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CHIPS

Die enigste tydskrif vir die aartappelbedryf • The only magazine for the potato industry

44 Weight loss of potatoes packed in 10 kg potato bags

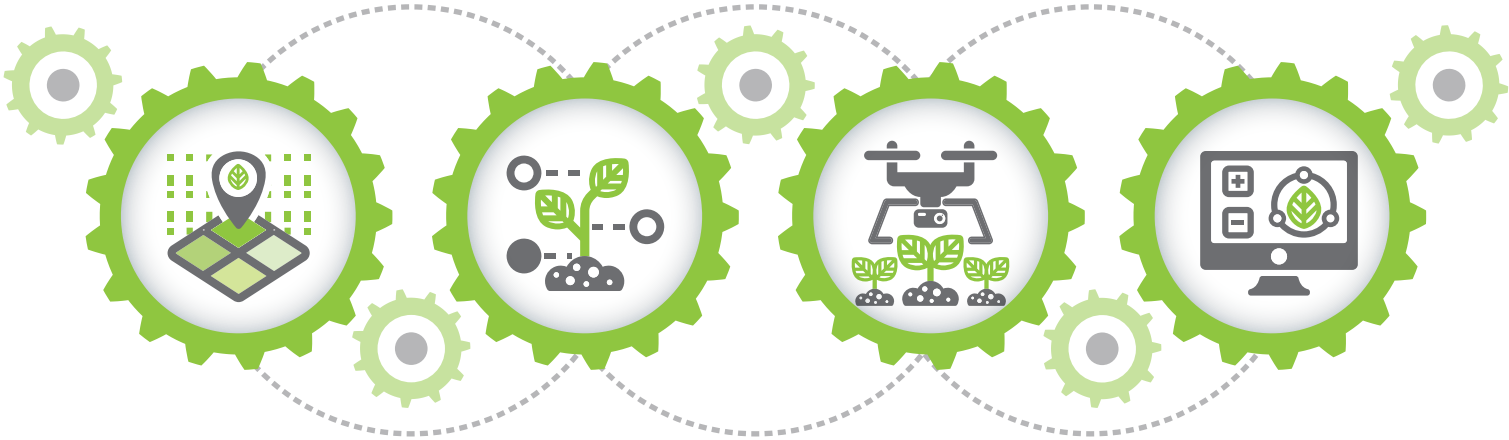
76 Prospects for the coming seasons

102 Top 10 Moerkwekers – 2019

GEÏNTEGREERDE GEWASBESTUURSPROGRAMME VIR VOLHOUBARE GROEI

NEXUS[AG] GEÏNTEGREERDE GEWASBESTUURSPROGRAMME SLUIT DOELGEMAAKTE PLANTVOEDING- EN OESBESKERMINGSPROGRAMME IN WAT GESONDE GROND EN VOLHOUBARE VOEDSELPRODUKSIE BEVORDER!

ONS WETENSKAPLIKE BENADERING WORD ONDERSTEUN DEUR `N REEKS TEGNIESE DIENSTE:



GRONDKARTERING

Dit behels die identifikasie, klassifikasie en kartering van grond vir die doeltreffende beplanning en bestuur daarvan.

PRESISIE-GRONDMONSTERNEMING

Geskied volgens ruitverwysings, waarna die monsters ontleed en regstellings gedoen word. Hierdie inligting word grafies uitgedruk op GIS kaarte.

HOMMELTUIG-DATA

Beelde en data word ingesamel met behulp van hommeltuie, waarna dit verwerk word om inligting oor gewasgesondheid en gewasgroei te verskaf.

DIGITALE PESMONITERING

Stel die moniteerder in staat om pesinspeksie-data digitaal vas te vang in die boord. Rekords word onverwyld outomaties gegenereer en gestoor per GPS punt.

Kontak gerus u naaste Nexus[AG] Croplife-geakkrediteerde gewasadviseur met navrae oor doelgemaakte aartappel-bestuursprogramme, wat u unieke omgewing en spesifieke omstandighede in ag neem, om volhoubare oplossings vir u boerdery te bied.

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ń Sensitiewe balans moet die fondasie wees van produsente se produksie- en bemarkingstrategieë

"Verbruik is die kern doel en rede vir produksie" – is die woorde van Adam Smith wat beskou word as die vader van die hedendaagse ekonomiese teorie en beginsels. Ons kan aanvaar dat sy sieninge gebore is uit sy observasies en studies van hoe markte reeds honderde jare gelede gewerk het. Alhoewel markte uit die aard van die saak baie meer kompleks is vandag geld die beginsel dat pryse bepaal word deur vraag en aanbod steeds, soos gesien kan word in die aartappelwaardeketting. As aanbod, byvoorbeeld lewerings na varsproduktemarkte, styg sal pryse onder druk kom en andersom.

Die mededinging vir 'n spasie op die verbruiker se bord het baie strawwer geword soos wat verbruikers meer gesofistikeerd geraak het en baie meer keuses het wanneer dit kom om te besluit wat om te eet. Bekostigbaarheid sal altyd 'n rol speel en verbruikers sal toenemend die waardeproposisie wat produkte bied oorweeg voordat hulle 'n besluit neem om 'n produk te koop. Dit geld natuurlik ook vir die aartappelbedryf. As pryse laag is as gevolg van groot volumes produk wat gelewer word sal verbruikers meer van die produk gebruik omdat die waardeproposisie relatief tot ander produkte verander. Dit is hoe markte werk.

Die probleem is egter dat produsente slegs volhoubaar kan produseer as pryse van produkte wat hulle verkoop op 'n vlak is waar winste kan realiseer. Gegewe die hoë produksiekoste van aartappels, tesame met die risiko's om aartappel te produseer, is dit uiters belangrik dat pryse op 'n vlak is waar 'n wins gemaak kan word. Pryse in die algemeen is egter 'n afgeleide van die vraag en aanbod. In kort, as te veel produk op enige gegewe oomblik in die

mark beskikbaar is sal pryse daal tot op vlakke waar verliese realiseer tot nadeel van die produsent.

Waaroor die produsent wel beheer het, is onder andere (i) die hoeveelheid produk wat hy/sy na die mark stuur op 'n gegewe tyd, (ii) die kwaliteit van die produk, (iii) watter bemarkingskanale gebruik word, en (iv) die handelsmerk wat gebruik word en die gepaardgaande persepsie wat die verbruiker koppel aan die handelsmerk. Die oorhoofse bepalende faktor van prysbewegings bly nietemin die balans tussen vraag en aanbod. Soos genoem is aanbod een van die faktore waaroor produsente wel beheer het en is dit nodig om daadwerklik hieroor te besin. Markseine bevat genoegsame intelligensie om te sien wanneer pryse tipies opwaartse neigings toon of wanneer pryse onder druk verkeer. Byvoorbeeld, as daar gekyk word na maandelikse pryse sedert 2015 is pryse in 70% van gevalle die hoogste tydens die laaste week van 'n maand en eerste week van die daaropvolgende maand. As daar ook gekyk word na pryse gedurende 'n week is pryse die meeste van die tyd op Maandae onder druk as gevolg van voorrade op markte wat eers verkoop moet word en styg dan op Dinsdae indien voorrade laer is. Soos voorrade vir die res van die week weer styg sal pryse tipies onder druk verkeer.

Binne die konteks dat vraag en aanbod pryse bepaal, is dit belangrik om kennis te neem dat die algehele vraag en die per capita verbruik van aartappels toegeneem het oor die laaste twee dekades. Dit is verder belangrik dat kennis geneem word dat hierdie toename gekoppel is aan die aanbod van plaaslik geproduseerde aartappels aangesien die invoere van vars aartappels verbied word. Dus, as produksie daal vir watter rede ook al sal die verbruik dienooreenkomstig afneem – geprosesseerde aartappels wat ook ingevoer kan word se markaandeel is steeds relatief klein teenoor die tafelaartappelmark en sal nie in staat wees om die korttermyn-gaping te vul nie.

Die belangrike vraag is daarom wat met reële pryse gebeur? In 2016 het rekord reële pryse gerealiseer as gevolg van 'n skerp daling in produksie vanweë ongunstige weersomstandighede. Die verbruiker was bereid om meer te betaal vir aartappels wat wys dat aartappels 'n voorkeurproduk is. Die verbruiker is egter ook rasioneel en sal minder betaal as daar genoegsame aanbod of oorvoorsiening is.

Dit is duidelik dat die aartappelmark 'n sensitiewe balans moet handhaaf. Dit is van toepassing op 'n weeklikse, maandelikse en jaarlikse basis. Daar kan nie staat gemaak word op natuurlike faktore (weersomstandighede) om te verseker dat pryse in die markplek realiseer wat dit winsgewend maak om aartappels te produseer nie. Dit moet die fondasie wees van produsente se produksie- en bemarkingstrategieë.

Op 'n breër front sal Aartappels Suid-Afrika voortgaan om aartappelverbruik te bevorder deur generiese produkbevordering en markontwikkeling. Die slagspreuk "Gesondheid uit die grond uit" en die gebruik van die Hartmerk as deel van die generiese promosieveldtogte is kernbelangrik vir die bevordering van aartappels as 'n vars en gesonde produk van voorkeur. Verbruikersnavorsing is huidig onderweg om meer te wete te kom oor verbruikersgedrag. Terselfdertyd word daar ook 'n studie onderneem oor die informele mark in Suid-Afrika gegewe die belangrikheid van hierdie marksegment in die aartappelbedryf. Die resultate van hierdie studies sal spoedig aan die bedryf gekommunikeer word.

Aartappelgroete

Dr. André Jooste
Hoofuitvoerende Beampte

A sensitive balance must be the foundation of producers' production and marketing strategies

"Consumption is the sole end and purpose of all production" – are the words of Adam Smith who is regarded as the father of the modern day economic theory and principles. We can accept that his views were borne out of his observations and studies as to how markets already operated hundreds of years ago. Although markets are inevitably much more complex today the principle still applies that prices are determined by supply and demand as is evident in the potato value chain. If supply, for example consignments to fresh produce markets, increases prices will come under pressure and vice versa. The competition for a space on the consumer's plate has become much tougher as consumers are becoming more sophisticated and have much more choices when it comes to deciding what to eat. Affordability will always play a role and consumers will increasingly consider the value proposition prior to taking a decision on purchasing a product. Naturally this also applies to the potato industry. If prices are low due to large product volumes being delivered, consumers will use more of such a product because the value proposition improves in relation to other products. This is how markets operate.

The problem is, however, that producers can only produce sustainable if the prices of produce they sell are at a level where profits can be realised. Given the

high production cost of potatoes, together with the risks to produce potatoes, it is extremely important that prices are at a level where a profit can be made. However, in general prices are a derivative of supply and demand. In short, if excess produce are available in the market place at any given time prices will drop to levels where losses will be incurred to the detriment of the producer.

What the producer certainly has control over is for example (i) the quantity of produce he/she sends to the market at a given time, (ii) the quality of the product, (iii) which marketing channels are used, and (iv) the trade mark used together with associated perceptions the consumer attach to the trade mark. The over-arching determining factor of price movements nevertheless remain the balance between supply and demand. As already mentioned, supply is one of the factors over which producers indeed has control and it is necessary that we have serious introspection about this. Market signals contain sufficient intelligence to see when prices indicate typical upward trends or when prices are under pressure. For example, when one looks at monthly prices since 2015, in 70% of cases prices were higher during the last and first week of consecutive months. If one looks at prices during the week, most of the time prices are under pressure on Mondays because of stocks on markets which must first be sold and which then rise on Tuesdays if stocks are lower. As stocks increase again for the remainder of the week prices will typically be under pressure.

Within the context that supply and demand determine price, it is important to take note that the total demand and the per capita consumption of potatoes increased over the past two decades. It is also important to take note that this increase is coupled to the supply of locally produced potatoes as the importation of fresh potatoes are prohibited. Thus, if production drops for whatever reason consumption will decrease accordingly – the market share of imported processed potatoes is still relatively small compared to the local ware potato market and will not be able to fill the short-term gap. The important question is, therefore, what happens to real prices? In 2016 record real prices were realised as a result of a sharp decrease in production because of unfavourable weather conditions. The consumer was prepared to pay more for potatoes which indicates that potatoes are a preferred product. However, the consumer is also rational and will pay less if there is sufficient stocks or an over-supply.

It is clear that the potato market must maintain a sensitive balance. This applies on a weekly, monthly and yearly basis and natural factors (weather conditions) cannot be relied upon to ensure that prices in the market place realise profits. It must be the foundation of producers' production and marketing strategies.

On a broader front Potatoes South Africa will continue to promote potato consumption through generic product promotion and market development. The slogan "Goodness from the earth" and the use of the Heart mark as part of the generic promotion campaigns are pivotal to the promotion of potatoes as a fresh and healthy product of choice. Consumer research is underway to learn more about consumer behaviour. Simultaneously a study is being conducted on the South African informal market, given the importance of this market segment in the potato industry. The results of these studies will be communicated to the industry shortly.

Potato regards

Dr André Jooste
Chief Executive Officer

BULLETIN

Lepidoptera beheer op *AARTAPPELS*

Die Orde Lepidoptera is daarvoor bekend dat dit van die belangrike peste (snywurm, Afrika bolwurm en aartappelmot) op aartappels insluit. Ander larwes soos die tamatie-valslandmeter, kool-valslandmeter, klein kommandowurm en die tamatie-blaarmyner (*Tuta absoluta*) mag ook voorkom.

SNYWURM

Die algemeenste spesies op aartappels sluit die gewone snywurm (Agrotis segetum), die bruinsnywurm (Agrotis longidentifera) en die swartsnywurm (Agrotis ipsilon) in. Volwasse snywurms is gewoonlik onaktief gedurende die dag en skuil onder plantreste of in die grond.

Voeding vind gewoonlik gedurende die nag plaas waartydens plante teen die grondoppervlakte afgesny word (vandaar die naam snywurm). Die skade is veral opmerklik as jong plante aangeval word. Die volwasse snywurm kan ook knolle aanval indien dit daarmee in aanraking kom.

'n Enkele larwe kan meer as een plant gedurende die nag afvreet. Beheer is gewoonlik met 'n piretroïed waartydens 'n chemiese hindernis op die grondoppervlakte geplaas word. Aangesien die snywurm bo-op die grondoppervlakte beweeg sal dit dan in aanraking kom met die kontakinsekdoder en gedood word.

AARTAPPELMOT

Aartappelmot kom in al die Aartappelproduksiestreke van Suid-Afrika voor. Die mot is slegs aktief in die nag en skuil tussen plante deur die dag. Motte leef vir ongeveer twee weke. Van eier tot volwasse mot neem ongeveer vier weke in die somer, maar kan tot vyf maande neem in die winter. Kenmerkende "vensters" kan in die loof gesien word waar die larwe tussen die boonste en onderste epiteellae voed. Ekonomiese skade vind plaas sodra die larwe in die knol inbeweeg en sodoende die bemarkbaarheid van die knol negatief beïnvloed.

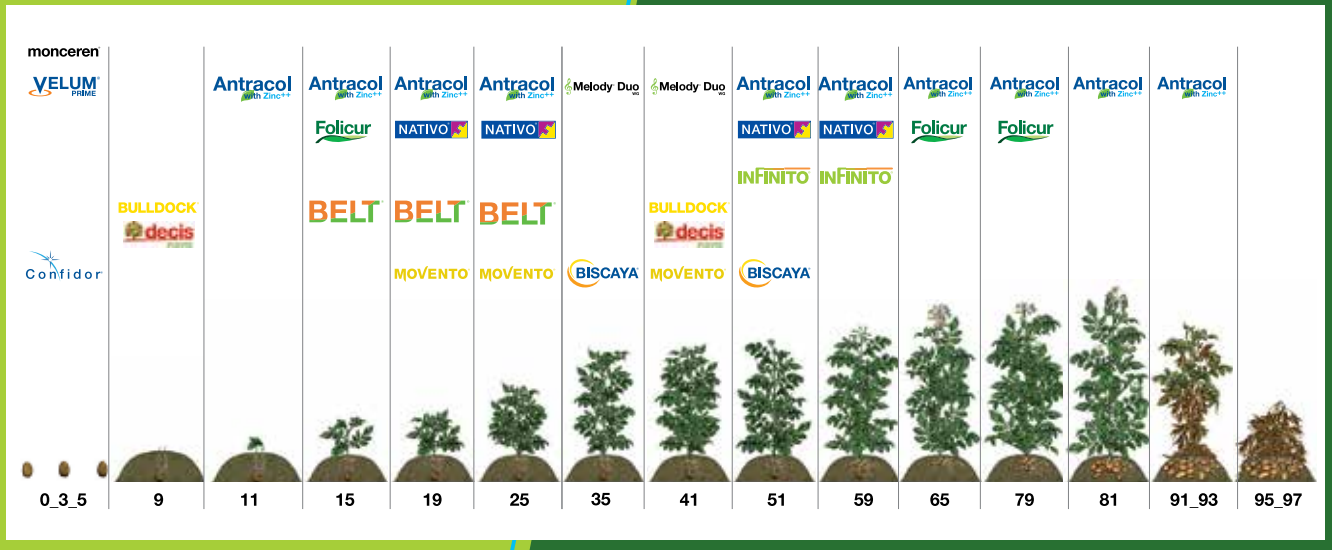
AFRIKA BOLWURM

Die Afika-bolwurm kom net sporadies op aartappels voor. Die larwes is 30 tot 40 mm lank en verskil van groen tot bruin en word uitgeken aan 'n wit of geel streep langs die kant van die liggaam. Die larwe vreet gate in die boonste blare of blomme en wanneer jong plantjies aangeval word, kan groot skade aangerig word.

BEHEER

*Geïntegreerde beheer van aartappelmot is krities om getalle onder die ekonomiese drempel te hou, asook insetkoste te beperk. Daar is 'n verskeidenheid natuurlike vyande in Suid-Afrika en die keuse van insekdoder is dus belangrik om die impak op hulle te verlaag. Operding is belangrik om die blootstelling van knolle aan larwes te verminder. Chemiese beheer moet met die nodige omsigtigheid toegedien word om die maksimum impak op die pes te hê met die minste impak op die omgewing. Uit 'n Bayer perspektief is daar die piretroïedes (**Decis® Forte** en **Bulldock® 125 SC**) en die diamied (**Belt®**) wat gebruik kan word. Indien die piretroïedes aan die begin en einde gebruik word, behoort dit die minste effek op die omgewing te hê met die hoogste impak op aartappelmotlarwes. Gebruik tydens die eerste toedieningsvenster sal ook snywurm beheer.*

BAYER MUCH MORE POTATOES SPUITPROGRAM



DECIS® FORTE

Piretroïedes is steeds van die beste groep produkte vir snywurmbeheer. Omdat hierdie 'n relatiewe harde groep chemie is, sal 'n vroeë toediening die effek op voordelige insekte minimaliseer. ***Decis® Forte*** *het net een isomeer en daarom sal dit die minste beïnvloed word deur ongunstige omgewingstoestande (warm, droë grond). Die struktuur verseker ook 'n egalige verspreiding wat die opname en effektiwiteit verbeter.*

*Die spesifieke formulasie verseker ook vinnige uitklop-aksie, wat die potensiële negatiewe impak minimaliseer. Beide die piretroïedes van Bayer (****Decis® Forte*** *en* ***Bulldock®****) het van die beste toksikologiese profiele in die industrie (Figuur 1).*

Aktiewe bestanddeel	Akute mondelingse LD_{50} in mg/kg	Gemiddelde toedienings-hoeveelheid (g.a.i./ ha)	Verhouding LD_{50} / toedieningshoeveelheid
Deltamethrin (Decis®)	**135**	**10**	**13,5**
Gamma-cyhalothrin	< 50	8*	< 6.2
Lambda-cyhalothrin	56	12	4,6
Cypermethrin	250	50	5.0
Bulldock®	**500**	**7.5**	**66.7**
Esfenvalerate	87	20	4,3
Profenofos	358	500	0,7
Methomyl	17	500	0,03

FIGUUR 1: ***Vergelyking van verskillende insekdoders se toksisiteit teenoor die mens*** *(hoe laer die verhouding LD_{50} / dosis, hoe minder toksies)*

BELT®

Belt® behoort aan die diamiede groep en is bekend vir sy uitstekende effek op lepidoptera peste. Na die inname van **Belt®** (flubendiamied) hou die larwe op voed, raak verlam en gaan dood. **Belt®** het 'n translaminêre translokasie en daarom is die produk in staat om deur die blaar te beweeg al is dit net aan een kant aangewend.

As **Belt®** vergelyk word met verskillende insekdoders op die beheer van Herfs-kommandowurm (*Spodoptera frugiperda*) wys dit 'n hoë effektiwiteit.

EIENSKAPPE

// Nuwe chemie met unieke metode van werking.
// Bied langdurige effektiwiteit.
// Uitstekende veiligheid.
// Geskik vir Geïntegreerde Pesbestuur en Insekdoderweerstandsbestuur.
// Lokaal sistemies en translaminêre aktiwiteit.
// Stop voeding dadelik.
// Hoë graad van reënvastheid.
// Breë toedieningsvenster en buigbaarheid.
// Uitstekende beheer van alle belangrike lepidotera.
// Kort onthoudingsperiode.

VOORDELE

// Beheer weerstandige lepidotera, geen kruisweerstand.
// Minder toedienings nodig.
// Veilig vir die gewas, omgewing en werker/operateur.
// Nie-toksies vir voordelige insekte.
// Aanvaarbaar vir voedselketting-vereistes en Insekdoderweerstandbestuursprogramme.
// Totale blaarbeskerming, meer bemarkbare produkte.
// Maksimum gewasbeskerming/-behoud.
// Geen vermorsing van toedienings.
// Makliker gewasbestuur. Werk goed onder ongunstige klimaatstoestande (temperatuur, vogtigheid, reën).
// Bied groter buigsaamheid in pesbestuur.

BELT®

Belt® pas goed in by 'n Geïntegreerde pesbestuur- en Insekdoder-weerstandsbestuurprogram vanweë die vele gunstige eienskappe.

Aktiewe bestanddeel	Flubendiamide	Methoxyfenozide	Spinosad	Indoxacarb	Emamectin benzoate	Lamda-cyhalothrin	Methomyl
IRAC (MOA) KLAS	28	18A	5	22A	6	3	1A
Werkerveiligheid	Versigtig	Versigtig	Versigtig	Versigtig	Versigtig	Waarskuwing	Gevaar
Herbetreding interval (REI)* *	12 uur	<12 uur	4 uur	12 uur	48 uur	24 uur	13-48 uur
Voor-oes interval (PHI)* *	1 d	1-2 d	1 d	3 d	7-14 d	1 d	1-10 d
Voordelige insektoksisiteit	Laag	Laag	Matige	Matige	Matige	Hoog	Hoog
Toksisiteit teenoor bye	Laag	Laag	Hoog	Hoog	Hoog	Hoog	Hoog
Sekondêre plaagopvlam	Nee	Nee	Matige	Matige	Matige	Hoog	Hoog
Spoed van voedingstaking	<12 uur	1 d	1 d	1 d	1 d	<12 uur	<12 uur
Spoed waarteen lepidoptera afsterf	1-2 d	>2 d	1-2 d	1-2 d	>2 d	<1 d	<1 d
Verenigbaarheid met bestuursprogramme	Hoog	Hoog	Matige	Matige	Laag	Laag	Laag
Reeds bekende weerstand	Ja	Nee	Ja	Nee	Nee	Ja	Nee
Nawerking	Hoog	Matige	Laag	Matige	Laag	Laag	Laag
Primêre tipe aktiwiteit	Inname	Inname	Inname	Inname	Inname	Kontak	Kontak
Translokasie-aktiwiteit	Laag	Geen	Geen	Geen	Geen	Geen	Geen
Translaminêre-aktiwiteit	Matige	Geen	Geen	Geen	Geen	Geen	Geen

Rooi - Minderwaardig tot standaard kommersiële produkte Geel - Gelykstaande aan standaard kommersiële produkte Green - Beter as standaard kommersiële produkte

Basis vir effektiewe pesprogram

// Beplan vooruit – bepaal wanneer pes teenwoordig sal wees en sorg dat middels beskikbaar is.
// Bou 'n pesbestuursplan vir individuele gewasse, maar let op pesbeweging na aangrensende lande.
// Maak gebruik van lokaal-geregistreerde produkte volgens die vensterbenadering.
// Roteer chemikalieë met verskillende metodes van werking – om weerstand te verhoed.
// Volg die vervaardiger se aanwysings.
// Vermy parallelle of opeenvolgende gasheergewasse met dieselfde peste.

Korrekte gebruik van Agrochemiese middels in 'n program

// Gebruik 'n vensterbenadering
- Toedieningsvenster moet nie langer as 30 dae per groep chemikalieë wees nie.
- Periode tussen toedieningsvenster moet nie korter as 35 dae wees nie, verkieslik 60 dae.

// Moet nie twee opeenvolgende generasies aan dieselfde groep chemikalieë blootstel nie.
// Bewaar nie-teiken en voordelige organismes. Kies produkte met die minste impak op voordelige organismes.
// Implementeer Geïntegreerde Pesbestuursprogramme – plant vroeg, roteer gewasse, ens.
// Gebruik insekdodermengsels – elke produk in die mengsel moet egter op sy eie ook effektief wees.
// Monitor gedurende die voor-plantperiode en as peste teenwoordig is, implementeer 'n beheerstrategie.

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05/2019_chips

Syngenta: Accelerating Innovation in a Changing World

Syngenta recently announced that it will accelerate its innovation to address the increasing challenges faced by farmers around the world and the changing views of society.

"Farmers today need to manage climate change, soil erosion and biodiversity loss, as well as changing consumer expectations and views on agricultural technology," said Alexandra Brand, Chief Sustainability Officer of Syngenta. "There is a clear call for innovation and more action to address these challenges in ways where everybody wins – from growers to consumers and the environment."

The announcement follows the completion of more than 150 listening sessions worldwide, engaging a broad cross section of views. The result was a much clearer understanding of what society and farmers expect and what sustainable agriculture means to different groups.

Syngenta's new approach aims to further improve the way crops are grown and protected, and find solutions that address interconnected environmental, societal and economic challenges.

Work will focus on three areas:

Society and nature guided innovation. Society's views and environmental needs will increasingly become central drivers for innovation alongside meeting farmers' needs. New products will be developed in consideration of externally verified sustainability principles.

Strive for the lowest residues in crops and the environment. Syngenta stands by the safety of its highly-regulated products and the role they play in protecting food quality and safety. Nonetheless, Syngenta has listened and will work with partners to further reduce residues in crops without impacting farmer productivity, and continue to improve soil health and prevent soil erosion.

Invest where it matters to farmers and nature. Syngenta will collaborate – with farmers, academia and environmental groups – on researching and developing sustainable solutions. And it will report transparently on the progress and outcomes of these investments.

Mrs. Brand said: "There is an undeniable demand for a shift in our industry. This has been the clear message throughout the listening sessions. We will put our

innovation more strongly in service of helping farms become resilient to changing climates and better able to adapt to consumer requirements including reducing carbon emissions and reversing soil erosion and biodiversity decline."

Next steps include further consultation with stakeholders to develop clear targets and metrics against these focus areas, which will be announced later in the year. Work is also underway to build insights from the listening sessions into the next evolution of The Good Growth Plan in 2020. The Plan, which is in its sixth year, is well on track to deliver all commitments.

Source: media.relations@syngenta.com

New variety of zebra chip disease threatens US potato production

Zebra chip disease, named after the dark stripes that form inside potatoes after they are cut and fried, is a potentially devastating affliction that can result in yield losses up to 100% for farmers.

The disease, caused by the bacterium *Candidatus Liberibacter solanacearum*, has been economically damaging commercial crops, including potato, tomato, and pepper, in the central and western United States, Mexico, Central America, and New Zealand since the early 2000s.

In a three-year period in the mid-2000s, chemical management of the disease in Texas cost an estimated $25.86 million. The Pacific Northwest spends an estimated $11 million a year on chemical management.

Swisher Grimm and S. F. Garczynski, authors of *Identification of a New Haplotype of 'Candidatus Liberibacter solanacearum' in Solanum tuberosum*, an article in Plant Disease, say: "The economic impact of zebra chip disease on the U.S. potato industry cannot be taken lightly."

Grimm and Garczynski received potato tubers from the Klamath Basin in Oregon that were suspected of being infected with the casual bacteria of zebra chip disease. When they analysed the tubers, they confirmed the presence of the pathogen but did not identify the sample as one of the six known varieties (haplotypes).

There is more to learn about haplotype F and research must be done to determine host range and identify the insect that transmits this pathogen. As this is the first time zebra chip disease has been identified in the Klamath Basin, it is important to identify the dynamics and geographic overlaps of haplotypes A, B, and F. In-depth surveys are necessary to determine the potential impact of the novel haplotype on the potato industry of Southwestern Oregon.

Source: phys.org / FreshPlaza

Peru's National Potato Day rescues the country's native varieties

The National Potato Day which is annually celebrated on 20 May, serves to rescue Peruvian native potatoes from extinction, said the executive director of the Center for Technological Innovation of the Potato and other Andean Crops (CITE Papa), Celfia Obregon Ramirez.

In 2004 the per capita consumption of potatoes in Peru was 60 kilograms, but now, thanks to the National Potato Day and the promotional campaigns that take place in that framework, it has increased to 90 kilos.

Celfia Obregón also said that it was not enough for Peru to have more than 3 000 potato varieties if they did not enter the market. Under that logic, she said, farmers have begun planting, multiplying, and conserving native potatoes.

She also said that adding the power of potatoes to the power of the market would allow articulating organized producers. "We shall save our native potatoes, which were in danger of extinction, using the market's logic."

She also stated that they had developed a business model called "Buy from the fields" through the non-governmental organization Aders Peru, which offers selected and classified potatoes, articulating small producers that are organized with supermarkets, large restaurants, and other businesses.

"This project made it possible to market potatoes that have a colourful pulp and that were previously unknown in the cities and that nowadays are everywhere," she added.

The director of CITE Papa stressed that after overcoming a period of crisis in the sector (loss of biodiversity, low productivity, loss of ancestral knowledge, lack of organization to access the market, and decrease in consumption), today the country's potato sector is a growing sector.

Source: agraria.pe

Australian potato industry recognises the importance of solid front for biosecurity

In the first week of May, AUSVEG, Plant Health Australia and RMCG's Doris Blaesing facilitated an industry consultation workshop with all sectors of the potato industry to understand the who, what and where of the industry's approach to surveillance of exotic and notifiable pests and diseases. The workshop was one of the first steps towards developing the National Potato Biosecurity Surveillance Strategy, and included members from the ware, processing and seed potato industries in relevant states and territories.

Funded through the Australian Government's Agricultural Competitiveness White Paper, the aim of this strategy is to improve crop monitoring outcomes for potato production in both commercial and urban/peri-urban areas; improve grower capability to detect and report exotic pest incursions; identify issues and opportunities for the establishment of a national potato biosecurity surveillance program.

After an introduction to the project's plans for the strategy and an outline of the workshop, attendees jumped straight into a series of interactive tasks designed to capture awareness and current crop monitoring approaches within the industry. These activities generated a lot of discussion, and with such a diverse collective of industry representatives, enabled the organisers to capture well-rounded feedback to a variety of themes covered throughout the day.

Overall, the Australian potato industry recognises the need for a unified front to combat issues surrounding biosecurity. It was acknowledged that sharing data and information collected during crop monitoring is important for the success of the industry. The project team is now putting together all of the valuable information collected during the workshop, and will apply that to the development of two industry-based pilot surveillance programs to be rolled out in the middle of the year. The team will continue to consult with industry to deliver a strategy the potato industry can be proud to stand behind.

Source: ausveg.com.au

Map reveals evolution of potato disease in Europe in 2018

An international consortium, including the James Hutton Institute which tracks the European spatial distribution of *Phytophthora infestans*, the plant pathogen responsible for potato late blight, has updated the distribution of the pathogen by adding new data that visualises the distribution and diversity of dominant clones in the 2018 crop.

Plant pathologists from the EuroBlight consortium, which includes Aarhus University, Wageningen University and INRA - working with industry and research partners, have presented their latest report on its pathogen monitoring in potato crops. The report, which is available on the research group website, collates information from over 900 samples collected and genotyped in 2018.

As in previous years, 'FTA cards' were distributed to disease 'scouts' from across the industry who visited blight-infected crops. Disease lesions were pressed on the cards and returned to the laboratories where the pathogen DNA was fingerprinted at the James Hutton Institute and INRA, Rennes. The DNA fingerprint data was used to define the clonal lineages of the pathogen and combined with geo-location data to plot the diversity across Europe.

James Hutton Institute researcher, Dr David Cooke, co-leader of the EuroBlight study, said: "In a very dry and generally low blight pressure summer sample numbers were lower than normal but still manage to span 22 countries. Around 80% of the samples belonged to defined clonal lineages observed in previous seasons. For more information, visit the Euroblight website

Source: FreshPlaza ©

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Bayer CropScience

Appointments at Bayer

Bayer Crop Science recently announced the next level of leadership for the African commercial operations. Appointments that affect the company's South African operations are:

Kobus Steenekamp, currently Monsanto Commercial Operations Lead South Africa, has been appointed as Country Commercial Lead (CCL) South Africa.

Pieter Smit, currently Monsanto Marketing and Product Management Lead for Africa, has been appointed as Head of Customer Marketing Africa.

Stephen Nel, currently Bayer Head of External Sales South Africa, has been appointed as Head of Market Development Africa and Small Farmers.

Mamati Tembe, currently Bayer Country Commercial Lead (CCL) Southern African Countries, remains in her position.

The appointments came into effect on 1 April 2019. ©

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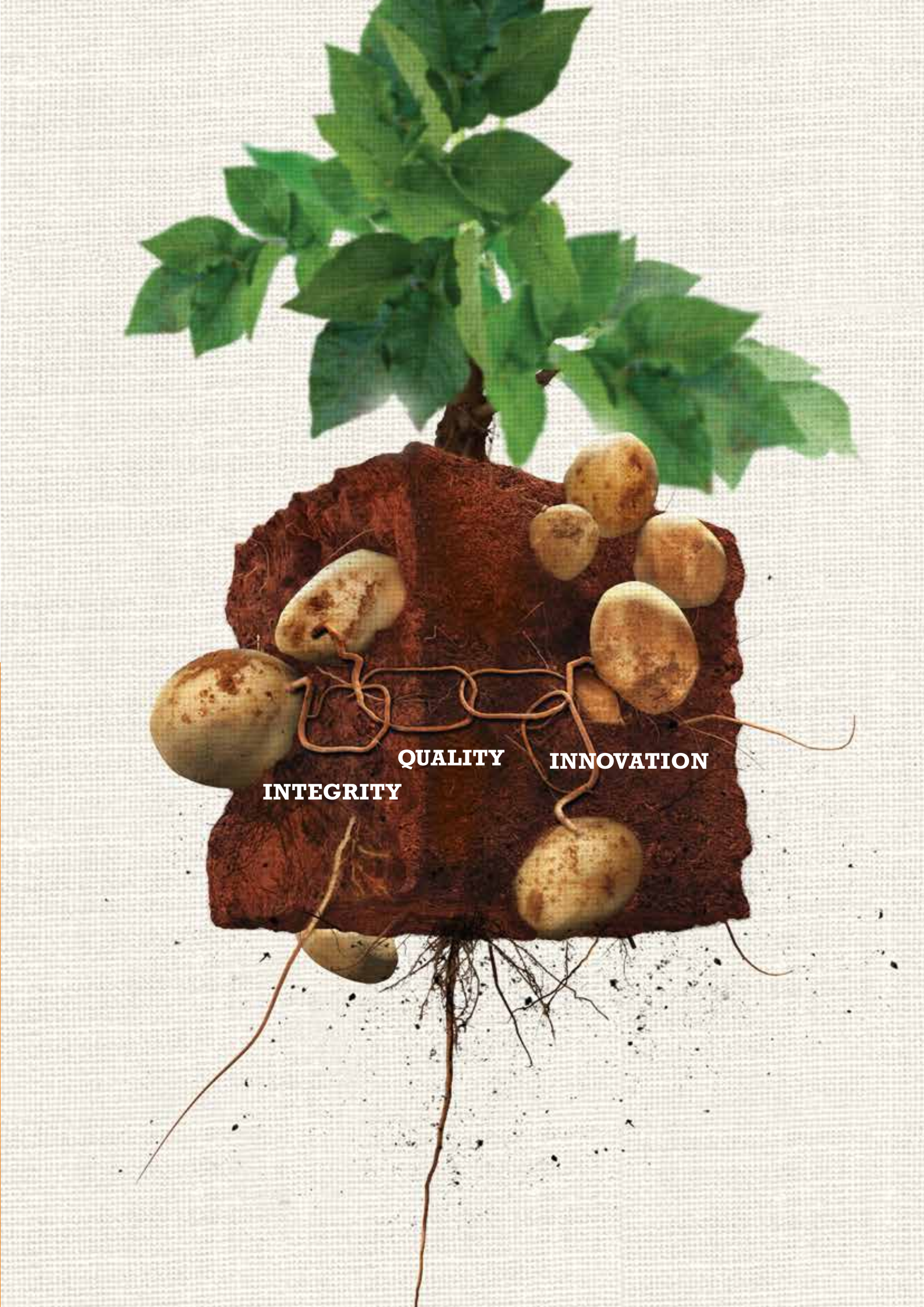
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Starches and Carbohydrates explained What fits in where?

Claire Julsing Strydom (Nutritional Solutions) / Contributor: Immaculate Zinde (Potatoes South Africa)

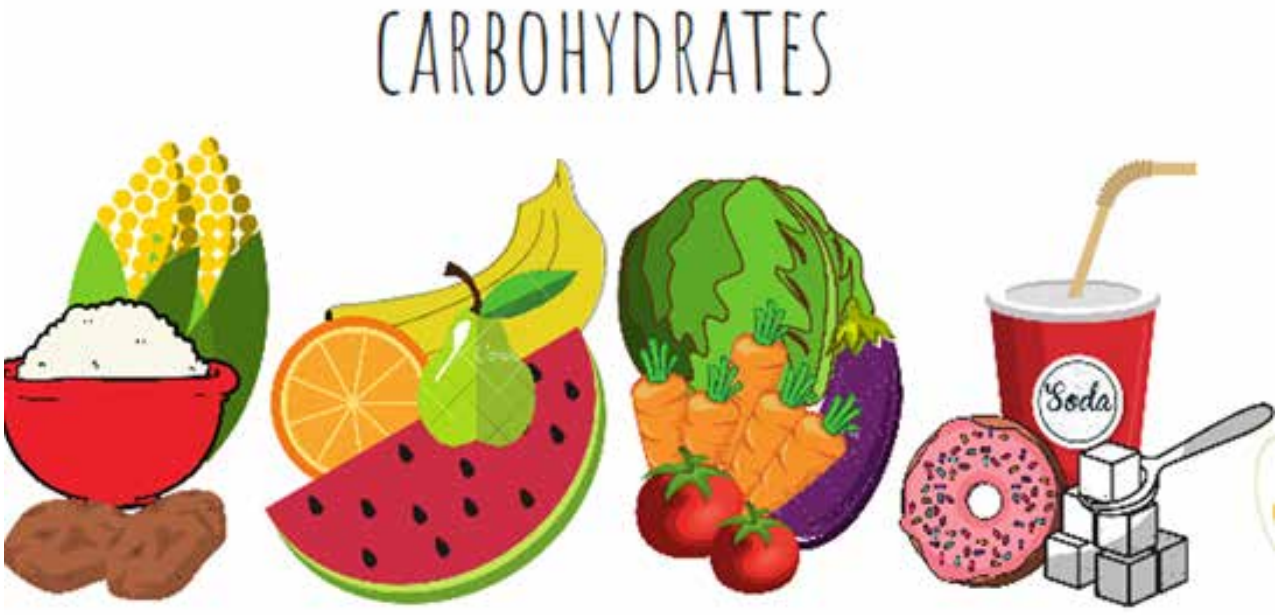
Many people may be confused about the difference between a "starch" and a "carb" or "carbohydrate". We often use these terms interchangeably and many people are said to be "cutting carbs" or "avoiding starch" to improve health or lose weight. Let's clear up the confusion once and for all and understand better, what these jargon terms really mean.

Carbohydrates: The Food Group

All food is grouped according to three main groups or macronutrients: Carbohydrates, Fats or Proteins. Within the carbohydrate group, foods are further divided into four sub-categories. These are: starches; sugars; fruits and vegetables. Yes, you read correctly: vegetables are also carbohydrates! Each carbohydrate sub-group contributes its own unique nutrients or attributes to the diet.

Starches

The starch includes foods such as rice, bread, cereals, potatoes, crackers, pasta, quinoa, couscous and a variety of other grains. These foods are a great source of energy in the diet and high quality options that are higher in fibre with a variety of B-vitamins. In order to get the benefits from starches, be sure to choose whole food options. Always remember that, the preparation does matter. Take care when preparing starches to limit fat or oil.



In the case of potatoes, always leave the skin on. Potatoes; baked, boiled or steamed provide optimal nutrient levels. Check packaging information on starches and aim to select starch options that have a higher fibre content. The aim is to choose starches with fibre higher than 6 grams per 100 grams.

Sugars

This sub-group of carbohydrates has taken a bad rap of late! A big reason for this is that sugars are becoming more and more prevalent in the diet and are regularly being added to foods and used in excessive amounts. There is no denying it, sugar is tasty and has a very high palatability. It can also be used as a preservative to increase the shelf life of foods such as pickles or jams. According to the World Health Organization, consumption of sugar should be no more than 5-10 teaspoons per day. Without realizing it, these teaspoons rack up quickly as added sugars are found in sauces, condiments, fruit juices, smoothies and many other packaged and processed foods. Sugar or honey (also a type of sugar) are also often added to hot beverages such as tea and coffee, and can contribute significantly to daily sugar intakes. Other sugars to be aware of are those more obvious ones found in chocolates, sweets, biscuits, cakes and other baked goods that are becoming increasingly consumed in the Westernized diet. It is vital to assess the diet for sugar content and avoid high intakes of sugars which contribute to high amounts of energy but very little nutrients to the diet. These energy-dense, high-sugar foods can increase total caloric intake and contribute to weight gain and other health complications such Diabetes and Heart Disease.

Fruits

Fruit too, is classified as a carbohydrate. Fruit is rich in natural sugars which are mainly in the form of fructose. Fructose is metabolised through different pathways in the body compared to the sugars mentioned above (sucrose) and because of this, the natural sugars found in fruit are released more slowly into the blood. This contributes to more stable energy release and blood sugar control throughout the day. Fruit, in its whole form, is also a source of fibre and this fibre is beneficial for gut health and also contributes to the slower release of fructose into the blood. Choose fruit in the natural, fresh form to get the most benefits which include fibre, vitamins, minerals and phytochemicals. Fruit juices, some smoothies, dried fruit and other fruit syrups are altered from their natural state and as such must be portion controlled if they are included in the diet. Many of them have sugars added or have had their fibre removed which decreases their benefits in the diet and impacts how quickly the sugars become available in the blood stream which can impact blood glucose levels.

Vegetables

The hero of the carbohydrate group, vegetables are a rich source of vitamins, minerals and phytochemicals and are also a source of fibre in the diet. There really is no negative when consuming any vegetables, they should be eaten in abundance in the diet. Particularly colourful vegetables as the different colours indicate that a variety of phytochemicals are available in the diet. So eat the colour of the rainbow on your plate every day and up-size portions of vegetables to improve satiety and fullness from meals which can assist with weight maintenance and even weight loss. Aim to eat 3-4 cups of vegetables every day, this will significantly improve your overall health

What's in a name?

And there you have it – clarity amidst the confusion! As you can see, there is no need for "name calling" when it comes to the different food groups. Better understanding and knowledge of where all foods fit in and the role they play in the diet, is far more beneficial in helping us to choose the best choice carbs, so that we can reduce risk of chronic disease and live a healthier life all-round.

Potatoes…always fresh, always in season!

References:

1. Mahan, L. K., & Raymond, J. L. (2016). *Krause's food & the nutrition care process*. Elsevier Health Sciences.
2. GBD 2017 Diet Collaborators. (2019). *Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017*. The Lancet [Published Online: April 3, 2019 http://dx.doi.org/10.1016/S0140-6736(19)30041-8].
3. Reynolds, A., Mann, J., Cummings, J., Winter, N., Mete, E., & Te Morenga, L. (2019). Carbohydrate quality and human health: a series of systematic reviews and meta-analyses. The Lancet, 393(10170), 434-445.

Exportation of South African potato products and potential export markets

By Xolisiwe Yolanda Potelwa / Contributor: Immaculate Zinde (Potatoes South Africa)

The South African potato industry exports fresh potatoes (HS code 07019000), seed potatoes (HS code 0701000) and frozen French fries (HS Code 20041000). South Africa exported 153 000 tons of potato products in 2018. Fresh potato exports amounted to 134 000 tons in 2018, which was 4% less than in 2017 (See Figure 1).

Fresh potato exports were mainly destined for Southern African countries, with Mozambique leading the list of market destinations (See Figure 2). Mozambique absorbed a total of 59 000 tons, followed by Namibia, Botswana, Swaziland and Lesotho with 19 400 tons, 18 400 tons, 11 400 tons and 10 230 tons respectively in 2018. South Africa also exported an estimated 1.1 % share to the Asian market, with the United Arab Emirates and Saudi Arabia being in the top 10 market destinations for South Africa's fresh potato exports.

