KATOEN COTTON SA

Volume 22 No. 1
February **2020**

A Cotton SA publication for the cotton industry of Southern Africa
www.cottonsa.org.za | R26,85 including 15% VAT

THE LATE-SEASON EDITION

- Cotton lint quality between cultivars – 2018/19 season
- Weed control with glyphosate – and its safety
- The R-CTFL value chain's master plan
- Update on cotton research trials
- Late-season pests

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TD 19/039R

GEBRUIK PLANTBESKERMINGSPRODUKTE MET VEILIGHEID EN VERANTWOORDELIKE SORG.
VOLG TEN ALLE TYE AANWYSINGS OP ETIKET MET TOEDIENING VAN PLANTBESKERMINGSPRODUKTE.

Hennie Bruwer
HUB: Katoen SA
CEO: Cotton SA

PRODUKSIEVOORUITSIGTE VIR DIE 2019/20-SEISOEN

Die jaar het goed afgeskop met wydverspreide reënneerslae in meeste van die produksiegebiede, maar nie sonder gevolge nie. Verskeie areas, veral in die Noord-Kaap, het onder swaar haelbuie deurgeloop wat heelwat aanplantings vernietig het. Hierbenewens is aanplantings in droëlandgebiede ook nadelig beïnvloed as gevolg van ongunstige toestande met planttyd. Onvoldoende vogtoestande het heelwat boere genoop om hul na alternatiewe gewasse te wend waar planttyd vir katoen reeds verstryk het.

Terselfdertyd het die administratiewe struikelblokke wat die samesmelting van Bayer en Monsanto tot gevolg gehad het, die saadvermeerdering van die populêre Candia-kultivar onder druk geplaas. Heelwat produsente, in veral die besproeiingsareas, het as gevolg van die beperkte beskikbaarheid van saad, besluit om ander gewasse te plant.

Bostaande verwikkelinge het tot gevolg gehad dat bykans 50% minder droëland- en 20% minder besproeiingshektare aangeplant is, wat die oesverwagtinge vir die 2019/20-seisoen nadelig sal raak. Die vroeë aanduidings is dat die oes met soveel as 20% teenoor die vorige seisoen kan afneem, wat ietwat van 'n demper op die goeie groei van die afgelope vyf jaar sal plaas.

Daar is egter vertroue dat die groeitendens in die volgende plantseisoen sal voortgaan, aangesien genoegsame saadvoorrade beskikbaar sal wees. Verder het katoen homself as 'n winsgewende gewas met uitstekende produkkwaliteite bewys, wat suksesvol bemark kan word, hetsy plaaslik of internasionaal.

PRODUCTION OUTLOOK FOR THE 2019/20 SEASON

The year started well with widespread rains in most of the production areas, although not without negative consequences. Several areas, especially in the Northern Cape, received heavy hailstorms that destroyed many cotton plantings. Planting in dryland areas was also adversely affected due to unfavourable conditions at planting time. Insufficient moisture has forced many farmers to consider alternative crops where the planting time for cotton had run out.

As a result of the red tape caused by the merger of Bayer and Monsanto, seed multiplication of the popular Candia cultivar came under pressure. Many producers, especially in the irrigation areas, opted to plant other crops because of the limited availability of seed.

Consequently, due to the above developments, nearly 50% less dry land and 20% less irrigation hectares were planted, which will adversely affect the expected harvest for the 2019/20 season. Early indications point to a decline of as much as 20% from the previous season, which may put a damper on the good growth experienced in the past five years.

However, we are confident that the growth trend will continue in the next planting season since enough seed supplies will be available. Furthermore, cotton has proved to be a profitable crop with excellent product qualities that can be marketed successfully, either locally or internationally.

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KATOEN COTTON SA
is published quarterly by Agri Connect (Pty) Ltd

Cover picture: Common cotton stainer (CLN du Toit).

OUTLOOK ON TEXTILES

by Helena Claassens, Cotton SA

SUSTAINABILITY

Sustainable living is an important ideology in the modern world.

We put a lot of effort into manufacturing textiles. Across the world and throughout history, textile production has formed the basis of the most lucrative economies in the world. We need to be aware of the economic impact of our role as consumers of textiles. There is a global trend to push for sustainable textile production.

Consumers' attitudes, perceptions, and intentions towards textiles and products that are produced sustainably, should be the driving force for environmental sustainability in the textile industry. Factors that affect the drive for the purchase of environmentally sustainable textiles and clothing, include awareness among consumers, product knowledge, perceived consumer behaviour, and consumer attitudes among others.

The population in South Africa is about 50 million people, with an unemployment rate of nearly 30%. A large part of the population lives off the bare minimum. The question is, how many of them are informed about sustainability? How many can afford to buy new clothes from retail stores and why would they care about the concept of sustainable production?

Textiles are interlinked with environmental, social and governance issues. Over the years, however, there has been growing concern about the environmental impact of textiles. Concerned parties have developed voluntary initiatives to reduce the environmental footprint of textiles, especially cotton and polyester, and the march towards more sustainable textiles is well underway. Currently, cotton producers and retailers mostly drive the advancement in the sustainability of textiles and are also thereby raising consumer awareness.

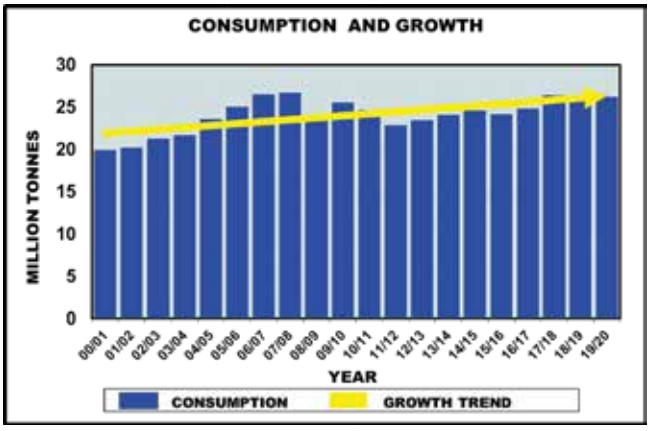
Textiles (particularly cotton) are always blamed as the "bad boy" when it comes to environmental issues. Most synthetic materials (e.g. polyester and nylon) are developed using petroleum, which is not considered to be environmentally friendly. A large part of cotton is produced under dryland conditions (dependent only on rain), is harvested by hand, and uses less fertiliser and chemicals, which contributes to sustainable production. When cotton is compared to maize, maize production also needs fuel, fertiliser, and chemicals, while some maize is also produced under irrigation. Some would argue that maize production is intended as a food source and cotton not, therefore maize is more acceptable as a crop planted with less sustainable methods. Cotton is not only used for textiles and clothing, but as animal feed in the form of oilseed cake, cottonseed oil (in food), and other by-products for medical and other uses.

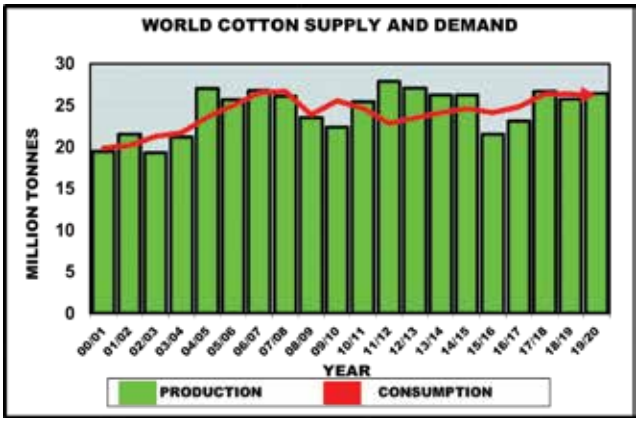
At present, business models are mainly linked to large volumes of sale and production. In large parts of the world retailers feel the effects of store closures, trade wars and customers' inability to invest in sustainability. Many consumers are only interested in fashion and price.

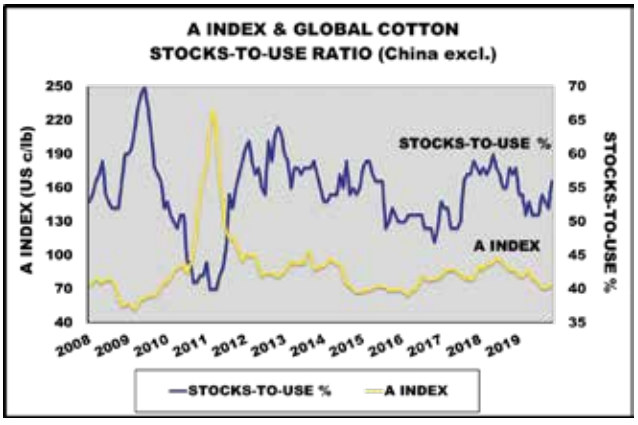
In South Africa, creating awareness around the concept of sustainability still has a long way to go, and consumers will have to be educated about the importance of introducing the sustainability concept along the whole cotton pipeline.

COTTON SA MARKET REPORT

by Mario Botha, Cotton SA







OUTLOOK FOR 2019/20 – LOWER CONSUMER GROWTH AS GLOBAL ECONOMIC GROWTH SLOWS DOWN

While global cotton consumption continues to increase, with recovery starting in 2012/13, the current prediction according to the International Cotton Advisory Committee (ICAC) for 2019/20 is 26,2 million tonnes, which is a 0,3% growth compared to the previous season. Global economic growth has decreased to the lowest levels in decades, as global trade disputes remain unresolved, resulting in uncertainty to secure increased manufacturing and investment. In the cotton industry, the economies of Asia and Southeast Asia have led consumption, and it is expected that growth in manufacturing and the demand in consumption of cotton consumer goods, will decelerate globally.

Settling the trade war, revising global trading rules, and increasing transparency in trade policies will help support growth, rebuild investment and increase consumer confidence for the cotton and broader economy. The current prospect for global cotton trade indicates a decline of 3% in volume with a projected consumption of 9 million tonnes. China is expected to continue leading global consumption of cotton with 8,05 million tonnes, which is 2,4% less compared to the previous season.

With domestic production expected to decrease to 5,8 million tonnes, imports will be necessary to support the mill use and replenish the reserves. Chinese national reserves are estimated at less than 3 million tonnes. China is expected to be in the lead, accounting for 20% of global imports.

In 2017/18, the imports from the USA represented 45% of China's total imports of 1,2 million tonnes. In

2018/19, China had increased its total imports to 2,1 million tonnes. However, the China–USA trade dispute subjected US cotton to a 25% tariff increase and the US share of imports had declined to 18%. Other major exporters increased market share with exports from Australia increasing by 97% to 555 000 tonnes, exports from Brazil increased to 480 000 tonnes (480%), and from India by 127% to 275 000 tonnes.

Total US exports will recover in 2019/20 after having dropped in 2018/19 by 7% to 3,2 million tonnes. Even if the trade disputes continue, it is expected that the USA will still lead with more than a third of world exports. It is currently expected that Brazil will remain the second largest exporter with a 17% share at 1,5 million tonnes. As Australia's cotton industry growth is limited by the availability of water and restrictions on water use, China's greater need for imports will likely be met by Brazil, with possible increases for West Africa and India. Brazil exports have increased from August to October, with 100 000 tonnes exported to China during October 2019.

SA COTTON CROP REPORT

The 11th and last report for the 2018/19 production year indicates a crop of 238 222 lint bales, a decline of 1,4% over the previous month, but still 30% more than the preceding season. Dryland and irrigation hectares show increases of 17% and 29% respectively over the previous year.

COTTON PRICE MOVEMENTS

Global ending stock levels are projected to increase by 1% by the end of 2019/20, according to the current estimates for production and consumption. Based on the present market fundamentals, cotton prices are expected to remain relatively low in the new year. The ICAC's current price forecast for the year-end average of the Cotlook A Index was revised this month to 75,4 cents per pound (South African price equivalent of approximately R24,19/kg).

The ICAC's price predictions are based mainly on the world's end-stock-to-consumption relationship (excluding China), the relationship between Chinese nett imports to world imports, and recent price movements.

Cotton crop report: 11th estimate 2018/19 production year

Production region	Hectares irrigation	Hectares dryland	Yield irrigation kg seed cotton/ha	Yield dryland kg seed cotton/ha	Production 200-kg bales cotton lint
LIMPOPO					
Loskop	4 683	0	4 300	0	36 246
North and South Flats	1 904	8 912	3 147	680	21 808
Koedoeskop, Dwaal-boom, Thabazimbi	7 720	0	5 000	0	71 410
Limpopo other	636	142	3 742	400	4 430
Weipe	1 482	0	4 194	0	11 499
NORTHERN CAPE					
Vaalharts	2 333	0	4 580	0	19 768
Lower Orange River	364	0	4 000	0	2 694
Rest of Northern Cape	4 065	0	4 858	0	38 313
NORTH WEST					
Stella, Delareyville, Schweizer-Reneke, etc.	628	3 578	4 349	2 008	18 346
Taung, Skuinsdrif	330	0	5 002	0	3 054
KWAZULU-NATAL	736	1 989	3 318	800	7 691
MPUMALANGA	0	1 771	0	755	2 474
FREE STATE	40	400	6 628	0	491
RSA TOTAL	**24 921**	**16 792**	**4 536**	**967**	**238 224**
Swaziland*	250	1 500	4 000	750	3 825
Botswana*	0	0	0	0	0
Namibia*	50	0	0	0	0
Zimbabwe*	0	0	0	0	0
Mozambique*	0	0	0	0	0
GRAND TOTAL	**25 221**	**18 292**	**4 531**	**949**	**242 049**

* Particulars relate to expected purchases of seed cotton by South African and Swaziland ginners from these countries.

