

Mondstuk van die Suid-Afrikaanse aartappelbedryf • Mouthpiece of the South African potato industry

CHIPS

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/ DRIE MAANDE VAN 2021
OP VARSPRODUKTEMARKTE**

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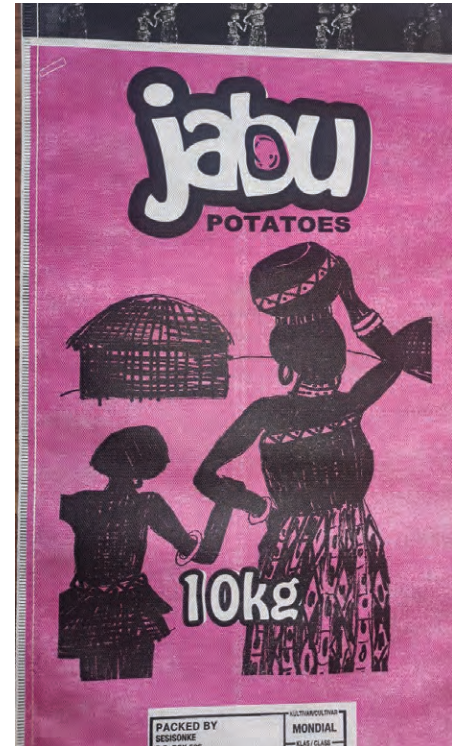
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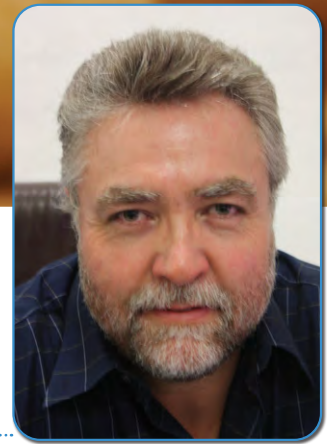


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Hoop is nié net 'n gerug nie

Deur Willie Jacobs, HUB van Aartappels SA



Goeie dag aan ons aartappelfamilie. Aartappels SA (ASA) het onlangs die #WhenHopeWhispers-veldtog geloods met die doel om die publiek en samelewing as geheel in te lig waarom landbou, en veral aartappelproduksie, werklik gaan. Ons wil verbruikers daarvan bewus maak dat aartappels nie hul ontstaan op die supermark se rak het nie, en beslis ook nie van die mark af kom nie.

Dit is belangrik dat die verbruiker verstaan dat daar 'n groep mense is wie hulle hart en siel daarin belê het om ons land van kos te voorsien. Hierdie mense is ons produsente, en nie alleen is hulle doel om werklik te sorg vir kos nie – dit is ook hulle wat ons landelike gemeenskappe aan die gang hou.

Wedersydse begrip

Die veldtog het ook 'n ander doel, en dit is om by ons produsente 'n beter begrip te ontwikkel van die werklike stryd waarin ons kleinhandelkopers hulle bevind. Die aartappel volg 'n lang roete vanaf die boer se plaas tot by die kassiekoswinkels in ons townships. Ons informele sektor dien beslis een van ons grootste markte in Suid-Afrika en het 'n beduidende invloed op die aartappelprys. Hulle is dan ook 'n baie belangrike komponent van die #WhenHopeWhispers-veldtog en dit is nodig dat daar begrip is vir die feit dat soveel van hierdie mense, veral met die aanvang van die inperkingstyd, hul toegang tot kos ontnem was.

Die goeie nuus is dat daar verseker plek is vir nuwe toetreders tot die aartappelmark en ASA is daar om hierdie

toetreders met raad en daad by te staan. Aartappelproduksie is 'n komplekse besigheid want dit is 'n gekompliseerde gewas. Ek wil my egter verstout om te sê dat aartappelproduksie dikwels dalk meer 'n emosionele uitdaging as 'n klimaatsuitdaging in die gesig staar.

Aartappelproduksie vereis 'n baie groot kapitale inset en indien jy graag tafelaartappels wil produseer, is 'n plaas nie al wat jy moet hê nie. Heelwat kapitaal en insette is nodig om pakstore en ander belangrike fasiliteite van die grond af te kry. Maar daar is geleenthede wat geskep kan word om die bal aan die rol te kry, en fasiliteerders wat kan help om die groot koste en impak van die produksieproses ietwat te versag. By ASA het ons al die tegniese kennis wat nodig is om 'n beginner-produzent te ondersteun.

Teenoor ons bestaande aartappelprodusente spreek ons graag ons opregte waardering uit. By ASA sien en verstaan ons die moeilike omstandighede waaronder julle soms moet aanhou produseer en ons verseker julle – dit gaan nie ongesiens verby nie. Suid-Afrika het julle nodig en van ASA se kant sal ons voortgaan om

te help en te fasiliteer, soos en waar nodig. Ons kan jou inderdaad bystaan met die ekonomie van jou besigheid en kan help om die vraag na 'n goeie produk te fasiliteer. Byt vas, hou vol – die mark is reg vir julle.

Positiewe invloed

Saam met die #WhenHopeWhispers-veldtog fokus ons baie pertinent op een van die grootste faktore wat die markprys van aartappels beïnvloed, naamlik die kommunikasielyn tussen wat in die produksie-omgewing gebeur, teenoor dit wat die mark nodig het. Na my mening is meer interaksie nodig en moet daar beter begrip wees vir die seisoenale aard van die bedryf en hoe dit werk. Dis belangrik dat ons weet wanneer tekorte verwag kan word en dat ons maniere kry om prysstabiliteit vir beide die verbruiker en die produsent in die hand te werk. Nie alleen sal dit die ekonomie van die bedryf verbeter nie – dit sal ook die verbruiker se sak positief beïnvloed.

Ons sal in hieropvolgende uitgawes van CHIPS verder gesels oor die insetkoste-ontleding waarna ek in die vorige uitgawe verwys het. En onthou: ons stap met oorgawe die pad saam.

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Hope comes in a potato bag

How true this is: Where there is hope, there are potatoes! When Potatoes SA (PSA) recently announced their #WhenHopeWhispers campaign, it got me thinking about history and how the humble potato has played a crucial part in feeding the world throughout the ages.

Just think of the Irish Potato Famine, or Great Hunger, which started in 1845 after *Phytophthora infestans* (*P. infestans*) spread through Ireland. As in many other parts of Europe, potatoes were a staple food in Ireland as they could be grown under difficult conditions and be used with just about any cooking method. The result of the infestation was mass starvation, which lasted for approximately seven years. Without potatoes, people went hungry and when scientists finally found a way to combat *P. infestans*, renewed potato production restored hope.

Fast-forward a mere year after the famine ended in 1852, when Vincent van Gogh painted his infamous 1853 'The Potato Eaters' with its earthy, potato-like colours and clear depiction of the harsh reality of country life. Though dark in colour and expressive of challenging times, this painting honoured manual labour, working the land, and earning one's food honestly – in this case, once again the trusted potato, a staple food of the time.

Creating hope

By the 1900s, potatoes were being grown commercially just about everywhere in the world, and consumers and producers alike were starting to respect this crop's versatility, dependability, and ability to produce more nutritious



food very fast, on less land and in harsher climate conditions than any other major crop.

From the 'old world' in the Americas some 8 000 years ago to where we are today, a great deal of time and effort has gone into improving the production ability of potatoes, its varieties, and its ability to tolerate diseases. These efforts and successes create hope – not only for a healthy, successful crop and sufficient yield, but also for nutritious and affordable food on the table.

Here, at the southernmost tip of Africa, poverty is a harsh reality. We are frequently confronted with statistics indicating how more people are living below the breadline due to growing unemployment and dire economic conditions.

Behind the potato curtain

What we don't often see or read about is the work done behind the scenes to improve potato production, processing and consumption in South Africa. Behind the proverbial PSA curtain, it is a hive of activity. Researchers are researching, varieties are being improved, diseases are being combatted, technology is being developed, markets are being opened, traders are trading, marketing campaigns are creating hope, and real transformation is taking place.

And amid it all, quietly and unassuming, potatoes are allowed to multiply in the soil, ready to make their way to an empty plate and a hungry tummy.

The pages of this magazine aim to showcase these activities and, most importantly, the successes. Enjoy this issue of *CHIPS*, which once again offers readers a smorgasbord of great content generated from the fruitful and productive activities of the PSA team.

Lynette Louw, editor
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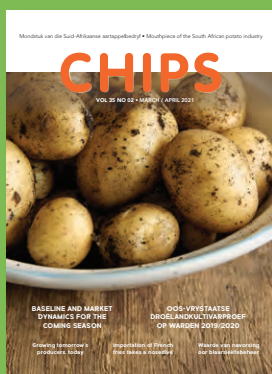
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Mexico lifts ban on US potato imports

"Mexico's Supreme Court released a final, unanimous ruling on a case that puts fresh potatoes from the United States (US) one step closer to finally gaining access to Mexico. This follows nearly 20 years of negotiations.

"The decision is important for American agriculture and for positive bilateral relations between the US and Mexico," said US agriculture secretary, Tom Vilsack. The US Department of Agriculture (USDA) has worked for years on a resolution to this ongoing issue. It is estimated that full market access for US potatoes could increase exports from approximately \$50 million in 2020, to more than \$150 million.

"We look forward to resuming bilateral technical engagements to finalise import requirements as soon as possible. Decisions like this one today are important for long-term export growth." – *Potato News Today*

Portuguese researchers develop edible packaging

Researchers from the Centre for Research in Engineering of Chemical Processes and Forest Products of the University of Coimbra in Portugal have developed edible and health-beneficial packaging made from fruit, vegetable and crustacean remains, as an alternative to plastic packaging.

The packaging is still a prototype, but the objective is to place it on the market soon. "There is already some edible packaging on the market, but these are pioneers in taking advantage of waste and including beneficial compounds for health, such as antioxidants and probiotics," the researchers stated.

Potato starch and quince pectin are two of the main ingredients of the packaging due to their structural polymeric characteristics, which allowed researchers to obtain very thin sheets through simple processing. This innovation allows for cooking the food without having to remove it from the packaging, as the edible film has been designed to contain bioactive properties. – *efeagro.com*

Smart robots increase value of fresh produce

From assessing and sorting fresh fruit to assembling vegetable packages, the intelligent robots of Wageningen AgroFood Robotics learn – from people – to perform multiple tasks. According to Wageningen University and Research, this makes the processing of fruit and vegetables much more cost-efficient.

All over the world, sorting, grading and assembling of fresh fruit and vegetables have always been done manually. "It would save companies a lot of time and money if robots could take over tasks from employees. And it would be even more efficient if one robot could perform multiple tasks," says Aneesh Chauhan, expert leader of the computer vision and robotics group at Wageningen Food and Biobased Research.

The Wageningen robots are equipped with cameras that capture the movements of a human expert performing picking and sorting tasks. – *Future Farming*

Namibian demand exceeds local supply

In Namibia, retailers and importing agents have spent N\$120,1 million (Namibian dollars) between 2019 and 2020 on importing washed potatoes to meet local demand. At the same time, local producers are struggling to meet the demand.

This is according to statistics released by Emilie Abraham, horticulture manager of the Namibian Agronomic Board (NAB). Forecast for local production stands at 14 904 tons, which is only 40% of domestic demand. Domestic demand stands at 37 129,40 tons.

Abraham says only seven Namibian potato producers currently wash potatoes. The country's high import bill is not only due to the inability to wash potatoes, but also because of low volumes produced by local producers, she says. Abraham says if more could be produced, the seven producers who currently wash potatoes could assist with this at a cost, and, as a result, grow the local value chain. – *The Namibian*

USDA to deregulate genetically engineered potato

The United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) is extending deregulation to JR Simplot Company's (Simplot) potato variety, which was developed using genetic engineering, designated as Snowden Z6 (Z6 potato).

The potato variety is engineered for late blight protection, lowered reducing sugars, low acrylamide potential and reduced black spot bruising. APHIS previously reviewed and deregulated these traits in another Simplot potato variety, referred to as Innate W8 Russet Burbank potato (W8 potato).

APHIS reviewed Simplot's extension request for its Z6 potato variety and prepared a plant pest risk similarity assessment (PPRSA) and a preliminary determination of non-regulated status, concluding that Z6 potatoes are not more likely to pose a plant pest risk than the previously deregulated W8 potatoes. APHIS reached a 'Record of Categorical Exclusion Determination' based on its similarity assessment. – *Potato Pro*

Canadian network combats silent killer

A national initiative to reduce the severity of potato early dying (PED) in Canadian potato fields, is claiming some early success halfway through its four-year programme.

The Canadian Potato Early Dying Network (CanPEDNet) is beginning to learn more about verticillium wilt and how to deal with this major yield-limiting pathogen in commercial potato cropping systems. The goal is to help potato growers identify verticillium in their fields, predict potential yield losses and provide tools to control the disease.

Other potato diseases such as late blight can be controlled by spraying fungicides onto potato foliage, but PED is more insidious as the fungus is present in the soil and difficult to treat. This is where CanPEDNet excels with projects designed to learn more about the pathogen, in order to relate that knowledge to disease levels and yield losses and evaluate control practices in commercial potato fields. – *Potato Grower*

Dutch potato industry faces huge losses

Potato growers in the Netherlands are facing huge losses with restaurants and snack bars being closed. The Netherlands is one of the main producers of potatoes for making fries.

Now that the majority of restaurants, bars and fast-food outlets worldwide have closed their doors to contain the spread of the coronavirus, growers are looking at 1,5 million tons of potato stock, two thirds of which cannot be sold.

The stagnating market is having a knock-on effect on potato processing firms such as Aviko, which produces some 15 million potato products a week on average. Deep-fried chips are being made until the company runs out of space to store them, Aviko sales manager, Dick Zelhorst, said.

The question of how to process a billion kilograms of potatoes is not easily answered. Many growers' stock had already been washed for delivery to restaurants, and so were perishable, growers said.

– *Dutch News*

Robotti field robot plants potatoes

For the first time, potatoes have been planted with the help of a field robot in the Netherlands. It is part of a research project that aims to determine whether potatoes can be cultivated more efficiently with fewer heavy machines.

The trial was carried out with the Agrobot Robotti, an autonomous tool carrier that can independently perform various activities. For this purpose, the robot was coupled to a trailed four-row Miedema CP 42 planter.

The trial is part of the robotisation project of Wageningen University, Agrobot and Dewulf. Part of the demonstration plot of the PotatoEurope fair has been reserved near the city of Lelystad for this purpose. During PotatoEurope, which takes place on 1 and 2 September 2021, the Robotti will also harvest the potatoes. – *Future Farming*

Belgians object to potato processing plant

Inhabitants of a small town in the Belgian province of Hainaut are attempting to stop one of the country's largest potato processors from constructing a gigantic €300 million factory on their doorstep. The company, Clarebout, says it will create hundreds of jobs in Belgium's south, which has been economically hammered by de-industrialisation.

A residents' collective called Nature Without Frying has managed to delay Clarebout's project, arguing the factory will bring bad smells, pollution, noise, and precarious, unsafe employment. "This site is not suitable for industry, not at all," Florence Defourny, spokesperson for Nature Without Frying, said.


The protesters insist that they are trying to protect something more than their own back gardens and are questioning the way food is produced. "We are against any industrial model that would completely damage our environment, and which doesn't fit with our values," Defourny added. Belgium's global supremacy in frozen exports means 90% of spuds are sold overseas.

– *Potato Business*

RACs hold promise for Uganda

Rooted apical cuttings (RACs) technology has the potential to create larger volumes of quality seed for Ugandan potato producers.

To complement current seed potato production systems in Uganda, the International Potato Centre (CIP), with financial support from the Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the CGIAR Research Program on Roots, Tubers and Bananas, is collaborating with its public and private partners to promote the production and field multiplication of RACs in Uganda.

RACs are like vegetable seedlings. They are produced in screenhouses from in-vitro plantlets by vegetative propagation and transplanted in the field by seed multipliers, where they each produce eight to 15 or more tubers. Due to their high productivity, RACs have the potential to produce larger volumes of quality seed, resulting in higher yields and income for farmers. – *Daily Monitor* 

PIF shines the spotlight on value chain resilience

By Ursula Human

The Potato Industry Forum (PIF) hosted by Potatoes South Africa (PSA) took place on 5 April this year. A small face-to-face function was hosted at the Woodhill Country Club and was also attended by role-players online. Formal proceedings included the annual *Chairperson's Report of the Potato Industry Development Trust*, delivered by Ernst Yzel, chairperson of the trust, along with a business report delivered by Willie Jacobs, CEO of PSA.

Speakers of the day included Dr Justy Range from Freshmark Systems who discussed the impact of Covid-19 on the potato value chain, Joe de Beer from Stats SA who shared information on potato production and prices, and Francois Knowles from the Agricultural Produce Agents' Council (APAC) who took delegates through the ins and outs of the *Agricultural Produce Agents Amendment Bill, 2020*.

Importance of information in the value chain

Dr Range's address highlighted the importance of market information in the potato value chain. He said that in South Africa, market statistics and price information are openly available. This concept of openly sharing market information is unheard of in countries such as the United States (US) and the European Union (EU). The Johannesburg Fresh Produce Market continuously makes daily data available regarding price movements.

In many international markets, industry information is very closely guarded and produce prices are determined before planting.



Willie Jacobs, CEO of PSA, and JF van der Merwe, chairperson of PSA.

Although a free-market system, as is used in South Africa, means that prices are more volatile, it also implies more opportunity to make more profit. Luckily, market prices are also closely monitored by the Competition Commission, especially when it comes to price inflation of specific fresh produce. Daily potato prices can be found on www.potatoes.co.za.

“The dependence on each node of a value chain that has little diversification in the way the commodity is supplied, is not always a good thing.”

Other types of information that are readily available to the public are production volumes, sales

volumes, quality standards and grading specifications, as well as information relating to traceability and food safety. The Produce Price Index (PPI) and the Consumer Price Index (CPI) can also provide farmers and other role-players in the value chain with insightful price trends. It is thanks to such readily available information that the potato industry was able to navigate the unprecedented conditions faced during the pandemic.

Impact of Covid-19 on the potato value chain

Covid-19 caused disruptions to global and local trade in several ways. For one, supply and demand have never been disrupted at an international level at the scale observed during this pandemic. The potato industry was especially impacted, as the commodity boasts a highly industrialised food supply chain. The dependence on each node of a value chain that


has little diversification in the way the commodity is supplied, is not always a good thing, said Dr Range. For example, with disruptions in travel that affected the mobility of people and exports, it was clear that this type of trading system poses a high level of risk.


Except for market disruptions, he also discussed another important factor that came into play along with the pandemic, namely contagion. The industry had to ensure that trade could continue without spreading the virus. There was also a definite shift in consumer focus towards produce. Before the pandemic, the consumer's focus was very much on the farm-to-fork concept, but now it has become fork-to-farm. The well-being of the consumer has become a priority and the potato industry wants to ensure that both food quality and food safety are reliable.



A panel discussion with important role-players took place at the forum. From left is Ernst Yzel, chairperson of the Potato Industry Development Trust, JF van der Merwe, chairperson of PSA, and Dr. Justy Range, Freshmark Systems. During the panel discussion, Yzel gave feedback on the important role that the potato industry plays in rural development. He said that crime in small towns tend to drop by as much as 50% when the potato packing season starts.

Despite all these changes, Dr Range said that the South African agricultural sector is a resilient industry. The local industry is used to facing many challenges that include

unpredictable crises such as irregular rainfall and logistical issues. This enabled the industry to adapt quickly to the many changes the Covid-19 pandemic threw its way. 



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First SOPIA celebrates the potato industry's resilience

By Ursula Human

State of affairs addresses are not only hosted by and for local government. The South African potato industry recently hosted its very own State of the Potato Industry Address (SOPIA), giving an overview of this vital sector and commodity.

This inaugural Potatoes South Africa (PSA) event was presented as a hybrid affair on 5 May 2021. A breakfast was hosted for media and industry role-players at the Woodhill Residential Estate and Country Club in Pretoria, which was also streamed live.

Themed #WhenHopeWhispers, the initiative aimed to give a voice to the role-players (producers, distributors, informal and formal traders, and consumers) that continuously move the potato industry forward.

Female powerhouses praise potatoes

Dr Brylyne Chitsunge, commercial farmer and Pan-African Parliament's (PAP) ambassador for food security in Africa, highlighted the role of the potato in ensuring food and nutrition security in South Africa.

Dr Chitsunge said, as a crop that is relatively easy to propagate and

has such high nutritional value, it is a crucial crop for small-scale and commercial farmers to produce. As a female farmer, she also emphasised the important role that women can play in driving food security in SA.

The second guest speaker of the event was another female powerhouse – Thabi Nkosi, agricultural economist of African Green Alpha. She gave an overview of the production of potatoes in the country and emphasised that potatoes have the potential to become an even bigger commodity, such as maize.

Although potatoes are the world's fourth most-significant food crop after maize, wheat and rice, its health benefits and ability to ensure food security means that the industry needs to expand even further, said Nkosi.

The humble spud and Covid-19

Willie Jacobs, CEO of PSA, delivered the official SOPIA speech and discussed the impact that Covid-19 has had on the industry, and how potatoes could contribute to recovering from the pandemic.

According to Jacobs, despite the chaos brought about by Covid-19, South African potato producers



Thabi Nkosi, agricultural economist of African Green Alpha.

planted on approximately 51 000 hectares, produced a total crop of 2,6 million tons and delivered 263 million 10 kg bags of potatoes during 2020.

Jacobs also emphasised how the humble spud could contribute to stronger immune systems and improve the nation's resilience to the virus. Potatoes contain some vital nutrients such as potassium. In fact, they have more potassium than most fruit and vegetables. A 150 g serving of boiled or baked potato, with the skin on, will provide 710 mg of potassium.

This little gem from the soil is also rich in other crucial immune boosting nutrients, such as vitamins B6 and B9 (folate), copper, iron, magnesium, and zinc. It also contains other important minerals, including calcium, iodine, phosphorous and manganese.

The industry is looking forward to next year's SOPIA where role-players will hopefully have the opportunity of networking and convening face to face. 📍



Dr Brylyne Chitsunge and Willie Jacobs.

For more information, contact PSA at 012 349 1906 or visit www.potatoes.co.za.

Tendense op varsproduktemarkte: Deel 2

Deur FP Coetzee en Pieter van Zyl, Aartappels SA

In ons reeks artikels wat handel oor varsproduktemarkte (VPM'e) in Suid-Afrika, kyk ons in Deel 2 na die vernaamste produkte wat op VPM'e verhandel word.

Figuur 1 gee 'n aanduiding van die algehele tonnemaat wat op VPM'e verkoop word.

Aartappels is die topverkoper, met net meer as 1 miljoen ton per jaar oor die afgelope paar jaar verhandel. Dit wil voorkom asof daar sedert 2009 'n stygende tendens vir alle produkte – ook alle groente – waargeneem kan word. Let egter op die dalings in getalle tydens 2019 en 2020. Is daar rede tot kommer?

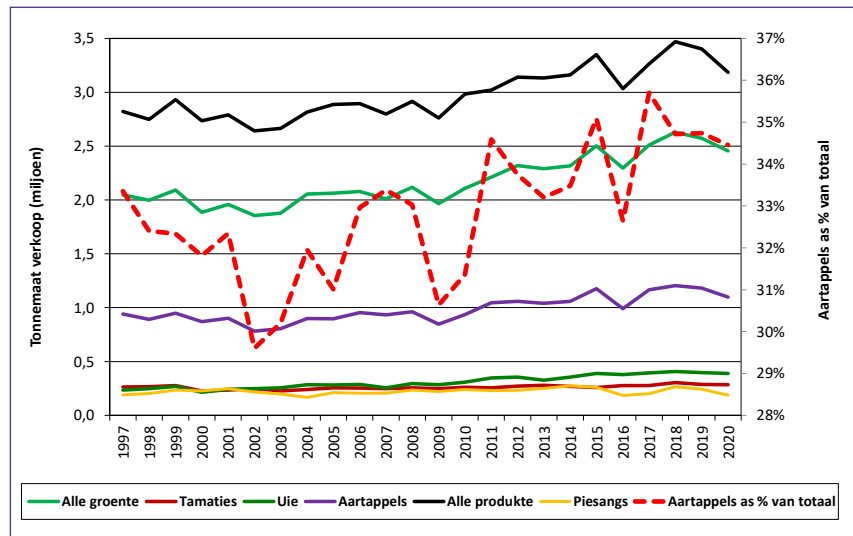
Die markaandeel van aartappels wissel oor tyd tussen 30 en 36%, aldus *Figuur 1*. Piesangs is die vernaamste vrug, met 'n gemiddeld van 220 000 ton se verkope per jaar oor die afgelope vyf jaar. Die markaandeel van uie is net meer as 10%, tamaties is sowat 9%, terwyl piesangs se markaandeel ongeveer 7% behoort.

