Issue 38 • January/February 2019

HarvestSA

Securing South Africa's Food Resources

Focus on citrus

New products and initiatives

Safe and smart

Plant protection guidelines

Banking on agriculture

Investor interest is growing

Top technique

Rovic Leers on spraying

Feeding the people

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On the cover

South African citrus is going full bore with innovative products, policies and technologies.

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EDS NOTE

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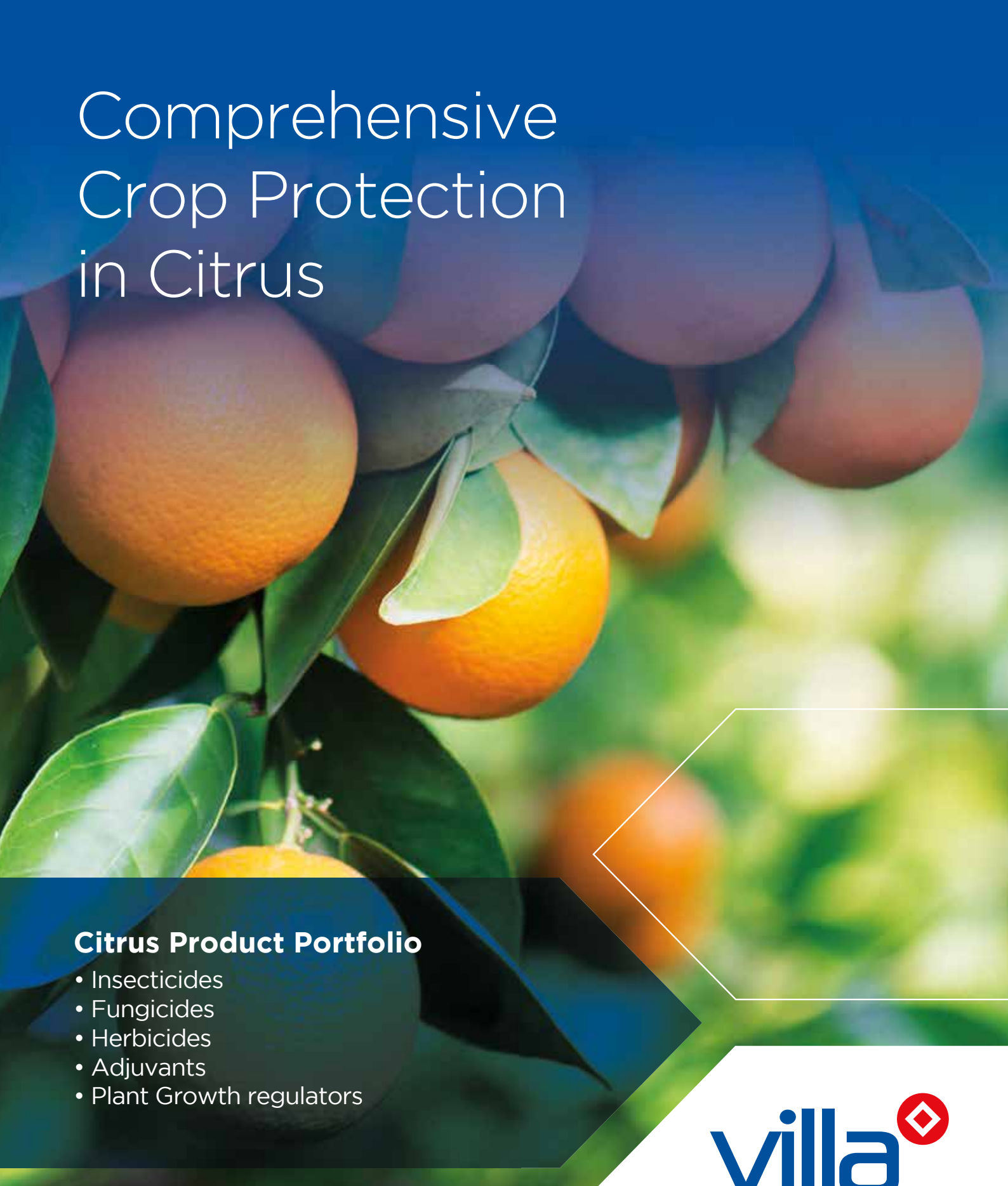
Welcome to the first issue of Harvest SA for 2019. It seems that time moves at a different speed nowadays: barely has one adjusted to the latest baffling revelation in the news than another comes along, only to be supplanted in its turn.

From the latest shenanigans in Washington or Caracas to the freshest twists and turns of the Zondo Commission, it's impossible to keep up with every development. As professionals, though, what we can keep up with are the latest developments in our field. When it comes to technology, especially, growers in southern Africa have a plethora of tools to help them produce the best. In this issue, the spotlight falls on citrus: from packing and pruning to spraying and developing new cultivars, it's all happening here. At the same time, on the policy level, it's essential that every sector has a voice to make itself heard above the noise everywhere it counts. The Citrus Growers Association has been doing just that on behalf of South Africa's citrus producers for years: don't miss CEO Justin Chadwick's message inside this issue. It's a message that is sure to resonate with all farmers, not only those who grow citrus.

Comprehensive Crop Protection in Citrus



Citrus Product Portfolio

- Insecticides
- Fungicides
- Herbicides
- Adjuvants
- Plant Growth regulators

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Farming to the fore

Agribusiness drives investment in developing economies

More than 640 high-level international delegates attended the African Agri Investment Indaba, incorporating the Agri Trade Congress Africa, which was held 27-28 November 2018 at the Cape Town International Convention Centre.

According to Ben Leyka, Executive Director of the African Agri Council, "a total of 498 meetings were facilitated through our matchmaking team, over 10 projects were presented to investors through our Investment Discovery Sessions (IDS) and two workshops (AfDB and SADC) during the Development Partner Day took place. This reinforced the African Agri Investment Indaba and Agri Trade Congress Africa as Africa's gateway to agri investment and trade opportunities, and a business platform that is playing an important role in shaping Africa's agricultural future growth and prosperity."

Key insights from the AAII Conference sessions

Most of the investment in developing economies will come from agribusiness corporations. These findings show that the contribution of agriculture to economic development is more significant in developing economies than in developed ones.

Absolute requirements to attract investment

- Strong, fair and enforceable regulatory environment covering all aspects of the value chain, including open and transparent competition driving efficiencies (Policy certainty)
- Return on investment
- Certainty (risk) of achieving that return.

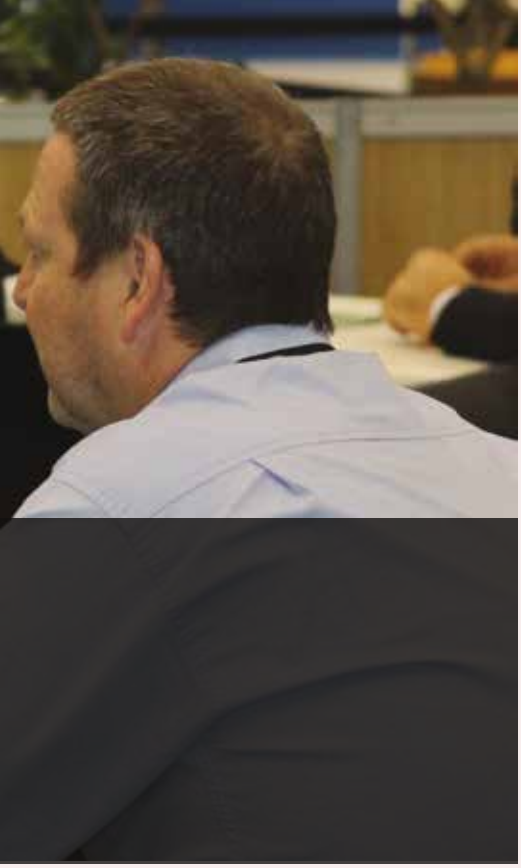
Land reform should be a national consultative conversation and assessed from an emotional, social, economic and financial standpoint.

In South Africa, investments into agriculture, forestry and fisheries have been increasing at a real annual rate of 1.7% between 2007 and 2017. The Western Cape is the second biggest recipient of investment for the sector, accounting for about 17% in 2017 and 20% over the past decade. Together, the province's agriculture and related agriprocessing sectors create over 300 000 direct and indirect jobs in the value chain.

As we face the fourth industrial revolution and all of the potential and change that it can bring with it, farmers and agri-business owners must be looking at ways to innovatively use technology to grow their businesses. It's up to us to ensure that we're making the most of the Fourth Industrial Revolution, that we're not stuck in the first, second, or third revolution because it's important for food security and it's important for the growth and development of the region.

Accelerating the implementation of National Agriculture Innovation Projects (NAIPs) to achieve the Malabo Goals

- At the African Union Summit in Malabo, Equatorial Guinea in June 2014, Heads of State and Government adopted a remarkable set of concrete agriculture goals to be attained by 2025.
- Only 10 countries have allocated the 10% to agriculture as required by the Malabo Commitment and only 12 countries have allocated the minimum 1% of agricultural GDP to agriculture research spending
- NAIP is all about transformation of agriculture at national level
- Transforming agriculture calls for increasing production, productivity and enhancing competitiveness



- Productivity calls for Innovation-driven agricultural transformation through effective use of Science
- The farming community was not included in the drafting of the Malabo Goals therefore creates a mismatch with expected outcome from farmers.

Trends in global mergers and acquisitions

If we consider mergers and acquisitions (M&A) globally, deal values have reached their highest levels since 2007, totaling nearly USD 2.49 tn through the first half of 2018. That's a 57% year/year improvement, despite a decrease in the number of deals relative to the first half of 2017. Globally, agriculture accounts for 6.1% of deal values and 15.6% of the total deal volume among M&A transactions announced in 2018 (as of November 15).

Meanwhile, if we just look at Africa, total deal volumes and values of M&A transactions fell sharply during the first half of 2018.

M&A in Africa

If we drill deeper into the data on M&A in Africa, energy and mining remains the most targeted sector in terms of deal volume, comprising 20% of total deal volumes in 2016-2017. The energy and mining and consumer sectors also represent the largest share of total deal values, with each comprising 29% of total deal value in 2016-2017.

By contrast, deals involving the agriculture sector represented just 1% of both total deal volume and deal value in 2016-2017.

