

Technical Symposium 2015



Bracing bitterly cold winter weather almost 400 producers, technical advisers, researchers and various stakeholders in the deciduous fruit industry gathered in June for the annual HORTGRO Science Technical Symposium that was held at Allée Bleue Conference Centre near Franschhoek, and also included field days in Ceres and Worcester.

This symposium kept to the theme of *Embracing the Future* with our international robotics expert, Prof. Salah Sukkarieh, from Sydney University, and APAL Director, Kevin Sanders - sharing their futuristic vision of agriculture.

Mercia Isaacs, Vito Rugani and Prof. David Venter inspired delegates with their stories and wisdom. Other hot topics were transformation and land reform, the growth of the African market, the importance of nursery tree quality, smart farms, plant-improvement, the realities around American Foulbrood and the invading fruit fly, while stem cankers and trellis systems were also put in the spotlight.

Journey with us through the symposium highlights. The HORTGRO Science team hopes to see everyone next year at the Technical Symposium 2016.

The Girl who dreamed Big



Chairperson Mercia Isaacs takes great pleasure and pride in how the Vuya Foundation is influencing the lives of people in the Cape Winelands and the Witzenberg region. She isn't after all called the "woman of steel with a heart of gold" for nothing.

The Foundation is funded through among others the Vuya Investments company of which Isaacs is also executive chair. The Oppie Koppie Kindergarten in Prince Alfred Hamlet is but one of many such examples of its involvement. The crèche opened in 2010 thanks to a partnership between the Witzenberg Municipality, the Vuya! Foundation and Henkel Germany. It was designed by German architectural students, and provides a dedicated space of learning and development for around 80 children from nearby farms who are between 3 and 6 years old.

"There are many children with potential, who need to beat the odds in South Africa," she stressed in the opening address of the HORTGRO Science technical symposium. "We need to nurture talent."

Isaacs' own story started not far from where the symposium was held at Allée Bleue in Simondium. She grew up as the daughter of a farm school principal who believed that the most important thing was that children should learn.

She wrote matric in 1969. As part of the Class of 1973 she qualified from the Dr Lapa Munnik School of Radiology as one of the first black radiographers in South Africa. When her engineer-husband Samuel fell ill in 1978, Isaacs took over the family business SMI Electrical. She has since grown the company into one of the biggest woman-owned businesses in the country, and has pioneered many firsts.

In 1997, she became the first woman to be awarded a then highly politicised electrical contract at Saldanha Steel. She was the first woman to chair the Western Cape Tender Board and also ABSA Western Cape, the first deputy chair of the Western Cape Gambling Board and the first black women to sit on the KWV board. She has been featured in *Finweek* and her business acumen has been acknowledged through the Lebone Woman of the Year award.

She joined the broadbased women's empowerment company Vuya Investments in 2004, which has investments in among others Henkel South Africa, TUV Rheinland and Drake & Scull.



Mercia with her mother and sister at their Simondium home – circa 1950's.

"If you do things right, you align yourself right for the big price," shared Isaacs. "I believe in the power of miracles."

Despite all her achievements, she still regards her children as her biggest success story. Samuel Jnr is a medical doctor with his sights set on becoming a plastic surgeon, while Joshua is in marketing and communications. "This is what makes mothers tick – no money can buy that!"

She reminded those attending the symposium that the survival of the local industry hinges strongly on the development, empowerment and education of farm workers, especially women and their children. "Transformation in this industry is about doing the basics right, and it is not rocket science," Isaacs stressed.

“Given a chance in life, any little girl from Simondium can dream big and become what she wants to be,” she reiterated.

Business masterclass ala Mercia Isaacs:

- Leadership comes from the heart. It should be flexible, transformational, sincere and driven by integrity.
- Leaders should not be takers but caretakers.
- Leaders must be concerned about the whole and not just about themselves.
- Take ownership of the people who work for you, and become involved in their challenges, their families and communities.
- Education is the only salvation. Investment in childhood development and adult education is crucial to develop an intellectual base and a nation of lifelong learners.
- Women bring very different aspects to business as nurturers, inclusive carers, coaches and change agents.

“Walking away from a deal is also a deal.” – Mercia Isaacs

Opening the Closing Window

Land reform represents a rapidly closing window of opportunity – are you going to be an initiator or victim?

This was the hard-hitting message from Prof. David Venter, international negotiations and communications expert at the HORTGRO Science Technical Symposium 2015.

Prof. Venter, who worked abroad for many years, said that when he had the opportunity to accept foreign citizenship he declined it, because “he is and will always be, proudly South African”.

“I have lectured and travelled all over the world. I can assure you that the human material in South Africa is the same as anywhere else in the world. But we have tragically wasted our human resources. To the detriment of this country, we have ignored the role that women and certain cultural groups can play.”

Successful, developed countries share the common denominator that agriculture has been the basis of their economies, said Venter. “Those countries that achieved high performance - did so because they took care of agriculture.”

Venter urged growers to “wake up and start paying attention”.

“The land reform time bomb is real and it is ticking. You always have a choice in life. You can sit back and let things be done to you, or you can take action and make things happen for you. If you are going to wait for the government to initiate actions – that will be messy – you will wait forever. It is far better to take control of one’s own life.”

Owning land in the country of your birth is the strongest form of belonging that anyone can have, Venter said. “Land ownership is an emotive issue that defies rationality. It completes who you are. We have to recognise these emotions that are intrinsic to all South Africans, and deal with them.”

In South Africa land distribution has been tainted by the legacy of colonialism and a misguided ideology, he said. “The 1994 negotiations left two issues unattended. The one was the question of open-ended affirmative action and the other is land reform. These two issues were going to be dealt with some time down the line. It was wrong! And we are suffering today because of those decisions.”

“The white population is dwindling – making up less than 9% of our population and yet the government chooses to chase ghosts. Our children are abroad and we have a desperate shortage of skills, yet politicians still force us to look at our society through a prism of colour. Emotions unleashed around the topic of land reform increases racial tension in this country daily like never before. It is a slippery slope and heaven knows where it will deposit us.”

In 2009 about 40 000 farming units covered 60% of South Africa, and a third of this was in the arid Northern Cape. In fact, only 13% of the land is classified as arable. 67% of commercial agricultural land in SA is considered ‘white-owned’.

The absence of a coherent vision, policy or commitment to deal with national land reform has now spawned fertile soil for populists and politicians to exploit, said Venter. “Everyone involved, including the government, acts in self-interest. The time for bargaining has gone – it is a rubbish approach anyway.

“We have to set aside futile and destructive self-interest reasoning. Success lies in cooperation and the creation of partnerships. We have to value the others’ position and bring that to the equation. Learn to work together, create a new framework for yourself and do not accept the one that government wants to force on you.”

Venter urged growers to think differently. “Innovative, fair and equitable self-generated solutions are urgently needed, because the issues at stake are bigger than you and me. We need responsible land reform to ensure food security, sustainable use of land and water and the upliftment of the poor. Agriculture today is an intensive science requiring a high quality of knowledge and commitment. By not taking care of agriculture we are endangering our food safety in this country.”

Venter said that failure to urgently attend to land reform could undo all the gains we have miraculously achieved since 1994. “Nelson Mandela spent 27 years in prison for a non-racial, non-sexist ideal. This will destroy his legacy.”

He told growers that they have to take a position: rather proactive than the current reactive. “I encourage you to explore different tenure models; identify land available for sale; identify best suited black farmers; develop innovative financing models; establish mentorship and shared resource models.”

Venter concluded with: “If an egg is broken by an outside force, life ends. If it is broken by an inside force, life begins. Great things always begin from the inside.

“The famous National Geographic photographer William James said: ‘Belief creates the actual fact. If you believe it you will see it’. I ask you to believe that you can unlock land reform in such a way that it will be beneficial for everyone in this country.”



Prof. David Venter.



Research & Development – Australian Style

The journey of the Australian apple industry was by no means smooth sailing. It takes courage and a strong conviction to change course. You have to focus on a goal.

This was one of the lessons, Kevin Sanders, Deputy Chair Apple and Pear Australia Ltd. (APAL) shared with delegates at the HORTGRO Science Technical Symposium 2015 on how they turned the Australian apple industry into a world class player.

Sanders, a.k.a The Colonel, said that he is first and foremost an apple grower, but has been an active member of the Research, Development and Extension Committee (RDEC) of APAL since the 1980's. After travelling and visiting other orchardists and researchers all over the world, he realised something had to be done to make the industry more competitive.

"If you want to bring about change you can't just talk about it. You have to do something."

One of their biggest challenges was to identify who would be joining the journey and who would not. "We needed team players with a national viewpoint, who could set aside conflicts of interest."

He quoted Jim Collins, management guru and author of Good to Great:

"Start by getting the right people on the bus, the wrong people off the bus, and the right people in the right seats. And stick with that discipline—first the people, then the direction - no matter how dire the circumstances."

