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Harvest

Securing South Africa's Food Resources

FULLY ENDORSED BY



Future-proof farming

Getting to grips with climate change



An innovative machine to make life easier for fruit pickers and farmers



As a young boy, Themba Dlamini witnessed his aunt returning home during fruit picking season with bruised hands and scratches from thorns that pricked her while picking fruit.

She would explain that the workers had to work quickly because it was seasonal work and they were paid per bag, so they paid little attention to the bruises they picked up during the day; the pain of the day's toil would only be felt in the evening. This would be exacerbated by sore muscles, because they had to carry ladders that were needed to pick fruit high in the trees.

This was a common difficulty faced by his aunt and many other women in the area during the citrus season.

Owing to South Africa's wealth of fruit varieties in different parts of the country, it makes sense for farmers to invest in agricultural equipment that is practical and has low maintenance costs.

According to Brand South Africa, the fruit export industry represents about 12% of the country's total earnings from agricultural exports. South African grown citrus, pears and other fruits are exported to other countries by over 360 fruit-exporter companies locally. After Spain and Turkey, South Africa is the third largest citrus exporter to world markets.

Mr Dlamini's experience as a child, watching his aunt and her colleagues struggle during the citrus fruit picking season, as well as an interest in drawing, inspired him to pursue a career in product design.



The result was the design and production of the Omniharvester, a lightweight, durable and user-friendly fruit harvester. It eliminates all the challenges that Mr Dlamini's aunt and other fruit pickers had to face.

"We took into consideration that pickers are pressed for time and they sometimes drop, step on or drive over their tools. There is no time to be observant. The Omniharvester has a hook, with the cutting blades concealed inside. The hook is made from durable plastic. Farmers want to invest in equipment that is practical and durable, and the Omniharvester is just that. It is designed in such a way that it can easily be replaced if it breaks," said Mr Dlamini.

Mr Dlamini was able to pursue his dream in product design with the help of the Technology Innovation Agency (TIA) of the Department of Science and Technology. TIA provided design training through the SABS, and he also received assistance in SMME development.

Through TIA's SMME programme, entrepreneurs also receive financial assistance to help them develop prototypes, which is exactly what Mr Dlamini did. TIA has an initiative called the Youth Technology Innovation Programme (YTIP). YTIP aims to promote and stimulate a culture of technology innovation and entrepreneurship among South African youth by providing access to financial and business support resources. The Acting Head of YTIP, Madimetja Segobola, said they look at novelty and socio-economic impact when assessing projects. Mr Dlamini's project was found to be innovative, had the potential to create jobs and improve quality of life. The process of commercialising the machine is currently underway.

Mr Dlamini said the plan was to distribute the Omniharvester through Agrinet, as they have a wide reach as far as agricultural equipment is concerned.



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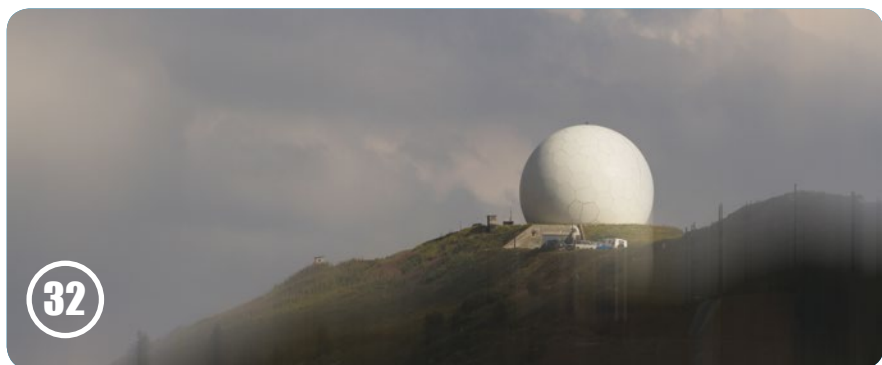
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EDS NOTE



GREG PENFOLD
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A new harvest

Spring is in the air, and with the change of seasons comes a change of direction for Harvest SA. It's time to broaden focus, not entirely away from grain, but to include all aspects of the burgeoning industry that is agriculture. This sea change in turn carries implications for content. It is no longer enough to carry informative, quality articles about the latest developments in the industry. These traditional pieces have to be augmented by scientific insights that make a valuable contribution to the knowledge base of any agriculturalist, from cotton to cattle, from tobacco to tinned tuna.

Fortunately South Africa is well endowed with scientific research institutions. Among the foremost of these establishments is the internationally respected Agricultural Research Council. You will

notice that this issue of Harvest SA is running a number of pieces signed off by ARC researchers.

That is a warranty of the reliability of the information contained therein. Information you can count on to help you make decisions - or at least to begin asking the questions you need to be asking in order to find the right path towards solutions to your particular set of challenges.

Naturally, agriculture is an industry not confined to South Africa. It is our fond hope that Harvest SA readers will include among their number agricultural practitioners in other African countries. Of course, given the high demand for South African expertise, it is quite likely that copies of this magazine will cross borders and find their way to completely unforeseen destinations.

It is in this spirit of cooperation that we offer you this September 2015 issue of *Harvest SA* magazine.



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Future-proof farming

Farmers urged to seek new ways to address changing weather patterns





According to Stats SA figures for the country's second quarter GDP growth, the agricultural sector recorded the largest fall in activity, contracting by 17.4% quarter-on-quarter. The current drought in South Africa – recorded at its worst levels since 1992 – was cited as the main reason for this decline and also for the decrease in the production of field crops, such as maize.

With just months to go until the upcoming maize planting season, droughts together

with climate change remain the biggest challenges facing South Africa's crop farmers, as they look to secure crop financing and insurance cover needed to successfully cultivate crops and mitigate the risk of failure due to climate vagaries.

How climate change is challenging crop farmers

Vast areas of the maize triangle have experienced the worst drought in 23 years and as a result, moisture levels in the soil are already low. Input cost financiers and suppliers of credit into the industry will be reluctant

to allow planters into fields where proof of adequate moisture levels and chemical soil mapping and rectification cannot be provided.

While these are risks that have traditionally been offset by insurance policies in the form of multi-peril or hail insurance cover, this type of cover has become increasingly expensive with many of the traditional crop insurers no longer willing to provide or increase cover in certain areas due to the risks posed by climate change. As a result, it is difficult for farmers to secure financing unless they have other collateral or solutions in place to

mitigate against the risk of drought and the resulting low or no harvests.

These include irrigation systems, as well as making use of precision farming technology to ensure maximum yields in normal rainfall years. Advancements in technology also mean farmers have access to drought

practices, with a few non-negotiable components, need to be implemented.

Against this backdrop, the time has come for every commercial farmer in South Africa to accept the responsibility that they have to fully embrace technology, adopt scientific farming practices and understand optimal

responsibility they have to optimise their financial matters—most significantly the price they can get for their crops. This is best achieved through the ‘third-third-third’ pricing approach, which is essentially a good way of ensuring that, when it comes to price optimisation, that they are right at least two thirds of the time. The approach is essentially this: for a third of a farmer’s crop, they ought to do nothing but expose themselves to the vagaries of the market. For the second third, they should hedge their price on the South African Futures Exchange (SAFEX). And, for the final third, hedge by way of buying put options will give farmers the right but not the obligation to deliver in a bear market; thus limiting their downside with no cap on the upside.

The final component of truly sustainable farming is insurance. While it would be unrealistic to recommend that every farmer should hold expensive multi-peril insurance, using the cost of insurance cover for hail as an excuse for not taking out any insurance is a very dangerous approach, particularly given the unpredictable and fast-changing weather patterns that now exist across the country as a result of climate change.

Given the myriad of challenges that today’s farmers face, arguably the most valuable piece of advice about sustainable farming any farmer can take to heart is not to attempt to be the master of all things. When farmers try to juggle so many balls at once, they are bound to drop at least one of them. Instead, farmers ought to be prepared to outsource some of these functions to the relevant experts so that they can focus on the core objective of their farming operation, which is, when they come right down to it, is to consistently grow the best quality crops with the highest possible yields in the most sustainable manner.

Introducing these mitigating strategies would be beneficial to small-scale farmers as well. However, expansive support is required to encourage them to adopt climate-resilient farming strategies aimed at adapting and mitigating the projected local effects of climate change.

Zhann Meyer, Africa Head - Global Commodity Finance at Nedbank Corporate and Investment Banking



resistant seed strains and quicker growing cultivars, which narrows the window for circumstances to deteriorate. The faster the crops reach maturity, the later in the season farmers can effectively plant, which is a huge advantage should summer rains be delayed.

On the insurance side, innovative brokers and underwriters are exploring index-based weather derivative and credit-based products. This requires a lot of historical data on rainfall, heat units and other weather factors on which to base these indexes, which are reasonably accurate and available in South Africa, but often not in the rest of Africa. Farmers are also taking the initiative in this regard and are putting up weather stations on their farms to gather point specific data.

Implementing sustainable farming practices

Due to unpredictable weather patterns, farmers can no longer afford to invest large sums of capital into planting and simply hope that the ‘weather gods’ would be kind to them. Rather, sustainable farming

price hedging structures and varying opportunities in a dynamic environment.

