture, benefits in many ways from Earth Observation (EO) data and information. These benefits accrue through the value adding of information derived from the data collected by EO technologies both in situ and through remote sensing.

The challenge to EO scientists and engineers is not so much the development of instruments for data collection but rather the development and operationalization of applications of EO data to improve the productive capacity of agriculture and for the sustainable use of the natural resources, the corner stone of a sustainable agricultural future.

The current volumes of EO data collected by satellites, airborne digital multispectral camera systems, DRONES, weather stations and other observation systems need to be timeously, efficiently and effectively converted to useful decision support information and made accessible to

agricultural decision makers at all levels, from policy makers to subsistence farmers.

Potential applications need to be released from the current extensive sources of EO data that is increasingly becoming accessible and freely available.

The arc-iscw coarse resolution imagery database

ARC-ISCW houses a variety of coarse resolution imagery datasets in its Coarse Resolution Imagery Database (CRID). Living with climate variability in SA is a normal phenomenon. Drought in SA is driven by natural climate variability resulting in water-deficit pressures on agricultural production in various parts of the country annually. Grazing capacity and crop production vary significantly from year to year due to inter-seasonal climate variability. Agriculturalists produce in a continuous state of variability and risk exacerbated by the fluctuations of SA's climate. Successful farmers are those that implement risk management, response farming technologies and water conservation practices. Climate change is seen as an increasing threat, thus effective prediction and monitoring of climate is crucial.

Information derived from the CRID data is disseminated through the Umlindi Newsletter to decision-makers in government and the private sector as well as to the public.

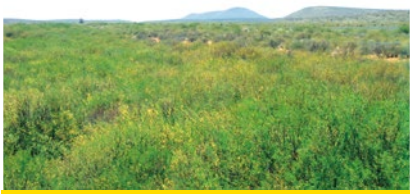
This coarse resolution data as well as other sources of EO data are used by ARC to develop various operational monitoring and assessment systems for natural resources and agricultural production.

Detecting, quantification and monitoring of prosopis in the northern cape province

Prosopis species and their hybrids have become invasive in the arid northern parts of SA because of their adaptability, vigorous growth, seed production and seed banks, absence of specific natural seed-feeding insects and an efficient seed dispersal mechanism.

Prosopis has spread at an alarming rate in SA over the past decades but the rate and spatial extent has only now been quantified through a study done by the

ARC's very light aircraft imaging system - ARCEagle



Dense stand of Prosopis on river bank.

Floodplain with dense stand of Prosopis.

A High resolution colour infrared aerial image of diverse irrigated agriculture, including grain and horticulture in the Hartswater area.

ARC. Serious consequences of the spread of Prosopis in the Northern Cape Province include the loss of agricultural land, mono stands of Prosopis having a negative impact on the already over-utilized drainage lines where it competes with other species reduces livestock carrying capacity and has a negative impact on the scarce water resource of the area. It is usually found in areas with higher groundwater reserves.

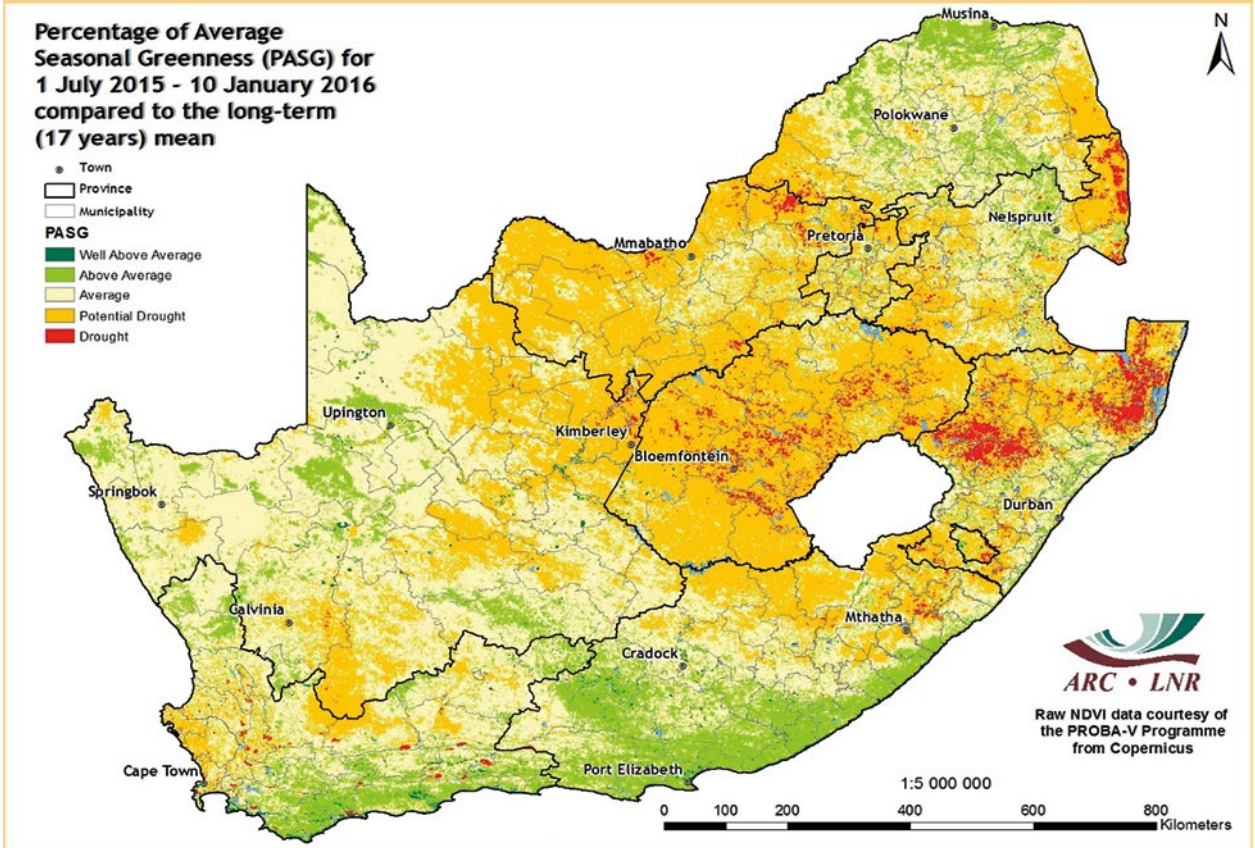
The study by ARC identified Prosopis and quantified its spatial extent and temporal rate of spread through the use of historical satellite data at provincial level. This was based on the phenological growth patterns of Prosopis which are measured by means of Vegetation Index (VI) values obtained from satellite imagery. Maps were derived of the occurrence and densities of Prosopis for 5 assessment years for the period 1974 to 2007. A map was also derived indicating areas of the likely occurrence of Prosopis using Modis multi-temporal data thereby creating an invasion risk index which assists with management interventions and to establish an effective monitoring programme for Prosopis by stratifying a large area into more meaningful intervention units.

National "invasive alien plant" (iaps) monitoring

The objective of the National Invasive Plant Survey was to develop a cost effective, objective, statically sound and therefore repeatable monitoring system for woody IAPS at quaternary catchment level. A map was produced and the project aims to continuously update the national distribution map of woody IAPS.

A rapid aerial based observation data collection system was proposed and developed. EO data in conjunction with other geographical data (e.g. topography) is used to model potential invaded areas which then forms the sample frame for a set of random sample sites for aerial observation. Observations are made by a team of observers based in light aircraft or helicopters. The observed data makes it possible to generate probability based distribution maps and forms the basis of the monitoring system.

The system is under continual improvement as higher resolution imagery from satellite, aircraft and DRONES becomes available. The success of the system is dependent on the ability and facilities to process "big" datasets rapidly. The development of specialized remote sensing equipment, comprising aerial data capturing systems and powerful computing systems to handle and process the data allows the ARC-ISCW to stay abreast of new developments in this research arena, so satisfying client requirements. When fully operational, the system should house vast amounts of natural resource monitoring information.



Percentage of Average Seasonal Greenness (PASG) derived from data courtesy of the PROBA-V Programme by the European Space Agency.

An integrated national crop estimation system for sa

Over the past decade the National Crop Statistics Consortium led by the ARC has developed a best practice and arguably a world leading crop estimation and monitoring system based on earth observations. The "Producer Independent Crop Estimation System (PICES) is a uniquely South African development.

As a first step, satellite imagery is routinely used to capture and update cultivated field boundaries. This provides a sample frame for a random geographic systematic selection of sample points across each province. These selected sample points are observed to determine the crop type for each field/point by aerial observation collected by an observer in a Very Light Aircraft (VLA). For the aerial survey trained observer that can identify different crop types, are used to record crop information for the selected points using a unique information technology system incorporating GPS, blue tooth, mobile and communication technologies. Collected observations are automatically relayed to a central server for near real-time processing. This makes it possible to collect crop observations for the whole country within a period of 4-6 weeks.

Data gathered during the aerial survey is firstly used to calculate a statistical area for each observed crop type per province. Secondly it is used as training dataset for satellite image classification procedures to generate a crop type map for selected provinces. The system further facilitates the collection of objective yield data where a subset of sample points is extracted once the crop types of the fields are known. The yield estimation data are collected in- field. With the estimated area based on the aerial observation of crop type and the yield estimation by objective yield measurement, the production per province can be estimated.