As part of their action plan the RDEC recognised the urgency to upskill, adopted a world view in terms of gathering research actively engaging researchers from abroad, and "jumped on the M9 rootstock train".

According to Sanders there was a lot of background debate on all levels in the industry. "Everybody chipped in - local, regional and national. We realised that this battle could only

be won if we could increase our growers' knowledge. We had to win them over with scientific facts that made sense to them."

From this period of turmoil followed the birth of the Future Orchards™ (FO) concept in 2004. "It was exciting times, but by no means was the battle won. We had only fired the opening salvos. We created an engagement team to bring the FO programme to growers. This team visited eight regions every year, during winter, spring and at harvest time.

We had to overcome the fear of the growers. We did this by pointing out falsehoods and instead brought them evidence that was real."

According to Sanders, they experienced great resistance from consultants who feared they would be losing their clients and saw the endeavour as competition.

We stayed focussed by turning the orchards into classrooms, placing the emphasize on rootstocks, tree density and structure, giving financial overviews showing growers overall profit versus orchard profitability.

In our Future Orchards™ we focused on everything. Pest and disease – sharing knowledge not products; we had sprayer demonstrations on the farms, pollination, post-harvest seminars, cool-storage techniques and products and we imagined changes.

The programme was supported by online extension material like webinar's, weekly posts, online material of every orchard walk, seminars in print format and weekly fruit growth charts on the web.

"We had an integrated approach and used all possible resources to bring the message across and combat misinformation.

The Aussie industry is still aiming to improve further and take production to the next level.

"We have co-opted the nursery industry as our partners, will further increase our knowledge base; set clear expectations; and will try out a range of modern rootstocks. One of our exciting endeavours is our new research in the PIPS™ programme.

"Focus on the end product. And work relentlessly towards it," he said.

Kevin's View on Tree Crop Innovations

As a grower we are first and foremost businessmen - we sell "fruit" not leaves, said Kevin Sanders, APAL Director during his second session at the HORTGRO Science Technical Symposium.

Sanders said that there are reality checks for growers, like most high prices come in the first 20 years of a new variety; poor nursery trees cost the industry 5% of yield and 80% of pest and disease lives on new growing shoots and leaves. "Some of us are in it for the "money" not the lifestyle," he said.

Sanders who farms 42 ha of apples with his two brothers, Peter and Robert, on the family farm in the Yarra Valley, Victoria, grows, stores, packs and sells all their own fruit.



The Sanders family: Peter, Robert, Kevin and their father, Hugh, who passed away recently.

We intend to harvest 5700 – 7000 bins annually. What is unique about their farm, says Sanders is that they grow all their own trees and pre-size all fruit prior to storage. Sanders said that over the last 40 years their journey had been full of “different points” along the way, but it is still an ongoing journey.

“We have evolved from a 6 m by 6 m tree to the sophisticated V-trellis shape that we now prefer, but in between we tried many different things, and always kept our options open.”

The problems with earlier orchard systems, said Sanders, were:

- Large branches led to inefficient fruiting wood
- Leading to lower early yields
- Higher skill requirement – as there are more detailed work
- It was difficult to harvest - mixed maturity
- Resulting in poor financial returns

“The reality is that poor tree shape leads to maturity and colour variation,” Sanders said. During a trip to Europe in 1999 he identified new orchard models for consideration. In Europe they focused on:

- New training systems / designs
- Dwarfing rootstocks
- Planting densities
- Light management
- Labour efficiency
- Pest and disease controls

At the farm-without-a-name near Three Bridges, it was time for change. Sanders said they planned everything meticulously and asked themselves where do we want to be in 20 years’ time?

Initially, in 2003, the new design they opted for looked like this:



The 2003 design.

- 3 m tall
- M26 rootstock
- 4 m x 0.75 m x 0.5 m
- 3300 trees/ha
- Ave 80 t/ha by year 5

This innovation was followed by the 2010 super narrow canopy for better light distribution.

- 4 m tall
- V-Trellis
- 4 m X 0.6 m X 0.5 m
- M9 rootstock
- 4200 trees/ha
- cumulative tonnage 200 t/ha by year 5



Super canopy with better light interception.

“It’s all about fruit quality and what you want your end-product to look like,” he said. Sanders had the following message for the South African industry:

- Use the correct rootstocks
- Higher densities is the way to go
- Better preparation at planting time
- Shorten time from planting to full cropping from 8 years to 5 years
- Improve fruit quality
- Lowering pest and disease pressure is possible
- The major thing to remember is that we harvest light. The more light we harvest the more carbohydrates we can convert.
- The giant V-Trellis is, within apples, the most efficient system available to harvest light in current canopy management systems.

Lastly, Sanders fired a farewell shot:
“Remember if you don’t do something tomorrow about what you heard today you will never change.”

Robot Man

As a boy Salah Sukkarieh wanted to work on Formula 1 cars. Instead, this 42-year old spends his days tinkering with robots and drones. Not a bad Plan B, if ever there was one!

Salah is professor of robotics and intelligent systems at the University of Sydney. As director of research and innovation at the Australian Centre for Field Robotics, he is part of the world's leading (and largest) group developing robots and intelligent systems to use outdoors. These can operate around the clock to solve various problems in the agricultural, mining, aviation, aerospace, military, education and environmental management sectors.



Last year he received a New South Wales Science and Engineering Award for Excellence. As a sign of how his technology is increasingly embraced by “smart farms” in his motherland, he was also named the Australian Vegetable Industry’s Researcher of the Year.

The use of drones in the South African agricultural sector is not new. However, some of the ideas he presented at the annual HORTGRO Science technical symposium was the stuff of mere dreams (and sci-fi movies) to many participants. Attendees were mesmerised by the many YouTube video he showed.

And who wouldn’t be, if you saw a clip of a two-wheeled robot herding runaway cattle? Or one that correctly IDs weeds and sprays them precisely, row after tedious row. Imagine all the workers in an orchard wearing Google Glass-type technology that shows them what to prune or which fruit to pick, thanks to smart sensors having done all the background information gathering first. Picture an adjustable solar-powered automatic vegetable picker resembling a giant ladybird, or being able to calculate yield quite precisely. Imagine pilotless robotic aircraft that can ID and spray invasive weeds in remote locations. Or a robot that laser scans each blossom and each apple in every row for precision crop adjustment and

yield estimates (in this case, actually yield determination) while also measuring soil water and leaf health.

These are just some of the advances his team works on – and that's just in the agricultural sector. On a grand scale they are now establishing an autonomous mine operation for Rio Tinto in Western Australia. In Brisbane they developed an automated berth where ships are loaded and unloaded 24/7 only by robotic devices. "People are notoriously bad drivers, and the savings on fuel alone is substantial," Salah explained.

Solving problems

He sees robotics and intelligent systems as being about solving problems. It's about getting the job done better, safer and more cost-effectively. It about taking the tedium out of chores that people is expected to do.

With the help of different types of sensors these devices perceive and understand their environment. They make informed decisions about any actions required and then carry them out, all without direct human input.

"When we provide new sets of information that wasn't there before, it changes things, and challenges how people do things," he adds.

"It can be challenging, but it is definitely exciting," the man explains his work, which seems to be all bells and whistles but entails a lot of engineering, flow charts and algorithms.

His group breaks new ground daily. One senses that the solving of problems is where the fun lies for Salah. Once solved, he gladly lets someone else sort out issues relating to commercialisation, patenting, licensing and marketing.

Student years

So how does one become a world leader in field robotics?

"I always enjoyed pulling things apart," Salah remembers. "If electronic things broke around the house, I pulled them apart. I knew I couldn't fix them but wanted to learn what was going on inside."

In his last year of school his father bought him a four cylinder car engine. "Every weekend I tinkered away," he reminisces.

When he headed off to the University of Sydney in the early 1990s, it was the natural thing for someone with his interests to go into engineering. It helped that he also liked computer programming.

Salah's plan was to do mechanical engineering and to work on Formula 1 cars. However, one of his professors interested him in a mechatronics degree, which combines mechanical and electronic engineering. At the end of his final year the same professor again changed the course of his life. The professor had just received a car from the Australian automaker Holden.

"He asked if I wanted to automate it for my PhD, because he knew I had a thing for cars," Salah fondly remembers. "It sounded cool."

He was juggling the idea of either working for an aerospace company in the UK or for NASA. Cars won, and he started on his PhD in 1997 as one of five members of the University of Sydney's new field robotics team. A brief stint in the UK aerospace industry followed, before returning to his alma mater to work on drone technology.

Family life

This father of four daughters actively develops their sense of visualisation and technical skills by teaching them to read and interpret maps, and how to draw three dimensional shapes. His daughters, aged between 7 and 13, also do some coding.

"I'm not trying to teach them to become computer scientists," he stresses, "but it is going to be a tool that's going to be quite important when they are older."