The adoption of a more scientific approach is especially important for farmers who recognise the imperative to mitigate against the potential for sustained lower rainfall in the future. In this regard, investment into technology that helps analyse soil profiles, check pH levels, map moisture levels and limit wastage as a result of planting in sub-optimal soils is vital.

Linear steering technology – where a tractor effectively steers itself using satellite tracking and soil profiling to minimise tilling and maximise planting efficiencies—is a prime example of such investment for the highest possible long-term yield. Of course, this is expensive technology, but forward-thinking banks are becoming increasingly open to financing it, provided farmers are able to demonstrate the levels of sustainable planning that can maximise its effectiveness and returns over time.

Apart from the physical act of farming, sustainable farmers also understand the

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Adding value

Agriculture and agribusiness can change Africa's story

Plunging cocoa prices in the past few months have been a major worry for more than 700 000 farmers located in the lush green forests of Ghana who depend on this cash crop to feed themselves and provide education and health to their families. But the inadequate capacity of Ghana to add more value to a large quantity of its cocoa is even more a big issue.

Global demand for chocolate is expected to grow 25 percent by 2020, so cocoa prices will eventually recover. But cocoa farms must increase Ghana's share of the final retail price of chocolate, which is only 5% at present.

By increasing the country's processing capacity, farmers in these countries can increase their incomes and create more critical jobs in the process.

Ghana's cocoa example mirrors the overall condition of Africa's export commodities. Africa still exports more raw agricultural produce with little or no value addition.

It has become increasingly obvious that while Africa is growing, it is not transforming. One well-known policy solution that has been offered to create more jobs is to scale up the manufacturing sector. And this includes making agricultural processing active.

To do this, Ghana like any other African nation will need the roads, energy, transport and markets to power the factories that process agricultural produce. With lower labour costs and easy access to raw materials, agro-industries in Africa offer an excellent opportunity for private investors too. It has the right markets for agro-industries to thrive and its regional market remains hugely untapped.

But there are several opportunities. Global food demand, for example, is set to double by 2050. Africa's agriculture and agribusiness markets could reach US\$1 trillion in 2030. For any economic transformation to happen, agriculture and agribusiness must grow and rightly combine to make value addition possible.

Africa loses billions of dollars for due to its inability to produce enough and process its agricultural commodities. The Africa Progress Panel chaired by Kofi Annan, in its 2014 report 'Grain, Fish, Money', estimates that Africa spends US\$35 billion per year in food imports. Indeed, connecting farm production, processing and distribution could create numerous jobs and lift millions of Africans out of poverty.

We must think of linking farmers to the market through mobile technologies and give accurate and timely information to smallholder farmers to enable them reduce the threats weather extremes pose. While we have witnessed mobile technology revolutions across Africa, we need to reinvent our meteorological institutions to enable them predict the weather and disseminate accurate and relevant data to farmers in the village. Here, forging a good partnership with the private sector initiatives like Esoko – an agricultural information service operating in 10 African countries—is key.

Agribusiness must center on smallholder farmers. Agribusiness investments must not, therefore, ignore "land-grabbing". Smallholders need the land and infrastructure to help feed themselves and others. Agriculture and agribusiness pursued in this manner could be the next frontier to change Africa's growth and transformation story.

Steven Yeboah, www.africaprogresspanel.org







Transnet Freight Rails Agriculture & Bulk Liquids Business Unit is focused on transporting Grain, Fast moving Consumer Goods (FMCG), Petroleum products, Chemicals and Fertilizers. The key agricultural commodities transported are maize and wheat amongst others.

This Unit is the most geographically dispersed with depots and yards spread across South African Durban, Pietermaritzburg, Pretoria, Sentrarrand in north and Bethlehem, Kroonstad, Bloemfontein in the Free State as well as East London, Worcester and Bellville in the Western Cape. Trade is also conducted with African countries such as Maputo, Botswana extending up to the Democratic Republic of Congo.

Critical train flows for grain are from Kroonstad to Durban, Kimberly to Cape Town and Klerksdorpo Polokwane.

In 2012, we reopened the Orkney-Vierfontein Branchline. This was to improve accessibility to export maize in Klerksdorp.





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Drop by drop

Rainwater harvesting can address food insecurity and poverty



According to the Agricultural Research Council (ARC), the in-field rainwater harvesting technique is sustainable in terms of increased agronomic productivity, decreased crop production risk, conservation of the natural resources and economic feasibility, and is also socially acceptable. The technique is used by more than 1400 households in 42, 8 and 19 rural communities in the Free State, Eastern Cape and Limpopo provinces, respectively, to produce a variety of cash and vegetable crops, mainly for own consumption as most households live under the bread line, as part of their strategy to fight food insecurity.

ARC researchers based at Glen near Bloemfontein have conducted research over a period of more than 18 years on the development, introduction and application of rainwater harvesting and conservation practices to address food insecurity and poverty in rural communities in semi-arid areas in South Africa. Rainwater harvesting is the process of concentrating rainfall as runoff from a larger area for its productive use in a smaller target area. The collected water can be applied either directly to an agricultural field for crop or rangeland production or be stored in some type of storage facility for domestic use and/or supplementary irrigation. This is combined with conservation tillage which creates a suitable soil environment for growing a crop that conserves soil, water and energy resources mainly through a reduction in the intensity of tillage and retention of plant residues.





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The in-field rainwater harvesting (IRWH) technique is a method whereby runoff water is stored in the soil profile to improve crop production on marginal clay soils. During a rainfall event the runoff water is channelled towards the production area and stored in manually constructed basins.

After the basins have been constructed, no-till is applied on the runoff area and a crust soon develops that promotes runoff. With the IRWH technique ex-field runoff is stopped completely and evaporation losses from the soil surface are minimized by the application of organic or inorganic mulches.

In a few communities in the Free State and Eastern Cape the IRWH technique is combined with roof water harvesting to enable community members to produce crops throughout the year. Water stored in tanks can be used for supplementary irrigation during periods of drought and in the dry winter season.

The ARC researchers developed various training materials and best management practice guidelines and trained both community members and extension officers in all aspects of rainwater harvesting. The technologies were transferred to rural communities at information/farmers' days

by using three-dimensional scale models, videos, posters, pamphlets and training manuals.

On-station field experiments were conducted at Glen Agricultural Institute (Free State) and the University of Fort Hare (Eastern Cape), whilst demonstration plots were laid out in the gardens of individual households, schools and clinics of communities around Thaba Nchu (a rural area east of Bloemfontein in the Free State), near Alice (Eastern Cape) and in Lambani (Limpopo) to promote the use of the IRWH technique.

Adri Laas and Dr Cobus Botha





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FOOD SAFETY FIRST

Protect your brands and reputation from the farm to fork

Food safety and quality are of the greatest importance to those involved in the manufacturing and distribution of food products and services. The cost of a product or process failure is measured in more than just money. It can also do lasting harm to a company's reputation.

There are many different needs and concerns that apply at each stage of the product chain, from the sourcing of raw materials through to the manufacture and distribution of the finished product, and various licensing requirements, regulations and standards that have to be met every step of the way.



Foodborne illness outbreaks remain a challenge for many food production facilities or food service establishments. This has been highlighted by the increasing number of food poisoning cases involving *Campylobacter*, *Salmonella*, *E.coli* and *Listeria* in raw and processed meats, chicken and fish; *Staphylococcus aureus* in pastries and pasta; and various outbreaks of norovirus globally. Some of these incidents have led to prolonged hospital confinements, court cases and even death.

One of the common solutions adopted by industry is the implementation

of a comprehensive food safety management programme that undertakes regular sampling and testing of critical food items including water and ice; and kitchen sanitation audits which include assessing the hygiene practices of food handlers and swab-testing food contact surfaces. In addition to tests and audits, delivery inspection and supplier product evaluations are also carried out.

Facilities ideally need to implement a comprehensive Food Safety Management System (FSMS) in accordance with certifiable international standards, such as ISO 22000, FSSC 22000, BRC and IFS. All of these standards are engaged through an independent body providing food safety services and aim to monitor food quality and safety. This ensures the consumer is always protected.

If we consider FSSC 22000 as an example, we see that it is an independent transparent, holistic GFSI recognised scheme, with broad international acceptance. It is comprehensive and accessible, and offers an added level of assurance and confidence for any business.

No food safety management system can guarantee that food is 100% safe, but can demonstrate due diligence regarding food safety.

Being a comprehensive food safety management system FSSC 22000 affords peace of mind and promotes a sense of pride throughout the company—from staff on the production floor to senior management. The scheme encourages input from everyone at every level and encourages a positive food safety culture, by changing the mindset, attitude and ethic within a business.

The FSSC 22000 audit is not simply a checklist; it is more of a process approach, comparable to a puzzle, with the audits being done in different stages.

The process starts with a stage 1 audit, which will address the short comings of the

food safety management system. The organisation is then given a designated time period to implement corrective action before the next stage can take place. A stage 2 audit will be done only once the organisation has implemented corrective action on all the findings raised during the initial audit.

The auditors will verify effective implementation and clearance of findings raised during first audit, and the organisation may be recommended for certification pending the clearance of any findings raised during the Stage 2 audit. Once the certification committee has independently reviewed the evidence, certification may be granted.

At this point the organisation enters into a three year cycle with annual surveillance audits being conducted during this time. Surveillance audits will ensure the food

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PROBLEM OR SOLUTION?