Foreign attractive markets for exporting fresh potatoes

"Potatoes are now considered as a high valued crop and vegetable in China. Demand for potatoes has been growing when other bulk commodities, such as rice and wheat, have seen demand declining" said Jikun Huang, a professor at the Center for Chinese Agricultural Policy under the Chinese Academy of Sciences (Extract from Forbes online reports). Although South Africa exports about 1% into the Asian market, this market presents a wealth of opportunities with an estimated untapped potential of $4.7 million in 2018. Vietnam, Malaysia, Afghanistan, United

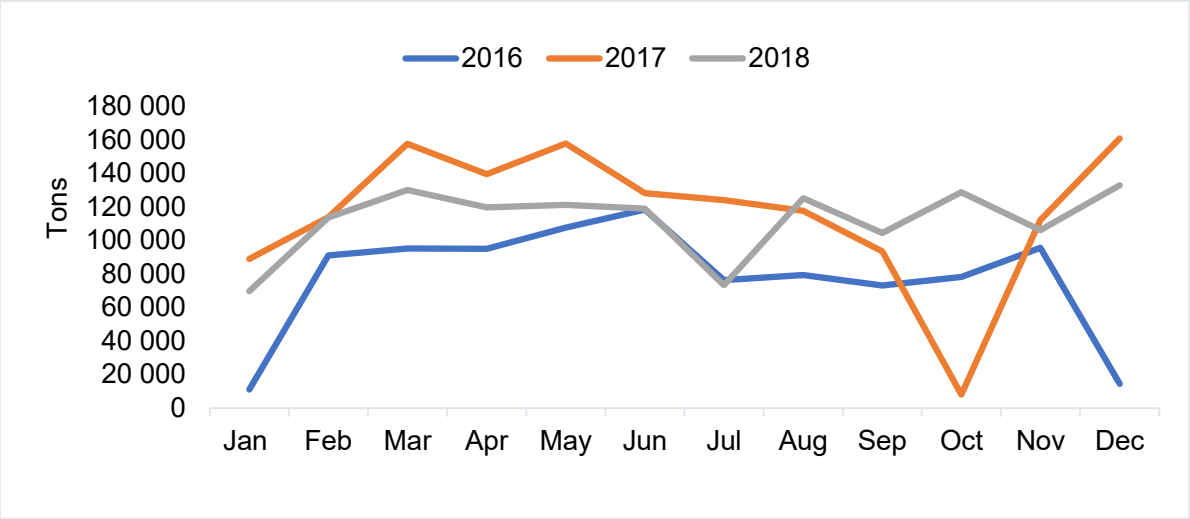


Figure 1: South Africa's fresh potato exports for 2016, 2017 and 2018
Source: Agriinspec, 2019

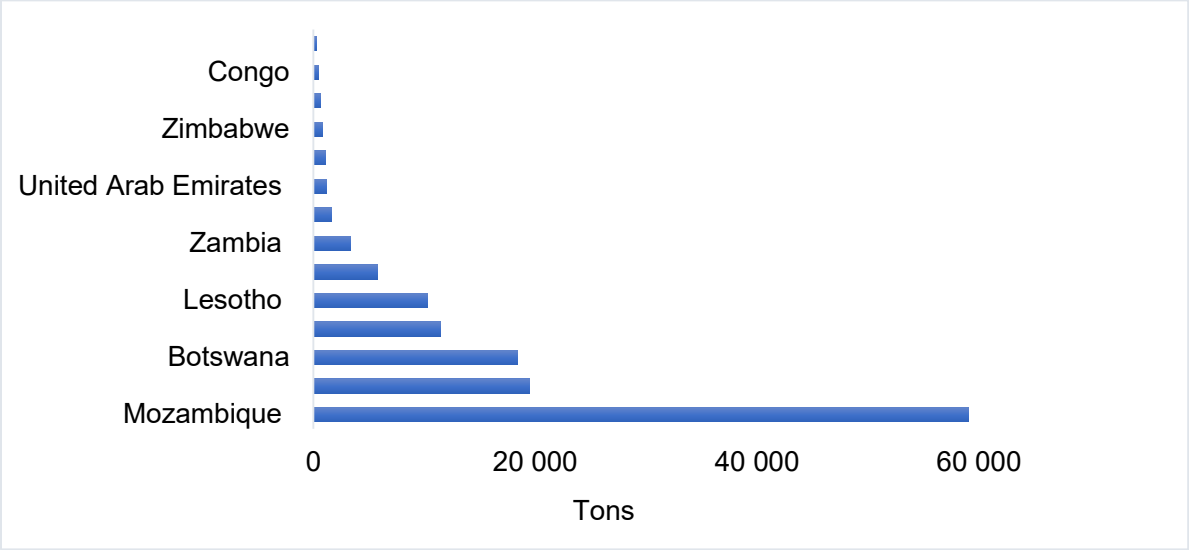


Figure 2: Main destinations for fresh potato exports in 2018
Source: Agriinspec, 2019

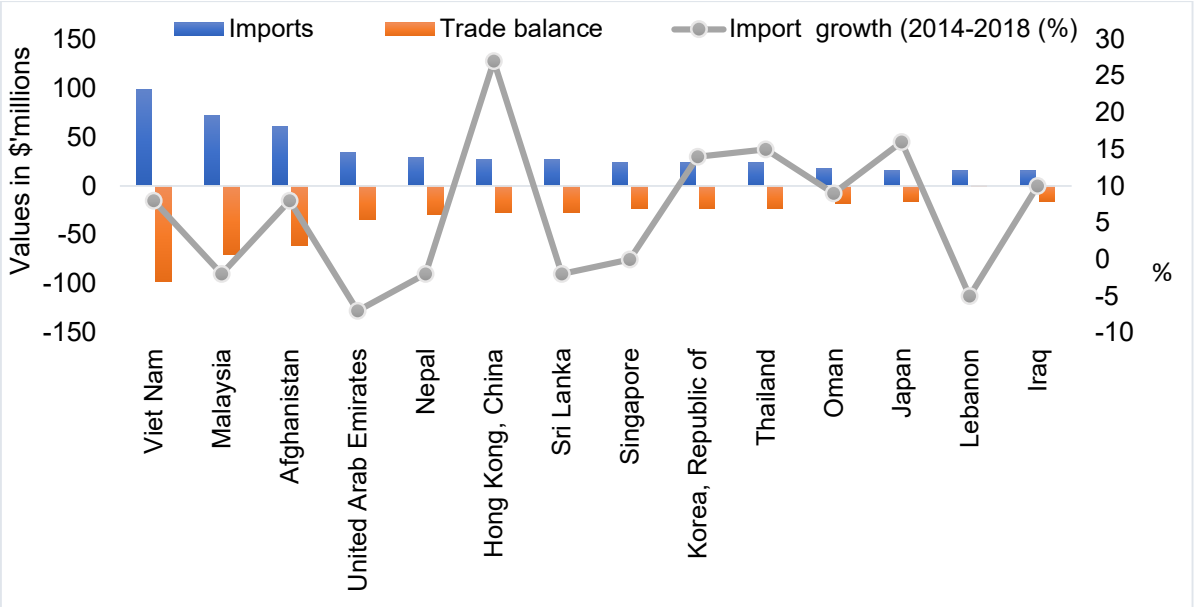


Figure 3: Attractive markets for fresh potatoes
Source: Trademap, 2019

Arab Emirates and Nepal are listed as the top five countries in Asia that are lucrative for the exportation of fresh potatoes (See Figure 3). For the period 2014 to 2018 these markets show negative trade balances (i.e. they import more than they export) and growing import demand for fresh potatoes (rising populations and income should stimulate demand further).

Seed Potatoes

Figure 4 indicates South Africa's monthly seed potatoes exports in 2018 with 12 400 tons being exported. Between September and December exports were the lowest which is ascribable to the high demand for seed potatoes locally.

Southern African countries are major importers of seed potatoes from South Africa, with Zimbabwe leading the list. Zimbabwe imported 6 300 tons of seed potatoes, followed by Namibia and Botswana with 1 700 tons and 1 010 tons respectively in 2018 (See Figure 5). The reason Zimbabwe is the biggest importer of seed potatoes from South Africa is due to the country's efforts to increase potato production to sustain their potato industry.

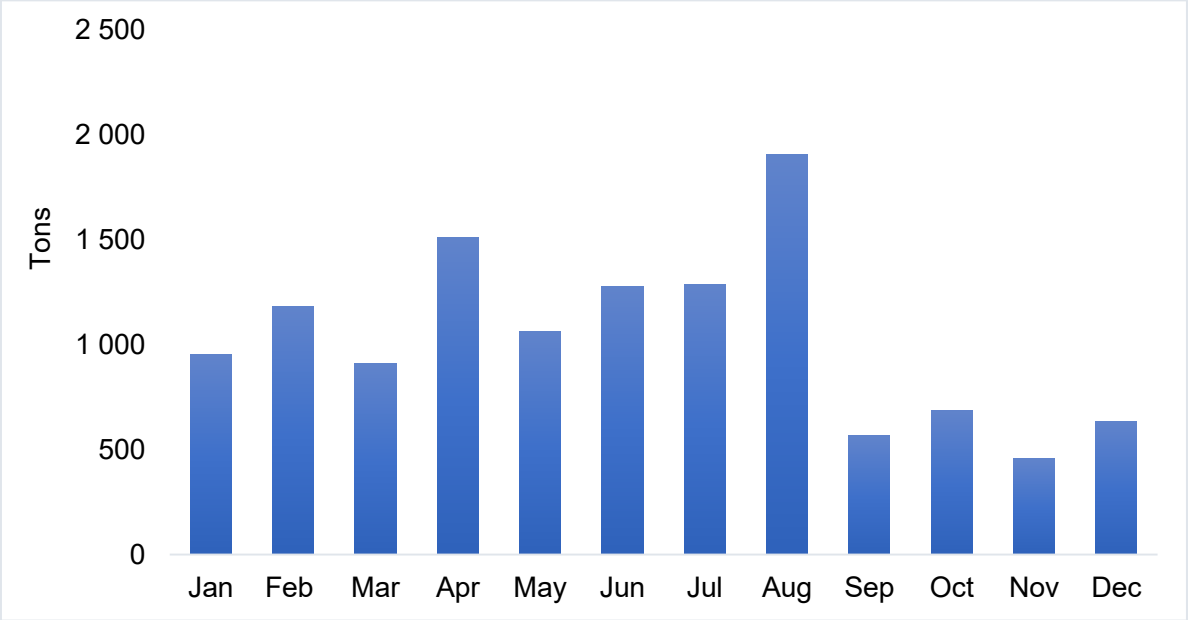


Figure 4: South Africa seed potato exports
Source: Agriinspec, 2019

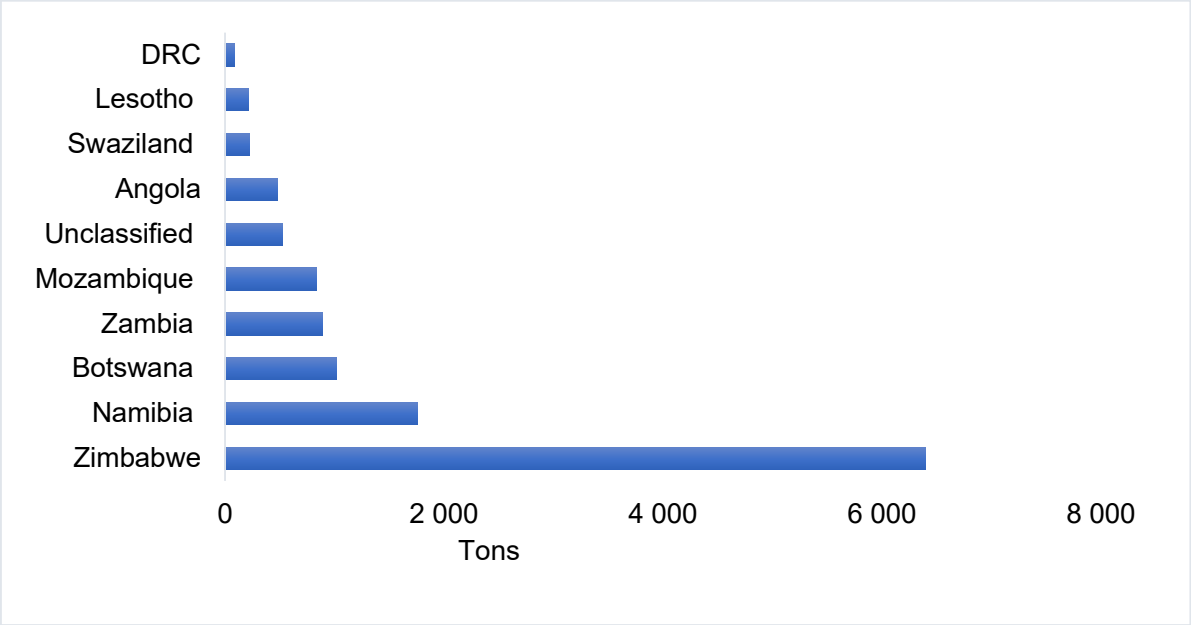


Figure 5: Main destination for seed potato exports in 2018
Source: Agriinspec, 2019

Attractive foreign markets for exporting seed potatoes

Trademap statistics revealed an estimated untapped potential of $3.3 million in 2018 in terms of seed supply, particularly in countries such as Saudi Arabia, Uzbekistan, Lebanon and Israel to name a few. Figure 6 depicts the percentage share and value in US dollar for each country.

Attractive foreign markets for exporting frozen French fries

Figure 7 indicates South Africa's monthly frozen French fry exports during 2018 with a total of 7 100 tons being exported for the year.

African countries are major importers of frozen French fries from South Africa, with Zambia leading the

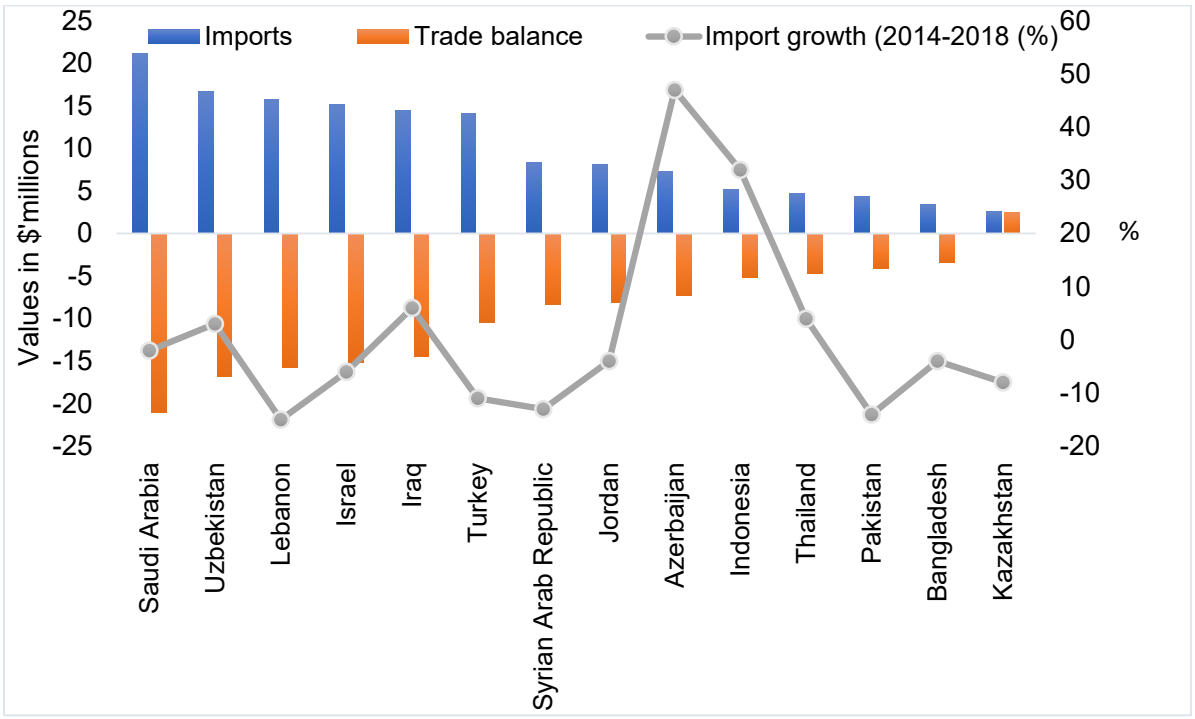


Figure 6: Attractive markets for seed potatoes
Source: Trademap, 2019

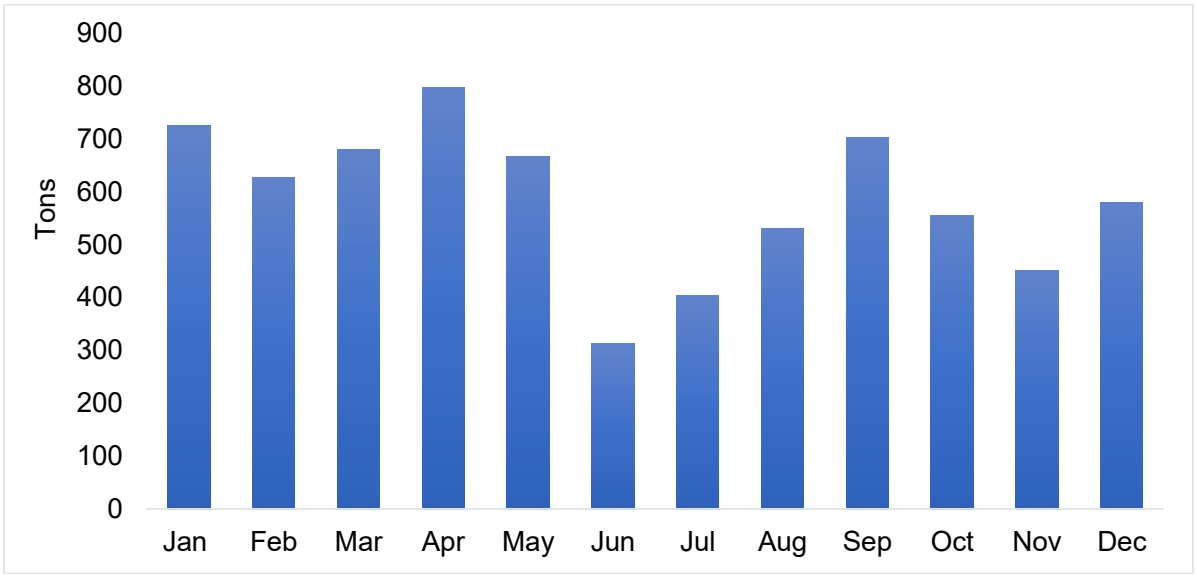


Figure 7: South Africa's frozen French fries exports
Source: Agriinspec, 2019

list. In 2018 Zambia imported 2 400 tons of frozen French fries followed by Botswana with 1 500 tons. During the said period 1 200 tons were exported to Australia (See Figure 8).

South Africa exported limited volumes of frozen French fries to the Asian market. This is mainly due to the competitive Chinese market as well as the ability of Europe to easily supply this market. Trademap revealed an estimated untapped potential of $8.7 million in this product line. Figure 9 indicates the attractiveness of Asian countries to which frozen French fries could be exported.

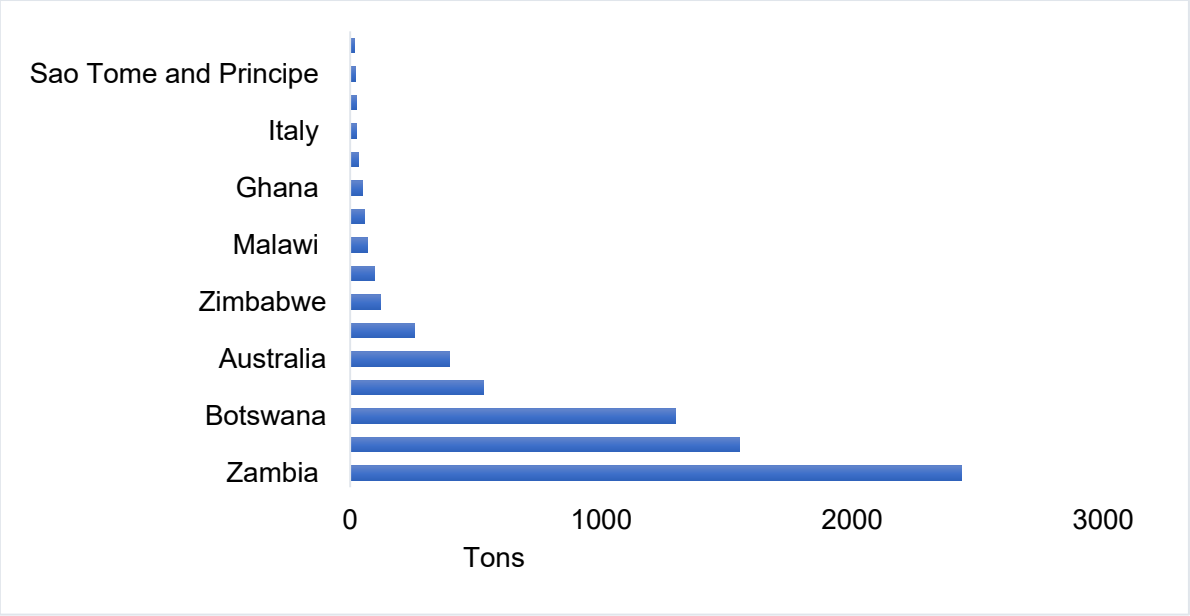


Figure 8: Main export destinations for frozen French fries in 2018
Source: Agriinspec, 2019

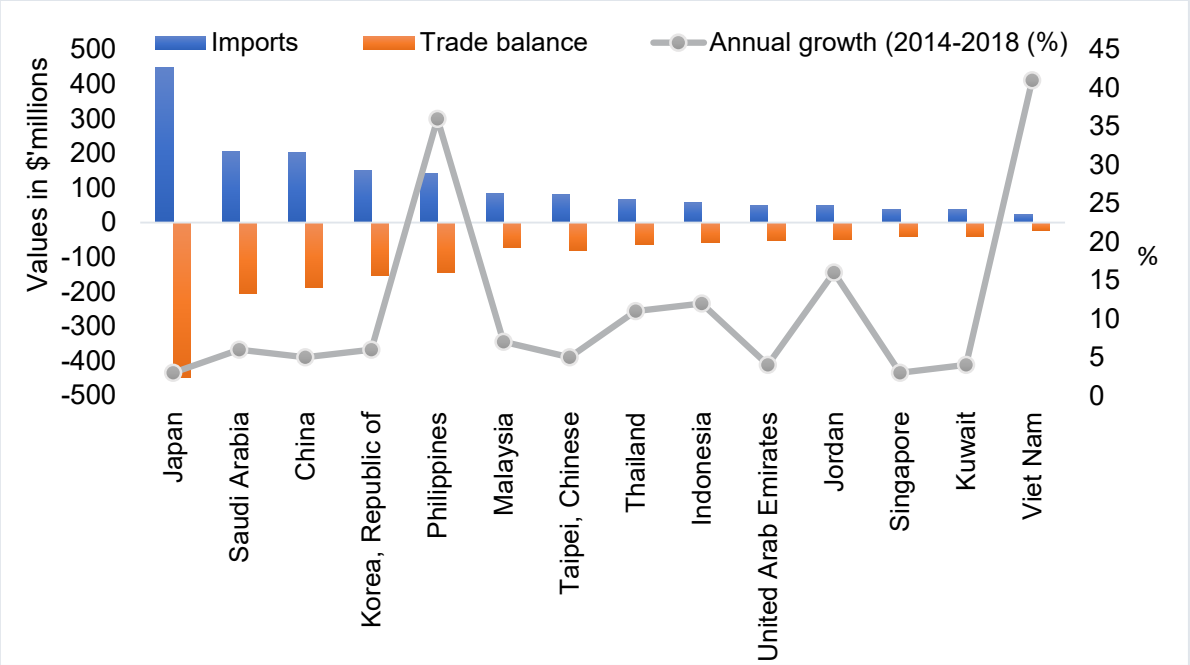


Figure 9: Attractive Asian markets for frozen French fries
Source: Trademap, 2019

Closing remarks

Exports is a vitally important part of the total demand for potatoes. This article shows that there exist significant opportunities for South Africa to increase exports of potato products. This will require a concerted effort to unlock these opportunities, especially if numerous non-tariff barriers are considered. These include, amongst others, but not limited to, untimely border closures and logistical constraints. The Marketing Core Business of Potatoes South Africa has been mandated to explore export opportunities.

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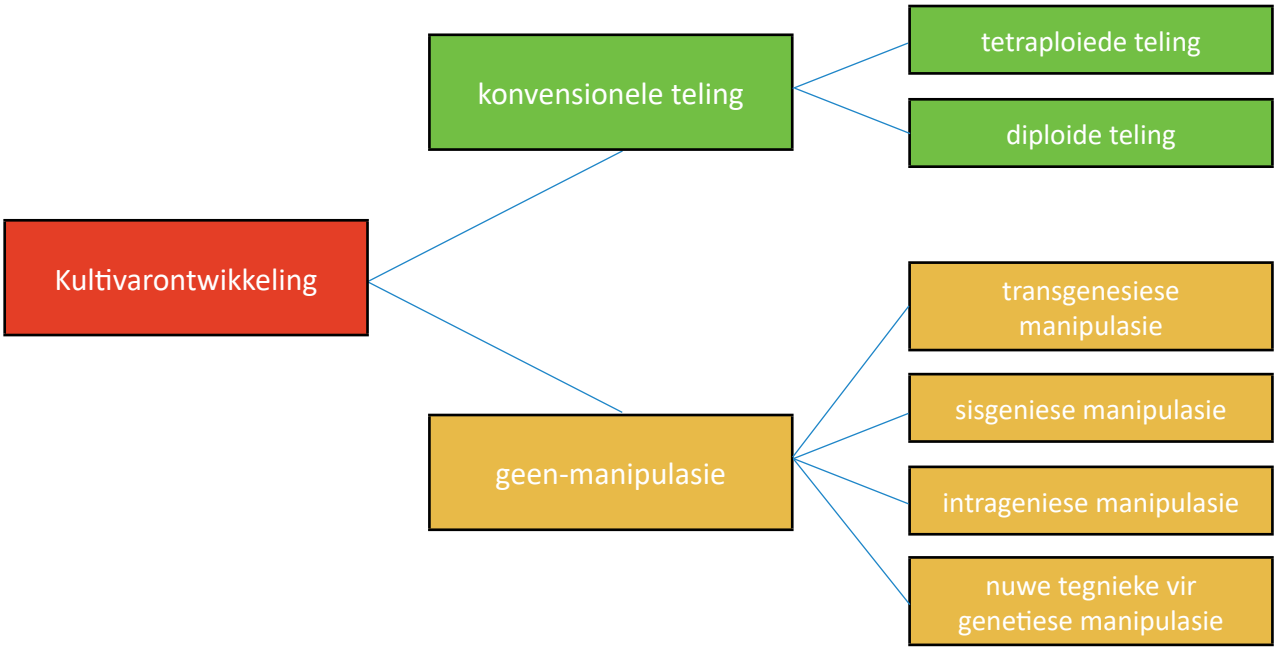
Dr. Fienie Niederwieser (Aartappels Suid-Afrika)

Bron: http://pixabay.com/search/biolog

Toekomstige uitdagings wat die aartappelprodusent in die gesig staar sluit in die effek van klimaatverandering op opbrengs, kwaliteit en plaagbeheer; volhoubare en effektiewe gebruik van hulpbronne soos water en grond; voorsiening van veilige, gesonde aartappels aan die verbruikers asook aartappels wat aan hul voorkeure voldoen. Kultivars wat vir die toekoms ontwikkel word sal 'n krities belangrike rol moet speel om bogenoemde uitdagings die hoof te bied.

Kultivarontwikkeling. Merkwaardige vordering is gemaak met konvensionele aartappelteling sedert die eerste kruisbestuiwing meer as 100 jaar gelede gemaak is, veral met betrekking tot opbrengs. Die meeste aartappelkultivars is egter steeds nie weerstandig teen siektes nie, ongeag die feit dat gene vir weerstand teen die belangrikste siektes wel in wilde aartappelspesies voorkom. Die aartappelbedryf het onlangs besin oor die potensiaal wat verskillende teeltegnieke inhou vir die bedryf. Die tegnologie wat

Die moderne aartappelteler se gereedskapskas



tans beskikbaar is, word in Figuur 1 gegee.

Konvensionele aartappelteling. Daar word gespekuleer dat 80% van alle kultivars wat in 1980 bestaan het, ontwikkel is van ouers wat die laatroes-epidemies van die 1800s oorleef het. Dit het aanleiding gegee tot die beperkte genetiese basis van huidige teelprogramme. Die oplossing om die genetiese basis uit te brei, sou wees om van die eienskappe wat in wilde spesies bestaan te gebruik. Daar is egter 'n beperking omdat die oorspronklike teelouers nie net die laatroes-epidemie oorleef het nie, hulle was ook almal tetraploid, m.a.w. elke sel bevat vier stelle chromosome. Wilde aartappelspesies daarenteen is diploid, m.a.w. elke sel bevat tweestelle chromosome. Om die eienskappe van diploide plante in kommersiële tetraploide plante te inkorporeer, vereis dat selfbestuiwing van ouerlyne gedoen moet word. Daar is egter 'n geen in aartappels wat selfbestuiwing verhoed, dus is huidige kommersiële kultivars almal tetraploid.

Die grootste uitdaging ten opsigte van die teling van tetraploide aartappels is sekerlik die feit dat daar vir elke eienskap in 'n plant vier gene is. Nadelige gene in bastersaailinge kom dikwels nie dadelik tot uiting nie. Dit beteken dat 'n groot aantal nuwe bastersaailinge vir baie jare, en onder verskillende omstandighede, geëvalueer moet word voordat hulle kommersieel geplant kan word. Die feit dat huidige kultivars tetraploid is, beteken ook dat basters nie met botaniese saad vermeerder kan word nie. Vegetatiewe vermeerdering deur dogterknolle beteken dat knolgedraagde siektes deur die moere versprei kan word.

Indien aartappels diploid kon wees sal dit vir telers makliker wees om eienskappe van wilde aartappelspesies te ontgin as in 'n tetraploide teelprogram. Die moontlikheid van diploide aartappels het 'n groot hupstoot gekry nadat navorsers in Japan en Nederland 'n plant geïdentifiseer het waarin die geen wat selfbestuiwing verhoed nie bestaan nie. Die Universiteit van Wageningen en die maatskappy Solynta, het die moontlikheid ontgin en in 2017 is die eerste diploide-basters bekend gestel. Intussen het ander teelmaatskappye ook diploide-teelprogramme op die been gebring. Die verwagting is dat volwaardige kommersiële kultivars oor 5 – 10 jaar vrygestel gaan word. Sien ook: CHIPS September/Oktober 2017 *Saailinge of moere?*

Geen kommersiële F1-baster kultivar is op hierdie stadium vrygestel nie. Ons kan dus net spekuleer oor hoe die innovasie die aartappelbedryf kan beïnvloed. Die basters word deur konvensionele teeltegnieke ontwikkel, soortgelyk aan F1-mielieteling. Vegetatiewe vermeerdering van aartappels is 'n goedgevestigde praktyk en dit is onwaarskynlik dat die praktyk heeltemal deur die produksie van saailinge vervang sal kan word. Die feit dat F1-basters met botaniese saad geproduseer word, maak internasionale handel veiliger as met moere. Die grootste voordeel van F1-basteraartappels is dat dit vir telers makliker sal wees om onontginde eienskappe van wilde

Knolle van wilde aartappels met eienskappe wat ontgin moet word om uitdagings van die toekoms die hoof te kan bied

aartappelspesies na kommersiële aartappels oor te dra.

Geen-manipulasie. Hierdie tegnologie behels verandering aan 'n plant se genetiese materiaal deur tegnologiese ingryping deur die mens. Die eerste genetiese manipulasietegnieke het behels dat 'n geen van een organisme d.m.v. 'n bakteriesel na die ontvangerplant se genetiese materiaal oorgedra word. Sedertdien is talle nuwe tegnieke vir genetiese manipulasie ontwikkel en toegepas. Sisgeniese manipulasie behels dat 'n geen van 'n plant wat geneties verenigbaar is aan die ontvangerplant oorgedra word. Intra-genetiese manipulasie behels dat die geen van 'n plant wat geneties verenigbaar is met 'n ontvangerplant verander word, en daarna na die ontvangerplant oorgedra word. Gene word oorgedra deur 'n bakteriesel, of deur 'n sogenaamde 'gene gun'. By alle genetiese manipulasietegnieke, het die mens geen beheer oor waar 'n nuwe geen in die genetiese materiaal van die ontvangerplant beland nie en dit is ook nie bekend wat die gevolge daarvan kan wees nie.

Sedert die eerste geneties-gemanipuleerde (GM) plante in die vroeë 1990s vrygestel is, word transgeniese mielies, soja en katoen op 170 miljoen ha in 29 lande verbou. Verskeie geneties-gemanipuleede aartappels is ook al in ander wêrelddele vrygestel.

Geneties gemanipuleerde (GM) aartappels

NewLeaf™ van Monsanto is in 1995 vrygestel en was weerstandbiedend ten opsigte van die Colorado besie en PLRV. Die geen vir weerstand teen die Colorado besie was afkomstig vanuit die bakterium *Bacillus thuringiensis* (vandaar die naam Bt mielies). Boere was gretig om NewLeaf aan te plant en na net vier jaar was >20 000 ha met NuLeaf beplant! Na 'n verdere twee jaar, het die area met NewLeaf beplant egter tot zero gedaal. Die redes vir hierdie dramatiese verwerping van die kultivar was veelvoudig, maar het ingesluit die vrystelling van 'n nuwe insekmiddel teen die Colorado besie en die publiek se vereiste dat geneties gemanipuleerde voedsel totaal apart hanteer moet word van konvensioneel verboude voedsel. Monsanto het hierna besluit om nie voort te gaan met genetiese manipulasie van aartappels nie.

Byna 15 jaar later is **Amflora™** van BASF vrygestel vir industriële styselproduksie in Europa. Hoewel die veiligheid van Amflora deeglik getoets en bewese was, het dit steeds 12 jaar geneem voordat dit vir produksie in Europa goedgekeur is. Steeds het die Europese publiek die produk nie aanvaar nie. Gevolglik het BASF Plant Science in 2012 besluit om Amflora uit Europa te onttrek en te konsentreer op die vrystelling van Amflora in die Amerikas en Asië.

Die Michigan State University en die Suid-Afrikaanse Landbou-navorsingsraad het **Bt-Spunta** met weerstand teen aartappelmot ontwikkel en het in 2010 aansoek

gedoen vir registrasie vir vrystelling in Suid-Afrika. Die Departement van Landbou, Bosbou en Visserye het die aansoek van die hand gewys nieteenstaande die feit dat die aansoek uit 'n tegniese oogpunt aan al die vereistes voldoen het. Die Suid-Afrikaanse aartappelbedryf het op daardie stadium gevoel dat die bedryf nog nie gereed was vir geneties-gemanipuleerde aartappels nie.

Innate™ aartappels is ontwikkel deur "RNAi gene silencing" tegnologie om die geen wat verantwoordelik is vir verbruining van gesnyde aartappels af te skakel om daardeur vermorsing van voedsel te verminder. Innate het ook verlaagde vlakke van asparagine en reduserende suikers wat die vorming van akrielamied verlaag. In die VSA en Kanada is Innate as "veilig en voedsaam" deur die owerhede verklaar. McDonald's het egter verklaar dat hulle nie Innate aartappels sal gebruik nie weens druk deur die organisasie "Food and Water Watch".

Sosiale aanvaarding van geneties gemanipuleerde voedsel

Huidig bepaal die Europese verbruiker tot 'n groot mate watter geneties-gemanipuleerde gewasse op groot skaal in die wêreld geplant word. Daar is minder weerstand teenoor gewasse wat vir biobrandstof, dierevoeding of industriële doeleindes gebruik word, vandaar dat GM mielies, soja en katoen op so 'n grootskaal aangeplant word. In teenstelling is GM voedsel wat direk deur die mens geëet word, byvoorbeeld rys, koring en aartappels, nie aanvaarbaar nie.

Die Europeër se weerstand teen GM tegnologie het 'n impak op wêreldhandel

Die regulering van GM gewasse in die VSA is meer buigsaam as in die EU, met die gevolg dat die VSA by verre die meeste GM gewasse produseer. Terselfdertyd word groot hoeveelhede voedsel vanaf die VSA na die EU uitgevoer. Verandering in die regulering van GM gewasse kan dus 'n groot impak hê op internasionale handel. 'n Goeie voorbeeld hiervan was in 2006 toe klein hoeveelhede GM rys in 'n kommersiële besending rys vanaf die VSA in Europa opgespoor is. Ongeag die feit dat die USDA en die FDA in die VSA bevind het dat die GM rys geen impak het menslike gesondheid of die omgewing nie, is die hele besending nie in Europa toegelaat nie. Die gevolg was dat die prys van rys uit die VSA wêreldwyd onmiddellik geval het. Bykomend daartoe moes die ontwikkelaar van die GM-rys, $750 miljoen aan boere betaal as vergoeding vir verliese gelei.

Die mening van die wetenskaplikes

Die sentiment ten opsigte van die veiligheid van genetiese gemanipulasie wissel van sterk ondersteuning tot afkeur. Ondersteuning word gebaseer op die potensiële voordele wat die tegnologie kan hê op die produksie van kos met verhoogde voedingswaarde en verlaagde gebruik van plaagbeheermiddels om die wêreld se groeiende populasie te kan voed. Wetenskaplikes wat die tegnologie afkeur is besorg oor die onbedoelde, potensieel-negatiewe effek van die tegnologie op die omgewing en menslike gesondheid op die lang duur. Die besorgdheid is veral gebaseer op die feit dat die mens nie beheer het op waar die genoom van die ontvangerplant, in die nuwe geen gevestig word nie.

Regulering van GM gewasse in die Europese Unie

Op 25 Julie 2018, het die Geregshof van die Europese Unie besluit dat alle organismes wat deur enige vorm van genetiese manipulasie ontwikkel is, aan dieselfde vereistes as konvensionele transgeniese plante moet voldoen, dat maatreëls en tegnieke vir naspeuring (traceability) in plek moet wees en dat alle produkte wat GM bestanddele bevat sodanig gemerk moet wees. Teenstanders van die GM tegnologie se verligting was groot. Die Europese biotegnologie assosiasie, EuropeBio, en ander voorstanders van GM tegnologie se opmerking was *"In addition to affecting global agricultural trade, this judgment has significant consequences for EU innovation"*.

Besluit van die plaaslike aartappelbedryf ten opsigte van geen-tegnologie

Daar is verskeie redes waarom die relatief klein aartappelbedryf in Suid-Afrika in die afsienbare toekoms nie in genetiese manipulasie-tegnieke gaan belê nie:

- Geentegnologie is net deel van 'n teelprogram. Die bedryf het reeds in 2011 besluit om nie in teelprogramme te belê nie omdat daar genoeg rolspelers is wat reeds suksesvol by kultivarontwikkeling betrokke is.
- Geneties-gemanipuleerde gewasse is vir ons handelsvennote in Suider-Afrika onaanvaarbaar en dit is belangrik dat die uitvoer van beide tafelaartappels en moere na ons buurlande uitgebrei word.

Die bedryf erken die potensiaal van F1-baster-aartappels, veral om gene vir weerstand teen siektes in kommersiële aartappels in te bou.

Sandveld: where does all the **groundwater** come from?

Julian Conrad and Jani van Gend (GEOSS South Africa (Pty) Ltd)

This question has been asked for many years and the theory was that the source of the Sandveld's groundwater is from outside the Sandveld itself. The article summarises the results of a study which confirms that the theory was indeed correct. Before understanding where the water comes from it is important to understand the environmental system in which most of the Western Cape's potatoes are produced.

Climate

- The Sandveld is located in the semi-arid west coast of South Africa. The area has a mild, Mediterranean climate with the majority of rainfall (less than 300 mm p a) falling in winter months between April and September (Schulze et al., 2008). Mean annual temperatures range between 18°C and 22°C, with temperatures reaching up to 35°C in summer and a low of 8°C in winter (Schulze et al., 2008). Evaporation rates range between 5.5 and 7.35 mm/day in summer and 1.5 and 2.3 mm/day in winter, with values increasing towards the coast (Watson et al., 2017; Schulze et al., 2008).

Soils and geology

- The geology of the Sandveld constitutes basement rocks of the Malmesbury Group overlain by units of the Cape Supergroup, more specifically, Table Mountain Group (TMG) and quaternary sediments (Conrad et al., 2004).
- The Malmesbury Group rocks, at 750Ma (750 million years), are the oldest rocks found in the area. These rocks are dominantly greywacke, schist, phyllite, shale, limestone, conglomerate and are generally highly lineated and foliated (Kisters et al., 2002).
- The Table Mountain Group (TMG) rocks are approximately 500 million years old and can be found above the Malmesbury group and below the windblown sands of the Sandveld. The TMG generally consists of quartzitic sandstones, conglomerates, siltstones and sandy shales. The TMG rocks are generally folded into series of longitudinal mountain ranges.
- The rocks mentioned above have experienced metamorphic event that left the rocks tightly folded.
- The most recent deposit in the area is a sedimentary deposit of aeolian (windblown) sands. The sandy sediments range between three and 80 meters deep.
- Figure 1 provides a simplified map of the geological setting of the Sandveld.

The productive potato growing areas are largely based on the most recent sedimentary deposits. These thick, acidic and nutrient poor sand deposits overlie the lower formations of the Table Mountain Group.

Irrigation and groundwater

- The calculated irrigation requirement for potatoes in the Sandveld is about 700 mm when the crop is planted in September and about 610 mm when the crop is planted in August. The required

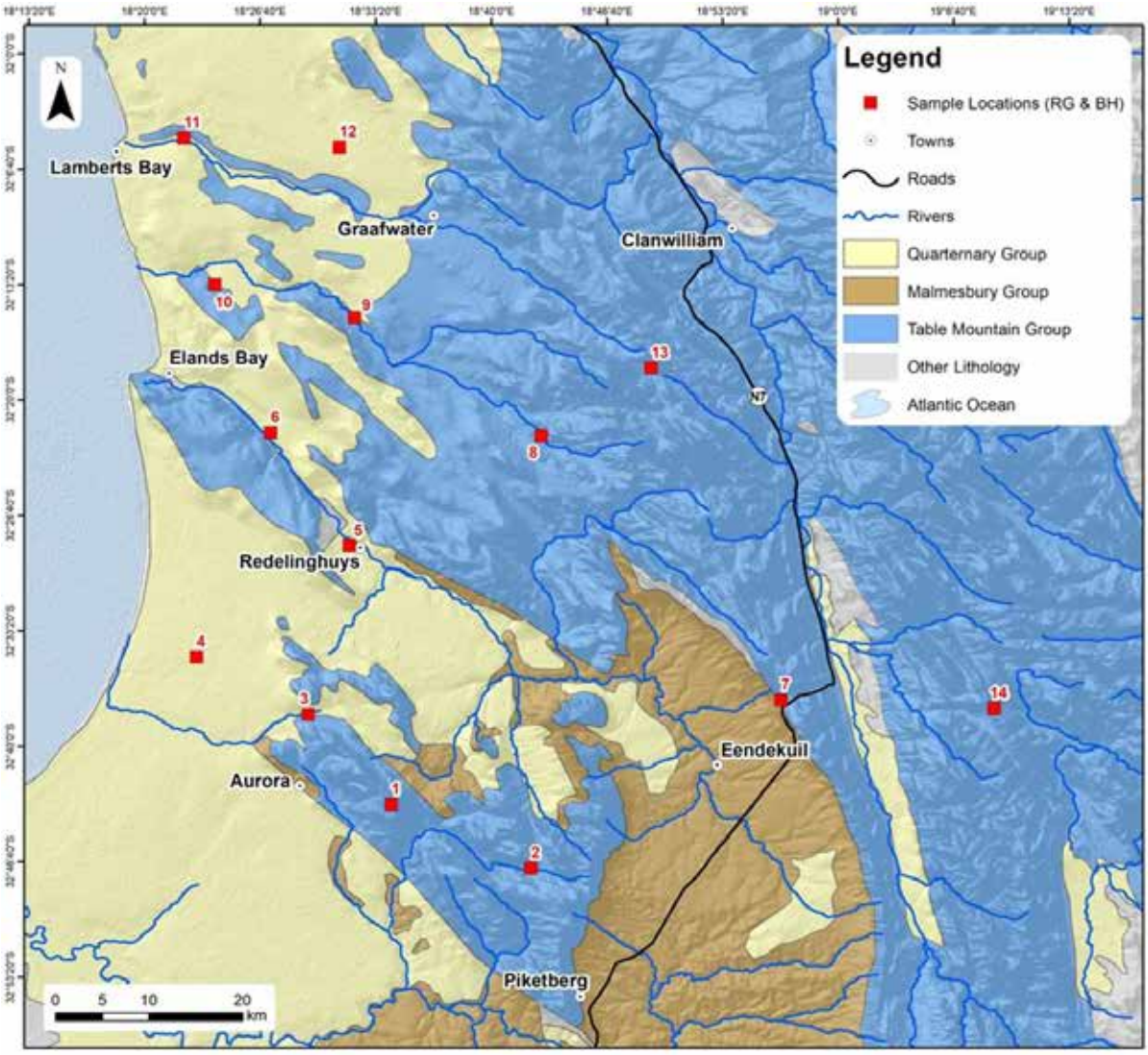


Figure 1: Simplified geology of the Sandveld

irrigation requirement will vary according to rainfall, temperature and wind.

- The bulk of the irrigation water is derived from groundwater which is hosted in sand deposits and in the underlying bedrock (mainly TMG).
- The direct rainfall is just too low to generate sufficient groundwater recharge to meet the volumes abstracted. Thus, the groundwater recharge is being derived from areas outside of the Sandveld. Vertical recharge is not replenishing the Sandveld aquifers.

Methodology

In order to understand and manage the groundwater within the Sandveld it is crucial to assess and delineate the recharge areas. There are numerous methods for calculating groundwater recharge quantities and for delineating groundwater recharge area. Taking into account geological settings; rainfall patterns; topographical conditions and budget, the Chloride Mass Balance (CMB) and Stable Isotope approach was selected. The CMB approach compares the concentration of chloride in rainfall to the concentration of chloride in groundwater and the ratio indicates the percentage of recharge. If groundwater is very pure then it is being directly recharged by rainfall whereas if the rainwater is very saline it is not being recharged by groundwater. Another approach is to use stable isotopes, which essentially indicates where groundwater recharge occurs.

A total of 13 sample sites were set up across the Sandveld and these sites included rain gauges and boreholes (that could be sampled) in close proximity. Sampling could not be completed as insufficient rainfall occurred across the Sandveld in 2015, 2016 and 2017. The CMB method provided interesting results and highlighted high recharges rates in close proximity to the coast. We know this recharge is not

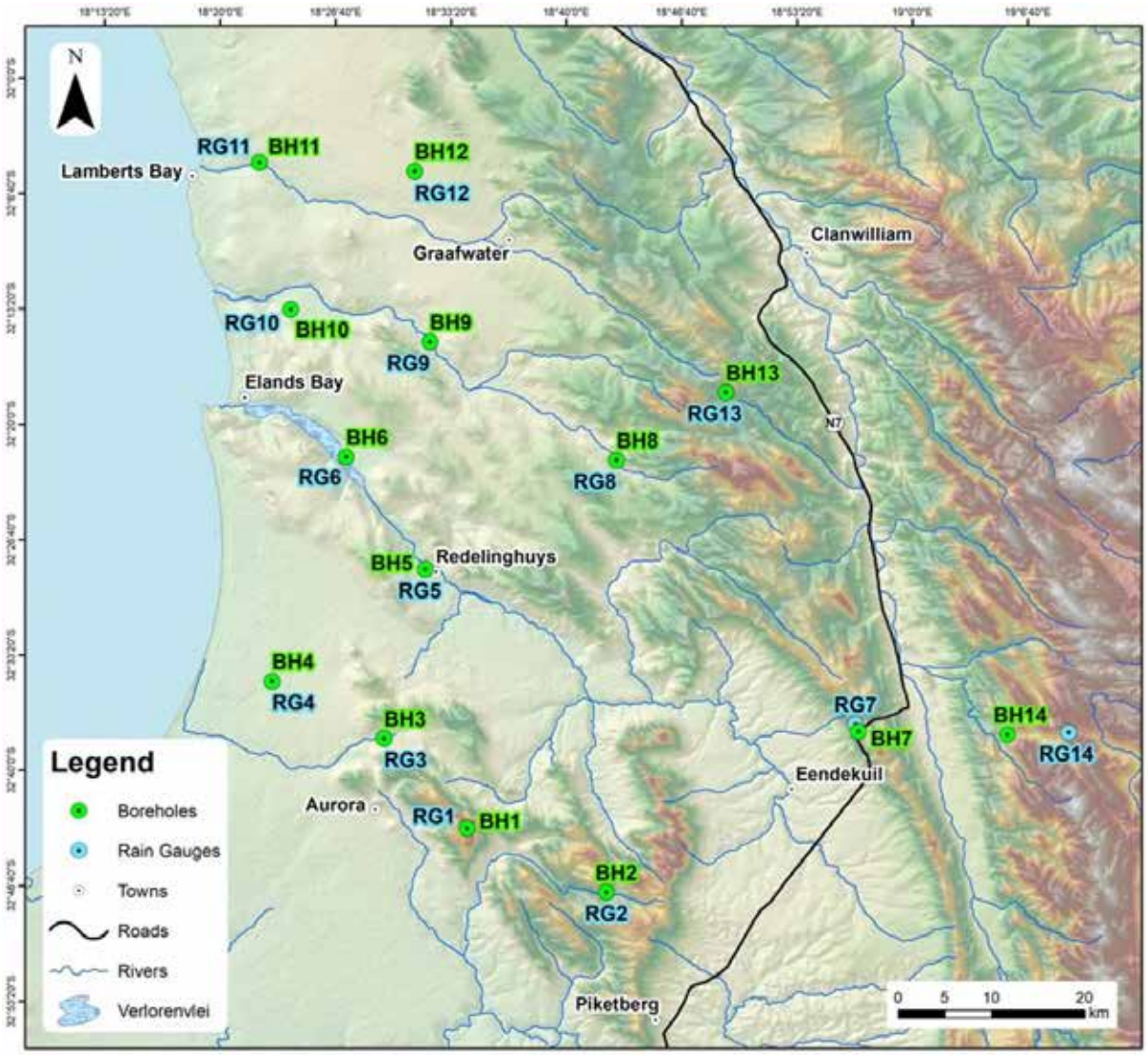


Figure 2: Map of the Sandveld area with sampling points.

from direct rainfall and must be flowing in from deep seated geological fault systems, however the question still remains as to where this recharge is occurring. The discussion below focuses on the stable isotope approach used to delineate the recharge areas for the groundwater within the Sandveld.