More about Salah:

- Supervised over 20 research fellows, graduated over 30 PhDs, five Masters and 60 Honours students.
- Author of over 300 academic and industry papers.
- On the editorial boards of the *Journal of Field Robotics*, the *Journal of Autonomous Robots*, and *Transactions of Aerospace Systems*.
- Visit <http://sydney.edu.au/engineering/people/salah.sukkarieh>



‘Carrot King’ strikes a balance

Practice ergonomic balance to avoid the inevitable addiction to cheap labour. Get this balance right between the costs involved in maintaining machinery and remunerating people to ensure high wage levels together with affordable labour costs.

These were some of the lessons that Vito Rugani distilled to attendees of the HORTGRO Science technical symposium. Together with Vincent Sequira, he is co-owner of Greenways Farms, the largest carrot producer in Africa.

The duo started their business in the early 1990s. The initial 20 ha venture has since expanded to include 2500 ha of land being irrigated in Limpopo, Gauteng and the Free State. Carrots are cultivated on 850 ha. A strict three-year rotation cycle is followed to ensure sustainability.



Things have not been without its ups and downs. Rugani told how in the early days Sequira walked in to the office, ready to quit. “We are just working to pay everyone’s salary,” he said miserably.

They were growing 25 different types of vegetable, managed a big labour force and had an annual staff turnover of 25%. “Training was difficult to do, wages were shamefully low and we battled to attract quality people,” Rugani remembers. “Working hours were unacceptable, there was no surplus to speak of and we faced bankruptcy.”

“Our wage bill was 35% of our turnover, and we thought it was normal,” remembers Rugani, who holds a degree in Agricultural Economics from the University of Pretoria.

Before making any drastic decisions about the future of the business, the duo went on an extended fact finding mission to Australia. There they found out how much farmers were able to do with the right machinery at hand. A big eye-opener was the mountains of broccoli they saw on one farm, all of which were harvested without anyone being physically involved in the cutting process.

They learnt that mechanisation improves productivity and reduces working hours. It empowers employers to pay higher wages and to in the process provide dignity to their workforce through improved working conditions and higher salaries.

“We came back with the realisation that we wanted to invest in machinery and the productivity of staff, and to marry man and machine,” he remembers. “It’s about making people productive, and making your day productive.”

To afford their plans, 40% of the business was sold to two silent partners. When things were on the up, they were bought out again.

“Don’t purchase machines in order to lay off people, but use them to make your staff more productive and grow your business,” Rugani advised.

“In South Africa it’s simply far too easy to just appoint some more people when a job gets too big,” says Rugani, who believes the many low wage earners who contribute to an unacceptably high wage bill is a big problem.

Striking a balance

Since 2001 Greenways Farm achieves ergonomic balance. Its wage bill is 12% of turnover, and repair costs stand at 13%. After paying for must-have’s such as seed, chemicals, packing material, fuel and road tolls, the business has a surplus of at least 25% left.

“This surplus is used among others for bond repayments, capital expansions and dividend pay-outs, to replace old equipment and for research and development,” he mentioned.

Rugani calculates that staff productivity has increased thirtyfold since 1995, and average wages eightfold. Staff turnover is below 1% per annum. “We now attract the best quality people in the labour market and each individual adds for more to the business than in the past,” he told the audience.

About Greenways Farms

- It was home to the first carrot juice factory in Africa.
- It produces 40% of all 1st grade carrots in Southern Africa
- Its whole crop is sold on spot markets under its own brand.
- There’s a 1 Megawatt biogas plant on the farm.

To find out more about how to strike an ergonomic balance in agribusiness, Google Vito Rugani’s July 2014 article in the journal *The International Food and AgriBusiness Management Review*. <http://issuu.com/ifama/docs/v17ib?e=2449599/8452535> page 145.

“A worker’s responsibility is to give his employer an honest day’s work, but it will always remain the employer’s responsibility to empower his labour to be productive! Failure to do so is in breach of the unspoken covenant between employer and employee, and this will always result in the collapse of the workplace as we know it.” – Vito Rugani



Hugh Campbell, HORTGRO Science General Manager, Vito Rugani, Mercia Isaacs and Prof. David Venter at the symposium.



Stephen Rabe, HORTGRO Science Advisory Council Chairman, thanks Prof. Salah Sukkarieh for his talk.

Land reform initiative brings hope.

A radical land reform initiative, tipped to create 12 000 new jobs, with a training college, housing, community and educational projects has come to fruition in the Western Cape.

The Witzenberg Partnership (Witzenberg PALS) is a clear example of reconciliation in agriculture, said Gerrit van Vuuren, PALS Project Manager and Ceres attorney - who is also hoping that this initiative will serve as a model for land reform for the rest of the country.

“South Africa belongs to all who live here, but it has a history of inequality and human rights abuse. We cannot deny our history and the damage it has done,” he said.

The Witzenberg PALS initiative came about through numerous meetings, phone calls and e-mails from agri-producers from Ceres, Koue Bokkeveld, Witzenberg Valley, Tulbagh, Wolseley, Breërivier, Ceres and the Karoo.

“We had to eradicate many decades of mistrust and slash stereotypes about each other and agriculture in general,” said Van Vuuren. Eventually agreement was reached between the agri-producers, Witzenberg Municipality, the community and Government as to the way forward and how to expedite land reform in such a way as to stimulate economic growth.



“We were determined to overcome the land reform challenges we face in South Africa and make no mistake those challenges were huge. But the only way to move forward is to solve problems together as partners. We wanted to be part of the solution and in the process positively contribute to economic growth, job creation, food security, social cohesion and successful land reform.”

Van Vuuren coined the term “deal-making not deal-breaking” to highlight the buy-in of both ‘white and black’ farmers on the project.

To illustrate the desperate situation the producers face, he used the parable of the two kittens that fell into a bucket of cream. “The one drowned, but the other one did not give up and kicked and kicked until the cream turned into butter and he could climb out. We have to overcome challenges and the only way to achieve this is by successful cooperation, consulting with all stakeholders and creating partnerships.”

Van Vuuren said they realised early on that they could not move forward if they did not have the Government as an enabling partner and therefore the Witzenberg PALS is in perfect alignment with the National Development Plan.

Van Vuuren said the Witzenberg PALS goals are simple:

- The establishment of successful black farmers;
- To involve the whole community in an inclusive process;
- To extend the initiative to other areas and agri-related industries;
- To establish the Witzenberg Centre as “one stop shop”;
- And to focus on mentorships and training programmes.



The PALS framework is a radical departure from past land reform in South Africa, said Van Vuuren. Properties of PALS are:

- Participant commercial farmers donate 30% of the shares in the project to the beneficiary farmer(s) to ensure that the latter have a veto over all major decisions.
- The relationship between the beneficiary and the partner farmer gives the former better access to finance, and guarantees access to markets.
- The beneficiaries have an option to purchase all the shares.
- The Workers Trust receives at least 5% of profits for community projects of their choice.
- The beneficiary farmer is indemnified from debts of the new venture while a minority shareholder.
- The “one stop shop” provides a physical location where the coordination, facilitation and mentoring functions can be implemented.

According to Van Vuuren success starts with our way of thinking. “As Nelson Mandela said in his inaugural speech in 1994: ‘Our greatest fear is not that we are inadequate. Our greatest fear is that we are powerful beyond measure’.”

It is easy to criticise anything different and very difficult to come up with constructive solutions that make business sense. “There are no hidden agendas. Witzenberg PALS has only one agenda and that is to inspire the Witzenberg community to work together and to give hope to our country, and to inspire our country in the process.

Free State

agri-entrepreneurs

The father-and-daughter duo of Pitso and Dimakatso (Nono) Sekhota are a formidable duo. The two shared the podium during the first session of the HORTGRO Science technical symposium, to share their insights into agri-entrepreneurship and how to encourage emerging farmers.

Their 2100 ha commercial family farm, Makolobane Farmers Enterprise, lies outside Senekal in the Free State and was established in 2008. They farm and breed with Ayrshire cattle, Boran and Charolaise beef cattle, as well as cash crops such as maize and sunflower. There is also a 4 ha apple orchard on Malolobane.

Mr Sekhota chairs Remmoho FS Apple Development, among others. Remmoho (meaning “we are together”) is a joint venture through which Free State farmers and cooperatives aim to plant 2000 ha of apples in the next 10 years around Warden, Clarens and Harrismith. “Yes, the

dream is to bring a bit of the Western Cape to the Free State,” he prodded local producers in the audience.

This keen business mind has a background in accounting and more than 30 years’ experience running various ventures. He was the owner of the first Kwik-Spar franchise in the Qwa-Qwa region, and also owned various industrial restaurants and catering endeavours in the Free State region.

“I am a businessman who wants to add value to agriculture,” he stated his intentions.

Mr Sekhota also chairs the Deciduous Fruit Development Chamber SA (DFDC-SA) tasked with land reform issues. He believes the battle to bring more black farmers into agriculture will not be won without the definite help of government and commercial farmers. It will need “transition farming”.

“For transition to happen there needs to be an exchange of knowledge, and a belief in doing things together,” he added. “South Africans need to come up with a plan to win the battle about land reform.”