The role of soil in climate change

Soil science researchers at the Agricultural Research Council (ARC) are of the opinion that agricultural soil is both part of the problem as well as the solution to global warming.

Agriculture has recently become increasingly important in world news. For the past few years global warming has dominated environmental reports, and climate change was recognised to threaten long-term global economic growth and sustainable development. The United Nations considers climate change to be the biggest challenge to humanitarian work, and the impact of climate change on agricultural production, especially in poor communities and developing countries, has been highlighted. Agricultural soil seems to be both part of the problem as well as the



solution. While agriculture provides food and addresses the issue of food security, intensive cultivation often degrades natural resources and reduces the production potential of soil over the long term. Agricultural production is and will continue to be directly affected by climate change, whilst simultaneously agriculture contributes to climate change by emitting greenhouse gases (GHGs). The agricultural sector contributes the three major GHGs: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

What makes agricultural soils such an interesting topic is that soil is seen as a promising opportunity for carbon (C) sequestration. This is the process by which C is removed from the atmosphere and stored in the soil. Soil around the world has a massive potential to store C; soil is in fact the largest terrestrial pool of C, containing more than in the atmosphere and vegetation combined. Good management practices such as conservation agriculture (CA), which includes aspects such as permanent soil cover, multi-cropping (specifically with legumes) and minimum soil disturbance, will help to conserve and build up the levels of soil organic C in cultivated soils. This will in turn improve soil quality, and as a result the soils will become more fertile, more resistant to erosion and have a greater water-holding capacity.

The ARC is currently undertaking research on C sequestration, C cycling and best management practices such as CA. Some of the field studies include direct measurement of GHG emissions from the soil. This is done by placing a closed chamber on the soil surface for a short period and measuring the level of the gases that build up inside the chamber with a probe. One shortcoming of this research is that the focus is very much on CO₂, since instrumentation to measure N₂O and CH₄ is currently not available in South Africa. However, a newly purchased gas chromatograph will enable researchers at the ARC to also focus on these other GHGs. The data will be modelled and used to identify optimal management practices, to compile GHG inventories for the agricultural sector, and to assist government departments with future predictions of GHG emissions from agriculture.

Ms Corrie Swanepoel, ARC-ISCW



Living in Paradise

Project leads to alien clearing, job creation and reforestation

The Working for Ecosystems Programme was started in 2006 as an Extended Public Works Programme co-funded by DEAT and eThekweni Municipality and managed by WESSA, KZN.

WESSA has run Working for Ecosystems for eThekweni Municipality since then, building it into a successful environmental programme that includes a significant focus on sustainable development.

On Saturday 13 June a walk-through and presentation was held at the eThekweni Municipality's Paradise Valley Nature Reserve, which was attended by a number of delegates, including author and plant expert, Else Pooley. The eThekweni Municipality was praised for identifying the need to rehabilitate this reserve as well identifying other

high priority areas within the municipal boundary, while WESSA was acknowledged for managing the Working for Ecosystems invasive alien plant control programme and the Wildlands Conservation Trust was commended for its work on reforestation.

Invasive alien plant control work started in Paradise Valley Nature Reserve in August 2010 prior to the launch of eThekweni's CEBA (Community Ecosystem Based Adaption) initiative. At this stage the invasive alien plant density levels were estimated to be above 90% of the 210 hectare reserve, and this was clearly evident during the initial inspection of the area where a public walk such as the one held in June would not have been possible due to the thick infestation of species such as Chromolaena and Lantana camara. Over the span of eleven follow-up visits to the area the invasive alien plant density levels

have dropped remarkably to approximately 5%, with the species of highest concern now being Litsea. In the period 2010 to 2012 a species list was mapped out indicating the density and spatial coverage of invasive alien plants within the reserve. 46 species were identified and controlled.

Working for Ecosystems has trained and employed approximately 200 staff to work within the Paradise Valley Nature Reserve, which has resulted in four stand-alone companies being established for those employees who displayed interest and motivation. These companies provide a sustainable source of income for their staff, and have promoted a sense of self-worth and pride that carries across into the quality of work being produced.

WESSA

Working on Fire can implement fire management on your land

The National Veld and Forest Fire Act 101 of 1998 (NVFFA) has changed the face and market for fire management in South Africa. The Act requires all land owners to conform to the NVFFA which requires land owners to have trained and equipped personnel to implement fire management practices on their owned or leased properties.

The vast majority of landowners in South Africa have limited capacity and experience in the implementation of firebreaks; fuel load reduction using prescribed fire and the suppression of wildfires.

Failure to comply in the event of fire spreading from their properties and causing damage to a neighboring property would result in the landowner being prosecuted.

Weather is the single biggest risk and therefore accurate weather forecasting is required to enable the prescribed burning operations to be carried out safely. This would require that a suitably qualified person be employed to allow for weather forecasting to be supplied to the various crews engaged in burning.

"Working on Fire (WoF) addresses the prevention and control of veld and forest fires, to enhance the sustainability and protection of life, property and the environment through the implementation of Integrated Fire Management (IFM)," says Llewellyn Pillay, Managing Director of WoF SA.



WoF Commercial Operations and the WoF Academy have developed capacity and products to assist landowners with developing their own potential, as well as the supply of integrated fire management services to rural landowners within South Africa.

They have also developed a pool of qualified and experienced Fire Managers, who are based across all the fire-prone regions of South Africa and are responsible for supervising any prescribed fire and suppression operations performed by the WoF Commercial Operations fire crews.

Risk of Spread of Fire

- WoF- Commercial Operations' burning operations are covered by Risk of Spread Insurance.

- All burning operations are carried out within very specific weather parameters.
- All our project managers and crew leaders are trained to adhere to these requirements.

All project managers and crew leaders are to adhere to the burning Best Operations Procedures.

Health and Safety

In terms of the Occupational Health and Safety Act, both management and employees have clearly outlined duties and as a measure to ensure streamlining of processes and operations it is imperative that WoF Commercial Services has a SHE Policy that will be an internal commitment and guideline.

The Kishugu group has implemented a standard Health and Safety Programme, which is managed by a National Health and Safety Manager. Selected personnel are trained and appointed under the occupational Health and Safety Act.

Dispatch and Coordination:

There is a dedicated network of dispatch centers that manage the day-to-day movement of all company resources. The dispatch Centers are all coordinated by Provincial Coordination Centers, which are overseen by a National Coordinator.



This dispatch and coordination system allows for resources to be effectively deployed for immediate reaction in the case of emergency.

Training

WoF Commercial Operations and the WoF Academy in Nelspruit have developed products to assist landowners in South Africa. All personnel are trained to international standards in: Basic Firefighting, Advanced Firefighting, Annual Safety Representatives Training, Selected First Aider Training, Selected Crew Leader Type 2 and Type 1 Training, Selected Drivers Training, Brushcutter and Chainsaw Training and Selected Teams for Herbicide Applicators Training. Additional specific training courses can be handled as well.



Products and Services:

WoF Commercial Operations has developed a range of unique fire management products and services that include:

- Transmission power line fire fault reduction and servitude management with prescribed burning and invasive vegetation management.
- Fire prevention suppression in commercial forestry, commercial farming and conservation areas – all types of prescribed burns as well as wildfire suppression activities.

Supply a permanent team to the client, with people employed from the immediate area. This team is then totally dedicated to the client and may be used for working as per training on all properties



belonging to the client. The period of contract will be 3 years. Transport and Project Manager is optional.

- Invasive vegetation management in the forms of manual and mechanical bush clearing of invasive vegetation;
- Aquatic weed clearing and management thereof,
- Carrying out veld and bush assessments.
- Supply of permanent teams to client – team dedicated to client only for three years, included vehicles, tools, equipment and management.
- Supply of firefighting tools and equipment.

Working on Fire's Commercial Department manages Integrated Fire Management Services (IFMS) to landowners and government as well as forestry companies.

Our services are spread throughout South Africa and includes more than 200,000 ha of plantation forestry.

Early detection of fires is key and therefore we have state of the art camera detection systems in high risk areas. Research shows the system is currently the most effective in the world and is one of the key building blocks for risk mitigation and prevention of large scale fire damage occurring.

IFMS includes

- Fire Awareness • Fire Prevention
- Fuel load reduction, prescribed burning and alien plant control
- Fire detection • Fire suppression

Contact Ginge: 082 417 5760 • ginge.hudson@wofire.co.za
www.workingonfire.com • www.kishugu.com

Fattening the soil

South Africa has limited arable land, so optimal soil health is essential

Soil is not just “dirt”! It is a living, breathing ecosystem, teeming with living, interacting organisms in various forms. A handful of soil contains millions of micro-organisms and soils also contain a range of larger organisms such as springtails, mites, nematodes, earthworms, ants and burrowing mammals like moles that spend all or part of their life underground. All these organisms, along with plants, form part of the soil ecosystem in which biological, chemical and physical cycles are continuously occurring. This ecosystem

is the environment which provides heat, water and nutrients for seeds and plants to grow.

With more than 95% of our food coming directly or indirectly from soil, it is crucial to keep soils healthy to provide an optimal growth environment for crops. With less than 13% of the South African land area considered arable, we have limited soil available to feed ourselves so it is of even greater importance that soils be managed sustainably.