The 2018 statistics appear to continue this trend, as agriculture represents only 0.46% of deal values and 1.9% of the total deal volume among M&A transactions announced in Africa as of November 15.

However, the data is also confusing when you listen to investors extol the promise of the African agriculture/agribusiness sector for future investment.

The 2017 Deloitte Africa Private Equity Confidence Survey (PECS) focused on the potential for investment and investment challenges in regions of Africa (East Africa, Southern Africa, and West Africa). In total, the PECS surveyed 75 general partners with operations in, and knowledge of, each region.

This Deloitte study, which surveys regions – not the entire continent – serves as a good reminder that we can't treat Africa as one place.

It's important that we approach investment in Africa regionally, as different investment strategies may be better suited to the particular economic and regulatory framework of given countries.

The results demonstrated that consumer-focused sectors, which include food and beverages, agriculture, healthcare, and financial services, rank among top focus sectors for respondents.

In East Africa, 62% of respondents expect to focus on opportunities in the agriculture/agribusiness sector during the next 12 months.

In Southern Africa, 21% of respondents expect to focus on opportunities in the agriculture/agribusiness sector during the next 12 months.

In West Africa, 74% of respondents expect to focus on opportunities in the agriculture/agribusiness sector during the next 12 months.

Given the importance of the agriculture sector to Africa's economic growth, and investors' apparent enthusiasm regarding the potential for investment in African agriculture/agribusiness in the coming years, it's surprising that the agriculture sector comprises such a limited percentage of M&A transactions occurring in the region.

Key insights from the ATCA sessions

High level discussions centred around:

- The challenges traders are facing and what the solutions are

- Game-changing trends which are disrupting traditional trading models in African existing markets
- The key strategies for developing successful trading in existing and new African markets.
- The success of African trade is tied to the political risk outlook; opportunities need to be balanced with the risk factors and other challenges.

The African Continental Free Trade Area (AfCFTA) will create opportunities to consolidate domestic markets, strengthen regional value chains and enhance export competitiveness. However the main threats to implementation include lack of political will, non-tariff barriers, supply-side constraints, nationalism and protectionism.

Alternative financing is a hot topic, but the consensus is that this form of financing is difficult to find due to lack of visibility. Senior bankers explored structuring as a key enabler of trade finance and using syndication, distribution and credit insurance to enhance trade finance structures.

A key focus area was Value Chain Development – viewpoints were provided on how to achieve formalised, low costs, low-risk access to markets.

Experienced traders also discussed the value–add of Commodity Exchanges and how to increase their impact in Africa. The power of blockchain technology and how decentralised commodity trading for emerging markets will be direct, secure and cost-effective was explored.

The success of Trade Corridors was also explored highlighting why Free Trade Zones (FTZ), Special Economic Zones (SEZ), Industrial Development Zones (IDZ), One-Stop Border Posts, and working with international support, are key to the way forward.

The final session featured country briefings on South Africa, Zimbabwe, Namibia and Nigeria. Country representatives detailed how their countries are 'Open for business' and what is being done to remove barriers, ease regulations, and to provide efficient access.

Investment Discovery Sessions

The Investment Discovery Sessions (IDS), held over the two days, matched accredited investors looking for compelling risk/return profiles with green- and brown-field projects looking to raise capital.

Investors were pre-selected based on their criteria and one-to-one meetings were then set up between project sponsors and potential funders.

The following investment opportunities were presented:

- Expansion of operations for award-winning pig breeder that supplies five leading meat processors. Based in Gauteng Province, South Africa and seeking R27.9 million in debt
- Greenhouse/hydroponic vegetables producer with off takers. Based in Botswana and seeking US$2 million in debt and/or equity
- Emerging maize and livestock producer with agreement to supply flour milling industry. Based in Gauteng Province, South Africa and seeking R12.6 million in debt
- Maize milling and production of value-added breakfast meal for local market, based in the Democratic Republic of Congo and seeking US$21 million in debt
- Established grain producer with off takers and livestock production and services. Based in Gauteng Province, South Africa and seeking R6.5 million in debt
- Establishment of a commercial milling plant with offtake already secured. Based in Lesotho and seeking US$25 million in equity
- Women-owned mixed farming operation of maize for bales and feedstock; livestock production, processing with off takers for all farm services. Based in Gauteng Province, South Africa and seeking R5.5 million in debt
- Expansion of fully irrigated commercial potato farm operation with other cash crops. Based in Sudan and seeking US$17 Million in equity and/or debt
- Expansion for an established operation that breeds and supplies live chicks and products herbs. Based in Gauteng Province, South Africa and seeking R4.5 million in debt.

The 2019 African Agri Investment Indaba will be held on 26 - 27 November. For more information or to find out how to get involved, contact Lauren at lauren.hansen@agricouncil.org

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Criteria for control

Stewardship is vital for the sustainable use of agrochemical products

Crop protection products (CPPs) generally refer to the group of agricultural chemicals called herbicides, fungicides, insecticides, and nematicides. These are biologically active products aimed at controling pests (insects and nematodes), diseases (fungi, bacteria) and weeds in crops.

CPPs are strictly regulated (ACT 36 of 1947) in South Africa. To be used safely and effectively, CPPs must be handled and used in accordance with the manufacturer's recommendations. Otherwise they may be harmful to people, animals and the environment.

Safe, effective CPP forms part of sustainable agriculture, which requires economically viable, environmentally friendly and socially acceptable practises. CPP best practises form part of a good integrated crop management plan (also referred to as good agricultural practises or GAP).

Choice of CPPs

CPPs are formulated to optimise the efficacy, safety and stability of the chemical. Many different formulations exist, but the basics are either liquids and powders or granules. In most cases the formulated products are mixed or diluted with water before use.

Some good product choice practices:

Keep an updated list of products that are registered for the crops you grow.

Ensure that only CPPs registered in South Africa are applied appropriately as recommended on the label

Ensure that only technically trained people are responsible for choosing which plant protection products to use. Competence can be demonstrated via official qualifications or specific training course attendance certificates.

Plant protection residue analysis

If a producer is intending to trade the produce in a market where the maximum residue levels (MRLs) are stricter than those of the country of production, the producer or the producer's customer must be able to demonstrate that these MRLs have been taken into account during the production cycle (i.e., modification where necessary of plant protection product application regime (pre-harvest interval) and the use of residue testing results).

Application is key

Mixability of remedies

Not all remedies can be mixed. Compatibility is indicated on the label under restrictions. Alternatively, contact a certified crop protection agent or CPP supplier. In some instances, two remedies may be mixable in terms of physical compatibility, but their biological mode of action can be affected in the process, rendering both products ineffective.

Never mix remedies in concentrated form; each remedy should be diluted separately before being added to the spray tank. This is especially applicable to wettable powders where it is necessary to make a suspension using a small amount of water before slowly adding it to the spray tank while stirring. Always read the label carefully for mixing instructions.

Water quality

The general guideline is to use clean water of a high quality. This is not always possible, due to water containing too much suspended soil and organic matter, which can adversely affect the efficacy of a product. Hard water containing high levels of calcium and magnesium salts (>500 ppm) can bind with the active ingredients of a product and often reduce efficacy. Adjuvants are available for the correction of water quality to ensure optimum efficacy but should always be applied according to the label.

Spraying equipment

Always consider equipment types, nozzles and droplets, calibration principles and thorough cleaning of the equipment after applications are made.

Spray application equipment is used to deliver the CPP to a target area, usually with water as the carrier. When selecting the equipment and nozzle type, always consider the product's intended use. This information is usually found on the label.

Almost all types of application equipment use nozzles to deliver the CPP accurately. Ensure that the correct nozzle is selected for the intended product. Droplet size is one of the most important aspects of the effectiveness of any application. Droplet size is a function of the pressure and the type of nozzle used.

Advances in adjuvant technology may further enhance droplet deposition through its potential effect on droplet size. Spray nozzle problems typically manifest in changes in the rate of flow. The flow rate will increase as the surface of the orifice and/or internal vane or core begins to deteriorate. Increased flow rates or lower spraying pressures may also result in larger droplet sizes. When spray pattern uniformity is affected, streaks of uncontrolled weeds or the occurrence of pests or diseases typically develop. It is therefore vital to maintain and replace worn nozzles frequently.

Cleaning equipment during the season

Equipment should regularly be flushed with clean water, preferably once a day, to prevent chemical residues drying out on filters and in the nozzles. If changing products, decontaminate the sprayer. Follow label instructions when required. Even very small amounts of some products (eg sulfonylurea and growth-regulator-type herbicides) can damage susceptible crops if the unit is not thoroughly cleaned.

"Weather" to spray or not?

The weather is critical in determining effective CPP application. Farmers must decide whether the application can be made safely and effectively under prevailing weather conditions so as to avoid spraying under conditions that increase the risk of drift. Understanding how weather affects spraying and how it can be monitored can inform the decision-making process.

Consider local forecasts and consult the label for product specifications such as optimal application conditions, drying time, absorption rate and retention time. If conditions become too windy or too hot, or it starts to rain, stop spraying until conditions improve. Temperature, relative humidity, wind and rain can affect effective pesticide application significantly. Adhere to the following guidelines:

- Spray when wind is steady and ideally at 2–15 km/h. Avoid variable or gusty wind conditions.
- Avoid calm conditions – small droplets may remain suspended for long periods.
- Look out for inversion layers.
- Spray when wind blows away from sensitive areas.
- Avoid spraying in temperatures above 28°C.

Safe handling

A few things need to be taken in to consideration regarding safe storage of CPPs. Products must be stored in accordance with local regulations, away from other materials, in a secure location appropriate to the products' required storage temperature conditions. The storage location must be fire-resistant and well ventilated in the case of walk-in storage. Shelving must be made from non-absorbent material and the storage facility must be able to retain or deal with spillage. Access should be limited to workers formally trained to handle CPPs. Liquids must never be stored on shelves above powders. An up-to-date stock inventory or record of use should be readily available.

Handling

All workers who have contact with crop protection products must be subjected voluntarily to annual health checks. The accident procedure must be evident within 10 metres of the CCP storage facilities, which must be able to deal with accidental operator contamination. When mixing CPPs, follow the correct handling and filling procedures as stated on the label.

Empty containers

Re-use of empty CPP containers for purposes other than containing and transporting the identical product must be avoided. Disposal must occur without exposing humans or contaminating the environment. Only official collection and disposal systems must be used; empty containers must be adequately stored, labelled and handled according to the rules of a collection system.