How do we know that the groundwater recharge is being derived from areas outside of the Sandveld?

Stable isotopes of water (oxygen and hydrogen) are commonly used in many groundwater related studies. Applications for these studies deal with the isotopic variation in water molecules that results from the evaporation and condensation cycles of water.

During evaporation, the light molecule of water ($^{1}H_{2}{}^{16}O$) is more volatile than the heavier molecule of water ($^{2}H_{2}{}^{18}O$), see Figure 3. As a result, vapour that evaporates from the ocean is depleted in heavier isotopes. This enrichment in the light isotope provides an isotopically negative signature (contains less heavy water molecules). When this vapour undergoes cooling, the precipitation is enriched in heavier isotopes. The lighter isotopes preferentially remain in the vapour phase therefore the condensation (liquid phase) is isotopically positive. Given this information, successive precipitation events from the same initial vapour mass will be more and more isotopically negative (Figure 4). Heavier ($^{2}H_{2}{}^{18}O$) and lighter ($^{1}H_{2}{}^{16}O$) isotopes naturally fractionate, and their signatures can be used to identify altitude, latitude, temperature and evaporation trends. It is important to note that isotopic signatures of water are reported in terms of the heavier isotopes i.e. ^{2}H and ^{18}O. It is important to note that isotopes are reported as ratios relative to international standards and not as absolute concentrations. In other words, an equation is used to calculate the ratio of heavy to light isotopes in the

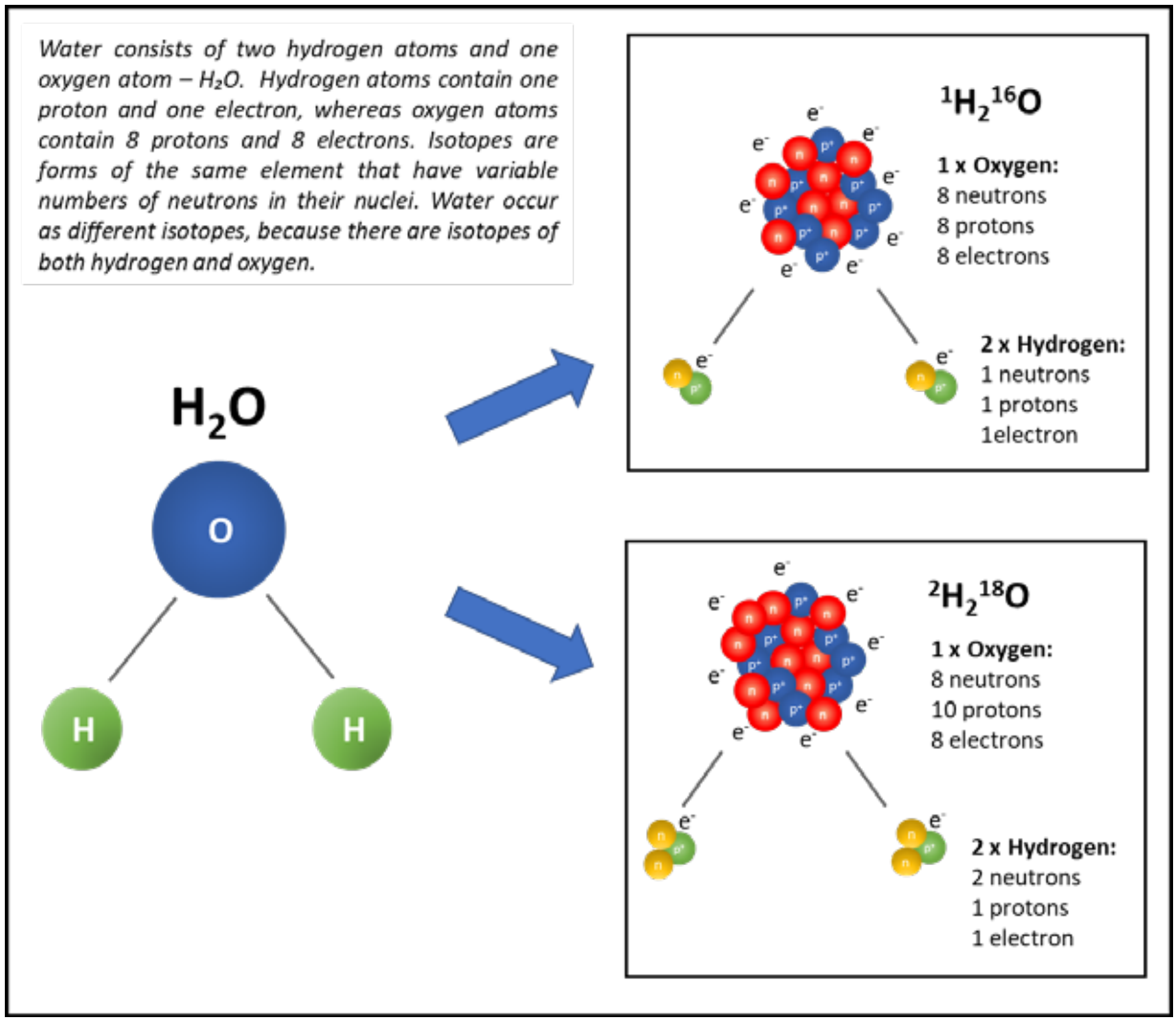


Figure 3: Chemistry of water molecules.

sample relative to the international standards. This ratio is reported as δ values. The following equation is used to calculate the δ values:
$\delta = (R_{sample} - R_{standard})/R_{standard} \times 1000$
Where $R = [^{18}O]/[^{16}O]$, therefore if $\delta^{18}O = -10$ ‰, it means that the sample is depleted relative to a standard in ^{18}O by 1%.

A positive δ value means that the sample contains more of the heavy isotope than the standard; a negative δ value means that the sample contains less of the heavy isotope than the standard. These δ values can be compared to global data in the form of the global meteoric water line (GMWL) as well as to local data in the form of a local meteoric water line (LMWL). These datasets are compiled by long term rainfall and stable isotope data.

Figure 5 shows stable isotope data from the Sandveld and explains that the groundwater recharge is not coming directly from rainfall in the Sandveld but rather the rainfall towards the Piketberg and Cederberg mountain areas. The rainfall in the Sandveld is just too low to generate sufficient groundwater recharge to meet the volumes abstracted. Thus, the groundwater recharge is being derived from areas outside of the Sandveld and it is crucial to understand where this groundwater recharge is being derived from for groundwater management purposes. It is the sandstone areas of the Table Mountain Group of the Piketberg and Cederberg Mountains where the recharge occurs. Thus for sustainable management of the groundwater resources within the Sandveld it is essential to monitor within the Sandveld and within the mountainous recharge areas. If over-abstraction occurs within the recharge areas it will have a negative effect on the Sandveld itself. It will also be useful to know how old the groundwater is within the Sandveld and what are the time lines for groundwater to flow from the recharge areas to the coast. A definite topic for future research. ©

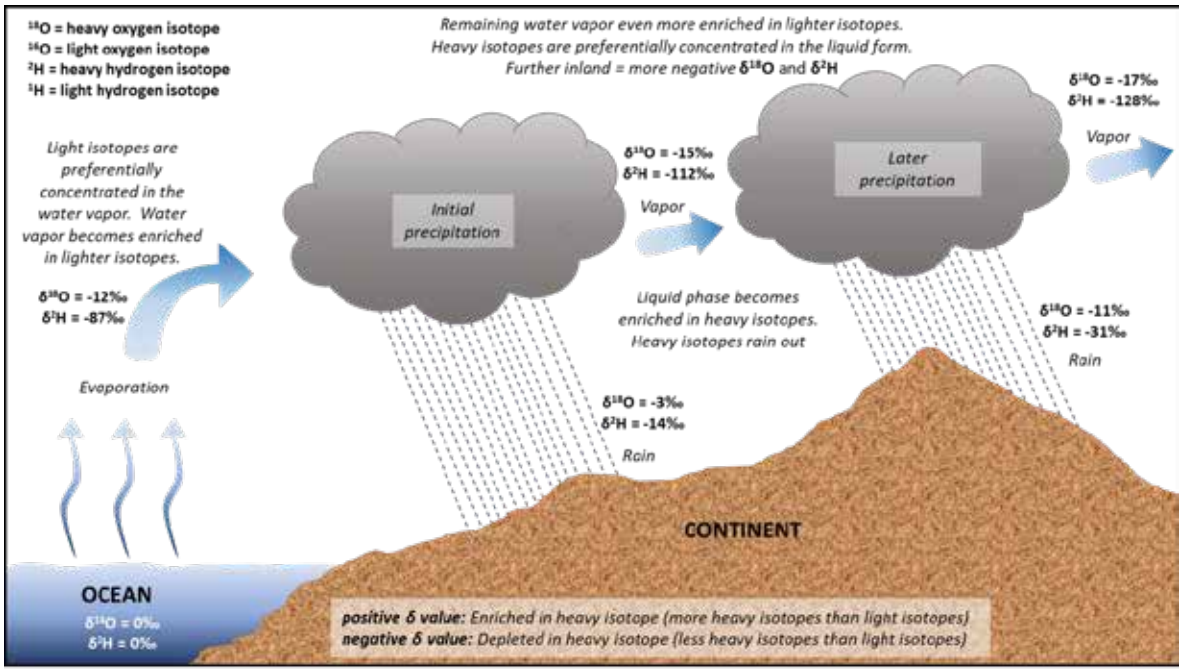


Figure 4: stable isotope fractionation explained

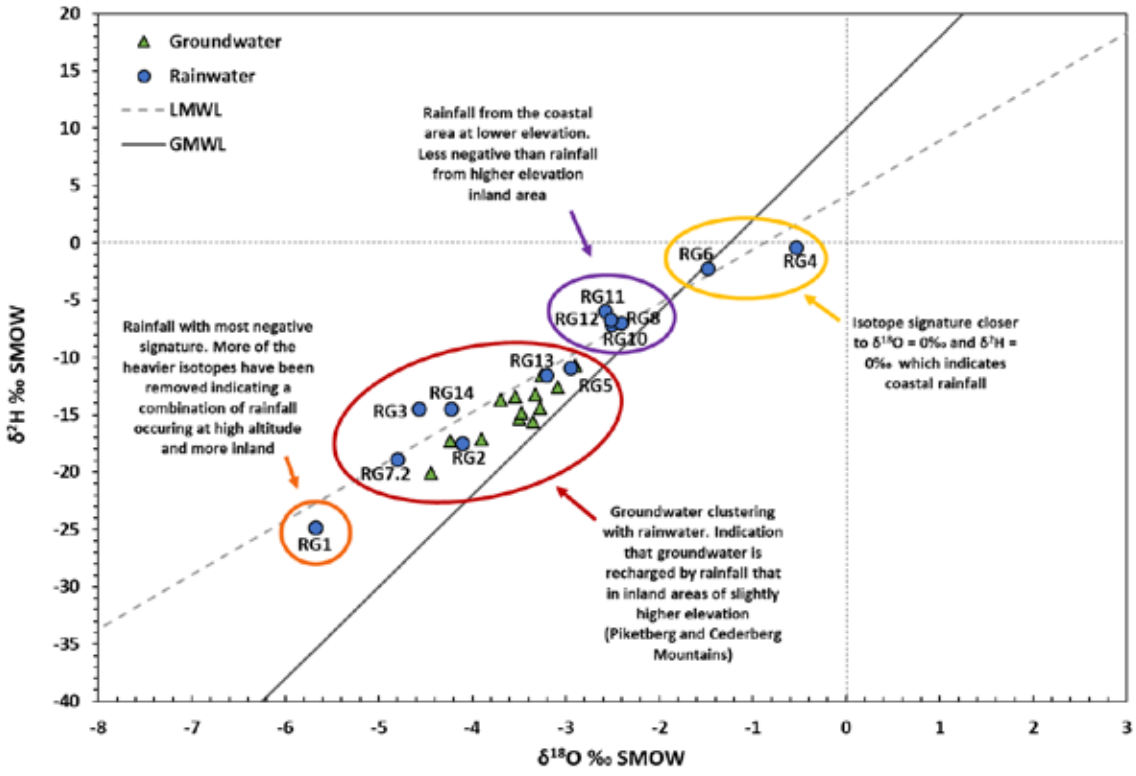


Figure 5: Stable isotope data from the Sandveld and explanation on what the plot tells us

References

Conrad, J., Nel, J. and Wentzel, J. (2004). The challenges and implications of assessing groundwater recharge: A case study–northern Sandveld, Western Cape, South Africa. *Water SA*, 30(5), pp.75-81.

Kisters, A. F. M., Belcher, R. W., Armstrong, R. A., Scheepers, R., Rozendaal, A. and Jordaan, L. S. (2002) Timing and kinematics of the Colenso Fault: The Early Paleozoic shift from collisional to extensional tectonics in the Pan-African Saldania Belt, *South Africa, South African Journal of Geology*, 105, pp. 257–270.

Schulze, R. E., Maharaj, M., Warburton, M. L., Gers, C. J., Horan, M. J. C., Kunz, R. P. and Clark, D. J. (2008) South African Atlas of Climatology and Agrohydrology: WRC Report No. 1489/1/08. Pretoria: Water Research Commission.

Watson, A., Miller, J. and de Clercq, W.P. (2017). Investigating potential additional sources of groundwater flow into a defined watershed. *Procedia Earth and Planetary Science*, 17, pp.546-549.

Monitoring of **virus vectors** in South Africa (2014 – 2017)

Western Free State and Northern Cape

Prof Kerstin Krüger (University of Pretoria)

Photo: Dr Diedrich Visser (ARC-VOP)

The South African aphid monitoring network is one of the most extensive suction trap networks in the southern hemisphere. Ten suction traps are situated across South Africa in major seed potato production regions to alert growers to the risk of potato virus spread by aphids. The network was initiated in 2005 by Potatoes South Africa and is coordinated by the University of Pretoria.

In South Africa, aphids are active all year round and samples are collected daily or weekly throughout the year. These are couriered to the University of Pretoria where species are identified. Results are sent to growers via email and SMS notifications, usually within 24 hours of receipt of samples. Growers receive further information on the South African aphid monitoring internet site (www.aphidmontoring.co.za).

The objective is to provide producers with up-to-date information on the flight activity of aphids that transmit Potato virus Y (PVY) and Potato leafroll virus (PLRV). Vector pressure indices for the different regions are calculated based on vector species composition together with their abundance (numbers). The

Figure 1. Abundance of aphid vectors (percentage of total number caught) of PVY and PLRV in Chrisiana.

information is used to inform growers of the risk of potato virus spread and provides an early warning system. Being aware of aphid flight activity assists growers in making management decisions on the location and timing of aphid control measures and the timing of haulm destruction.

Results from 2014 to 2017 for aphids collected from suction traps in the Western Free State (Christiana) sent to Wesgrow and from Northern Cape (Douglas) sent to GWK are presented in this article*.

Western Free State (Christiana)

In the Christiana region, 49 species and species groups were caught in the suction trap throughout the trapping period. Of these, eleven are vectors of PVY and three (listing Aphis spp. as one) vectors of PLRV. The most important vector species in the region were the bird cherry-oat aphid for PVY and *Aphis* species for PVY and PLRV. Numbers of individuals of the bird cherry-oat aphid collected decreased from 4 860 in the 2013/2014 season to 460 in the 2016/2017 season. Likewise, the abundance of *Aphis* spp. decreased from 2 213 aphids to 90 individuals from 2013/2104 to 2016/2017, whereas the importance of the rose-grain aphid as a vector of PVY increased during the 2016/2017 season. PLRV vectors such as the peach-potato aphid and the potato aphid only occurred in low numbers, with the exception of the 2013/2014 season (Figure 1).

Aphids that transmit PVY in the Western Free State peak during spring in October and November, and then again in late summer/autumn in February and March (Figure 2A). The peak in spring coincides with the movement of wheat aphids from the ripening crop to grasses, and the February/March peak could coincide with aphids moving from maize to sorghum. The peak in spring was largely due to the bird cherry-oat aphid, whereas the peak in later summer/autumn was due to both the bird cherry-oat aphid, the most abundant vector (Figure 3A), and, to a lesser extent, *Aphis* spp. (Figure 3B). *Aphis* species were the most abundant vectors of PLRV and were responsible for the single peak in February and March (Figures 2B, 3B).

Aphid numbers tended to be lowest during the cool winter months (June to August) and early spring (September) and then again during the hot summer months of December and January.

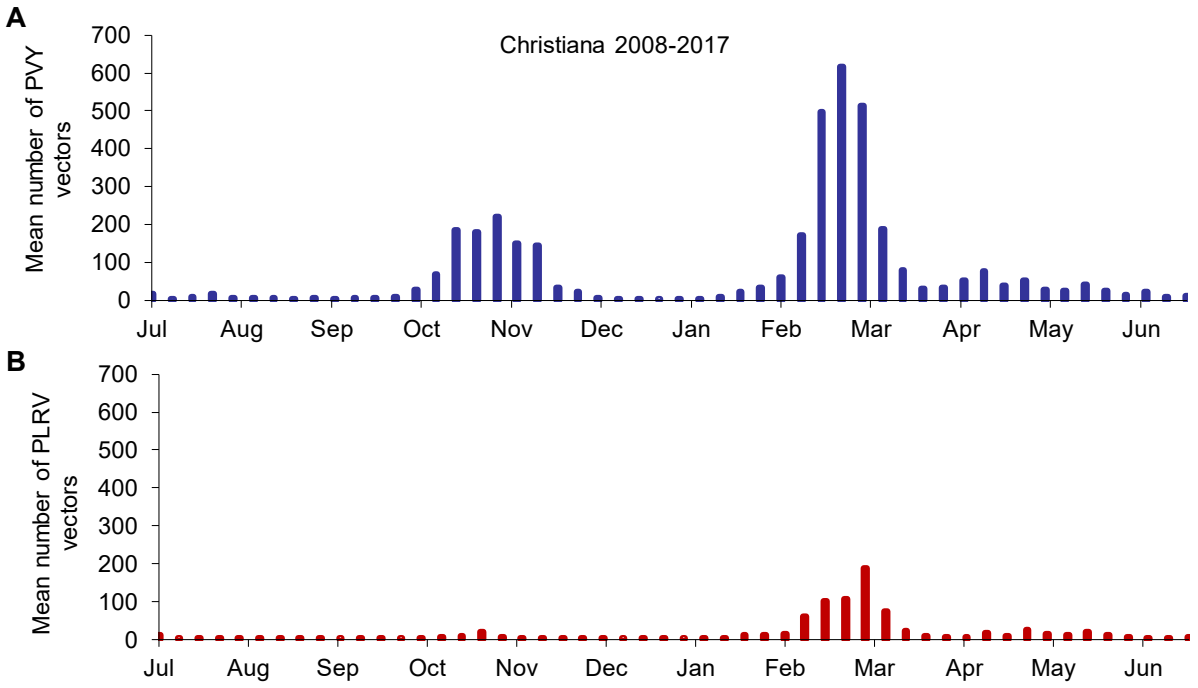


Figure 2. Trends in aphid flight patterns of PVY vectors (A) and PLRV vectors (B) in Christiana based on the mean abundance of aphid vectors caught in the suction trap between January 2008 and December 2017.

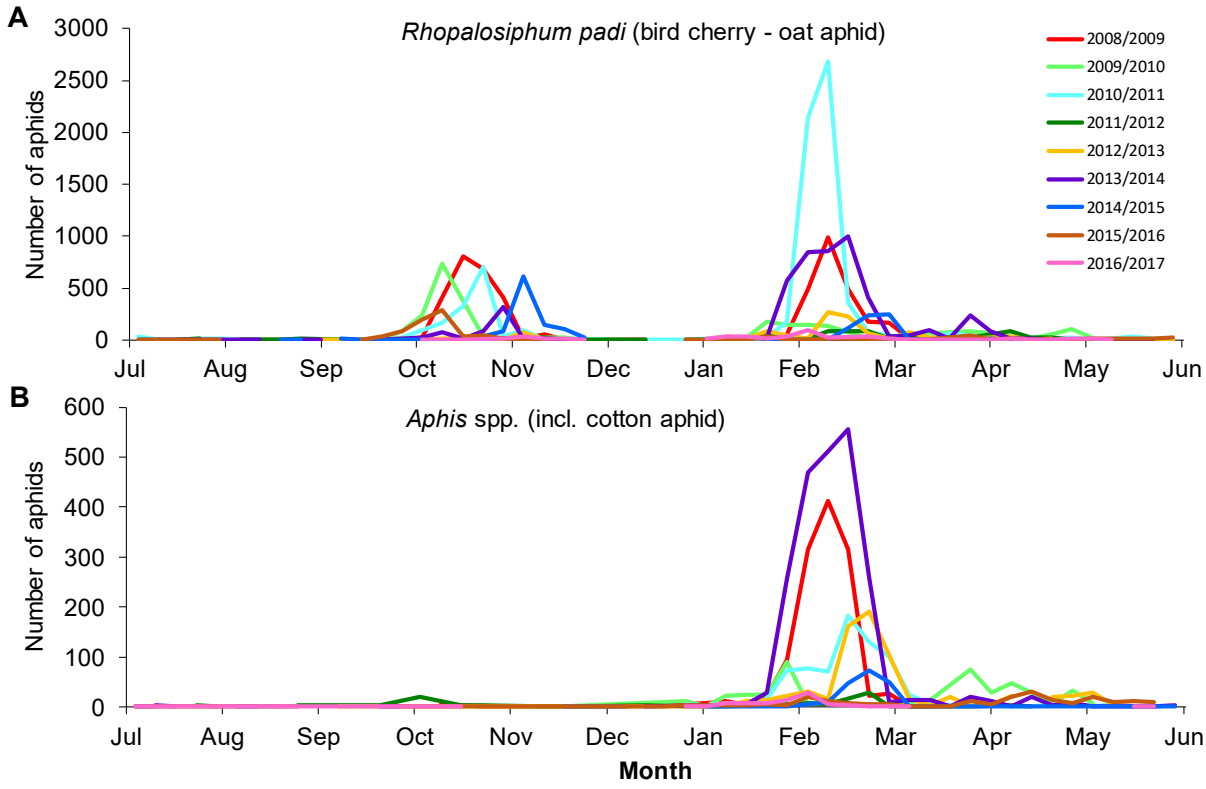


Figure 3. Aphid flight activity of the most abundant vector of PVY (*Rhopalosiphum padi;* A) and PVY and PLRV (*Aphis* spp.; B) in the Western Free State.

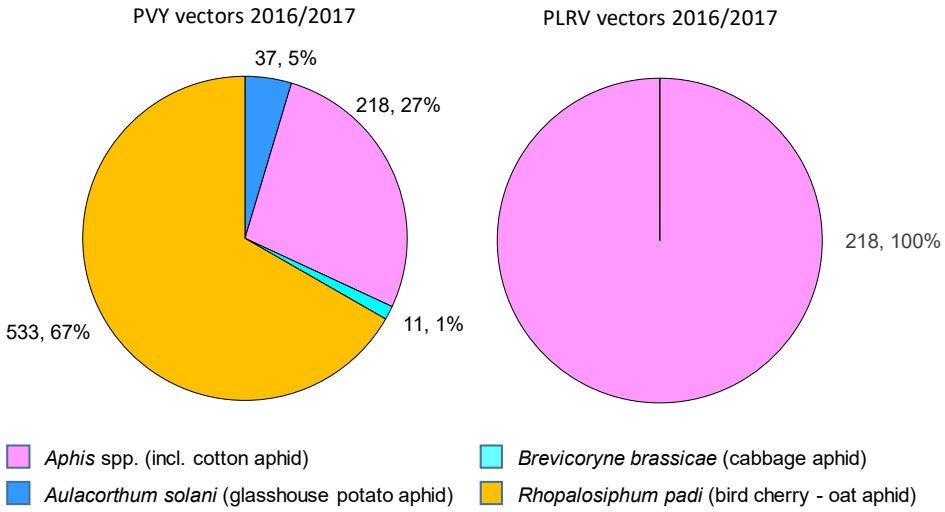


Figure 4. Abundance of aphid vectors (total number caught, per cent) of PVY and PLRV in Douglas caught between November 2016 and June 2017.

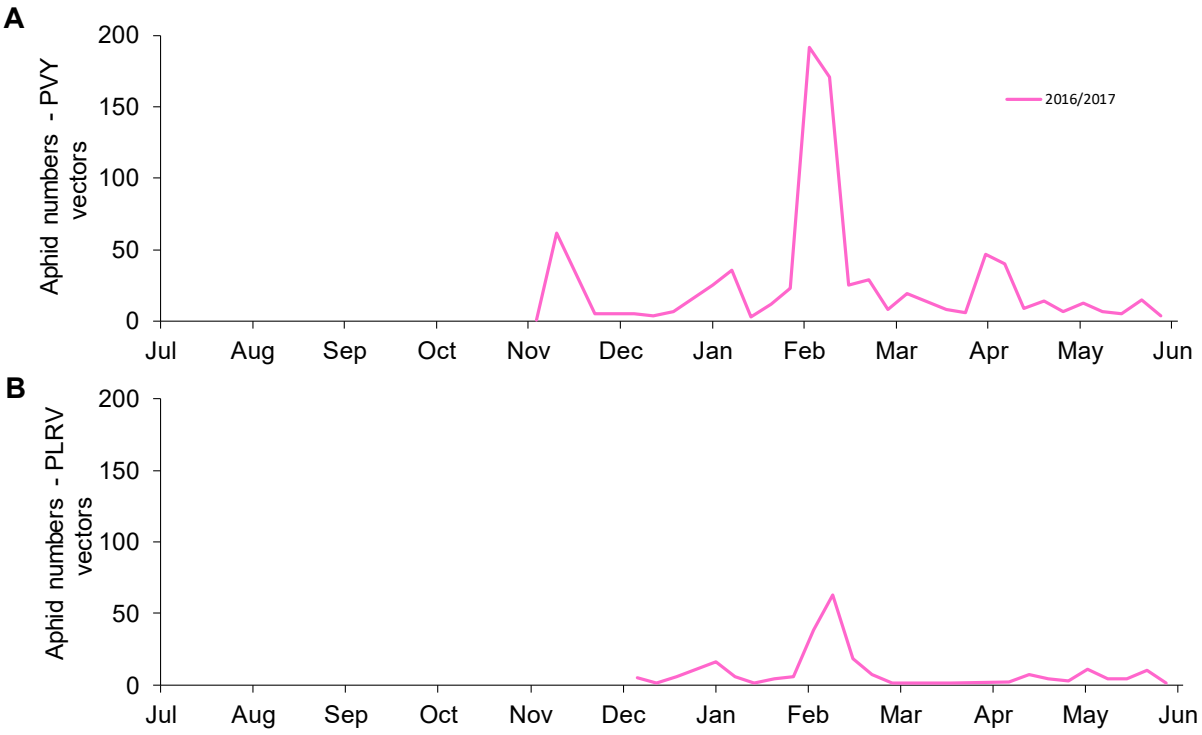


Figure 5. Aphid flight activity of vectors of PVY (A) and PLRV (B) based on numbers of aphid vectors caught in the Douglas suction trap.

Northern Cape (Douglas)

The most abundant vectors of PVY during the 2016/2017 season trapped between November 2016 and June 2017 were the bird cherry-oat aphid and *Aphis* species. *Aphis* species were the only PLRV vectors that occurred in larger numbers in the region (Figure 4). Aphid vector numbers for both PVY and PLRV peaked in February 2017 (Figure 5).

Concluding remarks and recommendations

Suction trap data provide information on migrating aphids from a radius of 30 km to ca. 80 km. However, vector pressure on the ground at field level may be variable and can depend on numerous additional

factors. The relationship between vector pressure based on suction trap catches and vector pressure at field level should be established on a regional basis. Aphid species composition within a region depends on climate, geographical characteristics and vegetation, including, for example, crops planted other than potato.

A long-term objective of the ongoing programme is to determine the possible impact of environmental changes, e.g. changes in climate, on aphid species composition and abundance and disease transmission, and ultimately to develop a virus-risk forecasting system for growers. Due to the high variation in aphid abundance, there is a need for longer term data series, which requires the continuation of the network as well as traps staying in their region to accumulate long-term data.

The suction trap in Christiana at Rascal Seed Research Laboratories

The 12.2 m high Rothamsted-type suction traps sample 45 m^3 of air per minute representing airborne aphids in a radius of 30 to 80 km depending on the topography of the region sampled.

Species-level identifications of all aphids trapped are available from Christiana since 2008 and Douglas since November 2016.

* The text is an excerpt from the final report "Aphid monitoring in seed potato producing regions (July 2014 - June 2017)" (http://www.potatoes.co.za)

Suction trap on the inside showing the fan and bottle with preservative in which aphids collected

Acknowledgements

This project is possible only as a result of team work and contribution of several persons and institutions:

- Wesgrow for collecting, sorting and posting of samples from the Christiana trap
- GWK for collecting, sorting and posting of samples from the Douglas trap
- Janine Snyman for aphid identification, communication and coordination of samples
- Potatoes South Africa, Technology and Human Resources for Industry Programme (THRIP) of the Department of Trade and Industry (DTI) and the National Research Foundations (NRF), and the University of Pretoria for funding.

Weight loss of potato tubers packed in 10 kg potato bags

Flip Steyn (Agricultural Research Council)

Consumers in South Africa are fortunate to have fresh potatoes year-round. Potatoes from about 50 - 55 000 ha are harvested every year and reach the consumer within approximately seven days after harvest. Potatoes are commonly harvested, washed and packed in paper bags on the farm within one day.

The objective of this study was to determine the weight loss of packed potatoes in South Africa. As potatoes are harvested during all seasons, weight loss was investigated in 2017 and 2018 by carrying out surveys on 52 commercial farms in eight different production areas (Table 1). Medium sized potatoes were selected randomly and packed in three 10 kg bags. The weight of each bag was determined with collecting (Day 0) and then daily over a period of 7-10 days (excluding weekends). The percentage loss was determined from the weight on day 0 when collected. Tuber weight loss from individual farms, seven days after packing, varied between 6.26% and 1.70% with an average loss of 3.53%. In this study, conditions found to contribute to this variation, included temperature, different varieties planted and production practices.

Table 1: Summary of the number of farm surveys done per production region and the varieties harvested.

Region	Harvest	BP1	Lanorma	Mondial	Sifra	Valor	Total
South Western Free State	Summer			6			6
Eastern Free State	Autumn			9	1		10
Western Free State	Winter			4	4		8
Northern Cape	Winter		6				6
Limpopo (Tom Burke)	Spring			4	1		5
Limpopo (Dendron)	Summer	1		8	2	1	12
Sandveld	Summer			3	2		5
	Grand Total	**1**	**6**	**34**	**10**	**1**	**52**

Weight loss is due mainly to the evaporation of water from exposed flesh (wounds) and the respiration (breathing) of the tubers. The higher the temperature the higher the loss through evaporation and respiration. Mechanical damage plays an important role in the extent of weight loss. Portions of the skin is removed exposing the flesh leading to increased evaporation. Commercial potato production in South Africa is becoming more mechanised. As mechanisation increases so too injury to tubers, impacting on the quality of packed potatoes delivered to the market. The aggressiveness of the harvesting and handling and precautions taken during this process, affects the potatoes after packing in bags. Mechanical damage also affects the external quality of the tuber, increases the susceptibility to and the

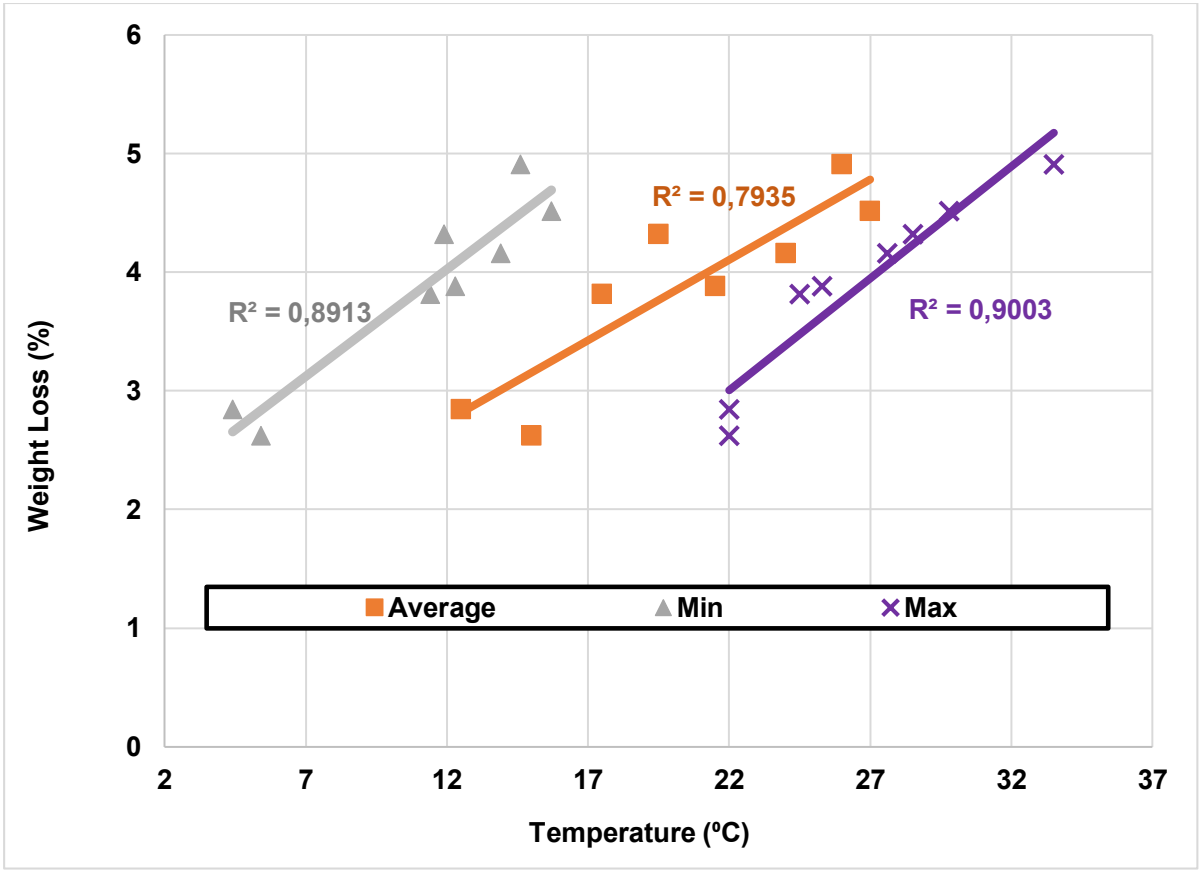


Figure 1. The relationship between weight loss at seven days after harvest and temperature. Average: average temperature during the production season. Min: average minimum temperature during the production season. Max: average maximum temperature during the season. Long-term historical weather data for the different regions were used in this correlation study.

occurrence of decay, and increases weight losses through evaporation and respiration.

Effect of temperature

Weight loss increases as the average maximum and minimum temperature during the growing season increase (Figure 1). There is also a strong correlation between weight loss and temperature during harvest (R2 =88.9%, not in the figure). One way to deal with high temperature is to change the planting times, but this may not always be feasible. Other factors affecting weight loss must therefore be considered.

The effect of variety

To determine how variety can affect weight loss, ten varieties were planted under irrigation at Roodeplaat in August and harvested in January. Fertilising was done to achieve a potential yield of 45 tonnes/ha. Potatoes were lifted after the skin has set properly, picked up by hand, washed and packed in 10 kg bags. Different varieties clearly do not lose weight at the same rate. However, the weight loss of all varieties was less than 5%, seven days after packing and stored at room temperature (Figure 2). The important aspect here is not to rank the varieties but to indicate the effect that variety might have on the weight loss.

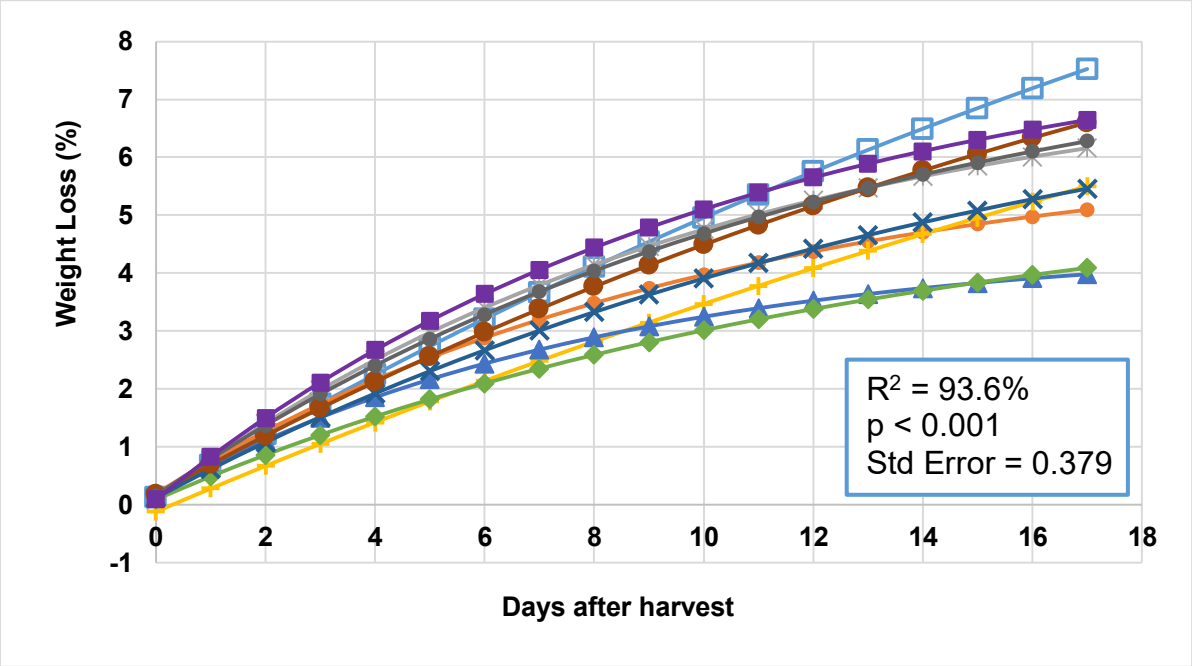


Figure 2. Post-harvest weight loss over a period of 17 days, of 10 varieties grown at Roodeplaat.

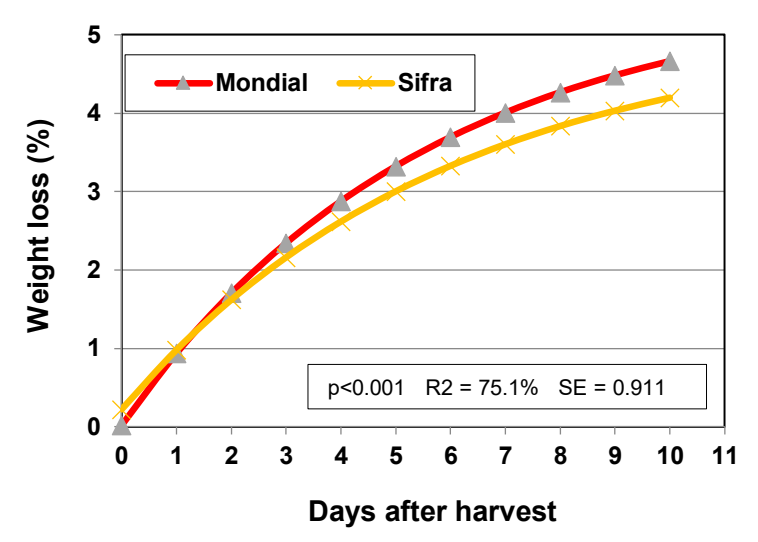


Figure 3. Weight loss of Mondial and Sifra from 44 on-farm audits in different production regions. Varieties grown in one season only are not included in this graph.

Five of the most popular varieties grown in South Africa were included in the on-farm surveys (Table 1). Figure 3 gives the average weight loss of Mondial and Sifra. Data for varieties that were grown in one season only (BP1, Lanorma and Valor), is not included in the figure. The

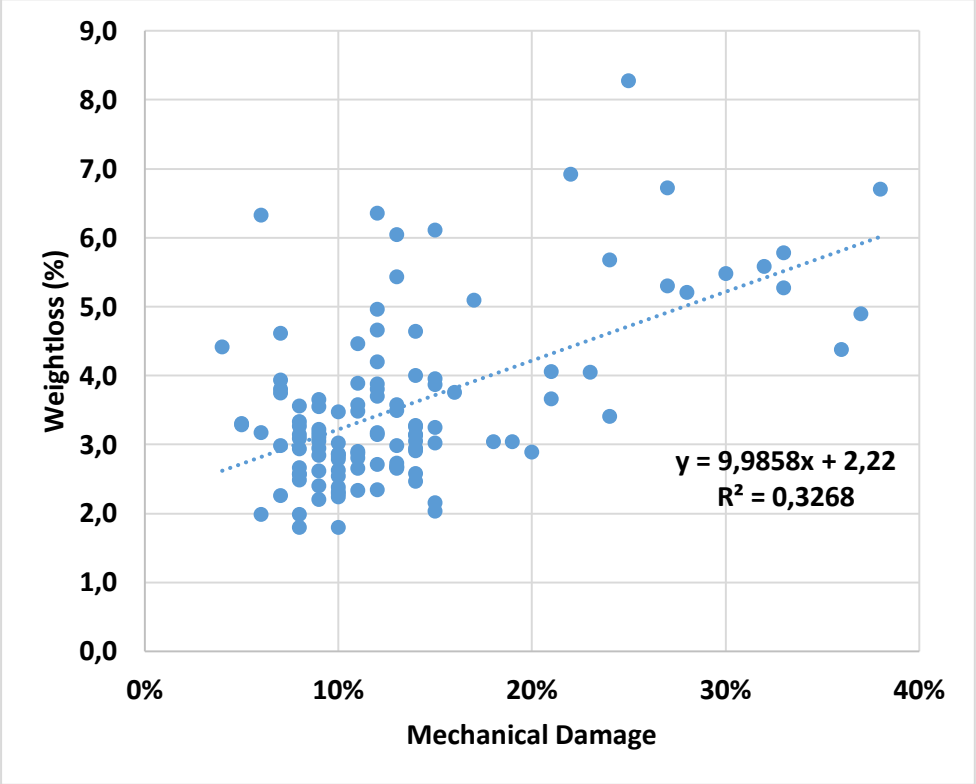


Figure 4. The correlation of potato tuber weight loss to mechanical damage in Eastern Free State 2017 harvesting season.

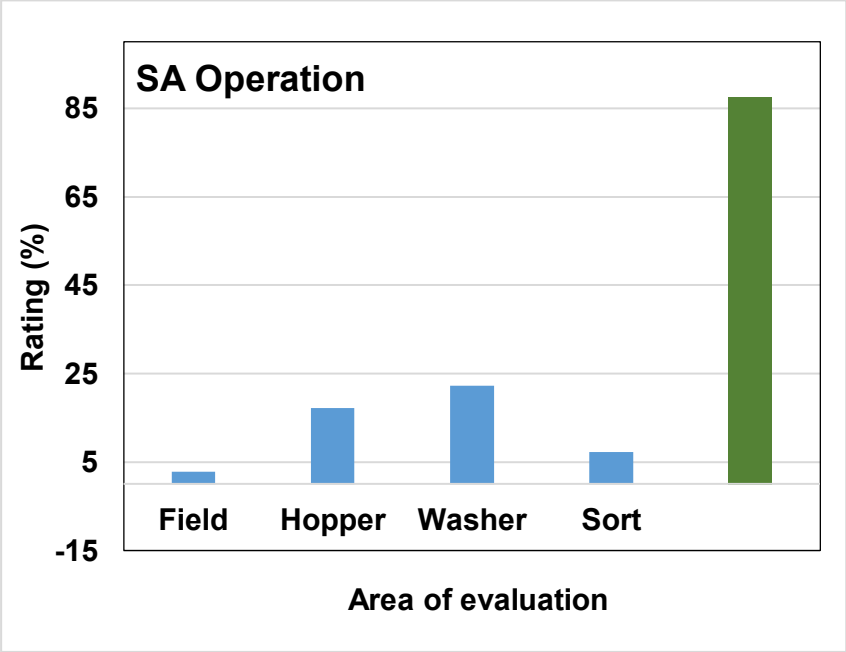


Figure 5. Damaged caused by the different operations on potato farms in South Africa (Blue). The index (Green) represent the tubers not damaged in the harvesting, washing, sorting and packing process. The benchmark for each farmer should be, achieving at least 85%.

average weight loss for both Mondial and Sifra was less than 5%, seven days after packing.

Effect of mechanical damage on weight loss

To determine how mechanical damage affects weight loss, the percentage weight loss was correlated to the percentage of tubers showing mechanical damage in the first survey in the Eastern Free State. Although Figure 4 shows a weak correlation between mechanical damage and weight loss, it is important to note that the type of damage could affect the results. If the skin of a considerable area of the tuber is removed, the surface from where evaporation can take place, can be considerable. If the damage is a hole or a cut into the flesh, less flesh is exposed and evaporation is expected to be less. With an increase in damage the respiration rate would also increase adding to the evaporation loss.

To investigate where in the on-farm handling process most mechanical damage occurs, three tuber samples were collected at each of the various points in the handling process. Potatoes were lifted and harvested by hand to minimise damage and weight loss. This 'field' samples were used as the baseline with regards to weight loss and mechanical damage for the rest of the samples taken in the survey. The 'Hopper' samples represent the harvesting and transport to the shed, 'washer' samples represent

Table 2. Weight loss seven days after packing from all the on-farm surveys and the season of harvest.

% weight loss	Harvest time							Total
	Feb/ March	May	May	Sep	Nov	Dec	Jan	
1.0 - 1.99	1	1						2
2.0 - 2.99	3	4	7		2			16
3.0 - 3.99	1		1	2	3	1	2	10
4.0 - 4.99	5	1		2	4	2	1	15
5.0 - 5.99				**1**	**1**	**1**	**2**	**5**
6.0 - 6.99					**2**	**1**	**1**	**4**

the washing operation only and the 'sort' samples represent the process in the pack shed after the washer but also on its own represent the losses during the complete process from harvest to packing.

