KATOEN COTTON SA

Volume 21 No. 1
March **2019**

A Cotton SA publication for the cotton industry of Southern Africa

www.cottonsa.org.za | R24,00 including 15% VAT

THE HARVESTING EDITION

- SCC contributes to cotton production
- Midseason pest control and plant development
- Produksiepraktyke wat veselkwaliteit beïnvloed
- Smallholder cotton farmer revival
- Why cotton?

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KATOEN KAN BY KLIMAATSVERANDERING AANPAS

In 'n spesiale VN-verslag is die Suider-Afrika-streek as 'n brandpunt van klimaatsverandering geïdentifiseer. Die negatiewe uitwerking van hittegolwe, brandgevaar en gereelde droogtes op landbou en watersekerheid in die streek kan egter versag of vermy word as aardverwarming tot 1,5 °C beperk kan word.

In Suid-Afrika is die temperature in die binneland reeds sowat 2 °C hoër as 'n eeu gelede en het dus sowat twee keer so vinnig as in die res van die wêreld gestyg. Die vraag is nou vir hoe lank somergewasse, en meer spesifiek katoen, teen hierdie agtergrond suksesvol in tradisionele verbouingsareas verbou kan word.

Alhoewel stygende koolstofdioksied (CO_2)-vlakke fotosintese verhoog, wat produksie van biomassa sal bevorder, sal dit nie noodwendig hoër opbrengste lewer nie, omdat hoër temperature 'n negatiewe impak op reproduktiewe groei het. Stygende temperature sal ook 'n langer groeiseisoen meebring met verskuiwing van plantdatums.

Vir katoen om te kan aanpas by toekomstige klimaatsveranderings, sal dit die genetiese verbetering van plantmateriaal asook aanpassing van landboupraktyke vereis, wat insluit behoorlike voeding en die gebruik van groeireguleerders en kultivars wat hittestres, droogte, versouting, peste en plae kan weerstaan. Katoenproduksie sal bly voortbestaan namate klimaatsverandering vorder, maar sal net soos ander organismes moet aanpas by die veranderde omgewing.

COTTON CAN ADAPT TO CLIMATE CHANGE

A special UN report has identified the Southern Africa region as a focal point of climate change. The negative impact of heat waves, fires and regular droughts on agriculture and water security may, however, be mitigated or avoided if global warming could be limited to 1,5 °C.

In South Africa, the temperatures in the interior are already about 2 °C higher than a century ago, indicating that temperatures are rising twice as fast compared to the rest of the world. The question is for how long summer crops, and cotton, in particular, can be successfully grown in traditional production areas, against this backdrop.

Although rising carbon dioxide (CO_2) levels will increase photosynthesis, which will increase production of biomass, it will not necessarily lead to higher yields due to the negative impact of higher temperatures on reproductive growth. Furthermore, rising temperatures will lead to a longer growing season resulting in shifting planting dates.

For cotton to adapt to future climate changes, the genetic improvement of plant material and a change in agricultural practices will be required, which includes proper nutrition and the use of growth regulators and varieties that are tolerant to heat stress, drought, salination, pests and diseases. Cotton production will continue to exist as climate change progresses, but will have to adapt to the changing environment, just like other organisms.

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KATOEN COTTON SA
is published quarterly by Agri Connect (Pty) Ltd for
KATOEN SUID-AFRIKA COTTON SOUTH AFRICA

Cover picture: The new Loskop Cotton Gin

OUTLOOK ON TEXTILES

by Helena Claassens, Cotton SA

Currently the local seed cotton harvest is the best since before 2000, and for various reasons, there is an increasing interest to produce more cotton. But what happens in the cotton textile pipeline? Unfortunately, not much, and we are not aware of any new investments or new textile mills to be built soon.

COTTON YARN

The next product in the pipeline after ginning is yarn. Although the final figures for 2018 are not available yet, indications are that the volume of cotton yarn imports increased by approximately 12% since 2016, while exports increased by 154%.

WOVEN COTTON FABRICS

The majority (78%) of woven cotton fabrics is imported from China and India. The estimated volume of imports of cotton woven fabrics increased by about 190% since 2016 while the volume of exports showed a decrease of around 13%.

KNITTED COTTON FABRICS

Approximately 14% of the volume of imports of all knitted fabrics is made up of cotton. The estimated volume of imports during 2018 increased by nearly 130% since 2016, while the volume of exports decreased by 40%. Cotton makes up about 20% of total exports of all knitted fabrics.

COTTON HOME TEXTILES

Home textiles and clothing are the final products in the pipeline. The estimated volume of imports of cotton home textiles showed an increase of 17% since 2016. About 84% of this volume comprises cotton towels. The volume of exports for 2018 has been more or less unchanged from 2016.

COTTON CLOTHING

In respect of cotton clothing, the estimated value of imports for 2018 is only 0,4% more than in 2016. The value of imports of cotton clothing represents approximately 50% of total clothing imports. Exports of cotton clothing are only about 2% more than for 2016. During 2018, cotton clothing made up about 30% of all clothing exports.

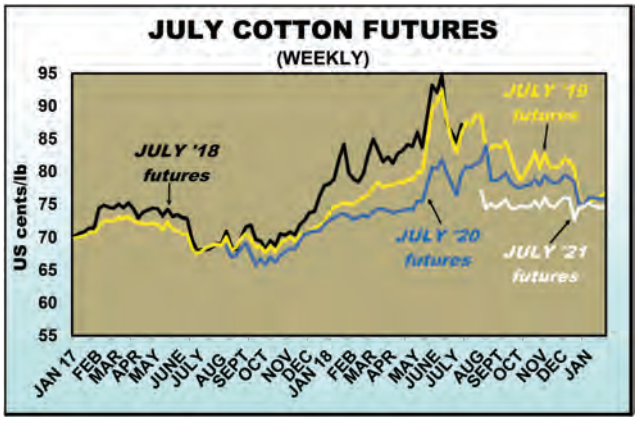
The local textile and clothing industries are experiencing difficult times with no real growth, while trade in cotton textiles and clothing showed mixed results.

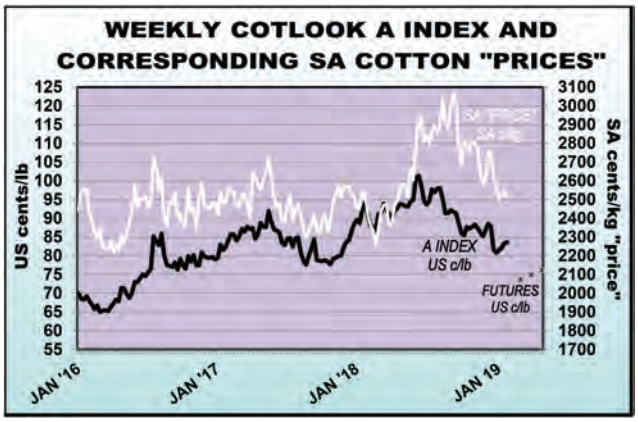
Figure1: Estimated cotton textile imports (tonnes)

KATOEN SA MARKVERSLAG

deur Koot Louw, Katoen SA

Die **COTLOOK A INDEKS** is 'n daaglikse aanwyser van internasionale katoenveselpryse en is die gemiddeld van die vyf goedkoopste kwotasies (koste en vrag) van die belangrikste katoentipes wat internasionaal verhandel word. Bestemming: Verre Ooste.	**COTLOOK A INDEKS**	**AFGELEIDE SA "PRYS"**
	Gemiddelde VSA c/lb	Gemiddelde SA c/kg
Desember 2018	85,66	2 684,67
Verlede week (28/01/19 tot 01/02/19)	83,58	2 489,70
Januarie 2019	82,43	2 525,88
Vandag (01/02/19)	**83,75**	**2 455,67**
Vandag 'n jaar gelede	87,85	2 325,10
Vandag twee jaar gelede	84,25	2 535,36





WÊRELDVOORRADE LAER, VERBRUIK BESTENDIG EN PRODUKSIE LAER

Die International Cotton Advisory Committee (ICAC) projekteer dat wêreldeindvoorrade van katoen teen einde Julie 2019 met 5% tot 17,6 miljoen ton gaan afneem, wat gelykstaande is aan ongeveer tweederdes van wêreldkatoenverbruik. Die globale afname in voorrade word gedryf deur bestendige wêreldkatoenverbruik te midde van 'n afname in wêreldkatoenproduksie. Hierdie vermindering in wêreldeindvoorrade is die vierde agtereenvolgende seisoen van afname sedert die historiese hoë vlakke van byna 23 miljoen ton vier jaar gelede.

China se aandeel in die globale katoenvoorrade sal na verwagting voortgaan om af te neem tot sowat 7,6 miljoen ton teen die einde van Julie 2019, die laagste voorraadvlakke sedert 2011/12. Terwyl Chinese katoenvoorrade afneem, sal katoenvoorrade buite China vanjaar vir die vierde agtereenvolgende seisoen na verwagting steeds toeneem met sowat 1% tot ongeveer 10 miljoen ton, 'n historiese hoogtepunt.

Wêreldkatoenproduksie vir 2018/19 word deur die ICAC op 25,9 miljoen ton geraam, 'n daling van 3% teenoor die vorige seisoen. Die verwagting is dat die 2018/19-oes van 'n aantal van die voorste katoenproduserende lande 'n daling gaan toon:

- Indië: verwagte daling van 7% tot 5,92 miljoen ton weens onvoldoende reënval
- Die VSA: verwagte daling van 11% as gevolg van droogte en orkane

- Pakistan: verwagte daling van 6% as gevolg van 'n tekort aan besproeiingswater
- Australië: verwagte daling van 44% as gevolg van die beperkte beskikbaarheid van water vir besproeiing
- Oesbekistan: verwagte daling van 20% as gevolg van 'n vermindering in katoenhektare.

Katoenproduksie sal na raming deur die ICAC in die ander groot produserende lande en streke in 2018/19 toeneem.

- China: verwagte toename van 1% tot 5,94 miljoen ton, wat dié land die grootste katoenproduserende land in 2018/19 sal maak.
- Brasilië: verwagte toename van 20% tot 2,4 miljoen ton weens 'n verhoging in katoenhektare.

Volgens die ICAC het voortgesette handelsonsekerhede en bekommernisse oor ekonomiese groei steeds 'n invloed op wêreldkatoenhandel en die vraag na tekstiele. Katoenpryse is onder druk, maar die huidige vooruitskattings vir globale verbruik bly op ongeveer 26,8 miljoen ton vir 2018/19. Sover dit katoenhandel betref, sal katoenuitvoere deur Brasilië na verwagting met 48% tot 1,35 miljoen ton in 2018/19 toeneem. Dit sal dié land die tweede grootste katoenuitvoerland ná die VSA maak, Na verwagting sal die VSA se katoenuitvoere met sowat 4% tot 3,3 miljoen ton in 2018/19 afneem.

SA KATOENOES

Die eerste skatting vir die 2018/19-produksiejaar dui op 'n katoenoes van 220 221 bale vesel vir Suid-Afrika, 'n styging van 17% teenoor die vorige seisoen. Droëland- en besproeiingshektare het onderskeidelik met 43% en 20% toegeneem teenoor die vorige seisoen, hoofsaaklik weens die gunstiger pryse van katoen teenoor mededingende gewasse, asook die hernieude belangstelling in katoenproduksie.

PRYSE

Volgens sommige markanaliste ervaar die katoenmark nou 'n stilte voor die storm. Voortgesette handelsonderhandelinge tussen China en die VSA kan tot gevolg hê dat daar 'n skerp herstel in die Chinese vraag na Amerikaanse katoen kan wees, wat tot beter prysvooruitsigte vroeg in Maart behoort te lei. Die termynmark het nie enige beduidende veranderinge in Januarie getoon nie, met termynpryse wat binne die 73–76 VSA c/lb band gewissel het.