Empty containers must be rinsed either by an integrated pressure-rinsing device used directly on the application equipment or at least three times with water. Empty containers need to be kept secure until disposal. All local regulations regarding disposal or destruction of containers must be observed.

Obsolete products

Obsolete CPPs must be securely maintained and identified and disposed of by authorised or approved channels. Surplus application mix or tank washings should be disposed without compromising food safety and the environment.

Equipment

Any equipment sensitive to food safety and the environment (e.g. fertiliser spreaders, crop protection product sprayers, irrigation systems, equipment used for weighing and temperature control), must be routinely verified and, where applicable, calibrated at least annually. The farmer should be involved in an independent calibration-certification scheme, where available.

Record of application

Record-keeping of all applications is not only required by certification bodies but is also an extremely valuable tool for the farmer to identify possible causes for good or poor control achieved with CPPs. All records must include:

- Crop name and/or variety
- Application location, date and time
- Product trade name, active ingredient and quantity applied
- Operator
- Justification for application (was recommended by a trained and certified professional?)
- Technical authorisation for application
- Application machinery used
- Conditions during application
- Pre-harvest interval

While there is no guarantee against accidents, these best practices will go a long way towards eliminating incidents and minimizing risks should any problems arise.

Marius Boshoff, National Marketing Manager, Villa Crop Protection

Taking a stand

It's time for SA citrus to square up against bullying EU

Justin Chadwick. CEO, Citrus Growers Association (CGA) of Southern Africa

Despite one of the best seasons on record in mitigating the risk of Citrus Black Spot symptoms on fruit arriving at EU borders, the EU seems determined to meet South Africa's best efforts with unflinching bureaucratic coldness.

The Rewe supermarket in Mitte, Berlin – along the banks of the Spree River – has a selection of Stellenbosch wine, chakalaka flavoured chips and baskets of fresh South African oranges. None of which, in the globalised 2018 world, is surprising or out of place. All of which makes it so difficult to accept the European Union's (EU) relentless and equally hardkoppige 26-year campaign to keep those oranges off the shelves – citing something called citrus black spot (CBS).

CBS is the fungal disease that can be transmitted through the movement of infected plant material that has presented an ongoing dispute between SA and the EU, since 1992. And yet despite science refuting the EU's claims that citrus fruit is a "pathway" for CBS transmission – and besides the fact that EU climate is unsuitable for CBS establishment – South Africa has borne the brunt of CBS interceptions for what seems like an interminable time.

Enter South Africa's Citrus Research International (CRI). This formidable network of researchers has developed testing regimes and a comprehensive CBS risk management programme. The results have been nothing less than remarkable. SA exported over 800000 tonnes of citrus to the EU during the 2018 season (up to 40000 containers), yet only two consignments were intercepted with CBS symptoms. In neither of the two intercepted consignments were laboratory tests conducted to determine if the fungus was still viable.

That these consignments were intercepted at all is a case of bureaucracy propped up by bad science – that farmers and workers must bear this consequence is just downright unfair.

SA has shown an enormous capacity to manage CBS over the past four years, even though it does not agree with the EU that CBS poses any threat to the EU. In fact, SA is aligned with the general world scientific view that citrus fruit without leaves is not a pathway for the spread of CBS.

Despite one of the best seasons on record in terms of mitigating the risk of CBS symptoms on fruit arriving at EU borders, the EU seems determined to meet South Africa's best efforts with unflinching bureaucratic coldness. At a meeting in Brussels late last month, the EU's Directorate-General for Health and Food Safety showed no interest in reviewing its position on CBS as a quarantine pest, demanding full compliance and refusing to consider any reasonable requests for relaxation of the excessive and unsustainable protocols governing the pest.

A recent independent study by the highly regarded Bureau for Food and Agricultural Policy institute found that the SA citrus Industry's costs associated with the CBS protocols and proactive measures amount to a staggering R1.86-billion, which is clearly not sustainable. The industry simply cannot afford to continue paying for these measures ad infinitum, especially when there is no good reason for them in the first place.

Furthermore, the CBS protocols also require intensive chemical spraying programmes, which is in conflict with a global move to environmental best practice.

To its credit, the South African government has so far been a valiant defender of the industry against what amounts to the erection of non-tariff barriers to trade. Minister Rob Davies himself has not shied away from this conflict with statements like this one in 2014: "If decisions are taken that keep us out of an important market and have implications for jobs, we will not hesitate to use whatever tools are available in our toolbox to defend our interests in this regard."

We stand four-square behind Minister Davies against the EU's intransigence. Sometimes, it seems that the EU has employed a Stalingrad strategy to continuously wear us down in the hope that we will eventually give up.

But we can't and we won't. We can't give up because it would mean risking the 10000 new jobs created by citrus last year, which means that 120000 people and their families are now dependent on citrus jobs. Not to mention the Citrus Academy which attracts young talent into the industry making it and it's jobs sustainable.

It occurs to me that we are fast reaching a point where South Africa is going to have to take a stronger stand against the increasing bully-boy tactics of the EU. We've tried talking and negotiation and convincing. We need to get tougher in 2019 – 120000 workers and their families need those oranges to stay on the shelves in Berlin.

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

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

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

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

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

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Citrus *PLUS*

Excellent response documented with the use of Potassium Nitrate

Citrus trees are high feeders of both nitrogen (N) and potassium (K), with K being taken up in the largest quantity. What citrus growers strive to achieve are yield increases from more fruit weight per ha, more fruits per tree and larger fruits; quality improvement by increased brix, TSS, acidity, vitamin C, less peel defects, increased peel thickness, reduced granulation and better colour and by reducing crop losses by increasing disease resistance. Potassium nitrate (Ultrasol K Plus[1] and Ultrasol K Plus Acid[2]) has been shown to improve all the above-mentioned parameters.

Fertigation programs including potassium nitrate

It has been well documented in many crops and many soil conditions that the combination of a positive potassium cation (K+) with the negative anion of nitrate (NO3-) act synergistically in the uptake of each. This charge combination maintains the electrochemical balance within the roots and the plant. Since both the elements of N and K are used by citrus in the greatest quantities, this combination is highly beneficial in fertigation programs. The presence of nitrates in a nutrient solution also directly proportionately limits the uptake of excess chlorides. Other important aspects of maximizing nitrate-nitrogen, as opposed to the positive cation of ammonium-nitrogen (NH4+) or urea nutrition (converts to ammonium), are maintaining an optimal pH close to the roots as well as reducing the antagonistic uptake between the positive charge of ammonium and the other positive charge cations such as Ca2+ and Mg2+ too. Therefore, using potassium nitrate to maximize the supply of negatively charged nitrates is the ideal way of optimizing K+ uptake, N uptake as well as the uptake of the other cations, Ca2+ and Mg2+, into the trees. Greater plant dry weight reflected in the wood and the fruit (yield and quality) is always the result.

Foliar applications with Potassium Nitrate alone or in combination[3]

Foliar applications are required in conditions where there is a recognized need. This could be in times of peak demand and/or poor rooting conditions resulting from nutrient imbalances, nutrient fixing, salinity, cold, waterlogging, drought, incorrect fertilizer applications and root diseases.

Fruit set, or prevention of fruit drop, is the greatest factor influencing yield. Flowering and fruit set are periods of high nutrient demand and often fruit set occurs when soil temperatures are low. Foliar potassium nitrate applications in combination with auxins in Nova, Valencia and Shamouti have been shown to improve fruit set and soluble solids, increase fruit size, weight, yield and decrease split fruit. In Nules and in Valencias, potassium nitrate applications have shown increased fruit set, increased TSS, increased fruit yield and gross income.

Potassium nitrate has been shown to increase a citrus tree's disease resistance. Attack severity is reduced by restricting the pathogen's food supply and by promoting the formation of disease inhibitory compounds such as phenols, phytoalexins, and auxins. This limits pathogen establishment and spreading within a plant.

Potassium nitrate is the preferred N and K source in citrus nutrition often resulting in optimum K and N uptake, stronger healthier plants, better set and fruit yields, increased fruit size, less rind issues, better colour intensity, increased disease resistance and enhanced stress tolerance such as drought, frost and salinity. For both fertigation and foliar applications, consult your agronomist regarding rates and timing of applications.

[1] Reg No K5020 Act 36/1947. Registration holder Sociedad Quimica y Minera (Africa) (Pty)Ltd
[2] Reg No K6489 Act 36/1947. Registration holder Sociedad Quimica y Minera(Africa) (Pty)Ltd
[3] All claims in this article can be substantiated with references which can be made available on request.