Soil fertility refers to the ability or the quality of a soil that enables it to provide the necessary nutrients in appropriate quantities

to plants. Apart from carbon, hydrogen and oxygen, plants obtain all other essential macro- and micro-nutrients from the soil, so soil fertility forms the basis of plant production.

A fertile soil is generally characterized by sufficient macro- and micro-nutrients necessary for plant growth; soil organic matter which improves soil structure and soil moisture retention; an optimal pH for the relevant plants; good soil structure to ensure optimal drainage for the selected plants; and a range of micro-organisms to support plant growth. Soil organisms play a central role, not only in making nutrients available to plants, but



also in improving the physical soil environment through aeration and organic matter breakdown.

Maintaining healthy and balanced communities of soil organisms will therefore contribute significantly to maintaining soil fertility over the long term. The various communities of soil organisms are varied, versatile and adaptable to changing conditions and food supplies, and are therefore directly affected by external nutrient application. Plant nutrition, on the other hand, looks at the nutrients necessary for optimal plant growth as well as their external supply and internal metabolism.

During crop production, nutrients are continuously removed from the soil with the

harvesting of plant material. In order to maintain soil fertility, external nutrients need to be applied to replenish the reduced or depleted stocks.

Feeding the plants therefore means feeding the soil with macro- and micro-nutrients, organic matter and water in balanced quantities to keep the soil ecosystem healthy and functioning. A soil rich in organic matter can hold water at various depths where it is available to roots during hotter, drier periods and stable organic matter or humus can provide a larger nutrient reservoir.

In addition, organic matter serves as an energy source for a multitude of soil organisms and serves as a source of essential nutrients for the growth of both organisms

and plants. This, in turn, leads to better yields, more nutritious food and ultimately to enhanced animal and human health.

Soil fertility and plant nutrition can therefore not be separated and an optimal balance of soil biological, chemical and physical (fertile soil) properties is necessary to provide optimal plant nutrition and food production.

The Agricultural Research Council is committed in its role to promote the optimal balance between soil fertility and plant nutrition.

Liesl Wiese, Agricultural Research Council - Institute for Soil, Climate and Water

wiesel@arc.agric.za



WEATHER

Why do we need weather stations?

Without complete datasets obtained from a well maintained, regularly calibrated weather station network, good research is not possible —especially when looking at micro-climate on farm level. This is the opinion of Mr Chris Kaempffer of the Agricultural Research Council.

The Agricultural Research Council (ARC) has more than 500 weather stations distributed over the whole of South Africa, particularly in agriculturally important and rural areas of the country. However, it is not only the ARC that operates weather stations; the South African Weather Service (SAWS), Department of Water and Sanitation (DWS), private companies, etc. all put up weather stations with a specific purpose in mind. As these institutions collect weather data for various reasons, their stations are found in different places. The SAWS stations are mostly found in and around cities and towns as the data collected is mainly used for national and regional weather forecasts. In contrast, the ARC weather stations are mostly installed in agricultural and rural areas as the data they collect is used for agricultural purposes.

In order to explain the purpose and functions of a weather station to the general public, one can start by explaining that weather patterns are very complex as weather conditions change and adapt to

elements like topography, distance from the sea, altitude, etc. For farming, micro- and meso-climate are more important than macro-climate. Farmers are interested in the exact weather conditions on their farm and surrounding area in the first instance as they use the information to take important decisions on the management of farming activities, such as irrigation scheduling, pesticide and herbicide spraying conditions, crop, fruit and vegetable suitability, and animal management. In the second instance seasonal weather conditions in the entire county are more relevant for longer-term farm planning. It is for this reason that every farmer would like to have a weather station on their farm! Climate change is a good example of long-term planning which researchers and policy makers need to address for the future sustainability of food security.

It is also interesting to know which elements are measured at a weather station. The most important elements for agricultural purposes are rainfall, temperature and wind (speed and direction), humidity and radiation. In addition, the ARC has recently started installing soil sensors at selected stations as part of a research project to measure soil water content and temperature.

Sometimes the question is asked: "What happens to the data that is collected at a weather station?" In the case of the ARC's automatic weather stations, the data is collected and stored on an hourly basis at the Institute for Soil, Climate and Water

(ARC-ISCW) in Pretoria. The data is used to produce reports to clients such as plant disease susceptibility warnings. The data is also used by ARC researchers. Some of the datasets are older than 20 years and can be used to calculate trends and other patterns. Climate change is on everyone's mind and no research on this topic would be possible without a well-maintained weather station network and correct data to verify outputs of models.

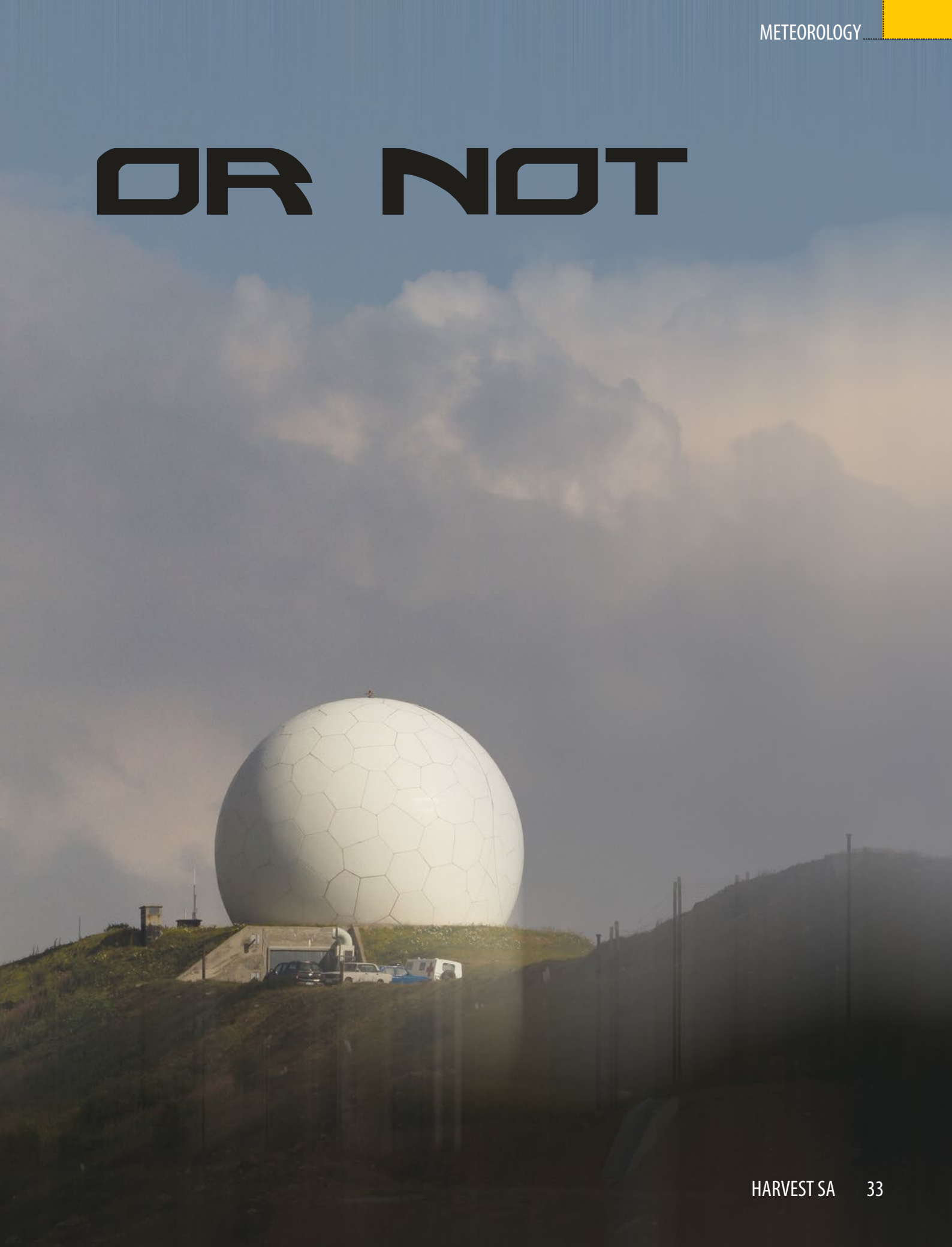
The ARC is at the forefront of research on climate change in South Africa.

Twenty ARC-ISCW staff members are directly involved in the weather station network. They are responsible for maintenance and calibration of every station in the network, programming, database maintenance, data quality and management. For hourly data, each weather station generates 24 values per day for every element such as rainfall. Therefore 500 weather stations generate 12 000 records per day and more than 4 million per year! Keeping these figures in mind, it is clear that the ARC is a vital custodian of this important national asset in South Africa.

What if the public wishes to obtain weather data? Although the ARC is currently in the process of revising its data provision policy, a request for a quotation can be made to Ms Maureen Fritz (FritzM@arc.agric.za) or Ms Irene van Gent (VgentI@arc.agric.za).

*Chris Kaempffer, ARC-ISCW
chrisk@arc.agric.za*

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@SyngentaSA

Young growers graduate

Syngenta produces Smart Farmers at the 2015 Grain Academy graduation

Syngenta, one of South Africa's leading agri-business companies, recently announced the 20 young commercial growers who graduated at the 2015 Grain Academy—a tailored business and leadership programme that equips our new generation growers with the skills and knowledge to take our agricultural sector into the future. This Grain Academy initiative is run in partnership with the University of the Free State and with the support of Grain SA.