ICAC 2019 – BRISBANE, AUSTRALIA

by Dr Annette Bennett, Cotton SA

A delegation from Cotton SA consisting of Hennie Bruwer (CEO), Leonard Venter (chairperson), and Annette Bennett (technical manager), together with Evert Genis, chairperson of the South African Cotton Producers' Organisation, attended the 78th plenary meeting of the International Cotton Advisory Committee (ICAC) in Brisbane from 2 to 5 December 2019. The theme of the meeting was "Global leadership: Pushing cotton's boundaries".

In her welcome message to the plenary meeting, Senator the Hon. Bridget McKenzie (Minister of Agriculture, Australia) stated that cotton production is one of the most important economic activities for many rural communities in eastern Australia, earning around $1 billion from annual exports, and directly employing around 10 000 Australians in years when the weather follows normal patterns. She mentioned Australia's rural research and development corporations (RDCs) and the Cotton Research and Development Corporation (CRDC), describing the role that they play in the industry. Together with the government, they ensure investments of around $20 million each year to improve the profitability and long-term sustainability of the industry.

The plenary meetings included interesting seminars on trends in cotton research. The plenary topics covered traceability, disruptive technologies, promoting innovation, and building community resilience in agriculture. Other open sessions examined the role of diversity, germplasm exchange, responding to climate change, supporting change and what the value proposition means for farmers. Delegates were informed about novel technology platforms for smallholders in developing countries, insect and weed resistance management, and techniques for breeding and producing high-yielding, quality seed. On the management side, experts discussed the efficient use of robotics and resources, farmers' needs and business models, how to ensure high-quality fibre, and meeting the needs of the textile industry. Other speakers provided feedback on production in different countries.

Extracts from the ICAC statement included the following:

- How country reports will be delivered in future
- Changes and innovation that address global megatrends, particularly climate change, geopolitical realities, and consumer choices, which shape agriculture
- Cotton traceability technologies that are expected to verify authenticity of fibre quality and fibre origins, quantify fibre purity, and track the processing path from fibre to fabric
- Governments' role in biosecurity and customer satisfaction

The report from an expert panel on the Social Environmental and Economic Performance of Cotton (SEEP) included the following:

- Indicators to measure and report progress on sustainable development goals (SDGs) in the cotton and coffee sectors, as part of the Delta Project, building on the ICAC/FAO framework on "measuring sustainability in cotton farming systems" (published in 2015)
- Reports from the secretariat concerning drivers for cotton consumption and the effect of trade barriers and trade disputes on importing and exporting
- The ICAC's report on government assistance to the cotton sector in 2018/19, showing a

decline from US$5,5 billion in 2017/18 to US$5,4 billion in 2018/19, with 2018/19 assistance averaged at 16 cents per pound

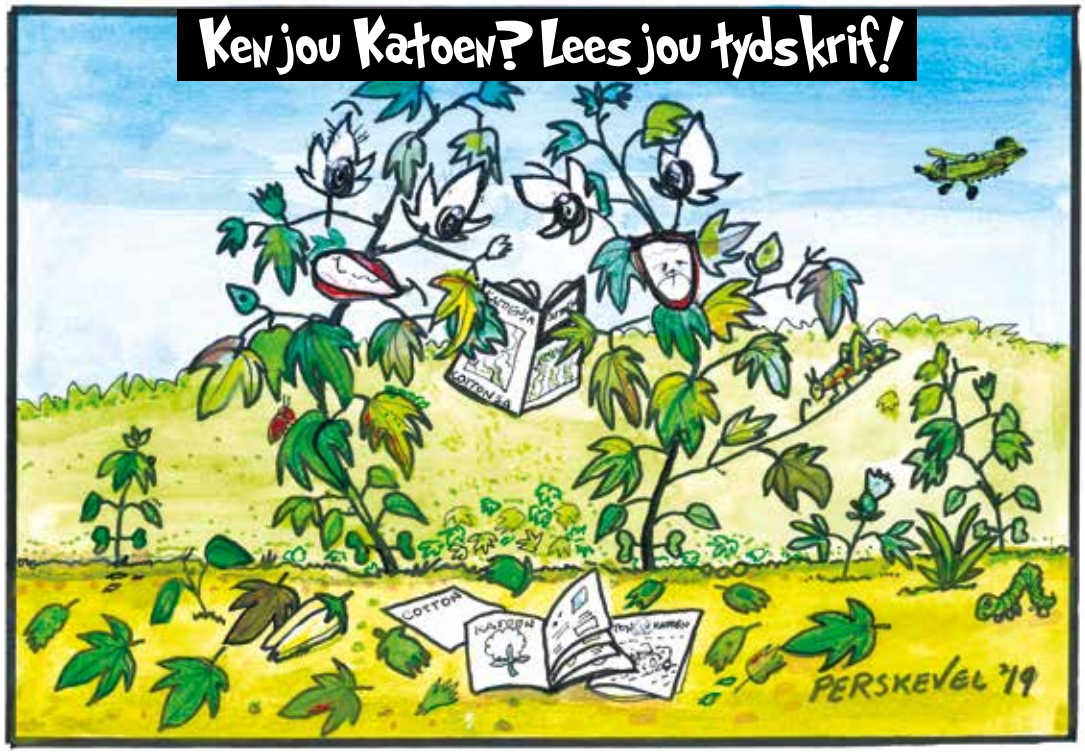
A full statement of the ICAC's 78th plenary meeting can be found on its website (**icac.org**).

The topic of the 2020 technical seminar will be "Advances and challenges of hybrid cotton technology", and the meeting will take place in November 2020 in Seville, Spain.

The Cotton SA delegation established connections with Peter Graham, the managing director of Cotton Seed Distributors (CSD), and Brett Ross, CSD's quality, research and international lead. They discussed strategies to introduce into South Africa Australian varieties with new technologies to the benefit of South African producers. In addition, South African production methods, research, and seed were discussed with Neil Forrester, a cotton specialist and consultant, Dr Kater Hake, vice president of Agricultural and Environmental Research at Cotton Incorporated in Cary, North Carolina, and Alan McClay, CEO of the Better Cotton Initiative.

Annette Bennett attended a two-day field trip to Toowoomba with delegates from other countries, and observed cotton plantings, drone release of beneficial insects, and robotic spraying methods being introduced by Australian farmers. The group visited Bayer's laboratory in Toowoomba, and was updated on current research on cotton. New technologies for surface irrigation sensing, yield prediction by means of "VARIwise", and precision weed spraying were demonstrated. Issues in biosecurity were also discussed. A demonstration was given of how the bollworm colony is maintained and how field larvae are screened for resistance. Participants appreciated the valuable insights into Bayer's research and resistance management initiatives.

The Cotton SA delegation found their visit very insightful and valued the opportunity to be able to attend the meeting.



Feedback from the Herbicide Resistance Action Committee

attended by Annette Bennett, Cotton SA

The Herbicide Resistance Action Committee (HRAC) is a specialist technical group of CropLife International that helps protect crop yields and quality worldwide by supporting efforts in the fight against herbicide-resistant weeds (croplife.org; hracglobal.com).

The HRAC – South Africa held a meeting on 1 November 2019, and emphasised the management of herbicide resistance in crops as part of the stewardship of herbicide products. The participants discussed why resistance develops in plants and what the producer should do. Only known resistant cases should be reported to the registrar of the Fertilizers, Farm Feeds, Seeds and Remedies Act (No. 36 of 1947).

It has been reported that the weed species *Amaranthus palmeri* shows resistance to glyphosate. It was confirmed in March/April 2018, after the weed was identified by a herbarium analysis at the national herbaria of the South African National Biodiversity Institute (SANBI), in Pretoria and Kirstenbosch. Species identification was confirmed by DNA analysis by the South African Herbicide Resistance Initiative (SAHRI) at the University of Pretoria (C Reinhardt, SAHRI, UP website: up.ac.za/SAHRI).

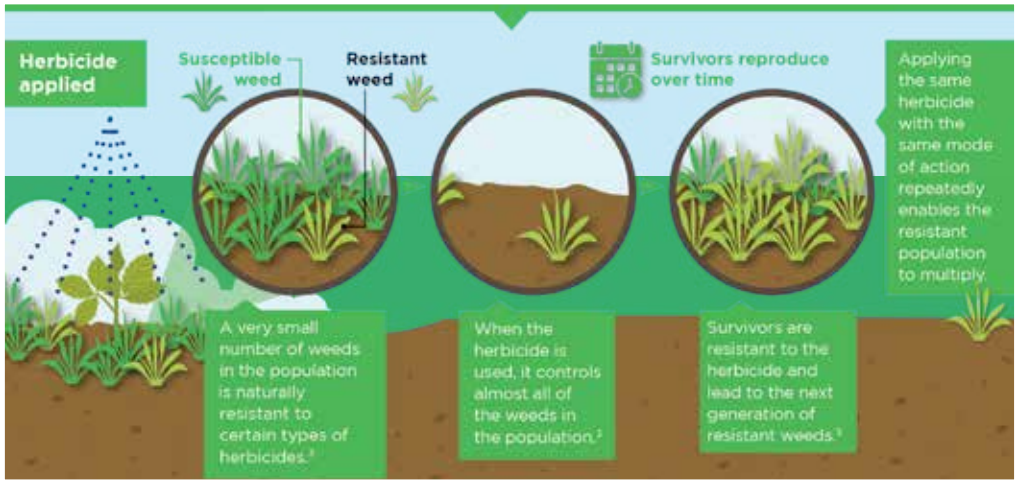
Prof. Reinhardt mentioned that correct identification is one of the important strategies for containment/management of any weedy plant suspected of showing resistance, together with a survey to determine its current distribution. Plants showing resistance are often difficult to distinguish from similar species that are not resistant to a particular herbicide.

At the meeting, it was suggested that in general, a plant can transfer resistance against one herbicide with a particular mode of action to be resistant to other herbicides with a different mode of action, and can "evolve" to show resistance to a range of herbicides. Different herbicides and spraying regimes for the weed are being tested currently by the industry and these initiatives are supported by Croplife. A large donation of 2,3 t of chemicals was given for testing on the producer's farm where the weed currently poses a problem.

The Insecticide Resistance Action Committee of South Africa (IRAC) will also look into the increase of whitefly on tobacco, the addition of adjuvants to chemicals, the transfer of knowledge on resistance, and the management of resistance.

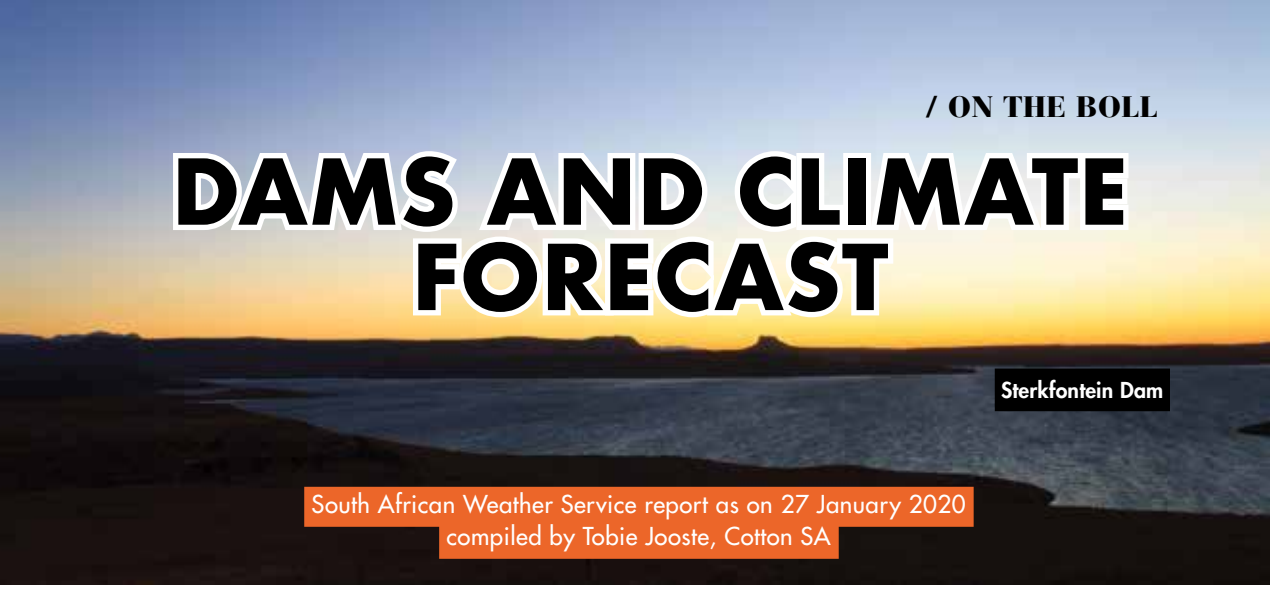
Farmers are encouraged to report any possible cases of resistance appearing in a particular weed to CropLife South Africa or the HRAC – South Africa, and to take note of the way how the development of resistance works.