Production estimates for summer grain crops are conducted around March each year and for winter grain crops in September each year. Comparison of the results with reconciled final crop delivery figures indicate confidence in the systems accuracy and deviations of less than 2% of delivered figures are often obtained. Through integrating and combining various EO technologies it is possible to statistically estimate crop areas for each province through aerial surveys, while also generating maps showing the spatial distribution of crop types for any polygon boundary of importance (district, municipal area). This provides decision makers with near real-time spatial analysis possibilities not previously available.

The system is potentially adaptable for many types of natural resource surveys.

For more information:
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ARC-ISCW
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Broad spectrum, continuous disease control

Plant Performance with AMISTAR® for Smart Farming

Plant Performance optimises the plant's growth potential. It therefore doesn't just offer a greener, healthier crop, but it also increases profitability through an increased yield and improved quality assurance.

Syngenta has for more than a decade studied the effect of AMISTAR® on various crops. The goal was to find innovative solutions that ensure optimal yield potential for the crop. In-depth research has shown that Syngenta products, such as AMISTAR TOP ®, offer broad spectrum control which, at the same time, influences the plant's physiological characteristics, thereby increasing yield and improving quality. The combination thereof offers producers the advantage which Syngenta calls Plant Performance.

Plant Performance goes beyond the departure point of plant health and gives clear evidence that internal processes in the plant – more commonly known as physiological processes – can be improved to ensure optimal yield.

Nowhere is it truer than in agriculture – prevention is better than cure! Disease infestation isn't always initially visually noticeable, yet at the start of infection it can result in up to 15% harvest loss – and even before the disease is visible to the eye. Preventative control delivers healthier plants which will certainly deliver higher yields.

Retention of the green-leaf area

Ethylene production is an internal process in the plant which causes aging. AMISTAR® inhibits the production of ethylene which therefore counters aging. If a plant is enabled to complete its life cycle without early exposure to abrupt aging – desiccation of the leaves, for example – it will have the opportunity to use the sun's energy for longer periods through photosynthesis. Therefore, longer periods of photosynthesis allows the plant to reserve healthy, greener leaves for longer – because the plant's quality improves and its yield potential increases.

Optimal water retention and use

During the day fog evaporates from various parts of the plant – a process called transpiration. The rate of transpiration is determined by factors such as light intensity, temperature, humidity, wind speed, and, the availability of water in the ground. During high temperatures or drought conditions transpiration increases (just like we humans sweat to cool down). AMISTAR TOP® increases the plant's ability to use water more optimally and effectively. This happens because it lowers the plant's respiration tempo whilst there is a water strike.

Increased Carbon Dioxide Assimilation (CO_2)

Carbon dioxide assimilation is the process of photosynthesis where carbon is converted into carbohydrates. Through advancing this process it enables the plant to better photosynthesise and thereby release more energy. It subsequently offers a stronger switch from sunlight energy, which results in a healthier plant and a higher yield.

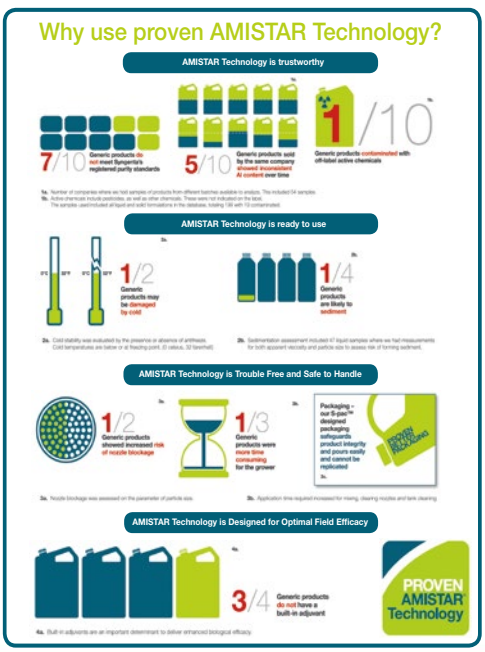
The X-factor

What makes AMISTAR TOP ® different to other insecticides? The mobility of the active ingredient in AMISTAR TOP ® is central because of its ability to protect new growth in the developing crop. This is where the fundamental differences in the strobilurin group come to surface. To protect the developing plant against infection the fungus-killer in the plant needs to move from the point of administration to the point of new-growth – this is the concept of systematical mobility, or Xylem-mobility. Syngenta phrases it the X-factor.

Most strobilurin has translaminer mobility, and moves through the top of the leave to the bottom. Only enstrobilurin allows for movement within the plant, which allows for new growth protection – AMISTAR®.

Optimal Disease Control

Most pathogens, over winter, experience from the previous season that plants produce a terrible amount of fungus which can rapidly expand over any geographical area. All parts of a maize plant become vulnerable for disease – seeds, roots, leaves, tribal heads, etc.. Plants, every season, are vulnerable to many diseases. It's definitely not always visible to the eye. However, the result can be a reduction of as much as 15% in yield. AMISTAR TOP® has the most comprehensive cure currently.



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Pest detectives

ERAfrica and DST lead the way in finding a holistic solution to combat the fruit fly problem

Fruit flies are international quarantine pests that cause significant crop losses in South Africa. If they are not controlled effectively, South Africa and its neighbours will find existing local and African markets threatened, and will not be able to exploit new markets.

The pests cause problems in South Africa for emerging, small-scale fruit farmers trying to enter the export market, and for informal communities for which food security is a major concern. Due to its environmental and human health impacts, pesticide treatment cannot be a long-term solution.

The Department of Science and Technology has partnered with ERAfrica to develop effective and accurate detection methods for fruit fly pests in Africa and the Indian Ocean Region. The ERAfrica fruit fly project brings together a cohort of experts from Citrus Research International (CRI) of South Africa, Ivory Coasts Centre National de Recherche Agronomique, Belgium's Royal Museum for Central Africa, and France's Agricultural Research Centre for International Development (CIRAD) in Réunion to investigate different aspects of fruit fly detection systems. There are already insect trappers on the market, but none of them were developed with a good understanding of behavioural patterns to combat a specific identified pest.

Project leader Dr Aruna Manrakhan, a principal investigator at CRI, cautions against the broad application of insecticides to combat fruit flies because the insecticides contain harmful chemicals that will be ingested by people who eat fumigated fruits and vegetables.

Dr Manrakhan says South Africa's fruit industry is a large role player in the economy and agriculture. The industry generates revenue estimated at about U$1,5 million from exported fruits, and creates half a million jobs. It is therefore important to find better ways to deal with pests. This involves analysing the genetic structure of the insect population to get a better understanding how it moves across South Africa and may invade it from outside.

The studies conducted at CRI aim to determine the efficacy of different trap and attractant combinations for fruit fly monitoring, the sensitivity of key African fruit fly pests to current detection trapping systems, and the dispersal capacity of an invasive fruit fly – Bactrocera dorsalis – recently introduced in South Africa and the genetic structure of the population in the Southern Africa and Indian Ocean.

Bactrocera dorsalis, also known as Oriental fruit flies, have recently invaded South Africa. Their favourite crops are mango, butternuts, watermelons and cucumbers. Other exotic fruit flies, Ceratitis rosa, Ceratitis capitata and Ceratitis cosyra, have also found a home in South Africa. The findings of the study will reveal the behaviour of the pests, including the pattern of flying, which pests specifically damaged which plants, and the type of attractant that can be used for a particular pest. This will ultimately lead to the development of an effective trapping system.

Since its inception in 2014, the project has made great progress. Various trapping and attractant combinations in commercial fruit production areas and natural areas in South Africa and Ivory Coast have been evaluated. Two safe, food-based attractants, Zingerone and EGO Phurolore, have been discovered.

The ERAfrica project will not only provide solutions for the farming industry, but will also make an enormous contribution to human capital development through the training is being provided to postgraduate students.

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REPUBLIC OF SOUTH AFRICA

EASING THE BLOW

Government has allocated R1.1 billion towards drought relief, according to National Treasury

"Over the medium term, R1.1 billion has been reprioritised to interventions such as drilling boreholes, distributing animal feed, moving cattle herds and transporting potable water to hard-hit areas," it said on Wednesday.

This as Finance Minister Pravin Gordhan tabled the 2016 Budget, in Parliament.

According to the Budget Review, resources will be made available to support additional interventions as these are identified. In addition, changes to the provincial and municipal disaster relief grants will also be proposed.

"Over the longer term, South Africans need to consider how the economy and households can adapt to the challenges of a water-stressed country," it noted.

Minister Gordhan in his speech said the Regional Bulk Infrastructure Grant programme has been allocated R15 billion over the medium-term for the construction of bulk water and sanitation infrastructure.

This comes as budget allocations for water infrastructure this year take into account the special needs of drought-affected areas and the need to address water losses in critical supply networks. Already this year, the Department of Water and Sanitation has reprioritised R502 million to deliver water, protect springs and refurbish boreholes in response to drought conditions.

Funds have also been provided for feed and support for livestock farmers and disaster relief measures. Additional drought response allocations will be made, as required, in the Adjustments Appropriation later this year.