Katoenoesverslag: eerste skatting 2018/19 produksiejaar

Produksiestreek	Hektare besproeiing	Hektare droëland	Opbrengs besproeiing kg katoenpluksel/ha	Opbrengs droëland Kg katoenpluksel/ ha	Produksie 200-kg bale katoenvesel	% Van oes hand-gepluk	% Van oes sover gepluis
LIMPOPO							
Loskop	4 467	0	3 800	0	30 554	0	0
Noord- en Suidvlakte	1 236	12 375	3 200	800	24 939	0	0
Koedoeskop, Dwaalboom, Thabazimbi	7 562	0	4 500	0	62 954	0	0
Limpopo en ander	275	690	3 500	400	2 229	0	0
Weipe	1 000	0	4 000	0	7 400	0	0
NOORD-KAAP							
Vaalharts	2 301	0	4 581	0	19 502	0	0
Benede Oranjerivier	364	0	4 000	0	2 694	0	0
Res van Noord-Kaap	4 065	0	4 860	0	38 313	0	0
NOORDWES							
Stella, Delareyville, Schweizer-Reneke, ens.	628	3 178	4 349	1 754	15 365	0	0
Taung, Skuinsdrif	388	0	4 204	0	3 017	0	0
KWAZULU-NATAL	736	2 400	4 211	750	9 064	53	0
MPUMALANGA	0	1 080	0	750	1 499	100	0
VRYSTAAT	50	800	3 500	1 600	2 692	0	0
RSA TOTAL	**23 072**	**20 523**	**4 345**	**957**	**220 221**	**3**	**0**
Swaziland*	250	1 500	4 000	750	3 825	100	0
Botswana*	0	0	0	0	0		
Namibië*	50	0	0	0	370		0
Zimbabwe*	0	0	0	0	0		
Mosambiek*	0	0	0	0	0		
GROOTTOTAAL	**23 372**	**22 023**	**4 341**	**943**	**224 416**	**5**	**0**

*Besonderhede het betrekking op verwagte aankope van katoenpluksel deur Suid-Afrikaanse en Swazilandse pluismeulens vanaf hierdie lande.

NUUS / NEWS

A typical cotton plant seedling.

COTTON PLANTS SPROUT ON THE MOON

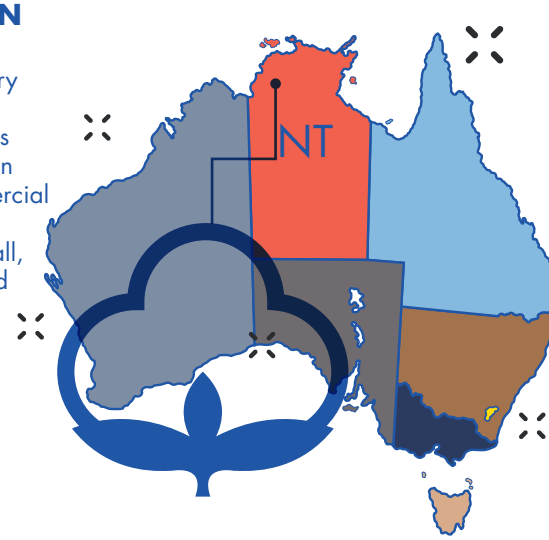
The cotton plants that sprouted on the moon's far side in an experiment aboard China's Chang'e-4 spacecraft in January this year have all died. These sprouts, however, mark the first time that biological matter has been grown on the moon.

Tucked aboard the spacecraft were seeds within a biosphere equipped with some of the comforts of home: water, soil, air and a heat-control system, Chinese researchers said. Once the probe touched down, ground control instructed the probe to water the seeds. The seeds that scientists hoped would thrive within a biodome aboard have all died, done in by the bitter cold of the lengthy lunar night.

NEW AUSTRALIAN COTTON PRODUCTION REGION

Signs of a cotton industry in Australia's Northern Territory (NT) are starting to emerge as drought-stricken southern farmers look elsewhere. Several farmers and researchers have planted cotton trials in 2019. Cotton has long been spoken of as a key to northern development, but commercial quantities have never been harvested in the NT.

The northern region's more reliable wet-season rainfall, its vast undeveloped land and climate, have all attracted the attention of cotton growers from the southern states as the NT farmers look to diversify. Tipperary Station, 160 km south of Darwin, is one of three localities undertaking commercial trials of cotton in 2019. Twenty hectares of dry-land cotton was planted in January and in the coming months, a further 50 ha will be planted under a centre-pivot.



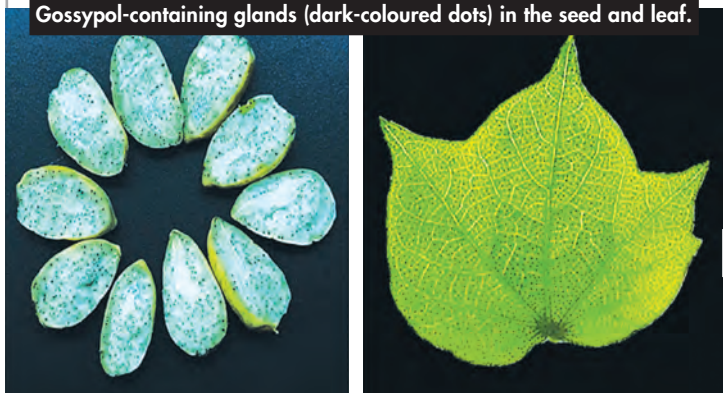
MANIPULATION OF GOSSYPOL-CONTAINING GLANDS IN COTTON CAN BOOST THE PLANT'S NATURAL DEFENSES

Development of a cotton plant with stronger natural defences due to a greater gland density and thus more gossypol in the leaves could soon be a reality. Seeds and other parts of cotton possess dark glands containing toxic terpenoids such as gossypol, that defend the plant against pests and pathogens, said Dr Keerti Rathore, AgriLife Research plant biotechnologist at the Institute for Plant Genomics and Biotechnology at the Texas A&M University.

Rathore and his team compared RNA production in the embryos from a glanded cotton and a mutant glandless plant. These analyses resulted in the identification of three genes that play a critical role in gland formation, he said.

Rathore's lab recently announced the development and deregulation of a gossypol-free cotton seed – ultra-low gossypol cotton seed (ULGCS) – that could be a new source of protein for the more efficient aquaculture species and poultry, or even as human food. However, equally important in the world of scientific discoveries, he said, is the intriguing possibility of enhancing the expression of these genes to increase the number of glands in the leaves and floral tissues. This would allow for boosting gossypol production in those locations and strengthening the plant's natural defences. "There is an increasing need for such a natural defence mechanism against pests because more and more insect species are developing resistance to various forms of *Bt*-cotton," Rathore said.

Gossypol-containing glands (dark-coloured dots) in the seed and leaf.



Tommy Hilfiger.

TOMMY HILFIGER TO LAUNCH 100% RECYCLED COTTON JEANS IN 2019

Tommy Hilfiger has achieved a new sustainable milestone. The PVH Corp.-owned brand recently announced that it would introduce its first 100% recycled cotton denim styles in the Spring of 2019 – the Tommy Jeans collection.

"We have a responsibility to future generations to manufacture products in a more thoughtful way to protect our environment," said founder Tommy Hilfiger. Moving forward, the company said the sustainable denim would become part of the Tommy Jeans collection each season.

The innovative jeans are made of cotton offcuts that are taken apart, using a mechanical separation process before being woven into new material. The thread used to sew the jeans is spun from recycled plastic bottles and buttons, while recycled metal will be used to create the buttons and zips.

"SMART" SPRAYER SHOWS PROMISE IN 2018 TESTS

A smart in-crop sprayer tested in the USA this season could significantly reduce herbicide costs for farmers and potentially minimise off-target movement of herbicides.

The sprayer uses image-recognition software and machine-learning techniques to see weeds growing in the crop, and then delivers a precise shot of herbicide to the weed. Blue River Technology's See and Spray machine was tested in cotton and soya beans in 2018. Blue River Technology is owned by Deere and Company.

As the smart sprayer moves through the field, it continuously captures images of the ground and sends them to a computer. When green vegetation is detected, the computer analyses it and makes a decision. If it is a bad guy, the sprayer turns on an array of straight stream nozzles that target the weed and not the crop.

The smart sprays can significantly reduce herbicide use, and Arkansas trials in 2018 on cotton showed a 95% reduction in herbicide compared with a broadcast application. The smart sprayer operated at about 10 to 12 km per hour.

NEW APPOINTMENT AT COTTON SA'S GRADING LAB

Calvin Knight is the new Senior Quality Control Officer at Cotton SA's grading lab. He previously worked at Starke Ayres seed in the research and pathology department, with a focus on trials for plant resistance to pathogens, quality control on produced seed, and other lab functions. He has a bachelor's degree in biochemistry and microbiology (University of Pretoria), and is looking to further pursue his studies. He has an avid interest in agriculture and looks forward to building a career at Cotton SA. When not grading cotton, Calvin enjoys spending time with his family, running, or working with his latest DIY project. You can reach him at 012 804 1462 or **calvin@cottonsa.org.za**

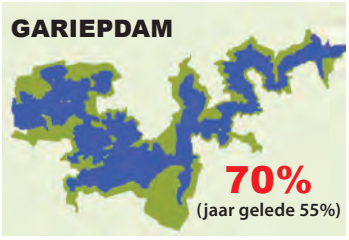
Calvin Knight.

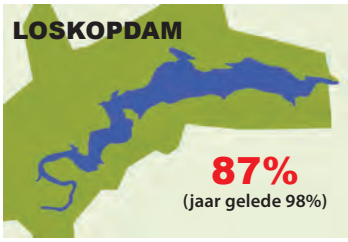
Gariepdam.

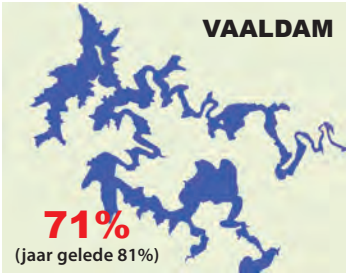
DAMME EN KLIMAATS-VOORUITSIGTE

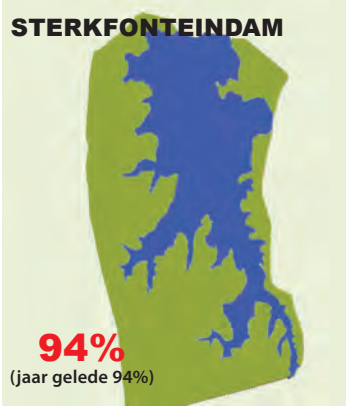
SA Weerdiens Verslag soos op 1 Februarie 2019
Saamgestel deur Katoen SA

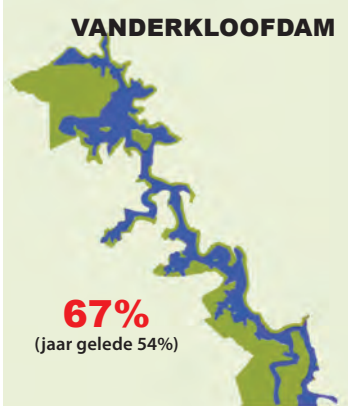
DAMMESTAND SOOS OP 11 FEBRUARIE 2019

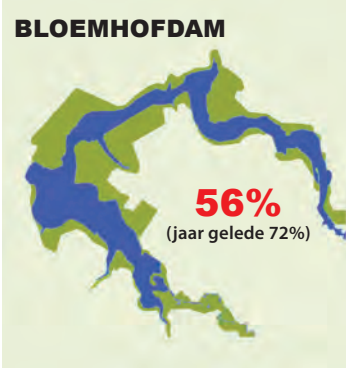












KLIMAATSVOORUITSIGTE VIR FEBRUARIE TOT JUNIE 2019

Die El Niño Suidelike Ossillasie (ENSO) het effens versterk na 'n El Niño-fase oor die afgelope maand. Soos voorheen, is die verwagting dat dit vir die res van die somer en vir die grootste deel van herfs sal heers. Gedurende die afgelope maand was daar 'n tipiese El Niño te bespeur, wat 'n invloed gedurende die laaste deel van die somerseisoen kan hê en wat dui op onder-normale reënval in hierdie tydperk.