Stygende tendens in reële prys

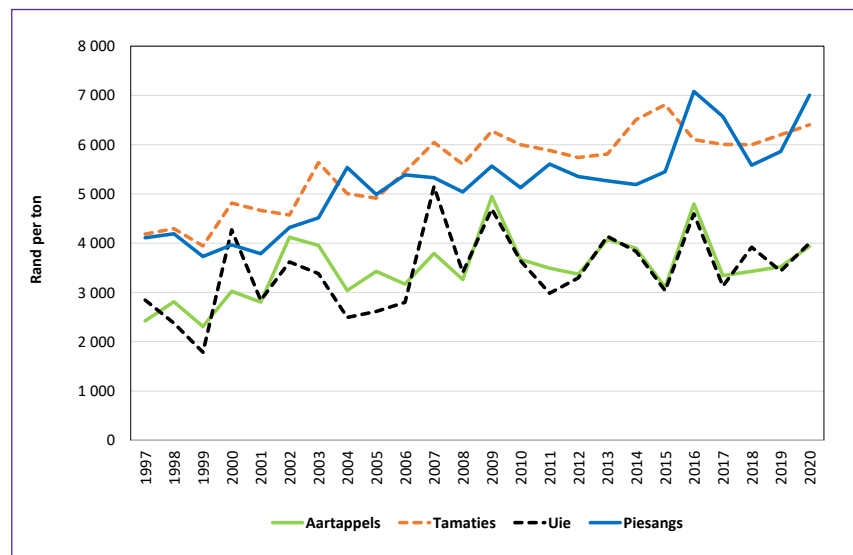
Figuur 2 dui daarop dat die reële pryse (nadat voorsiening vir inflasie gemaak is) van die geselekteerde produkte oor die lang termyn 'n stygende tendens toon. Dit blyk egter dat reële pryse in die laaste tien jaar sywaarts begin beweeg, spesifiek vir aartappels en uie. Reële produksiekoste styg, wat beteken produsente se winsgewendheid is onder druk.

VPM'e se algehele nominale omset van verlede jaar (alle produkte) was net meer as R19 miljard. Let op die voortdurende styging in reële omset oor tyd (*Figuur 3*), terwyl verkoopsvolume eers sywaarts

Figuur 1: Die algehele tonnemaat verkoop op VPM'e.



Figuur 2: Gemiddelde reële prys per ton oor tyd vir geselekteerde produkte.

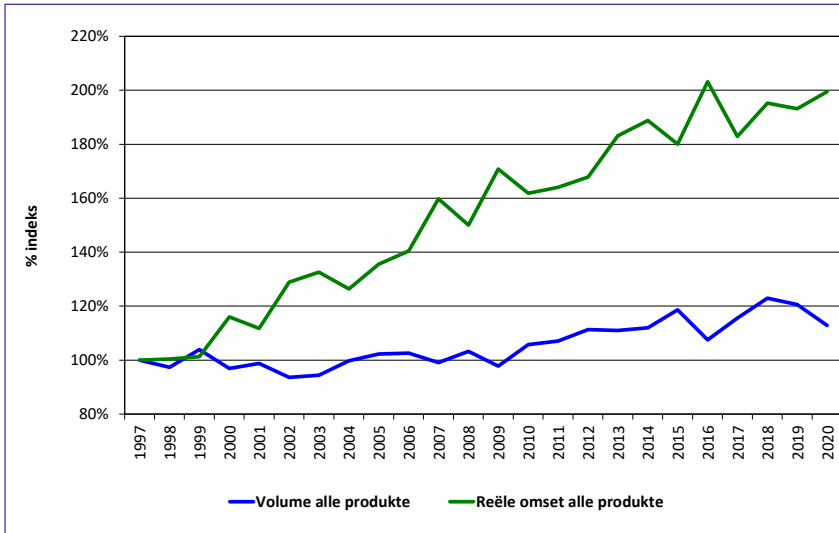


beweeg en sedert 2009 'n opwaartse tendens begin toon het.

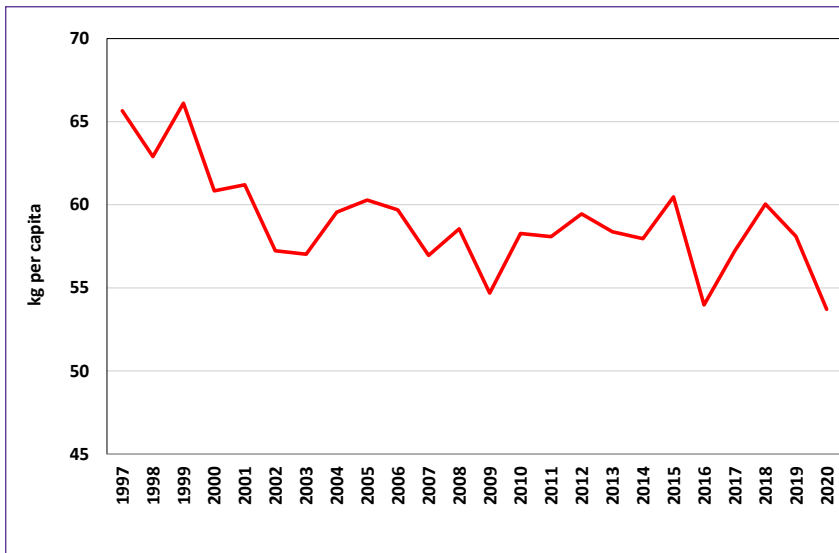
Figuur 3 is feitlik identies indien dit op aartappels van toepassing gemaak word. Produsente se reële

omset styg dus oor tyd, maar wat gebeur met hul produksiekoste? In 'n vorige artikel is die prys-kosteknyptang in die aartappelbedryf uitgewys.

Figuur 3: Alle produkte op VPM'e se reële omset versus verkoopsvolume – styging oor tyd (indeks 1997 = 100).



Figuur 4: Kilogram per kapita-verbruik van alle varsprodukte verkoop op VPM'e.



Dit is dan geen wonder dat die hoeveelheid aartappelprodusente konstant oor tyd afneem nie. Die twee tendense in *Figuur 3* wys dat reële inkomste vinniger styg as verkoopsvolumes oor tyd. In Deel 3 sal individuele markte egter van nader beskou word. Nou lyk die prentjie nie meer so rooskleurig nie.

Figuur 4 gee 'n aanduiding van die kilogramverbruik per kapita van alle varsprodukte wat op VPM'e verkoop is. Die per kapita-verbruik het afgeneem van 66kg in 1997, tot 54kg in 2020.

Ten slotte

Ons weet dat heelwat aartappels buite markte verkoop word, maar wat gebeur met ander produkte? Ons kan dus nie noodwendig beweer dat Suid-Afrikaners gemiddeld minder varsprodukte eet nie. Of is dit dalk so?

Die varsproduktebedryf word al hoe meer gespesialiseerd, en risiko's neem toe, onder meer as gevolg van stygende insetkoste wat marges onder druk plaas. Dit is ook redelik arbeids- en kapitaal-intensief. Produsente moet onder andere ekonomie van skaal najaag, ten einde te kan oorleef. ☺

Vir enige navrae, kontak FP Coetzee by epos fp@potatoes.co.za of Pieter van Zyl by epos pieter@potatoes.co.za.

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Markmonitor: Die eerste drie maande van 2021 op varsproduktemarkte

Deur Janó Bezuidenhout en Pieter van Zyl, Aartappels SA

Gedurende die eerste 13 weke van 2021 was die gemiddelde aartappelmarkprys redelik wisselvallig.

Figuur 1 dui die weeklikse gemiddelde prys op alle markte vir alle klasse aan. Hier kan gesien word dat pryse gedurende middel Januarie, Februarie en Maart erg onder druk was.

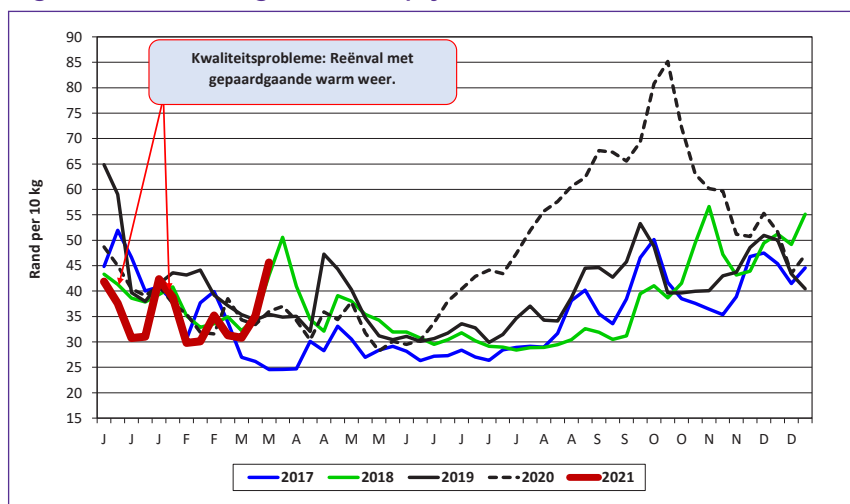
Gedurende hierdie weke was voorraadvlakke hoog en is gehalteprobleme gedurende Januarie en Februarie ervaar. Die prys is dus ook negatief beïnvloed. Hierdie gehalteprobleme is veroorsaak deur klimaatstoestande in die streke wat uitgehaal het.

Voorraad teenoor gemiddelde prys

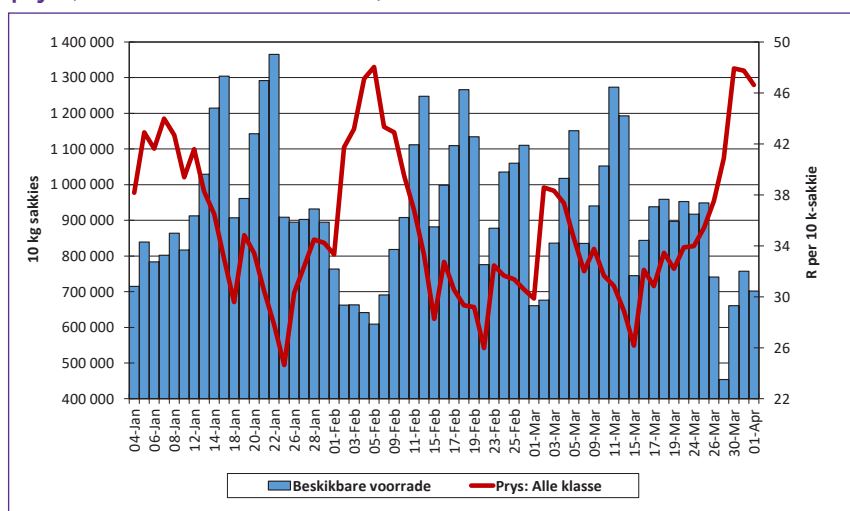
Figuur 2 dui die daaglikse beskikbare voorrade op varsproduktemarkte (VPM'e) aan teenoor die gemiddelde prys per 10 kg-sakkie (alle klasse en markte). Hieruit is dit duidelik dat gedurende die tydperke wanneer pryse onder druk verkeer het, die daaglikse voorraadvlakke opwaarts beweeg het.

Gedurende die eerste 13 weke van 2021 het verkope op VPM'e met 3% gestyg vanaf 2020 se ooreenstemmende syfer, aldus Figuur 3. Let ook op dat 2021 die hoogste verkoopsyfer vir die laaste vyf jaar realiseer. Figuur 4 illustreer die maandelikse verkope op VPM'e vanaf 2018.

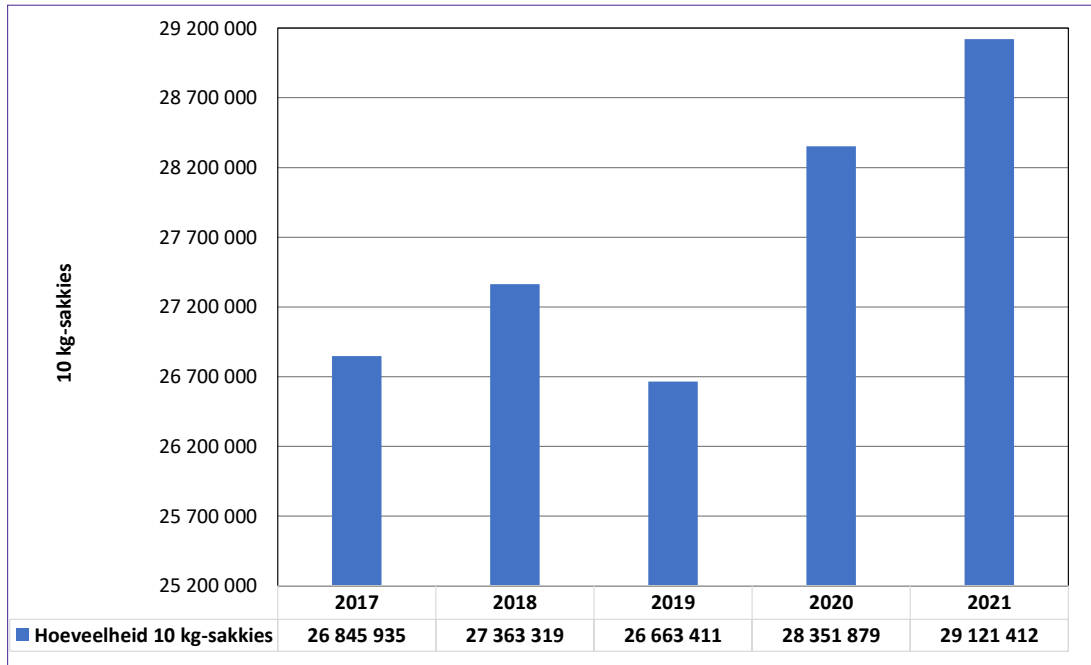
Figuur 1: Weeklikse gemiddelde prys vir alle markte en alle klasse.



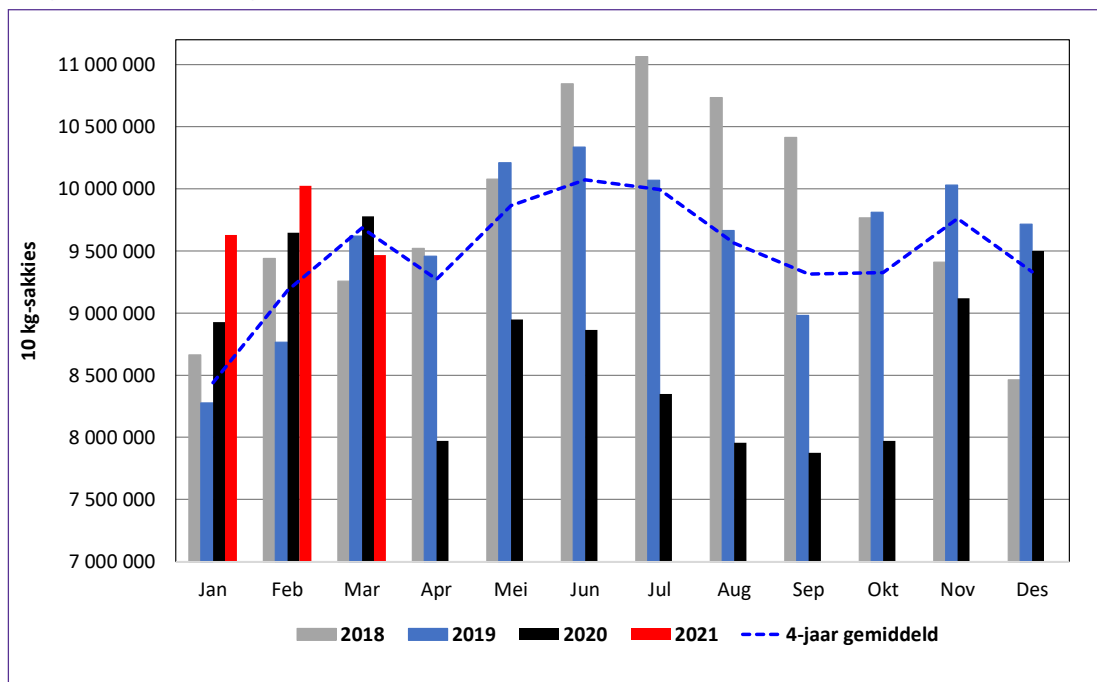
Figuur 2: Daaglikse beskikbare voorraad vs. daaglikse gemiddelde prys (alle klasse en alle markte).



Figuur 3: Kumulatiewe hoeveelheid 10 kg-sakkies verkoop op markte tot week 13 van elke jaar.



Figuur 4: Maandelikse verkope op markte vanaf 2018 tot 2021 (alle verpakings omskakel na 10 kg-sakkies).



Uit *Figuur 4* kan gesien word dat rekordverkope gedurende Januarie en Februarie 2021 plaasgevind het. Gedurende Maart 2021 was die verkope laer as die vorige twee jaar, maar die gesamentlike verkope (Januarie tot Maart) was steeds hoër as die vier-jaar gemiddeld vir Maart.

Tabel 1 bevat die aantal sakkies wat gedurende die eerste 13 weke van 2021 deur die verskeie markte verkoop is. Die vyf grootste markte gedurende hierdie tydperk was gesamentlik vir 81% van die land se verkope verantwoordelik.

Die gemiddelde prys (alle klasse en groottes) vir elke mark verskyn

ook in *Tabel 1*. Die gemiddelde prys vir hierdie tydperk was R35.29 per 10 kg-sakkie. Uit die vyf grootste markte was die Johannesburg- en Springs-markte se gemiddelde pryse laer as die land se gemiddelde prys. Van Johannesburg se totale verkope was 81% Klas 1-sakkies – die hoogste van alle markte.

Tabel 1: Verkope op VPM'e tot week 13 van 2021.

Mark	Aantal 10 kg-sakkies	% van totaal	Gem. prys (R/10 kg)	% van verkope op VPM'e			
				Klas 1	Klas 2	Klas 3 en 4	Klas 1 M
Johannesburg-mark	11 248 950	38.6%	35.05	81%	14%	5%	19%
Tshwane-mark	5 643 811	19.4%	35.77	69%	22%	9%	17%
Durban-mark	2 895 477	9.9%	36.06	76%	15%	9%	23%
Kaapstad-mark	2 324 339	8%	37.88	75%	22%	3%	22%
Springs-mark	1 478 556	5.1%	31.34	67%	23%	10%	15%
Klerksdorp-mark	952 426	3.3%	32.31	66%	22%	11%	16%
Port Elizabeth-mark	876 595	3%	35.15	67%	22%	10%	23%
Oos-Londen-mark	805 257	2.8%	38.14	72%	19%	9%	22%
Bloemfontein-mark	763 426	2.6%	36.63	71%	17%	12%	17%
Pietermaritzburg-mark	712 583	2.4%	31.21	62%	24%	14%	15%
Welkom-mark	613 259	2.1%	35.72	60%	25%	14%	13%
Vereeniging-mark	279 743	1%	29.05	73%	16%	11%	14%
Mpumalanga-mark	163 287	0.6%	42,71	77%	21%	2%	8%
Witbank-mark	141 576	0.5%	37,14	69%	23%	7%	11%
Nelspruit-mark	64 707	0.2%	35,02	52%	28%	20%	4%
Kimberley-mark	62 513	0.2%	36,13	72%	18%	10%	14%
George-mark	55 714	0.2%	39,07	76%	23%	1%	15%
Kei-mark (Umtata)	39 193	0.1%	32,47	54%	29%	17%	9%
Totaal	29 121 412	100%	35,29	74%	18%	8%	19%

Tabel 2: Voorsiening aan VPM'e tot week 13 van 2021.

Streek	Aantal 10 kg-sakkies	% van totaal	Gem. prys (R/10 kg)	% van verkope op VPM'e			
				Klas 1	Klas 2	Klas 3 en 4	Klas 1 M
Oos-Vrystaat	6 364 255	22%	35.19	66%	23%	11%	12%
Suidwes-Vrystaat	5 579 178	19%	36.33	79%	13%	9%	23%
Noordwes	4 033 459	14%	36.33	81%	11%	7%	17%
KwaZulu-Natal	2 937 772	10%	37.55	73%	21%	6%	16%
Wes-Vrystaat	2 572 204	9%	32.01	67%	25%	8%	22%
Sandveld	2 047 529	7%	37.81	74%	23%	3%	21%
Gauteng	1 978 176	7%	31.39	85%	12%	4%	27%
Limpopo	1 092 135	4%	31.71	83%	12%	5%	19%
Noordoos-Kaap	808 951	3%	35.94	67%	22%	10%	21%
Mpumalanga	786 979	3%	32.21	69%	26%	5%	14%
Noord-Kaap	493 952	2%	33.40	78%	19%	4%	19%
Ceres	295 298	1%	41.40	83%	10%	8%	27%
Oos-Kaap	61 648	0.21%	33.60	69%	24%	8%	23%
Suidwes-Kaap	36 780	0.13%	35.63	81%	18%	1%	24%
Suid-Kaap	33 096	0.11%	34.61	53%	45%	2%	21%
Totaal	29 121 412	100%	35,29	74%	18%	8%	19%

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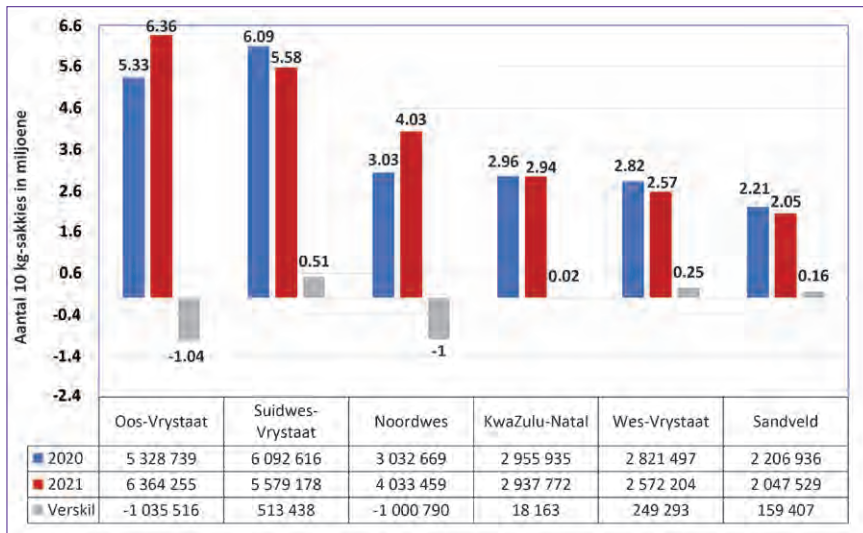
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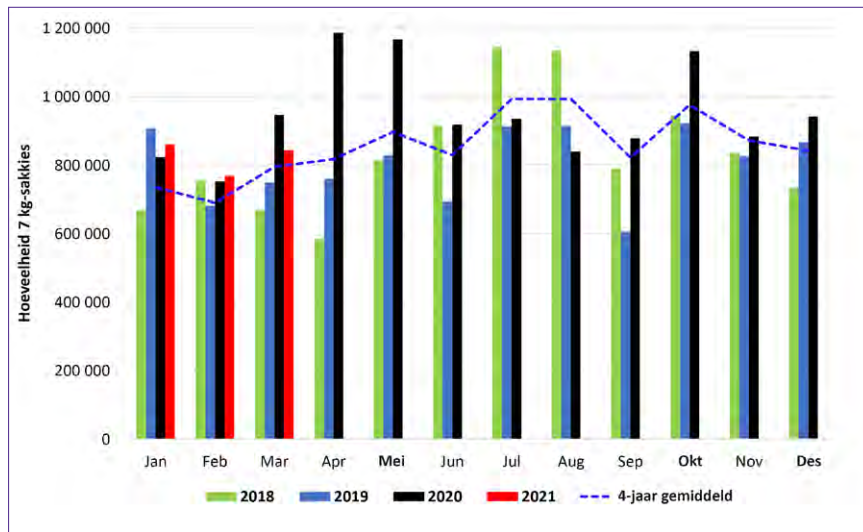
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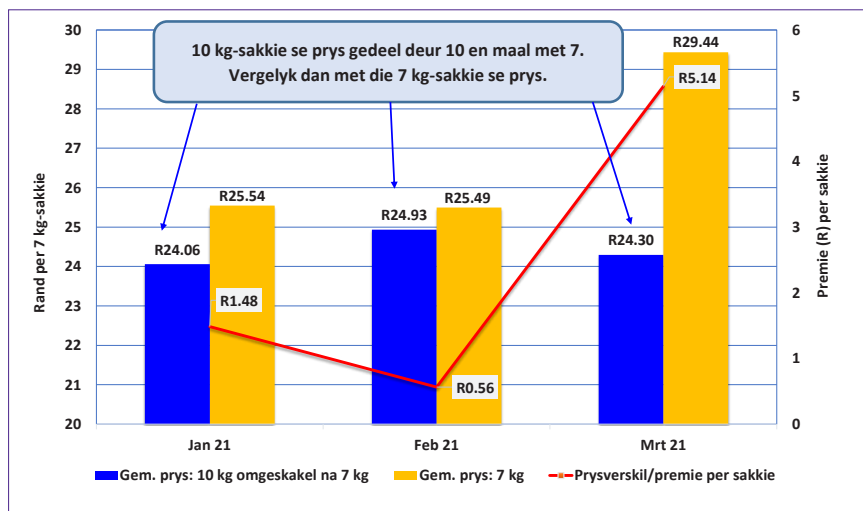
Figuur 5: Aantal 10 kg-sakkies verkoop (eerste 13 weke) per streek vir 2020 vs. 2021.