Syngenta believes that it is imperative to enhance farming methods and practices to tackle the challenges our agricultural industry faces head on. Syngenta also understands that adopting best management practices backed by research, science, and especially education and empowerment is key to improving agricultural resilience.

"Developing our younger generation growers by equipping them with knowledge and strong business-minded qualities are essential for the future of agriculture in our country," says Antonie Delpont, managing director of Syngenta South Africa.

Delpont also says that programmes like the Grain Academy allow our young growers to adopt Syngenta's SmartFarm mind-set, which encourages our farmers to consider changing the way they farm, make decisions, buy products, invest in their crops, and to start farming smarter. Ultimately it is a driver for growers to replace conventional methods with a modern, proven approach that will guide and enable them to achieve a greater yield.

For this year's graduates the Grain Academy was an enlightening experience, one that

stimulated them to become progressive and liberated from traditional approaches to farming. This is what some of them had to say:

"It was an amazing journey of leadership growth through self-discovery," says Thabo van Zyl, who has been farming full time since 1988 and currently plants maize and soya beans on approximately 3300ha in Wesselsbron. He is a member of Grain SA, Free State Agri and the Losdoorns Study Group and also serves on the Senwes board.

Johandri Jacobs, a successful female grower who joined her family's farming operation on the banks of the Orangare River about 18 months ago says, "The programme absolutely challenged me to think out of the box. It was unbelievably informative and enriching." In addition to physical farming, Johandri also assists with marketing, communication, bookkeeping and general administration.

"For me the journey was one of self-discovery, in which I learnt to reflect on my actions regularly, and to get to know how people think in order to persuade them to change the way they perceive a situation," says Johan van der Walt, who has been farming in Bothaville in a closed corporation with his two brothers for the past 15 years. They plant 3000ha of maize and run a wildlife operation that includes exotic game such as sable and roan.

Tom van Rooyen, has a mixed farming operation of about 5000ha in Potchefstroom which includes maize, sunflower, dry beans, teff and feed for the commercial Bonsmara herd and the small Boran stud. He says, "So many farming facets were touched on and the overall impact was meaningful and will definitely enhance me in all aspects of managing my farming operation."

Dirk Strydom, a farmer who grows maize on 4500ha in Delareyville says "The Grain Academy taught me the most innovative concepts of farming and agriculture. It was such an eye opener for me and I am privileged to have been part of the experience."

Fanie Janse van Rensburg, a grower in Sasolburg who helps his family run a diversified farming operation that includes grain, dairy, livestock and sheep says: "This was indeed an enriching experience, one that has liberated me by changing my way of thinking forever."

According to Delpont, by investing in these young growers and their leadership capacity development through its Grain Academy programme, Syngenta confirms its commitment to empowering Smart Farmers for the future.

"Even though this is only the start of a long road ahead, we should all celebrate with our new cultivar of Smart Farmers and encourage them to apply what they've learnt. Congratulations to our graduates – you've made us proud and we know you'll continue doing so. Our agri-future is safe in your hands," concludes Delpont.

About Syngenta

Syngenta is one of the world's leading companies with more than 28 000 employees in over 90 countries dedicated to our purpose: Bringing plant potential to life. Through world-class science, global reach and commitment to our customers we help to increase crop productivity, protect the environment and improve health and quality of life.

For more information about us please go to www.syngenta.co.za.



The struggle for a national minimum wage in South Africa has a long history, having been waged, largely by organised worker formations, since the 1930s. These efforts have taken various forms, from open class conflict to more subdued trade union representations to the various governments of the day.

After the farm workers' revolt and the Marikana massacre in 2012-2013, the African National Congress-led government decided to revisit the introduction of a national minimum wage, agreeing to an investigation.

The national minimum wage must therefore, by its very nature, be universal. This is so that it can enable the lowest paid workers,

If the minimum wage were calculated as 50% to 60% of the median wage of R3 033, it would result in a wage of R1 517 to R1 820. The median wage is the boundary between what the highest 50% of earners are paid and

what the lowest 50% of earners are paid. So if the median wage in South Africa is R3 033 a month, this means that 50% of workers are earning above the median and 50% are paid below.

Clearly, using the average and median wage as the rate at which to fix a national minimum wage would either be too high (as it almost exceeds the highest minimum for all industries) or too low (since it is below the poverty line) and would leave the majority of workers trapped in poverty.

What is important is that workers themselves have their own perspective on what their needs are and what a minimum wage and a living wage should be, regardless of what certain experts may argue.

In broader terms the figure of R3 000 (US\$229) in 2012 was what farm workers felt would take them out of a poverty wage and provide a minimum wage they could live on. Would it therefore be feasible to use the Labour Research Service (LRS) median minimum wage of R3 600 (US\$275) as a benchmark for all industries to fix a national minimum wage in 2015 or is it still too close to the poverty level?

We cannot set a benchmark for the national minimum wage without first examining the most important benchmark for workers

themselves. This consists of a living wage which should be based upon any working class family being able to afford a low cost house and is called a housing-based living wage. According to LRS, a housing-based living wage is premised on the assumption that housing is the biggest item of expenditure from household income, and that a

in 2015. Using the bank's bond calculator, we arrive at a monthly bond cost of R3,067 (US\$234) and a qualifying minimum gross income of R10 224 (US\$780) per month. This leads to a housing-based living wage of R10 224 (US\$780) per month for 2015.

It thus appears that in order to take workers out of the poverty wage system inherited

We should also consider that the majority of workers' incomes are being determined solely by the employer

living wage can be derived from the monthly cost of housing if this is set at a particular percentage of total income.

Banks recommend that a household should spend no more than a third (33.33%) of its monthly income (after tax and other deductions) on monthly bond repayments. First National Bank's Property Barometer for former "township" markets indicates that the average house price is R323 000 (US\$24 639)

from apartheid, the minimum wage would have to be located somewhere between the all industries median minimum wage of R3 600 (US\$275) and the housing-based living wage of R10 224 (US\$780). An important consideration is that the fixing of a national minimum wage should not be set so high so that it is confused with a living wage.

If the all-industries median wage of R3 600 (US\$275) is accepted, then workers covered



by sectoral determinations (ranging from domestic workers to workers employed in the private security industry) and workers employed in construction, finance and wholesale and retail—about seven million workers out of the total of 11.7 million formal sector workers in South Africa—stand to benefit. The extent of the coverage depends on how high the national minimum wage is finally set between the all industries and the housing-based living wage benchmarks.

But how feasible would it be to adopt a universal minimum wage without shedding jobs and causing harm to the broader economy?

There is much concern that a high national minimum wage may increase unemployment and that there is a difference between conditions for economic sectors involved in the export sector and those that essentially serve the domestic market.

In the famous 2012 farm workers' revolt in the Western Cape, farm workers demanded a minimum wage of R3 000 (US\$229) and on the other hand the Marikana (platinum mining) striking workers demanded a living wage of R12 500 (US\$955).

Of all the sectors studied (wholesale and retail, domestic workers, forestry, tax and security) researchers at the University of Cape Town found that it was only the agricultural sector where there was significant unemployment after the implementation of the agriculture sectoral determination

of 2003. However, the agricultural sector showed growth and there were no economic shocks (even in exports) that could have caused unemployment in the sector's largest employers, citrus, maize and grapes.

LRS's findings on employment in the agriculture sector over time indicate that the largest drop in employment took place in 2001 (just over 500 000), two years before the implementation of the 2003 sectoral determination. However, employment increased again between 2005 and 2006 by 181 000 jobs and dropped steadily until a low of 627 000 in 2011 then started to increase again to 891 000 in the first quarter of 2015. This represents an increase of 20% or an additional 182 000 jobs in the first quarter of 2015 when compared to the first quarter of 2014. Employment levels thus returned to the level of 2003, when the sectoral determination was first implemented.

The drop in employment of 55 000 farm workers by 2014 is thus a very small decline given the magnitude of the increase in the minimum wage and looking at employment levels over the long-term.

The figures show that most farmers had in fact absorbed a massive increase in the new minimum wage of R105 (US\$8) a day, a 50% increase (on the previous R69 (US\$5) a day) in 2013.

Workers also gained tremendously with an increase in the wage bill of R1.5 billion

(US\$114 million) in 2013 and a further R1.6 billion (US\$122 million) in 2014. However the wage determination has modestly increased real average wages and the overall wage bill was only 10.6% of total farming costs in 2013.

According to the Department of Agriculture Quarterly Economic Review, the sector registered strongest growth of 5.6% in 2014, up from 1.5% in 2013. The sector's growth was because of the R25.1 billion (13.2%) increase in gross income from agricultural products in 2014 compared to 2013. Thus profit levels in the agriculture sector increased despite the introduction of the sectoral determination for farm workers in 2003 and the increase of 50% in farm workers' wages in 2013.

A 2014 study by the Institute on Poverty, Land and Agrarian Studies (PLAAS) at the University of the Western Cape sums up the experience of the agricultural sector in relation to minimum wages. It shows that employment figures in the agricultural sector indicate a trend toward stabilisation of employment along with a significant shift from casual and seasonal to permanent employment, that is, both these factors are reversals of previous trends.