Bo-normale reënvaltoestande sal na verwagting tydens die vroeë herfs (Februarie tot April) oor die somerreënvalgebiede heers, maar dit is nie duidelik watter toestande tydens mid-herfs (Maart tot Mei) en laat-herfs (April tot Junie) verwag kan word nie. Voorspellings dui egter op bo-normale reënval tydens herfs vir dele van die suidelike kusgebiede.

In die algemeen word hoër temperature verwag op pad na die herfsseisoen toe. Gedurende laat-herfs word onder-normale maksimum temperature egter aangedui vir dele van die land.

SCC contributes to cotton production

by Tanya Aucamp, Cotton Cluster

Sustainable Cotton Cluster

It has been almost five years since Cotton SA and representatives from the cotton value chain and government launched the Sustainable Cotton Cluster (SCC), an initiative to increase capacity and competitiveness in South Africa's textile and apparel industries. According to Hennie Bruwer, CEO of Cotton SA, production has increased more than eightfold from 26 000 bales in 2013 to about 190 000 bales for the past season, and 32% of these lint bales were Better Cotton Initiative (BCI) cotton.

BCI is the largest cotton sustainability standard in the world. It exists to make global cotton production better for the people who produce it, better for the environment it grows in and better for the sector's future. BCI aims to transform cotton production worldwide by developing better cotton as a sustainable mainstream commodity.

On 1 April 2014, the Department of Trade and Industry (the dti) launched a five-year plan to establish a national textile cluster, the Southern African Sustainable Textile and Apparel Cluster (SASTAC), supported by an original R200-million grant fund. Its aim was to improve capacity and competitiveness and to create jobs in the cotton, textile and apparel industry value chains. Through this initiative, the cotton industry formed the SCC in May 2014 to serve the cotton-specific interventions. The SCC brings together the entire cotton supply chain under one umbrella: farmers, ginneries, yarn manufacturers, weavers and knitters, dyers, finishing plants, retailers and consumers.

South African retailers Mr Price Group and Edcon Group have created 22 integrated supply chains through this initiative, on items made with sustainable cotton sourced from South Africa. These include product lines like T-shirts, chinos, towels and underwear. Other retailers who have also been part of the journey are Woolworths and Ackermans. Woolworths Holdings is the first South African retailer to become a member of the BCI programme and has committed to sourcing

> "BCI aims to transform cotton production worldwide by developing better cotton as a sustainable mainstream commodity."

100% of its cotton as "more sustainable cotton" by 2020.

BCI aims to transform cotton production worldwide by developing Better Cotton as a sustainable mainstream commodity. BCI uses a chain of custody models called Mass Balance whereby volumes of Better Cotton are tracked on an online sourcing platform. Better Cotton may be mixed with or replaced by conventional cotton in its journey from field to product. However, the volumes of Better Cotton claimed by members on the online platform should never exceed the volumes physically procured by spinners and traders.

The significant growth in the cotton industry has also resulted in capital investment of more than R200 million on the ginning side. The Loskop Cotton Gin in Marble Hall has been replaced with a totally new gin with increased capacity and another new gin in Koedoeskop, Limpopo, is now in operation.

Farmers are also putting their hands deep into their pockets to buy new harvesting machines, mostly the latest technology, which consolidates picking and baling. Since the demonstration of the first new harvesting technology in 2015, 11 cotton strippers and 24 cotton pickers have been imported by participating farmers. These top-of-the-range cotton pickers cost between R9 million and R11 million each. They harvest between 15 ha and 20 ha per day, so a farmer needs at least 1 000 ha under irrigation to make the investment viable. This equipment makes cotton farming more productive and cost-effective, especially in the case of dry-land cotton production.

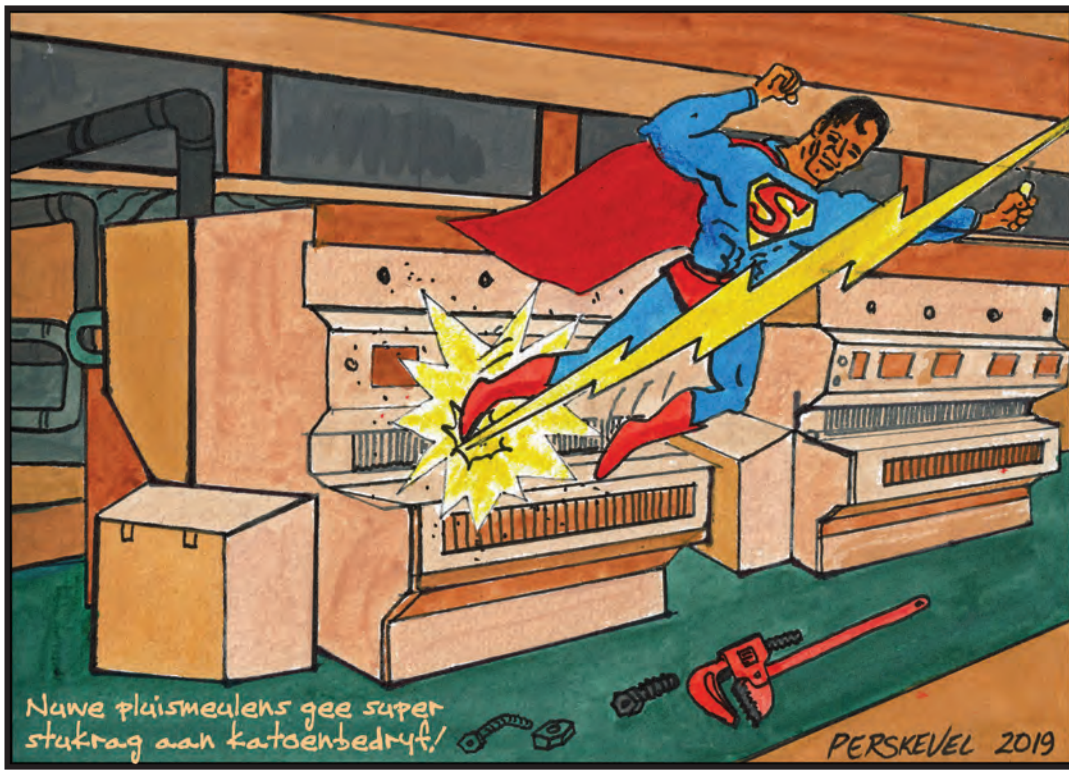
Mr Bruwer says that there was roughly 34 000 ha cotton planted during the past season, up from 7 500 ha in 2013, with more than 40 000 ha expected for the new season. The industry had about 230 commercial farmers and about 1 250 small growers last season, with 51 of the commercial farmers and 1 115 of the smallholder farmers being BCI-licenced. The South African cotton-growing

areas are mainly located in Limpopo, Northern Cape, North West, KwaZulu-Natal and Mpumalanga. During the 2017–2018 season, five smallholder cotton projects were funded in three provinces. A total of about 3 800 ha was planted to cotton by the 1 250 small farmers supported.

Based on the estimated calculation by the Bureau for Food and Agricultural Policy (BFAP), the labour multiplier at farm level is one worker per hectare, while the downstream linkages multiplier is 0,3. This means that on plantings of 34 000 ha, 34 000 jobs were created or maintained at farm level while a further 10 200 downstream jobs were maintained or created. This includes seasonal workers.

Another success that resulted from this cotton programme is the independent grading facilities at Cotton SA that were upgraded to a world-class high-volume instrument (HVI) laboratory, with the third HVI machine installed last year. This laboratory is a key contributor to the competitiveness of the cotton industry value chain as it provides a quality-grading certificate for each bale of cotton lint produced in South Africa. It also plays an important role in supporting transparency, traceability and global benchmarking for the industry, and became the first in the world to receive ICA Bremen certification. It remains the only facility in Africa with this status.

Through the Cluster programme there has been huge traction on farm and ginnery level. However, more work is required to address the challenge on spinning capacity. As the cluster is close to reaching the end of its five-year funding cycle, the new focus of SASTAC will be to reposition the Cluster as a closed cluster with a direct financial membership contribution. The new five-year framework aims to develop a sustainable and dynamic cotton value chain that provides its customers with compelling products, and is invested in growing local capabilities and employment by improving efficiency and competitiveness of the full South African value chain.



Ivory Coast - CIRCA 1974: a stamp printed in the Ivory Coast shows picking cotton.

77th Plenary Meeting of the ICAC in Abidjan, Ivory Coast

Hennie Bruwer (CEO, Cotton SA), Phenias Gumede (Director and Vice-chairperson, Cotton SA and Smallholder Cotton Farmer Forum Chairperson) and Dr Annette Bennett (Technical Manager, Cotton SA) attended the 77th Plenary Meeting of the International Cotton Advisory Committee (ICAC) in Abidjan, Ivory Coast, from 2 to 6 December 2018. Presentations were well received by the attendees, and the South African delegation thanks the Sustainable Cotton Cluster (SCC) for the opportunity to attend this important event.

Some background was given on cotton production in the Ivory Coast and changes to the structure of the ICAC. The Ivory Coast is the fourth largest cotton-contributing country in Africa, although the country still must get its policies in place to accept the introduction of genetically modified varieties. Nearly 90 000 farmers planted cotton in 2017/18 on 327 000 ha and produced 413 000 tonnes of seed cotton (175 000 tonnes lint). Roughly 15% of the lint produced is spun locally. Research initiatives are focused on the increase of fibre quality and mechanisation in harvesting for small-scale producers.

An overview of world cotton production was given, and in October 2018 a new website was launched by the ICAC, which represents all organisations in the cotton value chain. Interesting comments were made during sessions concerning the global status of cotton.

World cotton production for the 2018/19 season is projected at 26,12 million tonnes, 2% down from 26,75 million tonnes in the previous season due to a reduction in planting area and water availability, and limited improvements in yields. Consumption growth has slowed during the period but at 268 million tonnes, it is currently projected to exceed production. Global stocks are expected to decrease overall, leading to projected stable cotton prices, or a slight increase over the course of the season.

The Secretariat forecasts that the total textile fibre demand will increase to 121 million tonnes by 2025, implying 25,5 million of additional demand between 2018 and 2025. This is an important opportunity for the cotton sector. By increasing the average world cotton consumption per capita to 4 kilograms (the level in 2007), the cotton industry would be able to satisfy 28% of the additional projected demand for fibres. If cotton yields in India and sub-Saharan Africa were as high as the world average, cotton production would increase by 5,3 million tonnes.

ICAC's annual report on government support for cotton, which includes border protection, direct subsidies and crop insurance aid, shows an increase of 33% from US$4,4 billion in 2016/17 to US$5,9 billion in 2017/18, mainly due to increased production. This despite the fact that market prices rose, and

From left standing, Dr Annette Bennett, Technical Manager, Cotton SA and Phenias Gumede, Vice Chairperson, Cotton SA. Sitting, Ms Jenetha Mahlangu, South African Embassy in Washington, USA.

minimum support price programmes were not triggered in several countries.

The Intergovernmental Panel on Climate Change (IPCC) projected that climate change will result in a substantial loss in agricultural productivity. About 56% of the global cotton area is dependent on rain, and water stress can lead to significant reduction in yields. Climate change may introduce heat waves, increasing risks of enhanced insect pest problems, and bolls with reduced weight and poor boll retention. This would lead to yield losses and deterioration in fibre quality.

Increased levels of atmospheric CO_2 may lead to higher yields. The Committee urged governments to encourage the development of climate-resilient cultivars with high water-use efficiency, high nutrient-use efficiency and with the potential to adapt and withstand unpredictable drought, changes in heat, waterlogging, increased insect pests and diseases.

Cotton is a labour-intensive crop in developing and least-developed countries. Labour shortages and higher wages in nations where cotton is currently harvested manually may result in delayed harvesting, thus leading to quality deterioration. Even for small farms, mechanisation could enhance efficiency and reduce costs. The costs of manual picking in some countries are about US$100 to US$120 per tonne, and an economical mechanical

cotton picker could increase efficiency by five to ten times compared to manual picking. Recent advances in drones and robotics open new avenues and opportunities for their deployment in small-scale cotton production systems, for multiple activities relating to the management of the crop.