Figuur 6: Maandelikse verkope van 7 kg-sakkies op markte vanaf 2018 tot 2021.



Figuur 7: Johannesburg-mark 2021: Gemiddelde maandelikse prys per 7 en 10 kg (omgeskakel na 7 kg), asook premie verdien op 'n 7 kg-sakkie.



Die drie grootste streke wat gedurende hierdie tydperk in die mark was, het 55% van die aartappels op markte verkoop, aldus *Tabel 2*. Die Sandveld- en KwaZulu-Natal-markte het van die hoogste gemiddelde pryse (alle klasse en groottes) vir hierdie tydperk gerealiseer. *Tabel 2* illustreer ook die persentasiesamestelling van elke streek se Klas 1, 2, 3 en 4 wat gedurende hierdie tydperk voorsien is.

OVS en Noordwes neem voortou

Indien ons die ses grootste streke se voorsienings vir 2021 met 2020 vergelyk, is dit duidelik dat twee streke meer en die ander streke minder gelewer het as gedurende die eerste 13 weke van die vorige jaar (*Figuur 5*). Die Oos-Vrystaat en Noordwes het vanjaar sowat 1 miljoen sakkies elk meer gelewer as dieselfde tyd laasjaar, soos in *Figuur 5* aangedui. *Figuur 6* dui die maandelikse verkope van 7 kg-sakkies sedert 2018 aan.

In die eerste drie maande van 2021 was die aantal verkope van 7 kg-sakkies meer as die vier jaar se gemiddelde syfer. In Maart 2021 het die markte heelwat minder 7 kg-sakkies verkoop as in Maart 2020. *Figuur 7* toon weer aan wat die premie vir 'n 7 kg-sakkie op die Johannesburg-mark vir die onderskeie drie maande is. Gedurende Januarie en Februarie 2021 was die premie minder as R2 per 7 kg-sakkie. Gedurende Maart 2021 het die premie egter na R5.14 per 7 kg-sakkie verhoog.

Vir meer inligting, kontak Janó Bezuidenhout by jano@potatoes.co.za of Pieter van Zyl by pieter@potatoes.co.za.

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Transport issues under the spotlight

By Max Braun, Max Braun Consulting Services

As the second quarter of 2021 dawns, potato producers are plagued by ongoing cost increases, of which diesel and other transport-related operating elements are strongly in evidence. The wholesale inland price of diesel was, at the time of writing, just below R15/litre, before adding the transport differentials. The cost per kilometre for vehicles typically used by producers or the contractors they engage to transport their harvest to local municipal markets, and others catering for bulk buyers, is now R20/km or more.

Fuel usage for large vehicles will be at least R8/km, depending how well the vehicle is driven and maintained. Should the Covid-19 pandemic become more manageable, especially in major continents such as Europe, there is likely to be an increase in the production of crude oil in anticipation of more demand as economies reopen, allowing goods to move quicker and in larger volumes.

Don't disregard hidden expenses

Locally, as the South African rand improved during the end of March along with a weakening of the United States (US) dollar, the price of oil softened during the review period. Sadly, however, the increase

in fuel levies and the Road Accident Fund bumped up the price at the pump. In addition to the rising fuel price, toll fees, vehicle licences, and the cost of delays and traffic congestion must be noted.

Following the impact on international logistics and freight movements resulting from worldwide lockdowns, many ports across the globe, including those in South Africa, are suffering major log jams that result in massive build-ups of both loaded and empty containers. This is costing shippers, importers, and exporters huge amounts of money, which is already being felt by way of price increases in any number of products and produce. This includes vehicle replacement parts, raw materials such as iron and other metals, as well as food prices.

Gain control over operating costs

As new vehicle sales start to recover, several vehicle manufacturers are battling to replace inventories. Since there is no certainty about when trading conditions will return to more predictable conditions, it would be wise to give thought to replacing vehicles once they have reached their designated lifespan.

The following is based on market-related road transport owning and operating cost benchmarks as at April 2021, for a typical large vehicle covering 180 000km per annum on

national and provincial roads, and capable of transporting a payload of up to 36 tons, including the mass of pallets:

- Current capital cost (purchase price) is R2 900 000.
- Estimated total operating cost benchmarks for working 286 days a year are R3 300 000, excluding administration costs.
- Fuel costs are at least 40% of the total, depending on the region.
- Standing costs per day are R4 700 (costs incurred when the vehicle is stationary).
- Cost per kilometre is R20 or more, depending on timely maintenance and responsible driving.
- Driver and assistant wages including medical aid, pension and other employment benefits are R325 000 for a full year, depending on the region.

Simple steps such as keeping tyres properly inflated, responsible driving (no harsh braking or excessive acceleration), limited or controlled engine idling, timely maintenance and scheduled replacement are essential to gain sustainable control over operating costs. It is, however, possible to achieve more, especially in terms of the amount of fuel burnt day by day. This lies in monitoring fuel efficiency when expressed as 'specific fuel consumption' (SFC),

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with the conventional method being litres per kilometres or the number of kilometres travelled per litre.

These metrics provide a record of fuel used and needs to be properly recorded and kept up to date. Payload utilisation and the time taken to complete trips and average speed travelled are not considered. A more meaningful measurement is to monitor litres per hour or litres per ton-kilometres (this could be expressed in pallets, crates or whichever is relevant to a particular business).

Engine and vehicle manufacturers determine SFC via controlled dynamometer and on-road tests. The results of such tests are usually expressed in grams of fuel per kilowatt-hour (kWh). The tests depict the specific fuel consumption based on the average demand for sufficient power at different speeds. The demand for power is expressed as a percentage of the available maximum kWh of the engine.

The engine with the lowest SFC is the most fuel efficient. I acknowledge that this is a difficult concept to follow. The manufacturers of the vehicles you use, or are about to purchase, can provide you with the SFC as determined by their tests.

Potatoes South Africa (PSA) is familiar with the TruckScience program which enables simulated tests to be undertaken on specific routes according to desired average speeds. Conservative projections indicate that savings of three litres or more an hour can be achieved.

AARTO, at last!

Following its long history of being poorly communicated, misunderstood, and irresponsibly reported by ill-informed journalists, it seems to finally be coming off the Road Traffic Infringement Agency's (RTIA) backburner.

The presentation, *The Impact of the Administrative Adjudication of Road Traffic Offences (AARTO) Act*, by the Transport Forum, was well attended by senior members of the RTIA and a significant and comprehensive representation of senior personnel from the Southern African Vehicle Rental and Leasing

Association, the Southern African Bus Operators Association, the Road Freight Association, and taxi associations.

Restating the purpose and objectives of the *Administrative Adjudication of Road Traffic Offences Act, 1998 (AARTO, Act 46 of 1998)*, the RTIA reiterated that the focus is on saving lives and reducing injuries, thus reminding us that it can only succeed if the regulations are implemented, and drivers change their attitudes to become more responsible and accountable.

Should you have any doubt about the veracity of this statement, I recommend taking note of the latest published statistics by Zurobi, a driver education establishment based in the United Kingdom:

- 57.5% of fatalities on our roads involve alcohol.
- 31% of drivers do not wear seat belts.
- Road crashes account for 25.9 deaths per 100 000 citizens. Between 2010 and 2019, 132 503 people died in road crashes on SA roads. The statistics for 2020 are not yet available.

South Africa is a signatory to the international commitment to reduce road deaths by 50% by 2030. We need to minimise the carnage.

Driver behaviour prioritised

Discussions at the forum were more balanced and indicated an all-round willingness to work together. The RTIA wants drivers to accept and comply with all factors of traffic regulations. In restating the objectives of AARTO, the focus will be on safety rather than infringements. The formulation of an AARTO Tribunal will seek to resolve points of concern and to finalise and implement the Act by 1 July.

Concerns articulated by the various delegates focussed on the lack of communication, especially as it refers to relying on technology when serving notices of infringements, as it goes beyond the vehicle owner's ability to have control of this aspect. Vehicle rentals and leasing are examples of this. Additionally, it is the

lack of reliable response as it refers to eNatis, which is said to be unreliable and not always up to date. In other words, it is not practical.

This is important in shifting the emphasis of the AARTO regulations from chasing infringements to improving driver behaviour and reducing road crashes and injuries or fatalities. In summary, large fleet owners express disappointment and frustration flowing from the lack of communication in terms of the planning and enforcement of regulations. It is expensive due to the impact it has on achieving compliance with regulations and important business strategies.

In response, the RTIA voiced its views and a way forward to ensure drivers are trained, coached and motivated to improve their behaviour and accountability. The question we should ask is, how do we drive when no one is watching? Some basic disciplines need to be followed if we are ever to succeed in achieving a meaningful and sustainable reduction in road deaths and injuries.

Here are a few don'ts:

- Don't drive an unregistered vehicle.
- Don't drive without a licence.
- Don't drive without a licence disc displayed.
- Don't drive an unroadworthy vehicle.
- Don't drive without wearing your seat belt.
- Don't text or talk on the phone while driving.

The forum ended on a positive note with the RTIA and attending delegates agreeing to work together in a determined effort to resolve the concerns and reach an amicable conclusion. We will wait with keen anticipation to watch how the AARTO Tribunal progresses in taking steps that lead to improved road safety and fewer deaths and injuries. **C**

For more information, contact Max Braun at maxbraun@iafrica.com or 021 852 2352.



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Detection of *Spongospora subterranea* f. sp. *subterranea* in virgin fields

By Carmen Rensburg and Prof Jacquié van der Waals,
Department of Plant and Soil Sciences, University of Pretoria

Powdery scab (Figure 1.A), root galling (Figure 1.B) and root infection are three potato diseases caused by *Spongospora subterranea* f. sp. *subterranea* (Sss). Powdery scab is a serious disease in potatoes and a major challenge in the industry worldwide. The powdery scab lesions reduce the quality and marketability of seed tubers or tubers intended for consumption. Root galls and root infection influence water and nutrient uptake, which impair shoot and tuber growth and subsequently reduce yield.

Disease management has proven difficult due to the prolonged survival of Sss sporosori (collections of resting spores) in the soil and on infected tubers. Resting spores are triple-walled structures found in tuber lesions and root galls. The recalcitrant cell walls of the resting spores allow them to tolerate

Figure 1: (A) Powdery scab lesions on a potato tuber. (B) Galls on the potato roots. (Photographs: Carmen Rensburg).



extreme environmental conditions and survive in the soil for many years. Sss is a seed- and soil-borne plant pathogen.

Infected seed tubers have greatly contributed to the dissemination of Sss to areas previously known to be disease- and pathogen-free.

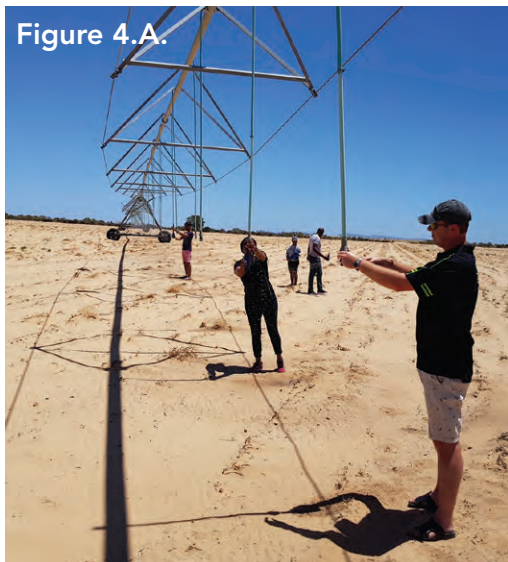
Figure 2



Figure 3



On the left (Figure 2) is the sampled field used for potato cultivation in the Sandveld potato growing region of the Western Cape. On the right (Figure 3) is the sampled virgin field in the Sandveld potato growing region of the Western Cape. (Photographs: J.E. van der Waals).



On the left (Figure 4.A) is the irrigation pivot on the farm from which water samples were taken, with the irrigation pit (Figure 4.B.) on the right. (Photographs: J.E. van der Waals).

The pathogen can also be spread by infested growing media as well as farm implements, and containers contaminated with sporosori. The infection process is initiated when the soil environment is cool (9 to 17°C) and wet.

Resting spores germinate and release zoospores, which can swim short distances until they make contact with a susceptible host. Concerns of potato growers in the Sandveld of the Western Cape, suggested that *Sss* dissemination may not be restricted solely to seed and soil, but that the pathogen could also be disseminated by wind and/or water.

There have been a few reports stating that *Sss* may be dispersed by wind due to the morphology of the resting spores in the sporosori. A recent study by Tsrer *et al.* (2020) in Israel using wind and ground spore traps, demonstrated how *Sss* can be dispersed by wind. Further studies of wind dispersal of *Sss* in South Africa were required.

Materials and methods

Soil sampling

Soil was sampled from two fields in the Sandveld potato growing region. One of those fields was previously used to cultivate potatoes and was known to be infested with *Sss*

(Figure 2). The other was an adjacent virgin field (Figure 3).

Five soil samples were taken from each field and placed into brown paper bags to perform DNA extractions and quantitative polymerase chain reaction (qPCR) analysis.

Water sampling

Three water sources were sampled, namely the irrigation reservoir on the farm, the borehole and the irrigation pivot located on the previously mentioned sampled field. The water from the Kromantories River (32°36'03"S 18°41'28"E) and the borehole is pumped into the irrigation reservoir and used to irrigate the fields on the farm (Figures 4.A. and 4.B.).

Four 500 ml plastic water bottles were filled with water sampled from each of these sources. Before water was sampled from the reservoir, the pump was turned on to stir up the water. The irrigation pivot was switched on

and the water was left to pump for two minutes before it was collected at the spray nozzles.

Borehole water was taken from the pump. Samples from the various water sources were centrifuged at 2 254 g for 5 minutes, after which the supernatant was carefully removed, and the pellet used to

Table 1: Mean quantity of *Sss* DNA (sporosori per gram of soil) in five soil samples from a potato field and five soil samples from an adjacent virgin field, determined by qPCR analysis.

Soil sample	Sporosori/gram of soil
Potato field 1	2.8 x 10 ⁵ c
Potato field 2	8.4 x 10 ⁶ b
Potato field 3	3.0 x 10 ⁶ c
Potato field 4	1.6 x 10 ⁷ a
Potato field 5	5.7 x 10 ⁵ c
Virgin field 1	2.5 x 10 ⁴ c
Virgin field 2	0 c
Virgin field 3	1.0 x 10 ⁵ c
Virgin field 4	0 c
Virgin field 5	5.1 x 10 ³ c

Different letters next to the values indicate significant differences at $p = 0.05$.

perform DNA extractions and qPCR analysis.

“It is therefore possible that virgin fields may be contaminated by Sss due to wind dispersal thereof.”

Results

Detection and quantification of Sss from soil samples

Data indicated that the levels of Sss DNA detected in soil sampled from the field used for potato cultivation, were significantly different ($p = 0.05$) to those detected in soil sampled from the adjacent virgin field (Table 1). Despite low levels of pathogen

inoculum in the virgin field, these results clearly showed the presence of the pathogen therein.

Detection and quantification of Sss from water samples

No Sss DNA was detected with qPCR in any of the water samples collected from the irrigation reservoir, irrigation pivot or the borehole on the farm.

Discussion and conclusion

In this study, Sss DNA was detected in soil samples collected from a virgin field on a farm in the Sandveld region. No Sss DNA was found in water sampled from three sources (irrigation reservoir, irrigation pivot and borehole). This indicates that wind could be involved in the dissemination of Sss, while water may not be a contributing factor to pathogen spread.

It is therefore possible that virgin fields may be contaminated by Sss due to wind dispersal thereof. Further research is needed in growing regions such as the Sandveld, where strong winds often blow soil from one area to another. Spore traps set up between Sss-infested fields and virgin fields could further confirm the dispersal of Sss by wind. Implications of the results from this research are of value to potato producers in the Sandveld region, where wind erosion is a problem.

To our knowledge, this is the first study conducted in South Africa documenting possible wind dissemination of Sss resting spores. **G**

For more information, contact Prof van der Waals at 012 420 4065 or email jacquie.vdwaals@up.ac.za.



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Potato tuber moth insecticides, their modes of action, and sensible use to prevent or delay resistance development

Principal author: Desireé van Heerden • Contributors: Dr Fienie Niederwiesser, Roleen la Grange and Dr Gerhard Verdoorn

Insecticides are grouped according to an international system developed by the Insecticide Resistance Action Committee (IRAC). The IRAC Mode of Action (MoA) classification groups each active ingredient according to a specific chemical class and resistance group, based on the MoA of the active ingredient.

Insecticides and their IRAC grouping

The IRAC classification guides the use of different modes of action successively to prevent sensitivity shift, and to prevent or delay the development of insecticide resistance (visit www.irac-online.org or download the IRAC app for smart devices).

During the past few seasons, higher than normal potato tuber moth (PTM) populations were reported and the dry and hot seasons most likely contributed to these numbers. Warm winters with high temperatures during the day and little to no frost allow earlier than normal occurrence of PTM. Seasons with high moth 'explosions' are not an unknown phenomenon and occur every few years, especially during droughts and warm periods.

Insect life cycles are temperature dependent and are normally shortened by increased temperatures, resulting in increased numbers of PTM generations in one season. A higher percentage of unmarketable potato tubers (>30%)

was harvested during the past three years, compared with the usual expected 5 to 7%.

Insecticides are classified according to five different categories based on physiological functions that are affected by insects:

- **Growth:** Insect development is mainly controlled by juvenile hormones, by directly perturbing cuticle formation/deposition or lipid biosynthesis. Insect growth regulators are generally slow- to moderately slow-acting.
- **Midgut:** *Lepidopteran*-specific microbes or their derived microbial toxins that are sprayed or expressed in transgenic crop varieties (not applicable to potatoes at this stage). Moderately acting.
- **Respiration:** Several insecticides interfere with mitochondrial respiration by the inhibition

of electron transport and/or oxidative phosphorylation. Generally fast- to moderately fast-acting.

- **Nerve and muscle function:** Most current insecticides act on nerve and muscle targets. Insecticides that act on these targets are generally fast-acting.
- **Unclassified functions:** Several insecticides are known to affect less well-described target sites or functions, or to act non-specifically on multiple targets.

By far the largest class of insecticides affects the nerve and muscle system of insects. This collective class consists of pyrethroids, carbamates, organophosphates, avermectins, and spinosyns, among others, each with a different MoA and specific target site.

Figure 1: The different target sites for controlling PTM.

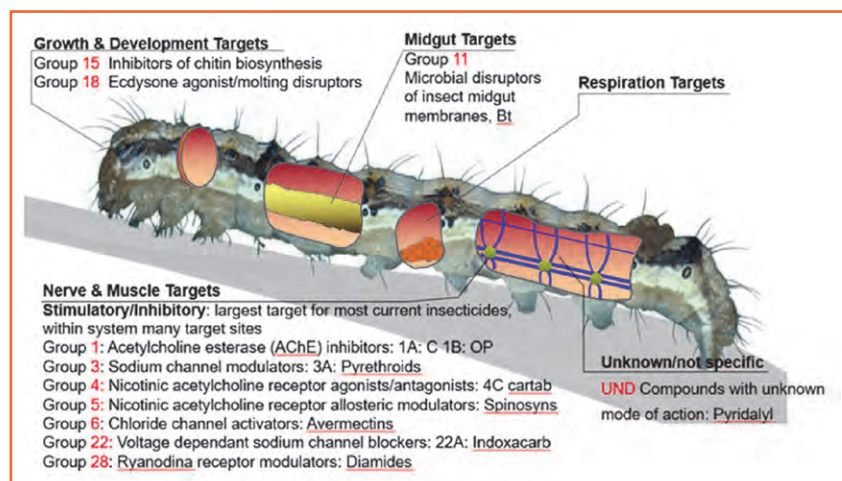


Table 1: Active ingredients that are registered for the control of PTM in potatoes.

IRAC group	Chemical class	Active ingredient	MoAs/physiological functions affected
1A	Carbamate	Methomyl	Acetylcholinesterase (AChE) inhibitors
			Nerve action
1B	Organophosphates	Acephate, azinphos-methyl, methamidophos, methidathion and profenofos	AChE inhibitors
			Nerve action
3A	Pyrethroids	Alpha-cypermethrin, beta-cyfluthrin, bifenthrin, deltamethrin, esfenvalerate, gamma-cyhalothrin and lambda-cyhalothrin	Sodium channel modulators
			Nerve action
4A and 3A	Neonicotinoids and pyrethroids	Acetamiprid and bifenthrin	Nicotinic acetylcholine receptor (nAChR) competitive modulators
			Nerve action
4A and 15	Neonicotinoids and benzoylureas	Acetamiprid and novaluron	nAChR competitive modulators, and chitin synthesis inhibitors
			Nerve action and growth regulation
5	Spinosyns	Spinetoram and spinosad	nAChR allosteric modulators – Site 1
			Nerve action
13	Pyrroles	Chlorfenapyr	Uncouplers of oxidative phosphorylation via disruption of the proton gradient
			Energy metabolism
14	Nereistoxin analogue	Cartap hydrochloride	nAChR channel blockers
			Nerve action
15	Benzoylureas	Diflubenzuron, lufenuron and novaluron	Inhibitors of chitin biosynthesis affecting CHS1
			Growth regulation
22A	Oxadiazines	Indoxacarb	Voltage-dependent sodium channel blockers
			Nerve action
28	Diamides	Chlorantraniliprole and cyantraniliprole	Ryanodine receptor modulators
			Nerve and muscle action
28 and 3A	Diamides and 3A	Chlorantraniliprole and lambda-cyhalothrin	Ryanodine receptor and sodium channel modulators
			Nerve and muscle action
UN	Pyridalyl	Pyridalyl dichloropropene derivative	Compounds of unknown or uncertain MoAs
UNF	Fungus	Beauveria bassiana	Compounds of unknown or uncertain MoAs
Pheromone and 3A	Pheromone and pyrethroids	(E,Z)-4,7 & (E,Z,Z)-4,7,10-tridecatrianyl acetate and permethrin	Lure and sodium channel modulators
			Lure and nerve action

Carbamates and organophosphates are both Group 1 but are categorised into Sub-group 1A and Sub-group 1B, respectively. To prevent sensitivity shift and the development of insecticide resistance, chemical classes of different MoAs (resistance groups) should be rotated, and consecutive insect generations should not continuously be exposed to the same MoAs (Figure 1).