The results with regards to mechanical damage for each stage of the harvest and postharvest handing process are summarised in Figure 5. The damage caused at each point was isolated by determining the damage on the tubers after storage for each collection point. To isolate the specific collection points contribution regarding damage, the previous collection points result was deducted from the specific collection point. The collection point across South Africa that caused the most damage was the washing operation followed by the harvesting and delivering proses with the sorting table causing the least damage. The data collected indicated that the different operations across South Africa need to be re-evaluated, especially the equipment used in the washing process. Two aspects need consideration: the brushes, both types and number of brushes needed to achieve the desired effect versus the damage caused followed by the production practises on the fields. Figure 5 also displays an index. This index represent the undamaged fraction over all operation in South Africa at all the collection points on the farm during the survey. The average damage of the different collection points is deducted from 100 to give the index. Decreasing the number of tubers with mechanical damage at each collection site will lead to a higher index. As benchmark a farmer should strive to achieve at least 85% and above.

Weight loss recorded during the survey

Legislation allows weights to be 5% lower than the advertised weight on the packaging. Results of all the surveys is combined in Figure 6. The weight loss on 84% farms in six production regions was within the permissible level of 5% less than 10 kg. The average weight loss in this study was 3.88% less than 10 kg, with a range of 1.70 – 6.26% for individual farms. Researchers in the northern Hemisphere where potatoes are stored at low temperature and high humidity reported weight losses of up to 2.1% after seven days. Taking into consideration the differences between local practices and climates and these in the northern Hemisphere, the average weight loss of 3.88% recorded in this study is acceptable.

Table 2 illustrates how weight loss is affected by the harvest time and indirectly the temperature during the growing season as well. In regions where harvest is during November to January, temperature during harvest can be expected to be high. So can the average temperature during the season, especially during the latter part of the season also be high. This implies that farmers who grow and harvest potatoes during the hottest part of the year, need to make sure to limit mechanical damage to the minimum and to make sure that the skin of the potatoes has set properly before the planned harvest date.

Conclusion and recommendation

The monitoring process followed during this survey can easily be implemented on farms. Samples should be taken weekly at the different locations and packed in 10 kg bags and stored in the pack shed. This monitoring should be repeated weekly so that the continued progress can be measured and the aspects implemented be quantified.

From the surveys it is evident that the washing operation on farms causes the most damage Research

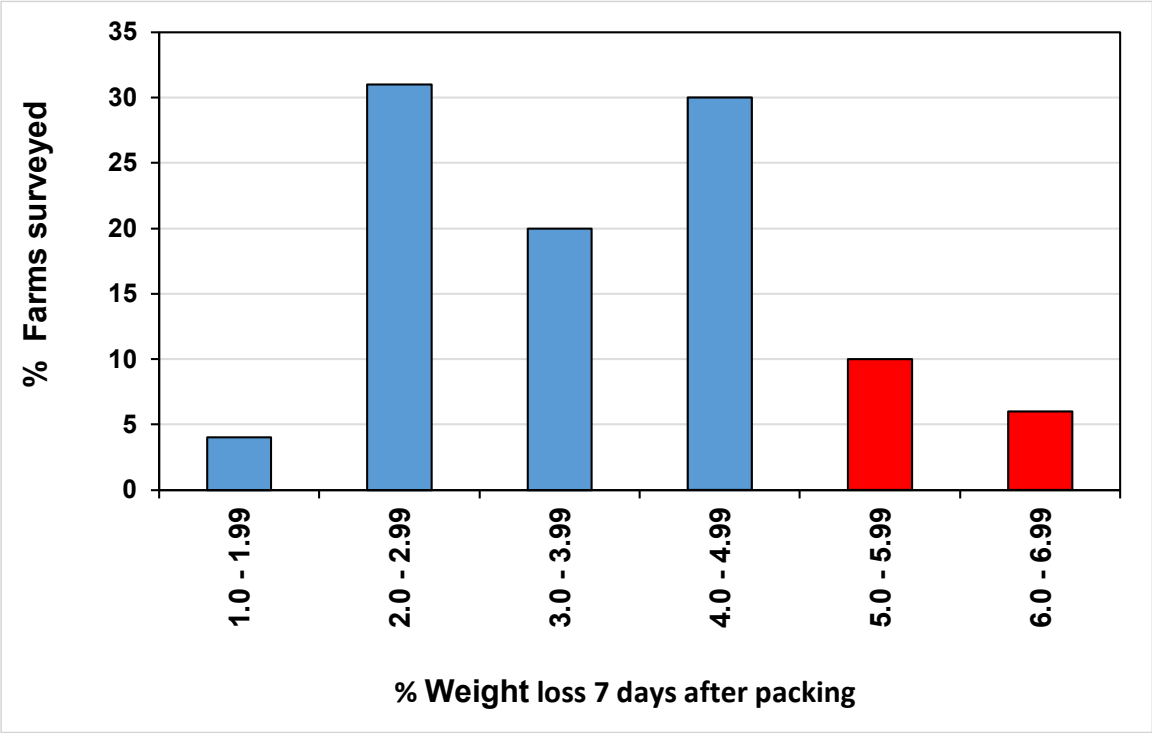


Figure 6. Weight loss of tubers packed in 10kg paper bags, 7 days after packing in 8 production regions.

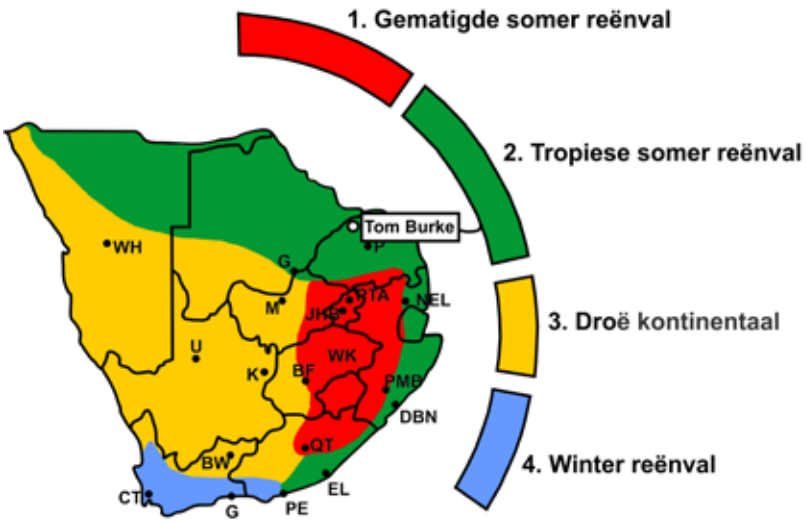
needs to establish the mechanism behind this finding. Commercial production relies on a high fertilizer regime, tubers harvested 21–45 days after vine kill will lose significantly less weight than those harvested 2–13 days after vine kill due to the relation between days after vine kill and skin set. As a general rule, skin set is taken as two weeks after burn-off. From the survey it is shown that higher temperatures lead to higher mechanical damage. Harvesting after 14 days in cooler areas might be adequate to reduce mechanical damage while 20 days is perhaps more suitable to ensure proper skin set in warmer areas.

Limpopo kultivarproef onder besproeiing op **Tom Burke** in 2018

Jaco Nel (produsent) en Chantel du Raan (Aartappels Suid-Afrika)

Die Limpopo produksiestreek produseer sowat 20% (2016-oesjaar) van die totale aartappelproduksie wat die hoogste in Suid-Afrika is. Hierdie streek plant vir die tafel- en verwerkingsmark onder besproeiing. Die streek se bydrae tot die verwerkingbedryf beloop sowat 8% (hoogste van al die streke in Suid-Afrika). Die hoofkultivars vir die tafelaartappelmark sluit in Mondial, Valor en Sifra terwyl die populêre keuses vir verwerking Hertha, Fianna, Markies en Innovator insluit. Proewe is op Tom Burke uitgevoer wat feitlik op die grens van Botswana geleë is. Tom Burke is in 'n tropiese somerreënvalgebied geleë met 'n jaarlikse gemiddelde reënval van 371 mm (Figuur 1). Baie warm somers kom voor, terwyl die winters weer koud is met swartryp wat dikwels in Junie en Julie voorkom. Een van die redes waarom hierdie streek so 'n groot bydrae kan maak in die bedryf is die feit dat die streek twee seisoene het. Dit sluit in 'n vroeë aanplanting wat geplant word gedurende Januarie tot Maart en geoes word vanaf Mei tot Augustus asook 'n hoofaanplanting wat geplant word vanaf April tot en met September en geoes word tussen September en April. Die proef is in 'n ewekansige blokontwerp uitgevoer in sandleem-grond met drie herhalings. Verdere tegniese inligting rakende die proefperseel en uitleg is opgesom in Tabel 1.

Verteenwoordigende grondmonsters is voor plant



Figuur 1: Ligging van Tom Burke in die Limpopo produksiestreek

Tabel 1: Opsomming van tegniese inligting rakende proefperseel en uitleg.

Plaas:	Ratho Boerdery		
Boer:	Mnr. Jako Nel		
Plantdatum:	24 Mei 2018		
Oesdatum:	31 Oktober 2018		
Besproeiing / Droëland:	Besproeiing		
Dubbel of enkel rye:	Dubbelrye		
Loofafsterwe:	Natuurlik		
Tussen-ryspasiëring:	0.75 m		
In-ryspasiëring:	0.30 m		
Proefperseel per eenheid:	15 m^2		
Plantestand:	44 444 plante / hektaar		
Bemestingsprogram:			
	Voedingswaarde:		
	N (kg/ha)	P (kg/ha)	K (kg/ha)
Totaal	301	142	106

geneem en ontleed om die grondvoedingstatus van die proefperseel te bepaal. Die resultate van die grondontleding vir hierdie proef word aangedui in Tabel 2.

Dit is belangrik om daarop te let dat groeiperiodes die oesopbrengs van kultivars kan beïnvloed. Groeiperiodes word gedefinieer as die aantal dae van opkoms tot natuurlike loofafsterwe, afhangend van die seisoen. Die presiese tydsberekening van die vyf groeifases (spruitontwikkeling, vegetatiewe groei, knolinisiasie, knolvulling en volwassenheid) hang af van die omgewing en die bestuurspraktyke wat wissel tussen lokaliteite asook kultivars, onder andere as gevolg van verskillende groeiperiodes. Die kultivars, plantgereedheid van moere, stand (%) en halmtelling van hierdie proef word aangedui in Tabel 3.

Temperatuur, dagliglengte en water is die belangrikste abiotiese faktore wat die groeipatroon, opbrengs en kwaliteit van aartappels beïnvloed. Om te bepaal wat die aanpassingsvermoë van nuwe kultivars in die Tom Burke-omgewing is, is dit belangrik om hierdie faktore in aanmerking te neem wanneer die prestasie van verskillende kultivars geëvalueer word. Dit is ook belangrik dat die kultivars vir 'n aantal seisoene geëvalueer word omdat klimaat van seisoen tot seisoen verskil. Daaglikse weerdata is verkry vanaf

Tabel 2: Grondontleding resultate vir Tom Burke kultivarproef (2017) voor plant.

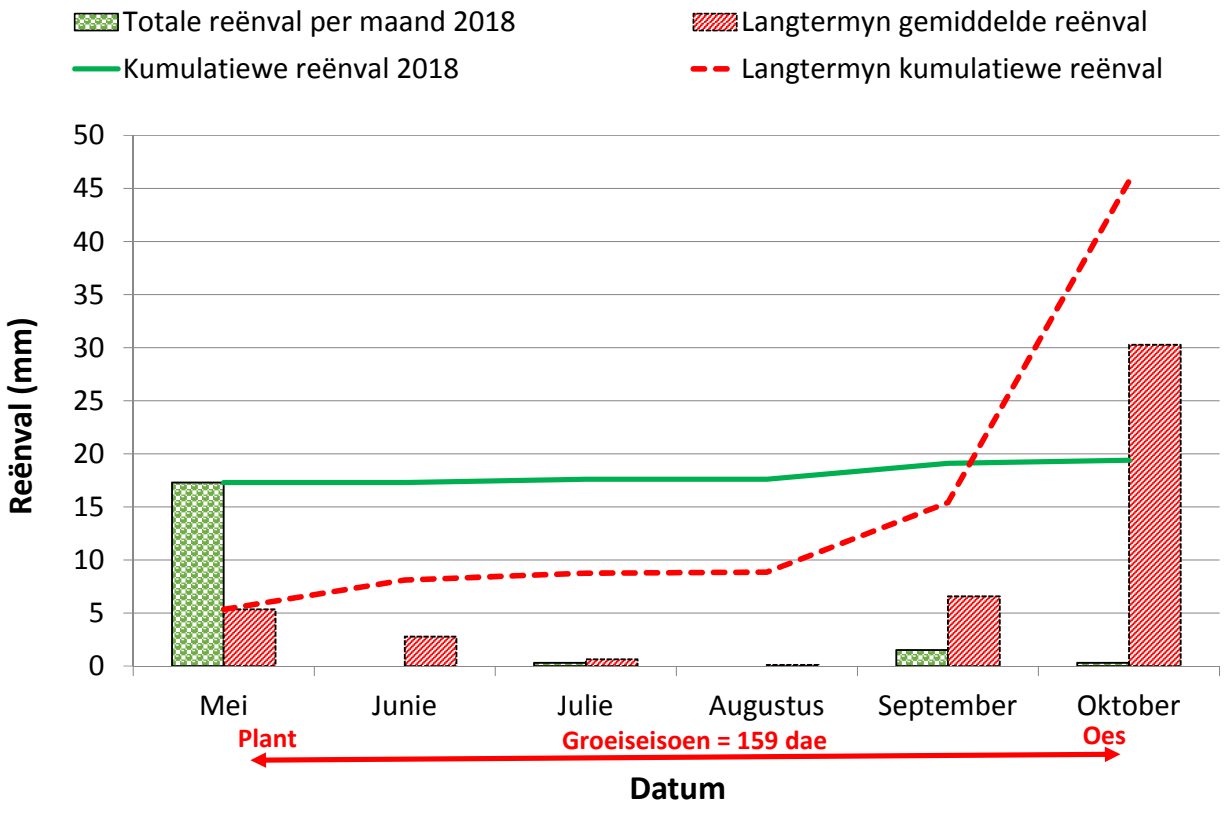
Brutodigtheid (kg.m^{-3})	pH (KCl)	P-Bray 2	Ammonium asetaat				% of KUK[1]			
		P	K	Ca	Mg	Na	K	Ca	Mg	Na
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	%
1370	7.37	25	543	2232	180	141	9.49	76.24	10.08	4.19

[1] *KUK = Katioon-uitruilkapasiteit*

Klei (%)	Silt (%)	Sand (%)
6	16	78

die Hanover-stasie op die proefperseel terwyl die langtermynweerdata verkry is vanaf die LNR se Swartwater-stasie (-22.85186, 28.19898). 'n Groot hoeveelheid reën is ontvang gedurende Meimaand van die 2018-groeiseisoen tydens die plant in vergelyking met die langtermyn-gemiddelde reënval (Figuur 2).

Die maksimumtemperature (Figuur 3) vir die 2018-groeiseisoen het vanaf Mei tot Julie laer vertoon in vergelyking met vorige jare terwyl die minimumtemperature effens hoër was in vergelyking met die langtermyn-data gedurende Mei tot Augustus. Tydens die knolvullingsfase (September en Oktober)



Figuur 2: Reënval gedurende die groeiseisoen (2018) asook die langtermyn gemiddelde reënval.

Tabel 3: Karaktereienskappe rakende groeiperiode, plantgereedheid, stand (%) en halmtellings vir elke kultivar in 2018.

Kultivar	Groeiperiode (Dae)[1]		Plant-gereedheid[2]	Stand (%)	Halms per plant	Halms per hektaar
Allison	Medium tot lank	(120)	3	100	3.4	151 110
Almera	Kort	(85)	2	82	2.5	91 110
Challenger	Medium	(110)	3	91	2.8	113 243
Electra	Medium	(110)	3	91	2.3	93 021
Essenza	Medium	(110)	1	97	1	43 111
Fandango	Medium tot lank	(120)	3	100	2.2	97 777
FPD 1001	-	-	1	52	5.3	122 488
FPD 3001	-	-	1	70	7	217 776
Georgina	Medium	(90-110)	2	91	2.5	101 110
Jelly	Medium tot lank	(120)	3	94	2.6	108 621
Markies	Medium	(110)	2	91	3.2	129 421
Mondeo	Medium	(90-110)	2	100	1.1	48 888
Mondial	Kort tot medium	(95-100)	2	94	2.7	112 799
Panamera	Kort tot medium	(95-100)	2	94	3.1	129 510
Rumba	Medium	(90-110)	3	100	2.5	111 110
Sifra	Kort tot medium	(90-100)	2	100	2.6	115 554
Tyson	Kort tot medium	(90-100)	3	97	1.7	73 288
Valor	Medium	(100-110)	3	100	2.9	128 888

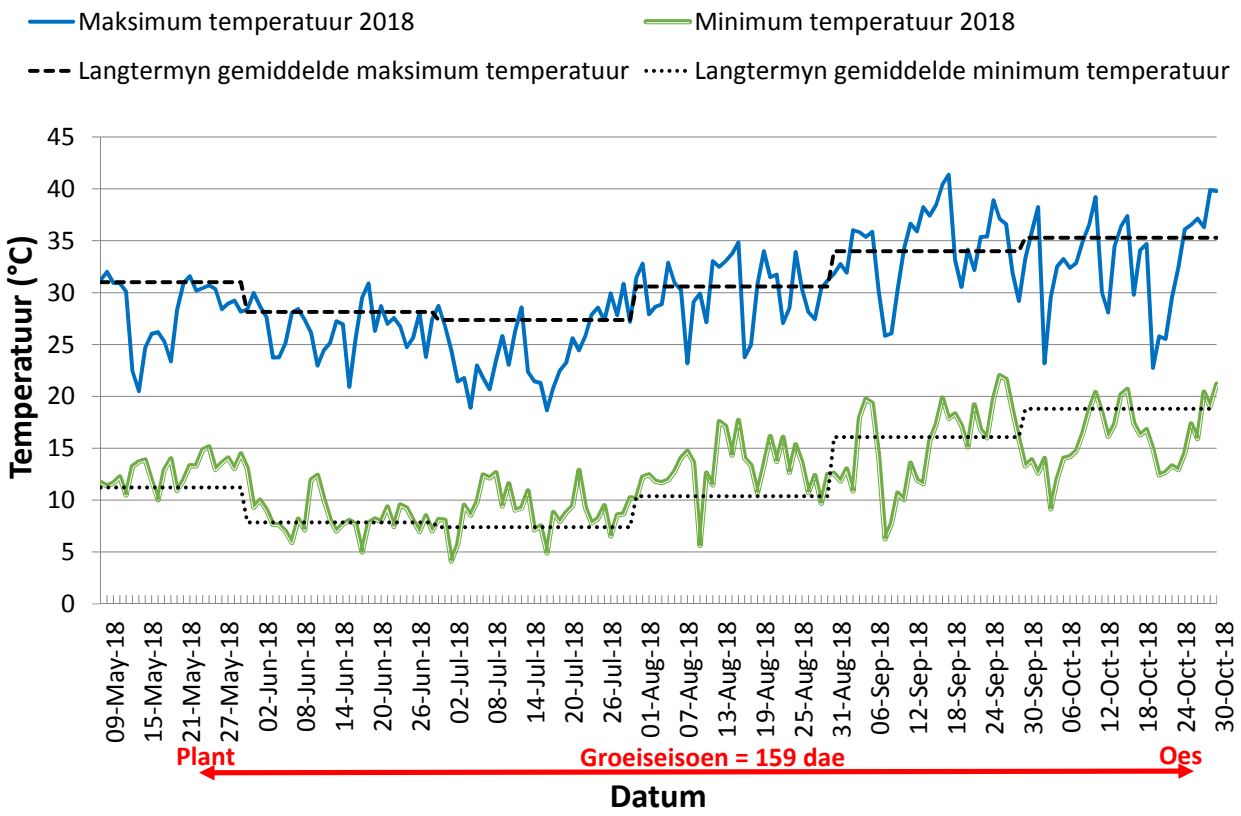
[1] *Algemene riglyne en kategorieë (dae van opkoms tot natuurlike loofafsterwe, afhangend van die seisoen):*
Kort = 70-90 dae; Kort tot Medium = 80-100 dae; Medium = 90-110 dae; Medium tot Lank = 90-120; Lank = 90-140 dae.

[2] *Plantgereedheid van moere*
1 – Vars; 2 – Effens vars; 3 – Plantgereed; 4 – Effens oud; 5 – Oud.

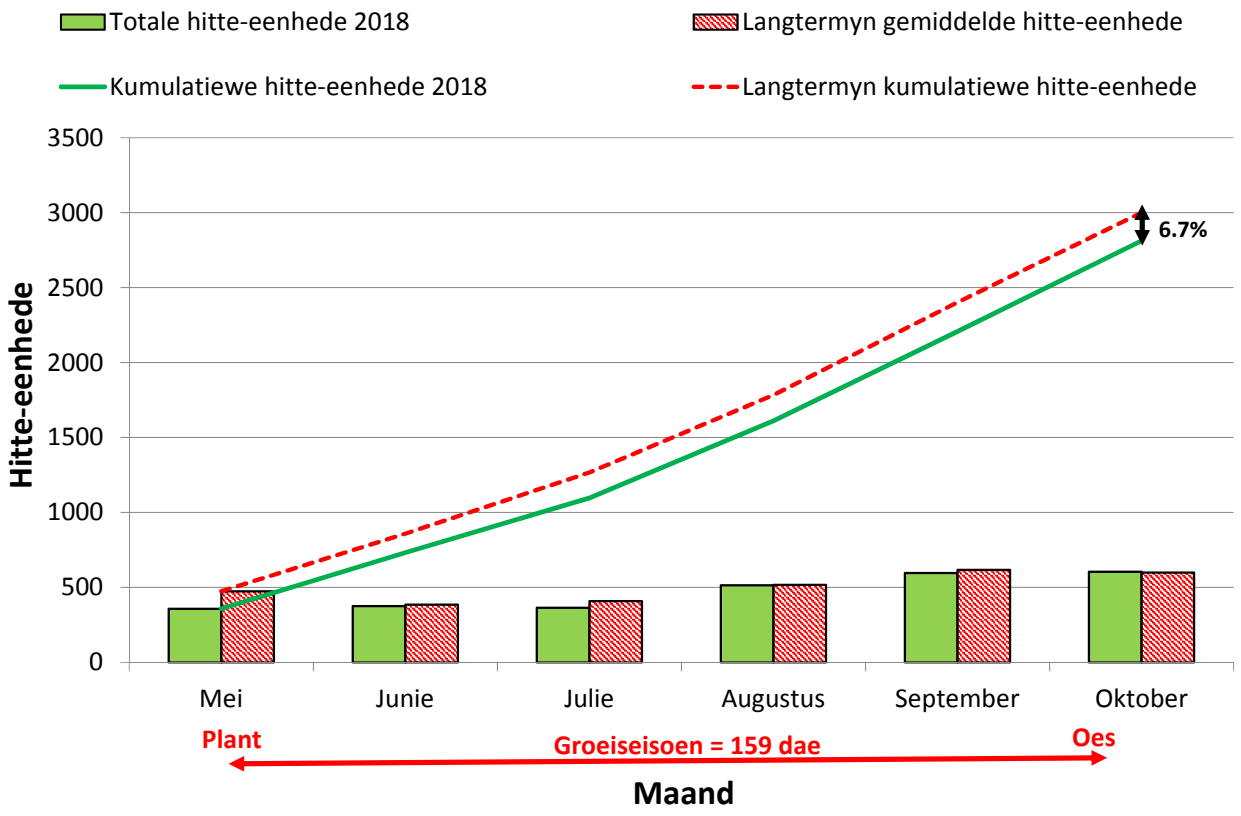
van die groeiseisoen het die maksimumtemperatuur aansienlik gewissel en was vir 'n aantal dae tussen 35 °C en 40 °C. Die optimale temperatuur vir knolvulling wissel tussen 15 °C en 22 °C. Wanneer die temperatuur bo 29 °C styg, sal min of selfs geen knolgroei voorkom nie as gevolg van die feit dat die koolhidrate gebruik word vir respirasie. Gedurende hierdie jaar is daar geen rypskade gedurende die groeiseisoen ondervind nie.

Hitte-eenhede is ook 'n belangrike faktor om in ag te neem aangesien die ontwikkeling van die plant hoofsaaklik gebaseer is op die versameling van hitte-eenhede. Daar word dus aanvaar dat die plant 'n sekere aantal hitte-eenhede moet versamel om 'n ontwikkelingsfase te voltooi. Die hitte-eenhede van die 2018-groeiseisoen het bykans dieselfde patroon gevolg as die langtermyngemiddelde hitte-eenhede en word aangedui in Figuur 4. Aan die einde van die seisoen was die langtermyn-data se kumulatiewe hitte-eenhede 6.7% hoër as die kumulatiewe hitte-eenhede van die 2018-seisoen.

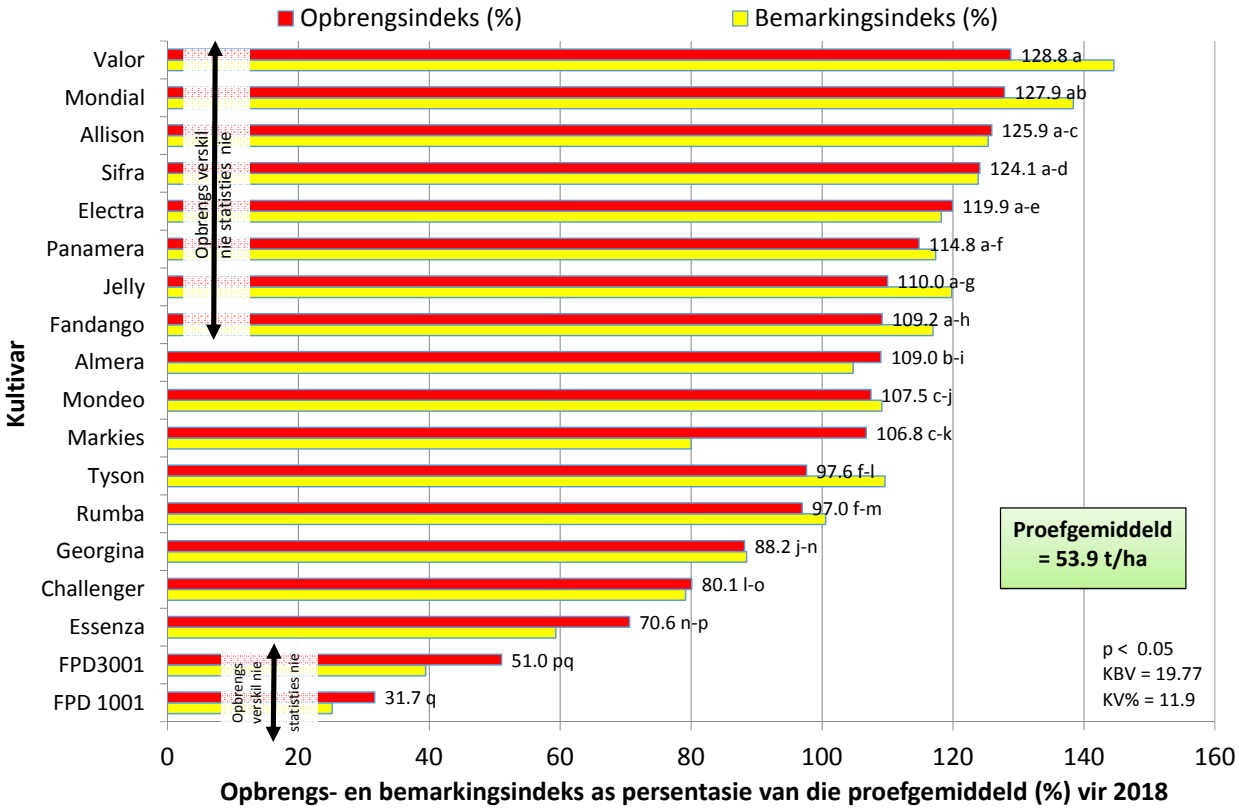
Die opbrengsdata is statisties verwerk met behulp van die GenStat® program en die gemiddelde was geskei deur gebruik te maak van die Tukey KBV-toets. Die kultivareffek gedurende die 2018-proewe (Figuur 5) was statisties beduidendend ($p<0.05$) ten opsigte van opbrengs terwyl die koëffisiënt van variasie laag (11.9%) was. Dit dui dus aan dat die proef



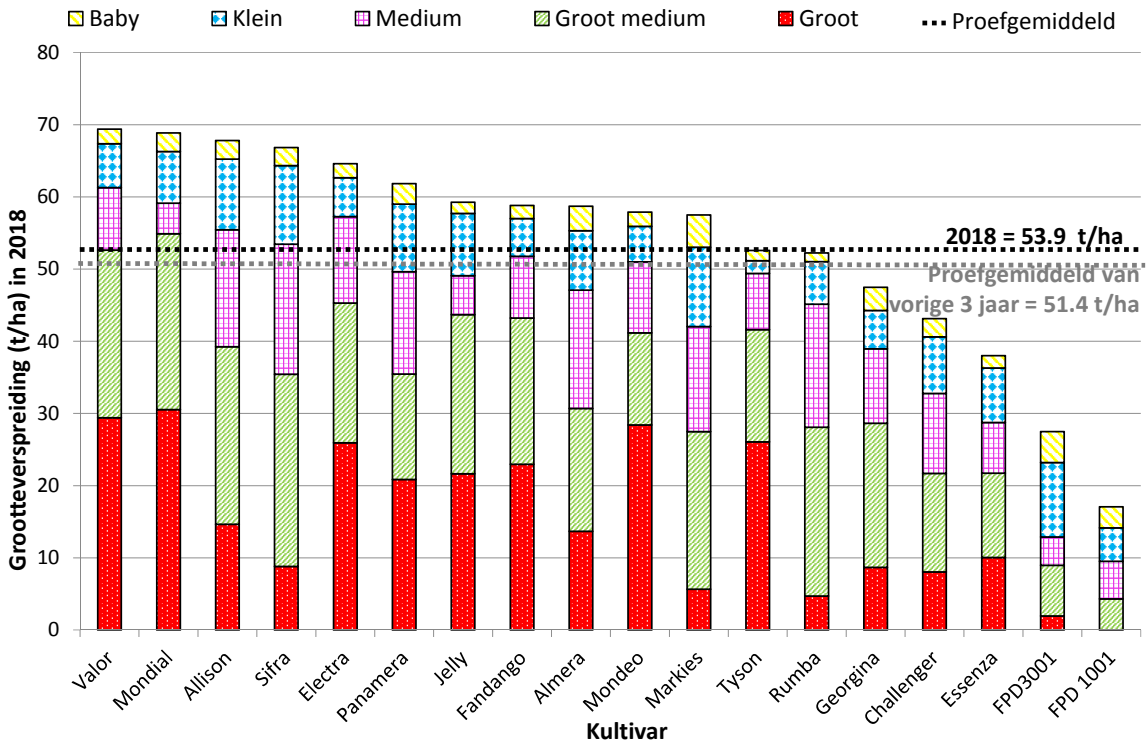
Figuur 3: Minimum- en maksimumtemperatuur (°C) gedurende die groeiseisoen (2018) asook langtermyn.



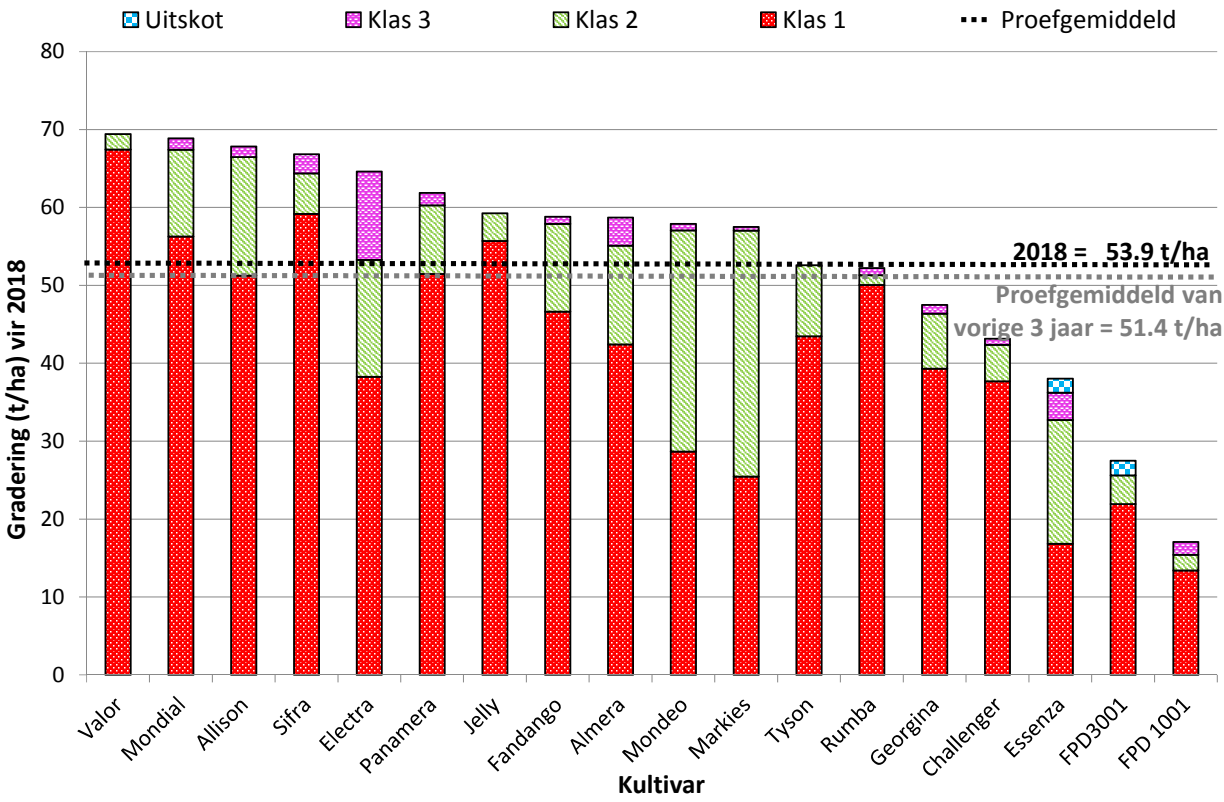
Figuur 4: Hitte-eenhede gedurende die groeiseisoen (2018) asook langtermyngemiddeld.
**Totale hitte-eenhede spesifiek bepaal vir aartappels (drumpeltemperatuur = 5°C) as gewas [bereken vanaf uurlikse data].*



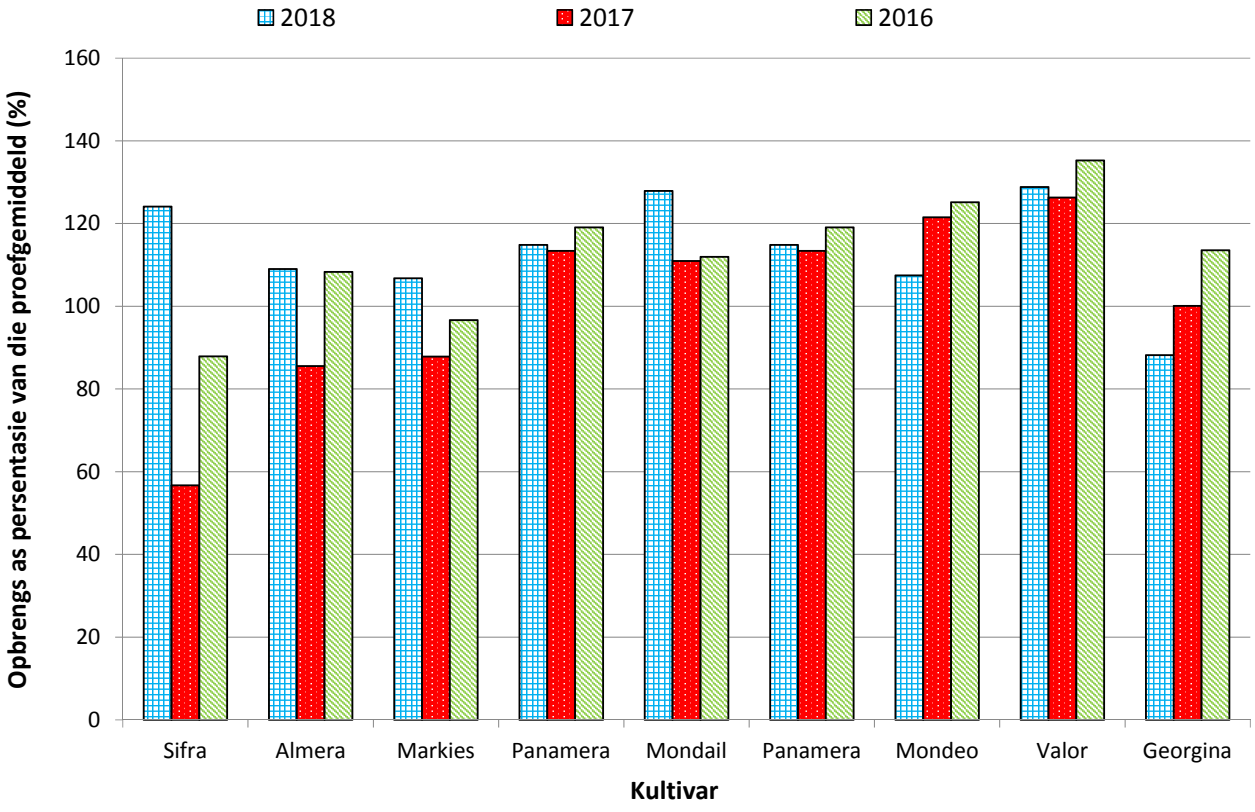
Figuur 5. Totale opbrengs en bemarkingsindeks per kultivar as persentasie van die proefgemiddeld.
**Waardes gevolg deur dieselfde letter is nie beduidend verskillend van mekaar nie.*



Figuur 6. Groottegroepverspreiding van elke kultivar tydens finale oes.



Figuur 7. Gradering van elke kultivar tydens finale oes.



Figuur 8. Prestasie van kultivars oor drie jaar uitgedruk as persentasie van die proefgemiddeld.

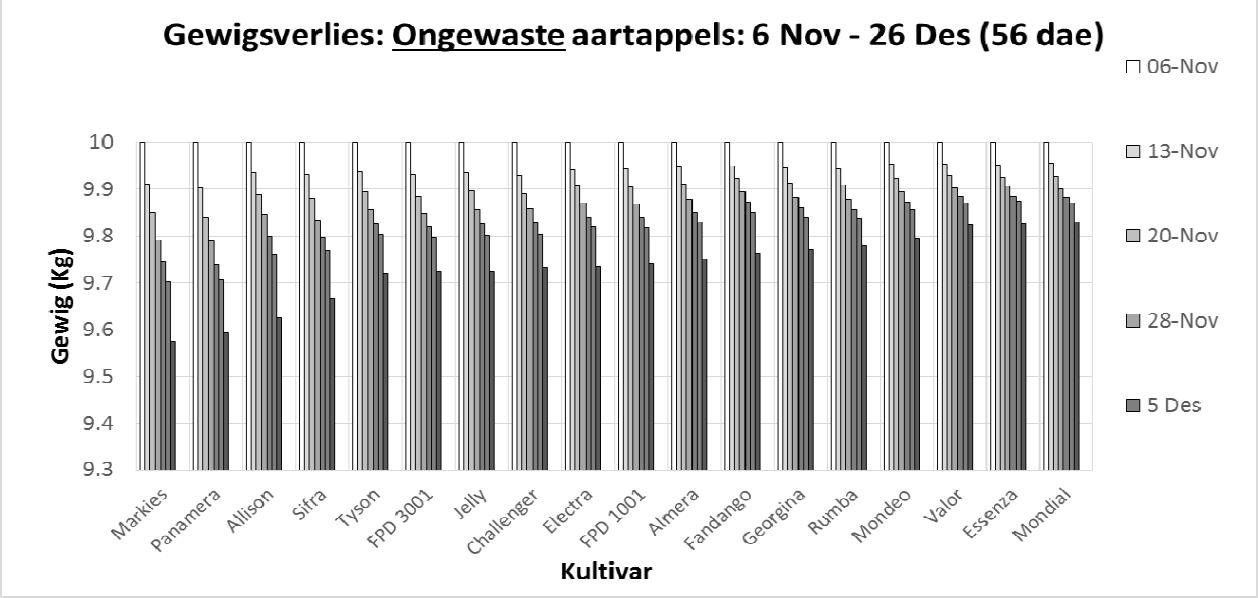
Tabel 4: Hoofredes vir afgradering tydens die 2018 Tom Burke oes.

Kultivar	Hoofredes vir afgradering			
	Vergroening	Meganiese beskadiging	Sandspleet	Rhizoctonia
Allison	X	X		
Almera			X	
Challenger		X		
Electra		X		
Essenza	X	X		
Fandango		X		
FPD 1001	X	X		
FPD 3001		X		
Georgina		X		
Jelly	X	X		
Markies		X		
Mondeo		X		X
Mondial			X	
Panamera		X		
Rumba		X		
Sifra		X		
Tyson		X		
Valor		X		

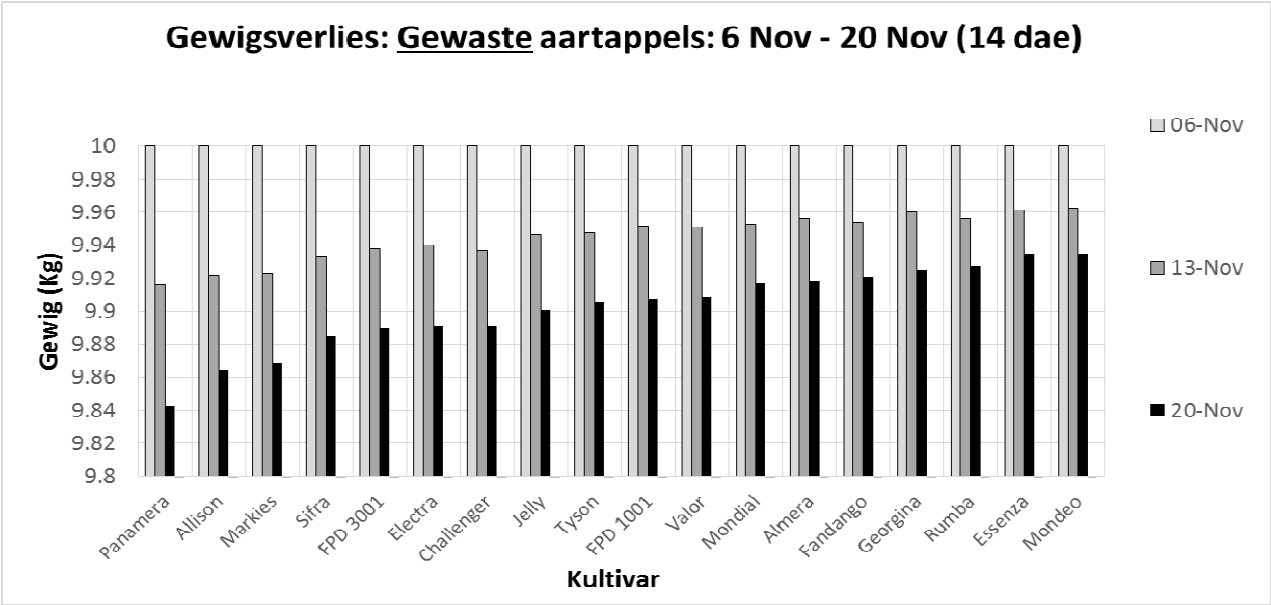
goed uitgevoer is en die resultate betroubaar is. Die proefgemiddeld van al die kultivars word as 100% geneem. Die opbrengs van die individuele kultivars word dan deur die proefgemiddeld gedeel en elke kultivar se opbrengsprestasie word as 'n persentasie van die proefgemiddeld uitgedruk (opbrengsindeks).

Die gemiddelde opbrengs (53.9 t/ha) vir die 2018-seisoen was 2.5 t/ha hoër in vergelyking met die proefgemiddelde van die vorige twee jaar (51.4 t/ha). Gedurende die 2018-proef (Figuur 5) het die kultivars Valor, Mondial, Allison, Sifra, Electra, Panamera, Jelly en Fandango die hoogste opbrengste gelewer. Hoër opbrengste as die proefgemiddeld (53.9 t/ha) was behaal deur die kultivars Valor, Mondial, Allison, Sifra, Electra, Panamera, Jelly, Fandango, Almera, Mondeo en Markies.

Ten einde die prestasie van die kultivars in terme van opbrengs en kwaliteit te bepaal, is die opbrengs, groottegroepverspreiding en klas gebruik om teen die gemiddelde markpryse vir die betrokke dag 'n bemarkingsindeks te bereken. Die opbrengs, vermenigvuldig met die heersende prys, wat bepaal word deur die groottegroepverspreiding en gradering, gee die bemarkingsindeks (Figuur 5). Valor het die hoogste bemarkingsindeks behaal wat toegeskryf kan word aan 'n kombinasie van hoë opbrengste, hoë persentasie groot groottegroepverspreiding (Figuur 6) en veral die hoë persentasie klas 1 gradering wat die kultivar gelewer het. Groottegroepverspreiding en gradering is ook van die faktore wat gebruik word om aartappels te klas, daarom is dit belangrike faktore om in ag te neem om optimale ekonomies-bemarkbare opbrengs te verseker. In Figuur 6 word die



Figuur 9: Gewigsverlies van ongewaste kultivars vir 'n periode van 56 dae (6 November 2018 tot 26 Desember 2018)



Figuur 10: Gewigsverlies van gewaste kultivars vir 'n periode van 14 dae (6 November 2018 tot 20 November 2018)

groottegroepverspreiding, in Figuur 7 die gradering van die opbrengs en in Tabel 4 die hoofredes vir afkeuring van die onderskeie kultivars aangetoon.

Die LINTUL-POTATO-DSS plantgroeimodel is gebruik om potensiële opbrengste van die kontrole kultivar, Mondial, te bereken. Potensiële opbrengs kan gedefinieer word as die teoretiese boonste opbrengsgrens in 'n situasie waar water, voedingstowwe en biologiese faktore optimaal is vir die seisoen waarin die proef gegroei het. Die inligting stel ons in staat om te evalueer hoe die werklike opbrengs behaal deur proef vergelyk met gesimuleerde potensiële opbrengste. Die verskil tussen die potensiële- en werklike proefopbrengs verwys na die opbrengsgaping. Dit illustreer hoe produsente optimaal gebruik maak van hul omgewing en beskikbare hulpbronne om hoë opbrengs te behaal. Die verhouding tussen werklike opbrengs (53.9 t/ha) : potensiële opbrengs (76.9 t/ha) is 70%. Daar is dus 'n klein opbrengsgaping wat daarop dui dat die beskikbare omgewing doeltreffend benut

Tabel 5. Kook- en prosesseringseienskappe en interne kwaliteit van opbrengs vir 2018 (Uitgevoer deur LNR-Roodeplaat).