Mr Sekhoto joked that while he “runs around changing industry” his daughter Dimakatso is the one who ensures that things run smoothly on Makolobane. She holds a BCom degree in Financial Accounting and a postgraduate diploma in Certified Financial Planning. She is also a graduate of the Goldman Sachs GIBS 10 000 Women Entrepreneur Programme.



Gerrit van Vuuren, Witzenberg PALS Project Manager, Nono and Pitso Sekhoto, Free State entrepreneurs and fruit growers, and Prof. Ferdi Meyer, BFAP Director.

Ms Sekhoto left a career of seven years in the financial services industry to start farming. “I knew about financial matters, but had to learn a lot about farming from the workers,” she tells of the stiff learning curve that followed. She hasn’t looked back since, and believes that agriculture has provides her with some of the best business opportunities possible.

“It’s about taking the lead, and not waiting to be saved,” is her attitude to the opportunities she receives.

She is passionate about enticing young people to also enter the agricultural sector. As founder of GrowthShoot she endeavours to empower youth in agriculture and to link upskilled young people with farms. “It is a sector that provides high quality jobs,” says Ms Sekhoto, who is the youth representative on the National Executive Council of the African

Farmers' Association of South Africa (AFASA) and a member of the Presidential Youth Working Group.

Last year Ms Sekhoto was one of 11 participants chosen from South Africa, Kenya and Uganda to participate in the Oklahoma State University's Professional Fellows Program for Empowering Aspiring Entrepreneurs. While touring the US as part of this opportunity she realised the value of focusing on niche markets such as farming with rabbits, the need to collaborate with others in the industry and to leverage relationships to develop one's skills and networks.



Gateway to the future - Makolobane Farmers Enterprises in the Free State.

Africa Rising

Magazine covers trumpet out: “Africa on the Rise” and “Africa is the new India”. This is true; after decades of dormancy Africa is experiencing rapid economic growth and half of the world’s ten fastest growing economies are in sub-Saharan Africa.

Prof. Ferdi Meyer, Director of the Bureau for Food and Agricultural Policy (BFAP) and his team analysed how this economic explosion is changing the continent and how it affects South African fruit growers.

According to Meyer some of these megatrends driving Africa’s dynamism and growth are: volatile energy and food prices; income growth, employment, urbanization; all of which have implications for food demand and the potential for further expansion.

“When we compare South African grain prices with the rest of the world we see that there is a growth rate, albeit a volatile one. Africa is still not producing enough food for its growing population and has to rely heavily on imports. This shortage of food is one of the biggest challenges we face, so too the lack of infrastructure combined with political instability.”



When they analysed population income, growth, wealth distribution and urbanization, says Meyer, Africa’s unique ‘age’ demographic picture became evident.

- 43% of Sub-Saharan Africans fall within the 0 – 14 age category, and
- an overall 62% of the total population is 25 years or younger.

“We have a huge population of young people in Africa - young people without work. The picture looks even bleaker when we combine this with wealth distribution over a thirty year period.”

In 1980, 80.6% of the continent survived on an income of 0 – 4\$/day. Thirty years later, the picture looks equally bleak with 81.8% of the poor surviving on 0-4 \$. The ‘rich’ group – earning more than 20 \$/day stayed the same, while the middle-class shrunk from 14.6% (4-20\$) in 1980 to 13.4% in 2010. Throughout this period, also, various regional drivers pushed Africans away from Agriculture, forcing them to look for work in the cities.

“We cannot look at these megatrends in isolation. It is a complicated puzzle where any single piece has an impact on the whole,” Meyer said. “Africa is not producing enough food for Africans.”

On a recent trip from Dar es Salaam to the Lusaka, Meyer was struck by the colossal import of food. “There were deep tyre markings on the left side of the gravel road - indicating heavy trucks running inbound, but nothing on the other side.

“On analysing the African market attractiveness index for apples, it emerges that Nigeria, Mozambique and Angola are top importing countries, with Nigeria showing a whopping 250% growth over the past five years.”

In South Africa oranges and apples were the fruit of choice for the poor and the middle segments, while grapes and pears were more readily consumed by the wealthy.

“It is clear that Africa has huge agricultural potential; with many countries showing high-input farming is possible due to rain-fed soil suitability and nutrient retention capacity.

“Agriculture will therefore remain an important source of income in the decades to come, as growth in non-farm sectors will not become high enough to absorb surplus labour. However, agricultural policies should be increasingly complemented by urban planning, industrial policies and measures to improve the foundations of economic growth, such as infrastructure and education,” he said.



WCDA introduces new GIS apps

New apps and GIS products designed by the Western Cape Department of Agriculture increasingly make it easier for producers and consultants to have up-to-date spatial information about their farms at the ready.



This was the news from Dr Mike Wallace, specialist scientist (GIS) of the Western Cape Department of Agriculture (WCDA). He introduced attendees of the HORTGRO Science technical symposium to new innovations (see sidebar) such as Cape Farm Mapper for PCs and the Cape Agricultural Mobile Information System (CAMIS) for cell phones and tablets. These were recently developed by the WCDA's GIS team.

Dr Wallace says the days of GIS being the domain of only a select skilled few are long gone. Tools like Google Earth, Google Maps and Bing have paved the way to make geographic information available to anyone with basic computer literacy skills.

"People have started to think spatially, and now require spatial solutions," he says of the increased drive to use and provide accurate and relevant geographic data.

The WCDA's recently completed flyover project provided a wealth of detailed information about agricultural endeavours in the province. Around 250 000 fields were mapped and the land use identified, as well as thousands of infrastructure points. This project has paved the way for the introduction of several new technologies, such as Cape Farm Mapper.

Climate change

According to Dr Wallace accurate spatial information is also being used to provide rational and scientific data about the influence of issues such as climate change. In this regard the Western Cape Department of Agriculture is a partner in the consortium driving the SmartAgri Project. Led by the African Climate and Development Initiative at the University of Cape Town, the project also includes the Western Cape Department of Environmental Affairs and Development Planning.

It divides the Western Cape into 23 different agro-zones and makes it possible to assess the impact of climate change on for instance future wheat yield under different scenarios.

The GIS team also helps with farm scale planning and drawing up business plans for new farmers, in collaborates with the WCDA's Farmer Support and Development Services. Such maps being drawn up accurately show the different camps, fence lines, irrigation and other infrastructure on a farm, what the land is used for and soil surveys where available. It could also include a slope analysis that takes into account the amount of sun a section of a farm receives.

His team also assists in the identification of suitability land for the production of specific agricultural crops. They recently for instance used GIS data available on among others soil types, microclimates and rainfall to suggest where black truffles or honeybush tea could be produced at best.



Aerial surveys play an integral part of GIS data recording. Photo: Mike Wallace.

Free GIS tools at your fingertips

Cape Farm Mapper is a desktop web mapping app that provides updated spatial information to farmers, environmental managers and land surveyors. Not only can you view, query, search and create spatial data, but you can create and print your own maps based on the information layers you choose. These could include vegetation and soil types, climate and hydrological features. Data can also be imported and exported. It can also be used to access even and farm cadastre boundaries made available by the Surveyor-General, as well as the administrative demarcation boundaries of the Municipal Demarcation Board.

The app is best viewed in Google Chrome or Firefox.

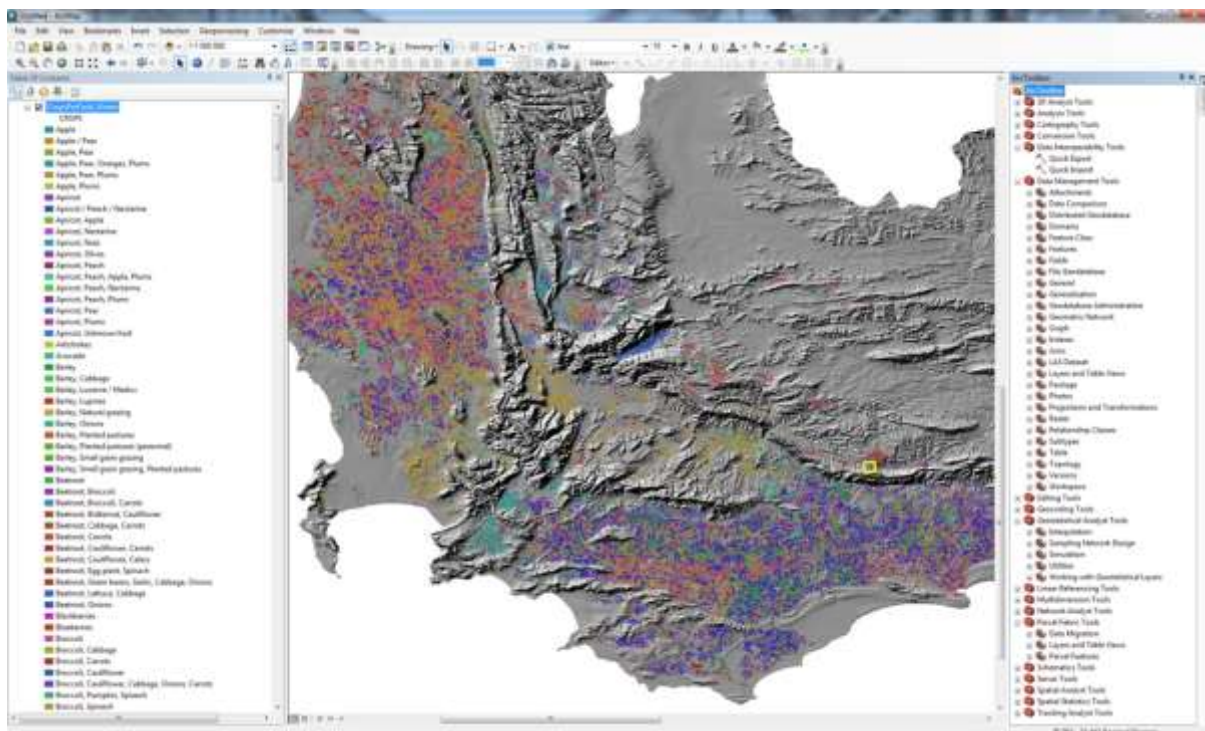
*Download Cape Farm Mapper here: <http://gis.elsenburg.com/apps/cfm/>.