Twelve different IRAC insecticide classes corresponding to their

equivalent resistance groups are registered in South Africa for the control of the PTM, *Phthorimaea operculella* (Table 1). Study the table and plan accordingly to develop a spray programme that will prevent sensitivity shifts and resistance development.

Performance of active ingredients

Not all the active ingredients in a specific chemical class share the same characteristics. Plant uptake can be by contact, translaminar, or

systemic action, while insect uptake can be through stomach or contact action.

The formulation type and quality, such as EC, SC, WP, rain fastness, stability in sunlight, mixability and compatibility with other products, application type and method, all play a crucial role in the efficacy of an active ingredient. Choosing an active ingredient requires taking all these characteristics into account along with the plant size, level of pest

infestation and the pest complex present, to select the best option.

Take note again that active ingredients within the same IRAC group share the same MoAs. Carbamates and organophosphates, for example, are both in Group 1 and share the same MoAs. A few examples of active ingredients registered against PTM are mentioned below. Always read the entire label to ensure that the products are applied correctly.

Carbamates (Group 1A)

- *Methomyl*: Contact and stomach action. Efficacy greatly reduced after spray residues have dried. Rapidly degrades in soil with a short half-life (DT_{50} 4 to 8 days) at 20°C. Soil moisture and pH are important in the breakdown of methomyl, which is not compatible with alkaline products. Relatively stable in sunlight.

Organophosphates (Group 1B)

- *Acephate*: Contact and stomach action. Moderate persistence. Residual activity of 10 to 21 days. Non-phytotoxic. Readily biodegraded and non-persistent in soil with a short half-life (DT_{50} 2 days).
- *Azinphos-methyl*: Non-systemic. Contact and stomach action. Rapidly hydrolysed in alkaline and acidic media. Half-life of several weeks under normal conditions (DT_{50} 87 days at pH 4 and 50 days at pH 7; only 4 days at pH 9). Low soil mobility. Photodegradation on soil surface.
- *Profenofos*: Non-systemic. Contact and stomach action. Exhibits translaminar effect and ovicidal properties. Not compatible with sulphur, alkaline products or captan. Do not mix with metal-containing compounds or apply with nitrogen-containing foliar feeds. Short half-life in soil (DT_{50} 1 week).
- *Methamidophos*: Systemic. Contact and stomach action. Rapidly degraded in soil. Short half-life in soil (DT_{50} <2 days). Photolysis contributes to rapid degradation.

Pyrethroids (Group 3A)

- *Bifenthrin*: Non-systemic. Contact and stomach action. Not compatible with alkaline products. Long half-life in soil (DT_{50} 65 days).
- *Lambda-cyhalothrin*: Non-systemic. Contact and stomach action, with repellent properties and rapid knockdown effect. Stable to light, stable in storage (>6 months), but rapidly degraded in soil, especially under dry conditions (DT_{50} 4 weeks). Strongly adsorbed to soil. Does not leach.

Neonicotinoids (Group 4A)

- *Acetamiprid*: Systemic, with translaminar movement in the plant. Stomach and contact activity. High potential for bioaccumulation. Mobile in soil, but degrades rapidly. Low potential for leaching into groundwater. Half-life between <1 and 8.2 days.

Spinosyns (Group 5)

- *Spinosad*: Non-systemic. Contact and stomach action. Short soil half-life (DT_{50} 9 to 17 days). Low pH value (< 6) of the spray mixture will decrease the residual performance. Performs best at pH 6 to 9.
- *Spinetoram*: Non-systemic. Contact and stomach action. Rapidly degrades in soil (DT_{50} 3 to 5 days).

Pyrroles (Group 13)

- *Chlorfenapyr*: Limited systemic activity. Mainly stomach with some contact action. Pro-insecticide (metabolised into an active insecticide after entering the host). Persistent in soil but binds very strongly to soil particles and does not leach.

Nereistoxin analogues (Group 14)

- *Cartap hydrochloride*: Systemic, with stomach and contact action. Stable in acidic conditions but hydrolyses in neutral or alkaline solution. Short soil half-life (DT_{50} 3 days).

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Figure 2: Tuber infested with PTM due to being exposed under leaves and not being completely covered.



Benzoylureas (Group 15)

- *Lufenuron*: Insect growth regulator. Non-systemic. Translaminar effect, with strong stomach and moderate contact activity. Larvicidal, ovicidal and transovarial action. Reduces egg fecundity. Stable at pH 5 to 7 and a very long half-life (DT₅₀ 512 days). Strong adsorption onto soil particles. Not compatible with carbamates or alkaline products.

Oxadiazines: (Group 22A)

- *Indoxacarb*: Contact and stomach action. Rapidly terminates insect feeding on crop. Moderately persistent but immobile in soil (DT₅₀ 3 to 23 days).

Figure 3: Soil cracks and cavities.



Figure 4: Sealed ridges.



Diamides (Group 28)

- *Cyantraniliprole*: Systemic effect by soil uptake with some translaminar movement. Active through ingestion and contact. Ovicidal, ovi-larvicidal and adulticide activity. Low soil mobility due to high soil adsorption, with moderate photodegradation and a short half-life (DT₅₀ 4 to 25 days). Degrades rapidly. Resistance risks seem higher than other MoAs.
- *Chlorantraniliprole*: Stomach and contact action. Weak translaminar activity. Slow soil degradation (DT₅₀ 270 days). Low soil mobility due to high soil adsorption, low water solubility and slow photodegradation.

Resistance risks seems higher than other MoAs.

Unclassified (UN)

- *Pyridalyl*: Non-systemic. Contact and stomach action. Moderately slow-acting. Highly immobile in soil with a long half-life (DT₅₀ 93 to 182 days).

Effective application and practice

Virtually no insecticide can be drenched into the soil to control PTM after senescence (maturation) and ridging. The best practice is to control it while green plant material is still available for chemical uptake and to minimise exposed tubers (Figure 2), soil cracks or soil cavities next to stems (Figure 3), especially in shallow bearing cultivars.

Moths can lay eggs close to cracks and young hatching larvae can then move down the cracks to infest tubers. Make sure cracks are sealed by irrigation after ridging (Figure 4).

Potato tubers that are slightly exposed are very easy targets for larvae; field observations showed that the tubers that were infested with PTM larvae were the ones very close to the soil surface with some level of exposure. It is therefore strongly advised to minimise exposed tubers to the absolute minimum. 📍

This article is Monograph 1 of the Potato Production Stewardship Programme, a collaborative initiative of Potatoes South Africa, CropLife South Africa and the IRAC. For more information, contact Dr Gerhard H Verdoorn at Gerhard@CropLife.co.za.



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WAT IS *aalwurms*?

Beheer aalwurms vir verbeterde plant-, grond-, en wortelgesondheid

Die belangrikheid van aalwurmbeheer in die sukses van jou boerderybesigheid kan nie onderskat word nie. Nie alleenlik het dit 'n direkte invloed op jou wortel-, plant en grondgesondheid nie, maar dit beïnvloed ook die opbrengspotensiaal en opkoms van jou aartappels. Dit is daarom krities dat die teenwoordigheid van aalwurms in jou lande so gou as moontlik geïdentifiseer word en die korrekte beheerstrategieë in plek gestel word ten einde jou opbrengs te beskerm.

Aalwurms is meersellige wurmagtige organismes – gewoonlik 0,25 - 1 mm lank en 0,1 - 0,2 mm in deursnee. Hulle is akwatiese diertjies en is suksesvol aangepas vir bykans elke ekosisteem, insluitend sout tot vars water, in die waterlae rondom gronddeeltjies. Aalwurms kom voor vanaf die pole tot die trope.

Die mees algemene plantparasitiese aalwurms kan in die volgende groepe gegroepeer word:

- // knopwortel-aalwurms (bv. *Meloidogyne* spp.),
- // sistaalwurms (bv. *Heterodera* spp., *Globodera* spp.),
- // migrerende aalwurms (bv. *Pratylenchus* spp., *Ditylenchus* spp., *Radopholus* spp. en spiraalaalwurms).

Aalwurms kom in groot getalle in die grond voor en voed op swamme, ander aalwurms en plantwortels. Normaalweg het plant-parasitiese aalwurms 'n stilet wat die selwande van 'n plantdeel penetreer ten einde toegang te verkry tot belangrike voedingstowwe. In landbougewasse kan grondgedraagde aalwurms oesverliese van tussen 15% en 20% veroorsaak terwyl daar in uiterste gevalle oesverliese van tot 85% waargeneem is.

Daar is verskeie faktore wat 'n baie belangrike rol speel in die ontwikkeling en oorlewing van verskillende aalwurmspesies. Hierdie faktore sluit in temperatuur, die pH-vlakke van die grond sowel as die grondtekstuur en -vog. Die optimale temperatuur vir aalwurms is 25 °C, maar hulle is redelik aanpasbaar as dit by temperatuur kom.

Die geskikte temperature vir aalwurm ontwikkeling is gewoonlik dieselfde as dié van die gasheerplant. Die temperatuurvlakke wissel tussen verskillende spesies.

'n Ander faktor wat 'n kardinale rol speel in die ontwikkeling en oorlewing van 'n aalwurm, is die grond se pH-vlakke. Optimum pH is gewoonlik by pH 4 - 7. Nes temperatuur, wissel die pH-vlakke tussen spesies en is dit gewoonlik dieselfde as dié van die gasheerplant.

Laastens speel grondtekstuur en -vog ook 'n belangrike rol in die skep van geskikte toestande vir aalwurm ontwikkeling. Sanderige gronde met 'n mate van slijk is gewoonlik optimaal vir aalwurm ontwikkeling. Aalwurms het ruimte nodig om te beweeg en kom voor in die waterlaag wat aan grondeeltjies kleef. Dit is belangrik dat hierdie spasies tussen die verskillende deeltjies suurstof moet bevat om lewensvatbaar te wees. Daar moet ook genoeg fyn grondeeltjies wees om worteluitskeidings te bind, om die aalwurm in staat te stel om die wortels te vind. Sommige aalwurms het egter optimale temperatuur en vog nodig om uit te broei en die wortels te penetreer. Die aanpasbaarheid by verskillende grondteksture verskil ook tussen verskillende aalwurmspesies.

Daar is verskeie simptome wat kan dui op die teenwoordigheid van aalwurms in jou lande. Die teenwoordigheid van aalwurms kan dikwels waargeneem word as besmette kolle in die land. Simptome op wortels sluit in knopwortels of galle, wortelletsels, oormatige wortelvertakking, beskadigde wortelpunte en vertraging in normale sapvloei.



Simptome op aartappels

Bogronse simptome is dikwels nie sigbaar nie en word soms verwar met simptome van droogte, fitotoksiteit en waterlogging, maar kan ook verwelking insluit selfs in gronde met genoegsame vog.

Verder vertoon geaffekteerde plante ook verlep, vergeel of verdwerg met minder of kleiner blare in sekere kolle. Knop- en stamaalwurms produseer swelsels op die stam en verkorte litte. Verdere simptome wat dui op die teenwoordigheid van aalwurms in jou aartappellande sluit in plantegroei-afwykings, gewasverliese, afname in opbrengs en kwaliteit, asook infeksie met sekondêre swam- en bakteriële siektes.

Indien die bogenoemde simptome in jou lande waargeneem word, is dit noodsaaklik om so gou as moontlik effektiewe aalwurmbeheer toe te pas.

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Wat beteken navorsing vir die aartappelboer? (Deel 3): Aartappelproduksie in 'n veranderende klimaat

Deur dr Fienie Niederwieser, Aartappels Suid-Afrika

Daar word verwag dat die atmosferiese CO₂-vlakke teen die einde van die eeu tussen 550 en 970 dpm sal wees. Dit is goeie nuus vir aartappelproduksie want anders as die meeste ander styselgewasse, lei 'n verhoogde CO₂-konsentrasie tot verhoogde fotosintese- en styselproduksie in die aartappelplant. Die stysel word ondergronds getranslokeer om knolvorming en -massa te vermeerder.

Onder ideale toestande lei 'n verhoging van 100 dpm CO₂ tot 'n toename van 10% in opbrengs. Die slegte nuus is natuurlik dat hoër temperature (1.8 tot 4°C teen die einde van die eeu) wat met klimaatsverandering gepaardgaan, tot hittestres en gevolglike verlaagde opbrengs kan lei. Aartappels is in wese 'n koelweergewas en knolvorming van kultivars wat tans verbou word, word by gemiddelde temperature van >17°C benadeel.

Indien die toename in temperatuur nie uitermatig hoog is nie, sal die verhoogde CO₂-vlakke en gepaardgaande verhoogde fotosin-

tese, kompenseer vir die nadelige effek van hoër temperature en kan verhoogde opbrengs verwag word. Waar aartappels reeds in 'n warm klimaat verbou word, sal selfs die verhoogde CO₂-vlakke egter nie kan kompenseer vir die nadelige effek van hoër temperature nie.

Plagbeheer: Goeie én slegte nuus

Vir elke patoogeen, aalwurm en insek wat 'n uitdaging vir aartappelboere bied, is daar spesifieke klimaatsomstandighede waarby hierdie plae die grootste probleme veroorsaak. Dus sal klimaatsverandering die impak van verskillende peste verskillend beïnvloed.

Moontlike aanpassings

Tegnies gesproke kan die impak van verhoogde temperature bestuur word deur 'n vroeër of later plantdatum, of om aartappels te produseer in streke wat tans te koud vir optimale produksie is. Kultivars wat beter aangepas is vir hoër temperature, kan ook ontwikkel word. Die beskikbaarheid van water kan geoptimaliseer word. Dit is egter nie in alle gevalle moontlik nie, as gevolg van verskeie faktore soos die beskikbaarheid

van besproeiingswater, markte of rotasiegewasse.

Sal aartappelboere in Suid-Afrika kan aanpas?

Tussen 2010 en 2016 het die aartappelbedryf navorsing deur 'n multidisiplinêre span aan die Universiteite van Pretoria (prof Martin Steyn, prof Jacquie van der Waals en prof Kerstin Kruger), die Vrystaat (prof Linus Franke) en Wageningen, Nederland (prof Anton Haverkort) befonds, om deur modellering voorspellings te maak en aanpassings vir Suid-Afrika voor te stel.

Omdat klimaat en planttye in die produksiestreke soveel verskil, is 'n studie vir elke individuele streek gedoen. Ook, omdat die onsekerheid ten opsigte van voorspellings vir temperature ná 2050 afneem, is voorspellings net tot 2050 gemaak.

Omdat bestaande modelle van klimaatsverandering nie met redelike akkuraatheid kan voorspel hoe reënval en uiterste klimaatstoe-

stande deur klimaatsverandering beïnvloed gaan word nie, is dit nie vir die studie in berekening gebring nie. Die aanname is gemaak dat waterbronne vir besproeiing verantwoordelik bestuur gaan word, sodat daar genoeg water beskikbaar sal wees vir aartappelproduksie.

Produksie

Die voorspelling is dat temperaturen teen 2050 'n gemiddeld van 2°C warmer sal wees as in 1960, terwyl die CO₂-konsentrasie 550 dpm sal wees. Hierdie data is gebruik om met behulp van 'n gewassimulasie-model

vir aartappels te bereken hoe hierdie toestande opbrengs, evapotranspirasie (waterbehoefte) en watergebruiksdoeltreffendheid sal beïnvloed.

In al die produksiestreke sal die verhoogde CO₂-konsentrasie in die atmosfeer deur verhoogde fotosintese-tempo en gevolglike styselvorming, 'n voordelige effek hê. Temperature in die sentrale deel van die land (Noordwes, Suidwes-Vrystaat, Noord-Kaap en Wes-Vrystaat) sal meer styg as in ander dele, maar die risiko van ryp sal nie verdwyn nie.

Die voordelige impak van

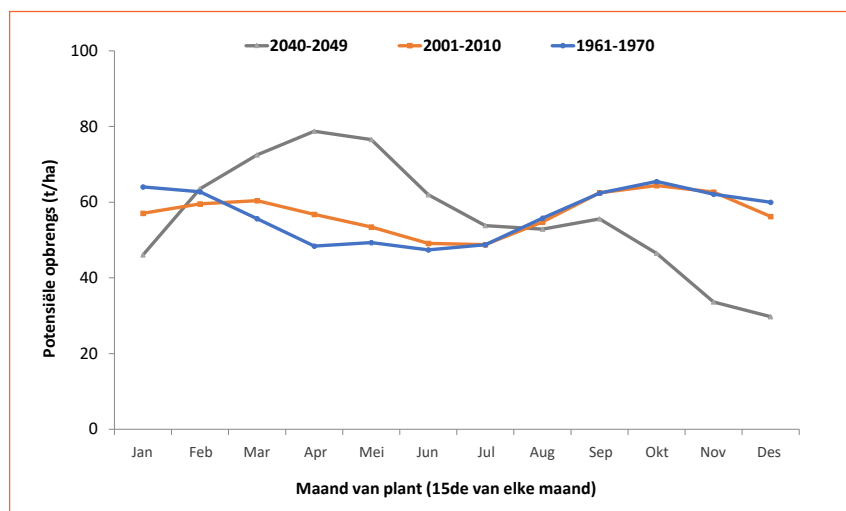
verhoogde CO₂-vlakke sal na verwagting ook nie kompenseer vir hittestres nie. 'n Geringe verhoging in opbrengs en watergebruiksdoeltreffendheid kan verwag word.

In die Sandveld en Limpopo sal die temperatuurverhoging produksie in die somer benadeel, maar tot 'n verhoging van opbrengs en watergebruiksdoeltreffendheid van winteraanplantings lei. Deur die planttyd aan te pas, kan Sandveld- en Limpopo-boere dus die voordelige effek van verhoogde CO₂-konsentrasie benut (Figuur 1 en 2).

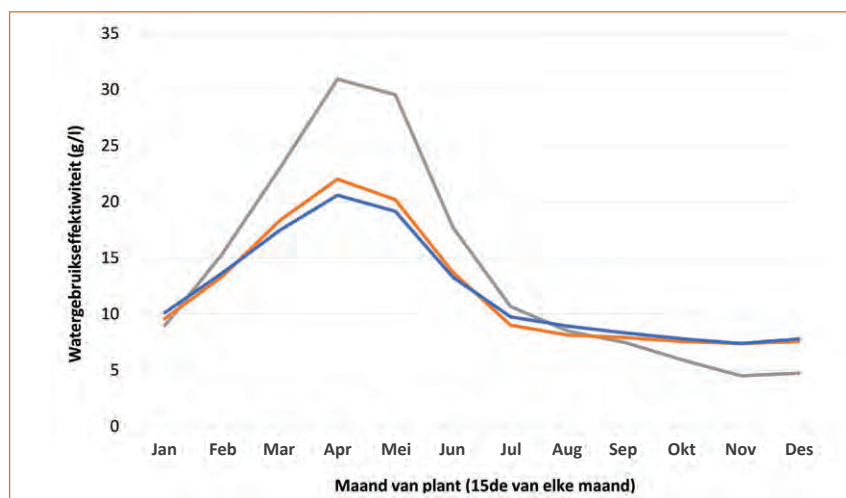
Streke waar huidige planttye optimaal sal bly is KwaZulu-Natal, die Noordoos-Kaap, Oos-Kaap en Suid-Kaap. Dit is omdat daar nie 'n noemenswaardige verhoging in temperatuur verwag word nie. Verhoogde CO₂-vlakke sal waar-skyklik die fotosintese-tempo (dus opbrengs) en die watergebruiksdoeltreffendheid in hierdie streke verhoog.

Daar is 'n aantal streke, naamlik Mpumalanga, Gauteng, Ceres en die Oos-Vrystaat, waar vroeër planttye voordelig kan wees ten opsigte van opbrengs en watergebruiksdoeltreffendheid. Verhoogde opbrengs kan in hierdie streke verwag word.

Figuur 1: Berekenende potensiële opbrengs van 'n 120-dag groeiseisoen wat op die 15de van elke maand vir drie periodes (1961 tot 1970, 2001 tot 2010 en 2040 tot 2049) in Limpopo geplant is.



Figuur 2: Berekenende potensiële watergebruikseffektiwiteit van 'n 120-dag groeiseisoen wat op die 15de van elke maand vir drie periodes (1961 tot 1970, 2001 tot 2010 en 2040 tot 2049) in Limpopo geplant is.



Plagbeheer (sien Tabel 1)

- Die voorkoms van sagtevrot sal na verwagting weens die toename in temperature, in alle streke toeneem.
- Plant-parasitiese aalwurms sal ook na verwagting meer algemeen voorkom.
- Laatroes sal waarskynlik minder lastig wees in die Oos-Vrystaat en tydens produksie gedurende baie warm somers, soos in die Sandveld en Limpopo.
- Vroeë- en malroes gaan na verwagting óf meer voorkom, óf dieselfde voorkoms hê as nou.
- Hoë en baie hoë temperature sal die beheer van aartappelrot meer uitdagend maak.

Wat staan boere te doen?

Siekte- en plagbeheer gaan meer uitdagings bied in 'n warmer klimaat. Dit, en die feit dat dit vir die plantbeskermingsbedryf moeiliker

Tabel 1: Die verwagte risiko ten opsigte van sommige peste en siektes in 'n warmer klimaat in die Sandveld, Oos-Vrystaat en Limpopo.

Siekte	Pes/patogeen	Sandveld-somer	Sandveld-winter	Oos-Vrystaatse somer	Limpopo-winter
Laatroes	<i>Phytophthora infestans</i>	↓	↑	↓	GV *
Vroeë- en malroes	<i>Alternaria solani</i> en <i>Alternaria alternata</i>	GV	↑	GV	GV
Sagtevrot en swartstam	<i>Pectobacterium brasiliense</i>	↑	↑	↑	↑
Knopwortel-aalwurm	<i>Meloidogyne incognita</i> en <i>Meloidogyne javanica</i>	↑	↑	↑	↑
Aartappelvirus Y en aartappelrolbladvirus	<i>Myzus persicae</i> , as virusvektor	↑	↓	↑	↑

*GV = Geen verandering.

raak om nuwe chemie te ontwikkel en te registreer, noodsaak produsente om alle aspekte van geïntegreerde plaagbestuursprogramme toe te pas.

Wat opbrengs en watergebruiks-effektiwiteit betref, kan sekere streke bevoordeel word en moontlik hul bemakingstye verleng, terwyl produsente in streke waar opsies vir aanpassings beperk is, hulself sal

moet toewy tot optimalisering van produksiepraktyke en -insette. In kort, hierdie inligting stel boere in staat om toekomsbeplanning te doen.

Inligting vir elke streek

'n Reeks CHIPS-artikels met gedetailleerde inligting oor die impak van klimaatsverandering op opbrengs en watergebruik vir elke

produksiestreek, is beskikbaar. Besoek www.potatoes.co.za/document-library. Vandaar af, kies 'Research', dan 'CHIPS articles', en dan 'Klimaatsverandering'.

Vir meer inligting, kontak dr Fienie Niederwieser by fienie@potatoes.co.za.



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Stikstof- en kaliumbemesting – dis 'n fyn balanseerkuns

Deel 2: Knolopbrengs en -kwaliteit

Deur prof Martin Steyn en Tlotlisang Nkhase, Universiteit van Pretoria

Stikstof (N) en kalium (K) is die twee elemente wat die meeste deur plante opgeneem word. Stikstof bevorder vinnige loofgroei en die ontwikkeling van 'n groot blaredak, wat nodig is om hoë opbrengs te verseker. Te veel N kan egter oormatige loofgroei ten koste van knolgroei by aartappels veroorsaak, terwyl 'n N-tekort daartoe kan lei dat die loof te vroeg afsterf en sodoende die opbrengs benadeel.

Aartappels neem ook groot hoeveelhede K op en daar moet voldoende K in die grond wees of deur bemesting aangevul word, om optimale groei en produksie te verseker. Kalium speel 'n belangrike rol by styselneerlegging in die knolle en voldoende opname is daarom belangrik vir goeie knolgehalte. Verder verleng K die raklewe en opbergkwaliteit van knolle.