Kultivar	Skyfiekleur[1]	SG[2]	Droë materiaal[3] (%)	Holhart (%)	Bruinvlek (%)
Allison	59	1.070	18.0	0	√
Almera	56	1.070	18.1	0	0
Challenger	52	1.080	20.1	0	0
Electra	55	1.066	17.3	0	0
Essenza	52	1.070	18.3	0	0
Fandango	57	1.071	18.4	0	0
FPD 1001	60	1.070	18.2	0	0
FPD 3001	55	1.071	18.3	0	0
Georgina	54	1.073	18.6	0	0
Jelly	49	1.072	18.4	0	0
Markies	59	1.075	19.2	0	0
Mondeo	56	1.071	18.3	0	0
Mondial	57	1.064	16.9	0	0
Panamera	57	1.075	19.1	0	0
Rumba	58	1.091	22.5	0	0
Sifra	55	1.069	17.8	0	0
Tyson	58	1.070	18.0	0	0
Valor	57	1.072	18.4	0	0

[1]Skyfiekleur met waarde >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.

[2]Soortlike gewig van >1.075 is aanvaarbaar vir die prosesseringsbedryf.

[3]Die persentasie droë materiaal is 'n berekende waarde:

*DM% = 24.182 + 211.04 * (SG-1.0988)*

Die werklike persentasiewaarde sal effens verskil tussen variëteite uit hierdie berekeningswaarde.

≥ Norm (Aanvaarbaar vir prosessering)

< Norm (Onaanvaarbaar vir prosessering)

word en gevolglik beperkte geleenthede vir verdere toename in opbrengste.

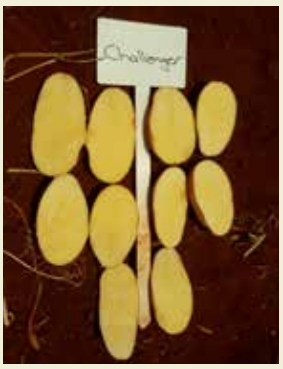
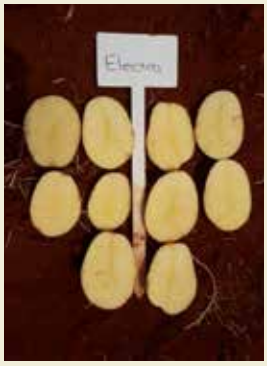
Dit is ook belangrik om te let op die kultivars se vermoë om konsekwent te presteer, ongeagfluktuasies in die klimaat oor tyd. In Figuur 8 word die drie-jaar data aangetoon vir die kultivarproewe in die Tom Burke produksie-area. Dit blyk dat die kultivars Panamera en Valor die minste variasie toon vir die betrokke area.

Verder is dit ook belangrik om op die interne kwaliteit van die produk te fokus om 'n optimale ekonomies-bemarkbare opbrengs, en dus winsgewendheid te verseker. Dit sluit belangrike faktore in soos prosesseringseienskappe, soortlike gewig (SG) asook inwendige defekte (holhart, bruinvlek en vaatbundelverkleuring) wat opgesom is in Tabel 5. Gedurende die 2018-groeiseisoen het die al die kultivars behalwe Jelly aan die skyfiekleurnorm van >50 vir prosessering voldoen. Wat die soortlike gewig

(SG) betref het die kultivars Challenger, Markies, Panamera en Rumba aan die norm van ≥1.075 vir prosessering voldoen. In die geval van inwendige defekte (Tabel 6), het geen holhart voorgekom nie terwyl slegs Allison bruinvlek getoon het.

Wat kommersiële aartappels op markte betref, word daar vereis dat die gewig van gewaste verpakte aartappels sewe dae na verpakking steeds moet ooreenstem met die gewig wat op die verpakking aangedui is. Faktore wat verdamping (gewigsverlies) na oes beïnvloed sluit in onvolwasse skil, los skil en meganiese beskadiging. Na afloop van die proef is monsters van een herhaling versamel en gereeld geweeg om die gewigsverlies en sodoende die houvermoë van elke kultivar te bepaal. Let wel dat hierdie resultate nie statisties uitgevoer is nie. Figuur 9 dui die gewigsverlies aan op ongewaste aartappels oor 'n tydperk van 56 dae (van belang vir prosesseerders tydens opberging), terwyl Figuur 10 die gewigsverlies van gewaste aartappels oor 'n tydperk van 14 dae aandui (aanvaar dat dit die verbruiker na 14 dae bereik het) van elke kultivar en is gerangskik van die hoogste verlies tot die laagste. Uit die resultate is dit duidelik dat die boer uitstekende produksiepraktyke toepas aangesien baie min (laer as 5% gedurende 56 dae) gewigsverlies plaasgevind het.

Tabel 6: Vleeskleur en interne kwaliteit van opbrengs vir 2018 in Tom Burke

Allison	Almera	Challenger
		
Electra	**Essenza**	**Fandango**
		

Tabel 6: Vleeskleur en interne kwaliteit van opbrengs vir 2018 in Tom Burke

FPD 1001	FPD 3001	Georgina
		
Jelly	**Markies**	**Mondeo**
		
Mondial	**Panamera**	**Rumba**
		
Sifra	**Tyson**	**Valor**
		

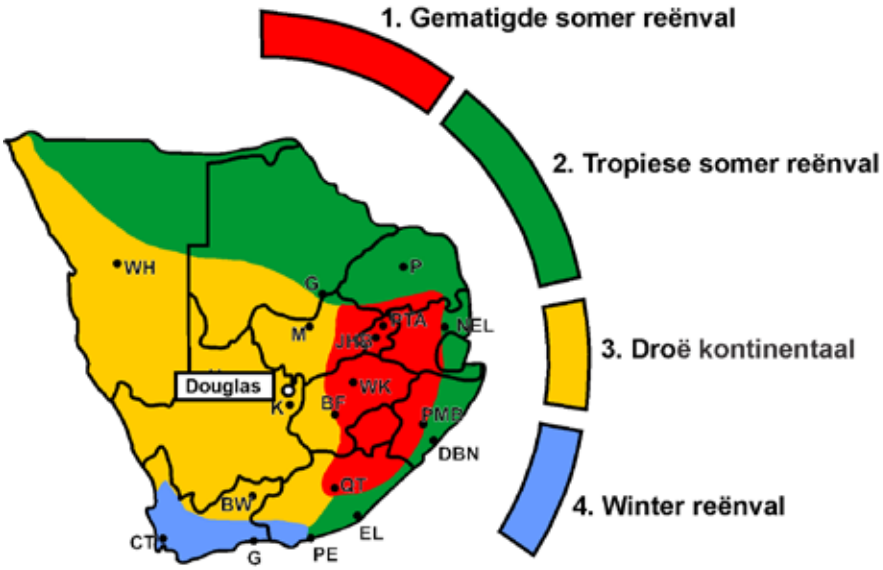
Noord-Kaap kultivarproef onder besproeiing op **Douglas** in 2018

André Prins (GWK), Enrike Verster en Herman Haak (Aartappels Suid-Afrika)

Die Noord-Kaap is 'n aartappelproduksiestreek waar 16 produsente op 1 681 hektaar 3% van die land se aartappels produseer. Nagenoeg 70% van hierdie streek se aartappelproduksie is toegespits op moerproduksie alhoewel daar in die 2018-seisoen bo-gemiddelde volumes tafelaartappels aan varsproduktemarkte gelewer is. Lanorma, FL2108 en Up-to-Date is die mees prominente kultivars vir moerproduksie in hierdie streek. Gewilde kultivars geproduseer vir kommersiële verbruik (tafel- en verwerkingsaartappels) is Sifra, Mondial en Fabula.

Douglas val in Suid-Afrika se droë kontinentale gebied (Figuur 1) met 'n gemiddelde reënval van ongeveer 211-334 mm. Winters ervaar ryp terwyl somers baie warm word.

Hierdie betrokke kultivarproef te Douglas is uitgevoer in sandleemgrond en die proef is uitgelê in 'n ewekansige blokontwerp met vier herhalings per kultivar. In Tabel 1 word ander tegniese inligting rakende die proefperseel gegee. Grondmonsters is voor plant geneem om die grondvoedingstatus van die proefperseel te bepaal (Tabel 2).



Figuur 1: Ligging van Douglas in die Noord-Kaap produksiegebied (Chantel du Raan).

Tabel 1: Opsomming van tegniese inligting rakende proefperseel en uitleg.

Plaas:	Landzicht Boerdery		
Boer:	Mnr. Jan Steenkamp		
Plantdatum	17 Januarie 2018		
Oesdatum	10 September 2018		
Besproeiing / Droeland:	Besproeiing		
Dubbel- of enkelrye:	Dubbelrye		
Loofafsterwe:	Natuurlik		
Tussen-ryspasiering:	0.9 m		
Proefperseel:	18 m^2		
Plantestand:	44 444 plante / hektaar		
Moergrootte:	250 telling (gemiddeld 100g)		
Bemestingsprogram:			
	Voedingswaarde:		
	N (kg/ha)	P (kg/ha)	K (kg/ha)
Totaal	229	156	185

Ingesluit in die kultivarproef is kultivars met kort- en langgroeitydperke en derhalwe kan groeiperiodes die uiteindelike opbrengs van sekere kultivars beïnvloed. Die lengte van groeiperiodes is onderhewig aan die aard van die seisoen, maar word gesien as die hoeveelheid tyd wat verloop vanaf opkoms tot natuurlike loofafsterwe. 'n Aartappelplant se leeftyd word verdeel in vyf groeifases, naamlik spruitontwikkeling, vegetatiewe groei, knolinisiasie, knolvulling en volwassenheid. Tabel 3 sit uiteen hoe die groeiperiodes van kultivar tot kultivar verskil. Omgewingsfaktore en bestuurspraktyke beïnvloed ook die verskillende groeifases en wanneer dit aanvang neem.

Stand en aantal halms per moer beïnvloed knolgrootte en opbrengs. Die aantal ogies per knol is kultivar-afhanklik en bepaal die hoeveelheid spruite wat per knol voortgebring word. Plantgereedheid van moere is baie belangrik in hierdie verband, aangesien beter plantgereedheid gewoonlik veroorsaak dat moere beter spruit en meer stamme per spruit voortbring. Plantgereedheid van moere ten tye van plant van die proef, sowel as standpersentasie en halmtelling wat later in die groeiperiode waargeneem is, word aangedui in Tabel 2.

Die evaluering van nuwe kultivars soos in die

Tabel 2: Karaktereienskappe rakende groeiperiode, plantgereedheid, stand (%) en halmtellings vir die betrokke kultivars.

Brutodigtheid (kg.m^{-3})	pH (KCl)	P-Bray					% of KUK[1]			
		P	K	Ca	Mg	Na	K	Ca	Mg	Na
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	%
1540	5.92	13	192	460	160	15	11.8	55.2	31.46	1.53

[1] *KUK = Katioon-uitruilkapasiteit*

Klei (%)	Silt (%)	Sand (%)
2	4	94

Tabel 3: Karaktereienskappe rakende groeiperiode, plantgereedheid, stand (%) en halmtellings vir betrokke kultivars.

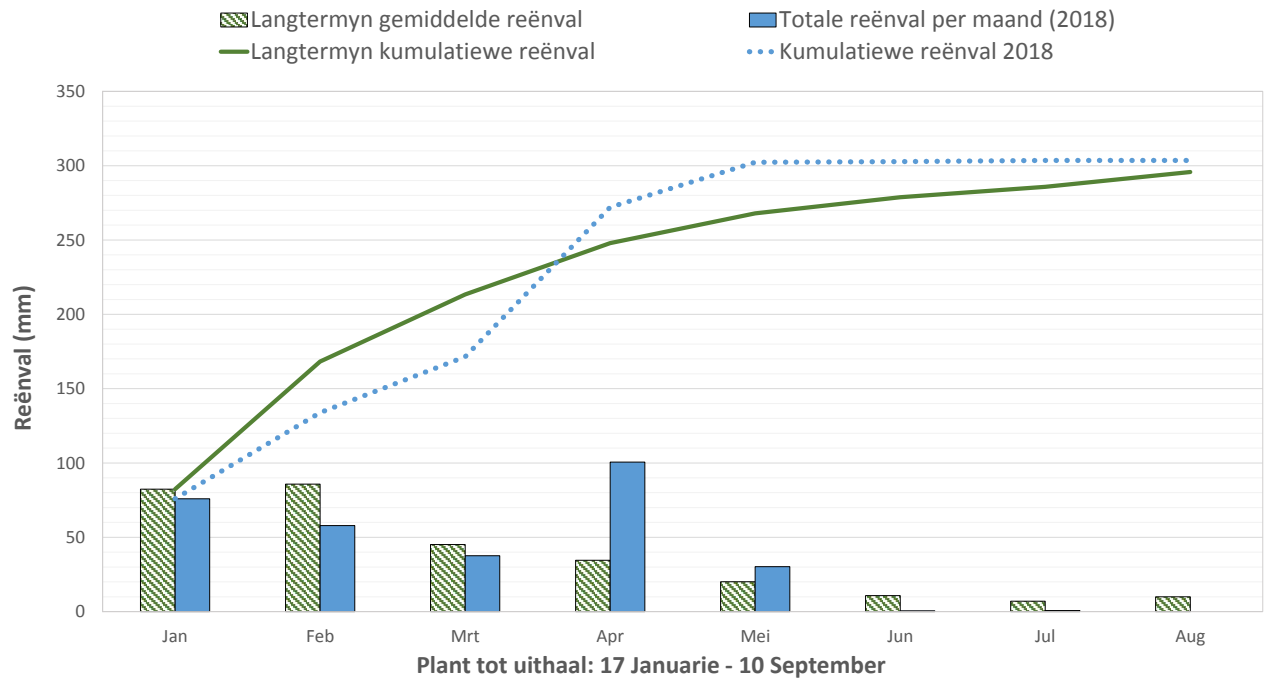
Kultivar	Groeiperiode (Dae)[1]		Plant-gereedheid[2]	Stand (%)	Halms per plant	Halms per hektaar
FL2108	-	-	3	87	3.4	131 464
Lanorma	Kort	(80-90)	3	87	3.2	123 731
Ludmilla	Kort	(70-80)	3	100	4.4	195 553
Mondial	Kort tot medium	(95-110)	3	100	8.0	355 552
Taisiya	Kort tot medium	(100)	3	94	4.8	200 531

[1]*Algemene riglyne en kategorieë (dae vanaf opkoms tot natuurlike loofafsterwe, afhangend van die seisoen):*
Kort = 70-90 dae; Kort tot Medium = 80-100 dae; Medium = 90-110 dae; Medium tot Lank = 90-120;
Lank = 90-140 dae.

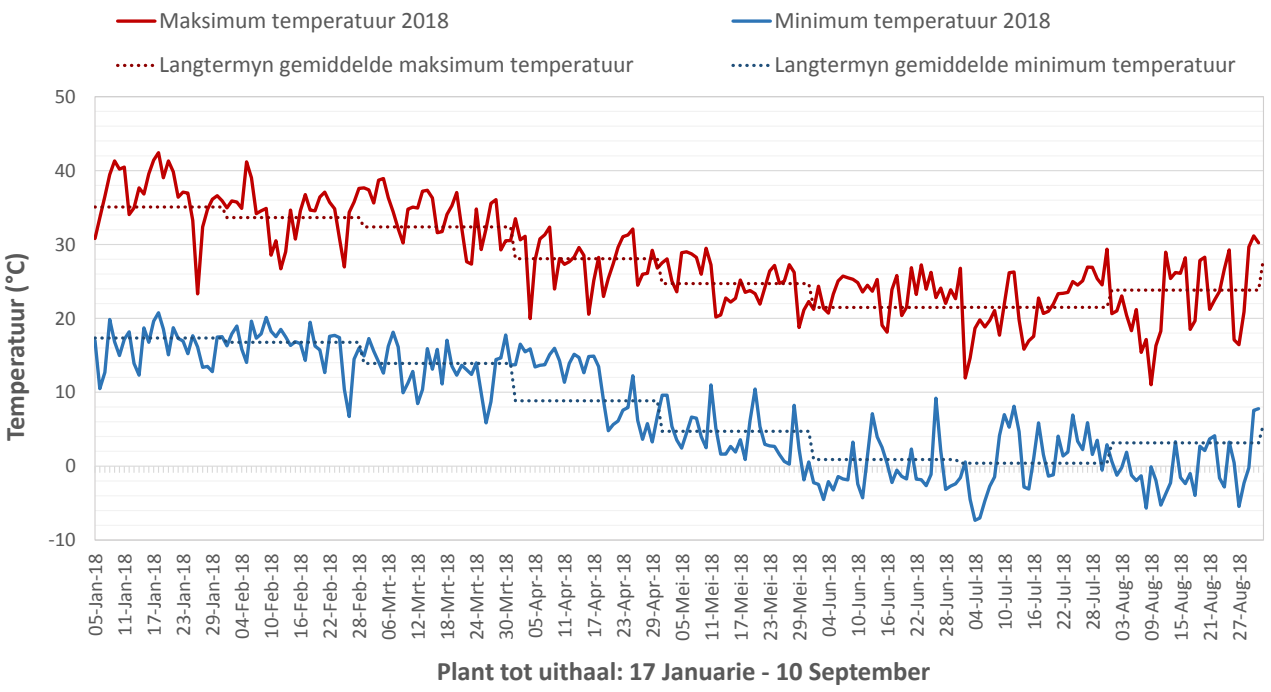
[2]*Plantgereedheid van moere: 1 = Vars; 2 = Effens vars; 3 = Plantgereed; 4 = Effens oud; 5 = Oud.*

Douglas-kultivarproef verskaf resultate rakende onder andere opbrengs en bemarkingsindeks. Die bemarkingsindeks van die betrokke kultivars word bereken deur elke kultivar te klas en te sorteer volgens kwaliteit en groottegroepe (byvoorbeeld: klas 1 groot of klas 2 groot-medium). In hierdie betrokke proef, is die bemarkingsindeks slegs op die pryse van klas 1 aartappels geskoei. Dienooreenkomstige prysvergelykings word dan gemaak met markpryse soos verkry ten tye van die oesdatum. Die prestasie van nuwe kultivars kan nie net op die resultate van een bepaalde seisoen geskoei word nie omdat klimaat van een jaar na 'n volgende kan wissel. Juis daarom word die kultivars verkieslik oor 'n aantal seisoene getoets.

Soos met enige gewas is die temperature, beskikbaarheid van water (hetsy goeie besproeiingskedulering of reënval), sowel as dagliglengtes belangrike faktore wat wesenlike invloed uitoefen gedurende die aartappelplant se groeitydperk. Hierdie faktore word dus in aanmerking geneem wanneer die prestasie van kultivars geëvalueer word. Toepaslike daaglikse en



Figuur 2: Reënval (2018 seisoen) en langtermyn gemiddelde reënval.

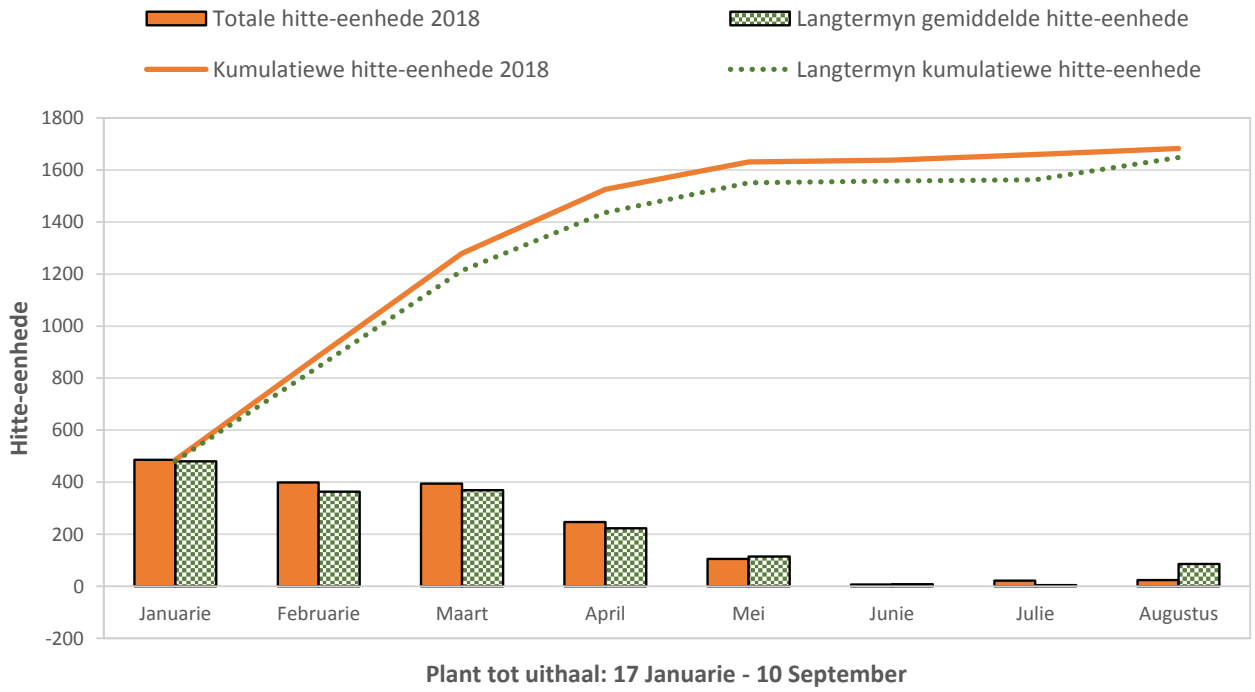


Figuur 3: Minimum- en maksimumtemperature (2018 seisoen) sowel as langtermyntemperature.

langtermynweerdata word verkry vanaf 'n gekose LNR-weerstasie wat so naby as moontlik aan die proefperseel geleë is.

Die seisoen het 'n reënval ervaar met hoër as normale langtermyngemiddelde reënval vernaamlik tydens April wanneer die stadiums van knolvulling tot volwassenheid waarskynlik plaasgevind het ten opsigte van die meeste betrokke kultivars (Figuur 2).

Minimum- en maksimumtemperature word uiteengesit in Figuur 3. Vanaf einde Mei is temperature onder vriespunt gereeld aangeteken tot en met einde Augustus. Die voortdurende temperature onder



Figuur 4: Hitte-eenhede (2018 seisoen) asook langtermyn gemiddelde hitte-eenhede.
**Totale hitte-eenhede spesifiek bepaal vir aartappels as gewas (drumpeltemperatuur = 5°C). Bereken vanaf uurlikse data.*

vriespunt vanaf Meimaand beteken ryptoestande en daarmee saam natuurlike loofafsterwe.

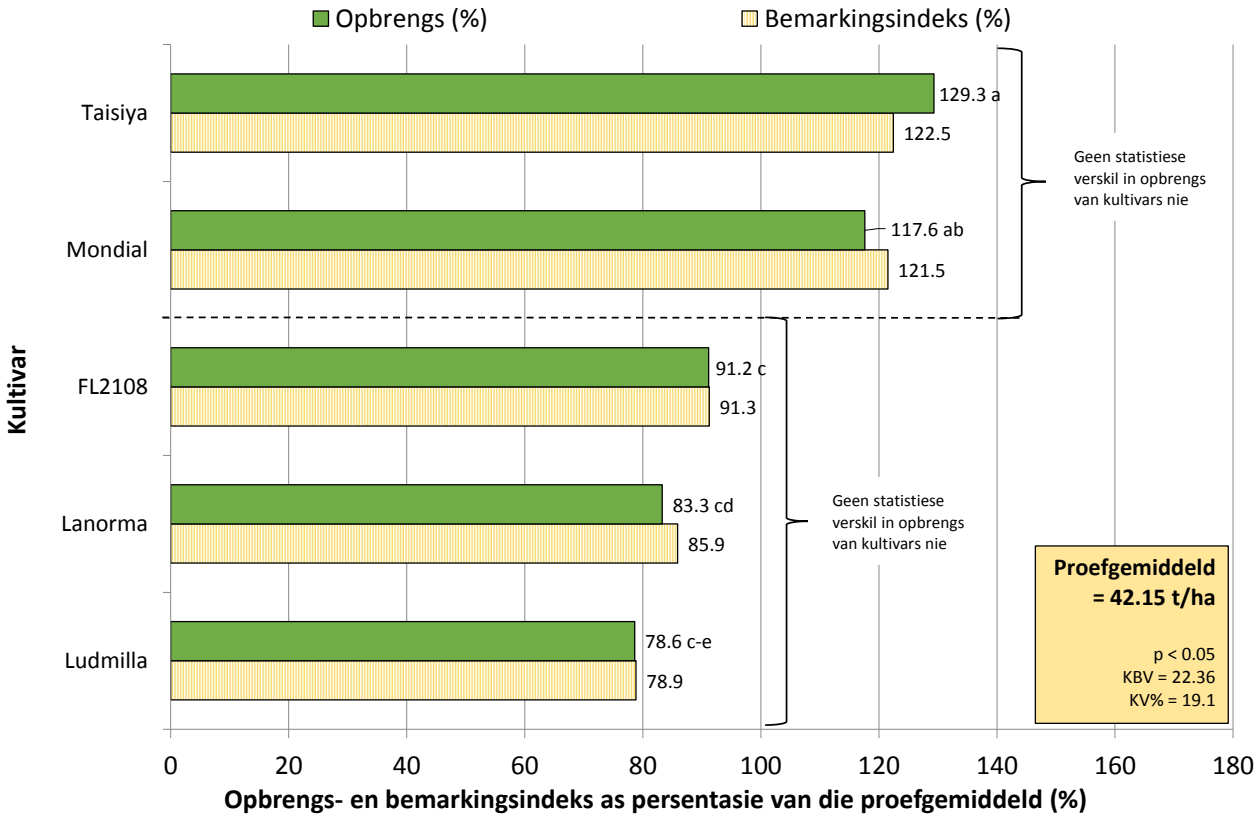
Versameling van hitte-eenhede gedurende 'n groeitydperk is 'n kardinale faktor in die ontwikkeling van 'n plant. Die tendens van hitte-eenhede beskikbaar vir die kultivarproef van hierdie betrokke seisoen, blyk baie na aan die tendens van langtermyn hitte-eenhede te wees (Figuur 4).

Opbrengsdata versamel tydens oesdag word onderwerp aan statistiese verwerking met behulp van die GenStat® program. Die Tukey toets van kleinste betekenisvolle verskille (KBV) is gebruik om die gemiddelde te skei. Die kultivareffek gedurende hierdie betrokke proef (Figuur 5) was statisties beduidend ($p<0.05$) en die koëffisiënt van variasie was aanvaarbaar (19.1%). Hierdie faktore dui daarop dat die proef goed uitgevoer is en die resultate derhalwe betroubaar is. Die opbrengs van elkeen van die kultivars word deur die proefgemiddeld gedeel (die proefgemiddeld van al die kultivars word as 100% geneem). Hierdeur word 'n opbrengsindeks geskep en word elke kultivar se prestasie in terme van opbrengs as 'n persentasie van die proefgemiddeld gelees.

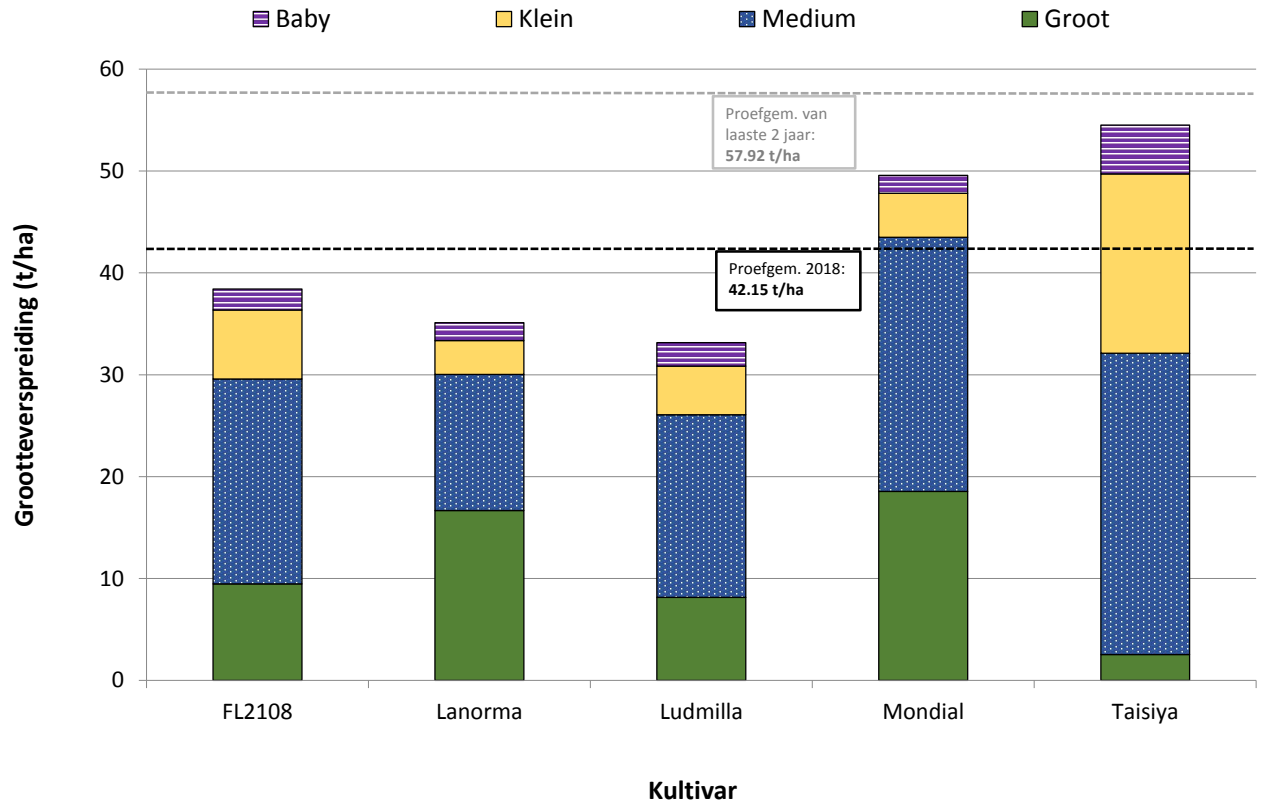
Die gemiddelde opbrengs van die proef vir die 2018-seisoen is 42.15 t/ha. Die kultivars Taisiya en Mondial het volgens statisties betekenisvolle verskille die hoogste opbrengs gelewer. Mondial het die hoogste bemarkingsindeks behaal en dit kan toegeskryf word aan 'n effens beter opbrengs in groot knolle (Figuur 6). Hoofredes vir afgradering van elke kultivar (Tabel 3) word ondersoek om te bepaal watter uitdagings die betrokke kultivars gehad het in terme van die kwaliteitsindeks. Bruinskurf as rede vir afgradering is aangeteken by FL2108, Ludmilla en Mondial.

Soos die aard van seisoene is, fluktueer die prestasie van kultivars van seisoen tot seisoen – bloot omdat klimaat van een seisoen na 'n volgende nooit eenders is nie. Derhalwe is dit belangrik om konsekwente prestasie van kultivars oor 'n aantal seisoene in ag te neem. Mondial en Taisiya toon tans die minste variasie vir die Douglas-proef van 2016 tot 2018 met 'n konstante verbetering in opbrengs (Figuur 7).

Laastens, om te voldoen aan prosesseringsvereistes, moet kultivars aan 'n skyfiekleurnorm van >50 en 'n soortlike gewig (SG) van ≥1.075 voldoen. FL2108 en Ludmilla het voldoen aan die SG-vereistes sowel as die skyfiekleurvereistes. Al vyf die betrokke kultivars het voldoen aan die regte skyfiekleur (Tabel 4).



Figuur 5: Totale opbrengs en bemarkingsindeks per kultivar as persentasie van die proefgemiddeld.
**Waardes gevolg deur dieselfde letter is nie beduidend verskillend van mekaar nie.*



Figuur 6: Groottegroepverspreiding van elke betrokke kultivar.

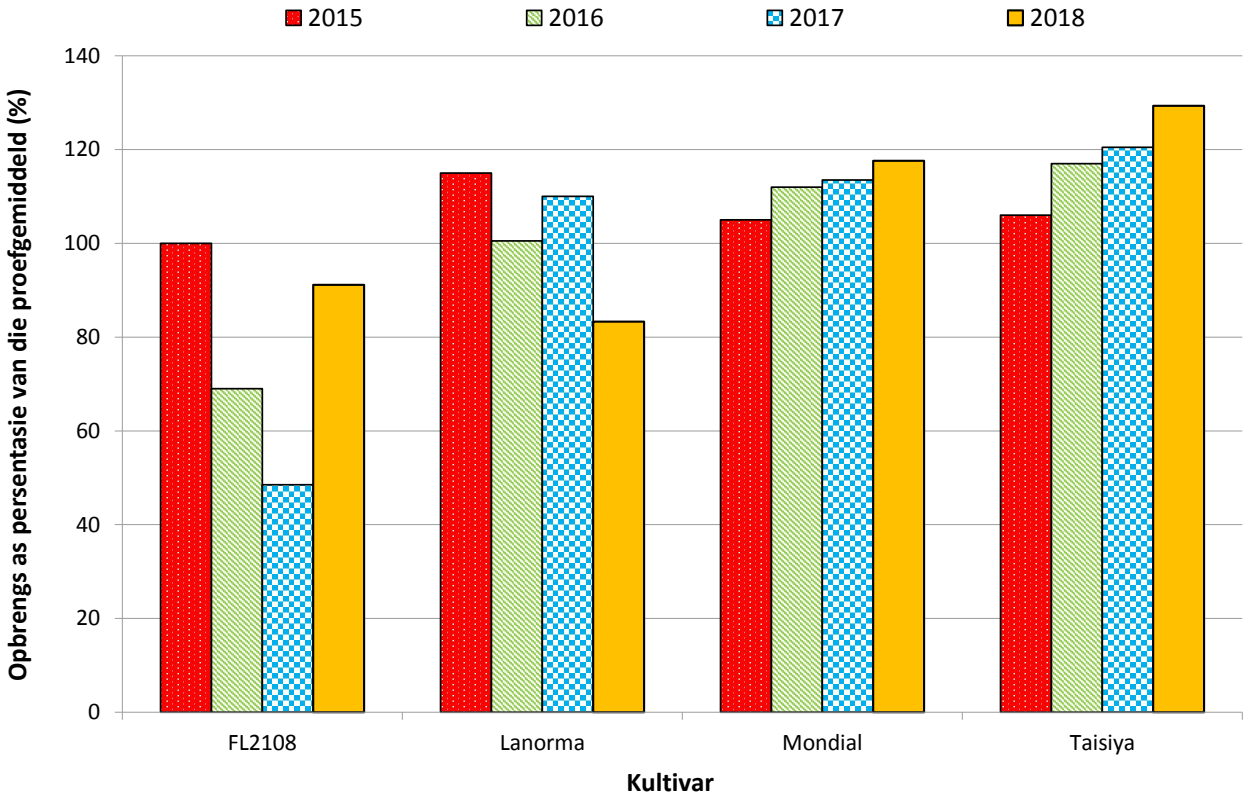
Tabel 3: Hoofredes vir afgradering.

Kultivar	Hoofredes vir afgradering	
	Bruinskurf	Insekskade
FL2108	x	x
Lanorma		x
Ludmilla	x	
Mondial	x	x
Taisiya		x

Tabel 4: Prosesseringseienskappe van kultivars (uitgevoer deur LNR-Roodeplaat).

Kultivar	Hoofredes vir afgradering	
	Skyfiekleur[1]	SG[2]
FL2108	55.0	1.102
Lanorma	57.0	1.073
Ludmilla	53.5	1.080
Mondial	52.0	1.069
Taisiya	53.0	1.0705

[1]Skyfiekleur met waarde >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.
[2]Soortlike gewig van ≥1.075 is aanvaarbaar vir die prosesseringsbedryf.



Figuur 7: Prestasie van kultivars oor vier jaar (uitgedruk as persentasie van die proefgemiddeld).

Boosting agricultural performance with better irrigation

Chantel du Raan (Potatoes South Africa)

Agricultural students, industry leaders, agribusinesses and enterprise development farmers came together on 24 and 25 April 2019 at Marlothii Lodge in Dendron for a practical irrigation course. Potatoes South Africa brought irrigation experts together with the aim to address issues faced by the enterprise development farmers regarding irrigation during the season. This irrigation practical course not only highlighted that water is a scarce and precious resource but also gave the farmers a tool to minimise wasteful losses of nutrients and maximise transpiration. Transpiration is the beneficial loss of water due to its direct link with photosynthesis and thus final yield and quality which will affect profitability.

Potatoes are shallow-rooted plants with a network of finely branched roots together with a fairly large leaf area. This makes this crop very sensitive to even small deficiencies of water which can affect growth rate, quality and yields negatively. Compared to other crops, the potato's sensitivity to water stress probably varies the most from one growth stage to the other. Therefore, it is of utmost importance to understand the requirements of each stage and how an excess or deficiency in moisture can affect your crop as presented by Pieter van der Merwe from VKB. Figure 1, illustrates a summary of the water requirements of potatoes as well as the effects of deficient and excess soil moisture regarding each stage of the plant. The seed tuber provides the crop with enough food reserves to kick start vegetative growth. As the leaf area increases the water requirements of the potato will also increase dramatically (Figure 1), and you need to take this into account

Chris Barnard from the Fertigation Academy gave an overview of important aspects such as climate and environment influences on irrigation as well as a farmer's perspective regarding challenges in fertigation. Some of his golden tips are given below.

Potatoes require a minimum soil depth of up to 600 mm, with no limiting layers or compaction. Soil structure and texture (percentage sand, silt and clay) is also important since it determines the rate of water infiltration, the amount of readily available water in the soil and consequently root growth and root function. We are thus actually farming with roots instead of potatoes since a good root system ensures optimal yields and quality due to optimal nutrient uptake, higher tolerance to drought and promotes resistance to diseases. To avoid moisture stress, the specific soil should hold enough moisture in the root zone between falls of rain or irrigation applications. Soils vary in their capacity to do this, depending on their texture, organic matter content and cultivation management. It can be illustrated in the following manner: you have two cars. One with a 300 L tank and one with a 10 L tank, which one uses more petrol to reach Cape Town? They use the same amount. The 10 L tank just needs to be refilled more often than the 300 L tank. The sandy soils are the 10 L tank because it does not have a huge water holding capacity and needs to be irrigated more frequently. Soil type thus have nothing to do with how much, but rather the frequency of irrigation.

Oxygen is a forgotten but essential element which affects uptake of nutrients as well as soil borne diseases. Chris Barnard compares this by asking the audience whether a person can eat a hamburger under water? No, you can't and plants work the

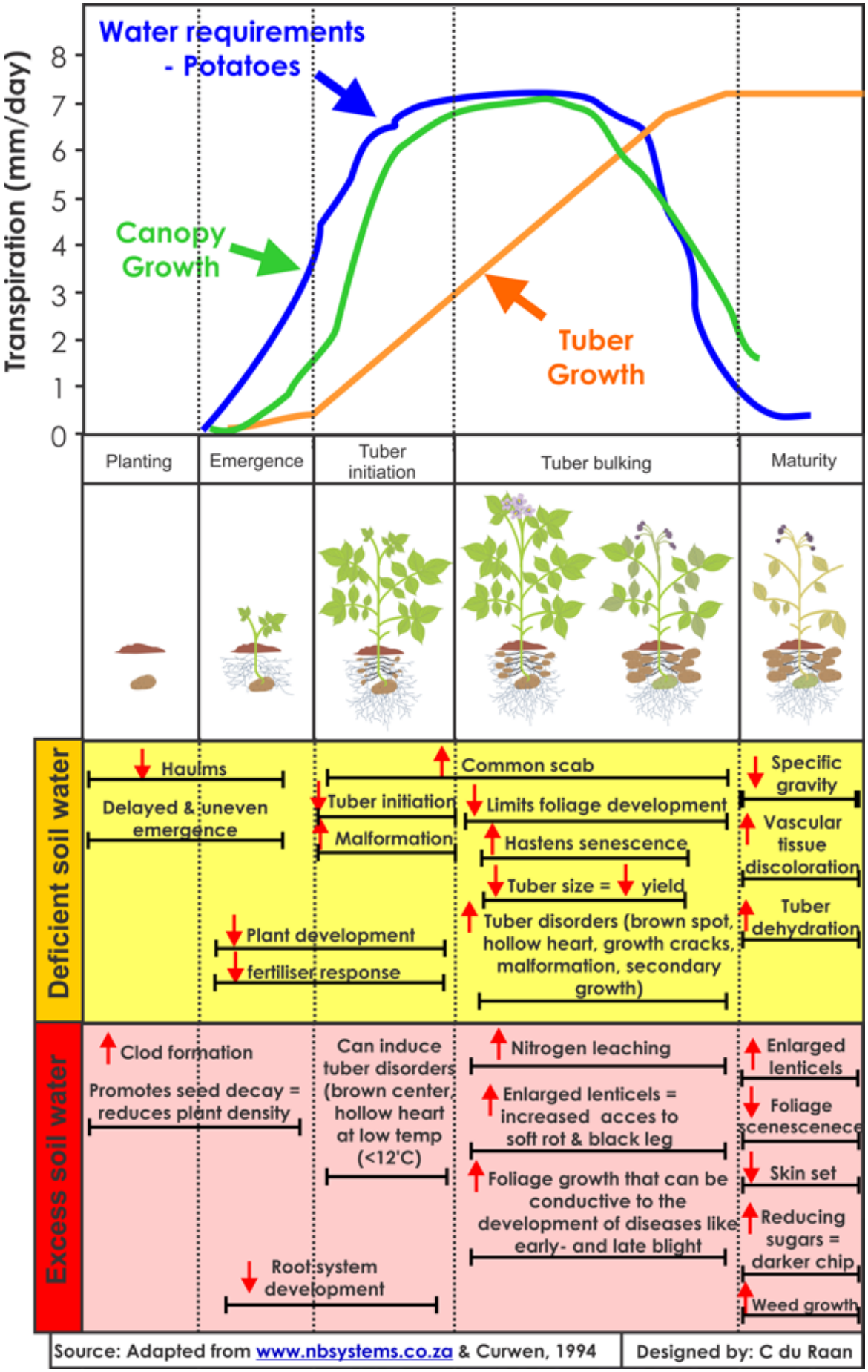


Figure 1: Summary of the water requirements of potatoes as well as the effects of deficient and excess soil moisture regarding each stage of the plant.

same. They can't take up nutrients if there is no oxygen (Table 1) in the soil. A balance should thus be obtained between oxygen and soil moisture since saturated soil contains too little to no oxygen. Determining the water content of the soil is of utmost

Table 1: The role of oxygen in the soil in the uptake of nutrients:

% O_2	% K uptake	% P uptake
20	100	100
5	75	50
0.5	37	30

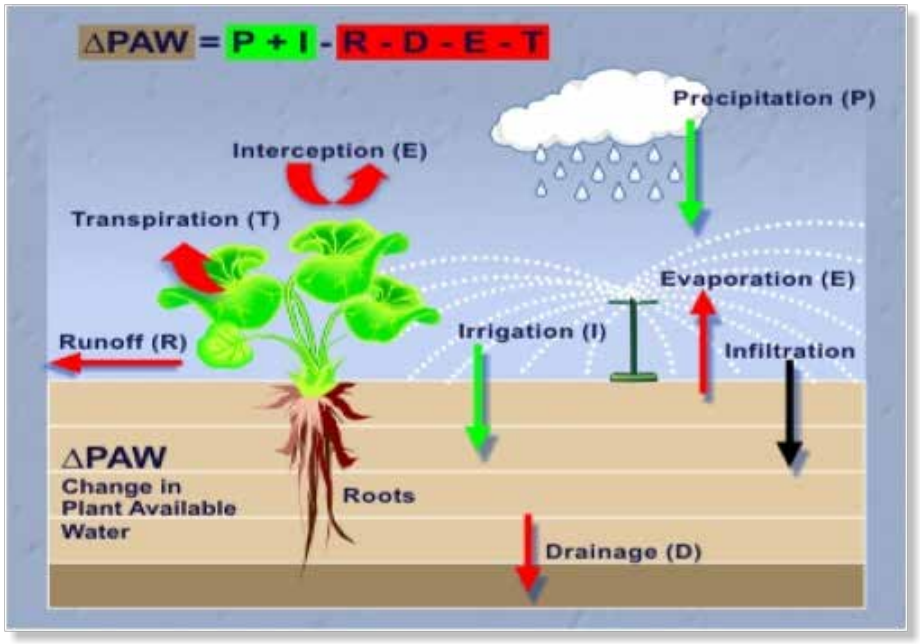


Figure 2: Components of the soil water balance (Annandale et al., 2005)

important and it will require from the farmer to be involved and not just present. The farmer thus needs to get out of the car and using a soil auger or even a shovel, check the soil moisture in the root zone (20 cm, 40 cm and 60 cm) and determine whether there's sufficient moisture by the feel method. When the ridge is dry (20 cm) it tells you that you need to irrigate but not how much. Your bottom layers (40 cm and 60 cm) will determine how much you need to irrigate. If the bottom layers are wet, this is an indication that you don't need to irrigate much you just need to refill the top layer.

The amount of water the crop will use dependent largely on environmental conditions. Environmental conditions that affect daily water usage include temperature, relative humidity, wind, and solar radiation. Vapour pressure deficit (VPD) is the atmospheric demand for water or the 'drying power' of the air, and is essentially a combination of temperature, relative humidity, radiation and wind in a single value which also plays a role. VPD values run in the opposite way to RH vales, so when RH is high VPD is low. The higher the VPD value, the greater the potential the air has for sucking moisture out of the plant.

The aim is to maintain a soil water balance which means that the incoming (rainfall & irrigation) and outgoing (crop use, evaporation, runoff, drainage and transpiration) soil water are balanced to ensure an adequate supply of soil water for the crop (Figure 2). The only outgoing soil water that is beneficial is transpiration since this facilitates the growth of the plant. Other outgoing soil water should be kept to a minimum to ensure adequate water for the crop.

The newest technology in soil moisture monitoring was demonstrated by Luan Steyn from the company Rural Integrated Engineering. This sensors' main purpose is to help small scale farmers optimize their irrigation, therefore saving water and increasing yields. Delegates to this course were lucky enough to be of the first ones experiencing them commercially. The Chameleon soil moisture sensor gives you an immediate reading for decision making by using colours instead of numbers to represent the moisture (Figure 3). It can thus be described as the fuel gauge of your soil, where you can see when to refill before it is too late. Numbers linked to the colours are also available for those who have a need for it. It is simple to use and affordable compared to other probes but still accurate. A very important feature of the system is the storage and interoperation of the data on the website. It gives a history of soil moisture at these measuring points as a pattern over a whole growing season, and will aid farmers as they can see the effects of irrigation events

and accordingly how they adapt their irrigation to improve soil moisture. The advantages of this system thus include:

- Affordable, while maintaining accuracy.
- The soil moisture pattern provides easy to interpret information.
- It gives a real time reading of soil moisture at three depths.
- Data analysis for schemes and regions to improve high level management and planning.

Discussions were followed up by practical irrigation on potato farms giving the attendees tools to monitor their irrigation and how to install and use the Chameleon. During this practical session the need to observe your plants well in the field was highlighted. Alex Jandrell explained that when you look at you plants it is like reading the book of life where you can read your sins. For instance, when the plant experiences stress it will convey the message by showing you symptoms which include a duller, more blueish colour in the canopy and slight loss of turgidity of the foliage. Especially at the land edges, where moisture shortages usually manifest first, you will recognise these symptoms first. The changes can often only be detected by looking at the crop as a whole rather than at the individual plants. When pulling out a plant, you can also read whether water stress occurred during the season by looking at the stolons and tuber initiation. When tuber initiation is reduced and the stolons are short and developed close to the haulm, it is a sign that moisture stress took place. Another indicator of water availability is the leaf temperature. If the leaves are cool during the hot part of the day, the plants do not suffer from water stress. However, if the leaves are warm, irrigation is needed.