The Land Bank has set aside a concessionary loan facility to assist farmers in recovering from the impact of the current drought conditions while over the next three years, R15 billion is allocated for land acquisition, farm improvements and expanding agro-processing opportunities.

According to the 2016 Budget Review, spending on water resources and bulk infrastructure is expected to increase to R36.4 billion over the medium term, at an average annual rate of 16.1%.

The major projects driving this growth include managing acid-mine drainage, raising the Clanwilliam Dam wall and constructing pipelines for the Olifants River water development project.

Water boards will also increase spending in the period ahead by R6 billion, mainly for bulk water infrastructure in the Bushbuckridge area (Rand Water), the Pilanesberg water project (Magalies Water) and the KwaZulu-Natal bulk water-supply masterplan (Umgeni Water).

Agriculture

The budget noted that R2.8 billion has been allocated over the medium term to Fetsa Tlala, a food security initiative.

The Department of Agriculture, Forestry and Fisheries aims to bring 120 000 hectares of land into productive use in the period ahead, benefitting 145 000 subsistence and smallholder producers each year.

Operation Phakisa

In addition, building on the Phakisa oceans economy initiative, a R9 billion investment in rig repair and maintenance facilities at Saldanha Bay, is planned.

According to National Treasury, work has begun on a new gas terminal and oil and ship repair facilities at Durban, KwaZulu-Natal.

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Go ahead for US meat

Game of chicken ends as SA concludes negotiation on AGOA meat issue

Government has concluded negotiations on poultry, beef and pork with the United States, a move that brings to a close months of discussions with the US on the terms required for South Africa to secure its position in the African Growth and Opportunity Act (AGOA).

In a statement on Thursday, the Department of Trade and Industry (dti) said the first shipment of poultry (frozen chicken legs) arrived at the Port of Durban and was cleared by the Port Health Authorities. This will allow the products to be placed on South African retail shelves before the 15 March 2016 deadline.

According to the dti, US Trade Representative Ambassador Michael Froman has communicated his satisfaction to the Minister of Trade and Industry, Rob Davies. Froman said he will recommend that US President Barack Obama lift the threat of suspension of South Africa's agricultural concessions under AGOA.

Minister Davies has thanked all South African stakeholders in the poultry, beef and pork sectors, the AGOA agriculture beneficiaries in the wine, macadamia nuts, citrus sectors and the public at large for their patience and understanding during the very complex negotiation.

South Africa and the United States have already started facilitating access to the import quota on chicken legs to newly emerging business from previously disadvantaged communities. The Minister said the process of discussing market access for SA products to the US is continuing.

"Discussions are under way to facilitate exports of SA products to the US in a number of products, including chicken breast, ostrich meat, avocados and mangos." He said progress has already been made with South African litchis accessing the US market at the beginning of 2016.

The understandings reached will also create new opportunities to deepen the trade and investment relations between the US, South Africa and the African continent as a whole. AGOA is a legislation that provides duty-free market access to the US for qualifying sub-Saharan African countries by extending preferences on more than 4 600 products. AGOA was re-authorised in June 2015 for 10 years until 2025, with South Africa's inclusion.

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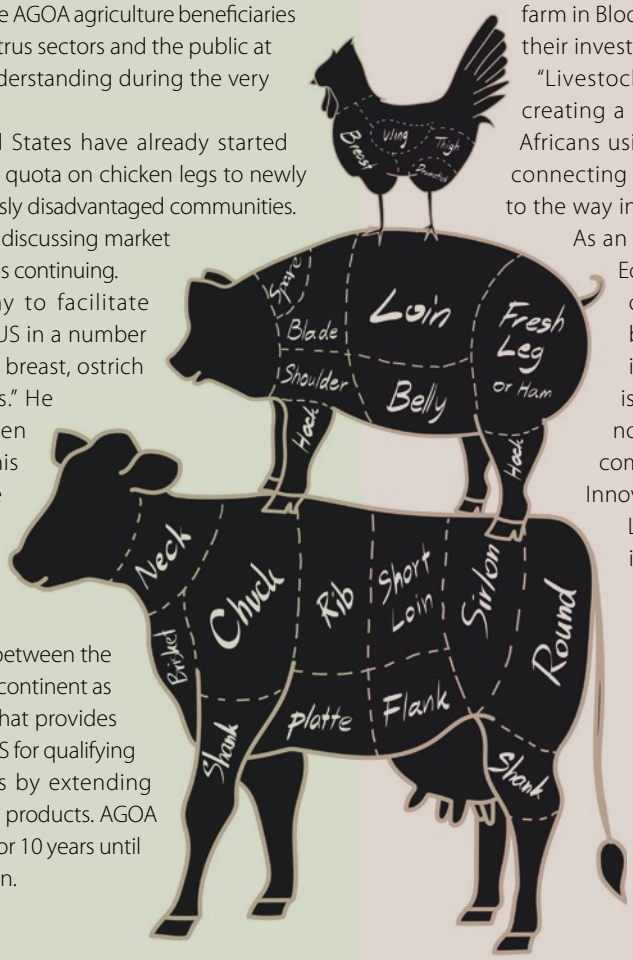

The wealth of the herd

New venture offers the opportunity to own livestock within a professionally managed farming operation

Livestock Wealth, an innovation developed by serial entrepreneur Ntuthuko Shezi, was launched on 13 October 2015 at The Innovation Hub. An easy to understand crowdfarming TM platform, Livestock Wealth offers people with no access to land, time and skills with the opportunity to own livestock within a professionally managed farming operation. Shezi is currently incubated at The Innovation Hub's business incubator – Maxum.

Livestock Wealth is a new, easy method of investing that speaks to the heritage of African people: cattle. It is a new investment opportunity for the South African market – where you invest your money in cows rather than unit trust and shares. Through a web and mobile application, potential investors can buy their cows online and Livestock Wealth will manage the cattle like an investment portfolio. The start-up is currently renting a farm in Blood River, KwaZulu Natal and will manage their investors' livestock portfolio from there.

"Livestock Wealth is an innovative concept of creating a culture of savings, wealth building by Africans using livestock as an asset class, thereby connecting investment as we understand it today to the way investment was done by our forefathers. As an agency of the Gauteng Department of Economic Development, which is focused on the development of high growth businesses, The Innovation Hub and its incubation programme Maxum which is supporting Livestock Wealth, we have no doubt of the potential of this start-up company."– Mr McLean Sibanda, CEO of The Innovation Hub

Livestock Wealth is accessible to potential investors through the interactive website; Google Play mobile application and via text message. Investors can SMS "COW" to 31022 and a portfolio manager will be in contact to guide them through the investment process.

The crowdfarming TM platform was founded after Livestock Wealth founding members discovered that the majority of South Africans need financial products that they identify with.

The Innovation Hub

Feathering THE NEST WITH SOUND BUSINESS BUSINESSES PRACTICES

Emerging entrepreneur secures biggest deal ever

Elliot Nyathi of Elzo Poultry in Casteel Village gave no thought to the scraggly hens roaming loose in the back yard while growing up in Edinburgh Village. "Those chickens never laid eggs, but Mama boiled them for a tasty meal once they were big enough for the pot," he says. This emerging entrepreneur recently received his biggest business deal ever with 5000 chicks on order for Christmas.

Unafraid of hard work, Nyathi was employed at the Bushbuckridge Local Business Service Centre (BLBSC) as an Aftercare Officer. Later he served as a loan officer for Agishana Business Credit, specialising in agricultural projects. He established good relationships with local businessmen, learning about their approach to business.

When the opportunity arose he leased premises to start his own bakery and restaurant, purchasing all the equipment he needed except for an expensive mixer. He secured a loan and paid it off promptly. Nyathi's business grew, but when the landlord terminated the lease he was downhearted, trying to figure another way to keep providing for his family.

His business mentor at BLBSC informed him of a chicken farm for sale. "I knew nothing about poultry, but my mentor said, 'This is gold. You can earn a good living.' I wanted to own my own business and its

premises. He lent me the deposit and I made many sacrifices, selling my vehicles in order to repay the loan."

He recalls his bumpy start, laughing. "It was the end of October. I sat with a batch of day-old chicks. The Christmas market was around the corner but I had no clue what I was doing." Nyathi rectified that promptly, seeking advice and assistance from others in the industry. They advised him to take the chicks from starter to grower to finisher over the next six weeks. He soon started small-scale vegetable farming to supplement his cash flow. Today, the business employs seven people and is growing fast.

Nyathi's entrepreneurial spirit and willingness to learn caught the attention of the SAB Tholoana Enterprise Programme's selection team. He was chosen in July as one of fifteen high-potential applicants who met the criteria. Some 127 applications were received in Mpumalanga alone, with just over 700 received countrywide, making Elliot's selection all the more noteworthy.

Catherine Wijnberg of Fetola, the implementing partners for the SAB Foundation Tholoana programme, explains his selection: "There's a vital need for healthy, environmentally friendly food production in South Africa. Elliot Nyathi's impressive track record of business growth and his personal determination make him an ideal candidate."

Since joining the programme, he has developed a marketing plan that has helped him reconnect with past customers, and explore new markets. He aims to move from supplying informal traders on an ad hoc basis, to supplying local supermarkets weekly. For this to happen, he needs an abattoir in order to slaughter, package and deliver to local shopkeepers. He is making plans to realise this potential.