Insect resistance to *Bt*-cotton and weed resistance to herbicides have emerged as challenges to the efficacy of biotech cotton across the world. The phenomenon of resistance is currently being countered by adding more and more new genes to develop new biotech varieties. However, the addition of new genes takes time and indirectly increases production costs. Insecticide-resistant whiteflies not only cause severe crop damage, but also transmit the cotton leaf curl virus in some major cotton-producing countries. Bollworms, whiteflies and cotton leaf curl virus can cause devastating effects on cotton production. The endorsement of a rigorous pest resistance management strategy together with growers and the industry was recommended.

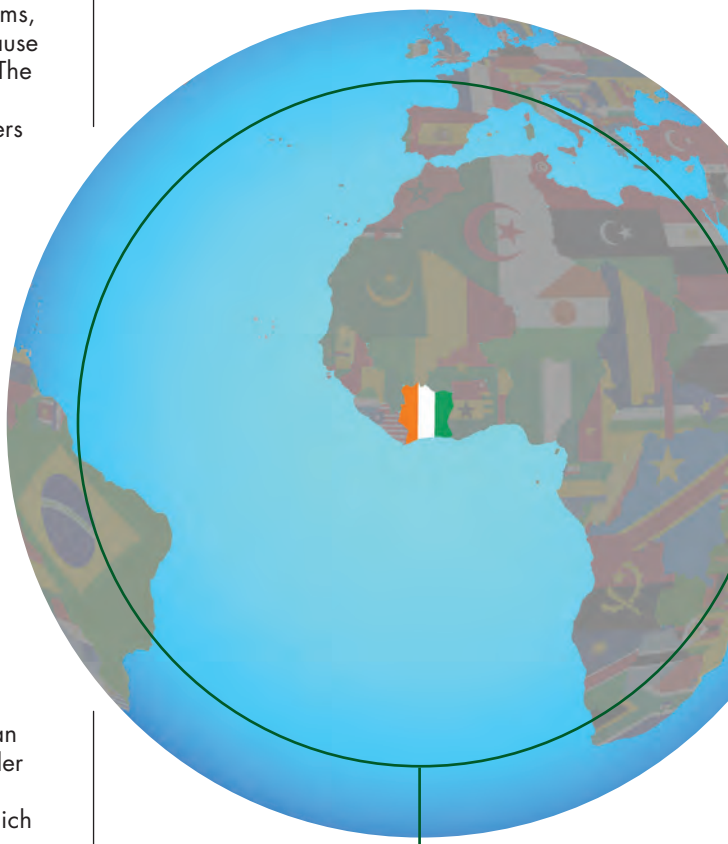
The exchange of seeds (germplasm) between countries can facilitate progress in agriculture. The narrow genetic base available for cotton improvement in major cotton-producing countries, and the ever-changing market demands for specific fibre qualities, along with the need to improve yields, make seed exchange important across countries. Access to new germplasm holds the key to genetic improvement, enhancement of genetic diversity, and expanding genetic variability for useful traits.

The speakers recommended that governments develop a roadmap to create a global platform that operates as a smooth and trustworthy channel of seed exchanges among countries across borders. They were also urged to create an International Cotton Research Institute under the Consultative Group for International Agricultural Research (CGIAR) system, which could act as a research and educational institute and a global repository of germplasm sources that could be freely shared.

New biotechnology tools (NBTs) are being used to enhance the performance of commercial cotton varieties. Scientists in Latin America are using these new tools in the form of Cry10Aa, a pesticidal crystal protein, to protect cotton from the boll weevil, thereby promising a dramatic reduction in insecticide use.

New uses for the by-products of cotton production, such as stalks and material remaining after ginning, are being developed to enhance the income of farmers. Products produced include 100% biodegradable packaging material as well as composites used in construction and other products.

The Committee decided on the topic "Cotton traceability technologies" for the 2019 Technical Seminar.



COTTON YIELDS IN AFRICA

Extracts from articles that appeared in the issues of *THE ICAC Recorder*, September and December 2018

Africa has all of the natural resources that should have made it big for cotton, but over the past 30 years, cotton yields in Africa have been stagnant at an average of about 350 kg of lint per hectare.

Cotton is a major source of foreign exchange earnings in more than 15 African countries and a source of cash income for poverty alleviation in these countries. African cotton farmers predominantly face three main constraints: very low cotton yield, lower prices and forced reduction of cotton area due to production of food crops to support increasing populations. The main constraints in Africa are influenced by political, socio-economic and ecological conditions. Cotton in Africa is predominantly a smallholder crop, mainly grown on small family farms of less than three to four hectares in size. Cotton in Africa is also mostly rainfed, with the exception of South Africa, where most of the cotton is irrigated, and countries such as Ethiopia, Nigeria, Kenya and Sudan, where some farms are irrigated.

Those who have been working for the betterment of the cotton sector in Africa are familiar with the small-scale resource-poor farmers, many of whom do not have access to fertilisers, pesticides, improved seeds and even the simplest of technologies due to poor purchasing power or weak logistics. Several researchers argue that without access to any of the technological inputs, yields in Africa cannot increase. In this context, it would be interesting to draw a parallel between Africa and India. India also has small-scale resource-poor farmers, but they have access to all the modern agri-technologies and inputs. However, yields in rainfed regions of India are as low as in Africa. Therefore, it would be pertinent to ponder if the introduction of *Bt*-cotton, especially in the form of hybrids, or increasing the application of fertilisers and

pesticide, would be great solutions to increase yields in Africa.

Why are cotton yields so low in Africa, and why have they been so stagnant over the past 30 to 35 years? These two questions lead to many more questions. Are the soils infertile? Is the weather unsuitable for cotton? Is there inadequate water? Are there no technologies for high yields? Is there a problem with technology transfer? Are farmers unable to provide necessary inputs due to poverty? Paradoxically, low yields in Africa persist despite many favourable conditions for cotton production. Experts would agree that:

- the weather in Africa is highly suitable for cotton, with good sunshine and rainfall;
- the soils are as good as, and probably better than, many other parts of the world where cotton is grown;
- new technologies have been developed in Africa and reach many farms; and
- farmers are hardworking and apply their best management skills for higher production.

SADC cotton yields – kg cotton lint/ha

	South Africa*	Mozambique	Tanzania	Zambia	Zimbabwe
Large farmers	1 118**	562	416	444	648
Smallholder farmers	291	162	222	208	209

**2017/18 Irrigation and dryland average*
***All farmers*

In contrast, Australia, China, Mexico, Brazil and Turkey have in recent years been harvesting more than 1 500 kg of lint per hectare, with Australia touching a record 2 680 kg/ha in 2014. Interestingly, Turkey harvests 1 800 kg/ha without using biotech cotton. The USA has been harvesting about 1 000 kg of lint per hectare. Cotton yields in these countries have been on a significant positive growth curve over the years. A critical analysis shows that the ascent in this growth curve was due to consistent improvements in plant breeding, agronomy and integrated pest management (IPM). Improvements are happening every year and yields are constantly on the rise. The strategies appear to be based mainly on interlinked elements, such as new varieties that were specifically developed to suit mechanised conditions that demand a particular type of agronomy. The new varieties were designed for a plant architecture that suits spindle-type machine pickers.

According to Dr Md. Farid Uddin from the Cotton Development Board in Bangladesh, the most common challenges to cotton production in Africa are as follows:

- Smaller scale of production
- Limited access to good quality seed
- Heavy reliance on insecticides
- Decreasing soil fertility
- Increasing production costs
- Volatile markets

Dr Md. Farid Uddin proposes the following strategies, which may assist in developing the cotton sector in Africa:

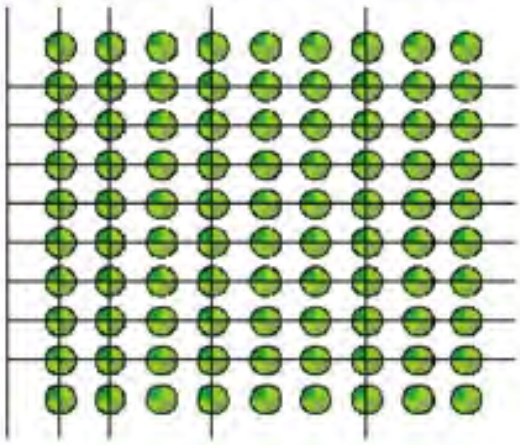
- **Upscaling:** There is a need to increase the scale of production. Large-scale projects and better support by national services and policies will definitively increase productivity and will bring down production costs.
- **Good quality seed:** Good agriculture results from good seeds. Improving access to good quality seeds will play a major role in yield enhancement.
- **Integrated pest management (IPM):** Effective pest management can efficiently prevent yield losses. Therefore, there is a need to actively promote IPM practices.
- **Soil health:** Adoption of integrated soil fertility management practices holds the key for good crop health. Integrated Nutrient Management (INM) practices need to be promoted, combining agronomic practices relating to intercrops, mineral fertilisers, organic inputs and other interventions.
- **Profitability:** Improving income from cotton is important to sustain farmers' interest in the crop. Profitability can be enhanced by optimising the usage of water and agrochemicals to prevent wastage of resources and investment. Cotton production cost should be rationalised by increasing productivity as well as adding value to cotton fibres and by-products.

- **Subsidies:** Subsidies in farm inputs and cotton prices will help farmers to cope with the uncertainties of volatile markets.

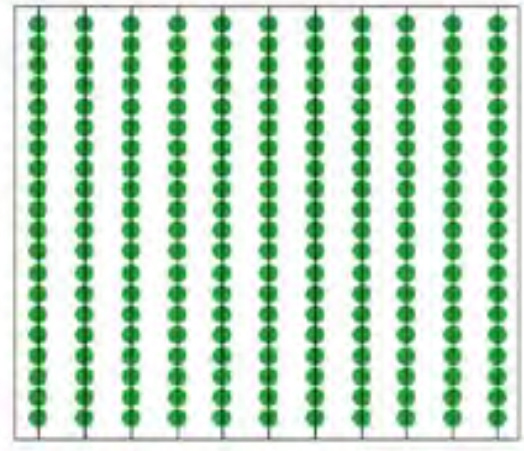
According to Dr Keshav Kranthi, Head of the ICAC's (International Cotton Advisory Committee) Technical Information Section, a change in plant architecture can break yield barriers in Africa. He says it would be possible to enhance yields by breeding "compact-architecture" cultivars coupled with "canopy management", in which excessive vegetative plant growth is curtailed at a critical stage (either through mechanical methods or with the use of plant growth regulators) to ensure a proper nutrient source-sink relationship. Apart from compact architecture, yield improvement in Africa requires best practices for plant mapping, canopy management, soil reclamation, soil conservation, cropping systems, conservation tillage, water-use efficiency, nutrient-use efficiency, pest management, and weed management.

In developed countries such as the USA, Australia and Brazil, plant breeders aim to develop cultivars that retain an optimum number of bolls, generally at 15 to 20 bolls per plant, with a population of 80 000 to 110 000 plants per hectare. However, in Africa and Asia, plant breeders traditionally have been developing plant types that produced the highest number of bolls (80 to 150) per plant. Agronomists recommended wider spacing for such varieties to cater to their potential for tall, wide growth (Figure 1). Producing more bolls per plant takes a longer time for higher yields, and if terminated prematurely, result in low yields.

Figure 1: Illustrating low-density planting* vs high-density planting.**



*Low-density planting, e.g. 90 x 60 cm – India and Africa; with bushy-type plants.



**High-density planting, e.g. 76,5 x 8 cm – Australia, China, Turkey, etc.; with compact-type plants.

According to Dr Kranthi, plant breeders must therefore seriously consider developing cultivars with the following plant features:

- Compact, short-statured
- Zero-monopodial
- Short season (140 to 150 days)
- Resistant to sap-sucking insects and local pathogens
- High initial shoot and root vigour
- High ginning out-turn and good quality fibre.