The course will be followed up by a second visit on each of the attended farmers farms in August to learn how they are doing and where further support can be given.

References:

*CURWEN D. 1994. Water stress-related disorders. Nebr Potato Focus, Proc. pp. 22-28. UNL PHREC 94-04.

*ANNANDALE JG, STEYN JM, BENADE N, JOVANOVIC NZ and SOUND P. 2005. Irrigation Management Multimedia software In: Technology Transfer of the Soil Water Balance (SWB) Model as a User Friendly irrigation Scheduling Tool. WRC Report No. TT251/05

*https://www.nbsystems.co.za/potato/index_27.htm

Figure 3: Chameleon field reader and each colours' meaning

Sandveld Aartappel-werkgroep-inligtingsdag weereens ń reuse sukses

Chantel du Raan (Aartappels Suid-Afrika)

Die jaarlikse Sandveld Aartappelwerkgroep-inligtingsdag op 7 Maart 2019 in Aurora is bygewoon deur meer as 60 persone van die area. Water was 'n groot besprekingspunt gedurende hierdie jaar se inligtingsdag weens die knellende droogte nog vars in die Wes-Kaap produsente se geheue. Landbou staar 'n dubbele uitdaging in die gesig om genoeg voedsel vir die wêreld se groeiende bevolking te produseer, terwyl die varswaterbronne van die aarde verminder. Aartappels maak egter die beste gebruik van grond en water in vergelyking met ander gewasse vir die produksie van energie en proteïen vir die bevolking. Verder het die aartappel 'n baie hoe voedingswaarde. Volgens die FAO, 2008 met elke kubieke meter water toegedien in die verbouing van aartappels produseer die aartappel 5 600 kalorieë (kcal), in vergelyking met 3 860 in mielies, 2 300 in koring en 2 000 in rys. Vir dieselfde kubieke meter lewer die aartappel 150 g proteïen, dubbeld dié van koring en mielies, en 540 mg kalsium, dubbel die koring en vier keer dié van rys (FAO, 2008).

Ongeag die feit dat aartappels die beste gebruik maak van grond en water in vergelyking met ander gewasse vir die produksie van energie en proteïen, streef die Sandveld produsente tesame met bedryfsverwante rolspelers soos Aartappels Suid-Afrika en tersiêre instansies daarna om steeds hierop te verbeter om plaaslike hulpbronne te bewaar en is dit by die inligtingsdag bespreek.

Grondwatermonitoring in die Sandveld

Hierdie projek word al vir 15 jaar deur Aartappel Suid-Afrika befonds en tans word daar 51 boorgate vir watervlak en 56 boorgate vir waterkwaliteit noukeurig gemonitor deur mnr. Julian Conrad (van GEOS). Die data dra baie by tot die identifisering van bronne waarvan die watervlakke en kwaliteit beslis afneem. Hierdie is een van die waardevolste grondwaterdatabasisse in Suid-Afrika wat ons in staat stel om 'n groter begrip rakende grondvloeipatrone in die Sandveld te verkry. Dit verbeter ook die hele aspek van monitering en bestuur van grondwater. Mnr. Conrad het verlede jaar se resultate met die van hierdie jaar vergelyk en gevind dat grondwatervlakke met 0.12m gedaal het terwyl grondwaterkwaliteit met 43% verbeter het.

Ontleding van ekologiese volhoubaarheid van aartappelproduksie in Suid-Afrika

'n Gedetailleerde studie om interaksies tussen nutriënt- en watergebruikdoeltreffendheid in aartappelgebaseerde rotasies te bepaal is deur prof. Martin Steyn (Universiteit van Pretoria) en mnr. Malcom Kayes (Stellenbosch Universiteit) voorgedra. Die projek word tans in Noordwes en die Sandveld uitgevoer met die doel om voeding- en watergebruiksdoeltreffendheid te optimaliseer.

Sandveld bewaringsboerderypraktyk

Dr. Jacques van Zyl (Departement van Landbou Wes-Kaap) het 'n voorlegging gemaak ten opsigte van drie bewerkingsbehandelings, naamlik maksimumversteuring, intermediêre versteuring en minimumversteuring.

Geen daling in opbrengs is gedurende die vier jaar tussen konvensionele mouldbord en paraplough bewerkings opgemerk nie. Dit is ook duidelik dat die groottegroepverspreiding en algehele gehalte nie negatief beïnvloed word deur 'n sekere bewerkingsbehandeling nie. Die grond verdigting tot 10 cm diep was nie beïnvloed deur bewerkingsbehandeling nie, terwyl die 20 en 30 cm dieptes getoon het dat die paraplough-behandeling tot die mees gekompakteerde lae op hierdie diepte gelei het. Op 40 en 50 cm dieptes is geen beduidende verskille ten opsigte van verdigting gevind nie. Op 60 tot 80 cm diepte het die paraplough-behandeling die laagste gronddigtheid getoon. Grond-koolstofvlakke was aansienlik hoër met die paraplough-behandeling in vergelyking met die konvensionele behandeling.

Wat grondrespirasie as 'n aanduiding van grondbiologiese aktiwiteit betref, dit is duidelik dat die paraplough-behandeling grondrespirasie verbeter en gevolglik biologiese aktiwiteit.

Plantluismonitering

Dr. Kobus Laubscher (Departement van Landbou Wes-Kaap) het die gehoor se geheue verfris rakende die hoë plantluisaktiwiteite gedurende Oktober in die 2017-seisoen. Hy het dit toegeskryf aan die feit dat onkruide en ander gasheerplante vinnig verdroog het gedurende Oktober. Die 2018-data het ooreengestem met die laaste elf jaar se vektordruk met die uitsondering van 2017. Tamatieblaarmyner het ook aansienlik meer in die Sandveld voorgekom tydens die 2018-seisoen in vergelyking met die 2017-seisoen. Dr. Laubscher het afgesluit af met die volgende punte van belang by insekbeheer:

- Moet geen gapings in beheerprogram laat nie.
- Hou by beheerprogram (weekliks).
- Wissel plaagbeheermiddels af.
- Sorg vir voldoende bedekking.
- Indien aalwurmbeheer toegepas word, moet plantluise ook beheer word.
- Aartappelmotprogram moet ook help om plantluisaktiwiteite te onderdruk.
- Spuitbalkdoeltreffendheid hang af van
  - Korrekte druppelgrootte.
  - Spuitpatroonkeuse.
  - Toepaslike watervolume per hektaar.
  - 'n Deurlopende spuitpunthoogte van 500 mm.

Kultivarproewe

Die inligtingsdag is afgesluit met die jaarlikse kultivarevaluasieproef-resultate wat deur mnr. Piet Brink (voorsitter van die werkgroep) voorgelê is. Die proef het 21 kultivars ingesluit wat onder besproeiing op die plaas Fisantevlug van mnr. Albert de Villiers in die Aurora-distrik op 10 Oktober 2018 geplant is. Knolle en skyfies van elk van die 20 tafel- en verwerkingskultivars is tydens die inligtingsdag uitgestal.

Prospects for the coming seasons

Pieter van Zyl (Potatoes South Africa), Divan van der Westhuizen (BFAP) and Marion Delport (BFAP)

For every agricultural industry a series of core drivers or fundamental factors exist that can determine the direction of an industry. A differentiation can also be made between drivers influencing an industry in the short term and the more long-term strategic drivers. The biggest challenge when making future projections, is to make assumptions pertaining to the fundamental drivers as well as to anticipate when the interrelationship between these drivers will change.

Prospects for potato hectares, production, consumption and market prices

Potato production in South Africa has increased by an average 2.1% per annum over the past 20 years (see Figure 1). During these two decades, potato area has remained relatively constant at an average 51.8 thousand hectares while yield improvements (2.1% average increase per annum) drove production increases. The average potato yield (dryland and irrigation) in 1998 was 30.4 tonnes per hectare, in 2018 the average potato yield was recorded at 46.5 tonnes per hectare and by 2028 BFAP anticipates yields close to 50 tonnes per hectare (average annual growth of 1.2%).

The projections generated by BFAP's potato partial equilibrium model (the Bureau for Food and Agricultural Policy) are based on a set of macro-economic assumptions as well as the latest industry information. For 2019, the potato production is projected to increase by 3.3% to 2.54 million tonnes. The area planted is projected to increase by 1 090 hectares in 2019 and the national average

yield is also projected to increase to just over 47 tonnes per hectare. Potato production is projected to increase by an average 0.7% per annum over the next decade to just over 2.7 million tonnes in 2028. The increase is primarily driven by higher yields. In the long-term it is assumed that factors such as research, cultivar development, better production practices and better plant protection products will drive an average increase in yield of 1.2% per annum.

Potato prices are driven by domestic supply and demand dynamics as potatoes are not typically traded in bulk. The nominal market price of potatoes seems to have normalised after the drought-induced extremes during 2016 and 2017. Due to an increase in domestic production, potato prices are projected to decline from R38.70/10 kg bag in 2018 to an annual average of R36.50/10 kg bag (-5.7%) in 2019. The real average market price (deflator CPI all products, December 2012 = 100) has been moving sideways at a level of around R30/10 kg bag (see Figure 2). Sideways real market price movement implies that nominal prices increase at roughly the same rate as inflation over the long run. In the short term however,

Table 1 – Summary of key input cost trends over the past seasons

	Packing material	Tractors	Implements	Fertiliser	Fuel
5-year average annual change	5%	6%	4%	3%	4%
10-year average annual change	8%	8%	7%	5%	6%
Total % increase: 2010-2019	87%	83%	69%	43%	68%
Total % increase: 2015-2019	24%	23%	18%	12%	23%
Total % change: 2018 & 2019	9%	7%	7%	5%	14%

Source: Department of Agriculture, Forestry and Fisheries (Agricultural Abstract), 2019

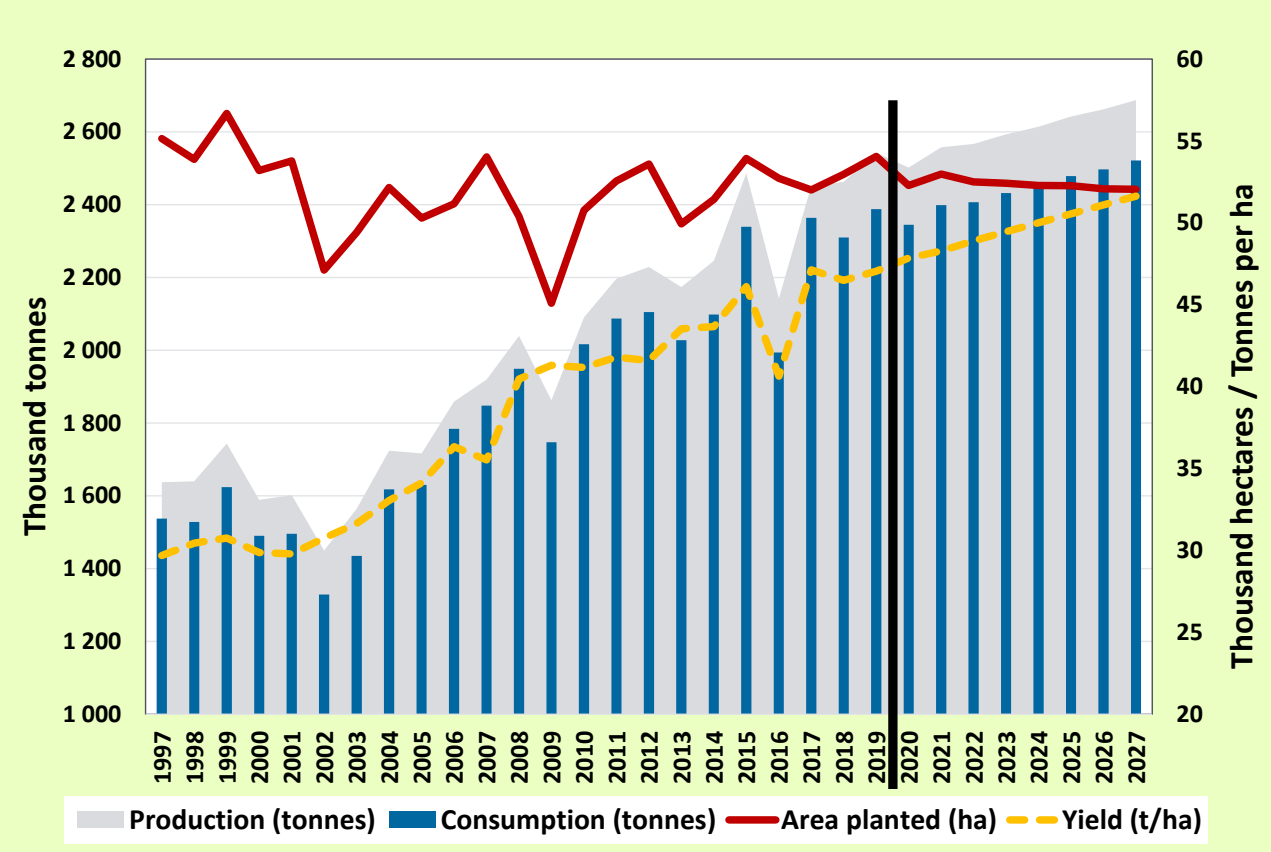


Figure 1: Projection till 2027 - production, consumption, hectares planted and average yield per hectare

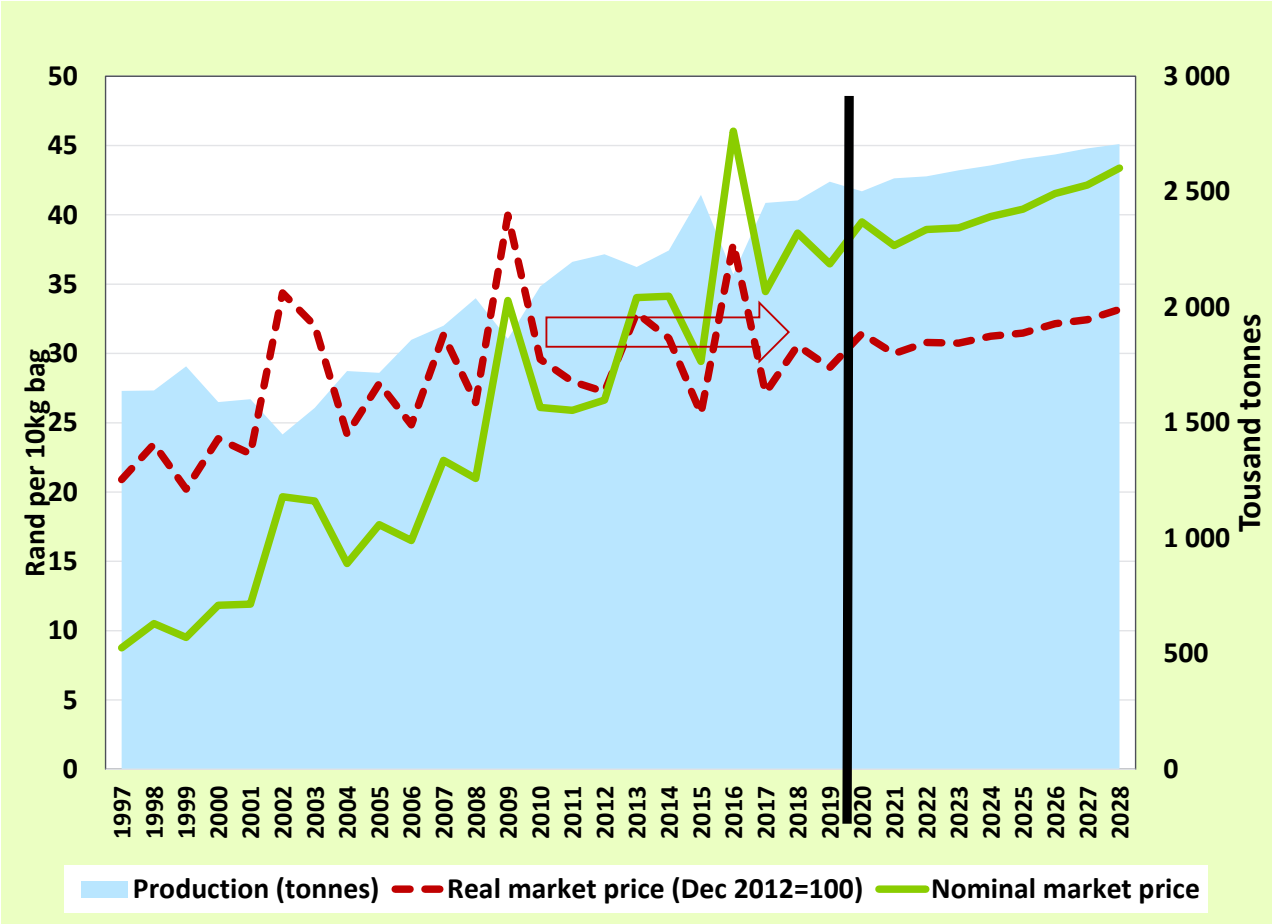


Figure 2: Nominal and real market prices versus production

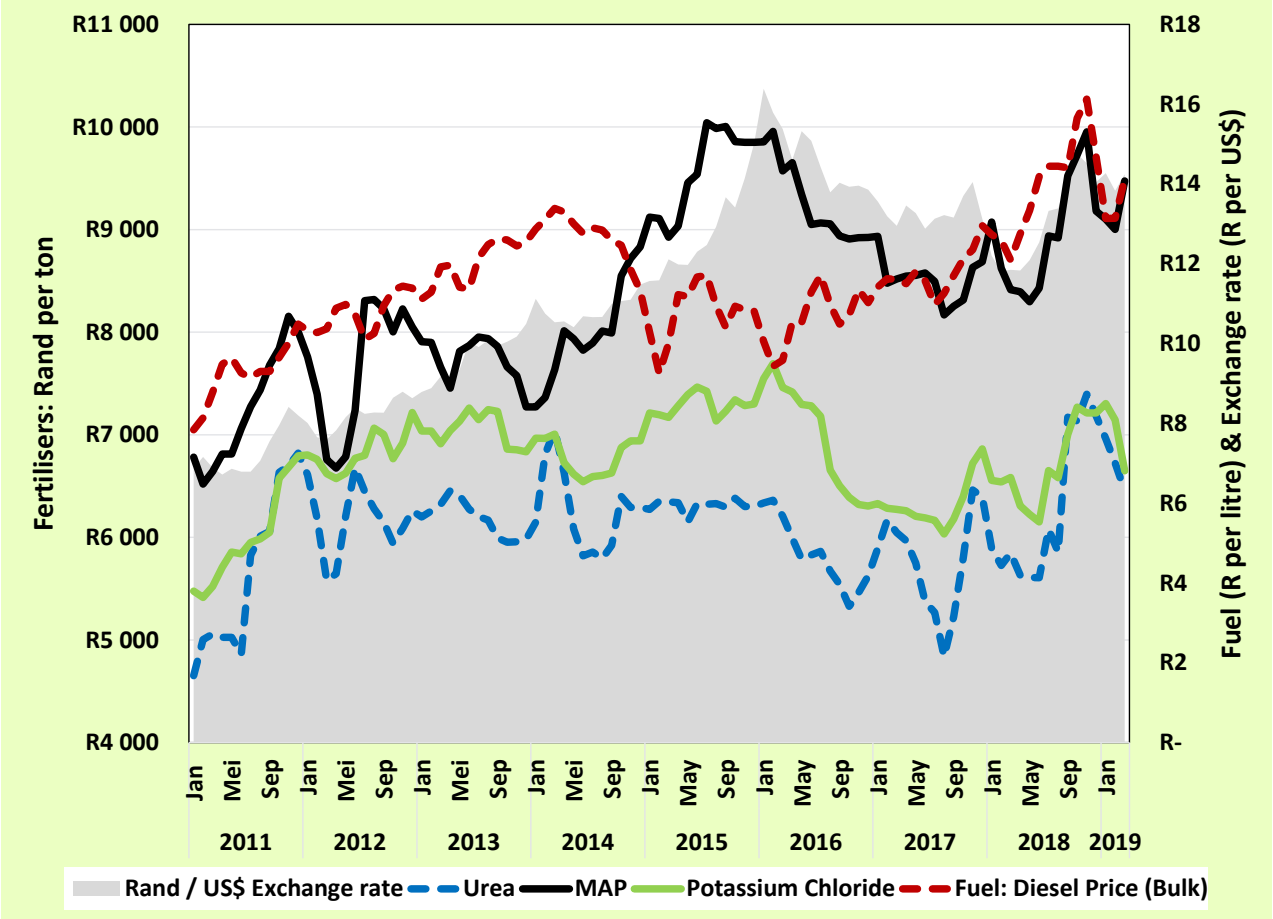


Figure 3 - Input cost trends for fuel & fertiliser / Exchange rate

the real potato market price is expected to decrease by R5.25 to R28.98 per 10 kg bag in 2019.

In line with increased production, domestic consumption is expected to increase by 2.1% to 2.38 million tonnes in 2019. Fresh formal consumption (at fresh produce markets and retailers) makes up 39% (883 000 tonnes in 2018) of the total domestic use, 32% (737 000 tonnes in 2018) of the potato market goes to informal fresh consumption while 22% of potatoes produced in a given year are processed and the balance is seed production. Since 2008 fresh informal potato consumption grew on average at twice the rate (2.4% per annum) compared to fresh formal potato consumption (1.2% per annum).

A similar trend is projected for the outlook period albeit at a slower rate – formal potato consumption is projected to increase to 995 000 tonnes while informal potato consumption is projected to increase to just over 800 000 tonnes in 2028.

Key trends in farming input expenditure

A prominent challenge within agriculture is declining commodity prices in real terms often in an environment where the cost of inputs is increasing. Since South Africa is a net importer of various farming inputs such as fertilisers and chemicals, these inputs are also subject to fluctuations in the exchange rate. Therefore, if the Rand is depreciating against the US dollar (US$), one could anticipate that the cost of imported inputs would rise. The objective of this section is to illustrate recent trends in the cost of key agricultural inputs in South Africa, especially for cost items that are not typically monitored such as electricity, wages and packaging material.

Figure 3 *(Source: Grain SA & BFAP, 2019)* indicates the cost for key fertilisers and fuel and is further compared to the Rand / US$ exchange rate. The exchange rate against the US$ has reported a depreciation of nearly 80% since 2011. The average exchange rate for 2011 was R7.27 per US$, R5.77 firmer opposed to 2018. Over the same period, the cost for fuel reported the largest increase, rising from R9.26 per litre in 2011 to R13.95 per litre in 2018, an increase of 51%. The cost for Urea remained relatively stable over the period, increasing marginally by 11% from 2011. The largest increase was observed in the

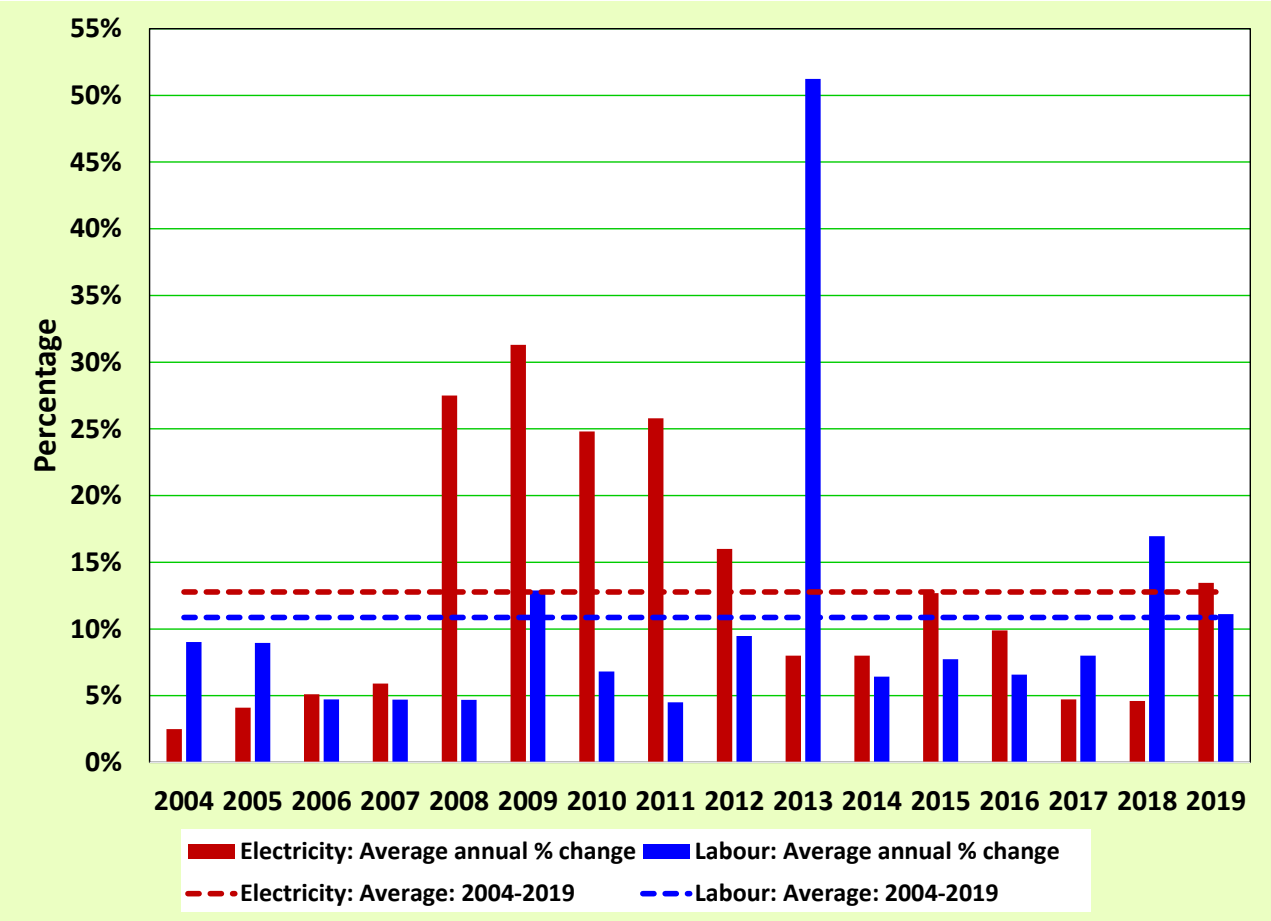


Figure 4 - Annual percentage change in the cost for electricity & labour

cost for MAP which indicated an increase of 24% since 2011. The cost for potassium chloride followed a similar trend as the cost for Urea. It is projected that the cost for Urea in 2019 will increase marginally from 2018 levels whereas the cost for potassium chloride is projected relatively sideways. For MAP, an increase of 5.8% is anticipated.

Administered costs, such as the cost for electricity and labour, play a vital role in the financial planning of horticultural producers. Previous studies have indicated that the share of these inputs towards total cost is increasing at an accelerated pace. Figure 4 (Source: Statistics South Africa, Potatoes SA and BFAP, 2019) indicates the annual percentage change in the cost for electricity and labour. Over the period from 2004, the cost for electricity has increased on average by 13% per annum with some significant spikes from 2008 to 2011 when the annual percentage change exceeded 25%. Similarly, the cost for labour has increased on average by 11% over the same period. For 2019, it is projected that the cost for electricity and labour will increase by 13.5% and 11.1% respectively from the 2018 levels.

Figure 5 (Source: *Department of Agriculture, Forestry and Fisheries (Agricultural Abstract),* 2019) illustrates the cost indices for packing material and tractors and is compared to the cost trends for fuel and fertilisers. Table 1 further provides a summary for these cost indices in recent years. The results indicate that packing material has increased on average by 5% per annum over the past five years where the cost for tractors has increased by 6%. Both these input cost variables have increased at a faster rate opposed to fuel and fertilisers. Over the period 2010 to 2019, packaging material is 87% more expensive, tractors 83%, fertiliser 43% and fuel 68%. In 2018 and 2019 alone, packaging material is projected to increase by 9% in total, 7% for tractors, 5% for fertilisers and 14% for fuel.

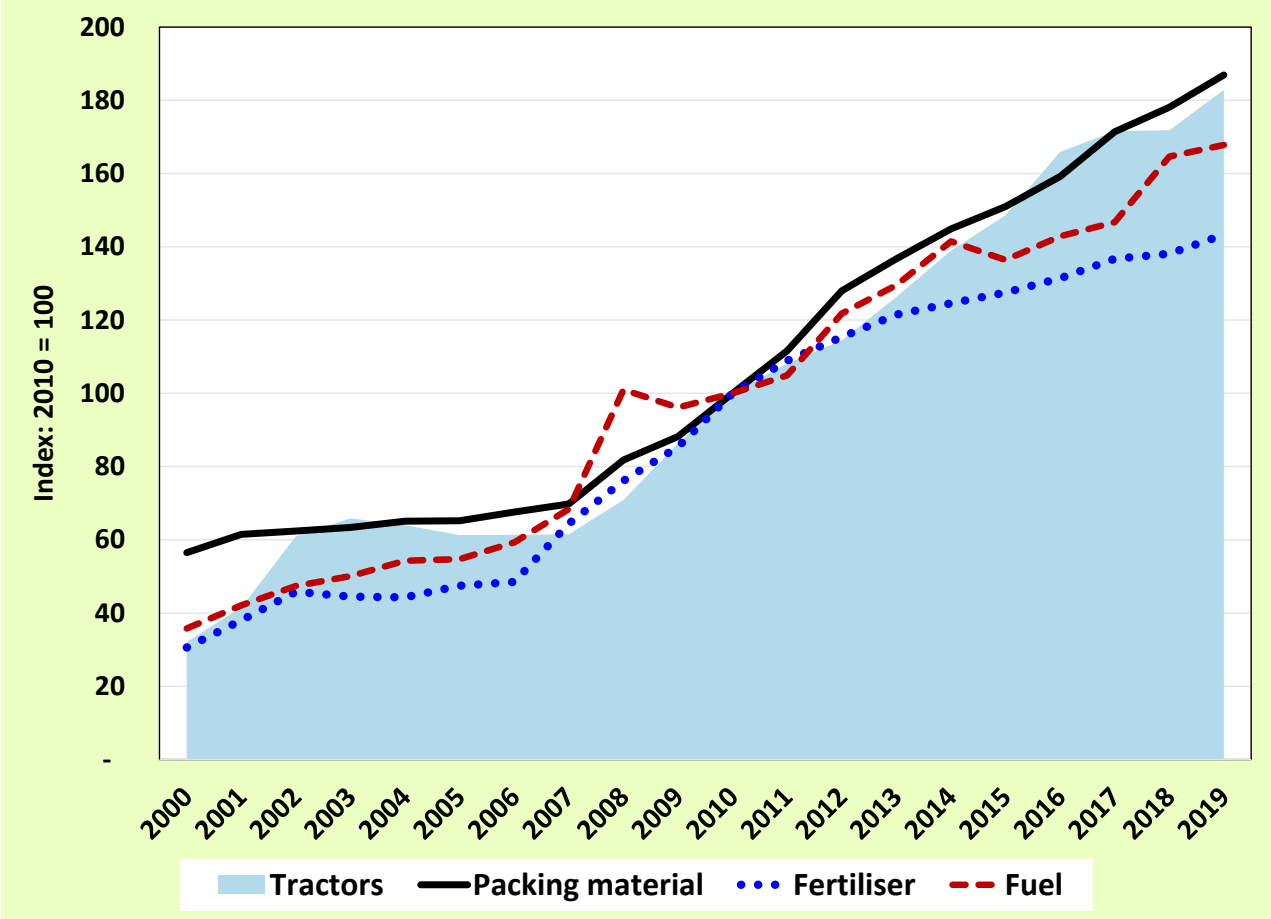


Figure 5: Input cost index for packing material, tractors, fertiliser & fuel

Hoe vergelyk die **verbruikersprys van aartappels** met ander produkte?

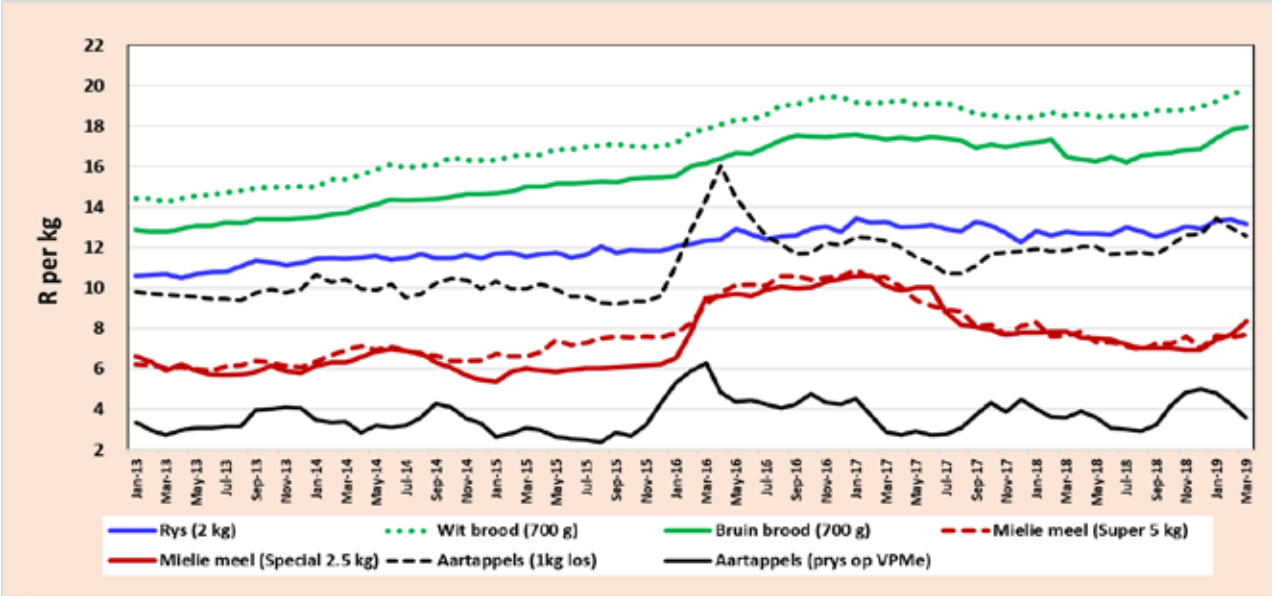
Laryssa van der Merwe (Aartappels Suid-Afrika)

Figuur 1 gee 'n uiteensetting van die verskillende verbruikerspryse vir verskillende styselgroepe vanaf Januarie 2013 tot Maart 2019 *(Bron: Statistiek SA)*. Alle pryse word uitgedruk in Rand per kilogram. Dit is duidelik dat die prys van brood (wit en bruin) op 'n per kilogram basis relatief die duurste styselgroep per kilogram is waar gemiddelde pryse oor tyd styg vanaf ongeveer R9.19 vir 'n bruinbrood (700 gram) en R10.28 vir 'n witbrood (700 gram) in 2013. In 2018 kos 'n witbrood (700 gram) gemiddeld R13.05 teenoor 'n bruinbrood (700 gram) se gemiddelde prys van R11.67. Vir 2019 tot en met Maart kos 'n witbrood (700 gram) gemiddeld R13.67 teenoor 'n gemiddelde prys van R12.41 vir 'n bruinbrood (700 gram).

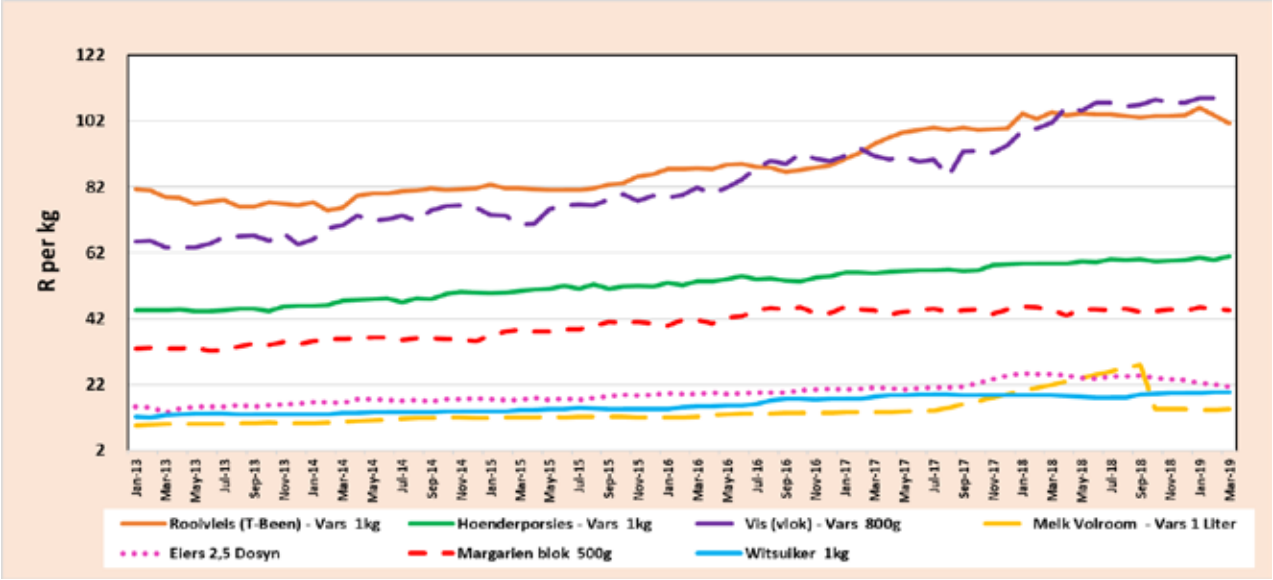
Sedert 2013 het mieliemeel se gemiddelde pryse sywaarts beweeg tot die eerste paar maande van 2016. Die erge droogte van 2015/2016 het ook in die graanproduksiegebiede geheers. Hoë gemiddelde pryse vir mieliemeel is tot ongeveer Julie 2017 ervaar, aldus die figuur. Pryse het aanvanklik effens gedaal en toe weer sywaarts begin beweeg tot einde 2018.

Aartappels (een kilogram los) se gemiddelde verbruikersprys het einde 2015 skerp gestyg nadat dit lank rondom R10 per kilogram sywaarts beweeg het. Vanaf middel 2016 het die verbruikersprys rondom R12 per kilogram sywaarts beweeg tot einde 2018. Ongelukkig is geen ander aartappelverpakking se data by Statistiek SA beskikbaar nie.

Die verbruikerspryse vir enkele ander voedselitems



Figuur 1: Verbruikerspryse vir verskillende styselgroepe (uitgedruk in Rand per kg)



Figuur 2: Verbruikerspryse vir verskillende voedselgroepe (uitgedruk in Rand per kg/dosyn)

word aangedui in Figuur 2. 'n Redelike prysstyging word waargeneem vir vars vis oor tyd. Volroommelk en witsuiker se prysstygings beweeg feitlik parallel vir die tydperk. Hoenderporsies, margarien en eiers ervaar geleidelike stygings oor tyd, aldus die figuur.

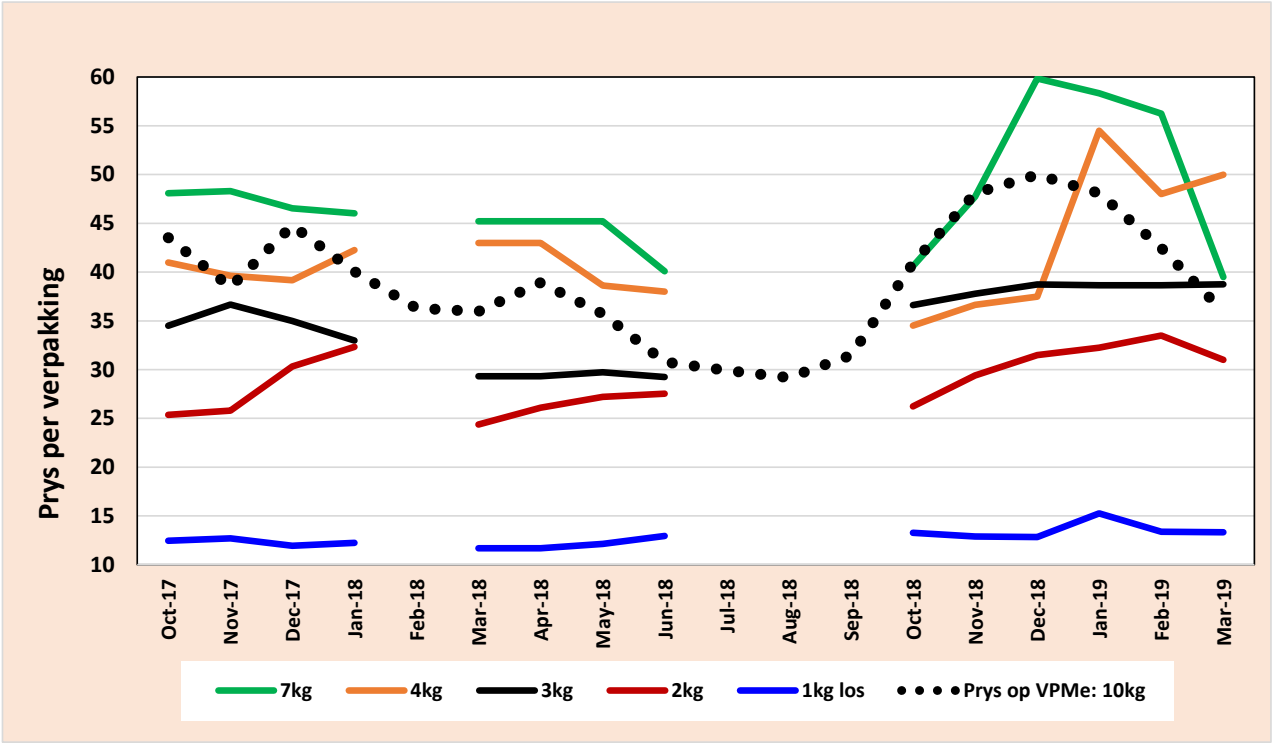
Volgens Tabel 1 het aartappels (een kilogram los) die grootste prysstyging (26%) getoon vir die tydperk Maart 2015 tot Maart 2019. Aartappels (tien kilogram) se gemiddelde prys op varsproduktemarkte het met 17% toegeneem, bruinbrood (700 gram) se gemiddelde prys het met 20% gestyg, rys (twee kilogram) se gemiddelde prys met 14%, teenoor 'n 23% styging vir mieliemeel (2.5 kilogram). Indien die verskillende styselprodukte op 'n per kilogram basis vergelyk word, bly aartappels 'n relatief goedkoop bron van stysel, veral as dit direk op markte aangekoop word. Die gemiddelde prys per kilogram vir rys is R13.15, mieliemeel kos R9.18 per kilogram en die gemiddelde prys vir een kilogram aartappels is R12.59.

Gemiddelde pryse vir aartappelverpakkings beskikbaar in vier stede word weergegee in Figuur 3 vir die tydperk Oktober 2017 tot Maart 2019 (Bron: Nielsen). Februarie en Julie tot September (2018) se inligting was nie beskikbaar nie. Die gemiddelde prys vir 'n sewe kilogram aartappelsakkie vir die gegewe

Tabel 1: Verandering in verbruikerspryse vir verskillende styselgroepe (Maart van elke jaar)

	Maart 2015	Maart 2016	Maart 2017	Maart 2018	Maart 2019	Verandering sedert 2015	Prys R/ kg: Mrt 2019
Rys, 2 kg	23,13	24,64	26,58	25,54	26,30	14%	13,15
Bruinbrood, 700 g	10,51	11,33	12,15	11,53	12,57	20%	17,96
Mieliemeel, 2,5 kg	18,71	25,23	28,58	22,29	22,94	23%	9,18
Aartappels, 1 kg los	9,96	14,38	12,31	11,86	12,59	26%	12,59
Aartappels, 10 kg (prys op varsproduktemarkte)*	30,72	62,78	28,75	35,95	35,93	17%	3,59

tydperk is R47.64. Laasgenoemde se pryse het tussen R40 en R50 sywaarts beweeg, maar het skerp gestyg teen einde 2018. 'n Vier kilogram sakkie aartappels het soortgelyke prysbewegings ervaar. Vir die tien kilogram aartappelsakkie op die varsproduktemarkte (alle klasse en alle groottes) was die gemiddelde prys R38.97 oor die tydperk. Let op die lae markpryse vir Junie tot September 2018 toe goeie opbrengste gerealiseer is in die onderskeie produksiestreke wat in bemarking was. Die gemiddelde verbruikersprys vir 'n een kilogram aartappelsakkie (los) was R12.77 oor die tydperk.



Figuur 3: Gemiddelde verbruikerspryse: Aartappelverpakkings in 4 stede

Vervoerkoste van 'n 10 kg sakkie aartappels met eie vragmotor

Janó Bezuidenhout (Aartappels Suid-Afrika)

Die vervoerkoste-model van Aartappels Suid-Afrika is opgedateer met die nuutste inligting beskikbaar tot Maart 2019 om as 'n standaard *"benchmark"* vir die produsent te dien. Produsente wat tafelaartappels produseer, bemark gemiddeld meer as 60% van hulle opbrengs op die nasionale varsproduktemarkte. Met vervoerkostes wat wissel van R15 000 tot R30 000 per hektaar is dit 'n koste-item wat aandag moet geniet en so doeltreffend moontlik bestuur moet word.

Die metodologie wat in hierdie model gebruik word om vervoerkoste te kan bereken, kan verskil van die metodologie wat deur 'n produsent gebruik word.

Eers wanneer die produsent sy/haar eie data in die geel gekleurde gedeeltes van die model ingetik het, sal dit hom/haar in staat stel om sy/haar syfers en berekeninge met die standaard te kan vergelyk.

Die volgende aannames is in die model gebruik om die model so verteenwoordigend as moontlik te maak vir die aartappelbedryf.