The **Cape Agricultural Mobile Information System (CAMIS)** is the answer for those who want to access such data while they are out and about in the orchard or the field. It can be downloaded to a tablet or cell phone, and is basically a mini-Cape Farm Mapper.

Download CAMIS here: <http://gis.elsenburg.com/mobile/camis/>

Challenge yourself on the GIS front by using ESRI's ArcGIS software (www.esri.com) or the freeware version QGIS (www.qgis.co.za/en/site/).

For more information about the latest apps developed by the Western Cape Department of Agriculture, visit <http://www.elsenburg.com/news/western-cape-government-showcases-sa-s-latest-agricultural-innovations>



Field data – GIS processed.

Silicon Valley

future farming

The right technology can be just as valuable to a farmer as the right dog can be. As important as it is to choose the most suitable breed for a job, so also one should carefully consider the different options of technology available.

“I think that in the near future, dogs will be at risk of losing their sidekick status as a farmer’s best friend, as drones, maps, satellites and apps find their way into our industry,” Mico Stander of Agrimotion joked during his presentation to the HORTGRO Science technical symposium.

He emphasised the value of technology in aiding current ways of doing. “It’s there to help us, not necessarily replace us,” he said.

Taking the dog metaphor further, Stander warned that getting a knack for the new tools of the trade available to producers is also much like raising a puppy. It takes patience, practice and time, and might mean taking advice from others who have already been around the block.



Standar is a consultant who embraces technology such as the remote sensing platform Fruitlooks to the max. One of its benefits is that it offers regular data updates. Its development is funded by the Western Cape Department of Agriculture. “At the moment it is free, but even when it becomes commercialised, it will still be a hugely powerful and cost effective way to monitor your orchards,” he adds.

“If correctly arranged, managers and consultants can make more informed decisions based on the information that

they gather with the help of such new tools at hand,” Stander reckons.

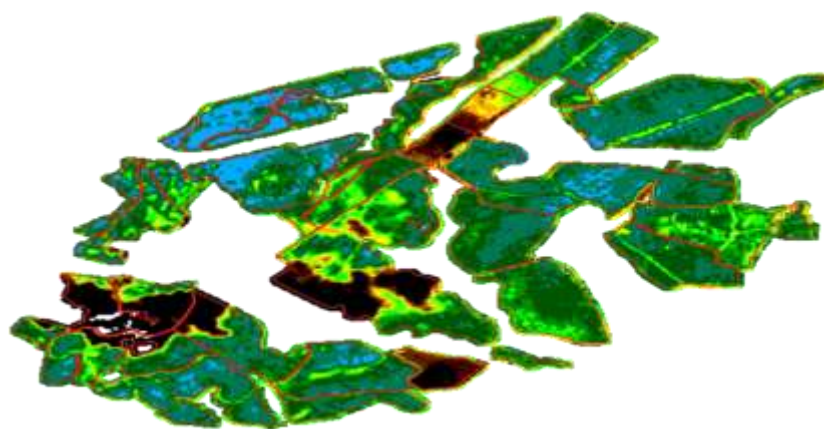
He believes that if used right, technology can be a real saver on time, input costs and resources, and could help to increase yields and reduce risk. However, he warned that one gets what one pays for. “If you paid for a pavement special, don’t expect pedigree performance,” Stander extended the dog analogue.

He believes that monitoring, data processing and trivial decision making could be fully automated, on condition that the process is driven by proven scientific principle and is

applied in a practical way. Such recommendations and the information derived should be available on a smart device, to provide farmers and consultants with immediate and easy access wherever they are.

He knows that to some his dream of a technology driven farm might seem like something belonging in Silicon Valley, but he believes such an ideal can be phased in within the next five years. His future farm operates something like this:

- Producers will know and understand the slopes and aspects of their farms, the distribution of various soil types present and the limitations these hold. Going forward such baseline information will advise all new developments, the installation of irrigation as well as suggestions on nutrition being made.
- Weekly remote sensing data is used to identify stress, assess growth and variation in the orchards and to keep track of seasonal progress.
- Irrigation water will be continuously monitored, as will system pressures and soil moisture extraction at various points in the orchard. Adjustments will be made accordingly.
- The traffic on the farm will be monitored to ensure that tractors are where they should be, and are moving at the correct speed.
- Labour movement will be monitored daily.
- The application of fertilizer, foliars and pest control will be done using precision equipment. This will only be done after carefully considering field observations, an orchard's history and remote sensing maps taken the week before.
- Weekly trap counts will be done.
- Onsite drones will be at hand to do weekly fruit measurements and counts during critical periods.
- The farmer will be able to keep on track by updating monthly budgets based on inputs made and measurements done.
- Monthly reports are summarized into a seasonal report that includes all the inputs and outputs per orchard.
- Yield maps will provide detailed information about specific management zone within an orchard.
- All of these reports are distributed at a click of a button to the farm managers, board of directors or Global GAP auditors.



An example of an automated data map.

The value of plant improvement and certification of nursery trees.

“In order to survive, South African growers have to stay competitive in a global market. It is up to us as an industry, to look “after our-own”, the Government has other priorities.”

This was the message from Calla du Toit, Ceres fruit grower, Procurement Manager at TruCape and SAAPPA vice-chair, on why plant improvement and certification of nursery trees are so important. “Without on-going plant improvement and an effective, trustworthy certification scheme, we will gradually lose international competitiveness, and our industry will die.”

Du Toit quoted the following definitions:

“Improvement is the process of a thing moving from one state to a state considered to be better, usually through some action intended to bring about that better state.” The concept of improvement is important to governments and businesses, as well as to individuals, he said.

“Certification refers to the confirmation of certain characteristics of an object, person, or organization. This confirmation is often, but not always, provided by some form of external review, education, assessment, or audit. Accreditation is a specific organization's process of certification.”

Du Toit said it is a known fact, that if plant material is not continuously selected, tested and managed, it degenerates over time. “This degeneration is mainly the cause of genetic degeneration and decline due to plant pathogenic entities that infect the plant material over time.”

There are many challenges for South African growers today, said Du Toit, of which the rising cost of production, unfavourable market conditions, climate change, sustainable use of energy resources and access to water are but a few. “We also have to deal with rising MRL requirements and production pressure - average is not good enough anymore. We have to be weary of all these challenges, while producing world-class products.



It is a tall order. The bottom line is you cannot afford to make mistakes.”

Du Toit urged growers to take up the challenge. “Use a hundred percent of your bearing hectares; when planting new orchards make zero mistakes; improve every season; plant the best trees you can buy and make a hundred percent sure of the plant material.”

Plant improvement fact file:

How is plant improvement done?

- Plant improvement and certification is governed in accordance with the Plant Improvement Act (Act 53 of 1976).
- The process is specified in the SA Plant Certification Scheme
- The Blue and White labels serve as conformation that the plant material conforms to the specified requirements of the Scheme.
- Currently, this scheme is voluntary

History of plant improvement in SA

- SAPO was formed in 1974
- Goal: reducing the risk of pathogens, viruses and pests in new plant material
: reducing the risk of genetically degeneration (ensure: trueness-to-type)

Who are the Enemies?

- Viruses: Apple mosaic-, Apple chlorotic leafspot-, Apple stem grooving- and Apple stem pitting virus
- Bacteria: Bacterial canker, Bacterial spot and Crown gall
- Fungi: Stem canker complex, Root rot complex (*Phytophthora spp.* which causes crown rot)
- Insects: Woolly apple aphid, Red spider mite, Scale insects
- Nematodes: Root knot- , stubby root- , lesion-, ring-, dagger- and pin nematodes.