The diagram below illustrates how herbicide resistance evolves.



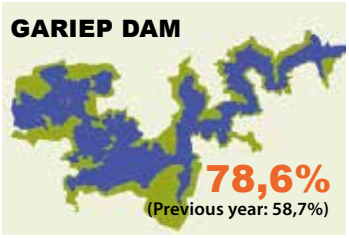
CropLife: Fact sheet – Herbicide Resistance Management.

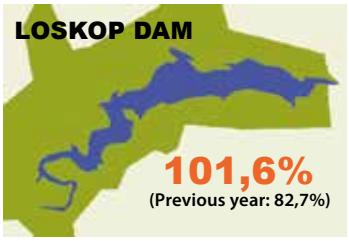
DAMS AND CLIMATE FORECAST

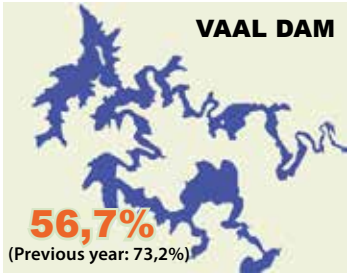

Sterkfontein Dam

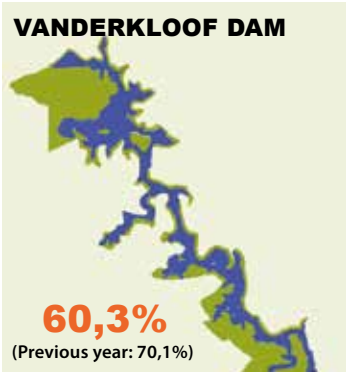
South African Weather Service report as on 27 January 2020
compiled by Tobie Jooste, Cotton SA

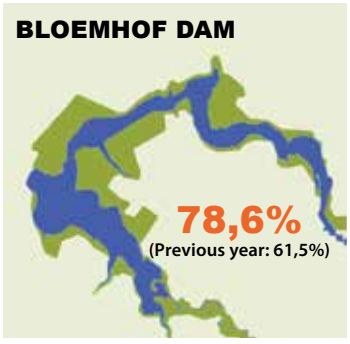
CURRENT DAM LEVELS COMPARED TO THE PREVIOUS YEAR











SEASONAL CLIMATE WATCH FOR JANUARY TO MAY 2020

The El Niño–Southern Oscillation (ENSO) is currently in a borderline weak El Niño state, and it is expected to remain on this border between the weak and neutral states for the rest of the summer season.

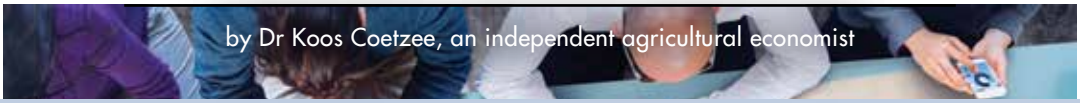
With the weather suddenly warming up during the past two months in the equatorial Pacific Ocean, higher sea surface temperatures, and the consequent higher likelihood of a weak El Niño state, a drier than normal late summer season is expected.

In general, however, there is still uncertainty about the expected rainfall conditions for the rest of the summer period. The rainfall forecast for late summer (January to March) and early autumn (February to April) from the SAWS/NOAA-GFDL Multi-Model system indicates a greater probability of below-normal rainfall over most of the country.

Mostly above-normal temperatures are expected this summer over most of South Africa, except for the far south-western parts with below-normal minimum temperatures throughout late summer and autumn.

GETTING THE BASICS RIGHT

A recipe for the South African economic recovery



by Dr Koos Coetzee, an independent agricultural economist

Prospects for a quick recovery of the South African economy seem weak. However, if government and the private sector work together to get the basics right again, we may see a recovery in the economy in the medium term.

REQUIREMENTS FOR AN ECONOMIC RECOVERY

In its October 2019 *World Economic Outlook*, the International Monetary Fund (IMF) studied the requirements for economic recovery in developing and emerging economies in detail. While these countries enjoyed good economic growth over the past two decades, they are still not growing at rates that enable their citizens to catch up with the living standards in the developed world. The IMF believes that countries must implement major reforms in six key areas:

- Domestic finance
- External finance
- Trade
- Labour markets
- Product markets
- Governance

The IMF emphasises that these reforms should all take place simultaneously. IMF studies show that the simultaneous implementation of these reforms can increase economic growth significantly.

THE SOUTH AFRICAN SITUATION

The South African economy experienced negative growth of -0,6% in the third quarter of 2019 after a surprising 3,2% growth in the second quarter following the first quarter's -3,1% growth. On an annual basis, the South African economy grew by only 0,2% from the third quarter of 2018 to the third quarter of 2019. There are many reasons for this slow economic growth. In its September 2019 *Quarterly Bulletin*, the South African Reserve Bank quantified the negative effect of load shedding on gross domestic product (GDP) growth. GDP is the monetary value of all finished goods and services made within a country during a specific period. The continuing drought also resulted in negative growth in the agricultural sector. Further disruptions to both mining and factory production also played a role.

We continuously import more goods and services than we export. In 2018 South Africans spent R172 962 million more on imports and payments to foreigners than we earned from exports and payments to us by foreigners. This so-called current account deficit must be balanced by an inflow of funds in the financial account. The inflow in the financial account consists of direct investment, portfolio investment, and investments in bonds and financial derivatives.

While foreign direct investment balances the country's "overdraft", the income from foreign investment increases the outflow on the current account. Instead of improving our bottom line, it increases the shortage on the current account. In recent years, the ownership of many South African companies has changed and foreigners now own a large share of the listed companies on the Johannesburg Stock Exchange (JSE).

While we, the man on the street, still manage to balance the country's accounts, the same is not true for government. While government expenditure increases, government income is under pressure. Government budgeted for a total revenue of R1 321 146 million in the 2018/2019 budget. Actual revenue fell short of this target by R49 914 million, mainly because of R57 268 million lower tax revenue. The shortage before borrowings at the end of March was R232 858 million, compared to a budgeted R191 054 million.

Unfortunately, government does not manage its finances well. Recently, the auditor-general released his 2018/2019 report for national and provincial government and their entities. The report pronounced the results as "disappointing" and emphasised that executive authorities and oversight structures did not lead by example.

South Africa faces enormous problems. Slow economic growth, high government debt, massive unemployment, serious infrastructure problems – especially at parastatal enterprises – together with huge corruption and unrest as people get disillusioned with failed service, all contribute to a negative perception of the future.

REQUIREMENTS FOR ECONOMIC RECOVERY

• Domestic and international financial markets

Our domestic financial system is still operating well. The South African Reserve Bank and the JSE still perform their oversight role efficiently. The independence of the Reserve Bank must be maintained. Unfortunately, in the auditing profession there were several cases where a lack of due diligence was clearly shown; the unfortunate KPMG case is an extreme example, but there are others. Recently, Tongaat-Hulett acknowledged misrepresentation of financial results. It will help if internal auditors are held to the same standards as external auditors. The external financial market is fully deregulated, and the South African currency, shares and bonds are freely traded. This is a big positive element.

Government is forging ahead with its plan to change the Constitution to allow for land expropriation without compensation. If it succeeds in changing the constitution, it will have a serious impact on financial markets. Foreign investors will take the uncertainty about property ownership into account when deciding whether to invest in South Africa or not.

• Trade

Government's role is to facilitate trade and not hinder it. Agricultural exports are subject to various phyto-sanitary and other non-tariff barriers. Importing countries demand government

certification of product safety. The recent foot-and-mouth disease debacle clearly showed that national and provincial government departments are unable to manage animal health issues. Various industries are providing their own quality control and expert certification schemes successfully.

There are a few examples where joint action between government and industry resulted in industry growth. The cotton initiative of Cotton SA and the Department of Trade and Industry working together in the Sustainable Cotton Cluster, is a good example. Other agricultural and agro-processing industries will do well to follow Cotton SA's example.

• Labour markets

Officially there are 6,6 million unemployed and 2,75 million so-called discouraged people that are no longer seeking jobs. The official unemployment rate is at 29%, the highest level since 2008. More than half the young people below 24 years are unemployed. Minimum wages and extreme overregulation of the labour market are the main reasons why industry does not employ more people. Labour unrest also plays a role. The unnecessary labour unrest in the Western Cape a few years ago accelerated the rate of mechanisation in the fruit industry. While there is an oversupply of unskilled labour, the education system does not supply the necessary skilled workers. We will have to deregulate the labour market and revamp the education system. It is counterproductive to raise the matric pass rate by lowering standards.

• Product markets

The free-market system in South Africa is vibrant and growing. The formalisation of informal markets is a tremendous success story with supermarket chains opening stores in the growing peri-urban areas and underdeveloped cities. Population growth and the increasing average per capita disposable income as more people enter the formal economy are driving retail demand. The growth of consumer demand will help to grow the economy.

The deterioration during the past 24 years because of neglect of infrastructure seriously impacts productivity. The current Eskom debacle and the crisis at Onderstepoort Biological Products are good examples. The only real solution, while probably not politically acceptable, is to privatise these organisations and change regulations to enable the private sector to take over these functions.

• Governance

Good governance is a prerequisite for economic growth. We have an independent judiciary system with judges who have amply illustrated their independence in the past. Unfortunately, corruption is a huge problem. The new president has appointed several commissions to investigate corruption in various entities. To date, no real action has been taken to bring the guilty parties to book, but at least there is some action against corruption, which is encouraging.

SUMMARY

Despite widespread corruption, a deteriorating infrastructure and inability of government to provide services, there are still positive aspects. We have a growing population, well-functioning financial system, free press, independent judiciary, excellent manufacturing and retail infrastructure, and a growing agricultural industry with access to new technologies, all guaranteed by a model constitution.

If we want to grow the economy, government will have to take some unpopular decisions and privatise ailing state-owned entities. The private sector is committed to transformation and economic growth, but its best efforts are hindered by unnecessary regulations. Government will have to change these regulations to accommodate private sector initiatives.

THE SOUTH AFRICAN AGRICULTURAL SECTOR IN RECOVERY PHASE

DESPITE ONGOING EXTERNAL CHALLENGES

by Mario Botha, Cotton SA

THE YEAR 2019, ONE OF THE TOUGHEST YEARS FOR THE AGRICULTURAL SECTOR

It has been quite a while since the South African agricultural sector has faced such a variety of negative challenges on the production side and down every aspect of the value chain. This includes the ongoing debate regarding land expropriation, drought, climate change, the ongoing water crisis, pest and disease occurrences, and the continuing failures of state-owned entities (SOEs). Farmers experienced 2019 as one of the hardest in a long time, and it was a challenging year for the broader agriculture and agribusiness sectors as well.

Despite these challenges, the broader industry remains remarkably robust and resilient. However, all entities in agriculture need to put in place a new set of building blocks in partnership with government and labour, to take forward not only the cotton industry but other industries and the country as well. This initiative was started through the Public–Private Growth Initiative (PPGI) and the Masterplan Initiative announced

by President Ramaphosa, which are hoped to gather momentum early in 2020.

In 2019 the Agbiz/IDC Agribusiness Confidence Index (ACI) fell slightly from 46 points in the third quarter to 44 in the last quarter of 2019. A level below the neutral 50-point mark implies that agribusinesses are still "downbeat" about business conditions in South Africa. This has been the case over the past six quarters, which is the longest period the index has trailed below 50 points since 2010.

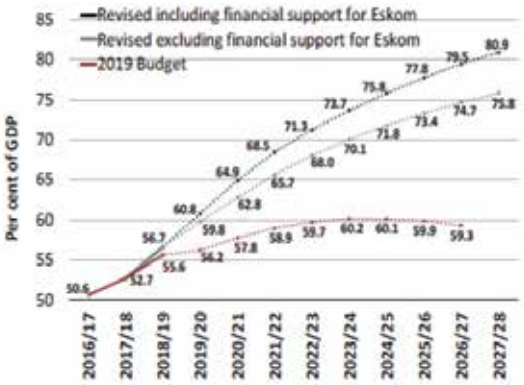
A survey was conducted in November 2019, covering agribusinesses operating in all agricultural subsectors across South Africa. The decline in the ACI was mainly brought about by a low nett income, unemployment, a low volume of exports, economic and general agricultural conditions, and a lack of debtor provision for bad debt sub-indices. South Africa's highest economic risk currently is the debt burden experienced by the agricultural sector measured against gross domestic product (GDP). This is critical and affects the agricultural value chain. Current debt is around R440 billion, and most of this debt was caused by SOEs, mainly Eskom, SAA and SABC. The consequences of these failing SOEs is the main reason that the South African economy is on the downgrade (Agbiz, 2019).

The South African GDP has been following the global GDP for years, but since 2010 a different picture has emerged. The South African GDP showed a consistent decline, clearly indicating the pressure on the domestic economy. This caused a ripple effect with investment declining, and consequently declining growth and job creation. The impact and consequences of poor investment and the subsequent weakening of the rand have truly been felt in the agricultural sector.