- Berekenings in hierdie model veronderstel dat die vragmotor nie net gebruik word om aartappels na die markte te vervoer nie. Die model maak voorsiening dat vyf verskillende produkte vervoer

Tabel 1: Vergelykende vervoerkoste vir `n twaalf maande tydperk gebaseer op `n enkele gevallestudie

	Maart 2017			Maart 2018			Maart 2019		
	per km	Jaarliks		per km	Jaarliks		per km	Per annum	
Vaste koste									
Kapitale & rentekoste (paaiement)	R 1,54	R 378 335	11%	R 1,52	R 373 196	11%	R 1,59	R 391 024	11%
Versekering	R 0,62	R 152 060	4%	R 0,62	R 153 250	4%	R 0,65	R 160 525	4%
Lisensiegeld	R 0,09	R 22 012	1%	R 0,11	R 25 968	1%	R 0,12	R 30 656	1%
Totale vaste koste (A)	R 2,24	R 552 407	16%	R 2,24	R 552 414	16%	R 2,36	R 582 204	15%
Lopende koste									
Brandstof	R 6,21	R 1 529 727	45%	R 6,31	R 1 552 291	45%	R 7,64	R 1 880 968	40%
Aanvul-olie	R 0,31	R 76 486	2%	R 0,32	R 77 615	2%	R 0,38	R 94 048	2%
Tolgeld	R 0,42	R 103 148	3%	R 0,48	R 118 094	3%	R 0,48	R 118 094	3%
Herstel & Onderhoud:	R 1,45	R 356 990	10%	R 1,43	R 352 000	10%	R 1,50	R 368 852	19%
Perd	R 1,05	R 258 510		R 1,12	R 276 800		R 1,18	R 289 652	
Sleepwa	R 0,40	R 98 480		R 0,31	R 75 200		R 0,32	R 79 200	
Bande:	R 0,94	R 232 505	7%	R 0,86	R 212 949	6%	R 0,92	R 225 345	6%
Perd - voorste 2	R 0,30	R 74 150		R 0,19	R 47 502		R 0,20	R 48 081	
Perd & sleepwa (behalwe bo)	R 0,64	R 158 356		R 0,67	R 165 446		R 0,72	R 177 264	
Onvoorsiene uitgawes & Admin	R 0,61	R 150 000	4%	R 0,61	R 150 000	4%	R 0,61	R 150 000	4%
Arbeidskoste:	R 1,67	R 410 920	12%	R 1,75	R 431 914	13%	R 1,89	R 466 467	11%
Bestuurdersloon	R 1,06	R 261 600		R 1,10	R 271 820		R 1,19	R 293 566	
Assistenteloon	R 0,39	R 97 000		R 0,43	R 105 730		R 0,46	R 114 188	
Reis & oornagtoelaag	R 0,21	R 52 320		R 0,22	R 54 364		R 0,24	R 58 713	
Totale loopkoste (B)	R 11,62	R 2 859 777	84%	R 11,76	R 2 894 862	84%	R 13,42	R 3 303 776	85%
TOTALE KOSTE (A+B)	R 13,86	R 3 412 184	100%	R 14,00	R 3 447 276	100%	R 15,78	R 3 885 980	100%
Aantal tonne wat vervoer word		7 910	ton		7 910	ton		7 910	ton
Aantal km wat vrag vervoer word		246 200	km		246 200	km		246 200	km

Totale gemiddelde vervoerkoste per ton (uitgesluit palette)	R 431	R 436	R 491
Totale gemiddelde vervoerkoste per 10kg	R 4,31	R 4,36	R 4,91
Totale gemiddelde vervoerkoste per rit (heen-en-weer)	R 15 098	R 15 253	R 17 195
Totale gemiddelde vervoerkoste per hektaar aartappels	R 19 412	R 19 612	R 22 107
Staankoste* per werksdag (Vaste koste + Bestuurdersloon)	R 3 350	R 3 392	R 3 604

* Die koste indien die vragmotor in die stoor staan en dus nie werk nie.

kan word gedurende 'n 12 maande tydperk. Slegs kostes word bereken en geen voorsiening word gemaak indien die produsent 'n inkomste met sy/haar vragmotor verdien nie.
- 'n Opname wat gedurende 2012 onder aartappelprodusente gedoen is, het aangedui dat 'n vragmotor maklik 95% van die terugritte leeg van die markte af terugkeer. Voorsiening word in die model gemaak dat daardie persentasie van die ritte wat die vragmotor leeg vanaf die markte af terugkeer, ingevul kan word. Produsente kan dus maklik bereken wat die verskil is tussen 'n vragmotor wat leeg terugkeer en een wat vol gelaai (met ander produkte) terugkeer. Verskeie ander scenario's kan ook met die model getoets word.
- Die vragmotor wat in die model gebruik word, is 'n *"7-as Tautliner Interlink"*.
- Vyf produkte word vervoer, onder andere aartappels en uie en ook insette, soos moere.
- Aartappels en uie word na vyf markte regdeur die seisoen gestuur.
- Alle terugvragte is leeg.
- Totale km per jaar afgelê = 246 200
- Totale tonnemaat vervoer per jaar = 7 910 (100% van terugvragte is leeg)

In Tabel 1 word 'n kostevergelyking gedoen tussen die Maart 2017, Maart 2018 en Maart 2019 modelle. Al wat in die Maart 2019 model verander het, is die onderskeie koste-items (Die model se koste-items is dus net weer in Maart 2019 opdateer). Dit is belangrik om te onthou dat die model nie noodwendig verteenwoordigend is vir 'n spesifieke streek nie. Dit is bloot 'n gevallestudie.

Volgens Tabel 1 is die totale beraamde jaarlikse koste vir die drie datums van opdatering R3.412 miljoen, R3.447 miljoen en R3.886 miljoen onderskeidelik. Vir die gegewe totale afstand van 246 200 km wat per jaar afgelê word, is die koste per kilometer gery R13.86, R14.00 en R15.78 onderskeidelik. Die gemiddelde vervoerkoste per 10 kg sakkie kom dus onderskeidelik op R4.31, R4.36 en R4.91 te staan. Indien die produsent 4 500 sakkies (10 kg) per hektaar sou realiseer, is die totale vervoerkoste sowat R22 107 per hektaar in die Maart 2019 model, teenoor R29 476 indien die produsent 6 000 sakkies (10 kg) per hektaar sou realiseer.

In Tabel 2 word drie scenario's se effek op die totale beraamde jaarlikse vervoerkoste per 10 kg sakkie uiteengesit. Die effek is duidelik sigbaar wat beklemtoon dat die vervoer-aksie so effektief as moontlik uitgevoer moet word.

Staankoste van 'n vragmotor is ook belangrik om in ag te neem en moet so ver moontlik deur goeie bestuurspraktyke beperk en selfs vermy word. Die staankoste bestaan uit die vaste koste en die bestuurdersloon wat uitgedruk word as 'n koste per werksdag en beloop R3 604 per dag (Maart 2019). Die vragmotor kos die produsent dus R3 604 per dag indien die vragmotor in die stoor sou staan en nie werk nie.

Die vervoerkoste model is op die volgende web-adres beskikbaar:
http://www.potatoes.co.za/industry-information/transport-cost-model.aspx

In Tabel 2 word drie scenario's se effek op die totale beraamde jaarlikse vervoerkoste per 10 kg sakkie uiteengesit. Die effek is duidelik sigbaar wat beklemtoon dat die vervoer-aksie so effektief as moontlik uitgevoer moet word.

Tabel 2: Drie scenario's se effek op die totale beraamde vervoerkoste per jaar	**Maart 2019 opdatering: Vervoer-koste per 10 kg sakkie per jaar**	**Nuwe vervoerkoste per 10 kg sakkie per jaar per scenario**
75% van terugvragte is leeg in plaas van 100% (meer produk word dus vervoer oor dieselfde afstand)	R4.91	R3.93 (20% daling)
Brandstof is R1 per liter duurder as begroot		R5.08 (3% styging)
Voertuig word 'n derde minder gebruik *(minder km per jaar dus)*		R5.86 (19% styging)

Bursary students' tour of the potato industry

Article and photos by Nomvula Xaba and Khathu Tshikunde (Potatoes South Africa)

Ms Lesego Pooe, Joburg Market's potato hall manager with the students

The Transformation division of Potatoes South Africa is tasked with ensuring that a number of young people choose agriculture as a career in order to grow the potato industry and the agricultural industry at large. To achieve this goal a budget is set aside for bursaries to fund students who are studying towards their diploma, degree and post graduate in Agriculture. At its seating in January 2019, the Bursary Committee approved bursaries of twelve new students, six undergraduate and six postgraduates to study at the different tertiary institutions in South Africa. The Bursary Committee follows a very strict criteria when approving the bursaries. While the approval of undergraduate studies is solely dependent on the academic performance of the student, the postgraduate bursaries are approved based on the

Ms Nokuthula Myeza, Manager: Gene Bank-ARC, with the students

Some of the students with Mr Gert Bester on the farm

relevance of the study and how it will benefit the potato industry. The performance of the student is also taken into consideration when making the selection. As per the norm for the past few years, the students were treated to an induction program which included being whisked off to Pretoria to engage with their funders and to also understand the potato industry. Only nine of the twelve approved students were able to attend. This is Potatoes South Africa's way of making sure that they love the industry so much that they will come back and add value after completion of their studies.

The tour started off with a crisp morning visit to the Joburg Market where Ms Lesego Pooe, a Potato Hall Manager, took a brisk walk with the students to the different halls including the fruit hall, vegetable hall and the potato hall. The students were intrigued when Ms Pooe explained how the market makes its money and also the importance of supply and demand forces in determining prices.

The students had a lengthy question and answer session with one of the market agents at the potato hall. He elaborated on the magnitude of potatoes that they sell and how the supply is dependent on the farmer and obviously the demand being dependent on the consumer. The tour at the market hall ended with a bang at the Prokon tables where one of the Potato Industry Development Trust (PIDT) former bursary recipient, Mr Mogau Bapela, was the one taking the students through the inspection that Prokon carries out on a daily basis. He is employed by Prokon on a full-time basis. This was a greatest inspiration to the students, it gave them hope that upon completion of their studies, the sky will be the limit!

After the cold morning at the Joburg Market, the students were treated to a HOT breakfast at the Potato house where the Potatoes South Africa's Chief Executive Officer, Dr André Jooste welcomed the students to the potato Industry and congratulated them on being selected to receive funding for their studies. He then gave the students an overview of the Potato Industry. All the core business managers of Potatoes South Africa as well as the managing director of Potato Certification Service, Ms Sanette Thiart, each had their turn with the students giving them more information about the services provided.

The first day ended with a visit to the Agricultural Research Council (ARC) at Roodeplaat where Ms Nokuthua Myeza, Gene Bank Manager, warmly welcomed the students to the Gene Bank and elaborated on how it fits into the potato industry. It was of interest to the students to understand the precautionary measures taken by the bank when performing seed propagation.

It would not have been a potato industry tour without a visit to a potato farm where it all begins! Day 2 started very early with a drive to the Petrus Steyn in the Eastern Free State to visit Mr Gert Bester's farm, a renowned potato farmer who has been around for a long time. Mr. Bester's mentorship and coaching approach came out strongly when he welcomed the students and gave them his background of how he started with his farming enterprise from a completely different background.

The students had an opportunity to visit the pack house which was in full operation. The students observed the washing, sorting, packing through to when the potatoes were loaded on the trucks for

Mr Gert Bester explaining the harvesting process to the students

Students helping out on the farm

delivery to the various fresh produce markets. The last stop was at the potato fields where harvesting was taking place. Few students got in the fun and assisted with picking up the potatoes just for that practical experience feeling.

Feedback from the students themselves:

"We really learnt a lot of things we didn't know before and from my point of view I could say each activity that took place there was very educational and inspiring to us as agriculture students. As we've learnt how interesting the potato production is, more especially when it comes to agronomy part and I've also took the decision that I will deal with agronomy in future."

"The induction was very educational, the different speakers and venues we went to open my eyes to the many different parties and processes involved in the potato industry, and this information you have given me I believe will be very useful in my current and future potato related studies."

"The induction program was one of the greatest experiences I have ever had in the agricultural field and more specifically the potato industry. The program was very educative, from it I was able to learn a lot about how various fields of agriculture are integrated in order for us to produce market demanded potatoes, the program also enhanced my networking skills and consequently my self-confidence as I got to interact with different students from different institutions as well as some of the Potatoes South Africa staff members."

Potatoes South Africa gets recognition from the O.R. Tambo District Municipality Mayor

Article and photos: Nomvula Xaba, Khathu Tshhikunde and Immaculate Zinde (Potatoes South Africa)

PSA Transformation manager Ms. Nomvula Xaba, Honorable Nomakhosazana Meth and ECDC delegates

The annual gathering of the Eastern Cape farmers' day which attracted over 500 farmers, was without a doubt a huge success!

The event showcased the successful partnership that Potatoes South Africa (PSA) has had with the Eastern Cape Development Cooperatives (ECDC), the Kei Fresh Produce Market and the Department of Rural Development, Agrarian and Land Reform (DRDAR).

Ten projects were fully funded by PSA while seven projects were funded by ECDC and PSA taking care of the mentorship. PSA's drive to form partnerships with various role players in the agricultural environment is starting to take shape, but a lot can still be done to ensure that long term and sustainable partnerships are built.

The ECDC contributed R3.1 million to seven cooperatives in the O.R Tambo district Municipality. This has gone a long way in starting-up these cooperatives and taking them to a stage where they can be on their own. The funds were used for inputs such as chemicals, fertilizer and seed. The ECDC's interest in getting involved in potato production was sparked by the fact that potatoes are amongst the major staple food crops in the province and also the fact that 95% of the potatoes consumed are received from other provinces. The representative from ECDC urged the farmers to seek assistance so that they can produce potatoes that are of acceptable quality.

During this gathering, the PSA Transformation Manager, Ms Nomvula Xaba pleaded with all the partners to join hands in bringing the whole of the Eastern Cape into full production, especially the O.E Tambo District Municipality. She further mentioned that the partners should encourage and show those that wish to start producing potatoes, that it is possible.

The Executive Mayor, the honourable Nomakhosazana Meth, who was also in attendance, congratulated the OR Tambo potato farmers in showing that agriculture is the backbone of the economy of the country. She also praised the partners involved in all the projects for their willingness to ensure that there is economic growth through

Some of the potatoes produced by cooperatives sponsored by ECDC and PSA

agriculture. She also emphasized that the municipality together with the partners should be strategic in using the funds and direct more funds to farmer training as this will eventually strengthen the economy.

The event ended on a high note with awards where Potatoes South Africa received certificates for valuable contribution and support. A recognition that was warmly welcomed.

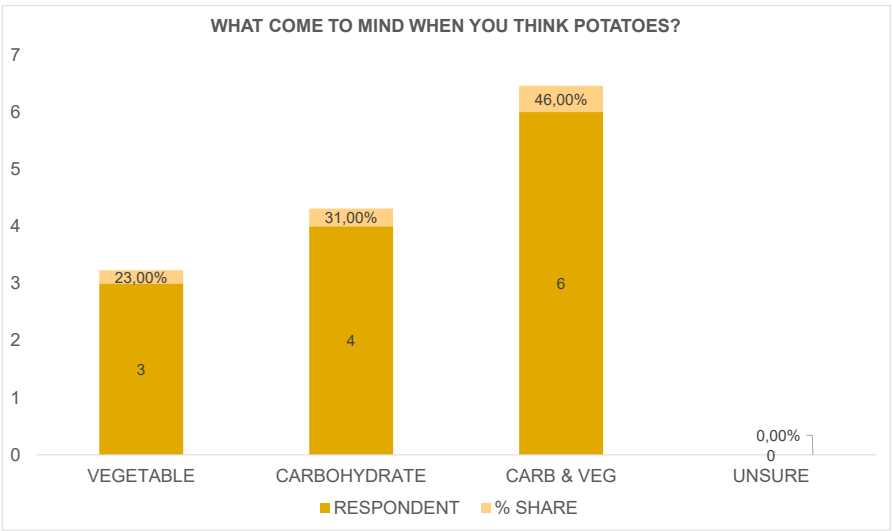
Potatoes a hit at Kei Fresh Produce Market

Over ten different potato dishes were prepared for tasting at the Eastern Cape information day. Youngsters, golden oldies, the Mayor and her team could not stop raving about the versatility of potatoes. On this day, 11 April 2019, PSA's Marketing division proved once again that potatoes have the formidable 4Ps: palatable, proficient, powerful and packed with nutrients.

The Eastern Cape has an estimated population of 6.5 million where Xhosa is the main spoken language. Some of the most popular Xhosa dishes are: Umphokoqo – crumble pap, umngqusho – a dish made from white maize and sugar beans, a staple food for the Xhosa people which is mostly consumed with umleqwa – a dish made with free range chicken.

It was very much befitting that the Marketing division initiated education about how potatoes can be incorporated into traditional Xhosa dishes as a staple, super vegetable and alternative starch. During the tasting sessions, potato recipe leaflets were shared with stand visitors who wanted to learn more about potatoes.

A mini survey was also carried out to determine, amongst other things, what position potatoes occupy in the mind of the consumer when classified as a vegetable and/or carbohydrate. The results revealed the following:



Visitors enjoying the potato dishes

It is safe to conclude that Potatoes were the Hero of the Event. The role potatoes play in addressing transformation, its continuous stance to inform, educate and inspire and the experiential marketing exercise that was executed at the stand affirm the commitment of Potatoes South Africa to build a viable South African potato industry through:

- The development and implementation of a marketing plan to promote the consumption of potatoes in the Republic of South Africa and abroad; and
- Lending a hand towards the transformation agenda by developing emerging farmers with the objective of grooming them into commercial potato farmers through market access and development.

Part 1: **Role of the Potato Industry Forum** in relation to Potatoes SA and other industry bodies

Hanrie Greebe (Potatoes South Africa)

The Potato Industry Forum (PIF) is an open forum where role players can speak their minds to ensure that their parts of the value chain are heard, that industry structures that influence various programmes are given cognisance and that the role of Potatoes South Africa in this ambit is understood.

At the recently held PIF meeting which was chaired by Prof Johann Kirsten, Dr André Jooste, CEO of Potatoes SA explained the roles and interaction of the different independent organisations, each with their own Boards of Directors, in the potato industry (refer to Diagram 1: Organogram of the industry structures in the potato industry).

Department of Agriculture, Forestry and Fisheries (DAFF): Advancing food security and transformation of the sector through innovative, inclusive and sustainable policies, legislation and programmes. DAFF is also the custodian of several Acts and regulations applicable to the potato industry.

Agricultural Produce Agents Council (APAC): The Council regulates the occupations of fresh produce, export and livestock agents and maintain and enhance the status and dignity of those occupations and the integrity of persons practicing those occupations, according to Section 9, Agricultural Produce Agents Act, 12 of 1992.

Product Control for Agriculture (PROKON): The company is the official assignee of DAFF to enforce the regulations applicable to the grading, packing and marking of potatoes destined for sale in the Republic of South Africa. These regulations are promulgated in accordance with the Agricultural Products Standards Act, 1990 (Act No. 119 of 1990).

Potato Laboratory Services (PLS): Planting material presented for certification is tested by Potato Laboratory Services for the presence of specific bacterial and virus diseases as required. The purpose of these tests is to determine whether the planting material submitted complies with the disease tolerances as prescribed in the South African Potato Certification Scheme. The advantage of these tests is the detection and quantification of harmful tuber-borne diseases occurring in seed – even in latent infections. The investigations are conducted at five national laboratories. The laboratories are registered with DAFF in terms of the Plant Improvement Act, 1976 (Act no. 15 of 1976).

Independent Certification Council for Seed Potatoes (ICCSP): The South African Seed Potato Certification Scheme that was established under the Plant Improvement Act, 1976 (Act No. 53 of 1976) has two main objectives namely to supply quality seed potatoes to the domestic potato industry; and to certify seed potatoes which are true to type and whose phytosanitary status with respect to diseases and pests falls within predetermined norms. The assignee is **Potato Certification Service (PCS)**.

The Marketing of Agricultural Products Act, No. 47 of 1996 led to the abolishment of all the Agricultural Marketing Boards. Dr Jooste stated that the Act made provision for the application of statutory levies aiming to continue with the different functions that were performed within the ambit of the Agricultural Marketing Board environment such as research and development and information. The industry applied for statutory levies via the National Agricultural Marketing Council (NAMC) who instructed the potato industry that certain structures are necessary to be put

into place in order to apply for the approval and management of such statutory levies.

One of the requirements was that a Potato Industry Development Trust (PIDT) must be established. Dr Jooste explained that the second important forum to be established was the PIF. The purpose of the PIF is to bring stakeholders of the total potato industry together so that Potatoes SA (NPC) can report back on what is being done with statutory levies in terms of the different core business programmes. That is the reason why Potatoes SA (NPC) presents its plans to the PIF for industry inputs and comment in order to implement these plans.

Dr Jooste explained that Potatoes SA (Voluntary) was a name change of the former Potato Producers' Organisation. Potatoes SA (Voluntary) has a Congress which is the highest decision making body within the potato industry. At a high level Congress determines how funding should be appropriatedand the way the organisation (Potatoes SA (NPC)) is structured and implemented. Congress takes place every two years, is governed by a Constitution and has a National Council.

The PIF has a very important function for feedback into the industry, especially when it comes to the core functions of Potatoes SA (NPC), namely Research and Development, Information, Generic Product Promotion and Market Development, and Transformation. Within Potatoes SA (NPC) all the functions are performed in terms of the different core businesses, governed by a Board of Directors. It is registered under the Companies Act 71, 2008 (Act 71 of 2008) and has a Memorandum of Incorporation. This is where all the work is being done, where staff is being employed and within the ambit of this organisation various committees consisting mainly of potato producers from different potato production regions have been established.

Committees within Potatoes SA (NPC) for the various core business functions advise the Audit Committee of Potatoes SA (NPC) in terms of the budget requirements to perform functions within the overall budget available from statutory levies. All project proposals and recommendations are escalated from committee level to the Board of Directors. The Board of Directors considers both the finances and projects and then recommendations are made to the Risk and Audit Committee of the PIDT. The PIDT ensures that the funds (statutory levy) are appropriated according to the approved business plan of Potatoes SA (NPC).

It is important to note that potato industry bodies other than Potatoes SA (NPC) discussed in this article are not funded by statutory levies.

In Part 2: Role of the Potato Industry Forum in relation to Potatoes SA and other industry bodies, processes of statutory levies will be discussed.

Role players in PIF

Bag manufacturers

Chemical suppliers

Consumers

Exporters

Fertiliser suppliers

Fresh Produce Markets

Labour

Market Agents

Processors

Producers:

- Commercial farmers
- Seed potato growers
- Emerging farmers

Quality Control Institutions

Retailers

South African Potato

agriculture, forestry & fisheries
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

(DAFF)

National Agricultural Marketing Council

(NAMC)

Product Control for Agriculture (Prokon)

- Non-profit company that renders a comprehensive quality assurance, product management and grading service to the SA fresh produce industry.
- Board of Directors
- Agricultural Products Standards Act, 1990 (Act No. 119 of 1990)

Agricultural Produce Agents Council (APAC)

- Regulates the occupations of fresh produce, export and livestock agents
- Agricultural Produce Agents Act (Act 12 of 1992), as amended by the Agricultural Produce Agents Amendment Act, No. 47 of 2003

Independent Certification Council for Seed Potatoes (ICCSP)

- Assigned authority to exercise powers and perform duties ito SA Seed Potato Certification Scheme
- Section 23 (1) of the Plant Improvement Act, 1976 (Act No. 53 of 1976)

Potato Laboratory Service (PLS)

- Five ICCSP approved laboratories (independent private companies)
- Planting material presented for certification is tested for presence of specific bacterial and virus diseases as required
- Board of Directors
- Plant Improvement Act, 1976 (Act nr. 15 of 1976)

Potato Certification Service (PCS)

- Non-profit company established for the certification of agricultural products under the laws of the RSA.
- Contracted by the Independent Certification Council for Seed Potatoes
- Board of Directors
- Plant Improvement Act, 1976 (Act No. 53 of 1976)

Industry Bodies

Potato Industry Development Trust (PIDT)

Potato Industry Forum (PIF)

Risk and Audit Committee

PSA (Voluntary)

- Is a producers' organisation
- Is a voluntary organisation – not for gain
- Established in terms of a CONSTITUTION
- National Council

PSA (NPC)

- Is a "Service Delivery" organisation
- Is incorporated as a Non Profit Company (NPC), as defined in the Companies Act 71, 2008 (Act 71 of 2008)
- Established in terms of a MEMORANDUM OF INCORPORATION
- Operates as an industry association and its structure represents a network of participating role players and individuals who are involved in various forums and committees
- Board of Directors

Working Committees:

- Research and Development
- Industry Information
- Transformation
- Generic Product Promotion and Market Development

National Committees and Forums:

- Seed Potato Growers' Forum
- Potato & Vegetable Processing Forum
- National Seed Potato Committee
- Regional Seed Growers Meetings
- Regional Management Meetings

***Under review**

Forum for Nuclear Material (NUMPRO)

- Discusses matters related to importation, varietal listing, plant breeders' rights, production of nuclear material etc.

South African Mini Tuber Producers (SAMPRO)

- A platform for the nucleus seed producers to get together annually to discuss technical matters related to the production of early generation material

Moerkwekersforum

“Kwaliteit plantmateriaal as grondslag van 'n kompeterende aartappelbedryf”

17 September 2019

Seed Potato Growers’ Forum

“Quality plant material as the foundation of a competitive potato industry”

Aartappels SA Kongres

“Gerat vir 'n veranderende omgewing om 'n volhoubare aartappelbedryf te verseker”

18 September 2019

Potatoes SA Congress

“Gearing up for a changing environment to ensure a sustainable potato industry”

potatoes aartappels SA

Tsogo Southern Sun Cape Sun Hotel
23 Strand St, Cape Town CBD
Enquiries: Association Business Events on behalf of Potatoes SA
+27 74 051 3318 petrie@abevents.co.za

Aartappelboere help veeboere

Gawie Geyer (CHIPS) en Naude Pienaar (Agri NW)

Die voortslepende droogte weens 'n gebrek aan voldoende reëns sedert 2013 in sekere gedeeltes van die Noord-Kaap met gepaardgaande weidingsprobleme het nie net 'n verwoestende impak op die veeboerderye nie, maar ook op die ekonomieë van die dorpe in die geaffekteerde gebiede. In die lig hiervan het 'n paar Oos-Vrystaatse aartappelboere besluit om hul kant te bring om die vraag na geskikte veevoer met uitskotaartappels en ruvoer aan te vul.

Om dit 'n realiteit te maak het Dries van Tonder, Oos-Vrystaatse aartappelboer, kontak gemaak met Naude Pienaar van Agri NW, wie as een van die droogtehulp koördineerders optree, met die aanbod dat hy en van sy medeboere (Gert Bester, Jan Hamman, Pieter Meiring, Freddie van Huyssteen, Johan Kotze en Thabo Bosman), tot 100 ton uitskotaartappels per week sal skenk. Tot datum is 21 vragte wat 630 ton aartappels verteenwoordig reeds aan veeboere op Sutherland, Rietbron, Fullarton, Williston, Strydenburg, Garies, Klipplaat, Jansenville, Loeriesfontein, Van Wyksvlei, Pofadder en Olifantshoek gelewer.

Volgens Naude Pienaar word die werwing van voer, vervoer, verdeling en aflaai daarvan voer wat die aartappelskenkings insluit, onderneem in samewerking met die koördineerders van Gift of the Givers (Hester Obermeyer) en Save the Sheep - Sutherland (Sybil Visagie). Fondse wat beskikbaar gestel word deur hierdie drie groepe asook Agri SA, Caring Daisies, kerke en individue word gebruik om die vervoer te betaal. Hy het verder genoem dat Dries van Tonder reuse werk doen wat betref die koördinering en laaireëlings van aartappels op die plase in die Oos-Vrystaat. Verder is hy ook tans besig om ruvoer bale bymekaar te maak vir latere verspreiding.

"Namens al die Noord-, Wes- en Oos- Kaapse veeboere wat gebuk gaan onder moeilike omstandighede wat hul voortbestaan wesentlik bedreig, wil ek my dank uitspreek aan alle skenkers asook aan Hester Obermeyer en Sybil Visagie wat reuse werk doen. Ongelukkig, soos met enige sodanige projek bly befondsing 'n probleem. Daar is wel beperkte hoeveelheid geskenkte voer beskikbaar, maar fondse om dit te vervoer bly 'n knelpunt en enige hulp in die verband sal waardeer word. Wat die aartappelskenkings betref is ons tot datum baie dankbaar dat Shoprite reeds tien vragte gratis vervoer het en Beniesa Transport een", het Naude Pienaar gesê.

CHIPS het met van die Noord-Kaapse boere geskakel wat aartappelbesendings ontvang het en ieder en elk het groot waardering uitgespreek vir die hulp wat hulle ontvang. Soos een boer dit gestel het – "dis soos manna uit die hemel en gee ons weer 'n bietjie hoop."

SAKO Algemene Jaarvergadering

Gawie Geyer (CHIPS)

Voorsittersverslag

"Aartappelproduksie in die Sandveld is die mees uitdagendste in Suid-Afrika as gevolg van die besondere verbouingspraktyke wat geld en verder as gevolg van die onder-gemiddelde reënval die afgelope vier jaar. Dit was egter veral 2016 wat gekenmerk was deur versengende hitte en uiterste droogte wat die Sandveld swaar getref het. Daarmee saam het die stagnering van die ekonomie, die verswakking van die Rand, politieke onrus, beleidsonsekerheid met die klem op grondonteiening en die swak beeld van landbou wat deur populistiese politici veroorsaak word, die produksie van landbougewasse 'n net nog groter uitdaging gemaak", het Jan van Zyl, voorsitter van SAKO, tydens die organisasie se algemene jaarvergadering van 11 April 2019 op Lambertsbaai gesê.

Hy verder genoem dat dit noodsaaklik is dat elkeen van die genoemde uitdagings met 'n ander bril in oënskou geneem word gesien die verskil in die aard en omvang daarvan, en dit soos volg gelys:

- Die onvoorspelbaarheid van die natuur. Produsente het al aanvaar dat die impak van die veranderde verbouingstoestande weens die natuur onvoorkombaar is en het derhalwe, sover moontlik, die nodige voorsorgmaatreëls en alternatiewe in plek gesit om die impak te minimaliseer. Wat verblydend is, is die feit dat nieteenstaande die droogte daar steeds genoeg produk geproduseer kon word om in die vraag te voldoen.
- Stygende produksiekostes, verswakking van die Rand en onsekerheid oor regeringsbeleid is langtermyn-uitdagings, maar het op die korttermyn 'n wesentlike impak op die volhoubaarheid van die aartappelbedryf.
- Die kosteknyptang is tans die bedryf se grootste dilemma wat saam met die negatiewe impak van die beurtkrag die risiko om volhoubaar te boer, dramaties eskaleer. Die onus rus nou op produsente om aanplantings oordeelkundig te doen sodat indien fase 4 beurtkrag weer kop uitsteek, hulle voldoende sal kan besproei.

Die Sandveld plant reeds 2 000 hektaar minder aartappels as gevolg van die winsgewendheid van aartappelverbouing wat erg geknou is. Volgens Jan van Zyl was die hoofoorsake die droogte, die impak van verhoogde insetkoste wat tussen 10 en 12% beloop, die verswakkende Rand, die verhoging in elektrisiteit wat reeds op meer as 300% staan vir die afgelope dekade, die verhoging in die brandstofprys en laastens die plaaswerker-minimumloon.

"Die behoud van die aartappelbedryf in die Sandveld lê daarin dat produsente en landboukundiges sal moet saamwerk en innoverend dink om kunsmis en plaagbestrydingsmiddels optimaal te gebruik om verhoogde opbrengste te genereer en ook vir die beskerming van die natuur, insluitende waterbronne. In dieselfde asem sal daar ook indringend gekyk moet word na korrekte planttye, kultivars met die klem op beste presteerders onder plaaslike produksietoestande, kultivar-spesifieke bemesting en kultivars vir spesifieke seisoene, toegespitste grondgesondheid en alternatiewe bemarkingsmoontlikhede (iets waarna reeds gekyk word met inagneming van die vereistes van die Kompetisiekommissie) – in kort, ons enigste uitweg is hoër opbrengste op minder hektare", het hy gesê.

Jan van Zyl het ten slotte verwys na die afname in die getal aartappelprodusente terwyl die boerderybesigheidseenhede al hoe groter word. Volgens hom is dit 'n tipiese bewys dat wins per hektaar al kleiner word en dat produsente onder druk is en word uitbreiding van bestaande boerderybesigheidseenhede as primêre oplossing gesien met die klem op:

- Presieseboerdery.
- Prysbedinging vir produksiemiddele (sinergie).
- Hoër waarde-ontginning uit die waardeketting.
- Biologiese boerdery.
- Meganisasie.

Die Sandveld – Uniek en Pragtig!

Monique Vlok, 'n aartappelboer van die Sandveld, het 'n interessante blik verskaf oor die ontwikkeling van landbou in die gebied, wat sy as uniek en pragtig beskou, met die klem op die deursettingsvermoë van die aartappelboere om ongeag plae en droogtes steeds daarin te slaag om die verbruikers via verskeie afsetkanale van hoë kwaliteit aartappels twaalf maande van die jaar te voorsien. Sy het ook klem gelê op die Sandveldse aartappelboere as direkte werkverskaffers aan sowat 6 200 mense plus sy indirekte bydrae tot werkverskaffing in verwante bedrywe soos afsetkanaal-instansies, insetverskaffers, verwerkers en vervoerders.

"Dit is belangrik vir die streek dat ekonomiese ontwikkeling plaasvind, maar nog belangriker vir ons is die bewaring van ons ryk fauna en flora erfenis. Daarmee saam is ons gefokus om die natuurlike hulpbronne te beskerm aangesien ons daarsonder geen bestaan kan voer nie. Dit is dan ook waarom die Sandveldse aartappelboere hande gevat het met CapeNature om die natuur te beskerm en te bewaar, en daarmee saam verantwoordelik en volhoubaar kos produseer. Mens moet aanvaar dat landbou nie suksesvol kan plaasvind sonder die handhawing van 'n gesonde balans met die omgewing waarbinne dit beoefen word nie", het sy gesê.

Monique Vlok het ook 'n oorsig verskaf van SAKO se aktiwiteite en die rol wat dit vervul as verteenwoordigende organisasie van die Sandveldse aartappelboere. "As die groot getal projekte waarby SAKO betrokke is in ag geneem word, is dit duidelik dat dit ernstig is om probleme wat die Sandvelde produsente in die gesig staar aan te spreek om volhoubare aartappelverbouing in die gebied as geheel te verseker", het sy ten slotte gesê.

Grondwatermonitering in die Sandveld

Wat die jongste inligting ten opsigte van die grondwater-moniteringsprojek in die Sandveld betref het Lizanne Smit van

SAKO-projekte wat in belang van die Sandveldse aartappelprodusente in samewerking met relevante instansies onderneem word – 2019

- Sandveld grondwatermonitering ten opsigte van die kwantiteit en kwaliteit van boorgatwater.
- Bewaringsbewerking vir aartappelverbouing.
- Plantluismonitering.
- Opleiding in besproeiingskedulering.
- Watergebruik in 'n veranderende klimaat.
- Optimalisering van besproeiingstelsels vir verbeterde energieverbruik.
- Ekologiese volhoubaarheid van aartappelproduksie.
- Grondwater-assessering en ondersoek na isotoop-data.
- Aartappelkultivarproewe.
- Ondersoek na die etiologiese en patogenisiteit van Verticillium verwelk.
- Blaarmyner- en poeierskurfwerkswinkels.

GEOSS genoem dat reënval vir die 2015 – 2018 periode deurgaans laer was as die langtermyn-gemiddeld. Sy het ook 'n oorsig verskaf van die watervlakke van boorgate in die verskillende opvangsgebiede en gesê dat indien die data van 2018 met die van 2019 vergelyk word die gemiddelde watervlak met 0.12 meter gedaal het terwyl grondwaterkwaliteit en grondwaternitraat gestyg het. Wat 2019 spesifiek betref is die huidige gemiddelde grondwatervlakke 15.1 mbgl, grondwaterkwaliteit (EK) 144 mS/m en grondwater-nitraat 4.33 mg/L.

Sy het ook verslag gelewer oor die vordering wat gemaak is met die studie oor isotope-datering met die klem op die aanvulling van grondwaterbronne deur bronne buite die Sandveld.

(Sien ook artikel Sandveld: where does all the groundwater come from? op pp. 32 tot 36 van hierdie uitgawe van CHIPS.)

Wat toekomstige werksaamhede ingevolge die grondwater-moniteringsprojek betref het Lizanne Smit die volgende as belangrik gelys:

- Voltooiing van die riglyne op grondwater-monitering en die bestuur daarvan.
- Voortsetting van die Sandveld se watermonitering.
- Uitbreiding van werksaamhede ten opsigte van die watervloei van die fontein op Matroosfontein.
- Uitbreiding van werksaamhede na ander kritiese areas in die Sandveld met die klem op Moutonshoek, die areas noord en suid van Redelinghuys en die Bergvallei.
- Voortgesette promovering van monitering, bestuur en goedkeuring van watergebruik.
- Nitraatvlak-opsporing.
- Voltooiing van 'n numeriese geohidrologiese model vir die Sandveld vir toekenningsdoeleindes.

Vertroue dryf groei in die Suid-Afrikaanse landbou-ekonomie

Wandile Sihlobo, hoofekonoom van Agbiz het tydens die vergadering as gasspreker opgetree. In sy voorlegging het hy vertroue as die drywer van die Suid-Afrikaanse landbou-ekonomie uitgelig met die klem op besigheidsvertroue, verbruikersvertroue en landboubesigheidsvertroue.

Wat die Suid-Afrikaanse landbousektor in besonder betref het hy die volgende as primêre vertrouensdrywers gelys:

- Omset, netto bedryfsinkomste en markaandeel van landboubesighede (plase).
- Indiensnemingsvooruitsigte.
- Kapitale investering.
- Uitvoere.
- Plaaslike ekonomiese groei.
- Algemene landbou-omstandighede.
- Voorsiening vir slegte skulde.
- Finansieringskoste.

Wandile Sihlobo het verder genoem dat die Suid-Afrikaanse landboumilieu in 2018 gekenmerk is deur moedeloosheid wat toegeskryf kan word aan moeilike verbouingstoestande weens ondergemiddelde reënval met gepaardgaande hoë hittevlakke asook stygende insetkostes en onsekerheid oor die toekoms van kommersiële landbou met die klem op onder andere grondonteiening sonder vergoeding en laastens arbeid. Dit het daartoe gelei dat agri-besigheidsvertroue en beleggings in landbou die afgelope paar jaar 'n wesentlike afname getoon het. Hy het ook uitgewys dat die eskalerende arbeidskoste en verwante onsekerhede aanleiding gegee het tot 'n verhoging in meganisasie.

"Wat die langtermyn-evolusie van plaasgroottes betref het, is die verwagting dat die getal hektare verbou grootliks onveranderd sal bly. Voorts word verwag dat die aantal boerderybesighede sal afneem en hul kapasiteit deur die oorblywende boerderybesighede oorgeneem sal word", het hy gesê.

Alhoewel buitelandse direkte beleggings in Suid-Afrika laasjaar 'n vyfjaar-hoogtepunt bereik is, het dieselfde ongelukkig nie vir die landbousektor gegeld nie en staan dit tans op slegs sowat 0.1%. Daar was egter wel plaaslike beleggingsteun in die Suid-Afrikaanse landbousektor waarneembaar en het dit jaar op jaar vir die afgelope vyf belastingjare (2012/13 – 2017/18) met gemiddeld 10% toegeneem.

Wandile Sihlobo het ten slotte die volgende gelys as sleutelfaktore wat aangespreek moet word om vertroue te herwin wat sal lei tot beleggings en groei in die Suid-Afrikaanse landbousektor:

- Onsekerheid oor die land se grondhervormingsbeleid.
- Klimaatsverandering en die landbousektor se vermoë om daarby aan te pas.
- Waterregte-wetgewing.
- Infrastruktuurbeperkinge in sommige landbougebiede en in besonder in die vorige tuislande.
- Internasionale handelsaangeleenthede soos byvoorbeeld nie-tariefhindernisse (non-tariff barriers).

Jan van Zyl herverkies as voorsitter van SAKO

Jan van Zyl is tydens die onlangse jaarvergadering van SAKO herverkies as voorsitter vir 'n verdere periode van twee jaar. Uit hoofde van sy verkiesing sal hy ook vir 'n verdere termyn op die direksie van Aartappels Suid-Afrika dien.

SAKO Algemene Jaarvergadering






Top 10 Seed Potato Growers – 2019 – Top 10 Moerkwekers

Sanette Thiart (Potato Certification Service)

The mission of Potato Certification Service (PCS) is to render an industry-related service which supports the South African potato industry to perform optimally by ensuring the availability of high-quality planting material.

However, the main role players in ensuring the availability of high-quality planting material are the seed potato growers themselves. PCS inspects, samples and certifies the seed potato plantings and seed lots presented, to verify and certify that the seed potatoes indeed qualify as good quality planting material.

It is therefore a pleasure to recognize excellence, by announcing the Top 10 Seed Potato Growers for 2019. In the three year term, which was used for listing the growers according to certification inspections and results, 68 growers planted an average of 30 hectares per year for three consecutive years, thereby qualifying for the Bayer Seed Grower of the Year award.

The growers who are amongst the Top 10 this year registered an average of 335 hectares annually, with the smallest grower registering 49 hectares on average.

Amongst the Top 10, are two growers from Limpopo, three from North West, two from the North Eastern Cape, one from KwaZulu-Natal and two from the Western Free State.

The growers are listed in alphabetical order as per grower code.

B 041 - H du Preez Boerdery (Edms.) Bpk. - Human du Preez

By Human du Preez Boerdery glo ons die volgende punte is van belang om 'n kwaliteit produk te produseer:

- Die grond tipe, 'n behoorlike rusperiode en goeie bewerking van die grond.
- Goeie kwaliteit aartappelmoere wat skoon en plantgereed is.
- Verantwoordelike en goeie waterbestuur.
- Tydige identifisering van virusbesmette plante en die behoorlike verwydering daarvan.
- Die volg van 'n baie streng chemiese- en kunsmisprogram.
- Die opberging van saad in koelkamers moet reg bestuur word.

Ter afsluiting, glo ons die belangrikste aspek vir 'n moerkweker is dissipline.

Johandré Breitenbach – ASD Streeksbestuurder: Mpumalanga, Limpopo en Gauteng

'n Glimlag sê baie... Die eerste dag toe ek op die plaas van oom Human Du Preez en sy seun, Pieter, aangekom het, was ek met 'n glimlag verwelkom.

Gou het ek agter gekom dat die glimlag nie net gaan oor 'n sertifiseringsbeampte daar is nie, maar omrede hulle trots is op hulle aartappelboerdery. Trots kan gesien word in die lande waar die aartappels groei, sowel in die eindproduk in die stoor.

Oom Human en Pieter streef daarna om die aartappelbedryf te verbeter en aartappelmoere van top gehalte aan hulle kliënte te lewer.

B 054 - Sirkel N Landgoed - Rudi Heinlein

Enkele faktore wat ons glo die kwaliteit van saadaartappels beïnvloed is die volgende:

- Aanvangs- en groeifase – Saad wat geplant word vir vermeerdering, moet van goeie gehalte wees. Optimale grondvoorbereiding, plant en operd is van kardinale belang, asook 'n bewese landbouchemiese- en kunsmisprogram wat noukeurig toegepas word. Laasgenoemde kan alleen effektief wees indien optimale besproeiing toegedien word. Doeltreffende verkenners wat goed opgelei is, is noodsaaklik vir deurlopende verwydering van virusplante, asook vroegtydige opsporing van ander plae.
- Uithaalproses – dit is belangrik om seker te maak dat die aartappels se skille vas is voordat dit uitgehaal word. Aangesien die saadaartappels gedurende die warm laat-lente uitgehaal word (Limpopo), moet die proses so vinnig moontlik sonder onnodige meganiese beskadiging plaasvind. Die saadaartappels wat reeds uitgehaal en gekrat is, moet so spoedig moontlik onderdak met goeie lugvloei geberg word.
- Opbergingsfase – Vooraf sortering is noodsaaklik om besmette en beskadigde aartappels te verwyder alvorens die saadaartappels verkoel word. Verkoeling moet so spoedig moontlik na die aanvanklike sorteringsproses plaasvind. Die afkoeling moet geleidelik plaasvind totdat die aartappels se interne temperatuur 2-3 °C is, en dit moet tydens die volle duur van die verkoelingsproses daagliks noukeurig gemonitor word.
- Opwarmingsfase – Aangesien dit in die warm somermaande geskied (Limpopo), is dit krities belangrik om dit geleidelik in die koelkamer te laat plaasvind. Wanneer die interne temperatuur tussen 12-15 °C is, moet die saadaartappels snags wanneer die temperature tussen 20-24 °C wissel, uitgehaal word. Die saadaartappels moet dan onderdak in 'n stoor met goeie lugvloei geplaas word om af te droog en verder op te warm. Wanneer die saadaartappels droog is en die omgewingstemperatuur in die stoor bereik is, kan dit verpak word.
- Verpakkings- en inspeksiefase – Streng vereistes moet deurlopend vir kwaliteit, massa en telling van saadaartappels gehandhaaf word. Eerlikheid en konsekwentheid met die inspekteur, bemarker en aankopers is van kardinale belang.

Die sukses en kwaliteit van die gelewerde saadaartappels is bo alles alleen te danke aan die genade van die Here. Sonder Sy hand van seën sal geeneen van die gemelde handelinge op sigself tot die sukses kan bydra nie.

Johandré Breitenbach – ASD Streeksbestuurder: Mpumalanga, Limpopo en Gauteng

Netheid, orde en stiptelikheid is die eerste dinge wat ek opgemerk het toe ek aangekom het op Sirkel-N wat aan oom Rudi Heinlein behoort. Gou kon ek sien dat die eienskappe wat ek opgemerk het oorgedra word na die aartappelboerdery van Sirkel-N. Hulle is passievol oor aartappels.

Daar word rekord gehou van alles aspekte van die aartappels op die plaas. Dit is die eerste keer wat ek op 'n plaas aangekom het, waar hulle presies vir my kon sê hoeveel plante elke dag getrek word wanneer daar gesuiwer (rogue) word.

In die finale produk, naamlik aartappelmoere, kan die trots ook gesien word. Hulle is met niks minder tevrede as met klas "Elite"-moere nie. Dan sal mense vra waarom? Oom Rudi se woorde: "'n Boer lees nie 'n knolinspeksieverslag nie, so die etikette adverteer ons produk".

L 002 - Firna (Edms.) Bpk. - Frans en Michiel Engelbrecht

Die Firna Maatskappy plant al vir meer as twee dekades saadaartappels. Die maatskappy se resep tot sukses is gebou op die volgende kernpilare:

- Goeie grond-voorbereiding. Dit verg tyd en beplanning, maar dit speel 'n belangrike rol in die proses.
- Kwaliteit aartappelmoere as bron; sonder hierdie pilaar sal geen suksesvolle oes moontlik wees nie.
- 'n Goeie chemiese- en kunsmisprogram. Kundigheid, goeie kommunikasie en samewerking dien as boustene vir hierdie pilaar.
- 'n Goeie suiweringspan (rogue), tesame met goeie arbeidsverhoudinge speel 'n onmiskenbare rol in die aartappelmoerbedryf en dus ook by die Firna Maatskappy.
- Effektiewe waterbestuur.

'n Goeie en kwaliteit oes hang van dissipline en 'n dringendheid in menswees af, om te sorg dat al die pilare goed bestuur en bedryf word. Geen besigheid kan egter suksesvol wees sonder 'n sterk fondasie nie en in Firna se geval is genade die fondament waarop hierdie maatskappy gebou is.

Pieter Leibbrandt – ASD Sertifiserings-beampte

Die plaas Sonop is geleë sowat 30 km buite Tosca in die Noordwes. Hier word verskillende kultivars aangeplant onder toesig van mnr. Frans Engelbrecht en 'n hele span wat hom bystaan. Vir die laaste drie seisoene is hier gemiddeld 170 ha en tot sewe verskillende kultivars per jaar geplant wat hoofsaaklik uit G0 tot G1 bestaan het. Vir ons as sertifiseringsbeamptes is dit altyd 'n plesier en 'n maklike taak om hier dienste te lewer, omdat die personeel op Sonop die erns van sertifisering verstaan, en daarom maak dit ook sin dat hulle vanjaar weereens onder die Top 10 Moerkwekers is.

L 017 - JP van den Berg

Dit is vir Buttermere Boerdery weereens 'n groot voorreg om deel te wees van die Top 10 moerkwekers. Graag bedank ek my vrou Linnè, ouers, Koos en Erina, personeel, insetverskaffers en finansierders vir die reuse bydrae wat hulle maak tot ons bedryf. Nie net intellektueel nie, maar ook emosioneel. Ek werk saam met 'n besonderse span mense wat my in staat stel om optimaal te produseer. Hiermee wil ek sê dat jy jouself moet omring met 'n span mense wat saam met jou droom en glo en inkoop in die einddoel wat julle wil bereik.