Nyathi attributes his success to his wife's loving presence. "The company name represents our joint commitment. ELliot plus ZOdwa equals ELZO," he explains with pride. "She's supportive and energetic, helping with everything." He starts describing his favourite chicken dish, but then he remembers that the recipe is secret!

Liesl Jobson

For more information about Elzo and their products, contact Elliot Nyathi on elliotnyathi@gmail.com or 081 380 2157.

The SAB Foundation Tholoana Enterprise Programme offers high-potential small businesses access to business support, training, mentorship and finance. Applications for the next intake will open in early 2016. For more details, visit the SAB Foundation website on www.sabfoundation.co.za.

HERDS UNDER STRESS

The ARC reports on how the 2015 drought has hit beef production

South Africa faced its worst drought in 2015 since 1982 and some reports indicate that it might be the worst drought ever recorded. This severe drought can be ascribed to the combination of events such as regular climate dynamics, the presence of a super El Nino, and global warming. According to the South African Weather Service 2015 was the driest year since recording of rainfall started in 1904. The average national rainfall in 2015 was approximately 400 mm compared to the long term average of just more than 600 mm. From 2012 to 2015 below average rainfall was recorded for every year. It is only the third time since 1904 that below average rainfall was recorded in four or more consecutive years, the other two periods being from 1930 to 1933 and from 1944 to 1949.

The 2015 drought was also accompanied by extreme heat and 2015 was the warmest year ever recorded, also due to the development of a super El Nino event in the Pacific Ocean. The current El Nino event is one of the strongest on record. Projections have also shown that average temperatures will continue to increase by between 3 – 6 °C by the end of the century and that rainfall will be much more variable.

It is clear that South Africa's beef cattle herds were under severe feed and heat stress during the latter part of 2015 and this will affect beef production in the years to come. Most of the beef consumed in the formal market originates from commercial and emerging farmers and the effect of the drought and heat will have a negative effect on the supply in the medium term, which will result in more imports of beef.

The drought, and thus poor condition of the animals as a result of limited grazing, in addition to the extreme heat waves, will probably result in lower conception rates during the 2015/2016 summer breeding season. In addition cattle also died as the result of the drought.

The fertility of the bulls may have been compromised. Heat stress is a common cause of reproductive inefficiency in mammals. Semen quality decreases

when bulls are continually exposed to high ambient temperatures. Furthermore, it decreases sperm concentration, lowers sperm motility and increases percentage of morphologically abnormal sperm in an ejaculate. After a period of heat stress, semen quality does not return to normal for approximately eight weeks because of the length of the spermatic cycle, adding to the carry-over effect of heat stress on reproduction.

If bulls cannot increase the rate of heat loss from the body when they are exposed to elevated ambient temperatures, semen quality and potential fertility is therefore reduced. It is important to note that in the South African beef production programs, eight weeks is crucial for resumption of normal semen production after bulls are exposed to elevated ambient temperatures that cause heat stress, especially where fixed summer mating seasons are practised.

But what are the recommendations for the farmer in view of the anticipated negative effect of high temperatures on bull fertility? One is tempted to suggest that the bulls must be kept cool before the breeding season, but this is not practical. A more practical approach would have been for farmers to re-do fertility testing / semen evaluation since the tests that were done prior to the mating season, may not be applicable at the start of the mating season. This recommendation is probably too late for the 2015/2016 breeding season, but should be kept in mind for the future. Multi-sire breeding can also be recommended for commercial producers. Multi-sire can also be considered by stud breeders but this should be followed by DNA tests to confirm parentage.

However the cow is also affected by heat stress. The maximum ambient temperature the day after mating has a big impact on fertilization. The critical period for survival of the embryo is between four and six days after fertilization. Both the ambient temperature and the nutritional status of the cow can therefore have a significant effect on the survival of the embryo during this period.

The combined effect of what is described above, will be fewer calves born in the calving season of 2016. This will result in a shortage of feedlot animals during the winter and spring of 2017.

Many farmers also reduced their cattle numbers in order to manage the limited availability of grazing and feed. This led to breeding stock also been slaughtered as a result of the drought, and this will result in a shortage of breeding stock in the next two to three years. It may take up to four years to replenish the breeding stock.

The net result of the drought, linked to the heat waves and the reduction in breeding stock, will be a shortage of beef for the next two to four years.

Michiel Scholtz, Matshidiso Matabane and Norman Maiwashe
ARC-Animal Production Institute
Contact details: Prof Michiel Scholtz, ARC-Animal Production Institute, 012 – 6729119, GScholtz@arc.agric.za

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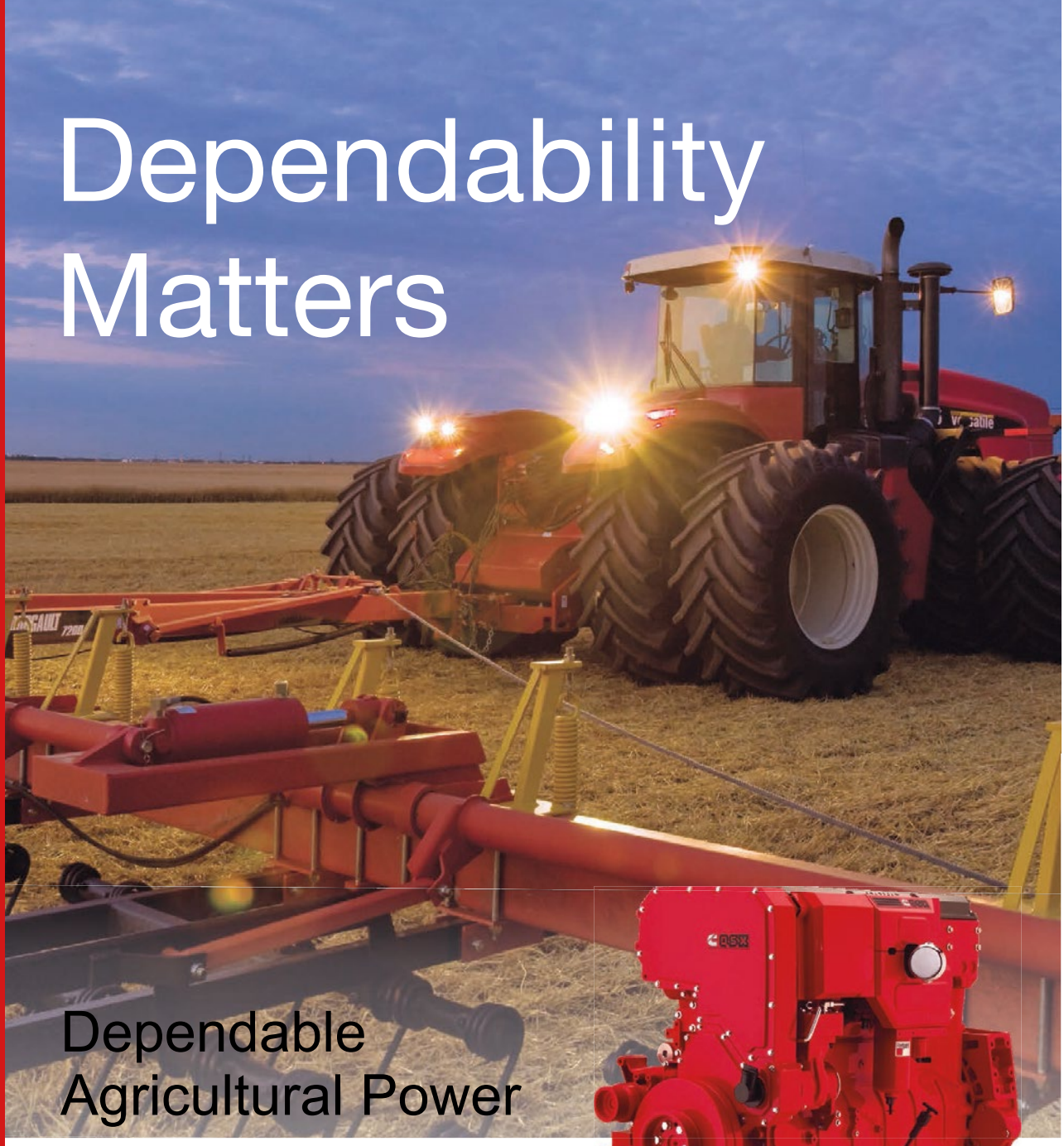