The South African agricultural sector requires a large proportion of agricultural inputs to be imported. This includes fertiliser, agrochemicals, fuel, and machinery. The weakening of the rand leads to higher input costs, with subsequent lower nett profits. The agricultural sector in South Africa has managed to create global markets, and continues to do so, against all odds.

Although the agricultural sector is fighting hard to stay afloat and is still able to create

Figure 1: Gross debt-to-GDP outlook. (*Source*: Department of Agriculture, Forestry and Fisheries (DAFF))



markets, intervention is needed urgently. Outlined below are some of the major contributors of the agricultural sector to the South African economy.

- In 2018/19, agricultural activities added between 10% and 12% to the GDP, if the entire value chain is considered. This shows that agriculture is very important to the economy and ensures food security.
- Contribution made due to exporting increased by 4,6%, from R104,6 billion in 2017/18 to R109,4 billion in 2018/19.
- Only 12% of land can be used for crop production, of which only 22% is high-potential land.
- The primary sector (this includes the workforce employed by civil services, public sector units, government services, multinational/national/private companies, schools, colleges, research institutes, management, organisations, and banks) employs approximately 842 000 people, and a major cost was labour at approximately R19,8 billion in 2018/19.
- The agricultural debt level increased to R181 billion. Farmers and agricultural companies can still obtain collateral when needed, and when investment is taking place.
- Nett farm income increased by approximately 12%.
- Cash flow of farmers decreased by approximately 11,5%.

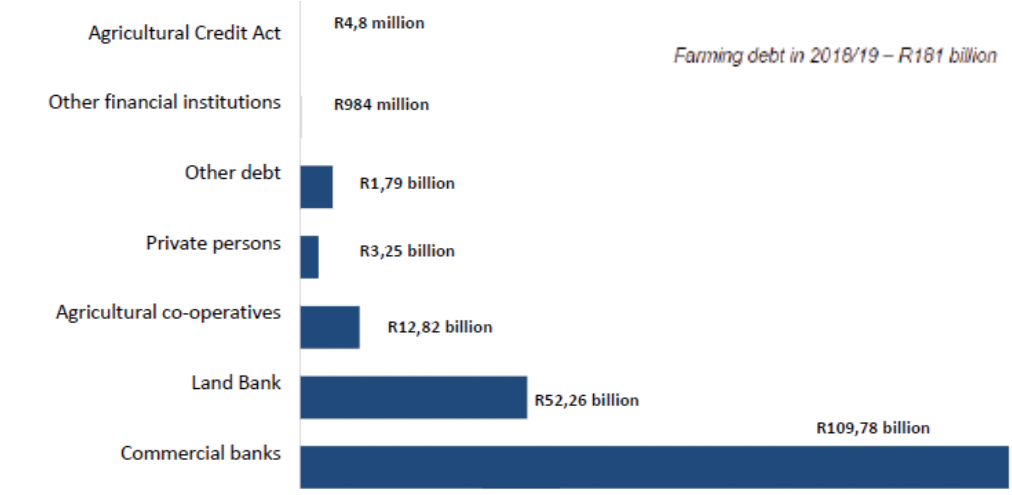
ECONOMIC OUTLOOK FOR THE FUTURE

Although a lot is needed to continue taking South Africa forward, there is optimism in the agricultural sector, and experts like Dr John Purchase (CEO of Agbiz), have a positive outlook on the future, which is encouraging. Dr Purchase remains hopeful that the agricultural sector will grow in the next decade, as indicated late in 2019 on an Agbiz-VKB information day. According to him, current government engagement is far more positive than with previous country leaders. Growth, investment, and increased agribusiness confidence are slowly but surely increasing. Amid this positivity, clear rules and building blocks to encourage investment need to be put into place. These building blocks must include partnership with government, labour and the private sector. Mentoring programmes to guide upcoming farmers, provision and access to funding, and clear rules regarding land expropriation and reform to prevent any negative impact on food security will be needed.

This will improve and attract investors and investor confidence. Markets need to be expanded locally and internationally, capital needs to be substantiated and acquired, more equitable and sustainable farming practices should be applied to attract global "greener" markets, and access to new technologies and the application thereof need to be supported. Major risk areas include health- and labour-related issues. Government must improve the current systems by the upgrading of infrastructure in rural areas, water systems, transport systems and the improvement of service delivery. For the small-scale cotton farmer, access to ginneries and transport of seed cotton remains a hurdle, as well as the costs of agri-chemical inputs. For the commercial farmer, access to cost-effective seed and new technologies are crucial to sustain the industry and promote growth.

Investment is crucial to move the South African agricultural sector forward. A clear indication of what rules to follow to secure future investment will lead to business confidence and the attractiveness thereof for local and global investment. In return, the agricultural sector should continue to grow to create opportunities for employment and skills development. Land reform and expropriation without compensation leave most farmers and agribusinesses insecure, and they are not investing in the purchase of infrastructure and new implements, as there is no certainty that they will benefit from their investment. Land reform, water-usage and -provision, labour legislation, and other disabling policy issues need to be clearly defined to create certainty. State-owned entities need to become the enablers and not be the disablers as they are currently viewed by farming communities.

Figure 2: Whom farmers owe money to. (*Source*: Department of Agriculture, Forestry and Fisheries, 2019)



Hard-to-control weeds in cotton.

WEED CONTROL WITH GLYPHOSATE AND ITS SAFETY

by Magda du Toit, Bayer

Every season, for every field, farmers must make more than 40 key decisions – all of which can make or break a harvest. Many of these decisions relate to crop protection, because at every stage of the growing season, seeds and plants are at risk from weeds, insects, and disease.

Farmers have a variety of tools that they may use to assist them and these include state-of-the-art seed treatments, herbicides, insecticides, fungicides, cultivation practices, cultivar choice, biotechnologies, advanced data analytics, and many precision technologies. While these tools are powerful individually, they can enhance farm productivity even more when used together.

Bayer's approach is to keep innovating, but always with the goal of making agriculture more sustainable. This means that crop protection options available to farmers today, are more sustainable than at any point in history.

The herbicide glyphosate has been instrumental in enabling cotton farmers to protect yields and to generate more income. To be able to generate a higher income, farmers need to protect their crops from weeds, and agrochemicals like glyphosate offer one way for cotton farmers to minimise input costs, like labour costs. Glyphosate is used on cotton that has the Roundup Ready Flex™ trait, to control weeds such as Wandering Jew (*Wandelende Jood*), Demoina bush (*Maria-Maria-bossie*), *Amaranthus* spp. (*misbredie spesies*), *Tribulus terrestris* (*dubbeltjie*), and many others (see main photographs).

Glyphosate is one of the most widely used herbicides during the pre-plant period, to encourage and enable conservation agriculture, as well as in the later post-emergence period of cotton and other field crops. These crops contain the Roundup Ready® technology, showing glyphosate tolerance, and this active ingredient accounts for one of the most thoroughly evaluated herbicides in the world and has a long and proven history of safe use. Extensive scientific evaluation of glyphosate spanning over 40 years by respected international agencies, has concluded that glyphosate poses no risk to human health or the environment when used according to label instructions.

Over the years, many scientists have conducted studies and field research with glyphosate-based herbicides, of which the results have been published in peer-reviewed scientific journals – more than 880 scientific studies are available. The overwhelming consensus is that glyphosate, when used properly according to the recommendations, poses no adverse effects to people, wildlife, or the environment.

Glyphosate inhibits an enzyme that is essential to plant growth. This enzyme is not found in humans or other animals, therefore it poses minimal risk to human health. Comprehensive toxicological studies in animals have demonstrated that glyphosate does not cause cancer, birth defects, DNA damage, nervous system effects, immune system effects, endocrine disruption, or reproductive problems.

Recently the United States Environmental Protection Agency (EPA) released its proposed interim registration review decision for glyphosate, a crucial step in the registration review process in the United States. Consistent with the conclusions of science reviews over 40 years, the EPA reaffirmed that glyphosate poses no risk to public health when used according to label recommendations.

Glyphosate has been approved for use in more than 160 countries, and the EPA announcement is just the latest instance of a global regulatory agency reaffirming that glyphosate is not carcinogenic, following similar findings by multiple leading regulators around the world.

Since the International Agency for Research on Cancer's (IARC) assessment in 2015, regulatory and scientific bodies that have reaffirmed their conclusions about the safety of glyphosate-based products – that glyphosate is not carcinogenic – include the European Food Safety Authority (EFSA), European Chemicals Agency (ECHA), German BfR, and Australian, Canadian, Korean, New Zealand and Japanese regulatory authorities, as well as the joint FAO/WHO meeting on pesticide residues (JMPR).

In January 2019, Health Canada concluded that "after a thorough scientific review," concerns about glyphosate safety, "could not be scientifically supported when considering the entire body of relevant data". Health Canada also noted that the 20 scientists who conducted the review, who had not been involved in its 2017 re-evaluation of glyphosate, "left no stone unturned" and, "had access to all relevant data and information from federal and provincial governments, international regulatory agencies, published scientific reports, and multiple pesticide manufacturers".

Health Canada lists 1 300 studies in its reference list relating to the 2017 re-evaluation, which supported its determination that glyphosate-based herbicides can be used safely. Similarly, the EPA's 2017 cancer risk assessment considered 121 studies that it considered relevant – 90% of which were sponsored by parties other than Monsanto. The European Food Safety Authority (EFSA) noted in 2017 that its 2015 assessment had listed 700 scientific references alone concerning mammalian toxicology.

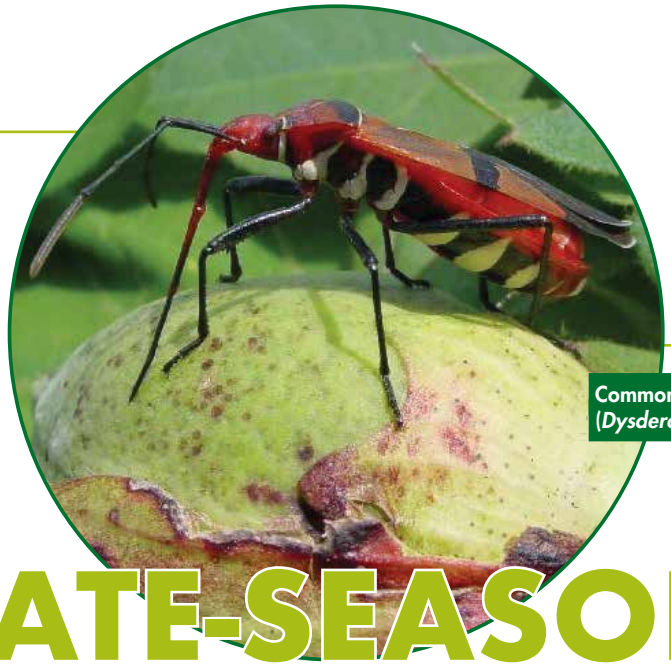
A United States health study, which involved tracking 44 932 glyphosate applicators from the 1990s through to 2013, concluded that there was no association between glyphosate and cancer. "In this large prospective cohort study, no association was apparent between glyphosate and any solid tumours or lymphoid malignancies overall, including non-Hodgkin lymphoma (NHL) and its subtypes." (*J Natl Cancer Inst.* 2018: 110(5):509-516. doi: 10.1093/jnci/djx233).

In South Africa, the regulatory system is rigorous and accountable, and has ensured robust management of the sector over years. Product safety and stewardship are important to Bayer. All our herbicides, including glyphosate, are rigorously tested, and then reviewed by third-party scientists at government agencies. All substances and finished products undergo extensive evaluation and testing in the interest of product safety. We assess possible health and environmental risks along the entire value chain and use these to derive appropriate measures to mitigate risks. This means that our products satisfy the highest quality standards and are safe for people, animals, and the environment, when used according to label recommendations.

Roundup® is one of the most trusted brands in many cropping systems and forms part of most integrated weed management programmes. For herbicide-tolerant crops (which include maize, soya and cotton) and specific products registered for these crops, visit the list of products registered for use on a particular crop approved by Croplife South Africa (agri-intel.com).

For more information on Roundup, visit bayer.com/en/glyphosate-roundup.aspx For more information regarding Roundup litigation, visit glyphosatelitigationfacts.com/main/

Acknowledgement for weed photographs: CLN du Toit (Agri-Biotech Research Consultancies cc) and A Bennett (Cotton SA).



Common cotton stainer (*Dysdercus* spp.).

LATE-SEASON PESTS

by Dr Annette Bennett, Cotton SA

Early- and mid-season pests were discussed in previous editions of the *KatoenSA/CottonSA* magazine.

Late-season pests (from 14 to 24 weeks) occur when bolls are starting to form, when bolls increase in size and start to crack or open, and when bolls expose the white fibre inside the boll. It is during this time that sucking pests that usually feed on the soft tissue of the young green bolls, or the young developing seeds inside the bolls, occur. These pests are bugs, and not beetles, and belong to the insect order Hemiptera. Other bugs of lesser importance include the brightly coloured rainbow shield bug, *Calidea dregei,* and some Lygaeidae (seed bugs).

Very few beetles occur on cotton at this late growth stage, or in the transition period between mid- and late season, while some *Nisotra* beetles that are small, brown or tan-coloured beetles, may occur as leaf feeders during this period. They are sporadic pests and very rarely do any severe damage. Some occasional leaf beetles (Chrysomelidae) that do not do any harm, may occur, as well as predatory ladybird beetles (Coccinellidae). Several beetles occur as sporadic pollinators on cotton and will be discussed at a later stage.