Experience in agriculture (an export sector) and minimum wage determinations indicate that there is no mechanical relationship between an increase in wages and greater unemployment. The simplistic argument that increased wages lead to unemployment is not supported by evidence. Instead, we observe increased employment and increased profitability. Thus, besides financial gains, farm workers have also scored a change from casual to permanent employment, including a reduction of workers' weekly hours from 47 (2008) to 46 hours, according to Statistics South Africa.

A national minimum wage is a powerful weapon in the hands of labour to fight poverty wages and is both reasonable and necessary. Only the labour movement can make a national minimum wage a reality.

Eddie Cottle is the head of collective bargaining at the Labour Research Service in Woodstock. This paper is based on his booklet: Cottle, E. 2015. Towards a National Minimum Wage in South Africa. International Labour Organisation. Geneva. Article first published by GroundUp.



apollo

GO THE ————— DISTANCE



Keen for quinoa

Peruvian grain and avocados in return for rooibos and SA wine

Peru is keen to enhance bilateral economic relations with South Africa, said the Department of Trade and Industry (dti). According to the mineral-rich South American country's Economic and Trade Attaché, Georgios Patsias and the country's Second Secretary Alberto Garcia Montoya, the country is also keen to increase trade and investment between the two countries.

"There are multiple opportunities that are available for business people, particularly those that are operating in the small and medium enterprise (SME) sector from both countries to explore.

"We are particularly excited about this mission to our country by a group of South African companies because it will encourage trade, investment, joint ventures and partnerships amongst companies from both countries. This will contribute in increasing bilateral trade and investments between South Africa and Peru," said Patsias.

This, as the dti is leading a delegation of 18 business people on an Outward Trade and Investment Mission (OTIM) to Peru that kicked off on Saturday and will conclude on 30 May.

Patsias added that the SME sector was thriving in Peru and was contributing significantly to the country's growing economic growth. He identified agro-processing as one of the sectors in which SA and Peru could explore the myriad opportunities available in both countries.

"For instance South African wines and Rooibos tea can certainly find a receptive market in Peru. We do not have Rooibos tea there. We are not producers of wine. As a result, we are importing it from countries such as Argentina and Chile. Companies from SA and Peru can even establish partnerships and joint ventures to find markets in



other countries neighbouring us and others beyond our region," said Patsias.

He identified quinoa, a native Peruvian high protein grain crop used for cereal, maca, a vegetable from which a naturally energising powder is made, and asparagus, as some of the Peruvian products that are already successfully being imported to SA where their market is growing. He said that the two countries have a lot to offer each other.

There are several South African companies operating in Peru's flourishing mining sector which constitutes more than 45% of Peru's Gross Domestic Product (GDP).

In addition, a number of South African farmers are operating in the Peruvian agriculture industry in the Ayacucho Province where they are producing avocados that they export to the United States of America, the biggest market for avocados in the world.

"This shows that we can work together for the benefit of both countries. We are also blessed with a 2000km coastline where the

fishing industry is prosperous and opportunities there are abundant and omnipresent. We are also importers of beef, canola oil and fruits such as apples, oranges and pears," added Patsias.

According to the World Bank, Peru, with a population of more than 30 million people, is one of Latin America's fastest growing economies and is expected to remain as such in the medium term.

Bilateral trade between South Africa and Peru totalled almost R600 million last year. It is heavily skewed in favour of South Africa which exported products worth more than R400 million to Peru.

"We are interested in strengthening mutually beneficial bilateral trade relations with South Africa. We view the exchange of trade and investment missions as one of the ways of enhancing these relationships," said Montoya.

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If Cyril has a workplace accident, there will be more than one victim.

At Bova, we understand that accidents have widespread consequences. It's why we believe you can't put a price on safety. We go beyond compliance through an uncompromising commitment to innovation and technology. We are dedicated to keeping people like Cyril and his community safe.

See Cyril's true story at beiersafety.co.za/a-day-in-the-life/plantation-supervisor

IT'S A DANGEROUS WORLD, MAKE IT SAFE.



www.beiersafety.co.za



Bova launch hard-hitting safety campaign

Industry leader Bova has found that many companies in Africa don't take safety seriously enough.

Most companies think of personal protective equipment (PPE) only in terms of compliance. They consider safety equipment a grudge purchase, only buying it to prevent prosecution in the event of an accident.

For Bova, safety has always been about protecting people

In this tough economic environment, these companies are looking to save money wherever they can. They cut costs by purchasing cheap PPE, including safety footwear, that only meets minimum compliance requirements. What they don't realise is that these can end up costing more in the long run. Generally, the quality of this safety footwear is inconsistent which affects

durability and overall protection. These inconsistencies increase the chance of an accident occurring, which would result in reputational damage. That's something no one can afford in such a competitive industry.

For Bova, safety has always been about protecting people, their families, their communities and their dreams. It's why they go beyond compliance in engineering their safety footwear. Through their uncompromising commitment to quality, innovation and technology, they ensure superior products, which are designed to keep people safe.

For these reasons, Bova have set out to educate the market on the true cost of safety with their *Day In The Life* campaign. It's a multi-channel campaign, made up of five documentaries. Each episode uncovers what

safety means to South Africans, like Cyril, who work in dangerous environments. The campaign also explores what effect a workplace accident could have on people like Cyril and their loved ones. After all, a lot of them are the sole breadwinners in their family. It's these widespread consequences that Bova wants to highlight in their campaign. Their aim is to shift the industry's current mindset.

Watch Cyril's story and see what safety means to him. He's been working as a plantation supervisor in Umzumbe for 22 years to support his family back home.

To view Cyril's video and all five Day In The Life documentaries visit www.beiersafety.co.za/a-day-in-the-life/plantation-supervisor.

**It's a dangerous world.
Make it safe.**

BACKING UP WATER

The system is having a quality control crisis

South Africa is experiencing a water crisis, with scientists saying there is strong evidence of decreased water flow and water quality, although the problem currently is mostly quality rather than quantity.

Council for Scientific and Industrial Research (CSIR) researchers also warned that continued population and economic growth, combined with climate change, could result in serious water shortages in some parts of the country by 2025.

Speaking to the media on 29 July, they mentioned a range of actions – besides investments into large inter-basin transfer schemes—that could be taken to improve the prospects for water supply and quality. “Everyone says there is a litany of bad news, but working with government we can look for where might the good news be, where the opportunities for innovation are,” said Emma Archer van Garderen, the CSIR chief researcher of integrated water assessments.

Meanwhile, Marie Brisley, the chief director in the Department of Water and Sanitation in charge of Water Policy, spoke about water shortages in the country at the Southern African Development Community National Water Week-South Africa Workshop.

She said the search continued for alternative methods to get water since the conversion of seawater to drinking water – and then distributing it to areas affected by severe drought – was extremely expensive. The conversion of seawater to drinking water was only possible in coastal areas as it would be more costly to reticulate seawater inland.

The water workshop comes amid severe drought in KwaZulu-Natal, Free State, Limpopo and North West. Brisley told delegates from the SADC about the National Water Resources Strategy-2, a guiding document to ensure the fair and equitable distribution of water in South Africa. Its key points include:

- Water conservation and water demand management;
- Surface water resource management (operation of water supply systems);
- Managing and use of groundwater resources;
- Re-use and desalination of water;
- Eradication of invasive alien plants (catchment care);
- Re-allocation of water;
- Eradication of illegal use;
- Development of surface water resources (e.g. dams);
- Transfer of water; and
- Rainwater harvesting.







The Olifants River

CSIR scientists

On Wednesday at the CSIR briefing, Dr Harrison Pienaar, the council's water resource competence area manager, concurred with the Department of Water and Sanitation that there was no immediate problem with regards to theoretical water availability, with South Africa still having sufficient resources to meet demand.

But in some parts of the country there was already not enough water available to meet the needs of citizens, agriculture and industry, or to sustain the country's ecological baseline.

Dr James Dabrowski, the council's principal researcher specialising in water quality and aquatic ecology, said that, with over 98% of South Africa's available water resources already allocated across various sectors, the country could face a water deficit of between 2% and 13% by 2025, depending on economic performance, reported Polity, the news and information resource.

These projections did not take water quality into account, despite the fact that water use was "dependent on both water availability and water quality".

Innovative ideas

While it is agreed there is a water crisis, scientists are working on innovative solutions to improve quality and quantity.

In an apple orchard in Western Cape, researchers were measuring exactly how much water the trees needed to allow for more efficient water use, said CSIR hydro-sciences researcher Mark Gush. It had shown it was possible to save water, particularly at

the end of the growing season. Research was also being conducted to reduce food waste, which would help to save the water that would have been used to grow the wasted food, he explained. "People in agriculture have done some incredibly innovative things, and we need to draw on those stories," added Van Garderen, referring to a rooibos tea co-operative.

Rooibos was grown in a winter rainfall area and was having a very bad season. The co-operative, with the help of a non-governmental organisation, brought in scientists and reduced its water use. It was now exporting its tea under a water-wise label. "Farmers are incorporating concerns about water and soil conservation into marketing agricultural products."

Regarding water quality, the Olifants River catchment area in Mpumalanga was "one of the worst case scenarios", said Dabrowski. The combination of agriculture, coal mining, and construction of Eskom's Kusile Power Station with its increase in human activity, was causing large-scale pollution of rivers in the province.