The Upside-down Relationship

“In 1973 there were 1273 fruit tree nurseries in South Africa, compared to the mere 18 deciduous fruit tree nurseries still operating in 2014. Growing fruit trees is a vulnerable business.”

Richard Hill, nursery tree expert and co-owner of Witzenberg Range Nurseries, made no bones about the realities that nurserymen face today. “Fruit growers and nurserymen have had a love-hate relationship since the beginning of time,” said Hill. “This is not only the case in South Africa but the world over. There must be some underlying fundamental reasons for this relationship to perpetuate in this manner. On top of that, we have a variable climate and poor and variable soils.”



According to Hill, South African nurserymen have a particularly difficult task. “Unlike nurseries in Europe and the USA, we are restricted to marketing nearly 90% of our product in the Western Cape. We do not have the luxury of marketing trees, as in Europe, to Morocco, Algeria, Egypt, and all other European and Eastern European countries. The nurseries are restricted in size and are dependent on the success of

their small and local deciduous fruit industries. If nurseries do not produce the tree model, quality, variety and rootstock which keep growers in business we will all fail together. The reality is that growers can do without nurseries for many years during a downturn, while the nurseries will not survive one year without growers. When this happens, we can only burn our product.”

Quoting nursery tree statistics, Hill, said it takes 180 days at 1 cm/day to grow a 1.8 m-tall tree. “The reality is that if we are 80% successful on planting rootstocks, budding and growing, we end up with 52% of our originally planted rootstocks as saleable trees! To make

things worse; only $\pm 40\%$ of the 52% end up as tall/larges, leaving us with 20% of what was originally planted achieving the most desired size.



Burning of the trees... when there is no demand. Photo: Richard Hill.

A nursery of 20 ha with rows spaced at 70 cm requires travel of 280 kilometres per job cycle if we work down every row. (A total of approximately 60 operations at 280 kilometres, that results in 16 800 km/season.)

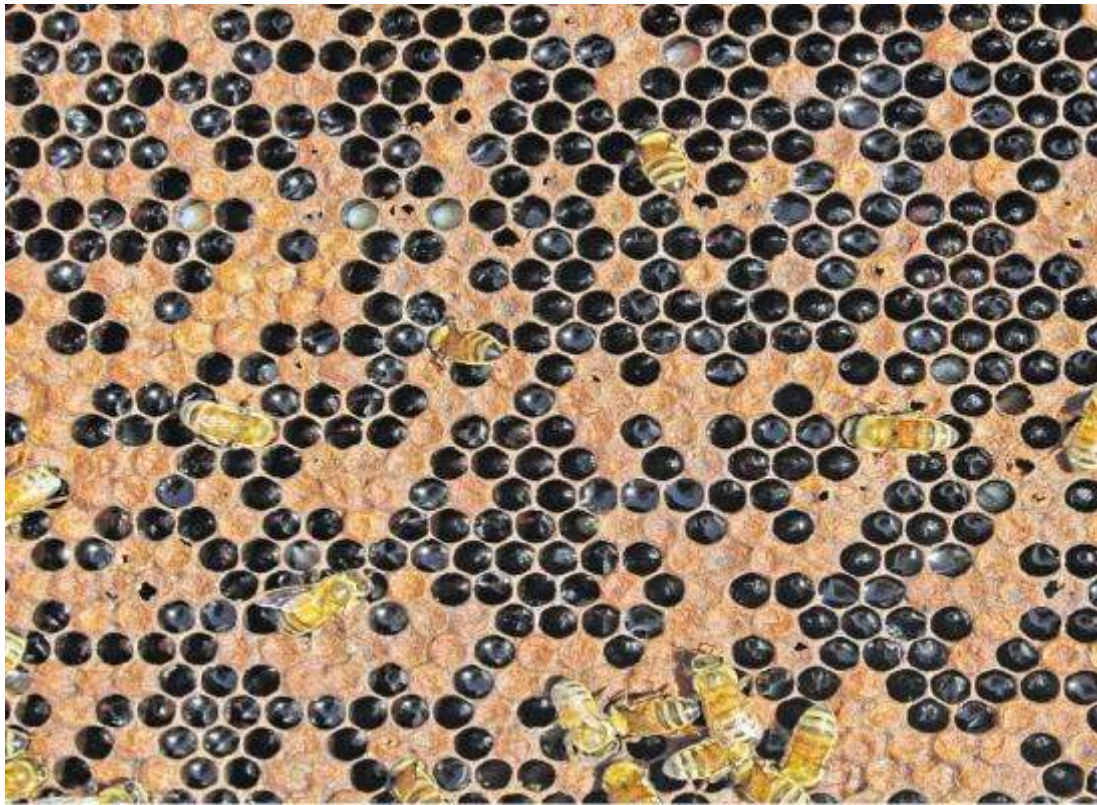
He sketched different scenarios explaining the turbulence between nurseries and growers. The salient point is the out of sync relationship between tree demand and supply. The industry go up and down. When things are on the up - growers order trees, which takes two years to make. So after 2 years when the trees are ready, growers may have a bad year and cancel tree orders. Hence, nurseries end up with a lot of trees and no demand. Nurserymen then make fewer trees and when the industry next cycles up, there are no trees. "I guess the answer lies in finding the equilibrium," said Hill.

Hill then posed the question whether change is possible?

"This situation will not be easily changed due to the unpredictable and uncontrollable outside forces presented to us, we will have to live with it. However we have been up to the challenge for the past 130 years, why should we fail now? I am convinced that we have the right people in the nurseries, and on the farms and an excellent team of technical advisors, world class innovative scientists and institutions plus sound and effective industry structures."

"When change is required, or forced on us, there are three actions that can be taken," said Hill. "We can do nothing; do more of the same; but it is only by doing something different that change for the better happens. When one is faced with no further alternatives it focuses the mind marvellously! I believe we can weather the turbulence and achieve equilibrium for all. We are South Africans!"

Warning bells ring over American foulbrood disease



The worst of all bee diseases” is threatening the Western Cape’s valuable honeybee populations, and in the process also local agricultural production.

This was the message from beekeeper Brendan Ashley-Cooper of the Western Cape Bee Industry Association about the epidemic proportions that American foulbrood disease (AFB) is taking on.

There is no sign that local bees have a general tolerance towards this disease, which has bugged beekeepers since the time of Aristotle. It is caused by the *Paenibacillus larvae* bacteria, which infects and kills developing honeybee larvae. In the long run this causes the collapse and death of the hive. Adult honeybees cannot be infected, but carry the spores and often transmit these when they feed larvae in the hives.

The bacteria spores are extremely hardy, and can survive up to 60 years and in temperatures ranging from -40 °C to 160 °C. They can only be killed through high heat or irradiation treatment.

AFB on the move

The first AFB outbreak in 2009 in South Africa was relatively contained, but in recent months its spread has mushroomed. It has been noted in hives from Vredendal and Langebaan on the West Coast to Tokai, Hout Bay and Kraaifontein in the Cape. It is found in the Overberg, the Little Karoo and the R62 and around Albertinia on the N2 in the Southern Cape.

“Most commercial beekeeping operations are now likely to be AFB positive,” mentioned Ashley-Cooper. “For instance, up to 10% of recently trapped wild swarms in the Boland and Overberg are AFB positive.”

“We must expect the worst, because the disease will not miraculously disappear,” he said.

He called on producers to only use the services of registered beekeepers who keep to the strict control and sanitation measures of the beekeeping industry to curb the spread of AFB. The only effective way of getting rid of it is to thoroughly destroy all infected hives, colonies and swarms. Antibiotics are seen as mere short-term measure to keep pollinating bees alive. Much work still needs to be done to select natural populations that are disease resistant.



Pollination costs

“Without pollinating bees, many farming practices are unlikely to survive, unless we also start doing pollination by hand as the Chinese do,” warned Ashley-Cooper.

The current recommended price per hive for pollination services is R603, up from R536 in 2014. This cost is likely to increase further, because the control of AFB necessitates much more input time and cost from beekeepers. For instance, they now have to inspect all of their hives up to four times per year. All equipment from AFB infected beehives must be sterilised, either by dipping these into boiling paraffin wax or through irradiation treatment.

Ashley-Cooper stressed the value of looking after wild swarms. They are the source of new genetic material to keep hives going and for beekeepers to replenish their empty hives.

For more information, contact the Western Cape Bee Association at info@wkbv.co.za or 021 865 2050, or Brendan Ashley Cooper at capepollinationservices@gmail.com or 082 484 0030.

Recognising African foulbrood disease

- Dead larvae are found within sealed cells in a hive.
- The cell capping change in colour and shape. They become sunken, concave, black, holed and moist.
- The remains of larvae turn from white to dark brown and black. It becomes slimy, mucus-like and ropy.
- It dries out to form a black scale at the base of a cell, often with a pupal tongue included.

Did you know?

- 88% of all bee hives in the Western Cape are used for pollination purposes (compared to 28% in Australia).
- Australia has better forage and climate for honey production. One hive produces up to 38 kg, compared to the 12 kg that South African bees on average manage.
- No harm can come to people who eat honey from AFB infected hives.