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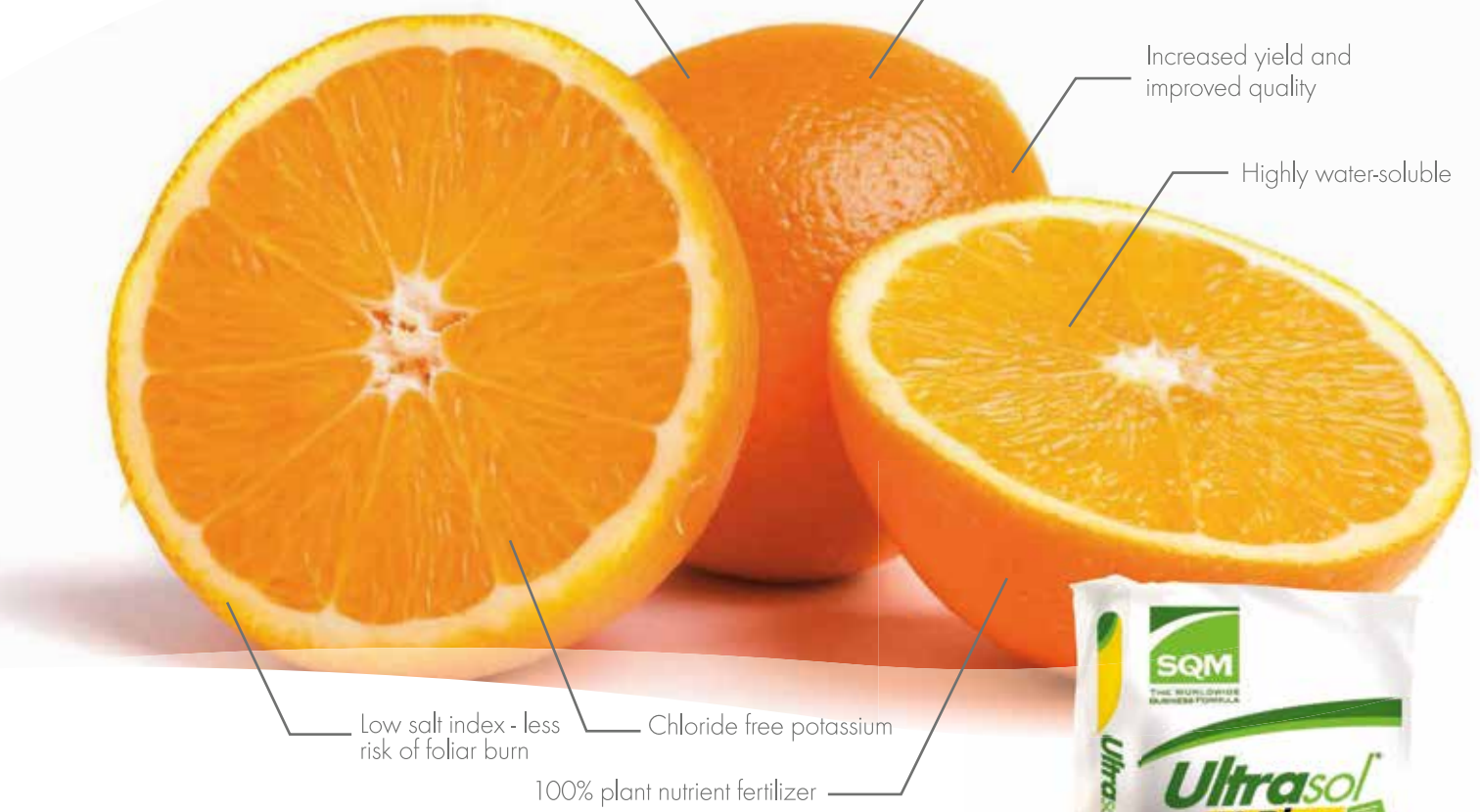

Spray Ultrasol® K Plus after fruit set to boost tree potassium at the critical time to increase size and quality.

Sprays are known to:

- Increase **rind thickness** and **reduce skin creasing** and cracking ✔
- Increase **organic acid** and **TSS content** to enhance taste ✔
- Increase **vitamin C** content ✔

Sprays after fruit set ensure sufficiency of potassium for fruit growth and development, when potassium demand is exceptionally high.

Spraying Ultrasol® K Plus on your citrus trees is a wise investment!
Consult your local agronomist for advice concerning rate and frequency of application.

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Contact Details:
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A better crop drop by drop

The benefits of drip irrigation in citrus

Due to the ongoing water shortage and the need for improved production, the use of drip irrigation in orchards is increasing at a rapid pace. Citrus crops can withstand drought stress better than other subtropical trees and thus have lower water requirements. That said, it is important to choose the correct irrigation system for your specific crop. Citrus crops require an approach which includes the application of fertilizers through the irrigation system, and the controlling of water and mineral availability. With drip irrigation there is quite a variety of dripper pipe choices available, and it is important to keep certain factors in mind, such as climate (water requirements), soil type, topography (flat or steep), the nature of your water source, etc. Drip irrigation needs a high level of management with well-trained employees. With effective Irrigation scheduling, water can be given accurately and timeously to the crop to ensure increased crop yields.

Micro sprinklers or drip?

Let's take one of our clients as an example. They are farming in the Swartland District between Malmesbury and Moorreesburg against the slopes of the mountains. They've done a couple of trials including micro sprinklers and drip irrigation and found that drip is a better fit. With the micro sprinklers they had a huge problem with water running away and the roots not receiving sufficient water to enable optimal growth. With the decision made, they've started off with a heavy-duty compensating dripper which is ideal for the steep uphill environment. Our technical advisor Johan Kemp recommended the use of a Vered 2.3 litre per hour dripper with a spacing of 0.75m, using only one line on the ground next to the young trees. In the second year, another line was added on the other side of the trees to ensure sufficient water.

Depending on your water source, there is always a chance of emitter clogging and therefore your irrigation system needs a good filtration system. In our example above, the client decided to use a Filtomat M100 automatic hydraulic filter with a self-cleaning mechanism and a 130 micron screen, which is sufficient for their filtration needs. They make use of water coming from the mountain and borehole water as well as water drawn from the Bergrivier River. When making use of drip irrigation, it is very important to pay careful attention to filtration. When this is done correctly, your irrigation system will require less maintenance.

With the drip irrigation system, an automated high-tech fertigation system was installed, which enables the crop to be fertilized with every irrigation session on a daily basis.

The farmers could also make use of block valves to assist with the opening, closing and pressure regulation of the irrigation system. The block valves can be controlled via wired or wireless options.

Our friendly, fully qualified technical advisors at Agriplas will gladly assist you with your irrigation needs, whether it be irrigation, filtration, fertigation or automation.

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At the point of sale

Citrus packaging for the 21st century

A manufacturer of advanced products since its inception in Spain in 1953, Daumar is a vertically integrated company that makes machines that are used in many phases of produce packaging. It makes sorting and counting machines as well as those that produce knitted netting, which is also used to package fruit and produce.

Now South African citrus producers can benefit from the company's wide range of citrus-friendly bagging machines, from semi-automatic to fully automatic, from basic to the most technologically advanced packaging system in the market.

Daumar's product range includes weighing machines, bagging machines, auxiliary equipment, knitted netting, extruded netting, printed labels and other accessories.

Known worldwide for design quality and innovation, Daumar has taken its recognized expertise in engineering to the forefront of the fruit and vegetable packaging sector. Daumar is a global supplier that provides efficient engineering with reliable service and support.

Daumar are the manufacturers of the world class CB 148 automatic welding machine, which produces the hi-tech D-pack bags.

This machine can be combined with a range of NEWTEC weighers, and minimal overweight giveaway can be combined with a production speed of 32 bags a minute, from 0.5kg to 5kg. The horizontal frame ensures gentle handling of delicate fruits.

The CB 148 supports the CEA-55 as a proprietary transfer printer. It prints on a thermo-adhesive label that gets applied to the D-Pack as it is being made. This allows the printing of print bar-codes, bag weight and any other bag traceability codes necessary on a per bag basis.

Maintenance is by remote ethernet port and users can expect minimal downtime.

The D-Pack is the result of DAUMAR's investment in research and development in fresh produce packaging.

The D-Pack is an attractive package and has an ergonomic "easy to grab and carry" handle, and also a large area for promotional information.

These beautifully finished, strong, stable bags utilize film widths from 75 mm to 158 mm wide and support two labeling options, namely, direct thermal transfer and thermo-adhesive sticker.

This stylish and practical package offers premium advertising opportunities and is available with knitted or extruded net.

Full colour printing is available for front or front and back.

Fruit packed in this packaging can command a premium price and is simple to use and easy to carry.

D-Pack stands out as having a large promotional band using a minimum of materials, giving it greater point-of-sale value.

Goldpack are the sole agents for Daumar machinery in South Africa.

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XCELL ROOTSTIM

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Reg. no.: K10668 (Act 36 of 1947)

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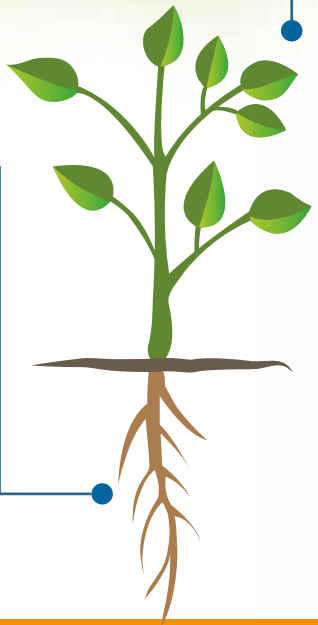

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Government and Agri partner for innovation

New paperless system saves South Africa's fruit export sector R250m

After a successful pilot and implementation by Department of Agriculture, Forestry and Fisheries (DAFF), the roll-out of a new e-Certification IT platform to the fruit industry in 2019 will save the industry at least R250 million over the next five years.

The e-Certification platform, which could be used by other agricultural sectors in the future, will deliver official export documentation to trading partners in electronic form and replace all paper equivalents. Governments exchange documentation as a means to certify that consignments of agricultural products meet the importing country's sanitary and phytosanitary rules. Electronic phytosanitary certificates (e-Phytos) for citrus were delivered to the Netherlands as part of the pilot exercise.

In 2013, the citrus industry began working on an IT platform to capture, store and report all relevant data that is necessary for certification, known as PhytClean. Paul Hardman of the Citrus Growers Association (CGA) developed Phytclean to improve efficiencies, reduce errors and cut down time and costs involved in the issuing of certificates to South African citrus growers.

The success of the PhytClean system was seen when European Union (EU) compliance requirements for False Coddling Moth (FCM) came into force from 1 January 2018. FCM is a pest affecting some agricultural products, including the citrus industry, and it requires special management to maintain market access. For citrus these requirements were entirely managed on Phytclean during 2018 to support this R18 billion citrus market.

South Africa's fruit export market is valued at R30 billion and the adoption of Phytclean by the agricultural fruit export sector will see a saving of R250 million over the next five years through improved efficiency, minimising errors (human and systemic) and reducing processing time.

PhytClean has been adopted by other fruit sectors since 2016 and became a Fruit South Africa (FSA) initiative. Then in March 2018 DAFF approached FSA to extend the functionality of PhytClean and build the e-Certification aspects so that the entire certification process is paperless. Both these platforms are being developed by FSA for DAFF, who now owns them.

The export process of fresh fruit is highly complex and subject to the application of highly technical handling and shipping procedures, taking into account that the product is highly perishable and required to be:

- compliant with quality standards by importing countries,
- safe for human consumption,
- compliant with various special market- and permit market access restrictions and phytosanitary protocols, and
- packed, presented, stored and transported according to variable specifications.

PhytClean has more than 3000 users registered from fruit sectors including citrus, apple, pear, peach, nectarine, table grape and pomegranate. Growers, packhouses, exporters and supply chain service providers are all connected to the system.