In my geval het ek nie saadaartappels gekies nie, saadaartappels het my gekies. Ek was bevoorreg om by kundige mense te leer, heel onder klein te begin en so myself te bemagtig met kennis en ervaring tot waar ek tans myself bevind. 'n Groot gedeelte van my kompeterende voordeel is dat ek waak teen die "ek weet nou alles"-mentaliteit; dit dryf mense weg van jou af en jy verloor die toegang tot gratis inligting wat mens kan verkry deur net te luister en te kyk.

Die lys van aspekte om 'n aartappelmoer te lewer

wat voldoen aan die Suid-Afrikaanse standaard is lank, die mark is hoogs kompeterend en die kwaliteit van wêreldgehalte. Die omgewing waarin jy saad vermeerder speel 'n noodsaaklike rol en dit wil voorkom asof die gesogte areas al skaarser raak. Daar is verseker streke wat laer virusdruk het as ander, dit gesê, geen streek is uitgesluit van virusrisiko nie. Die aanplant van gesertifiseerde saad wat plantgereed is binne in 'n plantmedium wat deeglik gerus, belug en bemes is, verseker goeie stand en gesonde plante. Natuurlik kan die verkeerde plantdatum en 'n uitgerekte groeiperiode baie van jou werk ongedaan maak.

Gemotiveerde en goed-opgeleide suiweringspanne, sowel as streng beheer oor higiëne, verhoog die waarskynlik van 'n goeie produk. Wees pro-aktief met jou bemesting- en spuitprogram en besoek self jou lande daagliks; die buite-wielspoor van die spilpunt vertel nooit die volle verhaal nie.

Ek het niks probeer herontdek nie. Ek is dankbaar dat ek in 'n groeiende bedryf beland het en steeds is. Al wat ek doen is om my stempel "kwaliteit bo kwantiteit" daarby te voeg en dit te geniet. Ek maak erns van my sosio-ekonomiese verpligting. Ek glo daarin dat my personeel en gemeenskap saam my moet groei, moet deel in my suksesse en ook vooruitgang moet beleef wanneer daar is. Ek is deeglik bewus van my omgewing; ek doen besigheid in ooreenstemming met die regulasies en ek benut die natuurlike hulpbronne verantwoordelik met die oog op die volhoubaarheid daarvan.

"Harde werk klop talent, wanneer talent nie hard werk nie". Tim Notke

Pieter Leibbrandt – ASD Sertifiserings-beampte

Buttermere, 'n familieplaas is geleë in die Noordwes se Vergeleë-distrik, sowat 180 km noord, noord-wes van Vryburg. Hierdie is hoofsaaklik beeswêreld, maar as dit tyd raak om aartappels te oes, vind jy vir JP selde êrens anders as in sy pakstoor. Hier is gemiddeld sowat 60 hektaar aartappels geplant oor die laaste drie jaar wat uit meer as 30 kultivars bestaan het; alles geplant as G0 en G1's en dit kan aanvaar word dat daar nie 'n knol gepak word as JP nie self in die stoor is nie. Vir hom en sy pa, Koos, is kwaliteit van kardinale belang en kom dit voor kwantiteit en daarom is hulle ook nou betrokke by alle aspekte van sertifisering.

L 026 - Carbrecht (Pty) Ltd – Carel and Rob Carrol

To produce good quality seed potatoes, you should start with healthy soil in a healthy area that is suitable for seed potato production. Good quality, disease-free seed is vitally important. We receive world class seed from Rascal and Wesgrow in Christiana.

From the arrival of the seed on the farm, until the day you load away the last of its progeny, the seed should be treated with the utmost respect and strict measures should be in place to prevent any damage or contamination of cultivars. We strive to maintain a level of excellence in the long term and there are no shortcuts.

People are the most important assets in any business. Seed potato production is no exception. Good communication and relationships with all stakeholders are vital. Success is much easier to achieve when everyone shares the same vision. Healthy plants produce healthy seed.

Good soil preparation, an efficient irrigation system that supplies enough water, together with a good fertilizer program are important for the production of healthy plants. Use available expertise. Our fertilizer/chemical agent is an expert in his field and has helped to develop our fertilizer and spray programs. Our irrigation agent has been instrumental in the design of our irrigation system.

Bio-security is vitally important to maintain the health of the area, as well as your crops. The necessary field rotation, a comprehensive spray program and strict eradication of volunteer potatoes are of utmost importance. An integral part of quality control is a well-trained team of roquers to root out any defects or cultivar contamination that might occur.

Pieter Leibbrandt – ASD Sertifiserings-beampte

Mnr. Carel Carrol en sy seun, Rob, is hier aan stuur van sake op die plaas Blackheath in die Noordwes se Vergeleë-distrik. Hulle kweek sedert 2012 moere in die Molopo. Hier is vir die 2015/2016 seisoen 23.22 ha geplant wat uit twee kultivars bestaan, vir 2016/2017 was dit 122 ha met 16 kultivars en vir

die 2017/2018 seisoen 130 ha met 16 verskillende kultivars. Slegs G0- en G1-moere aangeplant. Alhoewel hulle nog relatief nuut in die bedryf is, is dit duidelik dat hulle daarna streef om 'n goeie kwaliteit moer aan die mark te verskaf.

N 029 - GA Vorster - Gary Vorster

As a seed grower there are many aspects that need constant attention. For me the most important aspects are as follows, but not necessarily in order of importance.

- Your early generation seed source is critical to the success of the seed production. For this I must thank Wesgrow and Frans Engelbrecht and J P van den Berg.
- Virus control is a multi-pronged approach. There is no single silver bullet. Gavin Hill helped me to get through the despair we went through a few years ago and created the many faceted plan to control the virus in our seed potatoes.
- Soil-borne diseases are a constant threat to healthy seed production. A five year crop rotation system, as well as an integrated control programme for the control of scab and eelworm, as well as all the other fungal and bacterial diseases, are implemented.
- Volunteer control is critical. Crop rotation with Roundup Ready maize has made control of volunteer potatoes significantly easier.
- Cold storage is vital to be able to optimise the plant readiness of the seed sold, as per the customer's needs.
- A sales and marketing team that helps determine the best cultivars to grow for which customers.
- The best machinery and equipment to be able to sort and pack the seed according to the customers' needs and wants.
- All the staff that work for us. They are our biggest asset. Without them, nothing can happen.

Good quality seed production is a never-ending challenge. Constant attention to detail is needed to produce quality seed potatoes.

Ferdus Erasmus – PCS Regional Manager: KwaZulu/Natal and North Eastern Cape

I remember my first trip to Elliot in 2010, wondering during my drive down whether I even knew Elliot existed. Gary's farm is approximately 30 kilometres before reaching Elliot on the road from Ugie and 4 kilometres on a gravel road towards Gatberg.

The Eastern Cape was severely threatened by drought for a couple of years, which caused a lot of problems for the potato growers in this region. Gary pushed on and did what he could to deal with the drought and are now congratulated on being amongst the Top 10 Seed Potato Growers this year. Well done!

N 041 - East Cape Farms - Garrick Christiane

I consider the following aspects as contributing factors to the production of good quality seed potatoes:

- Crop rotation is important for the suppression of soil borne diseases.
- One should preferably only plant virus free seed to produce seed potatoes regardless of the generation. This will give you the best chance to succeed.
- A spray program applied at least once weekly taking all pests into consideration is paramount, this includes pests such as aphids, moths, leaf miner, blight.

The following is also of importance:

- The control of volunteers and to have a knowledgeable team that is motivated and dedicated to keep fields clean of virus plant.
- Consider the aphid pressure when planting the crop and burning off the crop.
- Spending time personally in the fields and monitoring the pack shed consistently throughout the day is crucial for me.
- Most importantly making sure the buyer of the seed potatoes is satisfied and that the seed which we have provided him gives him an excellent outcome and no doubt of success.

These above-mentioned aspects are just a glimpse of what makes the farming of seed potatoes successful.

Ferdus Erasmus – PCS Regional Manager: KwaZulu/Natal and North Eastern Cape

With my first trip to Elliot in 2010, Garrick Christiane and Gary Vorster were the only seed growers in the area. Garrick started planting seed potatoes in the 2006/007 season, so by 2010 he was still very much in the learning process. Since 2010, it is great to see how much Garrick has grown as a seed grower and the pride we have as certification officials to be part of his journey.

Garrick's farm is approximately 30 kilometres from Elliot at the turn-off to Gatberg, which makes Garrick and Gary neighbours so to speak. Garrick hopes that the drought conditions, especially during the growing stages, will move on to better his rainfed plantings. Best of luck to him.

N 058 - Pidelta (Pty.) Ltd. - Dean Brown

Dean Brown from Pidelta considers the following as important aspects of growing good seed potatoes. He advises growers to follow good agronomic practices, such as:

- Good crop rotation.
- Effective land preparation.
- Remedial soil corrections.
- Well thought-out strategy with regards to your spray program in advance.
- Ability to adapt quickly if required.

Following good husbandry practices are also required. Examples thereof are:

- Irrigation scheduling.
- Routine field inspections.
- Routine leaf sampling for trace element deficiencies and virus indication.
- Continuous rogueing throughout the growing season.
- Effective and timeous spray applications.

To ensure a good seed crop, proper management is of the essence throughout the production processes. It is therefore extremely important to follow good harvesting and storage practices:

- Efficiency and effectiveness to get the crop off timeously.
- Effective warehouse control, including sanitation and disease control.
- Competent logistics to move product timeously off the farm to mitigate risk.

Attention to detail is critical on every step of the crop cycle; don't take your eye off the ball for a second.

Keep up with all technological advances in the field, including machinery and packaging equipment which lead to improved efficiencies.

Ferdus Erasmus – PCS Regional Manager: KwaZulu-Natal and North Eastern Cape

Pidelta is situated in the Greytown area which has a vast difference in temperature compared to the Natal Midlands. This means Pidelta can start planting in the middle of July, finishing-off early in the season. This result in less sunburn and tuber moth problems since the KwaZulu-Natal main rainfall is during February to April.

Pidelta started planting seed potatoes in the 2011-2012 season and have been in the Top 10 once before. They do seed production for various crops and adding seed potatoes came naturally to them. From PCS in KwaZulu-Natal, we which them best of luck to reach the Top 10 again.

W 039 - Louis Claassen Familie Trust - Louis Claassen

Dit is vir ons 'n groot voorreg om onder die Top 10 Moerkwekers te wees. Sonder die genade, seën en leiding van ons Hemelse Vader was dit nie moontlik nie.

Ek wil vir Simba dankie sê vir die geleentheid wat hulle my gegee het om vir hulle aartappelmoere te vermeerder. Aartappels is 'n baie komplekse en tydrowende aandagvraat.

Die proses van 'n goeie kwaliteit eindproduk is geheel en al te danke aan 'n goeie span. Daar is wel baie stappe wat belangrik is ten einde 'n goeie produk te verseker. Stappe waarvan die een nie minder belangrik is as die ander nie.

Eerstens is die keuse van die aartappelmoere baie belangrik; 'n skoon bron is ononderhandelbaar. Daarbenewens so ook die chemiese- en kunsmisverskaffer wat van kardinale belang is in die

proses om goeie kwaliteit moere te produseer. Hulle moet absoluut dieselfde passie deel dat daar geen kortpaaie in die proses is nie. Ek wil vir Werner Ras uitsonder en dankie sê vir die waardevolle rol wat hy in ons boerdery speel. Jou insette en moeite word HOOG op prys gestel.

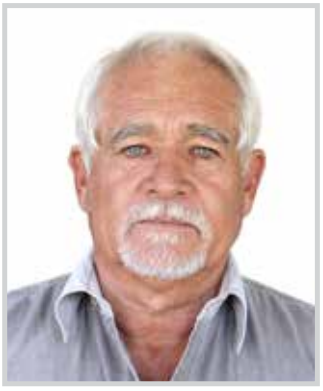
Tog kan al hierdie in plek wees en die sukses kan jou steeds ontwyk indien jy nie 'n goed geoliede span het wat als deurvoer tot by die eindproduk nie. Jou span is verantwoordelik vir daaglikse toesig en beheer. Die voorbereiding van die grond, die tydige toediening van al die chemiese stowwe en kunsmis en dan is die belangrike komponent die water. Daar moet ten alle tye 'n span wees wat ook jou visie deel en alles in hul vermoë doen om te verseker dat alles op tyd en met die regte hoeveelhede toegedien word. Om 'n goeie kwaliteit produk daar te stel verg tyd en toewyding, lojaliteit en gesonde oordeel wat met gemak verkry kan word met die regte span wat saamwerk.

Ek wil vir my pa, Louis Claassen, en Tannie Tharina Terblanche dankie sê vir hulle konstante vertroue en bystand, sonder julle was dit nie moontlik nie.

André Murray – ASD Sertifiseringsbeampte
In 2015 het Louis Claassen Familie Trust die eerste grond gebreek op die plaas Greylingslyn in die Wes-Vrystaat distrik, en die nuwe uitdaging as moerkweker is met baie entoesiasme aangepak.

Dit is altyd 'n vreugde om saam met Louis en sy span te werk. Gereelde, noue samewerking en hulle gretigheid om altyd nuwe kennis op te bou, maak dat probleme op die land en in die pakstoor vinnig reggestel word om te verseker dat daar altyd kwaliteit moere van goeie gehalte aan die bedryf gelewer word. Baie geluk met die prestasie, hou so voort!

W 057 - Dirlyn Boerdery - Dirk de Beer



Hoë kwaliteit aartappelsaad vorm die basis van aartappelproduksie. Die koste van aartappelsaad is wesenlik en daarom is dit belangrik dat die kwaliteit van die saad van hoogstaande gehalte is.

Om aartappelsaad van hoogstaande gehalte te produseer is dit van kardinale belang dat al die betrokkenes eienaarskap sal aanvaar vir die hele proses. Die proses van belang tydens die produksieproses begin al vroeg seisoen, byvoorbeeld beplanning van voorafgaande gewasse wat die produksie van aartappelsaad komplementeer. Voor plant moet die nodige grondmonsters geneem word en die nodige regstellings moet gedoen word waar nodig. Tydens plant moet die nodige chemiese beheer gekombineer word met biologiese beheer, indien nodig.

Die plantgereedheid van die saad is van kardinale belang. Klimaatstoestande, waar nodig, moet ook in ag geneem word. Tydens die groeiproses is onkruidbeheer, asook plaagbeheer, van die uiterste belang wat op 'n daaglikse basis toegepas en gemonitor moet word. Suiweringspanne (rogue) wat opgelei is om siektes te identifiseer moet tydig die lande deurstap om virusinfeksie op plante te identifiseer en te verwyder. Die toediening van kunsmis deur die seisoen is baie belangrik en word gewoonlik deur middel van blaarmonsters deur die seisoen bepaal. By Dirlyn Boerdery volg ons 'n biologiese benadering waar kompos 'n integrale deel vorm van die bemestingsprogram.

Ons is oortuig dat hierdie benadering die natuurlike weerstand van die aartappelplant optimaal aanskakel om weerstand te bied teen siektes.

Die gebalanseerde vrystelling van plantvoedsel deur middel van die kompos/chemiese kunsmis-kombinasie ervaar ons as optimaal vir die produksie van aartappelsaad van gehalte.

Leonard van der Walt – ASD Sertifiserings-beampte
Dirlyn Boerdery is geleë buite Bloemhof en val onder die Wes-Vrystaat streek. Dirlyn Boerdery doen aartappelsaadvermeerdering vir First Potato Dynamics (FPD). Jacques Cornelius is verantwoordelik vir die saadproduksie-vertakking van die boerdery. Dirlyn streef daarna om goeie kwaliteit moere aan die bedryf te lewer. Dirlyn is 'n goed-gediversifiseerde boerdery. Hulle plant ook baie wortels en mielies. Dit is altyd lekker vir ons as sertifiseringsbeamptes om aan Dirlyn Boerdery dienste te lewer. Hulle is altyd betrokke en bereidwillig om meer te leer. Ek wens hulle alle sterkte toe vir die huidige jaar en hulle moet net aanhou doen wat hulle doen.

PROKON
QUALITY CONTROL
FOR THE FRESH PRODUCE INDUSTRY

During the period March - April 2019, 15 potato producing regions as well as non-producing suppliers delivered potatoes nationally to fresh produce markets.

We have switched nearly all markets to the new Dipar system, which will make the inspections on the floor more efficient. We will be able to create a greater variety of statistics for submission to and use by Potatoes South Africa and the Department of Agriculture, Forestry and Fisheries.

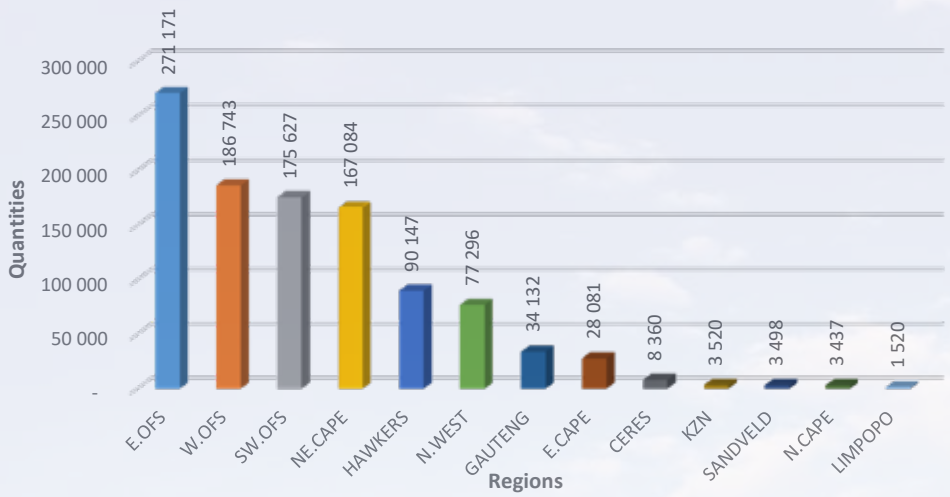
Markets that have started capturing data on the Dipar system:

Markets / Implementation date	
Tshwane (Pretoria) - end of 2018	Mangaung (Bloemfontein) - February 2019
Joburg - end of 2018	Mpumalanga and Nelspruit - February 2019
Durban - January 2019	Cape Town - February 2019
Welkom - March 2019	East London - March 2019
Pietermaritzburg - March 2019	Springs - March 2019
Port Elizabeth - March 2019	Sol Plaatje (Kimberley) - April 2019

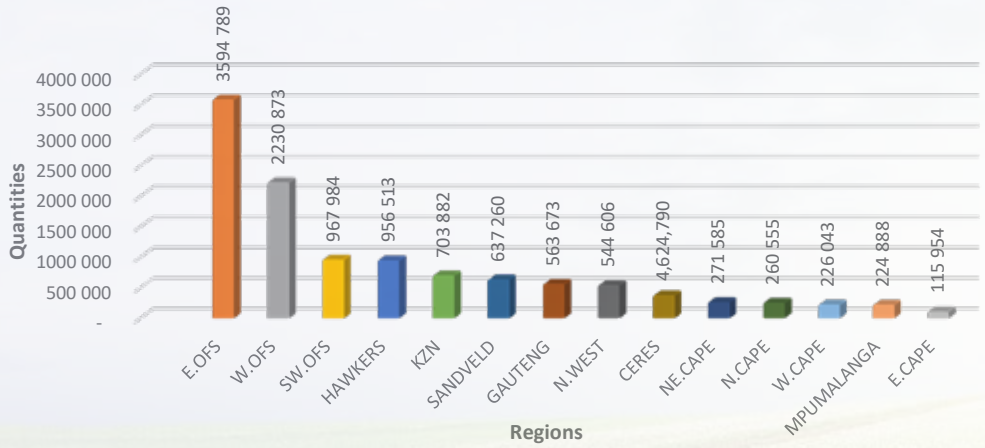
Matlosana Fresh Produce Market (Klerksdorp) is in the process of switching over.

- 12 860 925 bags from 15 regions as well as non-producing suppliers were delivered to the fresh produce markets.
- 8.10% were downgraded on average on both systems combined.

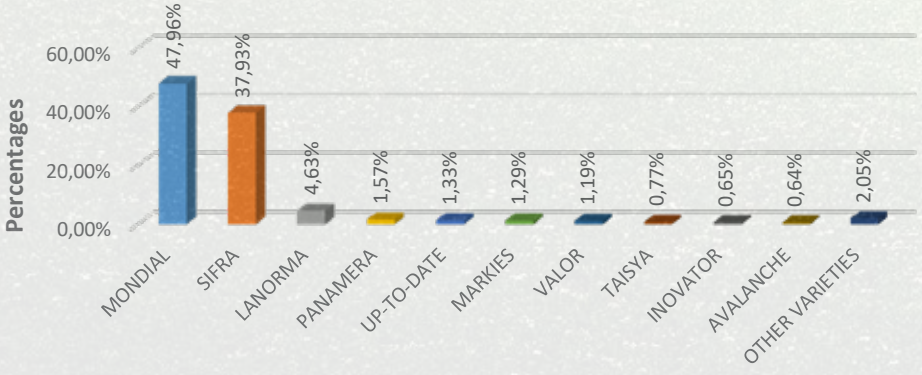
FRESHMARK SYSTEM: QUANTITY RECEIVED PER REGION DURING 1 MARCH - 30 APRIL 2019



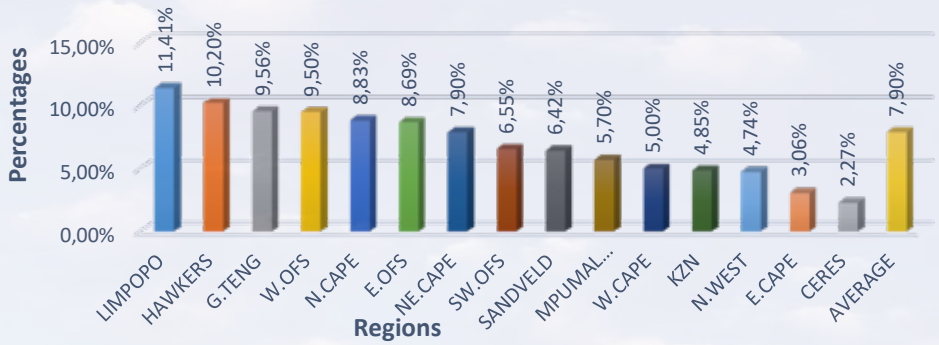
DIPAR SYSTEM: QUANTITY RECEIVED PER REGION DURING 1 MARCH - 30 APRIL 2019



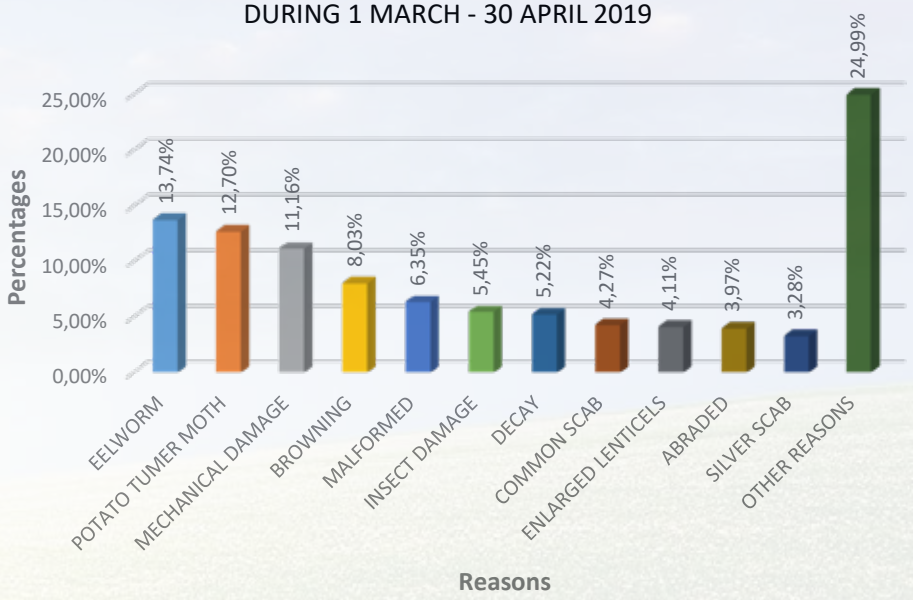
DIPAR SYSTEM: TOP 10 CULTIVARS DELIVERED PER REGION DURING 1 MARCH - 30 APRIL 2019



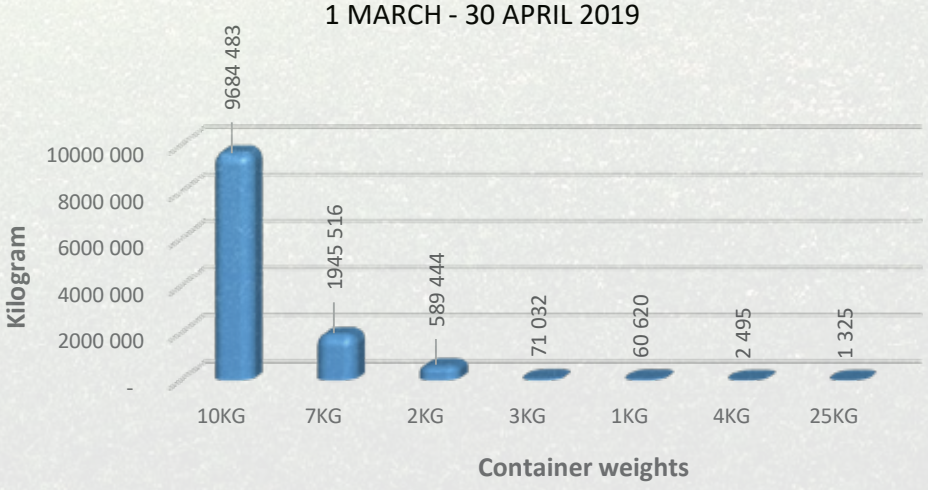
DIPAR SYSTEM (11 810 309): DEGRADED PER REGION DURING 1 MARCH - 30 APRIL 2019



DIPAR SYSTEM: TOP 10 REASONS FOR DEGRADING PER REGION DURING 1 MARCH - 30 APRIL 2019



DIPAR SYSTEM: KG'S RECEIVED PER REGION DURING 1 MARCH - 30 APRIL 2019



NAMPO – die ontmoetingsplek vir mense in landbou

Gawie Geyer (CHIPS)

NAMPO 2019 is gekenmerk deur goeie weer en 81 345 besoekers wie hierdie handelskou en gewilde ontmoetingsplek vir mense in landbou, bygewoon het.

Ná die grondhervormingsdebat, droogte en lae graanpryse van die afgelope jaar, was die gemoedelikheid en positiwiteit van produsente merkbaar. "Dit is opmerklik dat die onsekerheid minder is as verlede jaar. Ek het 'n oplossing- en 'n groei-gedrewe ingesteldheid by produsente opgemerk," het Jaco Minnaar, voorsitter van Graan SA, gesê.

Die Nasie in Gesprek-forum se gesprekspunte het vanjaar verskuif van grondhervorming na dit wat nodig is om die landbousektor en die land se ekonomie te laat groei. Wat na vore gekom het, is dat die landbousektor positief is om die plan vir ekonomiese groei te laat slaag. Sake waaraan die regering dringende aandag behoort te skenk, behels finansiering vir swart boere, die uitbreiding van markte, winsgewendheid van die sektor, 'n nasionale oesversekeringsubsidie, vaardigheidsontwikkeling, verbetering van infrastruktuur asook navorsing oor veral klimaat.

Op sy eerste besoek aan die NAMPO Oesdag het die adjunkminister van Landbou, Bosbou en Visserye, Sfiso Buthelezi, dit beskryf as die landbousektor se bes bewaarde geheim wat deur almal in Suid-Afrika wat voedsel verbruik, ervaar moet word. Hy sê in Chili en Argentinië – waar hy soortgelyke skoue bygewoon het – kom daardie lande tot stilstand om produsente te ondersteun. "Ek kan nie verstaan hoekom dit nie in Suid-Afrika ook die geval is nie," het hy bygevoeg.

NAMPO se fokus as handelskou word deurlopend behou, maar die menskant van NAMPO is 'n onmiskenbare kenmerk en die vestiging van verhoudinge, vennootskappe en vriendskappe bly 'n trekpleister. "Dit is vir Graan SA 'n voorreg om 'n NAMPO-platform te skep vir produsente en deur produsente. Om ons lede, meningvormers, rolspelers, politici en selfs landbou se pioniers by die Oesdag te ontvang, is telkens 'n hoogtepunt," het Jannie de Villiers, uitvoerende hoofbestuurder van Graan SA, gesê.

Volgens De Villiers bied NAMPO jaarliks aan die landbousektor 'n platform om een groot strategiese beplanningsessie te hou. "Individuele en kollektiewe planne vir die volgende jaar word hier gemaak om terug te neem na plaasvlak. Met die groter aanbod van tegnologie en geleenthede wat hier ontstaan, verg NAMPO toenemend meer as 'n een dag-besoek. Dit is opmerklik dat – net soos die drywers en rigtinggewers van landbou – daar regdeur die NAMPO-week 'n teenwoordigheid van insetverskaffers en landboubesighede se uitvoerende hoofde en ander besluitnemers op die terrein te sien is," het De Villiers gesê.

Dr. Dirk Strydom, bestuurder: Graanekonomie en Bemarking van Graan SA, sê vanjaar se 775 uitstallers het steeds aftrek gekry nieteenstaande die heersende ekonomiese druk op verbruikers. Sommige uitstallers het rekordverkope gehad. "Volgens uitstallers het die besoekers aan hul uitstalruimte gesorg vir kwaliteit navrae en belowende leidrade – wat baie meer werd is as net 'n volume mense."

"Ons mikpunt is nie om groter te gaan nie, maar om die ervaring vir besoekers deurlopend op so 'n standaard aan te bied, dat hulle volgende jaar weer wil kom. Die grootte van die terrein en die infrastruktuur wat goed versprei is, sorg reeds vir 'n rustiger ervaring wat gesinsvriendelik is en iets vir elkeen bied," aldus Strydom.

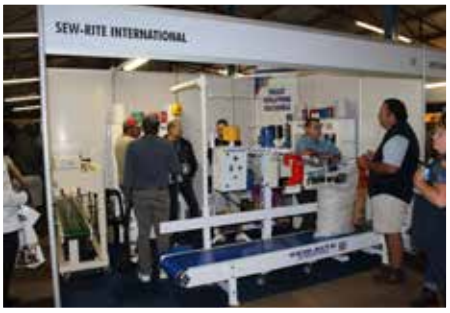
Bron: Graan SA Kommunikasie

Aartappelbedryfsvennote by NAMPO

Syngenta

Bayer

Corteva



Sew-Rite

New Holland

BASF

Arysta

Buckle Packaging

Afgri

Unikum

Dormas

Omnia

Topcrop

Yara

Besoekers

PROGRESSIEWE DISSIPLINE

Christo Bester (LWO)

Die verhouding tussen 'n werkgewer en werknemer is gebaseer op wedersydse voordele en respek. Duidelike reëls en riglyne verseker dat wrywing en misverstande beperk word, wat op sy beurt nie net produktiwiteit nie, maar ook 'n positiewe werksomgewing bevorder. Die oorgrote meerderheid van sake wat na die Kommissie vir Versoening, Bemiddeling en Arbitrasie (KVBA) verwys word, is na aanleiding van "onbillike ontslag", waarvan die meerderheid van hierdie sake verwant is aan wangedrag wat gelei het tot ontslag. Oor die algemeen word arbitrasie bevele wat in die werknemer se guns toegestaan word, direk gekoppel aan die werkgewer wat nie die korrekte prosedure gevolg het nie. Die KVBA kan bevele van tot 12 maande van 'n werknemer se salaris teen die werkgewer toeken.

Progressiewe dissipline is algemeen bekend in die arbeidsomgewing en een van die belangrikste punte wat oorweeg moet word deur die KVBA, Bedingingsrade en Arbeidshof waar 'n dispuut van onbillike ontslag ontstaan. Werkgewers moet seker maak dat progressiewe dissipline reg verstaan en toegepas word in die werksplek.

Wat is progressiewe dissipline?

Die Wet op Arbeidsverhoudinge omskryf progressiewe dissipline soos volg: *"Die benadering van progressiewe dissipline in die werksplek, beskou die doel van dissipline as 'n middel vir werknemers om te weet en te verstaan watter standaarde van hulle vereis word. Dus moet redelike stappe geneem word om werknemers se gedrag te verbeter of te verander deur middel van 'n sistematiese gebruik van waarskuwings en beraadslagingskonsultasies"*.

Dissipline in die werksplek het ten doel om gedrag aan te pas en te verbeter deur regstelling, konsultasies en waarskuwings, eerder as om 'n werknemer te straf of te ontslaan. Ontslag moet altyd die laaste opsie wees.

Tipes wangedrag

Dit is baie belangrik dat elke werksplek 'n relevante dissiplinêre kode het. Die dissiplinêre kode is noodsaaklik om te verseker dat daar duidelike reëls in die werksplek is, met toepaslike sanksies, wat werknemers kan volg. Wanneer hierdie reëls oortree

word, kan die werkgewer progressiewe dissipline toepas, of in gevalle van ernstige wangedrag direk voortgaan met 'n dissiplinêre verhoor. Die werkgewer moet deeglik rekord hou van oortredings en sanksies soos toegepas.

Daar is verskillende tipes wangedrag in die werksplek wat wissel van minder ernstige oortredings tot baie ernstige oortredings, beïnvloed deur die werknemer se tipe werk en verantwoordelikheid, die (moontlike) gevolge van die oortreding, asook die impak van die oortreding op die werknemer-werkgewer vertrouensverhouding.

In gevalle van minder ernstige oortredings, kan die werkgewer 'n informele proses volg deur middel van goeie advies of leiding, regstelling en konsultasie. Waar die oortredings van 'n ernstiger aard is, kan 'n formele proses gevolg word in terme van skriftelike waarskuwings en/of ontslag na afloop van 'n dissiplinêre verhoor.

Normale verloop van progressiewe dissipline

Progressiewe dissipline bestaan uit die volgende stappe:

- Mondelingse waarskuwing – geldig vir drie maande
- Skriftelike waarskuwing – geldig vir ses maande
- Ernstige skriftelike waarskuwing – geldig vir nege maande
- Finale skriftelike waarskuwing – geldig vir twaalf maande
- Ontslag (na afloop van 'n dissiplinêre verhoor)

Arbeidswetgewing omskryf nie die termyn wat waarskuwings geldig is nie, maar in praktyk stel ons bogenoemde voor.

Die werkgewer moet die erns van die oortreding oorweeg en progressiewe dissipline toepas volgens die aard van die wangedrag, byvoorbeeld in die geval van:

- Afwesig sonder toestemming vir een dag = skriftelike waarskuwing
- Afwesig sonder toestemming vir twee dae aaneen = ernstige skriftelike waarskuwing
- Afwesig sonder toestemming vir drie dae aaneen = finale skriftelike waarskuwing
- Minagting = finale skriftelike waarskuwing / dissiplinêre verhoor
- Versuim om 'n instruksie uit te voer = finale skriftelike waarskuwing / dissiplinêre verhoor

Wanneer die werknemer herhaaldelik dieselfde reël oortree en die werkgewer progressiewe dissipline toepas, kan die werkgewer 'n ernstiger waarskuwing uitreik indien die vorige waarskuwing steeds geldig is.

Voorbeelde van eenmalige oortredings wat ontslag kan regverdig, is as volg:

- Growwe oneerlikheid (diefstal, bedrog, valse verklaring)
- Opsetlike beskadiging van eiendom
- Aanranding, of poging tot aanranding
- Growwe nalatigheid
- Uiterse gevalle van minagting
- Om opsetlik mense se lewens in gevaar te stel

'n Werkgewer kan onder geen omstandighede 'n werknemer ontslaan sonder om 'n dissiplinêre verhoor te hou nie. Dit verseker dat billike prosedure gevolg is en daar substantiewe bewyse is om die werknemer te ontslaan.

Vele besigheidsrisiko's moet dus daagliks deur die werkgewer bestuur word. Ons beveel sterk aan dat werkgewers proaktief optree deur duidelike reëls in die werksplek te implementeer en korrekte prosedures te volg met betrekking tot alle arbeidsregtelike aangeleenthede, veral ontslag en algemene dissipline in die werksplek. ©

Uit die Argiewe / From the Archives

CHIPS - May June 2009

Who and what is going to feed the world?

During the recent (2009) World Potato Congress held in New Zealand, the Congress was opened with a challenge to the industry, namely: How are we going to feed nine billion people by 2050? Since then the G20 countries sided with the worldwide challenge.

It seems to be far away, but it is very nearby. The reality is not only pressure with regard to the availability of land, water and labour (as a result of urbanisation), but also on horizontal expansion – which is only possible in sub-Saharan Africa and South America.

With the current world population of more than 6.3 billion people, we are not doing very well in feeding them. Reasons for that are numerous, but the upsetting fact is that more or less one billion of the world population currently go to sleep hungry and unfortunately about 25% of them are on our doorstep, on our continent, in sub-Sahara Africa, but even as close as our own country.

The good news to the world is that potatoes are third largest food source after rice and wheat. Our product is the best-off and will also be the best-off in times of immense pressure on natural resources, energy, climate change, economic pressure and sustainability.

In South Africa we'll have to ask ourselves how do we position ourselves and the industry for the influx of people and resources into Africa who are searching for available resources to produce food for the growing world population which is currently growing at a rate double the total South African population per annum. This should surely hold benefits for the South African potato industry – as the potato leaders of our continent. Yes, we are third with regards to production in Africa (after Egypt and Algeria), but our productivity, level of technology and innovation beat these countries by far.

One thing is for sure – in order to further enlarge and ensure the role of potatoes in the feeding of the growing world population, we'll have to put in a joint effort in future to enable us to face the challenge.

Skyfie sê / Skyfie says

Monique Vlok se Sandveld-storie – Vriendskap is 'n belangrik ding

Die Sandveldse oom is op daardie stadium van sy lewe waar hy wil afskaal en dinge ietwat rustiger vat. "Ek het wel 'n skoonseun wat 'n boerklong is, maar omdat boer-wees in die Sandveld so 'n moeilike besigheid is, kan ek dit nie oor my hart kry om die klong met 'n plaas in Sandveld op te saal nie", sê hy vir buurman.

"Maar gee dan maar die plaas vir my. Ek het twee seuns wat my kan help", sê buurman waarop die oom antwoord – "Ek sal dit nooit doen nie, ek gaan nie 'n jarelange vriendskap so opfoeter nie. In elke geval, wat wil jy met nog 'n Sandveld-plaas maak as jy weet hoe swaar dit gaan."

Sê buurman – "Ek wou dit maar net vir iemand gee van wie ek nie hou nie."

Dis nou goeie buurmanskap!

Dagboek / Diary 2019

Aartappels SA / Potatoes SA

Aartappelnavorsingsimposium / Potato Research Symposium: 23 – 24 Julie / July

Vivo Bemarkingsdag / Marketing Day: 16 Augustus / August

Korkom AJV / AGM: 27 Augustus / August

Moerkwekersforum / Seed Potato Growers Forum: 17 September

Potatoes South Africa Congress / Aartappels Suid-Afrika Kongres: 18 September

Noordwes Inligtingsdag / North West Information Day: 7 November

Suidwes-Vrystaat Groentoer / South Western Free State Green Tour: 21 November

Ander / Other

PMA Fresh Connections: Southern Africa Congress &Trade Show: 30 – 31 Julie / July

11th African Potato Association Conference, Kigali, Rwanda: 25 – 29 Augustus / August

APAC
AGRICULTURAL PRODUCE AGENTS COUNCIL

REGISTERED FRESH PRODUCE AGENTS

BLOEMFONTEIN FRESH PRODUCE MARKET
Bloemfontein Market Agency
Modise Market Agency
RSA Bloemfontein Market Agency
Subtropico Bloemfontein Market Agency
Vrystaat Market Agency

CAPE TOWN FRESH PRODUCE MARKET
Boland Market Agency
Fine Bros Market Agency
Rhoda's Market Agency
RSA Cape Town Market Agency
Subtropico/Spes Bona Market Agency

DURBAN FRESH PRODUCE MARKET
Delta Market Agency
Hanly Market Agency
Port Natal Market Agency
RSA Durban Market Agency

EAST LONDON FRESH PRODUCE MARKET
AA Market Agency
Border Farmers Market Agency
Martin & Scheepers Market Agency
Subtropico East London Market Agency

EPPING MUNICIPALITY
Whoopi Up Epping Market Agency

GEORGE MUNICIPALITY
Garden Route Fresh Express Market Agency
Maverick Market Agency

JOBURG FRESH PRODUCE MARKET
Botha Roodt Johannesburg Market Agency
C L de Villiers Market Agency
Catu-Fresh Market Agency
Citi Deep Waatlemoen Market Agency
Citifresh Market Agency
Dapper Market Agency
DW Fresh Produce Johannesburg Market Agency
Egoly Johannesburg Market Agency
Exec-U-Fruit Market Agency
Marco Market Agency
Matla Market Agency
Metro Market Agency
Pula Nala Market Agency
RSA Johannesburg Market Agency
Subtropico Johannesburg Market Agency
Swartberg Market Agency
Uni Dev Market Agency
Wenpro Johannesburg Market Agency

KEI FRESH PRODUCE MARKET
Farmers Direct Market Agency

KING WILLIAM'S TOWN FRESH PRODUCE MARKET
King William's Town Market Agency

KIMBERLEY FRESH PRODUCE MARKET
Kimberley Market Agency
Subtropico Kimberly Market Agency

KLERKSDORP FRESH PRODUCE MARKET
Garfield Market Agency
J Frances & Son Market Agency
Matlosana Market Agency
Subtropico Klerksdorp Market Agency
W.L. Ochse & Kie Market Agency

LIMPOPO PROVINCE
RSA Limpopo Market Agency
RSA Mooketsi Market Agency

NELSPRUIT MUNICIPALITY
Whoopi Up Nelspruit Market Agency
Nelspruit Market Agency

NOORDEINDE FRESH PRODUCE MARKET
Noordeinde Market Agency

PIETERMARITZBURG FRESH PRODUCE MARKET
G.W. Poole Market Agency
Natalia Market Agency
Nkosi Market Agency
Peter & Co Market Agency
Subtropico Pietermaritzburg Market Agency

PORT ELIZABETH FRESH PRODUCE MARKET
African Market Agency
Algoabaai Market Agency
Gouws & Co Market Agency
Lansdell Market Agency
W Finlayson & Co Market Agency

SPRINGS FRESH PRODUCE MARKET
AM Meyer Market Agency
New Africa Market Agency
RSA Springs Market Agency
Springs Market Agency (Vegetables)
Subtropico Springs Market Agency

TSHWANE FRESH PRODUCE MARKET
Botha Roodt Pretoria Market Agency
Du Plessis & Wolmarans Market Agency
DW Fresh Produce Tshwane Market Agency
Farmers Trust Market Agency
Fresh Way Market Agency
Mabeka Market Agency
Noordvaal Market Agency
Prinsloo & Venter Market Agency
RSA Tshwane Market Agency
Subtropico/Protea Market Agency
Tshwane Green Market Agency

VEREENIGING FRESH PRODUCE MARKET
Impala Market Agency
Subtropico Vereeniging Market Agency

WELKOM FRESH PRODUCE MARKET
Botha & Roodt Welkom Market Agency
Opkoms Market Agency
Subtropico Market Agency

WITBANK FRESH PRODUCE MARKET
Subtropico Witbank Market Agency
Witbank Market Agency

OTHER
Core Fruit
Comfy Fresh
Farm Fresh Direct
Farm Market
Federated Farmers
Subtropico Online
Fruitways
Green Network
Lucerne Fresh
RSA Beyond
Stargrow
Westfalia

VISIT APAC'S WEBSITE REGULARLY

Do you know if your fresh produce agent practise sound financial management? Did your agent received an audit qualification on his last audit report? Does your agent submit their monthly trust reconciliation timeously and has no trust account shortages? Ensure that you visit our website monthly as it is updated regularly with information on the financial status of agencies.

**SUITE NUMBER 69, PRIVATE BAG X 9,
EAST RAND, 1462
TEL: (011) 894-3680, (087) 095 1335,
FAX: (011) 894-3761,www.apacweb.org.za**

REGISTRATEUR • REGISTRAR: FRANCOIS KNOWLES

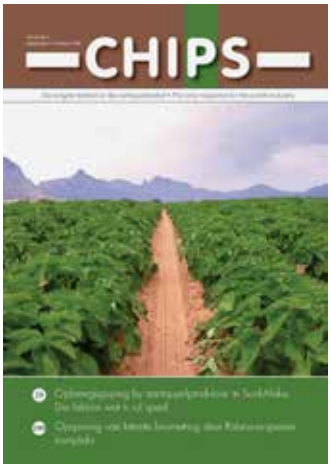
2019 CHIPS advertisement rates

potatoes aartappels SA

CHIPS
www.potatoes.co.za

ADVERTISE IN **CHIPS** TO REACH THE **POTATO FARMER**

ADVERTISING SPECIFICATION



FULL PAGE
R13 400

Back cover
R16 750
Inside cover - front
R15 900

210 mm x 297 mm
Bleed: 4 mm
Type area: 20 mm
Format:
High Res (PDF)
300 dpi (CMYK)

HALF PAGE
landscape
R7 150

190 mm (w) x 130 mm (h)
Bleed: no
Type area: no
Format:
High Res (PDF)
300 dpi (CMYK)

HALF PAGE
portrait
R7 150

90 mm (w) x 267 mm (h)
Bleed: no
Type area: no
Format:
High Res (PDF)
300 dpi (CMYK)

THIRD PAGE
landscape
R4 700

190 mm (w) x 92 mm (h)
Bleed: no
Type area: no
Format: High Res (PDF)
300 dpi (CMYK)

QUARTER PAGE
portrait
R3 930

90 mm (w) x 128.5 mm (h)
Bleed: no
Type area: no
Format:
High Res (PDF)
300 dpi (CMYK)

EDITION	BOOKINGS	MATERIAL
January/February	18/01	25/01
March/April	15/03	22/03
May/June	17/05	24/05
July/August	19/07	26/07
September/October	20/09	27/09
November/December	15/11	22/11

Rates exclude VAT and advertising agency commission

DIGITAL ADVERTISING MATERIAL FORMATS

The following are formats by which the magazine can accept digital advertisements:

- Document to be set up to advertising specifications (i.e. Ad specs)
- E-mailed advertising material should not be bigger than 5MB (PDF, Jpeg or Tiff)
- All advertising material to be in CMYK colour mode and the resolution 300 dpi
- If pictures are sent, save as high resolution (300DPI)
- Logos must be 300 dpi with a CMYK colour breakdown
- Press optimised PDF's on CD with a colour proof is also acceptable.
- PDFs supplied should include all fonts and in CMYK mode.

INSERTS & ADVERTORIALS

The same rates as for advertisements apply to articles and inserts. These rates exclude VAT and advertising agency commission.

PROMOTIONAL POLICY

If six advertisements are placed in six consecutive issues an advertorial of the same size may be placed free of charge.

CHIPS

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GWK Aartappels

Ons kweek aartappelmoere wat bekend is vir uitstekende opbrengs en markgeleenthede. Kontak ons.

GWK

innoveer landbou

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