'n Oormaat K in die grond kan egter 'n wanbalans met ander katione soos kalsium (Ca) en magnesium (Mg) veroorsaak, wat weer knolgehalte kan benadeel. Aartappels wat vir proses-

sering verbou word, moet veral aan streng minimum gehaltestandaarde ten opsigte van soortlike gewig (SG) en skyfiekleur voldoen.

Hierdie kwaliteitseienskappe van 'n kultivar word grootliks bepaal deur sy genetiese samestelling en bemestingsbestuur. Minimum SG-waardes van 1.075 en liggekleurde skyfies is aanvaarbaar, terwyl donker skyfies onaanvaarbaar is en op hoë vlakke van reduserende suikers wys. Dit is duidelik dat die bemestingsvlakke of peile van N en K 'n groot rol in die uiteindelijke opbrengs en gehalte van knolle speel.

Vlakke én verhouding is belangrik

Vorige studies het getoon dat nie nét die vlakke van N- en K-bemesting die opbrengs en gehalte kan beïnvloed nie, maar dat die verhouding van N:K-bemesting ook belangrik is. Aangesien hierdie aspek nog min aandag in plaaslike navorsing ontvang het, is hierdie studie gevolglik uitgevoer om dit te ondersoek.

In 'n voorafgaande artikel in *CHIPS* het ons gesien dat beide

die vlakke van N en K, maar ook die verhouding tussen die hoeveelhede N en K toegedien, die groei van plante en knolle beïnvloed.

In hierdie opvolgartikel kyk ons hoe verskillende peile van N- en K-bemesting die finale knolopbrengs en interne knolgehalte van die kultivars Innovator en Lanorma beïnvloed. Die resultate wat in hierdie artikel aangebied word, kom dus vanuit dieselfde studie waaroor die vorige artikel gerapporteer het.

Die studie, wat op die Hatfield-proefplaas van die Universiteit van Pretoria uitgevoer is, het die volgende ten doel gehad:

- Om die impak van stygende vlakke van N en K op die knolopbrengs en interne knolgehalte van die twee gekose kultivars te ondersoek.
- Om vas te stel of daar 'n optimale N:K-verhouding is wat die beste knolopbrengs, grootteverspreiding en interne knolgehalte sal lewer.

Tabel 1: Bemesting-behandelingkombinasies en N:K-verhoudings.

Behandeling	N (kg/ha ⁻¹)	K (kg/ha ⁻¹)	N:K-verhouding
1	160	160	1
2	160	230	0.7
3	160	300	0.53
4	230	160	1.44
5	230	230	1
6	230	300	0.77
7	300	160	1.88
8	300	230	1.3
9	300	300	1
10	160	0	-

Metodes

’n Landproef is gedurende die 2016/17-somerseisoen op ’n sandrige grond uitgevoer. Drie N- en K-peile (160, 230, en 300 kg/ha⁻¹ van elk) is gebruik, wat nege behandelingskombinasies en sewe N:K-verhoudings gelewer het. ’n Tiende behandeling van 160 kg/ha⁻¹ N en 0 kg/ha⁻¹ K is bygevoeg om die reaksie van die twee kultivars op K-bemesting sonder enige N te evalueer.

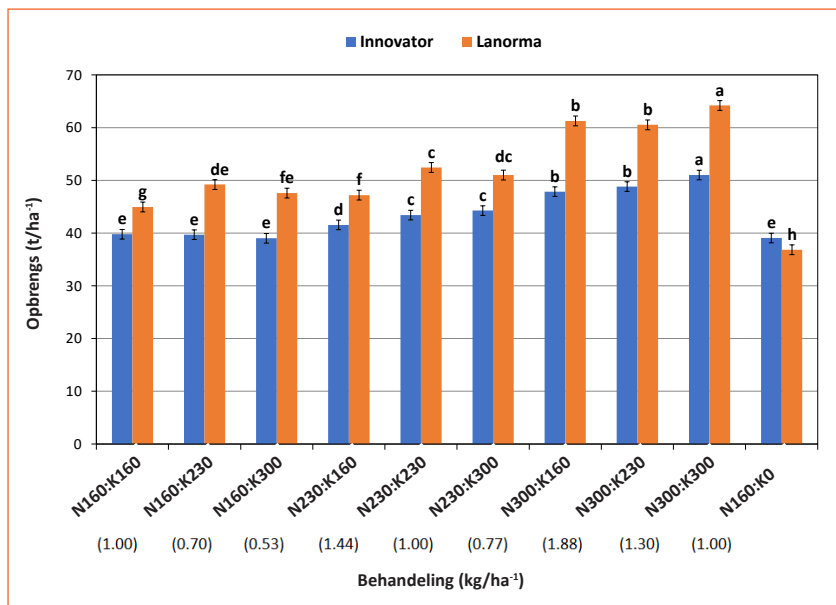
Tabel 1 toon die verskillende behandelingskombinasies en N:K-verhouding van elkeen aan. Meer besonderhede oor die behandelings en bemestingsbronne wat gebruik is, kan in die vorige artikel in die Maart/April-uitgawe van CHIPS verkry word.

Na natuurlike loofafsterwe is die knolle met ’n meganiese uithaler geoes en die totale knolopbrengs en grootteverspreiding is bepaal. Vir grootteverspreiding is knolle in drie kategorieë verdeel, naamlik klein (< 100 g), medium (100 tot 170 g) en groot (> 170 g).

Die massa per grootteklas is bepaal en as persentasie van die totale opbrengs per behandeling uitgedruk. SG is op ’n ewekansige monster van tien mediumgrootte knolle per behandeling met die onderwaterweegmetode bepaal, en dan met die volgende vergelyking bereken:

$$SG = \frac{\text{(massa in lug)}}{\text{(massa in lug-massa in water)}}$$

Figuur 1: Knolopbrengs per kultivar by verskillende N- en K-bemestingspeile (N:K-verhouding tussen hakies). Waardes met dieselfde letter per kultivar verskil nie betekenisvol van mekaar nie.



’n Addisionele monster van tien mediumgrootte knolle per behandeling is geneem en na die Landbounavorsingsraad Instituut vir Groente, Industriële en Medisinale Plante (ARC-VIMP) gestuur vir skyfiekleurebepaling.

Elke knol is geskil en in 1 mm-dik skyfies gesny, waarna dit teen 160 °C vir vyf minute in sonneblomolie gebraai is. Die skyfies is toegelaat om af te koel en die kleurwaardes is daarna met ’n Hunterlab-kleurmeter gemeet. Kleurwaardes van hoër as 50 word as aanvaarbaar vir verwerking geag.

Knolopbrengs en grootteverspreiding

Die algehele opbrengsresultate per bemestingsbehandeling vir die twee kultivars word in *Figuur 1* aangedui. Die hoogste opbrengs is vir beide kultivars met 300kg/ha⁻¹ N en 300kg/ha⁻¹ K (N:K-verhouding van 1) behaal. Vir Innovator was die hoogste opbrengs 51 t/ha⁻¹ en vir Lanorma 64.2 t/ha⁻¹.

Die laagste opbrengs vir Innovator is by 160 kg/ha⁻¹ N en 300 kg/ha⁻¹ K waargeneem (N:K-verhouding 0.53), gevolg deur die kontrole. Lanorma het die laagste opbrengs aangeteken by die kontrole (160 kg/ha⁻¹ N en 0 kg/ha⁻¹ K), gevolg deur die behandeling met 160 kg/ha⁻¹ N en 160 kg/ha⁻¹ K.

Met die uitsondering van die laagste N-vlak, het die N:K-verhouding die opbrengs betekenisvol beïnvloed. Dit kan duidelik gesien word by vlakke van 230 en 300 kg/ha⁻¹ N, waar N:K-verhoudings van tussen 0.77 en 1 betekenisvol hoër opbrengste gelewer het, in vergelyking met behandelings waar die verhoudings tussen 1.30 en 1.88 was (vergeelyking binne dieselfde N-peil).

Dit bevestig dat daar ’n interaksie tussen N- en K-peile is, op voorwaarde dat die N- of K-vlakke in die grond nie kritiek laag (< 160 kg/ha⁻¹ in hierdie geval) is nie. Hierdie bevinding stem ooreen met soortgelyke resultate wat in die literatuur gerapporteer is.

Dit impliseer dat N- en K-peile gelyktydig en in die optimale verhouding tot mekaar verhoog moet word, om nutriëntwanbalanse te

vermy en optimale benutting van bemesting te verseker. Sodoende sal voedingstowwe nie onnodig vermors word nie en die ekonomiese optimum-opbrengs behaal kan word. Dit is opmerklik dat opbrengs hoofsaaklik verhoog het soos die N-peil verhoog is.

Opbrengsreaksie teenoor N vs. K

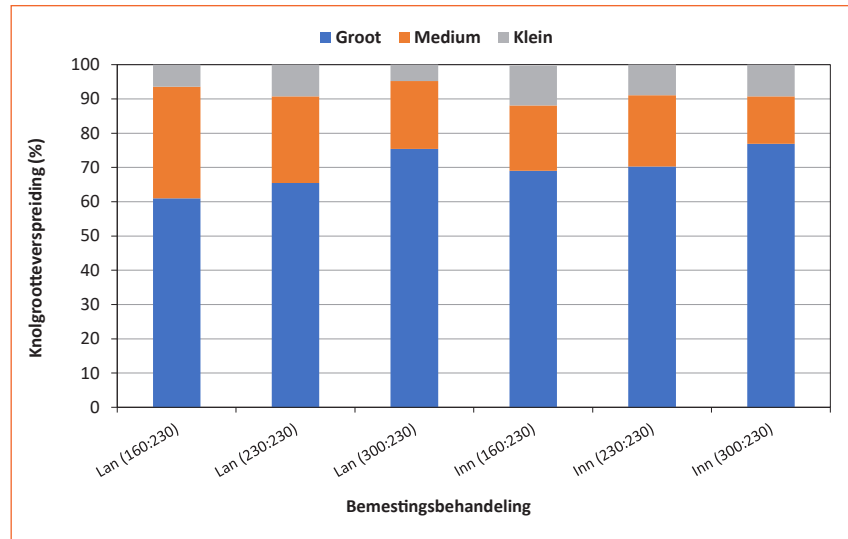
Vir Innovator het die opbrengs effens verhoog met 'n toename in K binne dieselfde N-peil. By Lanorma het opbrengs oor die algemeen (met uitsondering van die hoogste N-peil) toegeneem wanneer die K-peil van 160 na 230 kg/ha⁻¹ verhoog is, maar by verdere verhoging in K het die opbrengs begin afplat. Opbrengs het oor die algemeen meer op 'n toename in N as K reageer.

Tabel 2 toon die opbrengsreaksie op N (gemiddelde opbrengs oor alle K-peile), asook die opbrengsreaksie op K-verhoging (gemiddelde opbrengs oor alle N-peile). Daarvolgens is dit duidelik dat opbrengs vir beide kultivars betekenisvol toegeneem het met 'n verhoging in N.

Daarteenoor het opbrengs net betekenisvol gestyg met K-verhoging tot 230 kg/ha⁻¹, terwyl verdere verhoging in K tot 300 kg/ha⁻¹ nie tot verdere opbrengsverhoging gelei het nie. Verhoogde N-vlakke lei gewoonlik tot vinniger blaredakontwikkeling en verleng die groeiseisoen, wat die tydperk van maksimum sonlig-onderskepping vir hoër opbrengs verseker.

Die laer opbrengs van Innovator, relatief tot Lanorma in hierdie proef, kan waarskynlik aan die korter groeitydperk van Innovator toegeskryf word. Die

Figuur 2: Knolgrootteverspreiding soos beïnvloed deur N-peile vir die 230 kg/ha⁻¹ K-peil.



*Lan = Lanorma, Inn = Innovator.

Waardes tussen hakies verteenwoordig N- en K-peile.

lengte van die aktiewe groeitydperk is een van die belangrikste faktore wat opbrengs bepaal. Die korter groeitydperk beperk gewoonlik die opbrengs van kort-groeiseisoen kultivars.

Die twee kultivars het verskillende opsigte van hul knolgrootteverspreiding. Innovator het oor die algemeen 'n hoër persentasie groot knolle gelewer, terwyl Lanorma meer medium knolle gehad het. Die groot knolle van Innovator was oorewegend swaarder as 250 g, terwyl dié van Lanorma nader aan 200 g elk geweeg het.

By albei kultivars is grootteverspreiding hoofsaaklik deur die N-peil beïnvloed. Figuur 3 toon die knolgrootteverspreiding in reaksie op N-bemesting by 'n konstante K-peil van 230 kg/ha⁻¹ K (Figuur 2). Die persentasie groot

knolle het geneig om te verhoog met 'n styging in N-peil, terwyl die medium en klein knolle verminder het. Soortgelyke tendense is by K-peile van 160 en 300 kg/ha⁻¹ K waargeneem.

Aangesien knolgrootte hoofsaaklik toegeneem het met verhoging in N-peil en minder reaksie op K-peil getoon het, impliseer dit dat N:K-verhoudings van een of hoër tot groter knolle aanleiding gee. Daarteenoor sal N:K-verhoudings kleiner as een, meer medium en klein knolle lewer.

Dit was verder opvallend dat by die laagste N-peil van 160 kg/ha⁻¹, min knolmisvorming by Innovator voorgekom het, maar namate die N-peil verder verhoog het, het die hoeveelheid misvormde knolle vir die kultivar ook toegeneem. Feitlik geen misvorming is vir Lanorma by enige van die N-peile waargeneem nie.

Tabel 2: Die impak van N- en K-peil op knolopbrengs van kultivars Lanorma en Innovator.

Peil toegedien (kg/ha ⁻¹)	Lanorma-opbrengs (kg/ha ⁻¹)		Innovator-opbrengs (kg/ha ⁻¹)	
	N/reaksie	K-reaksie	N-reaksie	K-reaksie
160	47.24 c	51.14 b	39.49 c	43.06 b
230	50.21 b	54.06 a	43.08 b	43.98 ba
300	61.99 a	54.25 a	49.23 a	44.76 a
LSD	2.14	0.91	1.29	1.24
CV (%)	1.7	1.7	3.2	3.2

*Waardes gevolg deur dieselfde letter in dieselfde kolom verskil nie betekenisvol van mekaar nie $p > 0.05$.

Knolgehalte

Soortlike gewig (SG)

Innovator het die hoogste gemiddelde SG van 1.078 gehad, in vergelyking met 1.068 vir Lanorma. Die hoogste SG-waardes is oor die algemeen by die laagste N-peil waargeneem en daar was 'n neiging van daling in SG, met toename in N-peil (Figuur 3). Daar was egter nie

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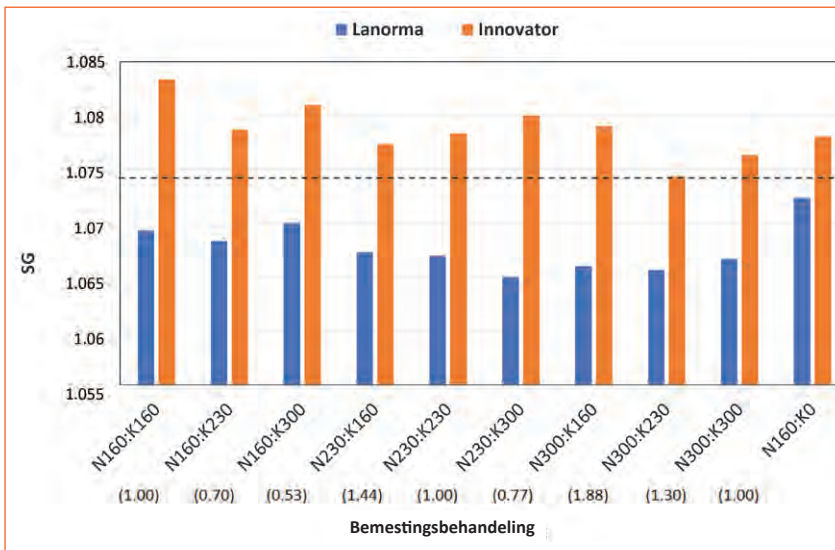
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Figuur 3: Knol SG-waardes soos beïnvloed deur N- en K-peile vir die kultivars Innovator en Lanorma (N:K-verhouding tussen hakies). Horisontale stippellyn = minimum aanvaarbare SG vir verwerking na skyfies.



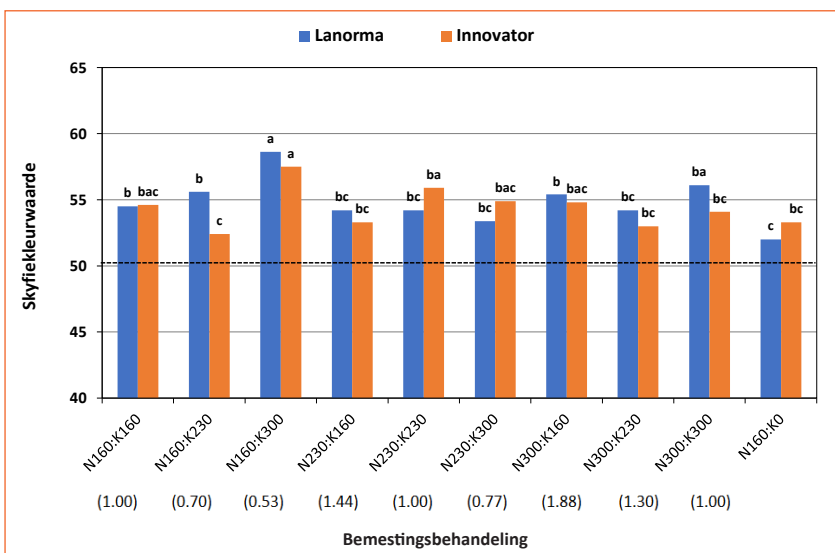
'n duidelike SG-reaksie op K-peil of op die N:K-verhouding nie.

Skyfiekleur

In hierdie studie het die twee kultivars se skyfiekleure nie betekenisvol van mekaar verskil nie (Figuur 4). Skyfiekleurwaardes van 50 en hoër word as aanvaarbaar beskou en al die behandelings van beide kultivars het aan hierdie minimum waarde voldoen.

By die laer N-peile (160 en 230 kg/ha⁻¹ N) was daar 'n neiging tot beter skyfiekleure met 'n styging in die K-peil, maar die tendens was nie deurgaans waarneembaar nie. Dit wil tog voorkom of skyfiekleur wel verbeter het met K-bemesting, aangesien skyfiekleur 'n daling getoon het in die afwesigheid van enige K-bemesting (vergeelyk die 160 N:0 K-behandeling met 160 N:160 K).

Figuur 4: Skyfiekleur-waardes soos beïnvloed deur N- en K-peile vir die kultivars Innovator en Lanorma. (N:K-verhouding tussen hakies). Waardes met dieselfde letter per kultivar verskil nie betekenisvol van mekaar nie. Horisontale stippellyn = minimum aanvaarbare kleur vir verwerking na skyfies.



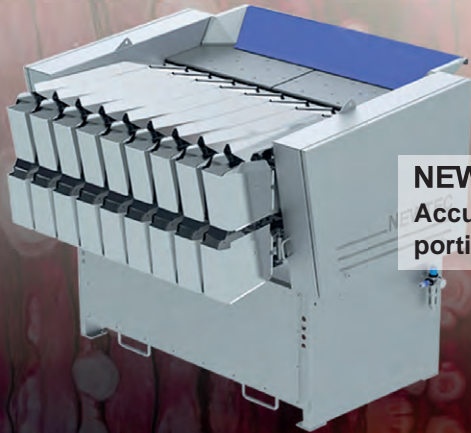
Opsomming en aanbevelings

- Lanorma het oor die algemeen hoër opbrengste as Innovator gelewer, terwyl Innovator meer groot knolle gehad het.
- Die totale opbrengste van beide kultivars het met 'n toename in N-peil gestyg.
- Die hoogste N-peil het tot die hoogste persentasie groot knolle gelei, maar dit het ook die meeste misvormde knolle by Innovator veroorsaak. Onder die spesifieke toestande van die studie was 'n N-peil van 230 kg/ha optimaal vir hoër bemerkbare opbrengs.
- By 'n spesifieke N-peil het opbrengs 'n stygende neiging getoon met 'n toename in K-peil van tot 230 kg/ha K, waarna opbrengs afgeplat het.
- Opbrengs was oor die algemeen die hoogste by N:K-verhoudings van 0.77 tot 1, behalwe by die laagste N- en K-peil van 160 kg/ha⁻¹.
- In hierdie studie het SG en skyfiekleur minder reaksie op N- en K-bemestingskombinasies as knolopbrengs getoon, maar SG het geneig om te daal met toename in N-peil.
- Die skyfiekleure van albei kultivars was aanvaarbaar vir verwerking en daar was 'n neiging tot beter kleure met styging in die K-peil, hoewel die tendens nie deurgaans sigbaar was nie.

Die resultate van hierdie studie het bevestig dat nie net N- en K-peile oorweeg moet word by die bemesting van aartappels nie, maar ook die N:K-verhouding van bemesting wat toegedien word. N- en K-bemestingspeile moet dus proporsioneel verhoog word om wanbalanse in die grond te voorkom, wat kan lei tot sub-optimale plantegroei, sowel as laer knolopbrengste en -gehalte. **G**

Vir meer inligting, kontak prof Martin Steyn by 012 420 3880 of martin.steyn@up.ac.za.

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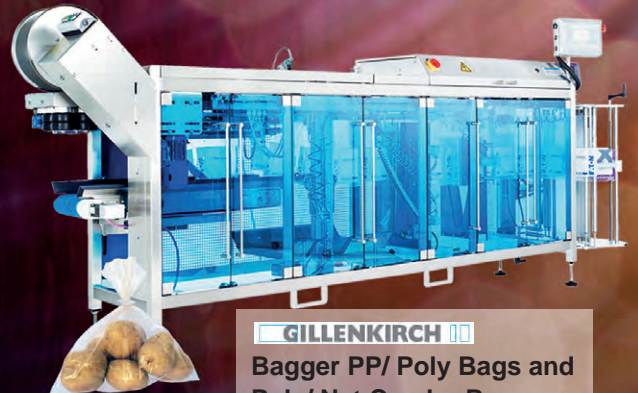
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Limpopo-kultivarproef onder besproeiing op Dendron in 2020

Deur Chantel du Raan, Aartappels Suid-Afrika, en Mossie Jongbloed, produsent

Die Limpopo-produksiegebied produseer sowat 22% (2019-oesjaar) van die land se algehele

aartappelproduksie, wat die hoogste in Suid-Afrika is. Hierdie streek plant vir die gebruik van tafel- en verwerkingsaartappels onder besproeiing. Die

hoofkultivars vir tafelaartappels sluit Mondial, Valor en Sifra in. Proewe is uitgevoer op Dendron, 'n klein Bosvelddorpie op die R521, ongeveer 61 km noordwes van Polokwane.

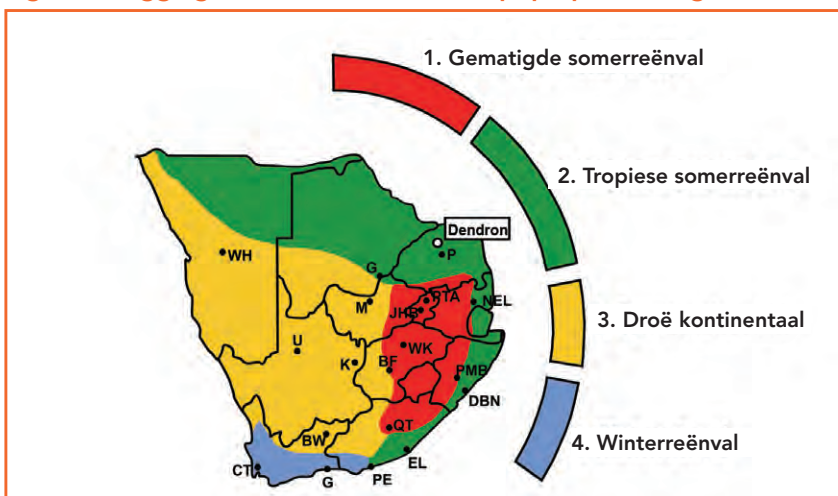
Dendron is 'n tropiese somerreënvalgebied met 'n jaarlikse gemiddelde reënval van 403 mm/jaar (*Figuur 1*). Baie lang, warm en gedeeltelik bewolkte somers kom voor, terwyl die winters weer kort, koel en droog is. Een van die redes waarom hierdie streek so 'n groot bydrae tot die bedryf kan maak, is omdat daar twee seisoene voorkom. Dit sluit in 'n vroeë aanplanting wat gedurende Januarie tot Maart geplant word, en die hoofaanplanting wat vanaf April tot en met Julie geplant word.