Paul Hardman, Project Manager of the e-Certification Project Team at CGA and FSA, said, "Phytclean has proven to be tremendously effective in improving supply chain efficiencies and being able to show that we are compliant at each step, so our growers are very happy to be using it. E-Certification now takes this to the next level where DAFF processes can be redesigned to be paperless and become more efficient"

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Showcasing SA fruit

Unveiling new fruit cultivars in Germany

Africa's premier science institution, the Agricultural Research Council (ARC), will for the first time have its own stand at the annual international trade fair for fruit and vegetable marketing, the 2019 Fruit Logistica, in Berlin, Germany, from 6-8 February to present its new fruit cultivars.

Funded by the Department of Trade and Industry (the dti), the ARC will be part of a South African delegation of fruit producers from across the country who will showcase South African produce to international markets.

The institution's stand at the expo presents the ARC with an opportunity to engage with new and non-traditional markets and partners and is an ideal platform to market its newest set of cultivars. Seven different cultivars will be unveiled and are ripe for commercialization in collaboration with partners. The ARC will also highlight its expertise to produce leading quality material that competes and is highly sought-after globally.

The presentation of this new set of fruit cultivars comes on the back of another successful launch last year of the popular Joy-Bell table grapes. The launch of these newest fruit cultivars is another feather in the cap of the ARC that is leading the global agricultural response to changing climatic conditions. The cultivars being unveiled in Berlin have been bred in response to different climatic conditions. This is also an opportunity to display South African fruit products and technologies and their ability to withstand harsh climatic conditions.

One of the objectives of the ARC is to grow and develop the agricultural sector that creates new markets, employment, and business opportunities and positively contributes to South Africa's National Developmental Plan. This is an opportunity to collaborate with the international agricultural community and entice young people to study agriculture and mitigate the global challenge of hunger and malnutrition.

The ARC's participation in the Berlin exhibition is also viewed in the light of the institution keeping abreast of global trends and positioning South Africa as a preferred destination for agricultural investment and agri-tourism. The agriculture sector faces enormous investment challenges especially in the much-needed area of research. The expo presents an opportunity for the sector to collaborate with international agricultural sector partners and players and to share the expertise.

About the ARC's fruit cultivar breeding programmes

The citrus cultivar-breeding programme, which was started in 1974, is mainly focused on breeding high-quality mandarins and niche market cultivars. The ARC's Tropical and Sub-tropical Campus in Nelspruit, Mpumalanga province is the base of the breeding programme, which is the only citrus breeding programme in South Africa.

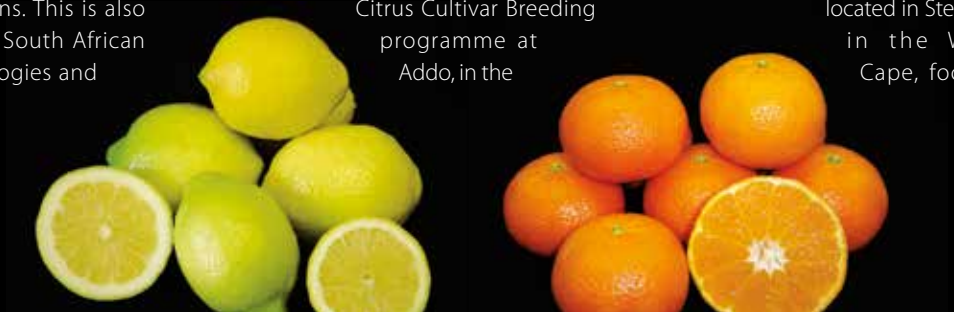
The objective of the Citrus Cultivar Breeding programme at Addo, in the Eastern Cape, is to develop improved citrus scion cultivars for cooler climates. The ARC has been focusing mainly on high quality mandarins and niche market cultivars. We have also been looking to develop seedless, easy-peel fruit with excellent internal and external quality, in appearance and flavour. The goal is fruit that ripens at a time when there is an opening in the market, such as selections that mature very early or late in the season.

Recently released citrus cultivars, which will be unveiled in Berlin by the ARC-Tropical and Sub-tropical Campus' citrus breeding programme through commercialisation agent, are:

- Eureka! Seedless LemonTM – the first and only commercial lemon variety to have a consistent zero seed content.
- ARCCIT1614' (Valley Gold) – a late maturing mandarin, selected for its attractive appearance and excellent flavour.
- ARCCIT1519' (African Sunset) – a late maturing mandarin, selected for its attractive appearance and excellent flavour.
- Sonet – an early maturing mandarin, which was selected for its excellent fruit quality and time of ripening.

ARC Nadorcott – a low seeded variety of Nadorcott (trade name – Clemengold), containing less seed than the commercial Nadorcott (Clemengold).

The ARC Infruitec-Nietvoorbij Campus, located in Stellenbosch in the Western Cape, focuses on



deciduous fruit, grape vines, alternative crops and indigenous herbal teas. The Campus also focuses on fruit and wine production and is the custodian of grapevine, deciduous fruit and wine yeast gene banks that preserve genetic resources for breeding purposes, training and comparative descriptions. It also boasts a Sterile Insect Technique Programme.

Recently released cultivars, which will be presented in Berlin by the ARC Infruitec-Nietvoorbij Campus breeding programme through commercialisation agents, are:

- Cheeky® – a red blush pear variety marketed and commercialized by Culdevco (Pty) Limited.
- Rosemarie – an attractive smooth-skinned pear with slight blush and good eating quality.

Breeding is a long-term project that requires dedication and commitment. Phase 1 can consist of a term of 7-10 years from the time the cross is made to the first fruit that is evaluated. Promising selections are then taken into Phase 2 where the trees are multiplied and evaluated for three seasons from the time they start bearing. Only after this Phase 2 evaluation can a selection be considered for release as a potential new cultivar. On average, this is a 15-20 year journey from the making of the cross until the release of a new cultivar.

The famished road

Nutrition in the Southern African context

There are serious nutritional challenges in South Africa: huge increases in obesity, problems contingent with changes in diet as rural people move to cities, and early childhood malnutrition, to name a few. A special report on obesity published in South Africa by Lancet in 2011 reported that rapid urbanisation of black people has led to the consuming of more processed, sugar- and salt-laden food. But little work has been done on the links between urbanization, obesity and malnutrition in South Africa.

The number of obese and overweight South African adolescents increased by more than 20% between 2002 and 2008. An added complication to the nutrition debate is the country's high level of HIV infection – nearly three million people were receiving therapy in 2014. Researchers in the United States found increasing obesity among HIV-positive patients taking anti-retroviral drugs.

The paradox of both under-nutrition and over-nutrition exists in South Africa. At national level, more than half of the female population is either overweight or obese, while millions of children suffer from under-nutrition. South Africa's 2016 General Household Survey shows 7.4 million people reported experiencing hunger. Although the SA government supplies a support grant to children of unemployed people, usually the money goes to feeding a whole family. As a result, many families survive on cheap energy-dense starchy foods such as maize meal, cooking oil and potatoes which have no nutritional benefits when consumed on their own in excess.

Childhood malnutrition starts early in life in Africa, with the first two years being the most

vulnerable period. Chronic malnutrition (stunting) is a bigger problem than endemic acute malnutrition. At national level, 33.3% of South Africa's pre-school children are Vitamin A deficient, 21.4% are anaemic and 5% suffer from iron-deficiency anaemia.

Population

South Africa's population consists of five races. The African population of around 43 million is subdivided into eleven ethnic identities. There is a vibrant Indian population of around one and a quarter million, while more than two million mixed-race people who are indigenous to South Africa live mainly in the Cape. White South Africans number around four and a half million, many of whom can trace their descent to the European settlement in the Cape in 1652. The original Cape inhabitants – the San people – inhabited the southern tip of Africa for millennia, according to some historians. Thus eating habits, nutrition, stunting, starvation, obesity and diverse food production levels are part and parcel of a divergent food and nutrition landscape.

Only 35 000 South African commercial farmers provide food for more than 53 million people: one SA farmer feeds 1540 people. French farmers number around 490 000 in a population of 67m: one farmer for 136 people. In Germany, with a population of 82 million and 374 500 farming operations (including forestry and fishing), one farmer feeds 218 people.

Only around 12% of SA's land is arable, and the country has less than the world average annual rainfall. This rainfall is sometimes erratic, and drought is a sword of Damocles that hangs over South African farming. Yet until a few years ago, the country was a net exporter of food, one of only six in the world.

The quality of South Africa's agricultural produce is excellent, but it doesn't reach everyone. South Africa has diverse populations groups and standards of living. The first world sits in juxtaposition with the third world, a situation unique on the planet. Infrastructure is uneven, and food cannot be economically transported to the far corners of the country. Strategies must be developed by the government to ensure that rural black people receive enough nutrition, but this is difficult given that millions live on subsistence agricultural plots.

More than 4000 productive farms were transferred to black people during the SA government's land redistribution programme but 99% of these went out of production due mainly to lack of support for the new farmers. These farms were handed over to communities with no managerial structures in place, and many of these recipients knew nothing about modern commercial farming and were not supported with backup from the government. They were unable to maintain commercial productivity for various reasons, one being that productive farming in South Africa relies heavily on a high degree of technological input.

Thus nutritional production was the first casualty of this handover, and still is to a great extent. There were too many people on one piece of land. Third-world farming traditions were unable to maintain a modern farm in production.

Scenario

This erratic scenario is not limited to South Africa. In Kenya, scientists found that

iron-deficiency anaemia is one of the most common health problems today. In Kenya alone more than 50% of the population suffers from this deficiency. Folic acid is also a nutrient deficiency and women who have low intakes of folic acid are at increased risk of having an infant with neural tube defects.

After the first six months of life, the first solid food babies in Africa receive is a starchy staple such as yams or cassava. Plain porridge made from cereals and tuber flour, though commonly used, is not sufficiently rich in energy. It lacks proteins and essential vitamins.

Thus Africa and South Africa are faced with drastically different social-cultural and economic environments, and the food consumed is not the same throughout the country, as it would be in other more homogenous parts of the world. Most Africans do not eat enough fruit: most rely on one or two staple crops. This uneven situation has significant effect on family nutritional well-being. Cultural influences affect attitudes towards some foods, such as pork.

Urbanization has greatly influenced African feeding habits but not always to their benefit. There is a high consumption of processed foods and snacks, and these "snack" foods have been found to have a high proportion of fat, starch and sugar content.