MIDSEASON PEST CONTROL AND PLANT DEVELOPMENT

by Dr Annette Bennett, Cotton SA

Knowledge about the cotton plant's development is very important in order to apply effective integrated pest-management and resistance-management programmes for pests and herbicides as well as for the spraying of growth regulators and defoliants. This article will deal with midseason pests in relation to plant development.

The cotton plant goes through the following development stages:

GERMINATION AND SEEDLING DEVELOPMENT

Planting should take place when the soil temperature, at 30 mm deep, is between 16 °C and 18 °C for longer than 10 consecutive days (ARC, 2004). The hypocotyl emerges from the seed and forms the stem, while the radicle forms the root (see Figure 1a). The hypocotyl straightens at the soil surface and pulls the folded cotyledons (first leaves/"false rounded leaves") out of the soil (see Figure 1b). The plant starts its active growing period.

COTYLEDONS AND FIRST TRUE LEAF STAGE

Cotyledons are the first two rounded leaves. They are storage organs that form in the seed and emerge from the soil as leaf-like structures. The apical meristem emerges from between the leaves and starts forming other leaves. Cutworm, false wire-worm and black cotton beetle (*Syagrus*) could damage this seedling stage, but it rarely happens.

As the seedling develops into the first true leaf stage (see Figure 1c), usually after seven days, some pests can occur from the first- to fourth-leaf stage, like thrips and various leaf miners. However, most plants "grow out of the problem" and control is rarely necessary. Thrip damage shows as silvery leaf damage, with tattered leaves (personal communication, late SW Broodryk). Wind damage can often occur on seedlings, but they recover well.

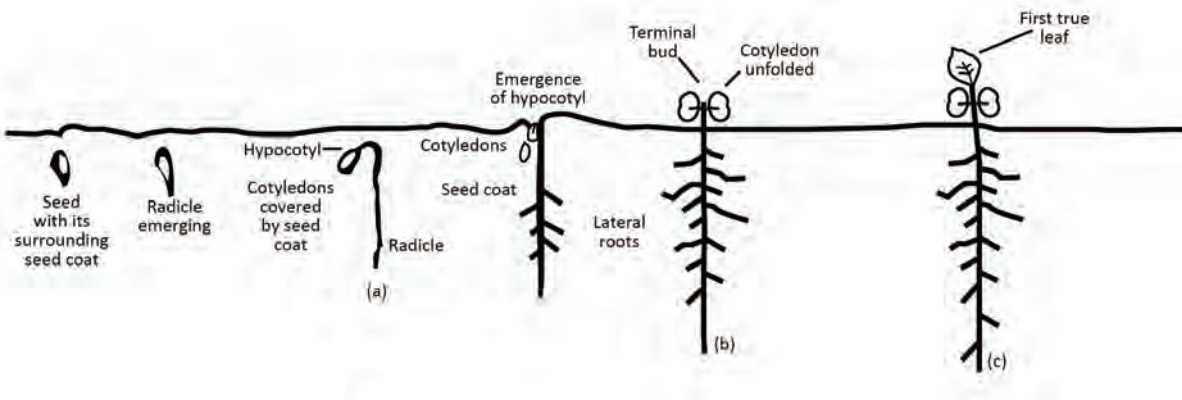
VEGETATIVE GROWTH STAGES

The four-leaf stage of cotton is often seen after three weeks and is used to indicate glyphosate spraying on Roundup Ready® cotton. It is also the stage where other sporadic pests occurring in some areas, can be present, e.g.:

- the cotton stem weevil (*Apion*), causing pin holes in leaves and larvae boring into the stem;
- aphids (honeydew on leaves and sooty mould);
- black cotton beetle (*Sygrus*) causing holes in leaves not reaching leaf edge; and
- leaf eaters causing random holes in leaves past the leaf edges.

Start scouting for aphids and whitefly at this stage. Use the threshold for aphids by scouting three leaves per plant in the top, middle and bottom of the plant. If more than three leaves per plant have more than 30 aphids in total on at least 15 plants per 24 plants scouted,

Figure 1: Development of the seed to the cotyledon and first true leaf stages.

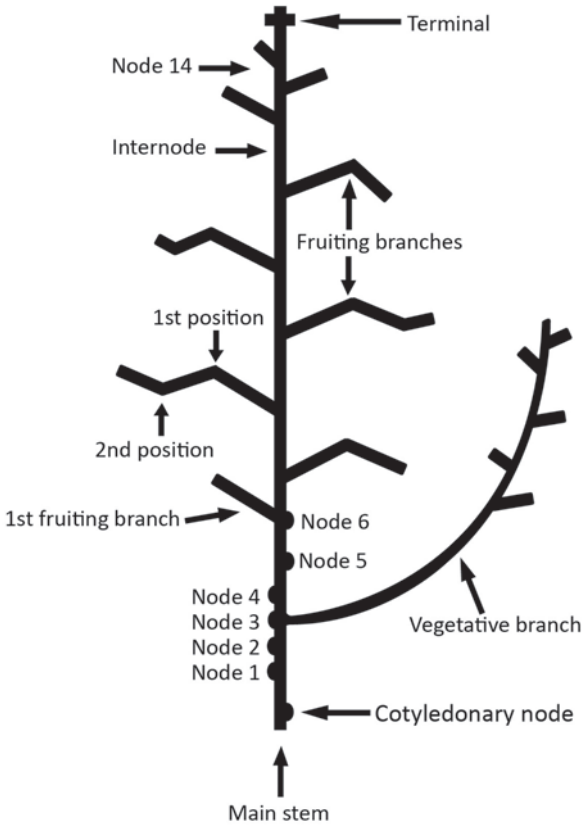


a "soft" insecticide should be applied, preferably not a pyrethroid. Predators often control aphids and spraying unnecessarily will escalate the aphid population later in the season. Whitefly has not been a large enough problem in South Africa since the registration of *Bt*-cotton, and therefore no threshold is available to actually require control. Whitefly nymphs are also controlled by predators, and possibly by effective seed treatments.

LEAF AND CANOPY DEVELOPMENT

Assessing cotton plant development is done by measuring node development (see Figure 2). The area on the main stem between nodes is called the internode. The length of the internode is used to determine when growth regulators should be applied. This can also indicate when "cut-out" occurs.

Figure 2: Nodes and internodes on a cotton plant.



(Ritchie & Bednarz, 2007. Redrawn, E van Wyk)

FRUIT FORMATION (SQUARE FORMATION)

The fruit formation stage is probably the most important stage when bollworms can affect your yield. Fruiting branches develop approximately every three days and squares form a spiral around the main stem. The youngest squares, or the bolls derived from these squares, are the ones closest to the stem for the sixth to the tenth/eleventh node (varies slightly between cultivars and localities planted). On the *Bt*-cotton varieties, the first instar bollworm larvae will emerge from eggs, but will not survive to do much damage. Eggs will be seen, but this does not indicate spraying. No resistance to the *Bt*-gene by the African bollworm (*Helicoverpa armigera*) has been documented yet and the stack-gene variety Bollgard II® was introduced to combat any possibility of resistance. The three species of bollworms, African (American), spiny and red bollworms will be seen in the refugia and depending on which choice the producer made in signing the license agreement, he would be required to spray the refugia or not. Use these threshold values of spraying for bollworm: more than five plants with one or more bollworm out of 24 scouted would require spraying. The *Bt*-cotton should also be scouted to make sure the cotton plants are resistant to bollworm. Report any problems to the licence holder.

At this stage leafhoppers can appear, though very seldom require chemical control. Leafhoppers should be sprayed when more than 12 plants out of 24 scouted have leafhoppers. Sometimes red-spider mite can be a problem, when pyrethroids have been used earlier in the season. They can be a problem on especially dryland cotton, and when around 15 plants out of 24 plants scouted are found with spider mite, it might require spraying. Insect predators and predatory mites often control spider mites. Around 0,5 predators per plant is

usually enough to control the aphids and spider mites on the plant (Broodryk, 2002).

BUD FORMATION (STAGE FROM SQUARE TO BLOOM/FLOWER)

Flowering occurs mainly between weeks 12 to 16 after planting. It takes 21 days to develop from square to bloom, forming a pinhead square first, then a match-head square, followed by a square with a growthpoint (see Figure 3). Prior to bloom, the square changes into a candle shape, commonly called a flower bud. This period of transition of the squares is called "squaring". Once the cotton begins to bloom, it is said to be flowering (Ritchie & Bednarz, 2007).

Figure 3: Square development to boll (pinhead and match-head squares not shown).

At first flower the aim would be to have in excess of 15 to 16 nodes (6 to 7 vegetative nodes, 8 to 10 fruiting branches). However, it is better not to have the plant growing too vigorously. At first flower, plant height should be about 50 cm to 60 cm, aiming to have a frame that will support a high fruit load during the flowering period. The new node vegetative growth rate should not exceed 6 cm to 7 cm per node (www.faststartcotton.com.au). On refugia or conventional cotton, bollworms can occur within flowers and young bolls. A pollinated flower is a pink flower after three days (see Figure 4).

BOLL FORMATION

The first small bolls start forming around week 12 onwards, with the first boll-burst during week 16 to 17 onwards. The bolls next to the stem contribute the largest part of the yield

Figure 4: A pollinated flower.

(around 80%), and these bolls should be well looked after. Stainers occur on cotton with the *Dysdercus* sp. being most common. Spray only when stainers form a focal point. A focal point is where a couple of small bugs can be seen together or an adult with nymphs (smaller bugs). Spray when six or more focal points can be found in 24 plants scouted. Other stainers can also damage young bolls, e.g.:

- the green stink bug, *Nezara* sp.;
- the mirid bug ("small black cotton stainer"); and
- the dusky cotton seed bug (*Oxycareneus* sp.) that damages open bolls.

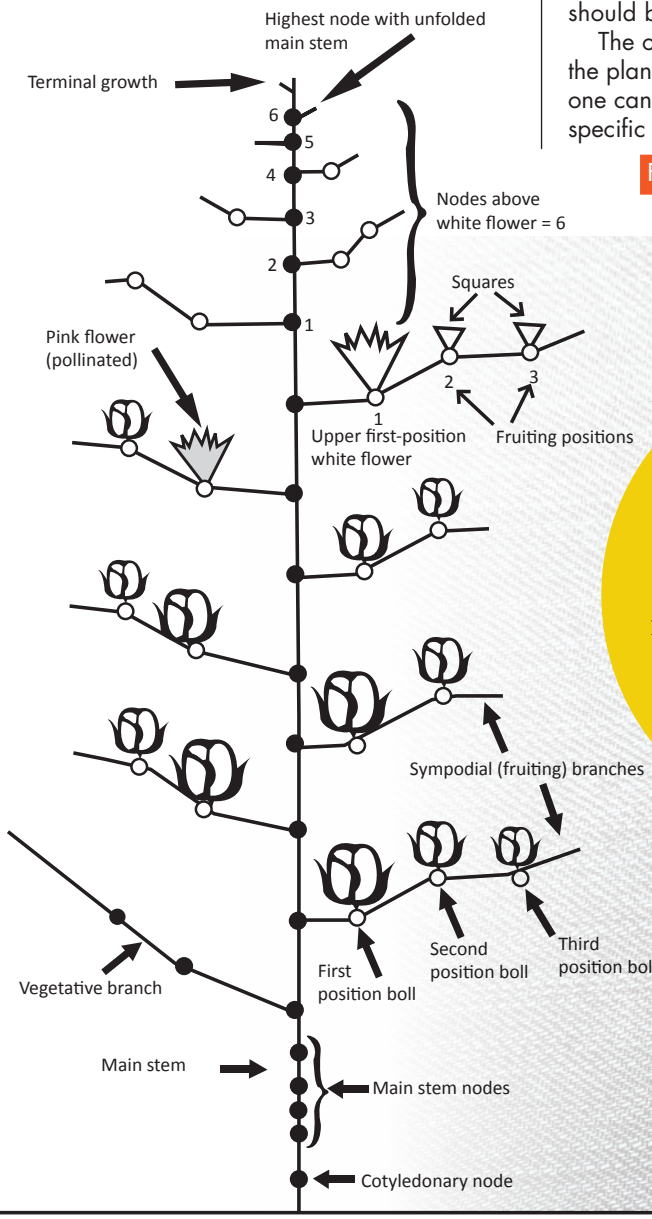
These very rarely require chemical control. Sporadic pests like flea beetles can occur as well as other occasional visitors that require no chemical application.