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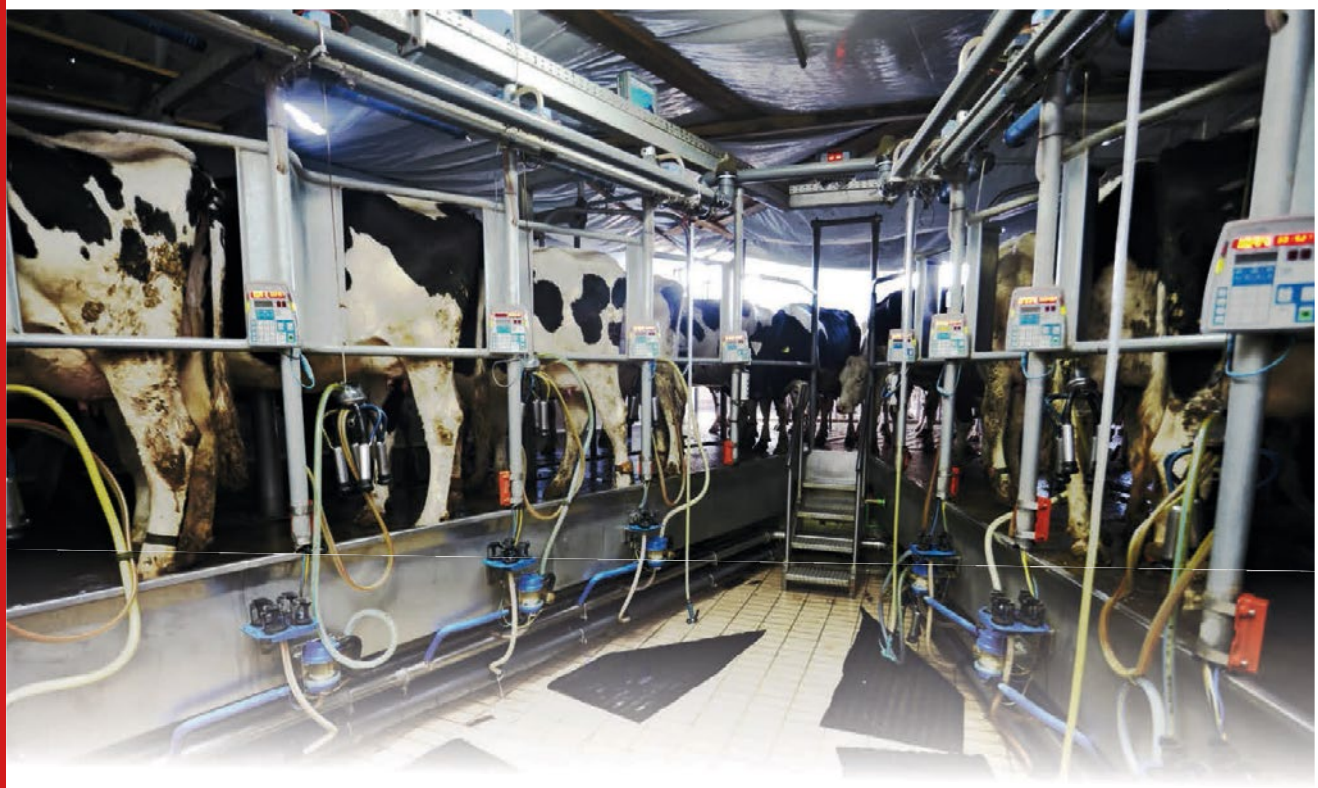

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WHAT'S THE BEEF?

Beef production could face 30-40% drop-off in 2016/17

Soaring maize prices, starvation and severe water shortages brought on by South Africa's deepening drought is strangling the local beef industry, a trend that is likely to continue into 2017. It has also placed the spotlight on the precarious state of South Africa's food security.

There is a dramatic decline in the quality and number of cattle coming into the feedlots. In the continued face of the drought, beef supply could drop by 30%-40% this year alone. When drought relief comes in the form of normal rainfall patterns, it could take another 18-24 months for farmers to recover and replenish their breeding herds, creating a deficit on the supply side. The next two years will be marked by a shortage of beef for local demand and export, the cost of beef will escalate dramatically and the economic viability of many cattle farmers and feedlots remains uncertain.

The lack of quality grazing land means beef producers have to supplement animal diets with expensive feeds, which are already in short supply. In many areas water has to be transported in at huge cost. The price of yellow maize used for animal feed has rocketed by 93% from R1946/ton inJan 2015, to R3 757/ton at the beginning of January 2016. South Africa may have to import an additional 5 million tons of maize due to widespread crop failures. High maize prices are expected to persist until 2017 according to Grain SA. To put a reality check on just how serious the drought conditions are, the highest amount of maize ever imported by SA in a year was only 1,2 million tons in 2007/8.

In the face of soaring costs and a shortage of food and water, farmers are forced to cut back on nucleus herds and breeding cattle to margins as low as 10% in a bid to stay afloat. Typically, farmers will keep 30-40% of their herds for breeding for the next season, but under the current conditions this is simply not possible. Beyond the economics of sustaining these animals, there are also real concerns regarding animal welfare. In the face of starvation and no water, many farmers face the unenviable decision of having to cull.

> In the face of starvation and no water, many farmers face the unenviable decision of having to cull

According to market statistics, South Africa slaughters around 3.5 million cattle each year to meet the local and export demand for beef. However, cattle placements into feedlots have dropped dramatically over the last few months and continue to do so. We'll be lucky if we can produce 2million animals for beef production this year. The knock-on effects of the drought economically and socially are significant for SA.

The drought has been particularly cruel to the beef cattle industry. The Red Meat Producers Organisation (RPO) stated in November 2015 that at the time in KZN, more than 40 000 cattle have died and serious losses of livestock are currently being experienced in the emerging sector country-wide. In the heat conditions, cattle consume between 40 and 50 litres of water per head

daily, rendering the logistics of water supply very difficult. Farmers have scaled down to nucleus herds and high costs are being incurred for feed and water supply. Even with normal rainfall figures, it will take commercial producers between three and four seasons to recover economically. It has a very negative impact on the 1,2 million households that own cattle, sheep and goats and on income and food security, according to the RPO.

High input costs have caused feedlots to lose around 30% revenue per head, and as a result herd reductions will continue until feed and grazing supplies are restored. This also directly impacts the availability of dairy products as farmers are now sending heifers into feedlots as the cost to sustain them is simply too high.

Innovation in food security in the spotlight

An aspect that has been highlighted by the drought has been food security in South Africa. Globally and in South Africa, our population is growing and this means greater demands on food production and our resources. The reality is that there is only so much land available for agriculture and only so much water - our resources are finite and already under pressure.

According to a food security report released by the ENOUGH™ movement spearheaded by Elanco, on the current trajectory, by 2030 we'll require double the planet's resources to meet our food needs. The absolute and undeniable reality is that we have to produce more, and do it with less. This can only be done through innovation in food production.

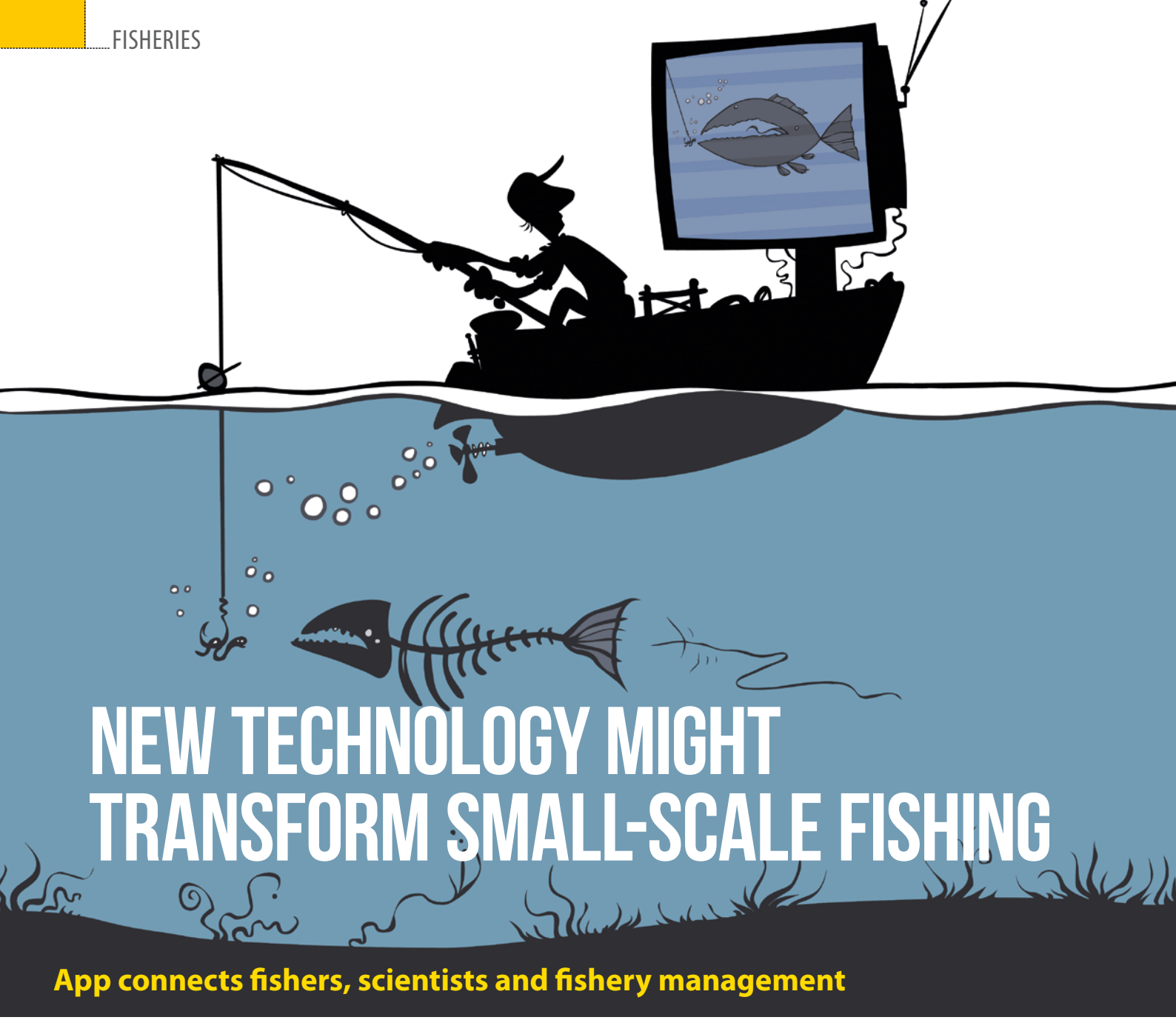
Worldwide there have been improvements in beef feeding practices and animal quality through technology and innovation - all of which have been scientifically proven to be safe for both humans and animals. Efficiencies in production must be improved as simply adding more animals to meet growing demand is not the answer to ensuring food security. South Africa's current drought is obvious proof of the strain on our natural resources.