These new feeding habits have brought a number of life-threatening nutritional disorders to Africa, and especially to South Africa. These include obesity, hypertension, diabetes mellitus, cancer and cardiovascular disorders.

South Africa is now experiencing an obesity epidemic and health issues associated with this are overloading South Africa's health system. Africa is the region in the world where diabetes is growing fastest. Type 2 diabetes used to be an adult condition and now it is not uncommon to see it in 15-year-olds.

To counteract this severe nutritional health problem, South Africa introduced a sugar tax on 1 April 2018. The level was fixed at 2,1 cents per gram of sugar for each gram above 4g per 100ml of sweetened beverage. The levy excluded fruit juices. The World Health Organisation announced its strong support for the sugary beverages tax.

Twin challenges

South Africa has twin malnutrition challenges: hunger and obesity. Many South Africans go hungry every day, at the same time as obesity rates are rising. This is unsurprising – both are forms of malnutrition and tend to go together. The coexistence of poverty and obesity is a global phenomenon.

Poverty leads to food deprivation and under-nutrition, and research suggests that under-nutrition in early life may play a role in promoting adult obesity. In 2014, over 10 million South Africans, nearly 20% of the country's population, reported having inadequate food access.

The SA government and NGOs have tried to promote urban and semi-rural food gardens producing vegetables but it is an uphill battle as people tend to eat the traditional food of their forefathers. Too little fruit and vegetables are consumed in South Africa within the black population.

School feeding schemes have had mixed results. Government policies in this regard mean well but there have been serious challenges. The current policy provides only a small amount of food to help relieve child hunger, and there are a number of problems:

Although specific food is allocated, many children only receive "cold" food such as a sandwich and some milkshake supplement. It appears that the children don't receive all the food that is allocated.

Parents talk of food disappearing from schools and in some cases there has been corruption and theft by people providing the food.

In many cases there is no system of accountability to the parent body. Food distribution is haphazard – parents are not sure what food is distributed and whether it is distributed fairly.

Schools do not always operate properly, closing half way through the morning or not opening at all. During the rainy season roads in rural areas become impassable, meaning the bread truck cannot get through to make deliveries. The milkshakes require water and many schools do not have potable water supplies.

It is clear therefore that proper nutrition for everyone in South and Southern Africa remains out of reach, with serious operational and policy challenges. These are acknowledged however, and many are working seriously towards the goal of nutrition for everyone at the southern tip of the African continent.

Bennie van Zyl, General Manager, TAU SA

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Uncompromising service

Tzaneen pruning firm cuts no corners

Founded by Tommie Schoeman in 2008, Trim Cut celebrated ten years in business in 2018. "I grew up in Tzaneen on the family farm and sawmill, gaining exceptional knowledge about fauna and flora from my dad and grandfather," says Schoeman. "The knowledge of trees they gave me played a big role in my successful pruning business. I started with a single Allcut pruning machine and with a lot of hard work and effort, quickly grew into a small, yet efficient company."

Based in Tzaneen, Trim Cut also operates in Limpopo, Mpumalanga, Northern Kwa-Zulu Natal and the Eastern Cape. "We specialize in orchard pruning," says Schoeman. "Today we have everything from mechanical skirting and pruning machines to cherry pickers as well as selective hand pruning teams, which is becoming more popular every season."

In 2012, Israeli family business Afron offered Schoeman its agency for sub-Saharan Africa. "It is a wonderful range of products, including mechanical pruners, cherry pickers, date harvesters and pollinators as well as hydraulically driven loppers and chainsaws. Afron has more than 60 years of experience in machine building and takes pride in delivering exceptional quality products, just as we take pride in our excellent service and well trained staff.

The Trim Cut mission

- **To prune, remove and chip all branches within three weeks after pruning a certain orchid.**
- To offer the best service and prices without compromising on quality.
- To maximise reliability of our equipment.
- To increase pruning productivity to the highest standards.
- To find pruning solutions for all customers' pruning problems.
- To become the preferred company in agricultural contracting.
- To encourage employees to realize their full potential and actively improve themselves.

The business of drought

Extraordinary circumstances justify support for farmers

Recently Agri SA published the results of a drought survey which highlighted projected job losses of 31 000 and an estimated R7 billion in damages, among other serious concerns. The South African agricultural industry is yet again struggling with a drought which is placing enormous strain on agriculture's financial systems.

The question, however, is whether the everyday business person understands the implication of a drought. To illustrate, a small comparison between agriculture and a normal business has been drawn. Let's start at the beginning.

Return on investment

Large capital investment is needed to start an agricultural business. Stock and machinery is expensive: a combine costs more than an Austin Martin Vantage. However, the challenge lies within the risk component. If a businessman starts a new business, a financial statement is reviewed, potential and target markets are analysed, and sales projection is developed, just to name a few. With all this information, a reasonable return on investment (ROI) can be calculated. In agriculture, one can use long-term average yields, develop cash flows and enterprise budgets to calculate ROI , but the chances of realising those fixtures are slim, due to climate dependence. The truth is, over and above the start-up funds, an average grain farmer needs to finance R14 million in order to produce his commodity – every season – without knowing what the outcome is going to be. Thus, everything can be planned and prepared with pinpoint accuracy and according to the book, but if it does not rain, there will limited or absolutely no sales.

In the business environment, following a month of below-normal or bad sales, the business can regroup and implement new plans, generally in the form of increased marketing spending, cost-cutting measures, stock reduction or launching specials to increase sales and move towards break-even. In industries such as grain production, the businessman only has one opportunity in a production year! If that opportunity is not realised, they are left with very little room for new plans. Thus, there is only one opportunity within a year to obtain an income. Yes, grain producers do diversify, but if the enterprise comprises a combination of livestock and grain, drought will affect both divisions. In fact, the cost of feeding livestock skyrockets when natural grazing has been depleted due to the drought.

Grain producers can experience two types of drought. In the first case, sufficient rain falls for the producer to plant, but later in the season there is no follow-up rain. This will result in producers obtaining a yield – albeit below average – and a partial income. Then there is a drought similar to this season where, due to a lack of rain, producers struggled to plant and in several areas, could not plant at all. There will be no

crop and no income for the producer for the rest of the year. Compare this scenario to a business enterprise not having clients for a year, resulting in zero sales. In spite of this, costs still have to be covered. Fixed costs, repayment on equipment, labour costs, insurance costs, electricity, just to name a few – easily adding up to 30% of total costs.

Price and the economy

Commodity prices are mainly determined by an international market. The international market currently has high stock levels resulting in low prices. Current prices can be compared to similar levels dating back 10 years. Thus, output prices have not followed normal inflation, while input costs have increased occasionally by more than inflation. In order to survive, grain producers are required to operate in a constant state of super efficiency and optimisation. A drought does nothing to assist in this instance. In a business enterprise, prices can be increased to test market absorption of these increases, which can at times provide a solution. I, for one, cannot name a lot of products that have remained at the same price levels since 2009.

The last few years have been a real agricultural rollercoaster with three out five years being dry. As a result, all reserves and various credit methods are now depleted. Typically, one would say that a producer can produce himself out of trouble in the next few seasons, but this implies higher supplies and lower prices (10-year low prices). Given the low international prices, it is extremely difficult to recover from a drought!

Keep in mind that agriculture plays a critical role in the economy, more specifically within the inflation figures. If food inflation increases, it can influence overall inflation, up to the point where if severe enough, it can even affect the homeowner through increased interest rates. Over and above regular food prices and food security, agriculture can also have an effect on the economy. This is clearly seen in rural areas, where the multiplier effect is estimated at 4:1, whereby a decrease of R1 in agriculture causes a R4 decrease in the rural economy.

Bail out

In reviewing the South African economy, if there is a problem with an industry which affects the public, a bail-out guarantee is offered towards that entity. A few of these come to mind, most notably South African Airways and Eskom. These bail-outs have yielded very limited results. Agriculture now needs help, and I am confident that agriculture can recuperate. There is historical evidence to prove this. Agriculture is in high need of support to survive this bad season and stay in production.

In reviewing all of the above mentioned, it is evident that agriculture is a risky business – and not for the faint hearted. How do these producers survive? They survive because they are among the best in the world, have an undying passion for what they do, and above all, they have faith. These producers need a boost in order to assist the entire economy.

Dr Dirk Strydom
Courtesy of Grain SA

Sweet sorghum

Establishing the case for a potential biofuel feedstock

The rising cost of fossil fuels and the associated increase in greenhouse gas emissions has of late resulted in an increase in the adoption of biofuel crops as alternative renewable and sustainable energy sources. Some countries have not only made the blending of petrol with bio-ethanol mandatory but provide subsidies for using biofuels. Biofuels are not new to South Africa, which used bio-ethanol derived from sugarcane in petrol between the 1920s and 1960s before the policy was dropped due to low international crude oil prices. However, of late, there has been worldwide growth in the bio-energy industry due to calls for environmentally-friendly energy sources to reduce global warming.

In this regard, in 2007 the South African government drew up the Biofuels Industry Strategy, which sought to focus initially on a short-term five-year pilot programme to achieve a 2% penetration of biofuels into the national liquid fuel supply. The strategy targeted production of biofuel feedstocks in the former homelands where 14% of arable land is under-utilized. Recently, the Department of Science and Technology's (DST) Bio-Economy Strategy identified agriculture as the industry which currently has the highest economic impact of the three sectors identified as crucial elements of the bio-economy. This strategy document emphasized that the emerging biofuels industry will rely heavily on the agricultural sector for low-cost, low-maintenance energy crops such as sweet-stem sorghum, sugar beet, triticale and some species of grass, cultivated exclusively for biofuel production. Use of these non-food feedstocks, particularly sweet sorghum, is of paramount importance as it prevents a potential food-biofuel conflict.

Sorghum characteristics

Sweet sorghum (Sorghum bicolor (L.) Moench) has become a very important crop due to its high potential for use as a biofuel feedstock. Sweet sorghum is a fast growing, tropical C4 crop with juicy stalks rich in sugars from which ethanol can be produced more cheaply than from starchy crops like maize. It has become a leading candidate crop for bioenergy purposes due to its versatility, yield potential and growth characteristics. The crop has lower agronomic requirements than other sugar crops such as cane or beet. For instance, it is well adapted for dryland production, has a short growing period, high water use efficiency and high biomass production. As a biofuel feedstock its advantages include superior quality of ethanol with less sulphur and high octane and lack of competition between biofuel and food purposes.