Tragedy! AFB slime in a hive.

Invading fruit fly – what you should know.

One of the most destructive pests for fruit growers is the oriental fruit fly, *Bactrocera dorsalis*. Interception could spell quarantine and the closing of international markets.

But where do we currently stand in South Africa?

Significant Threat

“This pest is a significant threat to industry,” said Matthew Addison, HORTGRO Science Crop Protection Manager. “Even though it is not in the Western Cape yet, does not mean it won’t get here. It will get here. It is only a question of time. Therefore, early detection and integrated area-wide management is the only way to combat this pest.”

Addison said for a number of years there were confusion about the name and the species. “We thought we were dealing with a new species - *Bactrocera invadens* – when it was in fact all along the more common *Bactrocera dorsalis* – native to Asia.”

Bactrocera dorsalis was first reported in East Africa in 2003 and detected in Limpopo in 2010. “The route down south is virtually always through informal traders and almost impossible to control.



Research

The big question is what is the risk of introduction to the South Western Cape? HORTGRO Science has done research and developed a trait based model of potential distribution. US researcher, Dr Ken Pringle, developed a risk assessment model, investigating the problem by looking at origin, volumes, consignment-size and infestation levels.

He concluded that the risk of introduction is unknown. For commercial fruit entering the Cape - the risk level is low if the fruit is packed at retail level. If fruit is dumped the risk is still low, but slightly higher. The risk is higher for citrus than for mangoes. The biggest problem is informal fruit, the so-called *bakkie*-traders, entering the Cape region, said Addison.

Other research projects that are currently underway are: Assessing host susceptibility through the season; Dispersal of *Bactrocera dorsalis*; GIS analysis of fruit fly populations; Biological control of fruit flies.



An example of *Bactrocera dorsalis* – the oriental fruit fly – a quarantine pest in South Africa.

Status

Bactrocera dorsalis is a quarantine pest in South Africa. When detected the response to incursions will mainly be addressed by DAFF, in terms of the **Agricultural Pests Act, 1983** (Act No. 36 of 1983), R110 and the SABIFF action plan.

Addison warned growers that “on detection, you have a legal obligation to report the pest. Strict quarantine restrictions will be imposed immediately. Traps will be used to monitor the situation. Movement of fruit can only happen under permit. It is strongly advised that fruit growers follow an eradication programme. The bigger industry must be consulted and informed. This is not a pest we can control alone, we need an area-wide approach,” he said.

Management options include: exclusion, eradication and suppression.

The Eradication Programme kicks in when 2 or more flies have been detected. A 25 square kilometre area will be treated; using weekly aerial bait sprays. Bait blocks will be put out. Sanitation protocols will apply and trapping grids monitored. All in all you are looking at an estimated cost of R3.5 million, said Addison.

We have to get the basics right, said Addison. “Monitoring and detection is crucial, as is real time data. You need to follow an integrated fruit fly management programme using bait blocks, bait sprays, ensure sanitation and sterile insect technique (SIT) is an option. Cooperate with researchers and report data regularly without that knowledge we cannot predict what the future holds.”

In addition, Addison said that growers need a pre-harvest management plan, using known methods – “especially if you have mixed crops”.

“For post-harvest management growers should make use of cold sterilization (14 days +) - whether it is mandatory or not. Early stone fruit cultivars are regarded as a problem as they often require dual temperature storage.”

***Bactrocera dorsalis* fact file:**

- native to Asia
 - found in approximately 30 countries
 - high reproductive potential, high biotic potential
 - rapid dispersal ability (50-100 km)
 - broad host range
- economic impact: loss of export markets, quarantine restrictions and eradication (Cabi 2014)

The Major Hosts (taking China as an example) are:

- Apple *Malus domestica*
 - Guava *Psidium guajava*
 - Mango *Mangifera indica*
 - Peach *Prunus persica*
 - Pear *Pyrus communis* (XJ Wang, unpublished data, 1988, as reported in White and Elson-Harris (1994)).
- In addition
- Avocado *Persea americana*
 - Kumquat *Fortunella japonica*
 - Water melon *Citrullus lanatus*
 - Tangerine *Citrus reticulata*
 - Sweet orange *Citrus sinensis*
 - Grape *Vitis vinifera*

SIT Successes

- Sterile insect technique was used successfully to eradicate *B. dorsalis* from Okinawa (FFEPO, 1987).
- Australia and Mauritius eradicated it with conventional methods (Seewooruthun et al. 2000)
- Local eradication in SA (Manrakhan 2011)
- Thailand and Vietnam have a SIT and area-wide programme using a genetically modified *Bactrocera dorsalis*

South Western Cape Action Plan:

- Make sure that you have a plan in place
- Use a monitoring grid (FFA and others) and reporting mechanism
- Central store for eradication materials
- Eradication team
- Increased surveillance / area wide
- Research and technical aspects

New study on stem cankers in young apple orchards

Why are stem cankers increasingly being found on very young apple trees? And what is the source of the pathogens infecting these trees?

These are some of the questions that Stellenbosch University (SU) student Minette Havenga will seek to answer as part of her MSc studies in plant pathology. The project is funded by HORTGRO Science.

In her presentation at the HORTGRO Science technical symposium, Havenga's study leader Dr Lizél Mostert of the SU Department of Plant Pathology gave an overview of the project, and the reasons why it was instigated.

According to Dr Mostert, it was recently discovered that the majority of apple trees sent for scrutiny to her department's Plant Disease Clinic in the past five years were between one and three years old. Below ground pathogens (especially *Phytophthora*) were found to have caused symptoms in 93 cases, while the dieback symptoms in 40 of the apple trees sent in were the result of above ground pathogens such as Botryosphaeriaceae, *Phomopsis* species and wood rot.



External examples of possible problems: Dieback (left) and Woodrot. Photo: Lizelle Mostert.

“It is worrying to see how much wood degradation already occurs in very young orchards, even among trees that have not been standing for longer than a year,” added Dr Mostert. She said it is still unclear if the young trees are infected at the nursery stage, or only once they are planted in their mother block.

In her study, Havenga will endeavour to identify stem canker pathogens in newly planted apple orchards. She will also look for possible inoculum sources for these stem canker pathogens in propagation material and nursery trees.

Orchards in the Koue Bokkeveld area have so far been sampled. Next year the project will be extended to other fruit producing areas in the Western Cape. Dr Mostert invited producers who experience tree die back or stem cankers in their orchards to have their trees sampled as part of the study.

Dieback and canker symptoms are more typical of older trees. A previous MSc study conducted by Dr Mia Cloete at Stellenbosch University showed for instance that various pathogens and fungi are found in especially Granny Smith apple trees and Packham’s Triumph trees older than 15 years of age. External symptoms such as dieback and wood rot, and internal symptoms such as cankers and wedge-shaped necrosis are often found. Dr

Cloete's survey was conducted in the Grabouw, Vyeboom, Villiersdorp, Wolseley and Ceres areas.

For more information, contact Dr Lizel Mostert at lmmost@sun.ac.za or 021 808 3397

Tips for keeping stem cankers at bay

Dr Mostert provided the following tips on how to manage the risk of stem cankers in apple orchards:

- Reduce stress factors in especially young orchards by using the best possible planting practices. Ensure that trees are planted in a big enough space/hole in which to develop adequately. Trees should not be given too much water or too much nitrogen.
- Remove all dead branches (with or without traces of cankers) and pruning debris from the orchard floor.
- Destroy pruning debris and do not use old orchard trees as mulch. This is especially true if cankers are present in an orchard.
- Only prune when the weather is good.
- Apply pruning wound protectant on the same day that the pruning is done.

In service of the industry

Do you have a problematic soil sample or plant material that needs to be analysed? Do you want to find out if it is caused by bacteria, fungi, fungal-like organisms, viruses or insects? The Plant Disease Clinic at Stellenbosch University's Department of Plant Pathology offers a consulting service. For more information, visit <http://www.sun.ac.za/english/faculty/agri/plant-pathology/disease-clinic/more-information>





The basics about high density trellis systems

Trellis systems used in high-density orchards should be built to last. By following a few basic principles and being picky about the details, these can be constructed to last the lifetime of an orchard and not only for the first few years of its establishment as producers are used to.

This was the advice from Willie Kotze, Research & Development Manager of Dutoit Agri. He sourced know how from other fruit producing countries on the construction of the best possible high density systems and presented it at the HORTGRO Science technical symposium.

“Budget correctly, because building such a system will cost double that of our traditional systems,” he warned.

Kotze reminded the audience that the poles, wire and anchors used to construct the framework should be able to support the leader growth of young trees, as well as the full crop weight. In the process the leaves and trees should also get as much exposure to sunlight as possible.