NODES ABOVE WHITE FLOWER AND COTTON CUT-OUT

To interpret the development of the cotton plant in terms of leaves, node number and the fruiting

stages, it is important to record the uppermost white flower in the plant. This flower is used to determine cotton cut-out, or "nodes above white flower" (NAWF) (see Figure 5) (Ritchie & Bednarz, 2007; www.faststartcotton.com.au).

Figure 5: Plant structure showing upper first position white flower.



In Australia, a value of 8 is used to express the NAWF value and plants should be monitored when approximately half the plants have a pink or white flower on a fruiting branch. Count the number of nodes above the highest first position flower, including the node nearest the terminal with an associated unfurled leaf (www.fast startcotton.com.au). A high number (>7) indicates that the plant is growing vigorously, and the use of a growth regulator should be considered.

The occurrence of pests can be noted against the plant stages. Knowing the planting date, one can calculate when your cotton will reach a specific development stage (see Figure 6).

For references, please contact the author.

> "***Bt*-cotton should also be scouted to make sure the cotton plants are resistant to bollworm. Report any problems to the licence holder."**

Figure 6: Plant dates and plant development.

Calculate plant development											
Weeks post-planting	Soil temp. 3 cm deep >16-18 °C for 10 days	Land preparation	Scouting for pests	Dates given are approximate planting dates to indicate weeks after planting							
	Days post-planting	Planting		15-Oct	30-Oct	15-Nov	21-Nov	15-Dec	30-Dec	07-Jan	14-Jan
1	1-7	Emergence	Aphids, thrips, *Syagrus*, leaf eaters, *Apion*, occasional visitors	22-Oct	06-Nov	22-Nov	28-Nov	22-Dec	06-Jan	14-Jan	21-Jan
2	8-14			29-Oct	13-Nov	29-Nov	05-Dec	29-Dec	13-Jan	21-Jan	28-Jan
3	15-21			05-Nov	20-Nov	06-Dec	12-Dec	05-Jan	20-Jan	28-Jan	04-Feb
4	22-28	First squares form		12-Nov	27-Nov	13-Dec	19-Dec	12-Jan	27-Jan	04-Feb	11-Feb
5	29-35			19-Nov	04-Dec	20-Dec	26-Dec	19-Jan	03-Feb	11-Feb	18-Feb
6	36-42	Flower buds		26-Nov	11-Dec	27-Dec	02-Jan	26-Jan	10-Feb	18-Feb	25-Feb
7	43-49		Bollworm damage (on refugia, also scout Bt cotton), leafhoppers, Spider mites, Stainers (*Dysdercus*, *Nezara* and mirid bugs)	03-Dec	18-Dec	03-Jan	09-Jan	02-Feb	17-Feb	25-Feb	04-Mar
8	50-56			10-Dec	25-Dec	10-Jan	16-Jan	09-Feb	24-Feb	04-Mar	11-Mar
9	57-63	First flowers appear (day 60)		17-Dec	01-Jan	17-Jan	23-Jan	16-Feb	02-Mar	11-Mar	18-Mar
10	64-70	Early flowering period		24-Dec	08-Jan	24-Jan	30-Jan	23-Feb	09-Mar	18-Mar	25-Mar
11	71-77			31-Dec	15-Jan	31-Jan	06-Feb	01-Mar	16-Mar	25-Mar	01-Apr
12	78-85	Flower formation (80 days)		07-Jan	22-Jan	07-Feb	13-Feb	08-Mar	23-Mar	01-Apr	08-Apr
13	86-92			14-Jan	29-Jan	14-Feb	20-Feb	15-Mar	30-Mar	08-Apr	15-Apr
14	93-100			21-Jan	05-Feb	21-Feb	27-Feb	22-Mar	06-Apr	15-Apr	22-Apr
15	101-107			28-Jan	12-Feb	28-Feb	05-Mar	29-Mar	13-Apr	22-Apr	29-Apr
16	108-115	Peak flowering period (day 117)		04-Feb	19-Feb	06-Mar	12-Mar	05-Apr	20-Apr	29-Apr	06-May
17	116-123	First boll burst (1st stage bolls = 79% of yield)		11-Feb	26-Feb	13-Mar	19-Mar	12-Apr	27-Apr	06-May	13-May
18	124-131	Deleafing period		18-Feb	04-Mar	20-Mar	26-Mar	19-Apr	04-May	13-May	20-May
19	132	Peak boll opening period		25-Feb	11-Mar	27-Mar	02-Apr	26-Apr	11-May	20-May	27-May
20	139	Bolls open		03-Mar	18-Mar	03-Apr	09-Apr	03-May	18-May	27-May	03-Jun
21	140-147	Harvest		10-Mar	25-Mar	10-Apr	16-Apr	10-May	25-May	03-Jun	10-Jun
22	148-155	Harvest		17-Mar	01-Apr	17-Apr	23-Apr	17-May	01-Jun	10-Jun	17-Jun
23	155-170	Harvest		24-Mar	08-Apr	24-Apr	30-Apr	24-May	08-Jun	17-Jun	24-Jun
24		Harvest		31-Mar	15-Apr	01-May	07-May	31-May	15-Jun	24-Jun	01-Jul

Joseph Kempen, Loskop Cotton Gin.

LOSKOP COTTON GIN UPGRADE

Cherokee Fabrication Company, Salem, Alabama USA

The Loskop Cotton Gin in Marble Hall was extensively upgraded last year by the Cherokee Fabrication Company, Inc. of the USA and fitted with the Cherokee Magnum 270 ginning line, which offers a complete ginning solution unique to the industry.

The Loskop Gin has been designed as a two-stage upgrade. The first stage has been completed and it is capable of producing 40 x 227 kg bales of cotton per hour (25,6 tonnes of seed cotton). Another way to look at it is that it will be able to process enough natural fibre to make 8 600 pairs of blue jeans an hour! Upon completion of the second stage, Loskop Gin will be capable of producing in excess of 60 x 227 kg bales per hour (38,5 tonnes of seed cotton). You could explain it this way: Loskop at capacity will package enough natural fibre in one hour to make 73 020 men's t-shirts!

It is a totally integrated system design that is balanced from the incoming stream to the finished bale off-take into warehouse placement. It is a fully automated plant that uses the latest technologies in its hydraulics, burners and PLCs to provide industry-leading efficiencies in the processing of raw cotton.

There are numerous advantages, including the following:

- A more efficient process results in decreased costs per bale.
- A safer, more efficient machine design minimises risk and exposure to workers and the finished product.
- A totally integrated system design provides a cleaner environment to work in.
- New ginning technologies capture and condition more lint per kg of seed cotton, and thereby improving finished lint turnout and maximising return on investment.
- Drastic reduction in gin repairs for the next three years.
- Consistent bale weights at proposed target bring savings in packaging costs.
- Reduced time from harvest to ginning cuts risk and exposure to seed cotton.

HIGHLIGHTS

Unloading and unwrapping

- The Cherokee roller bed module feeder unloads cotton modules from a module truck and conveys them to the disperser head. Both square modules and round modules work with this system.
- The Cherokee Round-up II module unwrapper removes the cover from round modules. Only one person is required, and this person is always in a protected area. He/she does not have to cut, pull, position, or touch the wrap until it has been removed from the module. The cover is not cut with a knife of any kind. This improves safety and eliminates the risk of contamination.

Drying and cleaning highlights

- Cherokee burners provide heat to the ginning process in a clean, efficient manner. The burner heads are designed to operate at 100% thermal efficiency. The fuel is clean-burning and odour-free.
- The Cherokee Savage stick machine cleans cotton after it has been discharged from the hot air/nine-cylinder cleaner. Loskop has been designed with a three-saw cleaner due to the increasing hectares being harvested by stripper-type machines. It is easily by-passed when ginning cotton that does not require additional cleaning.
- The Cherokee horizontal cleaner is being used in the second-stage cleaning system as a hot air pull-style cleaner.

The Cherokee saw gins.

Ginning

The heart of the new Loskop Gin is the patented Magnum gin stands and feeders, the highest capacity gin stands in the world, with capacities in excess of 30 bales per hour. The Cherokee saw gins have many award-winning innovations. The seed reclaimer can be adjusted on the fly to adjust the delinting level of the seed. The seed roll retainer automatically closes when the breast is pulled out to prevent the loss of the seed roll. The picker roller, seed roll agitator, and the upper moting each have a separate gear motor drive.

Lint cleaning

The Regal 142 lint cleaner is designed to work with the highest-capacity gin stands while maximising the value of the lint. Designed for ease of maintenance, the lint cleaner is valued by ginners for maintaining cleaning efficiency to protect the grower's investment.

Lint conditioning and packaging

- The Cherokee battery condenser separates lint (coming from the lint cleaners) from the conveying air. A fan pulls the conveying air through the condenser drum, causing the lint to adhere to and form a batt on the outside of the drum as it rotates.
- Cherokee's Cirrus cotton conditioner adds moisture to the lint batt directly after the battery condenser.
- The Chieftain press is designed for ease of operation and long life. The entire structure of the Chieftain press is heavy-duty. It is capable of maintaining 60 bales per hour.

KOEDOESKOP COTTON GIN

by Calvin Knight, Cotton SA

The Koedoeskop Cotton Gin is coming to the end of its first season of operation. After completing construction and starting their season in the second half of last year (2018), they have made quite an impression. They are currently processing 100 round seed cotton bales per day, resulting in 450 bales of cotton lint per day.

Based in Thabazimbi, Koedoeskop Cotton Gin is currently operating on two continental gin stands (from India) with space for an immediate third gin stand. The gin operates on the same standard process and procedure as many other ginning operations. Seed cotton is transported into the gin and separated (loosened from the compressed bale). It is then piped through the standard, rock trap, drying shelves, first clean, second clean, extractor, the gin stand itself, and finally to the bale press.

They do some things differently, however. They have a unique designed piece of equipment for removing packaging from seed

cotton bales. The bale tipper removes the covering and flips/inverts the bale, so that any foreign material that may be present due to storage before ginning can be removed. This is a major advantage in ensuring that the cotton is of good quality.

Additionally, they have elected to go off the electrical grid and run on diesel generators, which power the gin and all its equipment 24 hours per day, six days a week.

Aside from their goal to set up a third gin stand, they also intend to replace their current 30-bale-per-hour press with a 60-bale-per-hour press. This will more than double the gin's expected output next season.

Each bale is pressed and packed, but before it is sealed, two samples are taken. One is kept at the gin for reference and the other is sent to Cotton SA to be tested and graded.

Along with these plans for upgrading the gin, Koedoeskop will also install a cotton-grading room and micronaire (mic) measurement equipment. This will allow those with training to grade seed cotton before it is ginned, and allow for cotton of similar mic to be ginned together. Because low micronaire cotton will bring higher mics down to its level when ginned together, it is best to gin them separately. This will ensure that more high-quality cotton is produced.

Koedoeskop has had a good first season, doing better than many would have expected. With continued vision and ideas for expansion, they can do even better in seasons to come and may establish quite a footing for themselves in the cotton industry.

PRODUKSIE-PRAKTYKE WAT **VESELKWALITEIT BEÏNVLOED**

deur dr. Annette Bennett en Gert Klindt, Katoen SA

Katoenplukselkwaliteit kan beïnvloed word deur voor-oes- en na-oesbestuurspraktyke.

VOOR-OESBESTUUR

Voor-oesbestuur sluit produksiepraktyke en weersomstandighede in. Die effek van meteorologiese en fisiologiese parameters op saadontwikkeling is beduidend en veroorsaak 'n verskil in saadkwaliteit van verskillende pluksels of oeste. Die hoeveelheid sonlig, dag- en nagtemperature tydens groei, variëteit en produksie-insette het 'n invloed op veselkwaliteit.