A simple example of the importance of technology in food production is that of milk supply. The findings of the 2013 Global Food Forward Analysisestimate that based on our current productivity path, we won't even have access to a glass of milk a day on average by 2020. By applying technology available to us to produce just a half glass more milk per cow, dairy producers could annually save 66 million cows, 747 million tons of feed, 1.5 sqkm of farmland roughly the size of Alaska, and almost 2.4 trillion litres of water, the annual domestic use of Germany, France and the UK combined.

We are conflicted as a society in our support of innovation and technology that allows farmers to grow more food using fewer resources. In most instances these conflicts arise from misinformation and sensationalist claims that have absolutely no scientific ground. All consumers have a right to expect safe food produced responsibly and industry has a responsibility when it comes to defining responsible and sustainable production. Right now South Africa is at a cross roads and as consumers, producers and retailers, we have to invest the time, energy and resources to better understand the impact of technology in food security in the context of people, animals and the environment. There may be far too many unintended consequences of rash decisions on a trajectory that is not so much a given, as it is a warning to change and innovate in how we produce and manage our agricultural resources. This drought is our most telling warning that things have to change and we have to become more efficient.

PG Lombard, Sales Manager, ELANCO
For more information about ELANCO, visit www.elanco.co.za
For more information about the ENOUGH movement, visit www.sensibletable.com

PG Lombard, Sales Manager, ELANCO



NEW TECHNOLOGY MIGHT TRANSFORM SMALL-SCALE FISHING

App connects fishers, scientists and fishery management

It has been a long road for small-scale fishers in their pursuit of increased rights and recognition, with bureaucratic processes halting the implementation of the small-scale fisheries policy.

That policy aims to ensure that small-scale fishers have both rights and equal access to marine resources. The policy is set to be implemented soon and a new mobile app, called Abalobi, is using this new policy environment to record fishing activity and connect fishers, scientists and fishery

In 2007 small-scale fishers won a landmark case in the equality court where the State was compelled to finalise a policy for the small-scale fisheries. The Department of Agriculture, Forestry and Fisheries also acknowledged that small-scale fishers had been disadvantaged by previous decisions that had allocated marine resources mainly for commercial and recreational purposes.

In 2012 the policy was finalised but was unable to be implemented as the Marine Living Resources Act Amendment Bill needed to be signed off first. This took another two years. Small-scale fishing regulations then needed to be written up, which have now been approved, paving the way for the amended bill to be finally be promulgated, following which the regulations will be published.

A central tenet of the policy is enabling the co-management of the fisheries sector. The Abalobi team, which is a partnership between the University of Cape Town, The Department of Agriculture Forestry and Fisheries and small scale fishers themselves, believes that one way that this can be done is through fishers collecting data and sharing it will other fishers, scientists and fishery management.

Abalobi's director and UCT project leader Dr Serge Raemaekers says that the app is simply a "conduit" through which "local beliefs, local

knowledge and local images" of small-scale fishers can be included in fishing management decisions.

In the app, fishers can record all the information related to their catch such as the weight of the catch, where it was caught, what species it is, the sea conditions and their income and expenses. Eventually the app will also have a communication and safety at sea component and will also be able to connect fishers to suppliers.

The small fishing village of Struisbaai is one of the five areas where Abalobi is being piloted. Struisbaai is near Cape Agulhas, where the Indian and Atlantic Oceans meet, with the harbour being the pivotal point around which the village operates.

Sea and weather conditions determine whether fishers are able to go out to sea and when GroundUp visited the Struisbaai the conditions were poor, meaning that there were only a few boats out at sea. At midday the boats - many looking in need of repair - began to come into shore and offload their catch: yellowfin tuna, stumpnose and some small sharks were offloaded from the boats.

Niklaas Joorst, the skipper of one of the boats, is one of the five fishers in Struisbaai involved in the pilot of Abalobi. He believes that the app "will help a lot of people" if all fishers in Sruisbaai could use it, with one of the major benefits being able to set prices amongst the fishers so that they have increased bargaining power. In the bigger picture this would also mean that the information that fisheries management is gets is accurate, up-to-date and reflective of all fishers in the sea.

Joorst puts all his data into the app when he comes back from sea, saying that it has helped him a lot as he is able to go back over his data every month – looking at income, expenses and his catch.

The Abalobi system would make the notorious "blue books" obsolete. The "blue books" are where fishers currently record data pertaining to their catch – a process that is time consuming and often does not result in adequate feedback to the fishers themselves.

"The Abalobi is a much better system *[than the blue books]*," says Joorst.

This is something that Josias Marthinus, a catch data monitor in Struisbaai agrees with. Marthinus's job is to record data from each fisher's catch, such as the weight of the catch and the species, which is then given to the department

Currently he has to write everything out by hand and the data is only collected once a month.

"We sit with the data the whole month," he says, "I use many [pieces of] paper per boat." Marthinus has now been equipped with a tablet loaded with the Abalobi app, meaning that with a couple of clicks he is able to fill in the data for each fisher's catch.

Marthinus says that the data captured on the app can help fishers secure bank loans to fix their boats and can also aid in paying taxes as they now have detailed data on their income and expenses.

Josias Marthinus, the catch data monitor.

The data from various fishers using the app can also be combined to create a picture of the Struisbaai fishery, something that Stuart du Plessis, the Struisbaai project manager and implementation leader, says never happened before.

"[Before the app] When fishers sent information [about their catch] away, it was never returned. They will never see *[its effect]*," he says.

Du Plessis says that fishers are given things such as quotas and a total allowable catch but that the fishers do not know where the data for these restrictions came from or how the final allowances were worked out.

"It is of vital importance that these communication groups come together and support and increase the trust amongst them," he said.

Mistrust between small-scale fishers, scientists and fisheries management is a perennial problem say both Raemaekers and du Plessis.

Raemaekers explains that scientists often believe that fishers are going to under- or even over-report, depending on circumstances, because they will benefit more from doing this. "The current setup doesn't work too well. We need to turn it around - looking at ownership, looking at co-producing, looking at partnerships," he said.

The policy provides the framework for this, but the app is a method by which it can actually be facilitated.

Du Plessis believes that the app is "brilliant" and "is definitely going to revolutionise the fishing industry".

While the app is still in its pilot stage, the team is hoping it will soon be available for download so that every small-scale fisher can use it. As for its future, Raemaekers insists that the fishers will be the ones who dictate the direction it takes.

Ashleigh Furlong and Masixole Feni
Courtesy of GroundUp
www.groundup.org.za

INVITATION

The Minister of Science and Technology, Mrs Naledi Pandor, cordially invites you to the launch of two prototypes developed by the Hydrogen South Africa Centre of Competence for Systems Integration and Technology Validation (HySA Systems), established by the Department of Science and Technology through the Cabinet- approved HySA Strategy.

The Department of Science and Technology, and its partners Implats, UWC and HySA will unveil the prototype hydrogen fuel cell forklift and refuelling station.

The prototypes use hydrogen fuel cell technology as its main source of energy. Fuel cells are a family of technologies that use electro-chemical processes rather than combustion to produce power. Southern Africa is home to around 80% of the world's platinum resources so the potential for platinum based fuel cells to drive economic development is enormous. The fuel cell industry has the potential to revolutionise the way power is delivered to all areas of our lives - from cars to mobile phones and computers, as well as to our homes and workplaces.

Date: 31 March 2016
Venue: Impala Platinum Refineries, Springs

RSVP before 28 March 2016 to Mandy.Mtyelwa@dst.gov.za
Impala Platinum Refineries (GPS coordinates)

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SCIENCE, TECHNOLOGY AND INNOVATION SUPPORTS RENEWABLE ENERGY TECHNOLOGY

Minister Pandor launches the Hydrogen Fuel Cell project in Cofimvaba 2015 .The project provides stand-by energy

About Implats

Implats is one of the world's foremost producers of platinum and associated platinum group metals (PGMs). The group produces approximately three quarters of the world's supply of primary platinum. Implats is structured around five main operations including Impala, Zimplats, Marula, Mimosa and Two Rivers, with headquarters in Johannesburg.The Group's operations are also located on the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe, the two most significant PGM bearing ore bodies in the world.