Late-season sucking pests can be divided into two groups:

1. Leaf-sucking pests such as leafhoppers, red spider mites and aphids.
2. Boll-piercing pests such as common cotton stainers, green-vegetable stinkbugs, dusky cotton stainers, and mirid bugs.

Leafhoppers (left), and damage on cotton (right).

Some of these stinkbugs also occur in mid-season, and can be found in the lower plant parts where the bolls form on the lower branches closest to the main stem, in the latter half of the mid-season.

The leaf-sucking pests can occur during other plant growth periods but are particularly evident in the late season and difficult to control. Leafhoppers and spider mites occur on the underside of leaves, and the increase in their numbers is usually due to the application of too many insecticides, usually pyrethroids, earlier in the season.

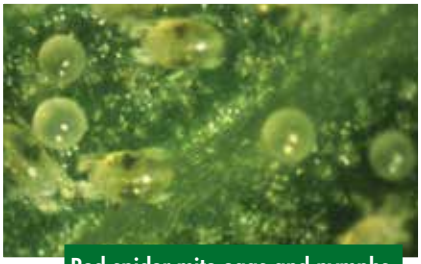
Leafhopper damage, as discussed under mid-season pests, appears as the red-purple staining of leaves, and the curling of leaf margins, which appear dry and discoloured. Leaves are weakened, the plants appear stressed, and the dead leaf matter can be a factor during the harvesting or de-leafing period, resulting in too much dead leaf matter in seed cotton being harvested.

Leafhoppers can appear at any time from 14 weeks onwards, and are sprayed when 12 out of 24 plants have leafhoppers on at least three leaves in total from the bottom, middle and top of the plant. Only use registered products to control these pests at this late stage, such as a systemic insecticide on its own, or in combination with a contact insecticide. Two sprays per season directed at leafhoppers should be effective for control.

Red spider mites, occurring mainly from 18 weeks onwards, occur commonly, and are usually controlled by insect predators, spiders, or predatory mites. A heavy red spider mite infestation usually occurs together with a leafhopper infestation.

Red spider mite can easily be spotted as red dots on the underside of a leaf, while nymphs are often present in higher numbers. Too many insecticide applications aimed at aphids earlier in the season, and at stainers during this time of the season, can result in an increase in red spider mite populations. If 12 out of 24 plants scouted have a heavy infestation of spider mites on three leaves from the bottom, middle and top leaves, it usually indicates spraying, according to the late SW Broodryk. Alternatively, make use of the guidelines given in the *Management guide for the cotton producer* to calculate a population index, and spray accordingly.

Red spider mite adults (*Tetranychus cinnabarinus*).



Red spider mite eggs and nymphs.

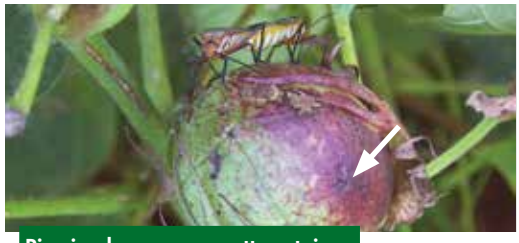
The boll-piercing pest group, which includes cotton stainers, is usually the culprit at this time of the season.

Adult common cotton stainers (*Dysdercus* spp.) (left), and nymphs of common cotton stainers (right).

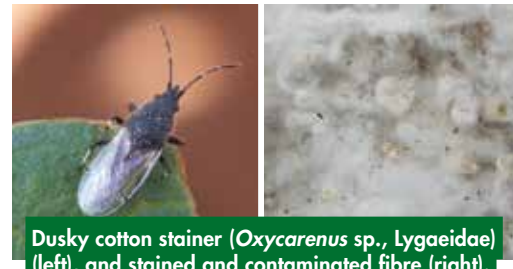
Common cotton stainers (*Dysdercus spp.*, Pyrrhochoridae), of which there are two species identified on South African cotton, occur mainly from 14 to 18 weeks and are scouted for in family groups. The threshold is reached if six out of 24 plants scouted per field have one or more than one family group (of focal point) per plant. This indicates a serious infestation, which requires spraying. A family group consists of two adults or more, with a few nymphs scattered around. Single common cotton stainers found alone do not require control yet.

Stainers lay their eggs in the soil around the stem, and the eggs are often covered with dead plant material or soil. One can often see nymphs running around in cracks in the soil. Stainer nymphs and adults suck plant sap by piercing the boll stems and tissue around young bolls, and the developing seed inside the boll with their mouthparts, thereby staining the fibre. This causes discolouration, from which they get their name, "cotton stainer". They transfer a bacterium called *Nematospora gossypii* to the boll on inserting their mouthparts into the boll (see Figure below). Rotten bolls can often be found when there is a heavy infestation of stainers.

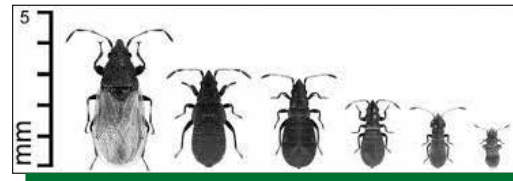
Similarly, Dusky cotton stainers (*Oxycarenus* sp.), occurring from 18 to 24 weeks onwards, are black soft-winged insects with transparent hind wings. They run around over the bolls, and often only occur when the bolls have started to open. They can be found within the cracked bolls, where they feed on the young seed that is exposed. They pierce the seed, stain the fibre, and can be a menace in seed multiplication trials, leading to damaged seed, and lowering the germination of harvested seed. Seeds fail to ripen and can have a decreased oil content. The bugs drop their faeces within the boll, which can stain the lint and lower the lint quality. Some bugs can end up in the harvested seed cotton and can further stain the lint during the ginning process by being crushed during ginning.



Piercing by common cotton stainer.



Dusky cotton stainer (*Oxycarenus* sp., Lygaeidae) (left), and stained and contaminated fibre (right).



Dusky cotton stainer – nymph to adult stages (right to left).

The green-vegetable stinkbug and mirid bug, occurring any time from 8 weeks to 14 weeks, were discussed in the previous edition of the magazine (mid-season pests), but they can sometimes be observed in the late season too, especially if cotton is planted later on one particular field than other fields on the same farm. Look out for these pests but refrain from unnecessary spraying.

Acknowledgements for photographs

- Fanie Friss (Bayer – formerly Monsanto SA): main photograph
- Research Gate.net: Dusky cotton stainer – from adult to nymph stages
- CLN du Toit (Agri-Biotech Research Consultancies cc) and T Joffe (Syngenta – formerly ABRC): other pictures

LESS CHEMICALS IN THE ENVIRONMENT AND MINIMAL IN A T-SHIRT

by Dr Annette Bennett, Cotton SA

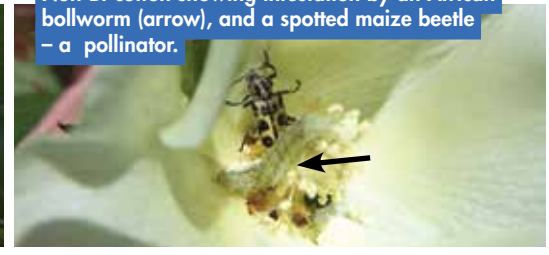
The use of chemicals in cotton production has long been described as "extreme". People not directly involved in the industry often make this statement. When the topic of "chemicals used on cotton" is addressed, one should not only refer to the chemicals used during cotton production in the field, but also to those used during the processing of lint. It is well known that cotton fibres, like all other fibres, are exposed to rigorous washing, spinning, bleaching and dyeing. Information on the chemicals used during the post-ginning processes is scarce, but when one focusses on the production side, the following information is relevant.

With the introduction of new technologies in crops, which include genetically modified (GMO) cotton, also called "*Bt*-cotton" in some instances, the use of pesticides has been drastically reduced. All cotton produced in South Africa (apart from that which is planted as the refugia as part of a resistance management strategy), contains Bollgard2 technology (Cry1Ac and Cry2Ab *Bt*-genes) providing the cotton with a bollworm-resistant trait. This cotton enables the farmer to apply less, if any, insecticide aimed at the bollworm complex. The technology is so efficient that virtually no insecticides are applied for bollworm control, and only a few are applied for the control of secondary pests. Before the introduction of *Bt*-technology, 10 to 14 chemical sprays were applied, often unnecessarily, to control the bollworm complex, which also assisted in keeping secondary pests at bay. With *Bt*-cotton no sprays are needed for bollworms under normal production conditions, and consequently, secondary pests have become more prominent and require chemical control just as before.

In addition to this bollworm-resistant trait, cotton cultivars currently planted also display herbicide tolerance, giving the farmer the opportunity to manage weeds by spraying over the cotton plants. Bollgard2 cotton or *Bt*-cotton with the Roundup Ready Flex trait can be sprayed with specific glyphosate products (according to the label instructions). This avoids applying a range of pre- and post-emergence herbicides, which minimises cultivation practices that contribute to the carbon load on the environment.

Cotton SA received data on chemical usage applied during cotton production under irrigation from an accredited Better Cotton Initiative (BCI) farmer. The BCI is a global cotton production initiative that enables farmers to farm more sustainably and make use of environmentally friendly products when necessary. In South Africa approximately 40% of cotton farmers are

***Bt*-cotton does not affect non-target organisms, showing here a blister beetle – a pollinator.**



Non-*Bt*-cotton showing infestation by an African bollworm (arrow), and a spotted maize beetle – a pollinator.

BCI-accredited. All the other farmers are also encouraged to use safer products and apply integrated pest management (IPM) principles. Together with the introduction of the technologies described above and following BCI principles, a huge effort is being made to minimise the effect of chemicals on the environment.

The quantity of chemicals used during each production phase was derived from available data. The concentration of the active ingredient of each pesticide (grams/litre) was multiplied by the registered dose per hectare (litre/ha) to calculate the grams per hectare of the chemical applied. The final quantity of chemicals in grams/ha was calculated by multiplying the grams/ha by the number of applications. The total quantity of all chemicals sprayed over the season under irrigated conditions is provided in Table 1. It was found to be 7 279,41 g/ha, or just over 7 kg/ha.

Seed cotton is cotton harvested from the field and consists of cottonseed and cotton fibre, which is sold as lint to spinners, after ginning. Using the amount of fibre in a kilogram of seed cotton, and the amount of fibre in a t-shirt (at 250 g/t-shirt), and an average irrigated seed cotton yield of 5 000 kg/ha, one could calculate that 1 900 kg of fibre or lint is produced per hectare. Therefore, 7 600 t-shirts could be produced per hectare. Each t-shirt could contain 0,96 g of pesticide-active ingredient at most, assuming that none of the chemicals were washed off during the t-shirt's production, and that all chemicals that were sprayed on the cotton during the season remained on the seed cotton, which is not possible, of course.

Table.1: Chemical product usage in irrigated cotton on a single hectare (2019).

Production stage	Product ®	Reason for usage	g/litre	litre/ha	Number of applications	g/ha
Pre-plant	Roundup Power Max	To control broadleaf weeds and grasses that have germinated	540	2	1	1 080
	2,4D-Amine	To prepare field before planting (registered on maize – used in the pre-plant period as a herbicide for presumably glyphosate-resistant weeds)	580	0,75	1	435
Planting	Vitavax Neutral (fungicide)	To limit seed-borne diseases – fungicide	300	0,0225	1	6,75
	Apron XL (fungicide)	As a systemic fungicide	350	0,0019	1	0,65625
	Dual Gold 960 EC (herbicide)	As a post-planting, pre-germination grass herbicide	960	1,5	1	1 440
	Vantex 60 CS (insecticide)	To control surface insects that destroy seedlings	60	0,1	1	6
Growth stage	Roundup Power Max (herbicide)	To control broadleaf weeds and grasses (all weeds)	540	1,8	3	2 916
	Pix (growth regulator)	To regulate plant growth for shorter internodes, fruit set and plant height	50	0,3	4	60
	Cypermethrin 200 EC (insecticide)	To control sucking pests that damage cotton fibre	200	0,4	3	240
Pre-harvesting	Ginstop 540 SC (defoliator)	To enable de-leafing, for a cleaner and better mechanical picking process	540	0,25	1	135
	Ethapon 480 SL (growth regulator)	To support the process of de-leafing and boll ripening	480	2	1	960
					Total	7 279,41

Table 2: Total chemical usage per t-shirt for irrigated cotton.

Total chemicals calculated per t-shirt	g/ha
Chemical usage g/t-shirt (total chemical usage g/no. of t-shirts, n = 7 600)	0,958

It should be noted that most of the chemicals used in the production of cotton are not sprayed on the fibre. Other factors that determine how much is released into the environment, include the absorption rate by the plant, the residual effect of the specific chemical, and the utilisation of the chemical to knock down pests. Chemicals such as fertilisers are used for plant growth and fruit set, and little, if any, would be on the fibre. How long the chemical takes to break down in the environment, how much of it ends up in soil or waste water during the production phase and possibly on the lint in the post-ginning phase, also play a role. This however, is beyond the scope of this article.