"It can't get much worse than what it is," he said of the catchment area. But one proposal was to follow the practices of places such as the UK and the US to reduce river pollution from sources such as fertilisers.

Land use in a catchment area is mapped. This information is overlaid with topographical and weather information, and combined with the location of wastewater treatment plants. The result is a map indicating the sources and extent of agricultural pollution. Each wastewater treatment works can then

determine the level of nutrients needed to filter out of the water.

"We do have quite a number of challenges, but there are solutions to these challenges," Dabrowski said.

Wastewater treatment

A particular concern was the state of wastewater treatment facilities. According to Polity, the most recent Green Drop status report indicated that about half of the country's 824 treatment works were in either a poor or critical condition.

Pienaar said the crisis lay with how South Africa's water was managed. "At local government level there are serious challenges. We are not addressing inefficiencies," he said.

His colleague, Dabrowski concurred, and said the department's recent release of a tender to develop an Integrated Water Quality Management Strategy was a welcome development.

Dr Marius Claassen, the principal researcher for resource-specific scientific measures, said the country needed to begin identifying its "preferred water roadmap and taking active steps in achieving it". A patient, methodical approach would be required, with "quick wins" eschewed in favour of long-term sustainability.

There were many elements to consider: the creation of large-scale infrastructure, such as dams and transfer projects; tackling municipal water leaks and dam silting; improving water efficiency in agriculture and industry; and drawing on groundwater and desalination solutions.

Gush added that, as a water scarce country, South Africa would need to use existing resources more wisely. "This means minimising wastage of water, through solutions such as rainwater harvesting, and increasing efficiencies."

The irrigated agriculture sector, which had been allocated 62% of the surface water resources, should be a key target for improved efficiencies, of "more crop per drop".

But there was no single water entity, such as Eskom in the electricity sector, the scientists pointed out, which meant dealing with the crisis would necessarily be complex.

SAinfo reporter

Branching out with olives

South Africa shines at the Verofiere olive oil contest in Cape Town

September beamed kindly on the olive growers of South Africa, bringing opportunity from sunny Italy in the form of the world's most prestigious olive oil competition: Sol d'Oro Southern Hemisphere.

The event was held from 8-11 September and the results were announced at gala reception in Cape Town. In attendance were the the Prime Minister of Western Cape Province, Helen Zille, the Minister for Economic Development, Tourism and Agriculture of Western Cape, Alan Winde, the Chief Executive Officer of Wesgro, Tim Harris,

the Italian Consul in Cape Town, Alfonso Tagliaferri, and Dr Damiano Berzacola, Vice-President of Veronafiere – the Fair of Verona, largest direct organiser of exhibitions in Italy. One could almost add to the number of participants the venue itself: the historic Casa Labia, whose elegant Venetian interior not only provided a splendid setting for the occasion but also served as a visible reminder of the long-standing friendship between Italy and South Africa, from the indefatigable efforts of Count Natale Labia to promote good relations between the two countries until today, when Italy is actively seeking to help olive producers raise their standards so that they may compete with confidence

at the highest levels. No wonder the olive branch symbolises both victory and peace!

Already South African producers are doing themselves proud. Although gold medals in all three categories envisaged went to South American countries, there were still places of honour for South Africa: the host nation of this year's most important competition dedicated to extra virgin olive oils took 5 out of 9 of these medals and 9 out of 12 Special Mentions

Splendid results in a difficult year

The gold medals for extra virgin olive oils at the Sol d'Oro Southern Hemisphere contest held this year in South Africa went to



Chile in the delicate category, Argentina in the medium category and Uruguay in the intense section.

Behind them, second and third places saw South African olive oil producers win as many as 5 out of 9 medals: a bronze medal in the delicate category, a silver and bronze medal in the medium category and a silver and

bronze in the intense section. To complete South Africa's fine result, Special Mentions were awarded to three delicate and six medium olive oils.

The overall medal table saw Chile also claim a silver medal and two Special Mentions in the delicate category and a special mention in the intense section.

The international judges had compliments for the quality achieved by all producers taking part in the competition, especially since they had to respond to a difficult year following prolonged drought.

A harmony of North and South

These impressive results crown the second edition of the Sol d'Oro Southern Hemisphere competition. This event was held for the first time in 2014 after splitting Sol d'Oro in two in order to give extra virgin olive oils made south of the Equator - out of season compared to traditional producer countries in the northern hemisphere - an opportunity to be assessed in all their optimal freshness.

As a travelling competition taking in production countries, Sol d'Oro Southern Hemisphere was organised by Veronafiere thanks also to the cooperation of the South African Ministry of Economic Development, Tourism and Agriculture, Western Cape Province and Wesgro, the official agency promoting tourism, trade and investments in Cape Town and the Western Cape area.

Addressing the gathering at the Casa Labia, Dr Berzacola recalled that "Veronafiere conceived Sol d'Oro as an occasion for comparisons and improvements for olive oil made around the world, where producers always look to Italy as an example of technological and manufacturing quality".

"I am sure," Berzacola concluded, "that this edition of Sol d'Oro Southern Hemisphere has been a memorable occasion for meetings and sharing knowledge which will help strengthen and renew the excellent partnership relations existing between the Republic of South Africa and Italy, between local wine and olive oil producers and Veronafiere, Sol&Agrifood and Vinitaly."

"Veronafiere," said Helen Zille, Prime Minister of Western Cape Province, "has clearly shown its confidence in the development of our olive oil and wine producers by giving them help and assistance to improve even to the point of surpassing produce from northern hemisphere countries. Veronafiere," she concluded, "has significantly encouraged the promotion of agro-food produce, a feature which is perfectly in line with the Western Cape's own policies and projects."

Adv. Glenn BabbSDun s

List of Winners and Special Mentions by category



Delicate fruit category

- ① Terramater S.A., Petralia, Chile
- ② Agricola Pobena S.A., Alonso olive oil ultra premium Frantoio, Chile
- ③ Rio Largo Olive Estate, Rio Largo, South Africa

Special Mentions

Agr. Y For. Don Rafael Lida, 8 Olivos Blend, Chile
 Oakhurst Olives, Oakhurst Delicate, South Africa
 Empresas Carozzi S.A., Carozzi Intense, Chile
 Willow Creek Olive Estate, Willow Creek Director's Reserve, South Africa
 Babylonstoren, Babylonstoren, South Africa

Medium fruit category

- ① Miditerra S.A., Grand Miditerra, Argentina
- ② Baleia Wines, Baleia Olives & Oil, South Africa
- ③ Adamskloof, Adamskloof, South Africa

Special Mentions

Morgenster, Morgenster Extra Virgin Olive Oil, South Africa
 Porterville Olives (Pty) Ltd, Andante Intenso, South Africa
 Tokara, Tokara Premium, South Africa
 Chaloner SACC, Chaloner Mountain Extra Virgin Olive Oil, South Africa
 Olivares de Quepu SA, 1492 Picual, Chile
 Homegrown Farms Cc, Prince Albert EVOO - Karoo Blend, South Africa
 P.C. Coetsee t/a Marbrin Farms, Marbrin Olive Growers Directors Reserve, South Africa

Intense fruit category

- ① Agroland SA, Colina de Garzón Trivarietal, Uruguay
- ② Wildekrans, Wildekrans Keerweer Extra Virgin Olive Oil, South Africa
- ③ Gabriëlskloof, Gabriëlskloof, South Africa





Western Cape update

Western Cape fights climate change food security

Alan Winde, Minister of Economic Opportunities, addressed the Landcare Conference, hosted by the Western Cape Department of Agriculture at Elsenburg.

Minister Winde outlined the impacts of climate change and the Western Cape's strategy to deal with these factors.

The Minister's full address follows below.

Landcare high on the agenda

This year's Landcare conference comes at a very exciting time for the Western Cape's agriculture sector.

The United Nations General Assembly declared 2015 the International Year of Soils. This is particularly relevant as today we are here to speak about landcare.

We've also just approved Project Khulisa, the province's growth plan for the next five years.

Project Khulisa identified sectors which are growing the fastest and have the highest job creation potential.

One of these is the agri-processing sector.

Under a high-growth scenario this sector could add up to 100 000 jobs to the economy and generate R26 billion.

We're well-placed to reach this objective.

The agriculture sector is the backbone of province's rural economy and 45% of the

country's exports come from the Western Cape.

Growing the size of the agri-processing sector stands to deliver a significant boost to rural employment.

This focus on agriculture is in line with the developments taking place across the continent.

In a recent address, Kofi Annan pointed to the fact that Africa is importing USD34 billion worth of food. We can produce the majority of this food ourselves.

At the same time, despite these volumes, Mr Annan highlights the fact that over 200 million people in sub-Saharan Africa are going hungry.

It's also estimated that about 9 million tonnes is wasted or lost of the 29 million tonnes of food produced in South Africa each year.

We know that Africa has the most arable land and we need to make sure that Africans lead the way forward.

The World Economic Forum has also looked at the trends shaping our continent. By 2030, the continent's population is set to double

and 50% of this expanding population will be living in cities. Coupled with climate change, these growth estimates will place increasing pressure on natural resources.

These are factors we have to consider in our own growth strategies.

Climate change specifically poses a major threat to global food security.