About HySA

The Department of Science and Technology of South Africa developed the National Hydrogen and Fuel Cells Technologies (HFCT) Research, Development and Innovation (RDI) Strategy. The National Strategy was branded Hydrogen South Africa (HySA). The overall goal of HySA is to develop and guide innovation along the value chain of hydrogen and fuel cell technologies in South Africa. The overall vision of the HFCT RDI strategy is to bring about wealth, jobs and IPR creation through the initiation of new high-technology industries based on minerals found on South African soil, especially Platinum Group Metals (PGMs).Allied to this is the goal of the developing cost competitive solution for the generating hydrogen locally focusing on using renewable energy, and the supporting enabling goal of developing a range of high-level skills, generally in accordance with the required human capital development strategy.

HySA has been established consisting of three Centres of Competence – HySA Infrastructure, HySA Catalyst and HySA Systems. The HySA Infrastructure (Hydrogen Production, Storage and Delivery) Centre of Competence, HySA Infrastructure in short, co-hosted by the North-West University (NWU) and Council for Scientific and Industrial Research (CSIR).

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EVERY DROP COUNTS

Saving water through better irrigation technology

Better use of irrigation technology geared towards water use efficiency could save millions of cubic metres of water in the agricultural sector in South Africa and contribute to water security, says the Strategic Water Partners Network South Africa (SWPN-SA).

As the biggest user of fresh water, the agricultural sector accounts for 60% of the total annual water demand in the country. In view of its significant demand, agricultural and supply chain water management has been a key strategic work area of the SWPN-SA, a public-private-civil society sector partnership that aims to improve the future security of South Africa's water since its inception in 2011.

The SWPN has supported projects such as the roll out of the Water Administration System (WAS), a water management tool for irrigation schemes to help manage their water usage, water distribution and water accounts. The initiative aims to minimise

water losses on irrigation schemes that distribute water through canal networks. It has been rolled out in four irrigation schemes including Hartbeestpoort Irrigation Board, Vaalharts, Orange-Riet and Sand-Vet Water User Association. Preliminary results obtained for three of the four schemes supported indicate a combined reduction in water losses of nearly one million cubic metres per week.

Irrigated agriculture plays a major role in food security in South Africa. According to AgriSA, only 12% of South Africa's landmass is considered arable with just 3% being truly fertile. Astonishingly, only 1,5% of the land is under irrigation and this produces 30% of the country's crops. Accordingly, creativity and innovation are essential to improving and sustaining food security without compromising or increasing the water demand emanating from this sector says the SWPN.

During periods of drought, the need for efficient, effective irrigation systems becomes all the more critical. "The R1bn allocation in this year's budget for drought relief is a welcome move," says SWPN spokesperson, Zama Siqalaba. "By developing mechanisms that address aging and inefficient water infrastructure as well as unlocking funding for irrigation scheme upgrades and transformation, solutions to water shortages can be found."

Research conducted by the Water Research Commission (WRC) shows that drip feed irrigation; proper scheduling of irrigation – watering at cooler times of the day for example; and irrigating appropriately for the different growth stages of crops plays an important role in making water usage more efficient. Professor Andries Jordaan, Director: Disaster Management Training and Education Centre for Africa (DiMTEC) at the University of the Free State, estimates that savings of up to 30% could be achieved by using more efficient irrigation systems.

A framework developed by the WRC points out that irrigation systems should apply the desired amount of water, uniformly, at the right rate to the whole field at the correct time. Getting the water to the root zone (where plants can optimise use) can also be achieved through modern drip feed technology.

In the Northern Cape's grape growing region, other mechanisms such as shade nets have also proven to be a successful and effective water saving technique. Many drought resistant varieties of the major crops are already being planted, and 'drought proof' commodities such as wool provide farmers with ways to cope with drought and water shortages. "We've found no correlation between the wool yield and drought, making it an excellent drought-proof product," says Professor Jordaan.

According to Felix Reinders of the Agriculture Research Council's Institute for Agricultural Engineering, rainfall varies greatly across the country, with wide fluctuations over the long-term. Between July 1960 and June 2004 for example, there were eight summer rainfall seasons where rainfall levels were less than 80% of normal ranges. "Advances in meteorological programmes and technology have meant early warning systems which predict extreme weather patterns such as droughts and floods are becoming more and more accurate," says Professor Jordaan.

Given climate change and the increased demand for food and water, implementing smart technologies in the management of water in the agricultural sector should be prioritised. By simultaneously implementing proper operations and maintenance measures on irrigation schemes, increased water availability for poor and disadvantaged farming communities could also be ensured. For this possibility to be realised, collaboration between government, agricultural organisations, research institutions, farmers and business - the very tenet upon which the SWPN-SA was established - is essential for future water security in South Africa.

Solving poverty means solving water

Xylem Water Solutions' Saajhi Treadle Pump used to assist farmers in Malawi

Agricultural production in Sub-Saharan Africa is adversely affected by erratic rainfall events within and between years. Farmers in this region have been using the traditional system of ropes and buckets to lift and distribute water from shallow open wells or watering canes to lift water from streams to irrigate their crops. Xylem Water Solutions launched a viable solution in Malawi through its Saajhi Treadle Pump to assist farmers facing these challenges.

Traditionally, Malawian farmers grow maize and other crops using rainwater. But as climate change intensifies, rains in Malawi are becoming erratic and less predictable. The Mangochi-district; a township in the Southern part of Malawi is a prime example of an area that faces these challenges.

In order to address problems of drought and resulting food insecurity and poverty faced by smallholder farmers a small but significant revolution has been taking place in the establishment of small scale irrigation schemes with the use of treadle pumps.

The Malawian government has also intensified the use of treadle pump irrigation technology to individual and small scaled irrigation schemes in an attempt to increase agricultural production and also to enrich the livelihoods of resource-poor farmers.

The team at Xylem Inc. was tasked with providing a feasible solution to drought alleviation and food shortage challenges within the region. With the Malawi Government's intensification of treadle pump irrigation; Xylem introduced the Saajhi treadle pump to help address the challenges posed to farmers within the catchment area of the Malawi Children's Village (MCV) through the Katumbiri and Kamwana irrigation- schemes. This project was channelled through Xylem's Essence of Life initiative.

The Saajhi treadle pump was launched by Xylem Inc.in 2013, through its Essence of Life initiative. The team at Xylem realised that poverty alleviation is impossible without food security and food security is impossible without agriculture. Xylem; through Rotary Club and other stakeholders, introduced Saajhi treadle pumps to improve the efficiency and of irrigation which uses utilises treadle pumps.

The Saajhi treadle pump is the product of extensive field research across India, Africa, Latin America, and Asia that included personal interviews and field tests with smallholder farmers intervened in the sector of agriculture. One of the unique features of the Saajhi treadle pump is the ability of self-priming, via the use of rubber diaphragms. The benefit of the latter is that it limits the number of working parts in the design.

The pump is designed for extracting water from boreholes, wells, ponds, streams and canals, then moving it to elevated storage or the point of use. The pump can also be connected directly to sprayers, micro-sprinklers and drip kits to effectively disseminate the water pumped, bridging the gap between purely manual solutions and motorised solutions (i.e., diesel or kerosene).

With the introduction of Saajhi pumps in 2014/15 irrigation season, it has shown tremendous changes in crops harvested by farmers. Saajhi treadle pumps have shown significant impact over two growing seasons to the farmers within the catchment area of Malawi Children's Village (MCV) in Mangochi district. An evaluation of piloted schemes indicated that farmers have had great success over two irrigation seasons since they have been using Saajhi treadle pumps. Due to the efficiency of the pumps, farmers are cultivating larger plots of land with less labour; thereby harvesting greater yields.

Within a short time-frame (two years); since the farmers of the Katumbiri and Kamwana irrigation schemes in Mangochi have been using the Saajhi treadle pumps, there has been marked social and economic benefits to both the farmers and their families. An increase in food security and diversity of crops is evident; due to the flexibility and ease of the Saajhi treadle pumps employed by farmers in the area.

Xylem Water Solutions South Africa continues to find innovative and cost-effective ways to assist clients both in South Africa and Sub-Saharan Africa.

Xylem (XYL) is a leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings.

For more information, please visit us at www.xylem.com.

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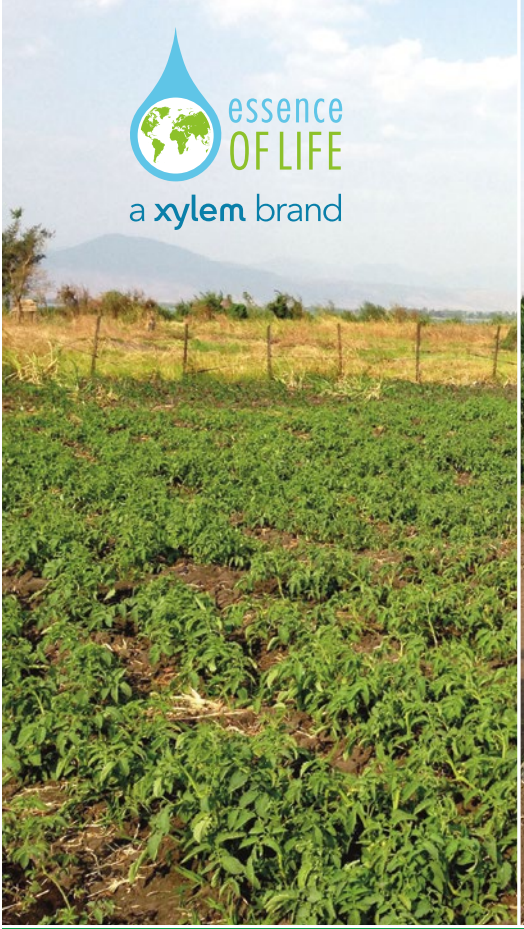

Xylem's Saajhi Treadle Pump

STEPPING TO PROSPERITY

This little pump is perfect to efficiently irrigate small-scale crops to help improve annual crop yield.