Based on data received from the farmer, less than a single gram of chemicals per t-shirt is possible at most, and could be much less, since parts can be omitted due to the reasons described above. Using these figures, only a little more than 7 kg of chemicals per hectare could possibly have been applied (Tables 1 and 2).

Providing figures on the volumes of chemicals sprayed on cotton is often misleading, and production practices on farms vary considerably. Nevertheless, using an estimate from a BCI-accredited farmer provides an insight into pesticide usage per hectare under irrigated conditions. It is, however, interesting to note that on the production side, the total amount of chemicals that could possibly be present on a cotton t-shirt produced in South Africa (using GMO cotton), is minimal and should put the consumer's mind at ease.

Acknowledgement

Thank you to Willem van der Walt, the BCI farmer, for providing his production figures in good faith.

NUWE INISIATIEF

om groeistadiums en water-behoeftes van katoen te bepaal

deur André Prins, GWK

Navorsing wat tans deur die GWK gedoen word, blyk groot voordele in te hou vir produsente in dié betrokke gebied. GWK werk aan 'n model waar data van ses weerstasies versamel word om huidige temperature en waterbehoeftes te bepaal. Hierdie data word gebruik om die waterbehoeftes van die katoenplant binne 'n gebied te voorspel oor 'n bepaalde groeiseisoen. Groei volg 'n duidelik gedefinieerde patroon wat uitgedruk word in daggrade (hitte-eenhede). Om gewasontwikkeling verder te omskryf, is die gebruik van temperatuur soos dit verloop deur die seisoen 'n handige manier om ontwikkeling van die plant te voorspel.

Heelwat navorsing is gedoen oor die katoenplant, gebaseer op artikels en toepaslike Suid-Afrikaanse data. Dit is gebruik om gemiddeldes oor 'n tydperk te bereken, en om 'n drempelwaarde te verkry waarmee die aantal daggrade wat katoen benodig vir die ontwikkeling van die plant in 'n betrokke gebied, bepaal kan word. Die aantal daggrade word verkry deur die gemiddeld van die minimum en maksimum temperature per dag te bereken en die minimum drempelwaarde temperatuur (°C) waar katoen ophou groei in die gebied, daarvan af te trek. As voorbeeld, word die waarde van Tmin (minimum temperatuur) = 15,5 °C gestel en vir Tmaks (maksimum temperatuur) = 43 °C.

Die model word tans in 'n Excel-formaat getoets, en met verandering van die plantdatum en die betrokke lokaliteit word die berekende groeistadiums en waterbehoeftes van die katoen grafies voorgestel vir die produsent se gebruik. Waterbehoeftes is op 100% effektiwiteit

Tabel 1: Berekende groei en ontwikkeling van katoen in Douglas geplant op 30 Oktober 2019.

Berekende groei* en ontwikkeling vir katoen	Datum 06/01/2020	Langtermyn (LTM)	Uitstaande
Groei-daggrade (GDD)	571	1 297	725
Waterbehoefte (mm)	192	562	370

* Aanname dat katoen 24 weke groei

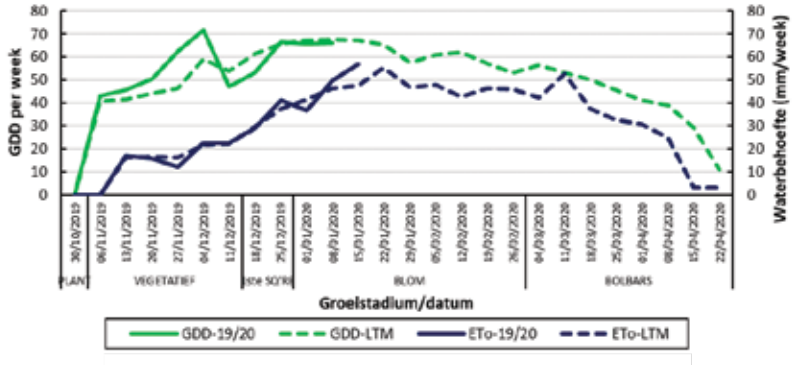
bereken, terwyl in die geval van spilpunte, die waterbehoeftes op ongeveer 90% effektiwiteit bereken is. In die geval van vloedbesproeiing, word berekeninge gebaseer op 70% effektiwiteit. Douglas se Luneburg-weerstasie word as voorbeeld gebruik met 'n plantdatum van 30 Oktober 2019.

Volgens berekeninge blyk dit dat katoen wat op 30 Oktober in Douglas geplant is, langtermyndaggrade van 1 297 benodig en teen 6 Januarie 2020 was nog 725 daggrade benodig (Tabel 1). Waterbehoeftes styg duidelik met blomknopvorming ("squaring") tot en met blom (Figure 1 en 2).

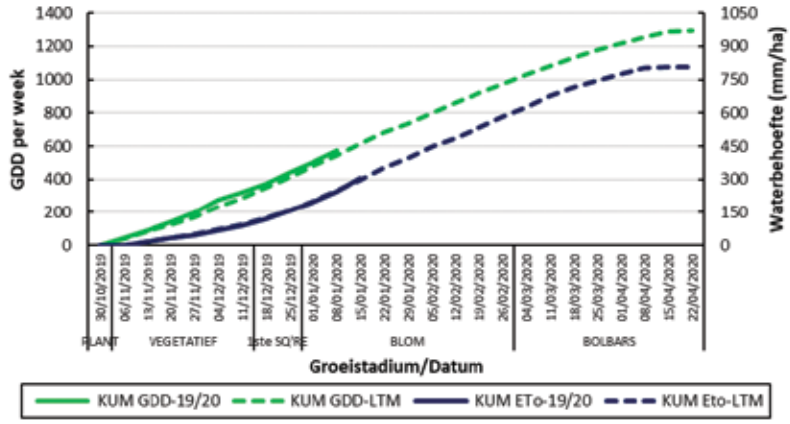
Met die voorspelling van plantgroei deur die gebruik van daggrade benodig per streek, kan die verwagte groeistadiums bereken word, en dit stel die produsent in staat om 'n geïntegreerde plaagbeheerstelsel meer effektief toe te pas en waterbehoeftes te monitor. Met die gebruik van weerstasiedata word beoog om groei in ander gebiede ook effektief te kan voorspel. Vaalharts Pluismeule het reeds toegestem om hul data beskikbaar te stel vir verdere verwerking. Sou die stelsel suksesvol benut kan word deur produsente in die GWK-gebied, kan gepoog word om uiteindelik al die katoenproduserende gebiede hierby in te sluit.

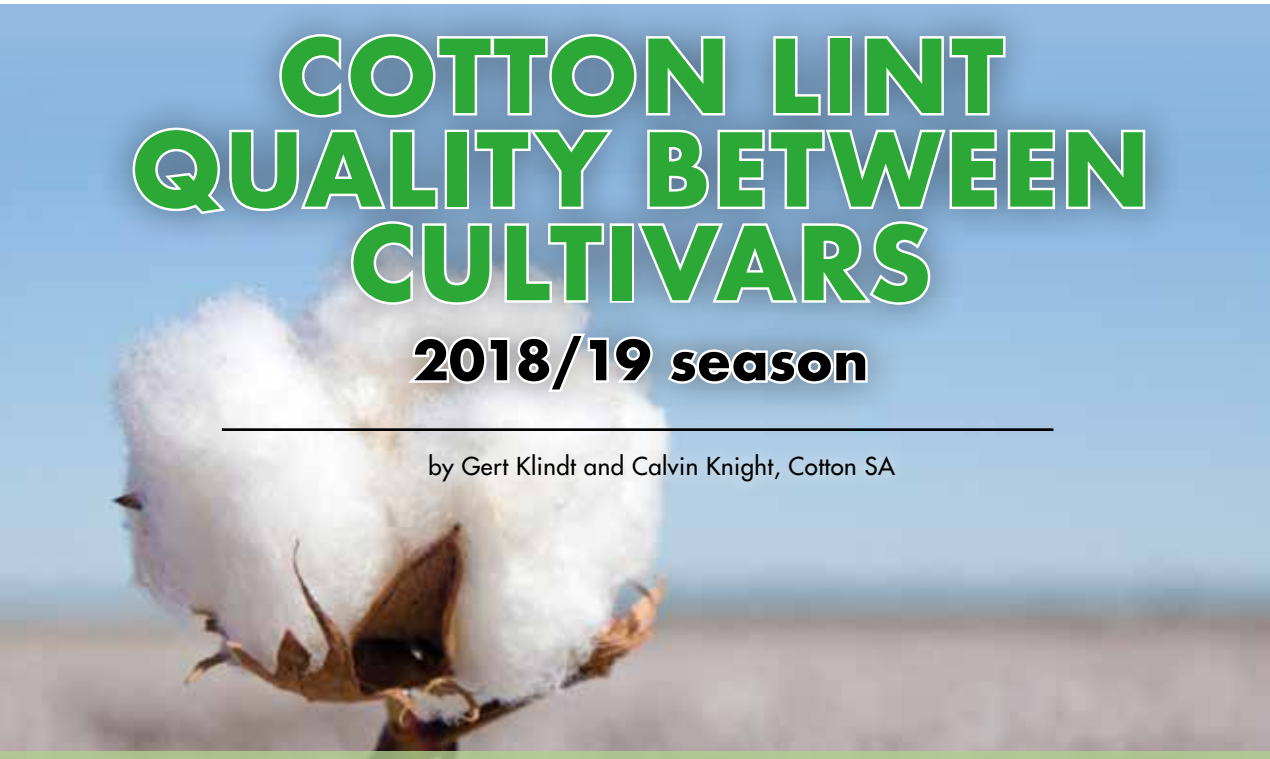
Vir 'n volledige bronnelys, kontak die outeur by andrep@gwk.co.za

Figuur 1: Groeistadium- en waterbehoeftevoorspelling vir die Luneburg-weerstasie, Douglas (GDD: groei-daggrade ("growing degree days"); GDD-LTM: groei-daggrade – langtermyn; ETo: berekende evapotranspirasie; ETo-LTM: berekende evapotranspirasie – langtermyn).



Figuur 2: Kumulatiewe groeistadium en waterbehoefte van katoen vir die Luneburg-weerstasie, Douglas (KUM GDD: kumulatiewe groei-daggrade; KUM GDD-LTM: kumulatiewe groei-daggrade – langtermyn; KUM ETo: berekende kumulatiewe evapotranspirasie; KUM ETo-LTM: berekende kumulatiewe evapotranspirasie – langtermyn).





COTTON LINT QUALITY BETWEEN CULTIVARS

2018/19 season

by Gert Klindt and Calvin Knight, Cotton SA

Farmers are often faced with the difficult decision of what to plant in their fields, having to choose between different crops and then sometimes choosing between different cultivars available for that crop. It is essential to always consider as much information as possible before planting. It helps to consider the best cultivar suited to the climate of the area, the inputs available for land preparation, management of pests and diseases, and monitoring of plant growth and harvesting. The availability of harvesting machinery, costs of transport to a nearby gin, fibre quality that can be achieved, the tempo of processing seed cotton by a gin, and timeous payments made to the producer, are important factors that enable a farmer to produce cotton.

Considering all cotton cultivars available for planting in South Africa, the farmer has a few options. To assist with these choices, a breakdown of the fibre quality for the 2018/2019 season is presented. These figures are based only on quality data of samples provided to the Cotton SA Quality laboratory and does not take into account any other factors that can influence quality.

Data presented cover the cultivars for KwaZulu-Natal and the Northern Cape, while data from Limpopo, Mpumalanga, and North West were combined for comparative purposes. Data presented up to date were compared from a total of 163 000 bales that have been graded so far (17/1/2020) for the 2018/19 production season. Data were not compared between ginneries.

An interesting cultivar is Paymaster (PM3225). It is intended for hand-picking and not machine-picking (due to its hairy leaves and plant architecture), and is mainly planted by small-scale farmers under dryland conditions, representing a small portion of the total crop (Figures 1 to 3).

From the data presented, Candia was the most popular cultivar across the growing regions (65% of samples received to date were Candia; see the number of samples tested in Figure 1). The Candia cultivar has a long staple and good physical properties. It also responds well to cooler weather (early onset of winter), making it a popular choice specifically for the Northern Cape growing regions. Analyses of samples from the Northern Cape showed that it experienced a better than average growing season, with good fibre qualities (Figures 1 to 4).

The fibre strength of DP1240 (Figure 1) was much better overall compared to the other cultivars, especially in the Northern Cape. Fibre strength achieved across all the cultivars was much better in the 2018/2019 season, which is an improvement over previous seasons where the lower strength values were a concern. This can be seen particularly in the case of Candia, which has increased from 27 g/tex achieved over the previous season, to almost 29 g/tex this past season.

Figure 1: Comparison of fibre strength between cultivars per growing region for the 2018/19 season, until 16/01/2020 (n = no. of samples).