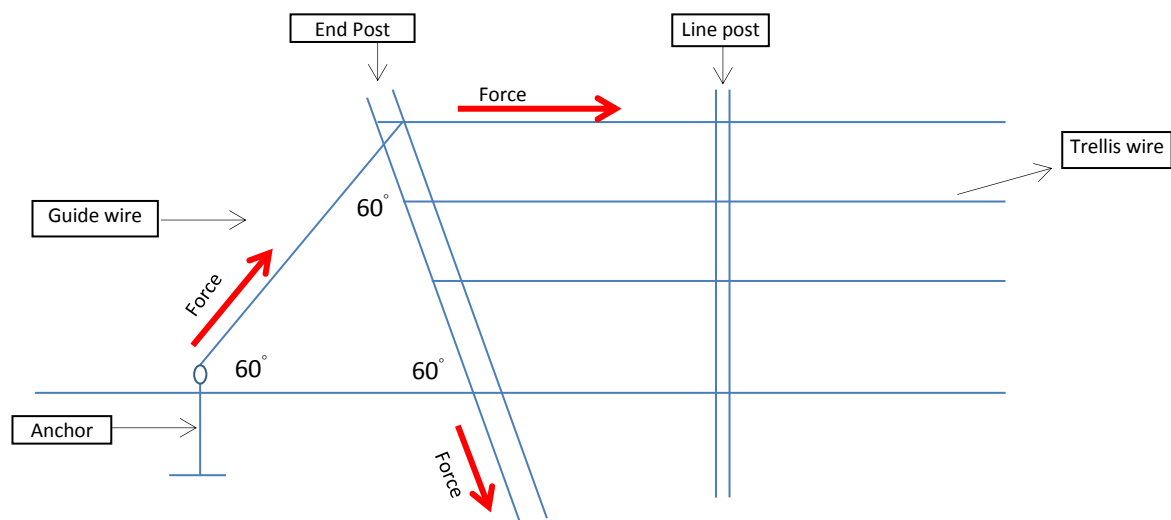
Here are some of the tips he presented to the audience:

About anchors

The end post and anchor combination is the most important part of the structure. Anchors must carry the weight of the entire system once it has been established. This means these should be able to support the wire tension and crop weight. A failure to construct it properly will result in the anchor slipping, and the whole system sagging.

Among the different types of anchors currently use are box braced anchors, slant braced ones, tie back anchors and others that combine slant brace and tie back versions.

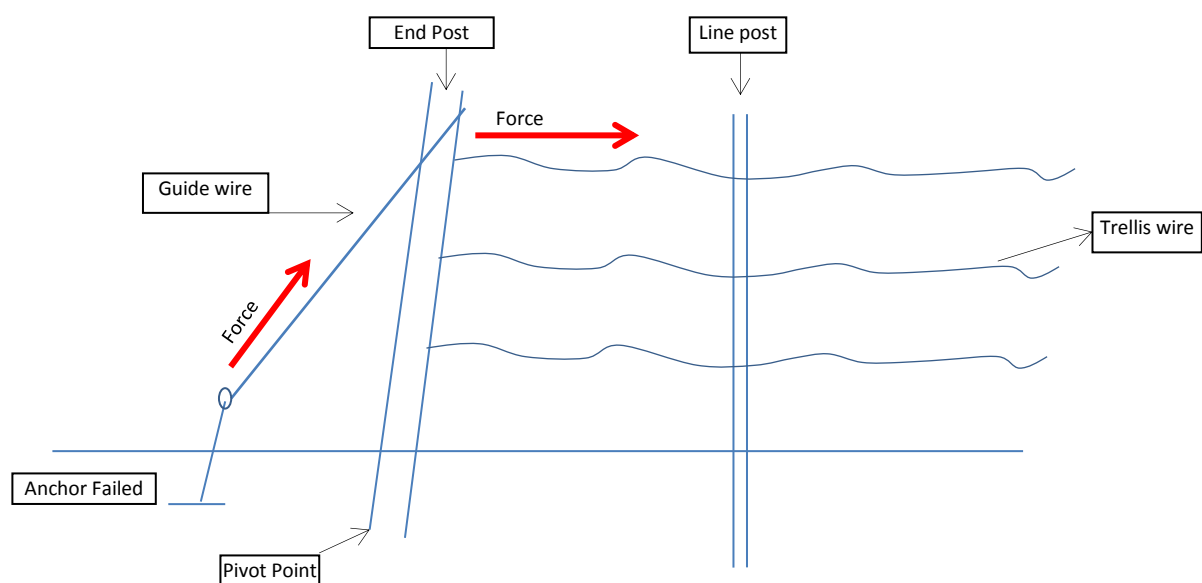
According to research by New Mexico State University the most stable anchors systems system is a tie back one. Its end post leans backwards to create an equilateral triangle (one in which all three sides are equal) with the anchor wire. In this way the anchor and back post carries the resistance.



Stable anchor support – Willie Kotze

Take note of the following:

- Use extra strong anchors in windy areas, because wind force could double the load on the system.
- Consider the soil type (sandy vs heavy soils) in which the anchor is to be planted. Bigger base plates are required in sandy soils.
- The longer the row length, the stronger the anchor should be.
- The strength of the anchor wire should be equal to the sum of all the trellis wires combined.



Unstable anchor support – Willie Kotze

About wires

- High tensile steel wire works best as it does not stretch easily.
- The wire should be tensioned to about 50% of the yield strength to prevent sagging under the crop weight.
- The wires connected to the end post should be taught and not be able to relax.
- New technology such as Gripple wire joiners can help to keep the necessary tension in the wire.

About staples

- Use staples to connect wire to the post.
- Drive staples in deep enough, but not all the way down into a post to prevent galvanise damage or the occurrence of stress points on the wire.
- Use slash-cut points that are orientated at a 45 degree angle to split the grain.
- Install wire on the windward side of an in-line post. In this way the wind pushes the wire against the post and causes less stress on the staples. Apply staples with an 11 o'clock and a 1 o'clock angle.
- Do not use staples that are too small. When the load gets too heavy it could rip the staples out of the poles, and cause wires to drop.



Staple balance: eleven o' clock and one o' clock.

About leader support

Kotze stresses that leaders should be supported at all times by a guide. It should not slide along the wire, and should resist the effect of wind. Clips should hold trees without girdling.

About hail nets

Kotze warned producers not to compromise on the construction of hail nets because of their cost.

- Use links to ensure stability.
- Losing one link will compromise the whole system.
- Link against the direction of force being placed on it.
- When using a trellis system within a hail net system, make sure the added strain is calculated for when you construct posts and anchors.
- The inter-pole and the row spacing should align with the net strip width.



An example of a netted orchard in the Milan-region, Italy.



Please note that the lecture by Prof. Karen Theron about nursery tree quality will be dealt with in an article series in the SA Fruit Journal.

Helen Marais Wins prize



Stephen Rabe, HORTGRO Science Advisory Council Chairman, congratulates Helen on her achievement.

If the recent recipients of the annual HORTGRO Science/Prof Daan Strydom Award are anything to go by, the Ceres valley is where top new industry talent is cultivated. Helen Marais, who matriculated from Charlie Hofmeyr High School in Ceres, is the latest recipient of this award, which annually goes to the top final year student in Horticultural Science at Stellenbosch University (SU). In 2013, the honour went to Gerrit van der Merwe who grew up on Fonteintjie in the Koue Bokkeveld.

According to Dr Lynn Hoffman, chairperson of the SU Department of Horticultural Science, Helen is a meticulous student with excellent technical insights.

Marais, who majored in Horticulture and Soil Science, is humble about her success. "All that is needed is a passion for and an interest in your field of study," she explains the reasons behind her successful academic career.

Thanks to a bursary from the Citrus Academy, Marais has embarked on studies towards obtaining a MSc Agric in Horticultural Sciences. She will research nutritional aspects relating to citrus, and specifically how nitrogen fertilisation and minerals contribute to the growing of the best possible quality mandarin fruit. She is supervised by Dr Paul Cronje and Dr Lynn Hoffman of the SU Department of Horticultural Science.

Pome Fruit Field Day 2015



Wet, wet, wet. Icy weather did not deter the more than 250 delegates that attended the Pome Fruit Field Day near Op-die-Berg, Ceres. Photo: Matthew Addison.



Damon Cupido, Pieter Immelman en Hendrik Pohl het die sessie op Bokveldskloof aangebied.



Gewapen met sambrele, reënstewels en jasse is daar geluister en geleer. Foto: Wiehann Steyn.



Field Days - important for networking and socialising ... and also to learn about the latest technologies.

Stone Fruit Field Day 2015 - Overhex



Hugh Campbell, HORTGRO Science General Manager, welcomes the 150+ delegates at the Stone Fruit Field Day held at Oudewagendrift, Overhex. Photo: Matthew Addison.



Rootstocks, nematodes, best planting practices... delegates heard it all at the HORTGRO Science Stone Fruit Field Day.



The Field Day Workshop presenters: Hannes Laubscher, Charl Stander, Bennie Diedericks and Dr Piet Stassen.



Bennie Diedericks verduidelik die verskil tussen 'n gesonde en ongesonde wortelstelsel.