Sustainable production

The anticipated increase in production, particularly in the former homelands, may present several challenges. For instance, apart from small-scale farmers being sceptical about venturing into biofuel crop production, the possible effects of intensive biofuel crop production on soil resources are still poorly understood. This is particularly important since many soils in the former homelands are highly susceptible to soil degradation. Incidentally, gains made in terms of carbon sequestration may be offset by the negative impacts on the soil due to intensification of production and land use change. Uncertainty on possible effects of intensification of production also arises from lack of knowledge on sweet sorghum management and recent breeding history. This is primarily because its development is still far behind that of maize, sugarcane or sugar beet.

It is generally agreed that annual biofuel crops may deplete soil organic matter and nutrients, causing soil erosion and soil pollution through associated direct and indirect land use change. Intensifying biofuel crop production on marginal or idle soils will also intensify demands for sustainable production systems. Appropriate agronomic management practices that enhance crop productivity must therefore be established. To achieve this, the ARC is conducting research aimed at developing sweet sorghum cropping systems that improve soil quality, C sequestration and N cycling through enhanced nutrient management, crop rotation, tillage and residue management. Funded by the National Research Foundation, the project is being implemented at the University of Fort Hare research farm and at Cala near Queenstown in the Eastern Cape.

Opportunities for smallholder farmers

According to the DST, the emerging biofuels industry will rely profoundly on the agricultural sector for low-cost, low-maintenance energy crops such as sweet sorghum, cultivated exclusively for biofuel production. Targeting production in the former homelands presents smallholder farmers in these areas with an excellent opportunity to enter into the bio-economy. This will not only introduce them to new income streams (i.e. biofuel crop production) but improve their soils, since appropriate cropping systems that are environmentally and economically sustainable will be established for them.

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Strengthening the rural economy

Agritourism initiatives deserve the support of all South Africans

A slightly warped view of the life of a farmer and those who live in rural areas exists in South Africa largely because communication has often been one-sided, reflecting the views of journalists who live in cities.

In October, I took my two 15-year-old girls and my mother on a journey into rural South Africa to meet farmers and to see the many towns that were in a state of decay because of poverty and unemployment. Rural towns are a true reflection on the state of health of any nation.

The FAO 2018 report released by the United Nations recently shows a significant increase in employment due to migration to urban centres, compared to those people who continued to live in rural areas. A total of 40% of rural dwellers who were employed in 2008 became economically inactive or unemployed in 2014, compared to only 21% who had chosen to migrate to cities. Quite clearly, rural development policies have not worked.

As we drove through some of the areas worst hit by the drought, we learnt about how valuable water truly is to communities and to farmers.The vision in our minds were of the waste of water in cities, for example, those who fill up their swimming pools with drinking water reminded us of how we had taken for granted not only water, but a regular supply of fresh food.

The first overnight stop was on a small holding near Ladismith which in the 1960s had been a thriving community with its own railway station, school, shops, and other amenities. The collapse of this town was caused when the railways did not repair the track after a flash flood which washed away part of the railway track. The railway track can still be seen, but without the railways bringing in supplies of food, the community dwindled, and Ladismith is now a ghost town.

The following day, we drove through the rural towns of Amalienstein and Zoar, mission stations from the 1800s where communities still live today. As we drove through the town, we saw many of its inhabitants sitting in the streets in the morning, when most people in towns would be at work.

We arrived late in the afternoon at an ostrich and sheep farm, owned by the Jonker family. Although they are still farming, they explained that many farmers in the Oudtshoorn valley were turning their farms into agritourism destinations. Several hiking and mountain biking trails had been developed on the farm for visitors seeking adventure in the great outdoors. Numerous events are held on the farm to bring in additional income.

We left the following morning to drive through the magnificent Kamannassie valley with its old farm houses, some of which were empty, but there were still farmers who were continuing to farm different types of fruit. One could see the poverty, despite the natural beauty of the valley. We stayed that night on a farm outside De Rust, where a very fit woman farmer, Maggie aged 75, took the girls hiking up the mountains behind her farm to see the natural waterfall, leaving the girls in her dust as she clambered over rocks. The girls then helped her feed the lambs, put the sheep in their pens and lay down the irrigation pipes for the next day. The girls were quite clearly exhausted when they arrived at the farm accommodation cottages, but not Maggie. She went home to bake home-made bread which she then brought up to the cottage.

Over the six days we had several different agritourism experiences, all of which were unique because the farmers had different approaches to their guests. All were very hospitable and generous, opening up their homes to guests. What impressed us above all was the employment opportunities they were creating for women on their farms, who had not been able to earn an income before.

Farmers that we visited all understood that diversification was necessary and that they had a duty to assist in keeping local communities actively employed. If for no other reason, this is why all South Africans should support our farmers with their agritourism initiatives.

At the end of the day, South Africa as a country, benefits from having farmers who care about providing food, employment and keeping rural South Africa economically active.

Jacqui Taylor, Founder and Managing Director, Agritourism South Africa

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No quick fix

Without intensive training and meticulous planning, land reform will end badly

Financial exclusion is a global problem with over 1 billion having no access to formal financial systems. But what does 'formal financial system exclusion' mean exactly? If people are choosing to hide their money under the mattress rather than bank it, it is perhaps understandable. Many governments have used socialist arguments to seize control of banks. This never goes well, and people lose their savings and investments. The banks are then very poorly run, bank staff are laid off or don't get paid, and the institution ends up closing, at least to public access.

This is likely the way forward for South Africa in the long term since the government has taken serious steps to end private ownership of land. Recent developments may seem like a benign concession intended to help the poor, but history has shown over the past 200 and more years that these government policies always leave the poor in a worse off position. Government officials' greed knows no bounds in such situations. Access to citizens' banking system is a massive risk, and it is inevitably next on the agenda once land expropriation has been perpetrated.

The people of Russia and other Slavic nations, and many African nations struggle to this day because of these exact types of policies. Recently, Venezuela has tried to warn South Africans not to proceed with land expropriation because it leads to economic hardships, but politicians are about to get access to our land, and there seems to be nothing we can do to stop them. If they can change our Constitution once in this way, we can expect that politicians with divisive agendas will continue to do so, and we are on a road to losing more of our hard-won rights.

In 2009, Venezuela began what South Africa is doing now, land grabs, but Venezuela's situation only got worse and in a very short time. One problem Venezuela had at the outset was that it imported food rather than producing enough. It was believed that by getting land into government hands, it could then be given to the poor who would then grow more food. This sounds good in theory, but in practice, it is disastrous for many reasons.

Venezuela soon began buying even more food into the country than before. This sounds a lot like what has happened in Zimbabwe. Those with knowledge of history and foresight are worried about what is about to happen in South Africa. Experts even now feel that Venezuela is too far gone and a 'lost cause'. Its poor are starving, and its labour skills have been drained as thousands have immigrated.

Among the reasons why Venezuela failed in this endeavour was poor planning and decision-making. Farming is a complex, labour-intensive, and often highly specialised affair. If you have ever lived on a farm you will know this. It's not a matter of sending cows off to graze in a meadow and milk flows abundantly, or of throwing seeds on the ground and returning a few months later to reap piles of food. Profitable or sustainablefarming requires day and night vigilance, careful planning, intensive monitoring, and quick action at times to save cattle and crops. It often requires enormous investment which will not see a return for years, sometimes even decades, or it develops into very unfortunate and painful losses despite best efforts put in.

But the idea people have is that land access is a quick fix. Land somehow equates to wealth. This is not true. So much depends on what land and how it is cared for. Some land is not being used because it is unsuitable for farming, and thus people incorrectly think it is going to waste. Some is protected for wildlife – which we need far more than we think (for example, where do bees come from to pollinate our crops?).

Being given land, even with buildings on it, can even become a major burden. South Africa needs to do much more than simply give away land. We must very carefully prepare, select, train, and equip the right people to farm. Otherwise it will be disastrous. Not everyone is suited to the demands of farming or similar endeavours. We have a large urban population (65%) who is not actually keen on making a living that way.

Farming can certainly bring prosperity, but for some, it feels like a curse. In the UK, for example, some people have inherited large estates which have been in the family for generations, but it becomes a massive burden. They cannot sustain it, so they abandon it. Likewise, in many cases where people have won lavish homes, they cannot pay the electricity, water and taxes on the house and it also becomes a greater burden than their previous situation. Why not just sell it then? It's not so simple. There isn't always a market for it, and some laws bind a family to a property. Moving to a farm also makes great demands on individual families, sometimes ending in divorce as well as child labour.

This is not to say that poor people shouldn't be helped, including with land ownership. But we must be smart about it and ensure it is not a sunken investment which leaves South Africans worse off. Start-up funding and skills are just as important, probably more so, than land ownership. It is more important that people be trained and that any endeavour be meticulously planned with the help of experts. Will this happen?

Corruption also happened in the case of Venezuela by favouring candidates for land ownership who were politically aligned and had some sway over voters. This only perpetuates the exclusion of the poor and is likely to happen in South Africa too.

Venezuela was once the wealthiest nation on the South American continent. South Africa is also the wealthiest and most advanced nation in Africa. But this may not last. Land expropriation has greater negative consequences than we people want to believe. Venezuelans soon found themselves queuing for six hours a day to get food.

In the coming years, we could slip down to being one of the poorest nations in Africa, importing food at high prices, with unbearable inflation. The poor just surviving on handouts from richer nations, and a massive brain drain the like of which we have never seen before, leaving us bereft of enough people who can try to clean up the mess. This does, however, leave some politicians in a very powerful and comfy position. A poor, hungry nation depending on food rations and without skills is easily controlled. This is a long-term political strategy which has worked very well for governments in the past. This all may sound quite foreign to some. Not in South Africa, that won't happen…

A colleague of mine out-sourced some work to a man from Kenya a while ago. When it came time to pay him, he sent an urgent email asking not to be paid yet. The bank he was with had just been seized by the government, supposedly for 'national interests'. He could not access his account and the branches were closed. His savings were out of reach including the money he put away for his children's school fees. What could he do? The money was paid into a friend's bank account and immediately withdrawn. A relatively small amount to try keep the family going until the next job came along.