Die eienskappe van die vesels is uniek en hang grotendeels af van die plantvariëteit, maar word ook beïnvloed deur omgewingstoestande en verbouiingspraktyke. Vesels begin verleng van die dag van blomvorming, en hou aan vir 15 tot 25 dae.

Omgewingstoestande wat mikronêr kan beïnvloed, sluit in lae temperature van <15 °C en langdurige bewolkte kondisies. Wat plantsiektes betref, sluit dit in Verticillium verwelksiekte en bakteriese skroeisiekte, asook insekplae wat blaar- en bolskade veroorsaak.

'n Hoë mikronêr katoen word geassosieer met droëlandkatoen waar vesellengte negatief beïnvloed word deur te min grondvog. Enige faktore soos ekstreme hoë temperature wat afspening kan veroorsaak, kan ook 'n hoë mikronêr veroorsaak. Die belangrike periode vir katoenbestuur om veselkwaliteit te verseker, is binne 20 dae na piekblom (week 16 tot 18/19), sodat die plant geen stres ervaar wat betref insekdruk, vog, plantvoeding of sonlig nie.

Die produsent het nie beheer oor die verandering van weersomstandighede deur die seisoen nie. Die aspek waaroor die produsent wel beheer het, is die toediening van kunsmis of plantvoeding, en plantestand.

Kunsmis

Tekorte aan die elemente fosfaat (P), kalium (K), kalsium (Ca), magnesium (Mg), boron (B) en sink (Zn) kan vrugsetformasie belemmer, meer as wat dit vegetatiewe groei kan beïnvloed, terwyl stikstof (N), swael (S), molibdeen (Mo) en mangaan (Mn) vegetatiewe groei en vrugvorming op dieselfde wyse benadeel. Die eerste groep van elemente speel 'n rol in koolhidraatmetabolisme, wat weer 'n rol speel in die suikers, o.a. boron, (Kohel & Lewis, 1984), wat vasgelê word in die sellulose wand van die vesel.

'n Tekort aan of 'n oormaat van stikstof het 'n beduidende effek op veselkwaliteit (Chaudhry & Guitchounts 2003). 'n Tekort aan stikstof veroorsaak 'n kort en swak vesel, terwyl 'n oormaat stikstof 'n langer vesel, wat swak en onvolwasse is, tot gevolg het. Stikstoftekorte kan om verskeie redes voorkom, moontlik a.g.v. denitrifikasie, loging, ens. Simptome sluit in verkorte groei, lae planthoogte en minder vrugvormende takke, asook blomknopafspening, en geel en pers blare later in die seisoen. 'n Oormaat stikstof gee rankgroei, stel volwassenheid van die bolle uit, en verhoog plaagvoorkoms.

Kalium is betrokke by veselverlenging en -verdikking, en kaliumbehoeftes is hoër met bolvorming, help met saadvolwassenheid en om die turgordruk in die bol te handhaaf vir veselverlenging. Kalium speel ook 'n rol in koolhidraatmetabolisme vir suikervorming in die sellulose struktuur van die vesel en in die plant, asook in ensimatiese reaksies en pH balans in die plantselle. Swak wortelvorming en nematode-infestasies kan lei tot kaliumtekorte en stremming op die plant se voedingstofopname.

Groei-onderdrukkers (Pix) en ontblaringsmiddels

Die vesel moet tydens oes versigtig hanteer word. Hedendaagse ontblaringsmiddels help die produsent om "skoner katoen" te oes, met minder blaarreste wat die pluisproses vergemaklik en help om vesel van 'n hoër kwaliteit te produseer, sonder plantreste.

Die tyd van spuit van 'n groeireguleerder soos Pix, is belangrik, ongeveer met die vorming van die eerste blomknoppe. Volg dus die etiketinstruksies. Produsente moet nie te vroeg spuit nie. Die teorie is dat groei in die top van die plant gestuit word, om voedingstowwe te kanaliseer na blomvorming en bolvorming, vir die eerste drag bolvorming.

Ontblaringsmiddels beïnvloed die ontwikkeling van bolle, en veselontwikkeling binne die bolle kan beperk word binne twee tot drie dae na blaarverlies, sodat vesel nie voldoende ryp word nie. Faktore wat 'n invloed het op die tyd wat bolle het om veselrypheid te laat geskied, kan 'n lae mikronêr veroorsaak. Dit sluit in, 'n laat vrugset a.g.v. plantdroogte, insekskade wat vroeë verlies aan blomknoppe (afspening) veroorsaak, asook ontblaring te vroeg in die seisoen. Sou 'n groeireguleerder of 'n ontblaringsmiddel te vroeg toegedien word, kan onderste bolle en eerste drag bolle moontlik reeds volwassenheid bereik, terwyl bolle in die middel van die plant en bo in die plant, nie verder ontwikkel nie, aangesien hul groei gestuit word. Oes van bolle met gemengde veselvolwassenheid, kan mikronêr en 'n swak kwaliteit vesel veroorsaak. Tans gebruik meeste kommersiële produsente ontblaringsmiddels.

Plantestand

'n Té digte plantestand verhoed dat die eerste bolle volwassenheid bereik omdat te min sonlig die plant bereik. Sonlig beïnvloed die koolhidraatmetabolisme in die plant en die vorm van suikers wat nodig is om veselrypheid te verseker. Hoë plantpopulasies kan 'n laer mikronêrwaarde gee.

NA-OESBESTUUR

Na-oesbestuur hou verband met die effek van die oes- en pluisproses op die vesel. Veselkwaliteit behels vesellengte, sterkte en mikronêr, en 'n graadklassifikasie wat verwys na kleur en die hoeveelheid toegelate blaarreste. Spesifikasies vir aanvaarbare kwaliteit is die volgende:

- Graad van katoenvesel: "Deal" of "Good Middling" verwys na plukselgraad A (wit met min tekens van geelvlekke en die toegelate persentasie blaarreste).
- Vesellengte: 28,2 tot 32 mm (1" ⅛ tot 1" ¼).
- Veselsterkte (g/tex): 28+ (verkieslik bo 30).
- Mikronêr: 3,5 tot 4,9.

In die pluismeule speel voghantering 'n belangrike rol in die bepaling van kwaliteit van die vesel.

Vog met pluis

Katoenpluksel word gewoonlik gedroog om die voginhoud te verlaag na 5% tot 7%. (Hefer *et al*. 2007). Omdat droging van die pluksel

die veselsterkte kan verlaag (wat veroorsaak dat vesels "breek" gedurende die pluisproses) sal oormatige droging 'n laer veselkwaliteit veroorsaak. Die struktuur van die vesel bestaan uit 'n primêre laag van sellulose en nie-sellulose materiaal, gerangskik sodat die sellulosefibrille mekaar kruis, wat die fleksiteit of rekbaarheid aan die vesel verskaf. Die sekondêre laag bestaan net uit kristalvormige sellulose en is 'n georganiseerde laag en het 'n kompakte struktuur waar die sellulosefibrille parallel gerangskik is teenoor mekaar, maar in spirale, wat die sterkte gee aan die vesel. (Docia *et al*. 2012). As die vog te veel verlaag, versteur dit die spiraalrangskikking van die sellulose in die vesel en sodoende die vorm van die vesel, wat dit minder sterk en maklik breekbaar maak (Farag & Elmogahzy 2009). Hoë vogkwaliteit van katoenpluksel kan help om veselsterkte te verseker, terwyl te veel vog weer die pluismasjienerie kan beskadig.

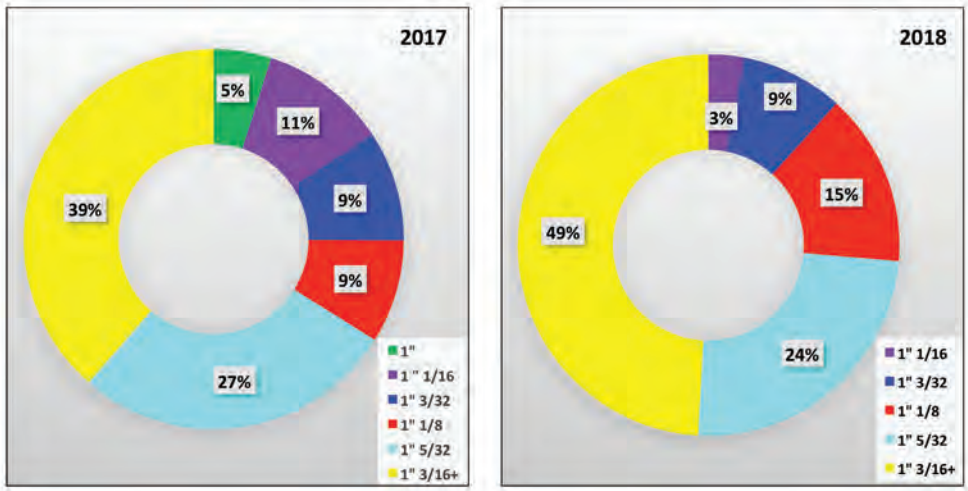
Die voorgestelde humiditeit vir katoenpluksel is tussen 6,5% en 8%. 'n Laer humiditeit mag veselgraad verhoog, maar vesellengte verminder. Na pluis, kan die herstel van vog na optimumvlakke die krag wat nodig is om 'n baal vesel te pers, verminder. Vog kan herstel word deur warm vogtige lug in die omgewing of bespuiting met 'n fyn mis water. Laasgenoemde word gewoonlik gebruik om vog te herstel voor baalpersing (Chaudhry & Guitchounts 2003). Pluismeulenaars moet voghantering ter harte neem (Hefer *et al*. 2007).

Katoen se hoogste veselkwaliteit en beste potensiaal vir die spinproses word behaal wanneer die bolle op die plant volwassenheid bereik het en pas vol oopgemaak het (Koh 2011). Die kwaliteit van gebaalde katoen hang af van faktore soos variëteit, weerstomstandighede met oes, graad van verwering, oes- en stoorpraktyke, vog en blaarreste ("trash") inhoud, asook die pluisproses (Koh 2011).

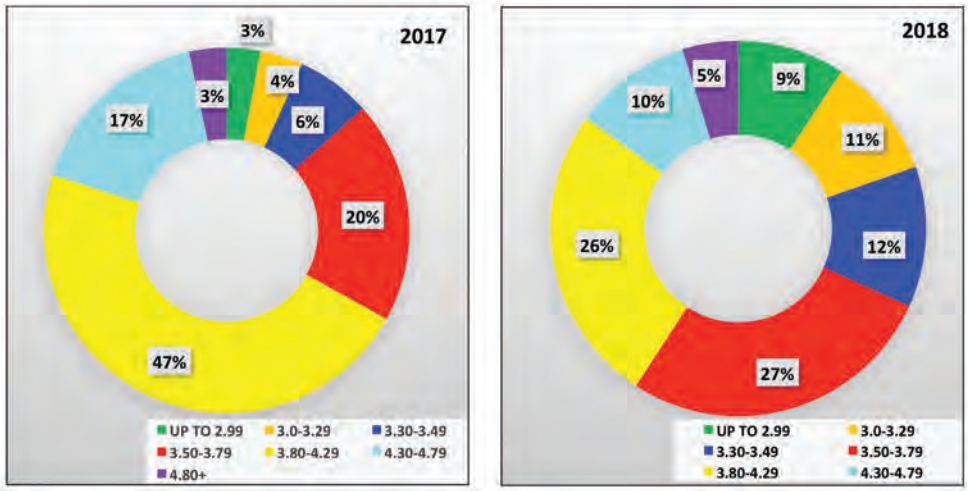
Figure 1 tot 3 dui die wisseling van veselkwaliteit van Suid-Afrikaanse katoen aan oor die laaste twee seisoene. Data van 2018 tot op hede is nie finaal nie.