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xylem
Let's Solve Water

Cape Town's bread basket under threat

City says no decision taken yet to develop a third of Philippi farming area

Although right on their doorstep, many Capetonians are quite unaware of the great bounty they enjoy from the vast, flat plains of the Philippi area. A cornucopia of table vegetables are grown here. Winter rains turn part of the area into a wetland, a little known paradise for flamingos and other water-loving birds.

But this farmland in the Philippi Horticulture Area (PHA) is threatened by two proposed property developments. The ongoing saga has left farmers and activists fuming and accusing the City of Cape Town of having a sham public participation process. The City says no decisions have been taken yet on the applications received for development of the area.

Convener of the campaign to preserve the PHA, Nazeer Sonday, who has been actively campaigning against the property development for years, said, "We know that if the City approves these developments, it is going to have a huge impact on the City, not only in terms of food, but also in terms of water. It is going to destroy the aquifer and it will destroy the City's ability to feed its population.

"We are so gatvol of the public participation process, because it seems like it's just a matter of the government saying they will do something and by law they have to ask you for your input. You give the input and they say thank you very much and go ahead and do what they want anyway."

The Philippi Horticulture Area Food and Farming Campaign applauded the Heritage

Western Cape committee decision taken on Tuesday (in a seven to three vote) not to approve the rezone application for the U-Vest development in the south of the PHA.

In 2014, Anton Bredell, Minister of Local Government, Environmental Affairs and Development Planning, also turned down the proposed U-Vest development, formerly known as MSP development (Multi Spectrum Property Developments).

However, spokesperson for Bredell, James-Brent Styan, said the City was a separate sphere of government that exercised control over all municipal planning matters in terms of the constitution and was still free to approve the rezoning.

"The City could approve this rezoning application by MSP even after the minister had previously refused the land use application," said Styan.

The decision by Western Cape Heritage is also not binding on the City.

Councillor Johan van der Merwe, the City's Mayoral Committee Member for Energy, Environmental and Spatial Planning, said the City did take into account public input and did consider comments made. Currently, two applications for development had been received, but no decision taken. He said the impact on the aquifer and food security were issues "typically considered as part of an Environment Impact Assessment (EIA)".

According to Sonday, there are two developments planned on the PHA: Oakland City and U-Vest.

"Oakland City ... will take 472 hectares and they are planning on building housing and a private prison, while MSP or U-Vest as it is now known, is 280 hectares which will also have housing and a private school.

"Developers are proposing 20,000 houses, creating about 2,000 jobs. And those jobs will last for about five years. What must happen after?"

Van der Merwe said that last year the City had "received a development application for rezoning of a portion of this land, about roughly a third [of the PHA], for residential purposes. This application is yet to be decided."

He said, the "City is not working with a developer, but rather at this stage fulfilling its constitutional mandate as an impartial development regulator".

Sonday said, "We have seen academics, we have spoken to local farmers, we have our own opinion because we live in the area, and we have spoken to food security experts and we put out 42 pages of comment, 17 appendices to support our argument. We are asking the City why they want to rezone the area for housing. And they tell us that it is for the people living in shacks in Philippi who need housing, but actually it's not for them, it's middle class housing which you have to get a bond on.

"So they fool people and paint the picture that housing is needed. So we are saying that they don't have to rezone the area to apply housing. We can develop our own housing model here without rezoning the area. One of those models is an agri village, which is a national government policy. We're trying to explore that but we are not making any headway, because the City wants to develop this area. So all our suggestions, they don't even listen."

The PHA, known as Cape Town's bread basket, borders Mitchell's Plein and Grassy Park. It provides employment for 4,000 workers, says Sonday.

Cabbages, carrots, spinach, cauliflower and coriander are some of the produce supplied to the big supermarkets by the PHA. According to the farmers, PHA supplies 150 000 tonnes of the vegetables consumed in Cape Town. The PHA farmlands and seasonal wetlands are a valuable resource and are crucial for recharging the Cape Flats Aquifer. Sonday said building over the aquifer would ultimately dry it up.

Mary-Anne Gontsana, Courtesy of GroundUp
www.groundup.co.za

FACTS ABOUT THE PHILIPPI HORTICULTURE AREA

- **Produces over 150,000 tonnes of vegetables and flowers per year**
- **Closely located to consumers, which keeps transport costs down**
- **Vital role in Cape wetlands environment**
- **Employs 4,000 people**
- **Information supplied by PHA Food and Farming Campaign**

EARN AS YOU LEARN

A farming education initiative in KZN is providing a unique work-integrated learning programme for young farmers of the future with the backing of Kwanalu.

Future Farmers is a social program which aims to cultivate skills and ignite passion in young aspiring farmers between the ages of 18 and 26 years old, by providing them with real job experiences in a field of agriculture of their choice. The programme is designed to give young people the opportunity to "learn as they earn" by finding apprentice positions on local and then later, international farms.

The brainchild of Howick dairy farmer Judy Stuart, Future Farmers was founded in 2005 after she identified a two-fold void in the agricultural sector. One being that of training and experience for potential young farmers and secondly, thanks to her international travels, the demand for hard-working and passionate youngsters on international farms.

Now 10 years later, with many successful placements of eager young South African farmers on farms in New Zealand, Australia, America and Denmark, Future Farmers has become a recognized role-player in the future of KZN farming. To this end Kwanalu have secured a funding for investment in Future Farmers programme to bring to fruition a joint vision of a skilled, motivated and dedicated "agricultural generation" to life.

The programme relies on local farmers to employ these young people at apprenticeship level to teach them the skills, knowledge and experience needed in farming. They are required to work for an agreed period of time on this farm before qualifying for a second apprenticeship abroad. Stuart explains why, irrespective of education or experience, each candidate must start at ground level.

Gaining international skills

The second part of the programme places young farmers with the necessary criteria, on international farms where they work for a period of one year, gaining further invaluable experience before returning to SA to secure employment in the agricultural sector of their choice.

"Our young men and women are encouraged to bring back to South Africa all that they have learnt and to invest their time into the future of others. They are able to set an example by showing their communities what can be achieved with passion and a good work ethic," said Judy.

Future Farmers receives hundreds of applicants monthly from all over the province and further afield who undergo a rigorous selection process that ensures that only the most passionate, hardworking candidates with a real heart and enthusiasm for farming are selected.

Funding future farming

Kwanalu has secured funding and identified the Future Farmers programme as a key partner in implementing in order to initiate, drive and support job creation and youth development in the province.

"This funding will expand Future Farmers' capacity to employ mentors and allow more young people into the programme. We are delighted to have found a way to help nurture and shape the future of agriculture in such a positive way" said Kwanalu's CEO, Sandy La Marque.

Sandy stressed that what Future Farmers and the future of farming really needs are open-minded, local farmers to come forward and participate in the program, either as mentors or as employers.

Any farmer wishing to participate in this program should please contact Future Farmers, Judy Stuart on 033 342 9043

The bucket overflows

Two sets of holstein twins produced 462 692 litres of milk

Two sets of Holstein twins from Wait and See Holsteins, Mortimer, Eastern Cape, produced over 100 000 litres of milk each over 31 lactations. As far as can be established, this is a world record. Holstein South Africa and Holstein International have confirmed that they do not have any similar data on record.

The first pair to achieve this feat were Wait and See Precious 123 (110 846 litres) over seven lactations and Wait and See Precious124 (143 268 litres) over nine lactations. Precious 124 is pregnant to the high type Taurus bull, Vitality – bred at Wait and See – and due to calve in March 2016 for the tenth time. These twins were sired by the American bull, Forbidden. Their grand dam produced 114 114 litres in nine lactations. She was sired by the famous Canadian bull, Rudolph.

The second pair were Wait and See Anna 204 (106 455 litres) in nine lactations and Wait and See Anna 205 (102 123 litres) in six lactations. They were sired by the Italian bull, Mtoto. Amazingly, their dam Wait and See Anna 53 produced 117 208 litres over nine lactations. She was sired by the Canadian bull, Aerostar.

Breeder John Sieberhagen says: "Obviously these cows are well cared for. The Anna twins are nine generations "very good" or better. Precious 123 is a fourth generation excellent. She is backed by seven generations 'very good' or better, of which six are excellent. However, combining the right genetic lines with particular emphasis on good udders, legs, feet and strength is a major contribution. Good conformation certainly played an important part in the performance of these cows."

Some 48 Wait and See cows have produced more that 100 000 litres of milk to date. Cows are run on partial mixed ration. They graze during the day and are fed at night. They are milked three times a day.

Hans Lombard
For more information contact John Sieberhagen 083 280 8369.