If we think we as South Africans are somehow above such things, we are far too overconfident or naïve. What is perhaps most sad about this situation is that no independent banks means that we cannot conduct international trade. Online businesses will not be able to operate in such an environment. EFT payments are impossible, let alone forex trade, and what will we revert to? Cash and cheques perhaps, or some say cryptocurrencies like Bitcoin, which are not particularly safe options. The Internet has been opening up many opportunities for the unemployed youth, and we are giving those away before they really have a chance to establish themselves.

Devan Moonsamy, CEO, ICHAF Training Institute, a Seta-approved training and development company.

Minimum wage

What employers and employees need to know

On 27 November, President Cyril Ramaphosa signed the National Minimum Wage Act. This was a significant moment for workers, because while certain vulnerable employees in, for example, the farming, hospitality and domestic work sectors have had sector-specific minimum wage standards, this is the first time that a universal minimum wage is a reality in South Africa.

We answer a few important questions about the new Act.

1. What is the national minimum wage in terms of the Act?

The Act provides that the minimum wage will be determined regularly by the Minister of Labour. The Minister has determined that the initial minimum wage is set at R20 per hour. Based on that hourly rate and the Basic Conditions of Employment Act, the weekly and monthly wage can be calculated on the ordinary hours of work of an employee. For full-time employees, that means no more than 45 hours a week (before overtime kicks in) and sets the minimum wage at R900 a week.

Part-time workers must be paid at no less than R20 per hour, provided that a worker cannot be paid for fewer than four hours in

a day worked. So if you only worked for two hours on a certain day, you must be paid for four hours for that day, or at least R80.

2. To whom does the Act apply?

The Act applies to all workers in South Africa, except for employees of the National Defence Force, the National Intelligence Agency and the South African Secret Service, and volunteers. But there are also important exceptions for three other groups of workers who have their own minimum wage standard: farm workers, domestic workers and people employed on the expanded public works programmes of government. These workers remain on lower minimum wage standards. Farm workers are now entitled to a minimum hourly wage of R18, domestic workers to R15 an hour and expanded works employees to R11 an hour.

The Act also sets minimum standards for people who are on learnerships and who have entered into agreements with an employer to provide them training as an intern or learner for a certain amount of time. Based on the level of the learnership in terms of the National Qualifications Framework, the Act sets minimum weekly allowances for such learners.

3. What is included in the wage?

The minimum wage of R20 an hour is what a worker must receive in cash. It cannot include benefits such as transport, meals or accommodation allowances unless the Minister makes a determination that such benefits may be included in the minimum wage for a specific group of workers. The minimum wage can also not include any tips or bonuses a worker receives.

4. Can an employer and employee agree to a lesser wage?

No. The Act specifically says that the minimum wage cannot be waived through a contract or collective agreement. If you sign a contract that says that you are willing to receive less than the minimum wage, that contract doesn't change your employer's obligation to pay the minimum wage.

5. Can any employer be exempted from paying the minimum wage?

Yes. Employers can apply for an exemption for a specific period of time, but it cannot be for longer than a year. It is not clear on what basis such exemptions will be granted yet, as the Minister must still make regulations to clarify when an exemption may be granted.

6. What happens to an employer who pays below the minimum wage?

The National Minimum Wage Act does not say anything about the penalties for not paying minimum wage, but the amendment to the Basic Conditions of Employment Act that was also signed into law recently says an employer must be fined for not paying minimum wage.

The fine for a first time offence may be either double the value of the underpayment or double the employee's monthly wage, whichever is more. For any further offence, the employer may be fined three times the value of the underpayment or the employee's minimum wage, again whichever is the bigger amount. Also, the Department of Labour must publish the names of employers who have had compliance orders against them.

The Minister must still publish guidelines to help with the determination of these fines.

7. How will the minimum wage be determined in future?

The Act creates a National Minimum Wage Commission made up of equal representatives from business, labour, "organised community" and independent experts. The Commission must review the minimum wage every year and determine whether it is having the desired effect on the alleviation of poverty and the reduction of inequality in wages taking into account inflation, the cost of living, productivity and the impact it is having on employers, among other things. The Commission must write a report to the Minister and the President every year based on their consideration of these factors and must also include the views of the public in their report.

The Minister must determine the adjustment to the minimum wage amount every year based on this report.

The Act provides, however, that the first review of the new minimum wage must only happen after two years (on 1 January 2021).

8. What else should workers know?

The Act provides that the minimum wage must be captured in employment contracts. Going forward, workers must therefore ensure that their employment contracts specifically include reference to the Minimum Wage Act and the minimum hourly wage requirements.

9. When does the new minimum wage come into effect?

The President has announced that the Act and the new minimum wage will come into effect on 1 January 2019.

Wilmien Wicomb
This article first appeared on groundup.org.za

Upping the game

Ford's Wildtrak redefines the bakkie

Lately, more and more Ford Ranger Wildtraks have been spotted on South Africa roads. The reason for that is simple: this new-generation bakkie is an irresistible combination of appearance, performance, and intelligence that is calculated to appeal to the modern, tech-savvy farmer.

Gone are the days when a bakkie was just a humble work-horse – it has become a noble steed, a veritable thoroughbred with a unique combination of ruggedness and good looks. The Wildtrak is one of the most eye-catching vehicles on the road at the moment, thanks to its imposing size, impeccable lines, new front-end styling, and exclusive colours, including that very special Pride Orange.

The leather-trimmed interior is nothing short of luxurious and extremely comfortable, while featuring some very up-to-date and useful technology. Ford's Sync3 infotainment system with eight-inch touchscreen includes navigation, and you can sync your smartphone with the system.

Safety comes first, and the Wildtrak truly impresses with some incredibly intelligent features. The radar-based safety system, which is unique to South Africa, includes adaptive cruise control and lane keep assist, warning you of lane departures and possible collisions while keeping a pre-defined following distance in traffic. If the vehicle is straying from its lane, vibration in the steering wheel gives you an alert; if you don't respond, the system uses steering torque to guide the vehicle back into its lane.

Further safety features include a tyre pressure monitoring system that alerts you when tyre pressure is too low, an electronic stability program with roll-over mitigation and trailer sway control to help you keep control in adverse conditions, and a driver impairment monitor that uses the forward-facing camera and on-board sensors to detect if you are nodding off.

Under the hood, Ford's famous 3.2-litre five-cylinder Duratorq turbodiesel, with six-speed automatic gearbox, provides the muscle – but it's an incredibly quiet and smooth driving experience, thanks to a fuel injection system that dampens the diesel racket and an updated turbocharger. Quite simply, the Wildtrak is great fun to drive.

If you want to go offroad, the Wildtrak 4x4 will take you there without missing a beat, thanks to the robust electronically controlled transfer case, 800 mm water-wading capability and 230 mm ground clearance. A dial between the two front seats initiates the part-time four-wheel-drive system, while a dash button activates the rear differential lock.

In short, if you're looking for style, comfort, intelligence and performance at the truly competitive price of R624000, the Ford Ranger Wildtrak will take some beating.

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High or low volume spraying?

Recover the maximum active ingredient on the target

The focus into improving biological efficacy of agrochemicals by improving application techniques and apparatus has never been more intense.

Risking over-simplification, there seem to be primarily two schools of thought that need to be considered:

- Improving biological efficacy by increasing application volumes.
- Improving biological efficacy by reducing application volumes and increasing chemical concentrates.

It is imperative to understand that neither of the above is intrinsically "right" or "wrong". What is important is to understand which strategy would be beneficial to the biological outcome in which circumstance.

Circumstances favouring increased application volumes

Applications where the "active ingredient" has no or very little chemical activity

Winter and summer oil applications (with no second active with a chemical activity for controlling the first instar larvae) for Red Scale. In this approach the functionality of the oil is physically to suffocate the dormant Red Scale. The principle is simple – although it is possible to drown in a cup, it is much more probable to drown in the sea! In this case – more free water/oil gushed into the target area will have a better chance of control, naturally at great expense and huge negative impact on the environment.

Winter oil sprays to break the rest cycle have the actual objective to "wake up the tree by strangling it momentarily" and also require the bark to be drenched.

Applications where chemical activity is the driver

Insect vectors hiding behind bark and/or protected by their own natural structures can pose a virtual impossible situation to get active ingredient into their environment to affect them. Again, this category requires drenching the environment in a quest to achieve contact.

The above applications are not technically spraying operations, but rather drenching, and have very little built-in science, achieving high levels of coverage by the mixture, but very little chemical recovery. This constitutes a huge amount of waste and environmental contamination, at tremendous cost to the producer. It should be restricted to the minimum.

Low volume, high concentrate

The science of effective application of agrochemicals has the sole purpose of optimizing the recovery of active ingredient on the target area. The proper distribution uniformity on the target and throughout the total target area is of equal importance.

This has been shown in numerous recent (2009-2015) trials to be far better achieved by a reduced volume and a pro-rata increased concentrate to keep the active per hectare constant. This has been demonstrated in Vineyard, Apples and Citrus through independent research*.

The reason is simple: A certain surface area will only be able to "carry" a certain amount of atomized solution before run-off will commence. At that point we have exited spraying and entered drenching.

What about product registrations for low-volume spraying?

Very few chemical registrations refer to a specific water volume per hectare – generally the amount of active is specified per hectare or per 100 litres of water.

Thereafter it is left open for interpretation. Phrases like "full cover spray" are used, and this supposedly indicates that the active ingredient should be recovered and retained over the entire surface to have the desired effect. In a case of a product that has a chemical function, e.g. a preventative spray against Black Spot, with copper as active ingredient, this means that control depends on the presence of copper.

The worst recovery and retention will be achieved with the highest volumes, resulting in the worst outcome – poor control, early re-infection, increased risk of resistance and gross environmental contamination.

On the other hand, if the "full cover spray" is used in context with an oil application against dormant Red Scale, where physical suffocation is the objective, the drench application will necessarily require large volumes per hectare for the desired result.

Tank mixes

It is clear from the distinction between spraying and drenching for different purposes that it is important not to use two contrasting chemical in one tank mix! If the oil spray requires high volumes for drenching and low copper compound volumes at higher concentrates for maximum recovery, they cannot be mixed.

In conclusion: merely reading product labels without understanding the difference between recovery (spraying) and coverage (drenching) applications might mislead one into choosing a non-optimal route.

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

**If you are interested in this research, please send an email request to: mariusr@rovicleers.co.za*

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