Die proporsie vesellengte (1"⅛) het toegeneem van 9% tot 15% oor die twee seisoene wat in die produsent se guns tel om vir 'n beter prys te beding. Selfs in die langer veselkategorie was daar 'n toename van 39% tot 49% (sien Figuur 1). Die mikronêr onder 3,0, het toegeneem vanaf 3% tot 9% in 2018 (tot op hede) a.g.v. ongunstige weerstoestande. Lae temperature beïnvloed ontwikkeling van vesel in die bol (sien Figuur 2). Die hoeveelheid monsters wat 'n laer sterkte het van tussen 26 g/tex en 27 g/tex is aan die toeneem (sien Figuur 3). Dit is moontlik te wyte aan ongunstige weerstoestande, maar verdere ondersoek van alles wat veselsterkte kan beïnvloed, is nodig.

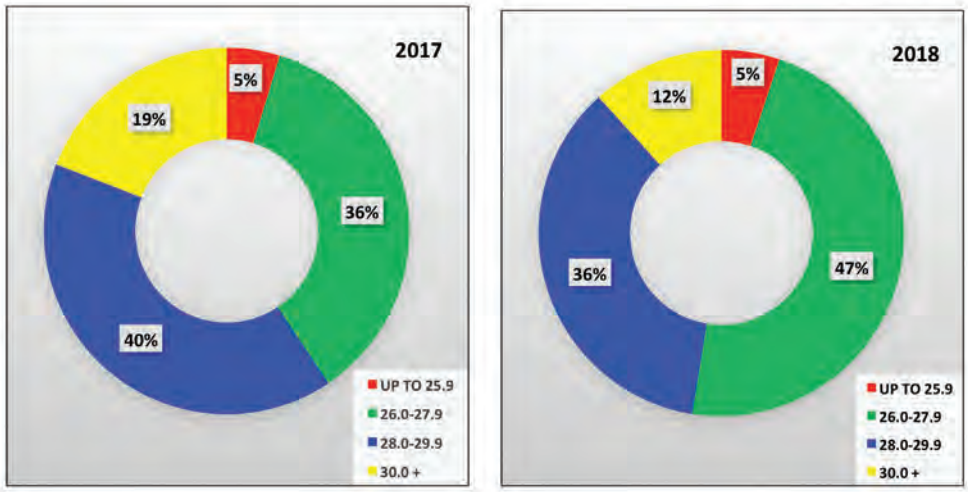
Figuur 1: Vesellengte (duime), seisoen 2016/2017 en 2017/2018 (tot op hede). Bron: Katoen SA



Figuur 2: Mikronêr, seisoen 2016/2017 en 2017/2018 (tot op hede). Bron: Katoen SA



Figuur 3. Veselsterkte (g/tex), seisoen 2016/2017 en 2017/2018 (tot op hede). Bron: Katoen SA



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Slotsom: Produsente en pluismeulenaars word gemaan om te let op die voedingsbehoeftes van die plant en die belangrikheid van die interpretasie en aanbeveling van grondmonsteranalises, skoner produksie van katoen, weersomstandighede met pluk, asook die regulering van vog in die pluismeule.

SMALLHOLDER COTTON FARMER REVIVAL

by Tertius Schoeman, Agricultural Development and Transformation Manager, Cotton SA

Farmers from the Nokaneng area, Mpumalanga.

Farmers ploughing in the Nkomazi area, Mpumalanga.


Farmers in the cotton field in the Taung area, North West.


Tertius Schoeman (Cotton SA) with farmers in the Taung area, North West.


Nantie Fourie (GWK mentor) with farmers in the Taung area, North West.

While the availability of funding for smallholder cotton farmers remains a major challenge, good progress has been made in this regard. Smallholder regions that previously produced good quality cotton are coming back into production and Cotton SA is optimistic about the future expansion of cotton production into rural areas in particular.

It is a fact that smallholder cotton farmers will have to contribute more and more towards their input costs as public funding has been drastically reduced during the 2018/19 planting season. Cotton SA, in conjunction with several private institutions, has designed a model where smallholder farmers can access production funding and by way of session contracts against the crop, pay back the loans at the end of the season. This model is currently in a pilot programme phase and should be expanded with good results in 2019/20.

An overview of the 2018/19 smallholder cotton production prospects can be summarised as follows:

- Limpopo, Dichoeng area: 100 ha irrigation, delivery to Loskop Cotton Gin
- Mpumalanga, Nkomazi area: 330 ha dry land, delivery to Loskop Cotton Gin
- Mpumalanga, Nokaneng area: 670 ha dry land, delivery to Loskop Cotton Gin
- KwaZulu-Natal, Jozini: proposed 3 000 ha dry land and 200 ha irrigation, delivery to Ubongwa Cotton Gin
- North West, Taung area: 230 ha irrigation, delivery to GWK Cotton Gin
- North West, Zeerust area: 100 ha irrigation, delivery to GWK Cotton Gin

It is expected that about 4 000 ha will be cultivated under dry-land production conditions and more than 650 ha under irrigation, the highest figures in a long time. It is very important to Cotton SA to establish more smallholder cotton farmers, especially on communal land that is currently unused.

It is a proven fact that in Africa, cotton production can play a crucial role in alleviating rural poverty, especially where other field crops fail due to heat and rainfall restrictions. The International Cotton Advisory Committee (ICAC) recently completed a survey in this regard, concluding that in several African countries cotton production supported 25% of the poverty-relief needed.

Cotton SA undertakes to provide mentor and other support services to communities interested to commit to successful cotton production. The best results are obtained through mechanical cultivation, using the latest seed technology and the continued involvement of smallholder cotton farmers. Research suggests that small farmers grow a significant portion of world cotton, and smallholder cotton farmers in South Africa can achieve the same.

DIE NUWE "BETTER COTTON INITIATIVE" BEGINSELS

deur Tobie Jooste, Katoen SA

Katoen SA saam met die Volhoubare Katoen Cluster (SCC) het die implementering van die internasionale standaarde van die Better Cotton Initiative (BCI) vir Suid-Afrikaans geproduseerde katoen sowat drie jaar gelede van stapel gestuur. Volgens BCI is die "Better Cotton Initiative" die grootste volhoubaarheidskatoenprogram in die wêreld. Verlede jaar het BCI en sy vennote opleiding oor meer volhoubare landboupraktyke aan 1,6 miljoen boere regoor die wêreld voorsien. BCI is in der waarheid 'n gesamentlike poging wat organisasies vanaf plaasvlak tot mode- en tekstielhandelsmerke insluit, om volhoubaarheid in die katoensektor te bewerkstellig.

1. BCI-boere verminder die skadelike impak van gewasbeskermingpraktyke

BCI ondersteun boere deur praktyke wat die skadelike effek van plaagdoders kan beperk, beter te verstaan. Alternatiewe plaagbeheertegnieke word gebruik deur geïntegreerde plaagbestuurtegnologieë toe te pas.

2. BCI-boere bevorder waterrentmeesterskap

BCI ondersteun boere in die doeltreffende gebruik van water. Dit sluit minder besoedeling in, met die doel om opbrengste te verbeter en om klimaatsveranderings beter te kan hanteer. Dit sluit ook in die bevordering van billike gebruik en toewysing van waterhulpbronne onder gebruikers buite plaasvlak tot en met waterskeidingsvlak.

3. BCI-boere sorg vir die gesondheid van die grond

BCI ondersteun boere om 'n beter begrip oor die gebruik van grond te verkry. Gesonde grondgebruik lei tot 'n toename in die kwaliteit en kwantiteit van opbrengste en tot groter kostebesparings op kunsmis, plaagdoders en arbeid.

4. BCI-boere verbeter biodiversiteit en die gebruik van grond op 'n verantwoordelik wyse

BCI ondersteun boere in die bewaring en verbetering van die biodiversiteit van hulle grond en om praktyke aan te neem wat die negatiewe impak op habitats in en rondom hul plaas sal verminder.

5. BCI-boere sorg vir en bewaar veselgehalte

BCI ondersteun boere in die bestuur van inherente veseleienskappe en mensgemaakte besoedeling en afvalinhoud. Dit verbeter katoengehalte en voeg waarde toe, wat 'n beter prys vir hulle verseker.

6. BCI-boere bevorder ordentlike werk

BCI ondersteun boere met die bevordering van:

- fundamentele beginsels en regte in die werksomgewing;
- indiensneming- en inkomstegeleenthede;
- sosiale beskerming, wat insluit sosiale sekerheid, en
- sosiale dialoog, gebaseer op internasionale arbeidstandaarde.

7. BCI-boere bedryf 'n doeltreffende bestuurstelsel

BCI ondersteun boere om 'n bestuurstelsel te bedryf met 'n raamwerk van beleide, prosesse en prosedures wat al die take kan vervul volgens die "Better Cotton Initiative", en om sodoende ook deurlopende verbetering in boerderypraktyke te bewerkstellig.

WHY COTTON?

by Tanya Aucamp, CEO and founder: Social Weaver Communications

Cotton touches most of our lives every day. Although numbers vary, it represents about 30% of all fibre used in the textile sector. Globally, around 30 million hectares are planted with cotton, covering more than 2% of total arable land and producing approximately 25 million tonnes of cotton annually. Cotton is grown in over 80 countries and its production supports over 350 million people, of which 50 to 100 million are farmers. People love cotton for many reasons:

It is practical and affordable

- Cotton is a versatile fibre that can be woven into many fabrics, from denim to lace. It can be easily dyed and blended with other types of fibres, like polyester.
- Because it is so widely available, cotton is affordable.

It is tough

- Cotton fibres are tough and durable. It is the only fibre that becomes even stronger when wet. Clothes made from cotton can be worn and washed repeatedly.
- Because cotton can tolerate very hot water and high temperatures, it is easy to sterilise, making it the fibre of choice for hospital clothing and accessories, as well as firefighting and other emergency services' uniforms.

It is comfortable to wear

- Fabrics made of cotton are soft and non-irritating – they do not scratch or chafe the skin. Cotton is one of the only natural fibres that causes virtually no allergic reactions, making it ideal for babies and people with sensitive skin, or those prone to skin problems such as eczema.
- Cotton allows the skin to breathe. It draws moisture away from the body, which means in hot weather it keeps you dry, and in cool weather provides great insulation.
- It is breathable and does not retain odours.

It is environment-friendly

- Cotton is biodegradable and a renewable resource (though it can use non-renewable resources in the growing process).
- Cotton fibres can be reused and recycled. Using the right technology, cotton fabric can be broken down and the fibres recycled into new yarn, or even into paper.

It is more than a fibre crop

Cotton is an important rotation crop for smallholders – for fibre, fuel and food such as cottonseed oil. The cash income it generates is vital to improve living standards.

Source: http://cottonupguide.org/why-source-sustainable-cotton/cotton-at-a-glance

Ons is daar van plant, tot stoor, tot in die mark.

GWK Katoen

As jy na die beste oplossings vir jou katoenboerdery soek, vertrou ons span by GWK Katoen. Of jy al jare katoen aanplant of dit vir die eerste keer oorweeg, het ons spesialiste wat elke jou in elke stap kan ondersteun. Met gevestigde internasionale markkanale verseker ons dat jou produk in die regte hande beland.

Fanus Linde | Bestuurder | 082 888 0016 | fanusl@gwk.co.za

gwk.co.za

GWK

innoveer landbou

BLOU BETEKEN

Effektiwiteit en produktiwiteit

RUBIN 12 SWAERDIENS KOMPAKTE SKOTTELEG

Individueel gemonteerde 736 mm skottels met oorlaai beskerming

LEMKEN se Rubin 12-skotteleg is die ideale hulpmiddel om groot hoeveelhede plantmateriaal doeltreffend in die grond te werk. Die Rubin 12 is ontwerp met 'n aggressiewe invalshoek wat bewerking in moeilike omstandighede vergemaklik. Die hidroliese beheerde rollers beheer die diepte van die werktuig en verseker 'n uitsteekende ferm saadbed

- Werksdiepte van 7 - 20 cm, hidrolies aangepas
- Simetriese skottelrangskikking om sywaardse beweging tee te werk
- Meng organiese materiaal eweredig in die grond vir vinnige organiese materiaalontbinding

Nader jou naaste LEMKEN Handelaar om meer uit te vind oor ons wye reeks LEMKEN produkte

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