Economically, climate related events cost the Western Cape R3 billion between 2003 and 2008. We know that extreme weather events are not a new phenomenon.

Yet, we are also seeing that temperatures are rising and there has been a reduction of rainy days in autumn and summer. There's also been a progressively later start and end to the rainy season.

The projections for the Western Cape for 2040 to 2060 also show a changing planet.

Higher minimum and maximum temperatures as well as reduced annual rainfall are predicted.

For extensive livestock production, dairy cattle may be impacted by heat stress leading to reduced milk production and, in a worst case scenario, infertility.

Intensive livestock production, which includes chickens and feedlot cattle, is also more likely to be impacted by heat stress which could lead to diseases.

The biggest threat facing winter grains are the spread of diseases and weeds.

The situation demands that we take immediate action.

In the Western Cape, we've already introduced conservation agriculture. As a result of this intervention, the province's wheat farmers have seen increased production and profit, reduced soil erosion and improved water quality and soil health.

South Africa currently imports about half of its wheat, making innovation essential to encourage an increase in local production.

This approach, which is being driven by the Western Cape Department of Agriculture and the Agricultural Research Council, involves minimum soil disturbance, maximum soil cover and crop rotation.

An impact study we conducted in partnership with the ARC found the initiative resulted in a R341 million saving. Farmers used less herbicide and it was cheaper to



fertilise. To produce a yield of three tons per hectare using conventional methods costs R4 444/ha compared to R2 387 for conservation agriculture, making conservation agriculture R2 057 cheaper per hectare.

In addition, to ensure that we can respond speedily to the unpredictable environment we are experiencing, we are investing in research.

In this financial year, the Department of Agriculture's Research and Innovation unit receives over R100 million.

This unit is busy with groundbreaking work. Their trials on the effects of tillage and crop rotation on soil quality are producing the kind of knowledge we need to adapt.

Their studies on soil management include the development of strategies to enhance soil quality in our province's grain producing regions.

In the Southern Cape, teams are assessing how we can improve the efficiency of pasture systems to produce the best quality of milk.

Through the Fruitlook system, we are using satellite technology to analyse crop growth and water use.

The technology has helped farmers to improve their production, reduce costs and has raised awareness around water use.

We are also partnering with the University of Cape Town and the agricultural sector to develop the climate change response plan, the SmartAgri project.

This is being driven jointly by the Department of Agriculture and the Department of Environmental Affairs and Development Planning (DEA&DP).

Through province-wide workshops we are seeking to develop feasible risk management approaches, new technologies, and effective implementation for specific climate risks.

Operating sustainably is not only the right thing to do for our planet; it will ensure that here at the tip of Africa we are working smartly to put strategies in place to sustain our sector and secure the future of food security.

Bronwynne Jooste

Spokesperson: Alan Winde, Minister of Economic Opportunities, Western Cape Government



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STRATEGY FIRST

Be a good farmer first, then introduce technology



While the adoption of precision farming technology can increase yields and improve the quality of an operation's output, it can also impede operations if it isn't part of an integrated plan.

Too often, technology is implemented in a haphazard way, either costing more than the benefits it should have provided or actually getting in the way of normal operations.

Some of our clients have applied technology so astutely that they can forecast their yield per millimetre of water needed. They have taken precision farming to its logical conclusion by implementing a range of appropriate technologies across the full spectrum of their operations in such a way that what they do in one area of the farm benefits and supports everything else they do.

However, they've achieved this only because they are good farmers. They were successful before they introduced new technologies. They have simply used the technologies to do what they have always done well in more efficient, more cost effective ways.

One needs to understand, therefore, that technology won't make you a better farmer. Like a tractor or even a pitchfork, it's a tool. It needs to support rather than dominate a farm.

On large farms, technology can often reduce the time and effort needed to do certain tasks. On smaller farms, the same technology can become a financial burden. It is therefore important to do proper market research and choose technology that is best aligned with your business.

The point is not to be blinded by the bells and whistles of technology. Weigh the pros and cons carefully, in the context of your overall planning. In a long term business like farming, technology isn't a short cut to success. It's a partner that makes the long haul easier.

The need for a planned and holistic approach to the use of technology is reinforced by the fact that technology today

is not limited to equipment and computer software and hardware. It also incorporates biological technology in the form of seed and fertilisers, genetics and new methods of breeding for specific attributes in livestock, the production and use of energy – specifically renewable energy, and soil science, to name just the tip of the iceberg.

Many farmers fear that they need to become specialists in a very broad range of disciplines in order to produce just a few outputs. In fact, the only significant change that technology calls for is a whole farm approach that optimises the farmer's efficiency, including use of water, waste, soil, energy, and, most importantly, time.

Our recommendation, therefore, is that, instead of opting on an ad hoc basis for a piece of technology that seems to address an immediate need, take the time to understand the ripple effect of the choice you are about to make.

Get to grips with both the operating and fixed costs of the technologies you want. Ensure that you have the right technology for your specific case and that the costs of that technology will not exceed the advantages it confers.

Precision farming is a comprehensive concept. You need to understand the full concept and how individual pieces of technology will impact the whole—or, indeed, how not applying the full range of technologies will impact the whole.

Precision irrigation, for instance, calls for precise application of specific types of fertilisers and particular rhythms of planting of particular crops.

A useful picture to carry with you into the era of technology in agriculture is that of a piece of cloth lying flat on a surface. No matter where you pick it up—in the middle, at a corner, along a side—the whole cloth will move. In the same way, no matter where you touch your farm with technology, you will affect the whole farm. Make strategic rather than just tactical choices.

Nico Groenewald, Head of Agribusiness at Standard Bank



A juicy story

Tru-Cape Fruit Marketing announces discovery of new apple

Tru-Cape Fruit Marketing, the largest marketer and distributor of South African apples and pears announces the discovery of Bigbucks - a new superior clone in the Gala family.

Buks Nel, Tru-Cape's varietal expert, made the find in an orchard on Oak Valley Estate on January 18, 2011. The apple, a mutation of Corder Gala, also a strain discovered by a Tru-Cape grower, is set to be successful because of its high colour and stability - two things that plague the Gala-type apple. Tru-Cape's





Buks Nel on Oak Valley with Bigbucks

managing director Roelf Pienaar says that like Royal Beaut, discovered by Robert Zulch on Wakkerstroom in the Witzenberg Valley in Ceres, Corder Gala by Derek Corder on Beaulieu in Grabouw and now Bigbucks by PJ (Buks) Nel, Tru-Cape continues to lead development of better strains and best growing practices. "We are incredibly proud of Buks as this discovery is the just reward of a lifetime of passion and commitment to the fruit industry and frequent orchard walks - something of a rarity nowadays," he says.

Nel explains: "Deep in its soul a Gala is an unstable varietal with between 5% and 50% of trees planted not being true to type. Bigbucks is the exception so growers know when they plant a Bigbucks tree they will always get Bigbucks fruit. Another, albeit cosmetic improvement, is the deep full wine red that the fruit achieves from early in its life while most Gala types are striped. While redness is usually an indication of ripeness, with Bigbucks the fruit is full red from the start which also means a higher percentage pack-out (the number of fruit on the tree that meets the colour and size specification). Normally a Gala tree needs to be picked on three different occasions to find fruit of the right colour spec, now trees can be picked once.

"I have always had a soft spot for this New Zealand-bred variety by Bill Ten Hove (which we started to test here in the Cape in the 1970's as I remember how hard it was to convince the then Deciduous Fruit Board that Royal Gala had real potential in our South African apple industry. At the time, they thought it might be confused with an over-ripe Starking! A few of us believed in Royal Gala and in the Two-a-Day Group, one of the owners of Tru-Cape, we planted the first Royal Gala at Oak Valley Estates and grafted some trees on other farms within the Group. When I received the O.H.S. Reinecke medal from the Cape Pomology Society in 2000 for contribution towards the development of Royal Gala I thought of it more as a group effort", he reminisces.

Ceres grower Calla du Toit, Tru-Cape's procurement manager, assisted Nel with the registering of Plant Breeders' Rights (PBR), valid for 25 years. "Although the numbers are still being finalised, growers that purchase Bigbucks will pay a royalty to plant the tree and a levy on every carton of Bigbucks fruit being sold. Tru-Cape will manage this process and ensure the returns are shared among the PBR owners: Buks Nel, Derek Corder (as Bigbucks is a hybrid of the Corder

Gala) and Anthony Rawbone-Viljoen of Oak Valley as Nel found the first fruit there.

According to du Toit, Bigbucks trees planted in Ceres show the same potential as those planted in Grabouw so this varietal, with its more than 90% pack-out potential, is set to be the most significant find of the decade. This represents a 30% improvement over most.

"Gala is among the most planted varietal in the world and there is every reason to think that the 1700 Bigbucks trees currently in the ground and the 20, 000 to be planted this next season, will grow exponentially. An indication of potential can be seen from the success of Royal Beaut of which more than 170 000 trees were planted last year."

Nel says that Bigbucks will be picked and stored the same way as other Gala types. "There is a myth that redder fruit has less flavour but this is an old wives' tale. Bigbucks is beautiful to look at and delicious to eat. Although it will take some years before there is sufficient volume to market commercially, as trees normally take between five and seven years for full production, this is something to which we all can look forward."

Brian Berkman