Die proef is in 'n ewekansige blok-ontwerp in sandleemgrond met drie herhalings uitgevoer. Verdere tegniese inligting rakende die proefperseel en uitleg word in *Tabel 1* opgesom.

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

Plaas	Zandput Boerdery
Boer	Mossie Jongbloed
Plantdatum	5 Augustus 2020
Oesdatum	17 Desember 2020
Besproeiing/droëland	Besproeiing
Dubbel- of enkelrye	Twee enkelrye per kultivar
Loofafsterwe	Natuurlik
Tussenry-spasiëring	0.9 m
Inry-spasiëring	0.3 m
Proefperseel per eenheid	18 m ²
Plantestand	37 037 plante/ha

Figuur 1: Ligging van Dendron in die Limpopo-produksiegebied.



Rol van groeitydperke

Dit is belangrik om daarop te let dat groeitydperke die opbrengs van kultivars kan beïnvloed. Groeitydperke word gedefinieer as die aantal dae vanaf opkoms tot natuurlike loofafsterwe, afhangend van die seisoen.

Die presiese tydsberekening van die vier groeifases hang af van die omgewing en die bestuurspraktyke wat wissel tussen lokaliteite asook kultivars, onder andere as gevolg van verskillende groeitydperke. Die kultivars, plantgereedheid van moere, stand (%) en halmtelling

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Tabel 2: Karaktereienskappe rakende groeitydperk, plantgereedheid, stand (%) en halmtellings vir elke kultivar in 2020.

Agente	Kultivar	Groeitydperk (dae) ¹	Plant-gereedheid ²	Stand (%)	Halm-telling	Halms per ha
	Allison	Medium tot lank (120)	4	97	4.9	176 144
	Belmonda	Kort tot medium (100)	2	94	3.1	108 061
	El Mundo	Kort tot medium (90-100)	4	100	4.9	181 481
	Kingsman	Medium (100-110)	3	94	2.8	97 603
	Labadia	Kort tot medium (100)	3	94	4.8	167 320
	Lanorma	Kort (80-90)	1	88	2.8	91 503
	Mondeo	Medium (90-110)	3	100	4	148 148
	Mondial	Kort tot medium (95-100)	3	100	4.6	170 370
	Moonlight (Crop13)	Medium tot lank (110-120)	3	100	3.4	125 926
	Panamera	Kort tot medium (95-100)	4	97	3	107 843
	Sababa	Medium tot lank (110-115)	4	100	3	111 111
	Satin King (Crop34)	Medium tot lank (110-120)	4	100	3.6	133 333
	Sifra	Kort tot medium (90-100)	3	97	3	107 843
	Sound	Medium (100)	3	91	4.8	162 091
	7 Four 7	Kort (80)	1.5	91	2.5	84 423
	Taisiya	Kort tot medium (90)	1	97	2.4	86 274
	Tyson	Kort tot medium (90-100)	4	94	3.1	108 061

¹ Algemene riglyne en kategorieë (dae van opkoms tot natuurlike loofafsterwe, afhangend van die seisoen):

Kort: 70 tot 90 dae, kort tot medium: 80 tot 100 dae, medium: 90 tot 110 dae, medium tot lank: 90 tot 120, lank: 90 tot 140 dae.

² Plantgereedheid van moere: 1 – vars, 2 – effens vars, 3 – plantgereed, 4 – effens oud, 5 – oud.

van hierdie proef word in Tabel 2 aangedui.

Temperatuur, dagliglengte en water is die belangrikste abiotiese

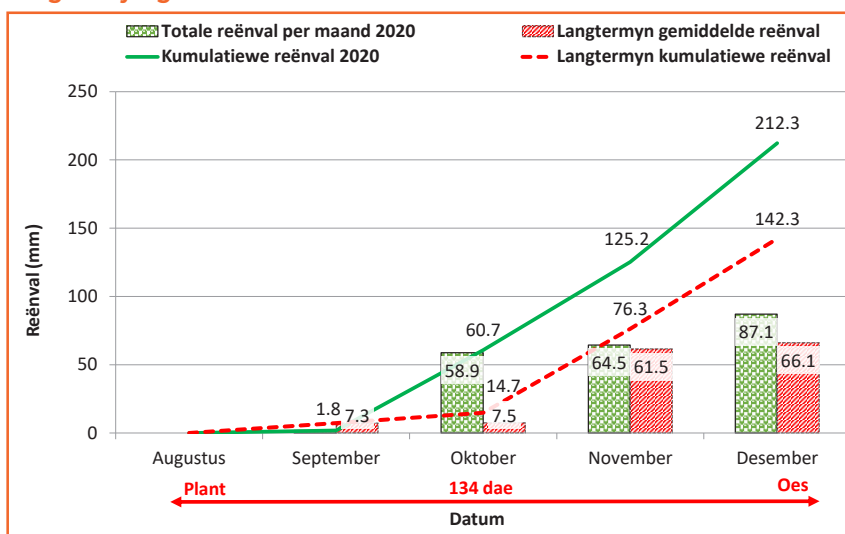
faktore wat die groeipatroon, opbrengs en gehalte van aartappels beïnvloed. Om te bepaal wat die aanpassingsvermoë van nuwe

kultivars in die Dendron-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 asook langtermynweerde data (laaste vyf jaar) is vanaf die Zandput-stasie op die proefperseel verkry. Bogemiddelde reënval is gedurende Oktober en Desember ondervind.

Kumulatiewe reënval vir die groeiseisoen (212.3 mm) was aansienlik hoër in vergelyking met die gemiddelde kumulatiewe langtermynreënval (142.3 mm) (Figuur 2).

Figuur 2: Reënval gedurende die groeiseisoen (2020) asook die langtermyn gemiddelde reënval.



Temperature hou by patroon

Die maksimum asook minimum temperature (Figuur 3) vir die 2020-groeiseisoen het regdeur die

normale patroon van vorige jare (langtermyndata) gevolg. Veral gedurende September tot November van die groeiseisoen, het die maksimum temperature aansienlik gewissel en was dit vir 15 dae tussen 35 en 39°C, en vir 65 dae bo 30°C.

Die optimale gemiddelde lug-temperatuur vir knolvulling wissel tussen 14 en 22°C. Wanneer die temperatuur bo 29°C styg, sal min of selfs geen knolgroei plaasvind nie. Dit is weens koolhidrate wat vir

“ Die inligting stel ons in staat om te evalueer hoe die werklike opbrengs behaal deur die proef, vergelyk met gesimuleerde potensiële opbrengste

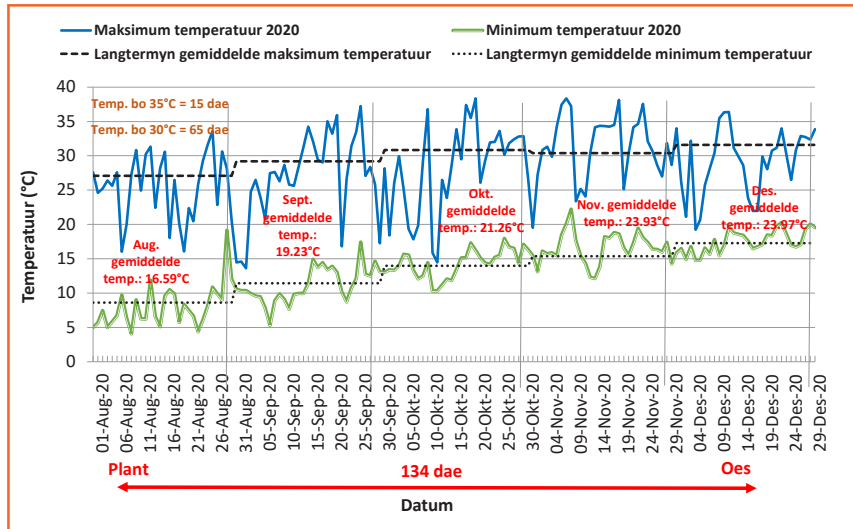
respirasie gebruik word.

Hitte-eenhede is ook ’n belangrike faktor om in ag te neem, aangesien die ontwikkeling van die plant hoofsaaklik op die versameling van hitte-eenhede gebaseer is. Daar word dus aanvaar dat die plant ’n sekere aantal hitte-eenhede moet versamel om ’n ontwikkelingsfase te voltooi. Die hitte-eenhede van die 2020-groeiseisoen het dieselfde tendense as langtermyndata getoon en word in *Figuur 4* aangedui. Aan die einde van die 2020-groeiseisoen was die kumulatiewe hitte-eenhede 3.8% laer as die kumulatiewe langtermyn hitte-eenhede van hierdie jaar se seisoen.

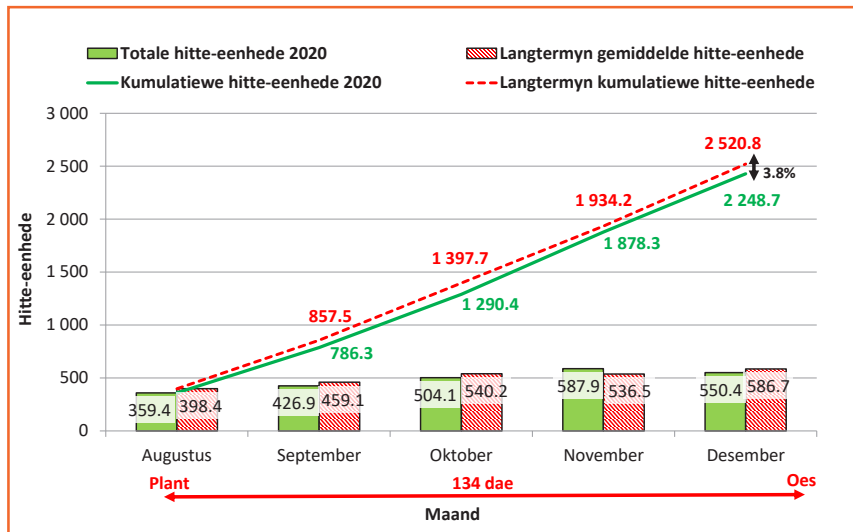
Die opbrengsdata is met behulp van die GenStat®-program statisties verwerk en die gemiddelde is geskei deur van die Tukey KBV-toets gebruik te maak. Die kultivareffek gedurende die 2020-proewe (*Figuur 5*) was statisties beduidend ($p < 0.05$) ten opsigte van opbrengs, terwyl die koëffisiënt van variasie laag was (12.8%).

Dit dui aan dat die proewe goed uitgevoer en die resultate betroubaar is. Die gemiddelde

Figuur 3: Minimum en maksimum temperature (°C) gedurende die groeiseisoen (2020) asook oor die lang termyn.



Figuur 4: Hitte-eenhede gedurende die groeiseisoen (2020) asook die langtermyn gemiddeld.



*Aantal hitte-eenhede spesifiek bepaal vir aartappels (drumpeltemperatuur = 5°C) as gewas (bereken vanaf uurlikse data).

opbrengs vir die 2020-seisoen kultivarproef was 56 t/ha. Gedurende die 2020-proewe (*Figuur 5*) het die kultivars Sound, Satin King (Crop34), Moonlight (Crop13), Labadia, Kingsman, Lanorma, 7 Four 7, El Mundo, Allison, Sababa, Panamera, Mondial en Tyson die hoogste opbrengste gelewer.

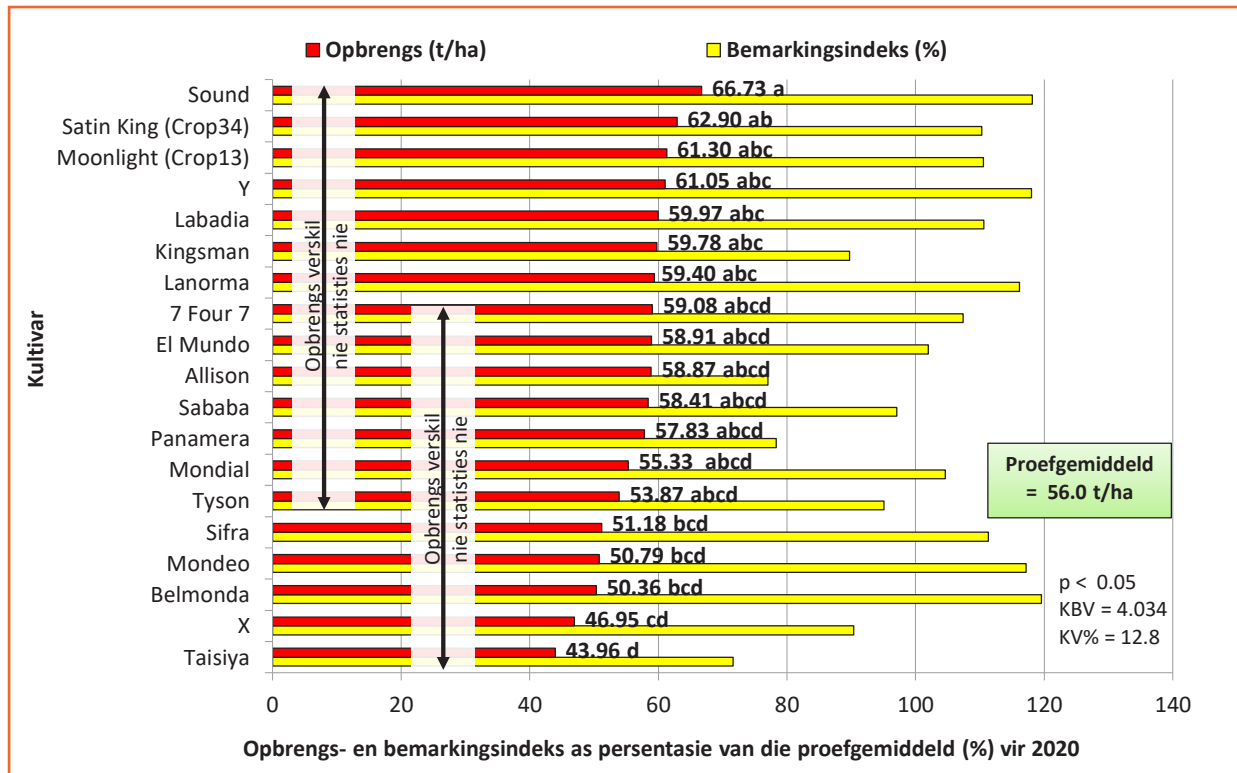
Die kultivars Sound, Satin King (Crop34), Moonlight (Crop13), Labadia, Kingsman, Lanorma, 7 Four 7, El Mundo, Allison, Sababa en Panamera het hoër opbrengste as die proefgemiddeld (56 t/ha) behaal.

Prestasie van kultivars

Ten einde die prestasie van die kultivars in terme van opbrengs en gehalte te bepaal, is die opbrengs, grootteverspreiding en klas gebruik om teen die gemiddelde markpryse ’n bemerkingsindeks vir die betrokke dag te bereken.

Die opbrengs, vermenigvuldig met die heersende prys wat bepaal word deur die grootteverspreiding en gradering, gee die bemerkingsindeks (*Figuur 5*). Belmonda, Mondeo, Lanorma en Sound het die hoogste bemerkingsindeks behaal, wat

Figuur 5: Algehele opbrengs en bemarkingsindeks per kultivar as persentasie van die proefgemiddeld.

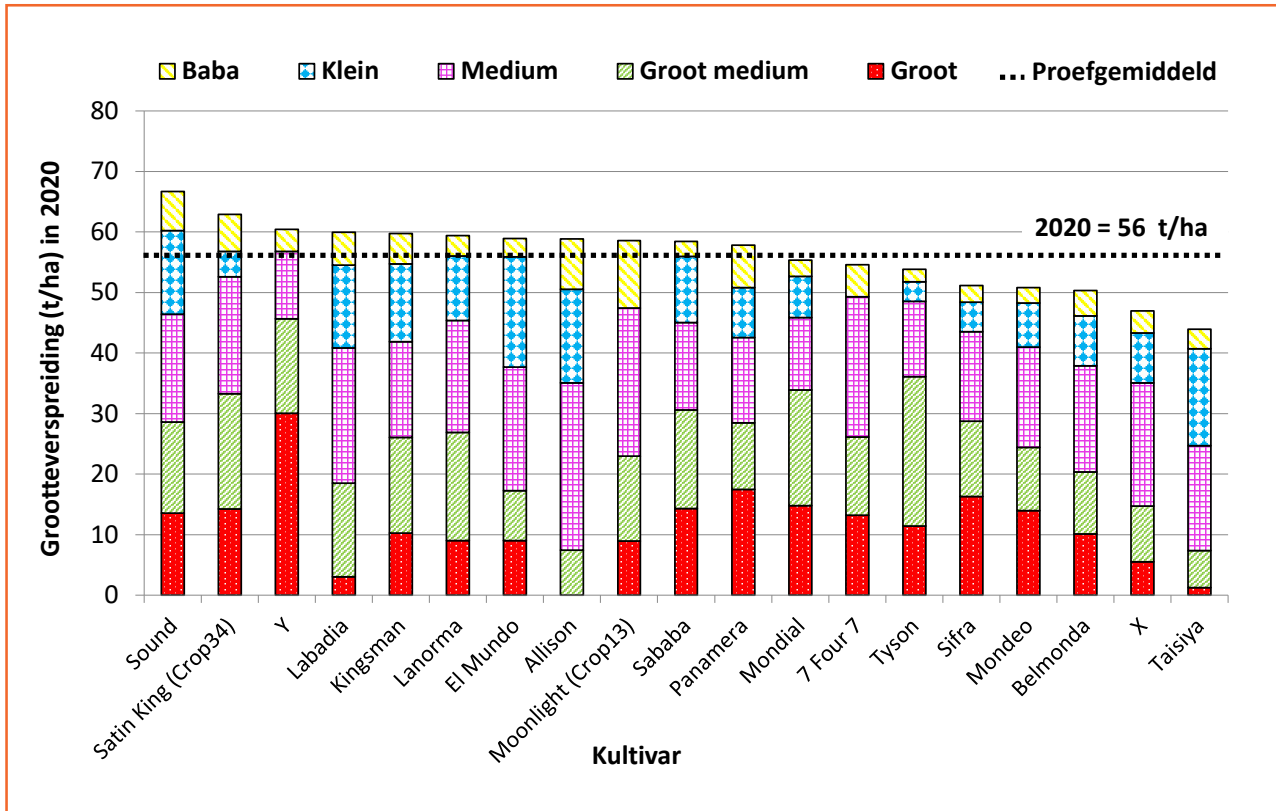


*Waardes gevolg deur dieselfde letter verskil nie beduidend van mekaar nie.

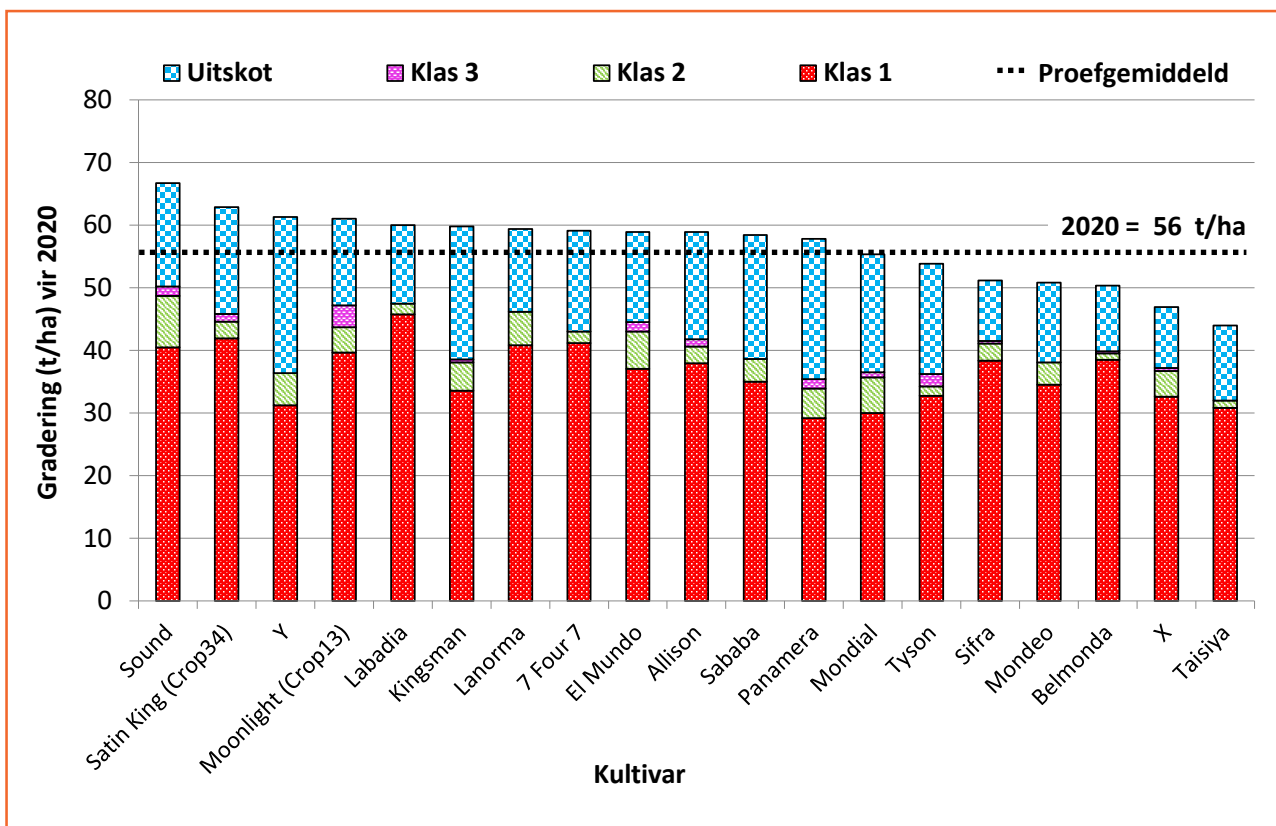
Tabel 3: Hoofredes vir afgradering tydens die 2020-Dendron-oes.

Kultivar	Aal-wurm	Bruin-skurf	Fusarium	Sagte-vrot	Insek-skade	Losskil (onvolwasse/Swart-spikkel)	Meganiese beskadiging	Misvorming	Mot-skade	Sand-spleet	Swart-skurf	Vergroening
Allison			X			X			X			X
Belmonda						X	X	X				X
El Mundo				X	X	X		X				X
Kingsman	X							X	X			X
Labadia						X		X				
Lanorma						X		X	X			
Mondeo						X		X	X			
Mondial			X			X		X	X	X		
Moonlight (Crop13)		X		X	X			X	X	X		X
Panamera		X	X			X						X
Sababa						X	X					
Satin King (Crop34)					X							X
Sifra			X		X			X				
Sound						X		X	X			X
7 Four 7			X			X			X			X
Taisiya						X		X	X			X
Tyson		X	X		X	X				X	X	X

Figuur 6: Groottegroepverspreiding van elke kultivar tydens finale oes.



Figuur 7: Gradering van elke kultivar tydens finale oes.



Tabel 4: Prosseringseienskappe en interne gehalte vir 2020 (uitgevoer deur Landbounavorsingsraad, Rooideplaat).