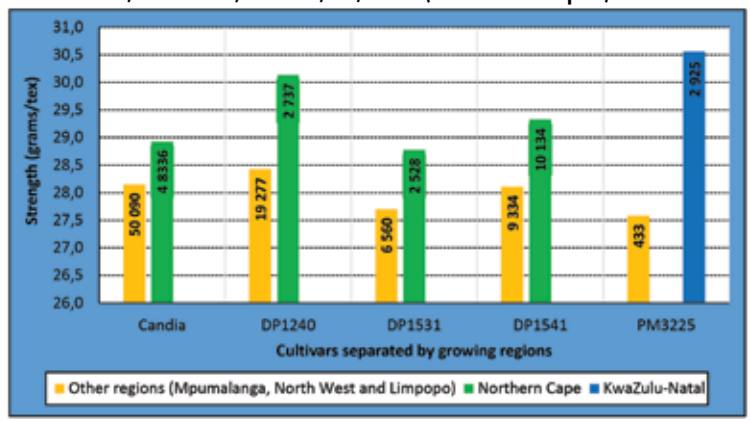


Figure 2: Comparison of fibre length between cultivars per growing region for the 2018/19 season, until 16/01/2020 (n = no. of samples).

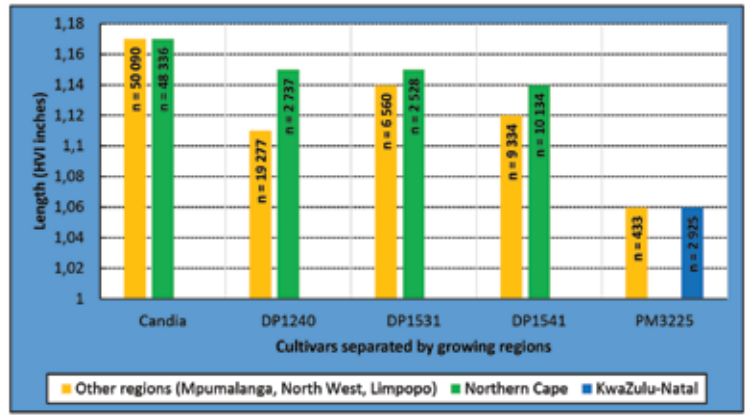
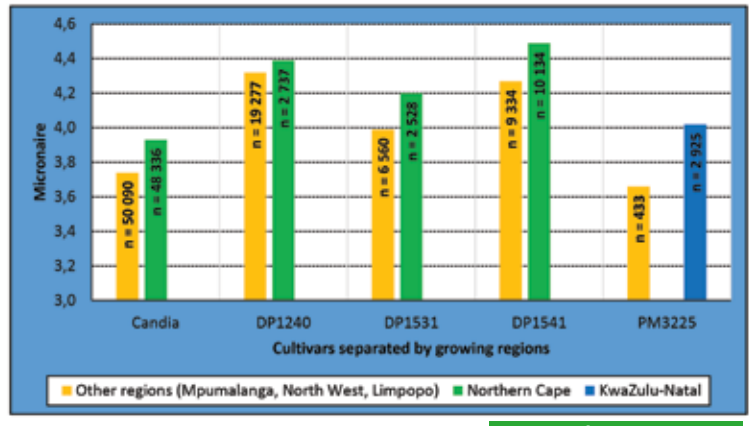


Figure 3: Comparison of fibre micronaire between cultivars per growing region for the 2018/19 season, until 16/01/2020 (n = no. of samples).



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RELATIONSHIPS BETWEEN COTTON FIBRE PROPERTIES AND FIBRE LENGTH

by Calvin Knight, Cotton SA

Longer staple cotton is highly prized in the market owing to its stable physical qualities. Cotton is graded visually and physically. Visual grading is based on the appearance of the cotton, its colour and any particles (contaminants) in the fibre. Physical grading is based on the properties of the fibre – in particular fibre length, strength, and micronaire. The visual grade and the physical grade of the cotton are independent of each other and are not related in any specific way.

The physical properties of cotton fibre have important relationships with one another; the length, strength and micronaire of cotton fibre are key components in determining the class and therefore the price. According to Uster Statistics (Uster Technologies AG, 2019), the properties of cotton change in several ways when the length of the cotton increases. The relationships are:

1. The micronaire value decreases as the length increases.
2. The strength value increases as the length increases.

Table 1: Staple lengths as measured by high-volume instruments (HVI) by Cotton SA – Bremen accredited laboratory.

Length in inches (pulled by hand)	UHML* [inches] HVI length	UHML* [mm] HVI length	32nds International Classes Code**
<13/16″	<0,79	<20,1	24
13/16″	0,80–0,85	20,1–21,6	26
7/8″	0,86–0,89	21,8–22,6	28
29/32″	0,90–0,92	22,9–23,4	29
15/16″	0,93–0,95	23,6–24,1	30
31/32″	0,96–0,98	24,4–24,9	31
1″	0,99–1,01	25,1–25,8	32
1 1/32″	1,02–1,04	25,9–26,4	33
1 1/16″	1,05–1,07	26,7–27,2	34
1 3/32″	1,08–1,10	27,4–27,9	35
1 1/8″	1,11–1,13	28,2–28,7	36
1 5/32″	1,14–1,17	29,0–29,7	37
1 3/16″	1,18–1,20	30,0–30,5	38
1 7/32″	1,21–1,23	30,7–31,2	39
1 1/4″	1,24–1,26	31,5–32,0	40
1 9/32″	1,27–1,29	32,3–32,8	41
1 5/16″	1,30–1,32	33,0–33,5	42
1 11/32″	1,33–1,35	33,8–34,3	43
1 3/8″	>1,36	>34,5	44

*UHML – Upper half mean length **International length code

3. The total amount of short fibres present decreases as the length increases.
4. The uniformity index increases as fibre length increases.

The length of the fibre does not affect its elongation values, trash count, trash area, or Rd and +b values. The degree of reflectance (Rd) indicates how bright or dull a sample is, whereas the yellowness (+b) indicates the degree of colour pigmentation.

The only value that is negatively affected by the length increase is the micronaire. It is outweighed by the importance of fibre length, which explains why such a high premium is placed on longer staple cotton. Longer cotton will retain its physical properties better, while the visual grading properties remain independent.

There are also harsh discounts for lower strength values in the market, which explains the large price difference between high and low classes of cotton. Furthermore, the quality of cotton is attributed to the plant's genetics, which is why so much is invested in breeding cotton that yields the best physical and visual properties possible. Cultivars and technology that provide good quality fibre, together with good growing practices can consistently produce good, long staple cotton that can reach the best prices.

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- Uster Technologies AG. (2019). *Uster Statistics 2018*. Uster Technologies AG.

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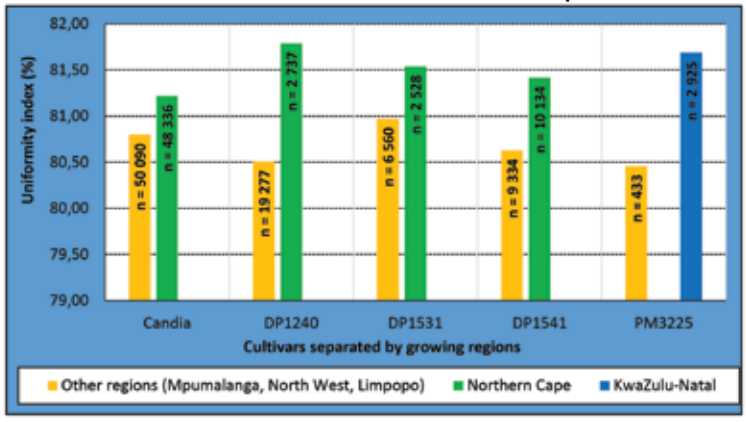
Figure 4: Comparison of fibre uniformity between cultivars per growing region for the 2018/19 season, until 16/01/2020 (n = no. of samples).



Fibre length values (Figure 2) are mainly determined by each cultivar's specific genetics, without much deviation. Candia is a long-staple cotton, and the DP cultivars are medium- to long-staple cultivars, while Paymaster produces short-staple fibres.

Micronaire values fluctuate (Figure 3), which seems to be consistent with it being dependent on environmental conditions. This is especially true during specific critical development stages of boll formation and maturation. Figure 3 is an excellent example of the micronaire range around an average value, between cultivars.

The average uniformity index of cotton is 81% and each of the values shown is within 80% to 82% (Figure 4). This shows that all the values fall within a small range of variation, and that the differences are insignificant. The fibre properties across all cultivars and growing regions for the 2018/2019 season are good and give a good representation of the qualities of the South African cotton crop.

ISEAL support for sugar cane and cotton project based on international standards

by Tertius Schoeman, Cotton SA

The Good Practice, Better Finance project is an ISEAL Alliance[1] Innovations Fund project that aims to develop and test methodologies, and to improve monitoring tools, which would allow for improved access to affordable finance for farmers. As part of the project there is a need to identify the farms that will participate in the pilot study. The project management is done by Bonsucro[2] and SRK Consulting (Africa)[3].

The project is supported by Bonsucro (Sugar Production International Standard), Akwandze Agricultural Finance[4], the Alliance for Water Stewardship (AWS), RCL Foods Limited[5], Cotton SA, the South African Cane Growers' Association, the World Wildlife Fund (WWF), and a local commercial bank. Cotton SA is the custodian of the Better Cotton Initiative (BCI), promoting sustainable cotton that follows international standards. The focus areas of the pilot project are on sugar cane and cotton production in the Malelane and Komatipoort area in Mpumalanga. The main beneficiaries are the smallholder sugar cane and cotton farmers in the region.

Four models of financing have been identified as potentially falling within the project domain, namely:

Scenario 1: Large-scale sugar cane and cotton farming operations

Large-scale sugar cane and cotton farms → Commercial banks

Scenario 2: Smallholder sugar cane farming operations

Smallholder sugar cane farms → Akwandze → Commercial banks/ DFIs[6]/FIs[7]

Scenario 3: Smallholder cotton farming operations

Smallholder cotton farms → Co-ops or other participants → Cotton SA → Commercial banks/ leveraging finance with funders and DFIs

Scenario 4: Smallholder sugar cane farming operations with crop rotation to cotton production

Smallholder sugar cane farms using cotton as rotational crop → Akwandze/ Cotton SA → Commercial banks/ DFIs/FIs

Using these models, the project partner/ participant inputs were requested to finalise the criteria for selection of the pilot site. Once the criteria are finalised, farms proposed for the pilot study will be assessed and evaluated to motivate why the farms are considered suitable for the study.

Cotton SA is excited by the prospect of what cotton production as a rotational crop can bring to the sugar cane industry in Mpumalanga, and what can be achieved by connecting with the international sugar cane standard of Bonsucro.

References

1. ISEAL Alliance stands for International Social and Environmental Accreditation and Labelling (acronyms.thefreedictionary.com/ISEAL)
2. Bonsucro is an international not-for-profit, multi-stakeholder organisation established in 2008 to promote sustainable sugar cane (bonsucro.com)
3. SRK Consulting (Africa) is part of the SRK Group, an independent, international organisation of professional engineers and scientists providing a comprehensive range of technical consulting services to natural resource industries (srk.co.za)
4. Akwandze Agricultural Finance Proprietary Ltd is a sugar cane development finance organisation (fineloans.co.za/akwandze-agricultural-finance)
5. RCL Foods Limited is a South African consumer goods and milling company
6. DFIs – development finance institutions
7. FIs – financial institutions

UPDATE ON COTTON RESEARCH TRIALS

by Dr Annette Bennett, Cotton SA

Cotton SA assists to facilitate several cultivar strip trials and other research trials that were requested by the industry via the South African Cotton Producers' Organisation (SACPO). In total, 22 research trials are being undertaken for the 2019/20 season, in cooperation with the ginneries, a private contractor, the Agricultural Research Council – Industrial Crops (ARC-IC), and universities.

The industry is funding two students doing postgraduate research at the North-West University and the University of Pretoria respectively.

The assistance of Jurg Bester (Vaalharts Gin), Nico Swart (Koedoeskop Gin) and André Prins (GWK Gin), together with Dr Tilla van der Westhuizen (ARC-IC), in getting the strip trials in their areas planted and monitored, is much appreciated.

Apart from the strip trials, two trials are being performed at the Loskop experimental farm and the Jan Kemp research farm (ARC-IC) to evaluate the effect of boron in relation to calcium and potassium respectively, on cotton. In addition, two Pix trials under irrigation are being undertaken in the Makhathini district by Jurie Steyn (private contractor), and on the Loskop research farm by Coleen Fourie (ARC-IC).

A word of thanks also goes to the producers who are participating in the trials. They are contributing to research in finding the most suitable cultivar for their area under specific production methods. Farmers largely donated their own seed and labour and are thanked for their input and dedication. Joseph Kempen from Loskop Gin has donated a considerable amount of seed to enable the planting of a large-scale cultivar dryland trial with all varieties in the Roedtan area. The results of this trial would benefit the dryland farmers on the Springbok Flats. Cotton SA donated some seed where needed on behalf of SACPO to supplement donations by farmers for the Pongola area.

A small-scale farmer trial with different plant population densities has been planted by Jurie Steyn in the Mkuze area for demonstration purposes. Progress on all the trials will be reported on at a later stage.

UPDATE ON SMALLHOLDER COTTON FARMERS FROM NKOMAZI

by Tertius Schoeman, Cotton SA

A group of smallholder cotton farmers in the Nkomazi district in Mpumalanga has been showing a steady growth in yield on their rainfed fields over the past few years. In 2014, during their first season with Cotton SA as a partner, the farmers averaged a yield of 553 kg of seed cotton per hectare, with only seed and insecticides to their disposal. This was remarkable given that the average smallholder yield in Africa is around 395 kg of seed cotton per hectare.