Kultivar	Skyfiekleur ¹	SG ²	Droëmateriaal ³ (%)	Holhart	Bruinvlek
Allison	54	1.06	16.08	0	0
Belmonda	51	1.091	22.74	0	0
El Mundo	52	1.08	20.3	0	0
Kingsman	52	1.081	20.6	0	0
Labadia	43	1.098	24.14	0	0
Lanorma	56	1.062	16.67	0	0
Mondeo	49	1.094	20.3	0	0
Mondial	57	1.059	15.86	0	0
Moonlight (Crop13)	51	1.091	22.64	0	✓
Panamera	57	1.065	17.3	0	0
Sababa	55	1.072	18.77	0	0
Satin King (Crop34)	56	1.11	26.62	0	0
Sifra	55	1.056	15.24	✓	0
Sound	54	1.091	22.59	0	0
7 Four 7	48	1.055	15.01	0	0
Taisiya	49	1.058	15.66	0	0
Tyson	55	1.064	17.05	0	0
≥ Norm (Aanvaarbaar vir prossering)			< Norm (Onaanvaarbaar vir prossering)		

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

²Soortlike gewig van > 1.075 is aanvaarbaar vir die prosseringsbedryf.

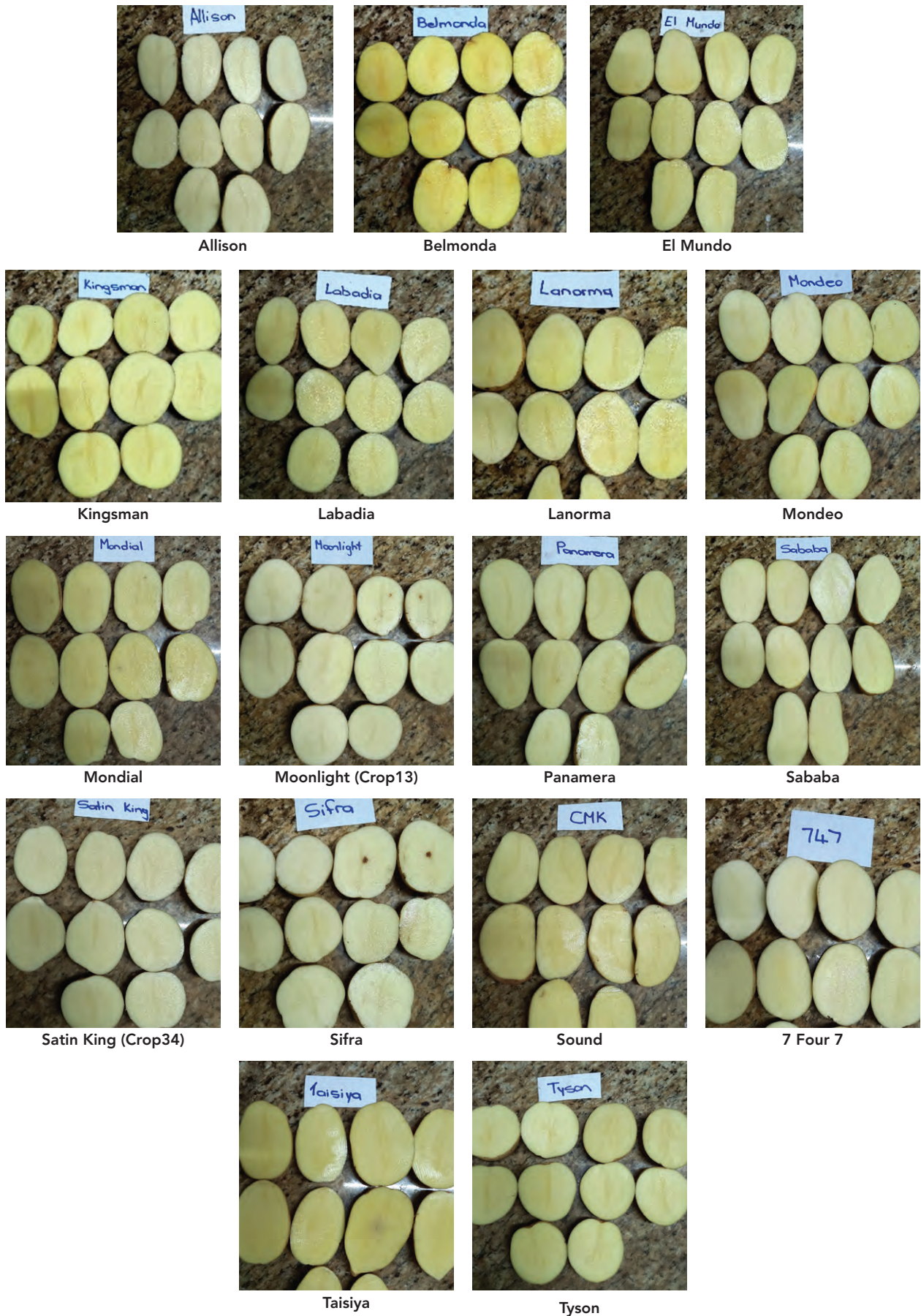
³Die persentasie droëmateriaal is 'n berekende waarde: $DM\% = 24.182 + 211.04 * (SG - 1.0988)$.

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



Temperatuur, dagliglengte en water is die belangrikste abiotiese faktore wat die groeipatroon, opbrengs en gehalte van aartappels beïnvloed.

Tabel 5: Vleeskleur en interne kwaliteit van opbrengs vir 2020 op Dendron.



toegeskrif kan word aan 'n kombinasie van 'n hoë persentasie groot knolle (*Figuur 6*) en 'n hoë persentasie Klas 1 (*Figuur 7*) wat die kultivar gelewer het.

Grootteverspreiding en gradering is dus ook van die faktore wat gebruik word om aartappels te klas en is belangrike faktore om in ag te neem om optimale ekonomiese, bemarkbare opbrengs te verseker. In *Figuur 6* word die grootteverspreiding, *Figuur 7* die gradering van die opbrengs, en in *Tabel 3* die hoofredes vir afkeuring van die onderskeie kultivars aangetoon.

Die LINTUL-POTATO-DSS-plantgroeimodel is gebruik om potensiële opbrengste van die kontrolekultivar, Mondial te bereken. Potensiële opbrengs kan gedefinieer word as die teoretiese boonste opbrengsgrens in 'n geval 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 die proef,

vergelyk met gesimuleerde potensiële opbrengste. Die verskil tussen die potensiële en werklike proef-opbrengs verwys na die opbrengsgaping. Dit illustreer hoe optimaal produsente gebruik maak van hul omgewing en beskikbare hulpbronne om hoë opbrengs te behaal.

Die verhouding tussen werklike opbrengs (56 t/ha) en potensiële opbrengs (67 t/ha) is teen 83.6% bereik, en het dus 'n klein opbrengsgaping, wat daarop dui dat die beskikbare omgewing uiters doeltreffend benut word.

Daar is dus beperkte geleenthede vir verdere toename in opbrengste, gesien in die lig van die klein opbrengsgaping. Aangesien die kultivarproef vir die eerste keer op Dendron uitgevoer is, kan daar nog nie terugvoer gegee word oor die prestasie van die kultivars oor die afgelope drie jaar nie.

Fokus op interne gehalte

Verder is dit ook belangrik om op die interne gehalte van die produk te fokus om optimale ekonomie-

se, bemarkbare opbrengs en dus winsgewendheid te verseker. Dit sluit belangrike faktore in soos die prosesseringseienskappe, soortlike gewig (SG) asook inwendige defekte (holhart, bruinvlek en vaatbun- delverkleuring), wat in *Tabel 4* en *5* opgesom word.

Gedurende die 2020-groei- seisoen het al die kultivars behalwe Labadia, Mondeo, 7 Four 7 en Taisiya aan die skyfiekleurnorm van > 50 vir prosessering voldoen. In terme van die SG, daarteenoor, het die kultivars Belmonda, El Mundo, Kingsman, Labadia, Mondeo, Moonlight (Crop13), Satin King (Crop34) en Sound aan die norm van ≥ 1.075 vir prosessering voldoen.

Wat inwendige defekte betref, het holhart by kultivar Sifra voorgekom (*Tabel 5*). Wat bruinvlek betref, het slegs Moonlight (Crop13) hierdie defek getoon (*Tabel 5*).

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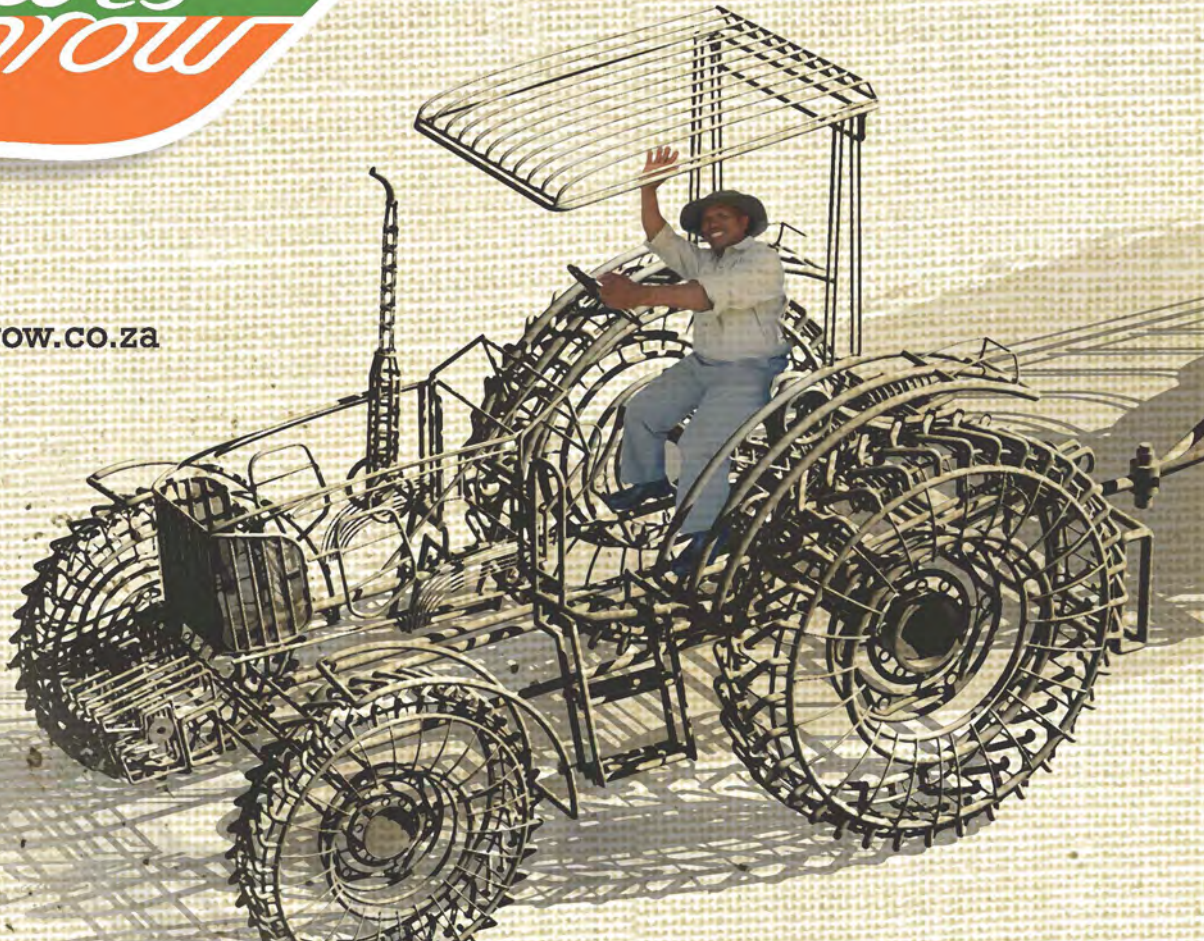
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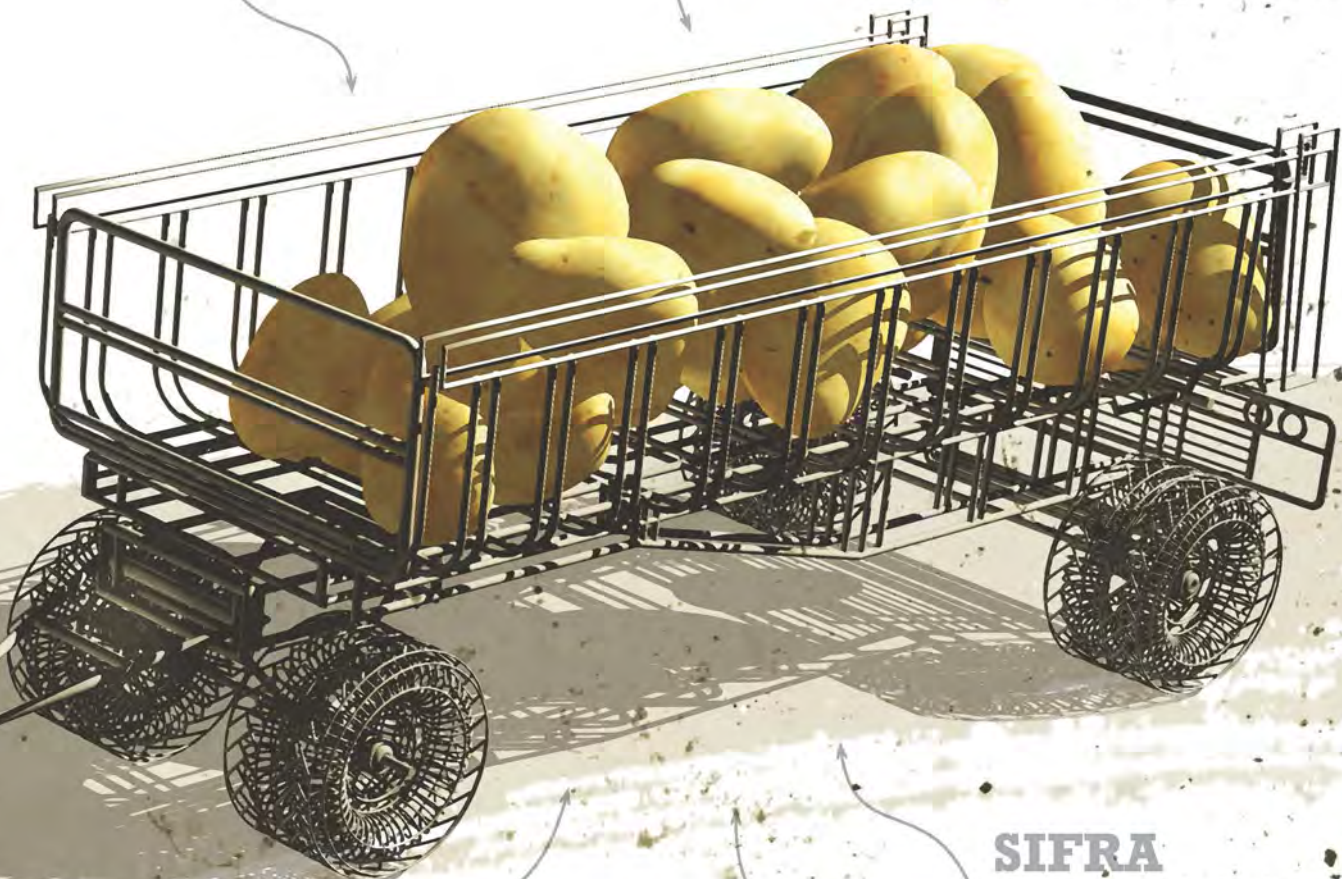
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- * powdery scab resistant
- * very strong foliage
- * blight resistance

TYSON

- * early bulking
- * powdery scab resistance
- * even tuber set, big sizes

ALLISON

- * very high yield
- * strong emergence
- * drought tolerance



PANAMERA

- * high yield
- * bright smooth skin
- * blight resistance

SIFRA

- * bright smooth skin (prepacker)
- * high yield
- * high percentage first grade

MONDIAL

- * we still aim to supply the best quality seed all year round

Wes-Vrystaatse kultivarproef onder droëlandtoestande op Kroonstad in 2020

Deur Enrike Verster en Herman Haak, Aartappels SA, en Fanus van Zyl, Aartappelnetwerk Suid-Afrika

Die Wes-Vrystaat is 'n groot aartappelproduksiestreek waar 40 produsente op ongeveer 7 372 ha sowat 14% van die land se aartappels produseer. Die mees prominente kultivars geproduseer vir kommersiële verbruik (tafel- en verwerkingsaartappels) is Mondial (33%), Sifra (39%) en Lanorma (18%).

Kroonstad val in Suid-Afrika se somerreënvalgebied (Figuur 1) en teken

die afgelope sewe jaar 'n gemiddelde jaarlikse reënval van 499 mm aan.

Die matige klimaat van die streek sluit baie warm somers in (warmste in Desember/Januarie), tot koue winters met ryp wat vanaf Aprilmaand kan voorkom. Die kultivarproef te Kroonstad is in sandleemgrond uitgevoer en is in 'n ewekansige blokontwerp uitgelê met drie herhalings per kultivar. In Tabel 1 word bykomende tegniese inligting rakende die proef gegee.

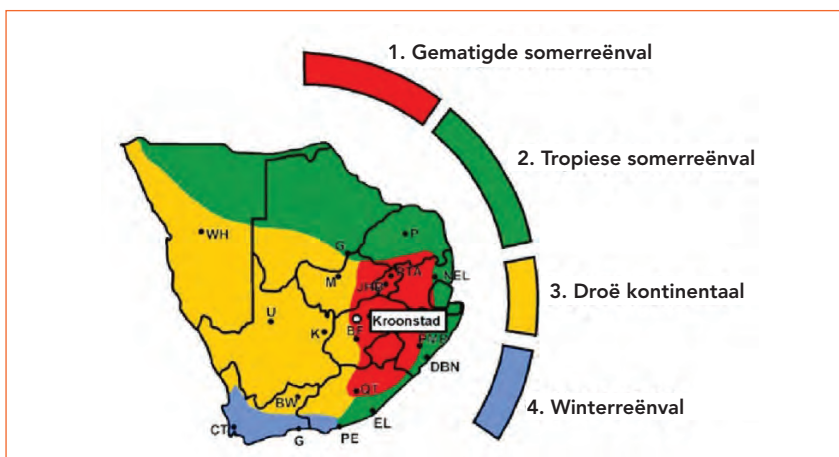
Grondvoeding en groeitydperk

Grondmonsters is vóór plant geneem om die grondvoedingstatus van die proefperseel te bepaal (Tabel 2). Ingesluit in die kultivarproef is kultivars met kort en lang groeitydperke; derhalwe kan groeitydperke die uiteindelijke opbrengs van sekere kultivars beïnvloed. Die lengte van groeitydperke is onderhewig aan die aard van die seisoen, maar word gesien as die hoeveelheid tyd wat verloop vanaf opkoms tot natuurlike loofafsterwe.

Tabel 3 sit uiteen hoe groeitydperke van kultivar tot kultivar verskil. Omgewingsfaktore en bestuurspraktyke beïnvloed ook die verskillende groeifases en wanneer dit aanvang neem. Die ideale praktyk sou wees om kultivars te oes wanneer hulle oesgereed is, maar dit is nie prakties wanneer die proef op 'n kommersiële plaas gedoen word nie.

Stand en aantal halms per moer beïnvloed knolgrootte en opbrengs. Die aantal ogies per knol is kultivarafhanklik en bepaal die hoeveelheid spruite wat per knol voortgebring word. Plantgereedheid van moere is belangrik in hierdie verband, aan-

Figuur 1: Ligging van Kroonstad in die Wes-Vrystaatse produksiegebied.



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

Plaas	Grootkuil			
Boer	Kobus Crous			
Plantdatum	7 Januarie 2020			
Oesdatum	28 Augustus 2020			
Besproeiing/droëland	Droëland			
Dubbel- of enkelrye	Enkelrye			
Loofafsterwe	Natuurlik			
Tussenry-spasiëring	1.8 m			
Proefperseel	18 m ²			
Plantestand	16 000 plante/ha			
Bemestingsprogram				
Tyd van toediening	Voedingswaarde			
	N (kg/ha)	P (kg/ha)	K (kg/ha)	Ca (kg/ha)
Voor plant	93	28	40	12
Met plant en topbemesting	67	17	25	55
Aantal	160	46	65	67

Tabel 2: Grondvoedingstatus van die proefperseel vóór plant.

Bruto digtheid (kg/m ³)	pH (KCl)	P-Bray					% van KUK ¹			
		P	K	Ca	Mg	Na	K	Ca	Mg	Na
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	%
1 240	4.1	22	112	522	117	10	7.23	65.93	24.32	1.22
Klei % = 14		Slik % = 3					Sand % = 83			

¹KUK = Kation-uitruilkapasiteit.

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

Kultivar	Groeiperiode (dae) ¹	Plantgereedheid ²	Stand (%)	Halms per plant	Halms per ha	
7 Four 7	Kort	(80)	3	76	5	60 800
Mondial*	Medium tot lank	(95-110)	3	88	4	56 320
Lanorma*	Kort	(80-90)	3	80	5.5	70 400
Allison	Medium tot lank	(120)	1	60	4.5	43 200
Alverstone Russet	Medium tot lank	100	1	96	5	76 800
Belmonda	Medium	(100-110)	3	72	5.5	63 360
Lanorma	Kort	(80-90)	3	76	5.5	66 880
Mondial	Medium tot lank	(95-110)	1	84	4.5	60 480
Morgana	Medium	(110)	1	76	6	72 960
Panamera	Medium	(90-110)	1	48	3.5	26 880
Sababa	Medium	(110)	1	68	4.5	48 960
Sifra	Kort tot medium	(90-100)	1	56	7	62 720
Taisiya	Kort tot medium	(100)	2	12	5.5	10 560
Tyson	Kort tot medium	(90-100)	1	84	3	40 320
Up to Date	Medium tot lank	(90-120)	3	68	4	43 520

¹Algemene riglyne en kategorieë (dae vanaf opkoms tot natuurlike loofafsterwe, afhangend van die seisoen): Kort: 70 tot 90 dae, kort tot medium: 80 tot 100 dae, medium: 90 tot 110 dae, medium tot lank: 90 tot 120, lank: 90 tot 140 dae.

²Plantgereedheid van moere: 1 = vars, 2 = effens vars, 3 = plantgereed, 4 = effens oud, 5 = oud.

Kommersiële kultivars in proef ingeskryf. Mondial: kommersiële Mondial; Lanorma*: kommersiële Lanorma.

gesien die ideale plantgereedheid gewoonlik veroorsaak dat moere beter spruit en meer stamme per spruit voortbring.

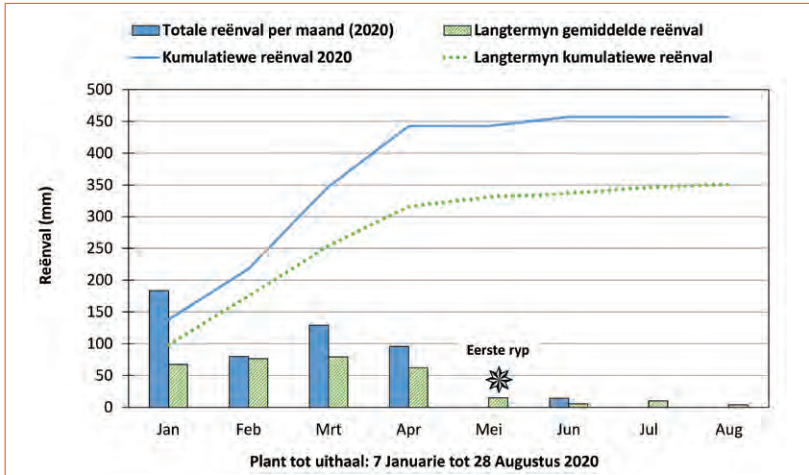
In hierdie proef is die belangrikheid van die fisiologiese ouderdom van moere goed geïllustreer. In die tyd wat verloop het tot die plantdatum van die proef, het redelike onsekerheid geheers weens die reën. Op kort kennisgewing is toe besluit om op 7 Januarie te plant. Derhalwe is moere van die meeste kultivars in die proef laat uit koelkamers gehaal.