In 2017, the group's average went up to 724 kg/ha, still without the use of fertiliser. The 715 farmers who were actively involved in the project planted 1 750 ha of fields in 2018. The preliminary figure for the 2019 harvest is a seed cotton average of 1 100 kg/ha, achieved with all the necessary inputs available, which include assistance with land preparation, access to funding to purchase seed, insecticides, and fertiliser. Although it is early days to predict the grading and quality results for the season, top-class results can be expected from the crop given the farmers' production history.

The success story of the Nkomazi farmers shows that making use of a functional cost-reporting tool within the farming community is non-negotiable, especially for smallholder farmers, in order to farm sustainably. Cotton SA is providing day-to-day mentoring and project management services to ensure that vital statistics and accurate records are being kept. More training is needed in production skills to ensure continuous success.

UPDATE ON COTTON SKILLS TRAINING COURSES

by David Mtsweni, Cotton SA

A cotton skills training course for the 2019/20 season was presented from 11 to 15 November 2019 at the Taung Hotel School and Convention Centre. The module that was presented covered financial management and planning, which could not take place earlier due to unforeseen circumstances.

This module followed the initial module that was presented on land preparation and planting. The next module to be presented from 27 to 31 January 2020 will deal with integrated pest management and mid-season pests.

A total of 16 farmers attended the course, which is not ideal since it is an opportunity for around 30 to 40 farmers to get trained in cotton production. Attendance was coordinated by GWK and included thirteen males and one female. These learners are involved in a project where 10 hectares were planted under irrigation by 140 farmers. Two other farmers from Vaalharts also attended the courses, each planting 150 hectares under irrigation. Farmers enjoyed the training and found the information useful.

Although farmers often find it difficult to attend due to time constraints and other obligations, the hope is that the effort put in by the trainer, together with support from the industry, will encourage more persons to attend future courses. The course is designed to include illiterate learners, less academically inclined learners, as well as academically strong learners. Every effort is made to accommodate everybody.

These training programmes are accredited AgriSETA skills programmes, funded this year by Cotton SA, and coordinated and presented by David Mtsweni, Cotton SA's training coordinator, trainer and assessor.

> "The next module to be presented from 27 to 31 January 2020 will deal with integrated pest management and mid-season pests."

Cotton farmers from across the country attending a cotton skills training course at the Taung Hotel School.

THE RETAIL, CLOTHING, TEXTILE, FOOTWEAR, AND LEATHER

(R-CTFL) value chain's master plan

by Helena Claassens and Tanya Aucamp, Cotton SA

Governmental changes brought about in the South African retail industry through the domestic R-CTFL value chain master plan have brought hope for the textile industry, which has endured a turbulent period. The country's once-mighty apparel and textile sector, which employed 200 000 people in 1987, has been halved with dozens of factories closing, and manufacturers who are currently struggling as the market is flooded with cheap imports. South Africa's textile and apparel industry is no longer what it used to be.

Government, through an interactive and inclusive stakeholder engagement process facilitated by the dti (the Department of Trade and Industry), drafted the R-CTFL value chain master plan to change the way the local industry operates down the value chain. This initiative sparked off a revival of the industry through the promotion of the "Buy local" campaign, preventing illegal imports, and a commitment by big clothing retailers to buy an additional 85 million units of locally manufactured clothes, shoes and leather goods over the next few years.

The R-CTFL master plan was signed off at the South Africa Investment Conference in Sandton in November 2019, by the government, labour unions, the Foschini Group, Pepkor, Edcon, Mr Price Group and Woolworths, among others. Government pledged to take decisive action in the R-CTFL master plan against illegal imports, and unions have committed to make adjustments in the employment environment, which would

hopefully result in increased production and competitiveness. Manufacturers promised R6,8 billion in investment over the next five years. These undertakings by some of the biggest players in the clothing retail sector will boost the acquisition of locally produced goods from its present level of 44% to 65% by 2030.

The plan was developed through a process of consultation with all stakeholders and is based on extensive research. Its vision for 2030 is "a competitive, sustainable and dynamic R-CTFL value chain that provides its customers with compelling products, encouraging increased employment opportunities and advancing inclusion and transformation".

The process culminated in the following seven core commitments:

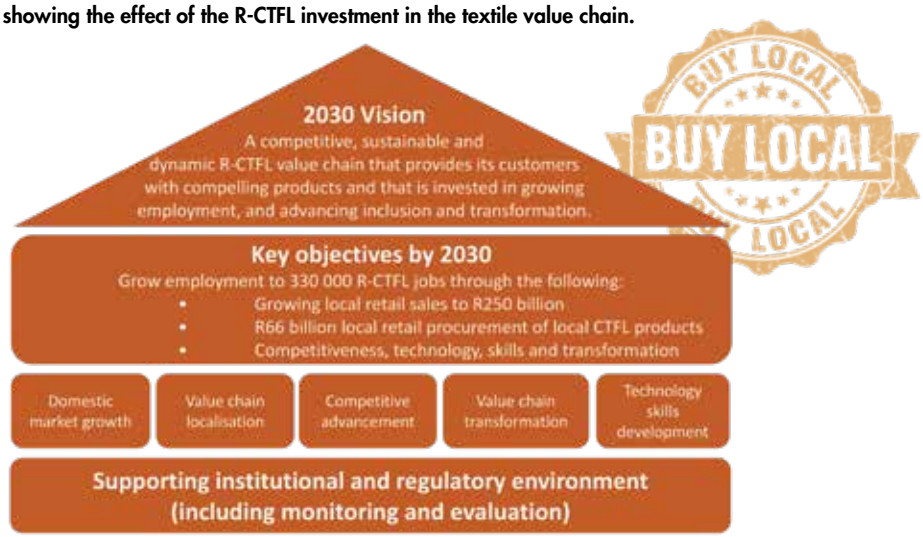
- Grow the local market for local CTFL products. The agreed target is to grow total retail sales to R250 billion by 2030.
- Increase local CTFL procurement. Retailers have made a commitment to grow local share of sales to 65%.
- Stem the flow of illegal imports to eliminate unfair competition against local retailers and manufacturers.
- Employ strategic and effective tariff and rebate measures to provide fair protection for the domestic CTFL value chain, to substantially reduce illegal and under-invoiced imports.
- Extend the Competitiveness Improvement Programme (CIP) and the Production Incentive (PI) in an appropriate format for three years, to increase investment and drive competitiveness and productivity. The objective is to develop future supply-side incentives.
- Align production capacity to sales cycles.
- Transform the value chain. The target is to accelerate BBBEE and economic inclusion through the R-CTFL value chain, focusing on black investment growth, increasing small-, medium- and micro-enterprise (SMME) participation and worker empowerment.

The success of such an initiative is only possible if all involved stakeholders commit to and actually implement the actions. This will require the following:

- Structural changes based on growing the domestic market
- Increasing purchases from local suppliers
- Accessing and growing export markets
- Enhancing competitiveness
- Driving transformation
- Increasing skills and technology

This is only the start of reviving the industry because there are other areas that need further work. These are being addressed by joint task teams that have been set up to stimulate the textile pipeline.

Figure 1: Diagram showing the effect of the R-CTFL investment in the textile value chain.



COTTON CLUSTER DELEGATES ATTEND TextileExchange19 IN VANCOUVER

Anton Peters (Woolworths), Paulina Urben (Mr Price Sport), Allison Lloyd (Woolworths), Tanya Aucamp (Cotton SA), Sadah Moodley (Edcon), Shaun Gannon (Mr Price Group), and Ian Taverner (SACC).

by Tanya Aucamp, Communication Specialist for Cotton SA

The 2019 Textile Exchange Sustainability Conference, held in Vancouver, Canada during October 2019, had the greatest turnout to date with over 900 registered attendees, including more than 200 speakers from 46 countries representing over 450 companies. TextileExchange19 was the largest conference on the topic of sustainable textiles ever to be held in North America, and for the first time in its history it was recognised as being climate-neutral through a partnership with South Pole[1].

Textile Exchange (TE) is a global non-profit organisation that works closely with its members to drive industry transformation in preferred fibres, integrity and standards, and to form responsible supply networks. It identifies and shares best practices regarding farming, materials, processing, traceability, and product end-of-life cycle, to reduce the textile industry's impact on groundwater, soil, air, as well as on the human population. It is committed to identify barriers to growth and drives collective action to overcome these challenges.

Conference attendees were welcomed by two members of the First Nations Musqueam Tribe[2] with a blessing from Elder Rose Guerin and an

opening message from the Musqueam Nation's representative Debra Sparrow. This traditional Indian tribe's spiritual ceremony was touching, leaving many delegates with tears running down their cheeks.

The theme of the conference was "Driving Impact through Integrity and Preferred Fibre and Materials," to advance united in action, on the United Nations' sustainable developmental goals (UN SDGs). The threats facing our planet (from global warming to losses in biodiversity) are common knowledge, and we are on an urgent timeline to find solutions. As the world's seventh largest economy, the textile industry is in a strong position to help drive the changes that are needed at grassroots level. To this end, Textile Exchange has invested in the development of "impact credits" that allow brands to bypass the cost and complexity of the supply chain and deliver value directly to farmers and producers. The concept of impact credits provides an opportunity to use market forces to encourage best practices where they will have the greatest impact on the challenges facing our planet. The 17 UN SDGs were a common theme used throughout the conference, and it was emphasised that "development without conservation is not sustainable and conservation without development is not viable."

In recent surveys with Textile Exchange's members and the community at large, price was identified as the key reason why brands and retailers are struggling to scale up or increase the use of preferred fibres and materials. This is called the "price-versus-value" paradigm because the current, or "typical business model" paradigm, focuses on price. This problem is also a hard reality faced by the South African retailers in their strive towards increased local beneficiations, while also driving improved competitiveness. It set the scene for discussions during the conference around promoting responsible and fair pricing practices, taking an initial look at some of the concrete solutions that will help companies reframe the conversation around "price," to one around "value".

Discussions around sustainable fibres remained a critical topic, not only looking at raw fibres but also at recycled fibres, FSC[3] and biosynthetic fibres. Cotton is one of the most used fibres in the fashion industry. However, the possibility to use more recycled polyester is also important to make sure that we are reducing plastic in landfills and the sea.

The South African Cotton Cluster (SACC), as a member of the Textile Exchange, was prominent at the conference with seven delegates attending. This international conference provides a valuable benchmark and learning platform for industry stakeholders.

What some of our delegates had to say about their conference experience:

"The highlight of the conference," said Sadah Moodley (Edcon), "… was while UK and US retailers and international big brands shared the same table as the South African team (Woolworths, Mr Price and Edcon), they were surprised to find out that three major retailers from the same country are together as one united force. This was made possible through the retailers' partnerships with the South African Cotton Cluster. The spin-off from the cluster was not only enabling the increase of cotton production and creating employment, it got three of the country's major retailers together to work on sustainability in the retail environment. This sent a clear message that the retail sector is working together to help the industry and country. Seeing all the retailers in South Africa forming a task team to work together to address sustainability would be encouraging."

"The 2019 Textile Exchange Sustainability Conference had the greatest turnout to date with over 900 registered attendees, including more than 200 speakers from 46 countries representing over 450 companies."

> **"THE ROOTS of the fashion business are in the FIELDS and FORESTS, and extracted from deep WITHIN THE GROUND" – La Rhea Pepper (managing director of the Textile Exchange)"**

Anton Peters (Woolworths) said that his understanding of the difference we can make in the global challenge of sustainability has increased. "Rubbing shoulders with like-minded global players across the industry has challenged me not only to educate myself, but all that I interact with, to slow down the impact the textile industry is having on our planet with bad manufacturing practices."

Alison Lloyd (Woolworths) indicated that challenges around sustainability can be overwhelming. She emphasised that Woolworths is on this journey and needs to commit to reach targets. "In order to deliver these, we need to be focused, ensure we are clear in our purpose, choose the right partners, collaborate (internally as well as externally with other retailers and organisations) and communicate extensively," she said.

"It was inspiring to be a part of the global conversation around the sustainability opportunities in our industry. It highlighted the importance of the impact that we can make in our local context and that we are not alone on our journey to make a sustainable difference in the garment and textile industry." – Paulina Urben (Mr Price Sport).

Tanya Aucamp, Cotton SA said: "This was my third year of attending the TE conference. This conference remains an amazing learning platform. I am grateful for the opportunity provided to me to attend, as this put me in a position to raise my concerns in an open forum on the skewed positioning of genetically modified cotton by the organic cotton activists. Statements by them result in myths on facts pertaining to water and chemical usage in cotton production, tainting the industry."

The 2020 Textile Exchange Sustainability Conference is scheduled to take place during the first week of November 2020 in Dublin, Ireland.

References

1. southpole.com/sustainability-solutions
2. An indigenous historic tribe from Canada, from the Musqueam Indian Reserve, located south of Marine Drive near the mouth of the Fraser River. (musqueam.bc.ca/our-story/who-we-are)
3. FSC is the preferred certification for forest-based fabrics. (fsc.org/en/news/forest-catwalk-fsc-preferred-certification-forest-based-fabrics)

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