Onttrekking van kultivars

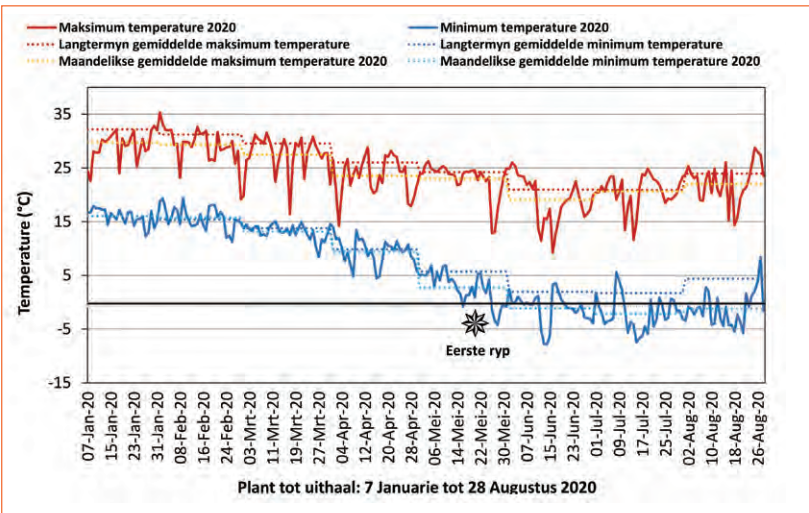
Twee kultivars is uit die proef onttrek en die betrokke boerdery het twee ander kultivars van kommersiële saad wat lank reeds uit die koelkamers gehaal was, in die plek van dié wat onttrek is, laat plant (Mondial en Lanorma). Die Mondial en Lanorma vanaf die proefsaad is noodgedwonge eers kort voor die plant van die proef uit die koelkamers gehaal.

Wanneer die opbrengs vergelyk word, is die verskil duidelik waarneembaar. Let wel dat proefkultivars in hierdie proef (met die uitsondering van kommersiële Mondial

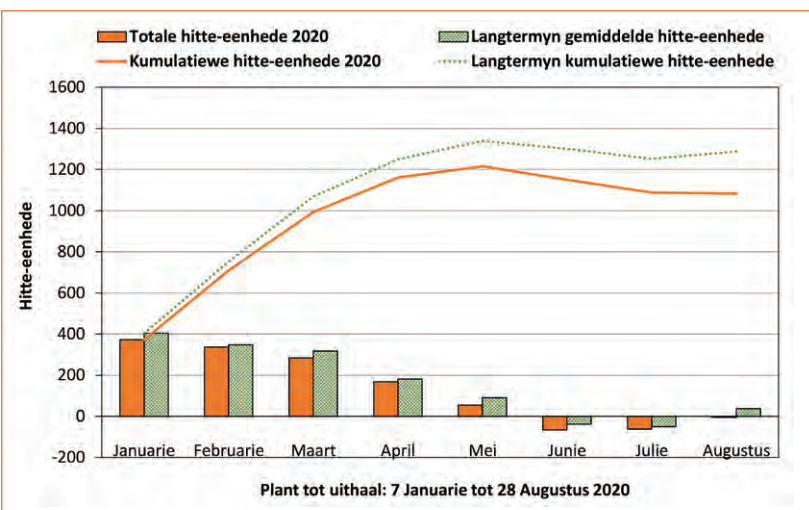
Figuur 2: Reënval vir die 2020-seisoen, asook die langtermyn gemiddelde reënval.



Figuur 3: Minimum en maksimum temperature vir die 2020-seisoen, sowel as langtermyn temperature.



Figuur 4: Hitte-eenhede van die 2020-seisoen, asook die langtermyn gemiddelde hitte-eenhede.



*Totale hitte-eenhede spesifiek bepaal vir aartappels as gewas (drumpeltemperatuur = 5°C). Bereken vanaf uurlikse data.

en Lanorma wat fisiologies meer gereed was) in die algemeen laat uit die koelkamers gehaal was weens kort kennisgewing oor die plantdatum vroeg in Januarie.

Plantgereedheid en plantestand word in *Tabel 3* aangeteken. Die plantestand van die proef was dus laer as wat normaalweg aange-teken word, juis as gevolg van vars moere.

Die evaluering van nuwe kultivars soos met die Kroonstad-kultivarproef, verskaf resultate rakende onder meer opbrengs en bemarkingsindeks. Die bemarkingsindeks van die betrokke kultivars word bereken deur elke kultivar te klas en sorteer volgens gehalte en groottegroepe, byvoorbeeld Klas 1 Groot of Klas 2 Groot tot Medium.

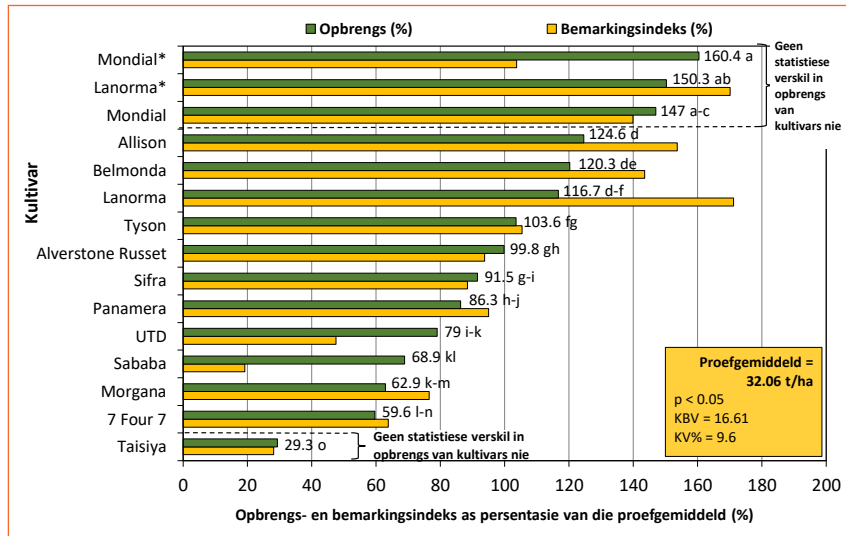
In hierdie proef word een herhaling geklas en sorteer. Dienooreenkomstige prysvergelings word dan gemaak met markpryse soos verkry ten tyde van oes. Die prestasie van nuwe kultivars kan nie net op die resultate van een bepaalde seisoen geskoei word nie, omdat klimaat van een jaar na 'n volgende kan wissel. Juis daarom word die kultivars verkieslik oor 'n aantal seisoene getoets.

Soos met enige gewas is temperatuur, beskikbaarheid van water (hetsy goeie besproeiingskudering of reënval), sowel as hitte-eenhede belangrike faktore wat 'n wesenlike invloed gedurende die aartappelplant se groeitydperk uitoefen. Hierdie faktore word dus in aanmerking geneem wanneer die prestasie van kultivars geëvalueer word.

Impak van reënval en temperatuur

Toepaslike daaglikse en langtermynweerde data word verkry vanaf 'n gekose Landbounavorsingsraad (LNR)-weerstasie wat so na as moontlik aan die proefperseel geleë is. Die reënvaltendens vir die 2020-seisoen toon 'n aansienlike hoër reënval (vergeleke met die normale langtermyn gemiddeld). Januarie het buitengewoon hoër reënval ervaar, so ook Maart en April (*Figuur 2*). Na April het die

Figuur 5: Algehele opbrengs- en bemerkingsindeks per kultivar as persentasie van die proefgemiddeld.



Mondial* en Lanorma*: Kommersiële moere (meer plantgereed) ingeskryf in proef. Waardes gevolg deur dieselfde letter verskil nie beduidend van mekaar nie.

seisoen se reënval drasties afgeplat en ondergemiddelde reënval is in die wintertydperk ervaar.

Minimum en maksimum temperatuur word in *Figuur 3* uiteengesit. Vanaf begin Mei tot einde Augustus is dae met temperatuur onder vriespunt deur die winter aangeteken. Matige maksimum temperatuur is deur die seisoen ervaar, met bykans geen dae bo 35°C aangeteken nie. 'n Heelwat kouer winter as

die langtermyntendens is in 2020 ervaar.

Die versameling van hitte-eenhede gedurende 'n groeitydperk is 'n belangrike faktor in die ontwikkeling van 'n plant. Die tendens van hitte-eenhede beskikbaar vir die kultivarproef van hierdie betrokke seisoen te Kroonstad, blyk aansienlik laer te wees as die tendens rakende langtermyndata van hitte-eenhede. Verlaag vanaf Mei

en gedurende die wintermaande, is dae van ondergemiddelde maksimum temperatuur aangeteken (*Figuur 4*).

Opbrengsdata en afgradering

Opbrengsdata versamel tydens oesdag, word aan statistiese verwerking onderwerp 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 laag (9.6%).

“Soos die aard van seisoene is, fluktuëer die prestasie van kultivars van seisoen tot seisoen.

Hierdie faktore dui daarop dat die proef baie goed uitgevoer is en die resultate betroubaar is. Die opbrengs van elk van die kultivars word deur die proefgemiddeld gedeel (die proefgemiddeld van al

Tabel 4: Hoofredes vir afgradering.

Kultivar	Aalwurm	Stingelend-verrotting	Spleetskurf	Misvorming	Bruinskurf	Insekskade (mot)
7 Four 7						X
Mondial*	X		X	X		X
Lanorma*	X					X
Allison					X	X
Alverstone Russet	X				X	X
Belmonda						X
Lanorma						X
Mondial	X		X			X
Morgana	X					X
Panamera				X		X
Sababa	X	X				X
Sifra					X	X
Taisiya				X		X
Tyson				X		X
Up to Date					X	X



In hierdie proef word een herhaling geklas en sorteer. Dienooreenkomstige prysvergelykings word dan gemaak met markpryse soos verkry ten tyde van oes.

Tabel 5: Prosesseringseienskappe van kultivars (uitgevoer deur LNR-Roodeplaat).

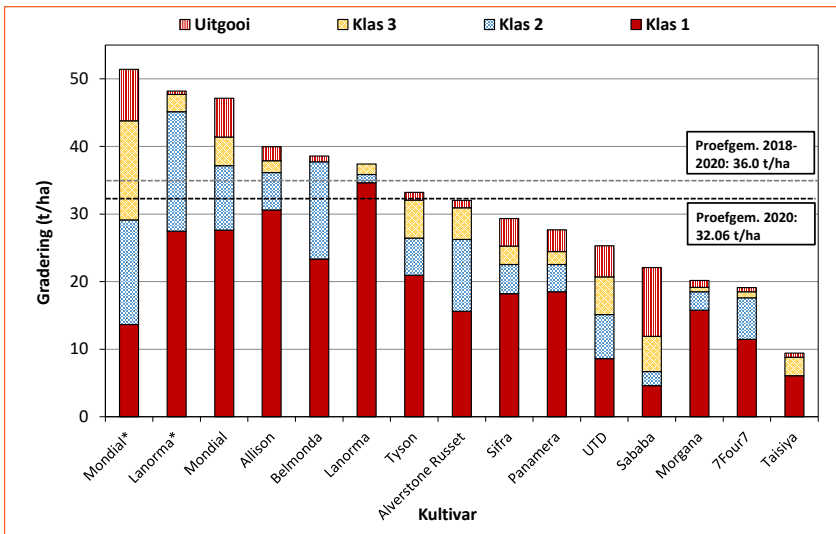
Kultivar	Skyfiekleur ¹	DM ²	SG ³
7 Four 7	55	16.42	1.0620
Mondial*	58	16.67	1.0632
Lanorma*	65	17.47	1.0670
Allison	61	17.77	1.0684
Alverstone Russet	68	21.4	1.0856
Belmonda	50	18.95	1.0740
Lanorma	65	16.65	1.0631
Mondial	59	16.23	1.0611
Morgana	57	16.94	1.0645
Panamera	59	18.19	1.0704
Sababa	46	15.32	1.0568
Sifra	45	17.77	1.0684
Taisiya	51	15.38	1.0571
Tyson	64	17.39	1.0666
Up to Date	58	19.6	1.0771

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

² Die persentasie droëmateriaal is 'n berekende waarde: $DM\% = 24.182 + 211.04 * (SG - 1.0988)$. Die werklike persentasiewaarde sal effens verskil tussen variëteite uit hierdie berekeningswaarde.

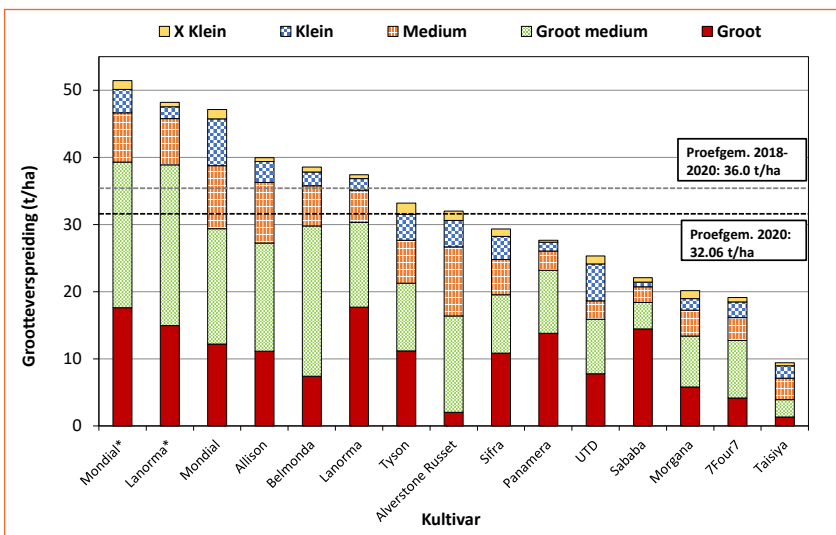
³Soortlike gewig van ≥ 1.075 is aanvaarbaar vir die prosesseringsbedryf.

Figuur 6: Gradering van elke betrokke kultivar.



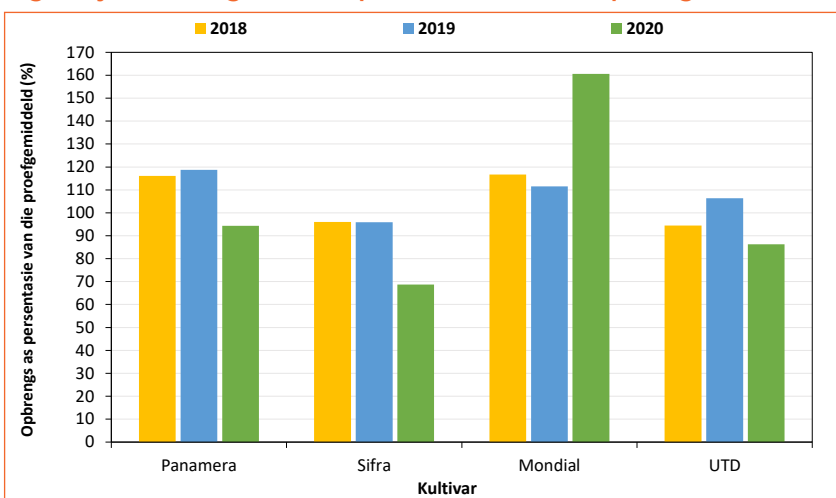
Mondial* en Lanorma*: Kommersiële moere (meer plantgereed) ingeskryf in proef.

Figuur 7: Groottegroepverspreiding van elke betrokke kultivar.



Mondial* en Lanorma*: Kommersiële moere (meer plantgereed) ingeskryf in proef.

Figuur 8: Prestasie van kultivars wat vir drie jaar in die proef ingeskryf was (uitgedruk as persentasie van die proefgemiddeld).



die kultivars word as 100% geneem). Hierdeur word 'n opbrengsindeks bepaal 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 2020-seisoen was 32.06 t/ha. Die addisionele kommersiële kultivars, Mondial* en Lanorma*, tesame met die Mondial van die proefsaad, het die hoogste opbrengs gelewer (Figuur 5).

Lanorma (beide proef en kommersiële) en Allison het die hoogste bemerkingsindekse behaal, wat aan 'n goeie opbrengs van groot sowel as Klas 1-knolle toegeskryf kan word. Groottegroepverspreiding en gradering is die evaluasies wat uitgevoer word om die kultivars se bemerkbaarheid te bepaal (Figure 6 en 7).

Hoofredes vir afgradering was motskade, bruinskurf en aalwurm (Tabel 4). Ongelukkig was daar 'n merkbare kol binne die proefperseel waar aalwurmskade onmiskenbaar was. 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.

Panamera en Up-to-Date toon tans die minste variasie vir die Kroonstad-proef van 2018 tot 2020 (Figuur 8).

Laastens, wanneer daar gekyk word na die interne gehalte van aartappels, kan prosesserings-eienskappe ook geëvalueer word. Om aan prosesseringsvereistes te voldoen, moet kultivars aan 'n skyfiekleurnorm van > 50 en 'n soortlike gewig (SG) van ≥ 1.075 voldoen (Tabel 5). Alverstone Russet en Up to Date het aan beide die SG- en skyfiekleurvereistes voldoen. Byna alle kultivars het aan die korrekte skyfiekleurvereiste voldoen.

Vir meer inligting, kontak Enrike Verster by enrike@potatoes.co.za of Herman Haak by herman@potatoes.co.za.

Aartappelmotbeheer in aartappels

Deur Theunis du Plooy, Villa Crop Protection

In vandag se tyd waar produsente konstant onder 'n kosteknypang deurloop en ook geen of baie min beheer het oor die pryse van die produkte wat hulle bemark, moet allerhande uitdagings deurlopend bestuur word om kostedoeltreffend te produseer.

Een van die mees algemene uitdagings by aartappelproduksie is die aartappelmot (*Phthorimaea operculella*) wat regdeur die aartappelgroeienseisoen 'n probleem kan wees. Die aartappelmot is goed aanpasbaar in verskillende omgewingstoestande en, met 'n relatiewe kort groeisyklus, is die grootste probleem nie die insek opsigself nie, maar die baie hoë infestasielakke wat moeilik onder beheer gebring word.

Beheer van aartappelmot

Die meeste aartappelgroeienseisoene wissel tussen tien en 14 weke, en produsente spuit met tussenposes wat kan wissel tussen sewe-, tien- en 14-dagintervalle. Waar sewe-dagintervalle gebruik word, kan die produsent weggom met produkte wat 'n effe korter nawerking het, maar kan baie vinnig hul vingers verbrand wanneer 'n opvolgbespuiting nie gedoen kan word nie weens reën en ander klimaatstoestande of selfs spuittoerusting wat onklaar kan raak.

Om bogenoemde risiko's te bestuur, is dit raadsaam om 'n baie deeglike en noukeurige aartappelmot-beheerprogram bymekaar te sit om sodoende al die uitdagings aan te spreek. Let egter mooi daarop om nie die voordelige insekte wat tydens die groeienseisoen in die lande voorkom, ook te benadeel wanneer aartappelmotbeheer toegepas word nie.

Vroeg in die seisoen is infestaties gewoonlik laag en met aartappelplante wat nog nie uitgegroeï is nie, is daar ook relatief min afskerming van die blaredak. 'n Mens kan in hierdie tyd makliker weggom met bloot 'n kontakproduk soos lambda-sihalotrien in die piretroïede chemiese groep.

Effens later, wanneer blomme begin vorm en die blaredak al redelik welig is, sal 'n sistemiese produk soos metamidofos met 'n langer nawerking, altyd voordelig wees vir daardie paar motte wat goed wegkruip in die loof.

Meer aggressiewe produkte

In die laaste helfte van die seisoen word daar gewoonlik meer aggressiewe produkte of kombinasies van produkte met meer as een metode van werking gebruik. Dit is omrede die aartappels al knolle gemaak het en die grootste risiko op opbrengs en gehalteeverslies nou bestaan. 'n Voorbeeld hiervan is indoksakarb in die oksidiasien chemiese groep, wat beide 'n maag- en 'n kontakaksie het. Indoksakarb het ook 'n redelike lang residuele nawerking vir die opvolgende paar weke.

Aan die einde van die groeienseisoen kan produkte met eierdodende eienskappe in die program ingebring word om sodoende die motte wat wel oorleef het, se eiers wat in grondkrake gelê word, te steriliseer om verdere infestasielakke te slaan. Die produk wat ons hier aanbeveel is lufenuron van die bensamied chemiese groep. Lufenuron het ook beide 'n maag- en kontakaksie in



Foto verkry van <https://idtools.org/>

die aartappelmot self tesame met 'n eierdodende effek wat dan die eiers steriliseer.

Gesels met 'n kenner

Gaan deeglik te werk en beplan die programme saam met jou gewasbeskermingsadviseur. Maak seker dat alle risiko's in ag geneem word tydens besluitneming.

Ten slotte, maak ook seker dat die chemie wat toegedien word, geregistreer is vir die gewas en teen die betrokke probleem wat jy wil aanspreek. Maak seker dat voldoende dosisse aangewend word en gebruik altyd korrekte, aanbevole byvoegmiddels wat geregistreer is om hierdie toedienings suksesvol te kan doen.

Vir meer inligting, skandeer die QR-kode vir Villa se volledige aartappelprogram.



WHAT ON EARTH?

Part 2: Cauliflower-like symptoms of powdery scab

By Dr Fienie Niederwieser, Potatoes South Africa

Most potato producers are familiar with the common powdery scab symptoms on tubers, as shown in photograph 1, whereas the symptoms that can be seen in photographs 2 and 3 are not commonly observed.

When asked for an expert opinion, Dr Richard Falloon, a pathologist in New Zealand, gave the following explanation: "Light-coloured gall-like symptoms progressing to dark brown powdery scab – these symptoms

have been previously referred to as cauliflower-like symptoms, which describes how the individual galls appear when magnified using a low-power microscope.


"These galls result from the proliferation of host cells, which is induced by *Spongospora*. This occurs on stolons and tubers, but also on roots. The creamy-white galls later develop into brown masses of *Spongospora sporosori*, with each of the proliferated host cells being filled with a single *sporosorus*, which in itself contains many resting spores (50 to 1 500+).



The common powdery scab symptoms.



Light-coloured gall-like symptoms progressing to dark brown powdery scab (cauliflower-like symptoms). (Photographs: J van Zyl)

"It has been suggested that the cauliflower-like symptoms develop on stolons and tubers when soil conditions are wet. The symptoms have also been noted on tubers developing when infected plants are growing hydroponically (in a nutrient solution), a system that has been used experimentally. This, however, is not always the case." 

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Sustainable farming: Mechanisation skills transferred to Limpopo emerging farmers

By Masabatha Motsoaneng

Potatoes South Africa's (PSA) Enterprise Development Programme (EDP) focusses primarily on supporting black emerging potato farmers to establish viable commercial farming operations. It provides farm-based training and development as a support mechanism to these new farmers, which translates into a cost benefit and worthwhile return on investment for the producer and his/her farming operation.

PSA partners with McCain Foods

PSA's transformation division partnered with McCain Foods to offer a two-day theoretical and practical training course to enterprise development farmers in Limpopo. This took place during March this year at McCain Foods' demo farm and workshop.

The transformation division is committed to helping farmers apply the skills and knowledge acquired

through training programmes, which are provided in a sustainable manner to adhere to its mandate of developing emerging commercial potato producers.

Mechanisation and soil management

The training was based largely on the basic principles of potato production, including mechanisation as a key component to increase production and food security. For this reason, developing countries are showing a growing interest in mechanisation.

While most emerging potato farmers do not have modern or large-scale machinery, the basics of soil management in potato farming still apply. The training therefore covered this important aspect as well.

Topics discussed included the following:

- Selecting suitable implements for soil preparation.
- Planting seed at the correct depth and spacing.
- Inter-row cultivation practices.
- Crop rotation methods.

During the training, the farmers also relayed the challenges they face with soil preparation, planting, and harvesting. Solutions and ideas were formulated, which will be implemented during the coming May/June 2021 planting season. The producers also visited the McCain Foods workshop, where they were exposed to various types of machinery used for the production of potatoes.

Crop rotation

The last stop was the demo farm, where different types of

crop rotation were presented to producers. Crops shown included soya bean to suppress the infestation of nematodes, and alfalfa to feed livestock, cover the soil and suppress high infestation of weeds.

“The transformation division is committed to helping farmers apply the skills and knowledge acquired through training programmes, which are provided in a sustainable manner to adhere to its mandate of developing emerging commercial potato producers.”

Low yields, high weed pressure, soil erosion, nematode infestation and diseases occur when proper crop rotation systems are not implemented. PSA and the EDP mentors encouraged the emerging potato producers to practice crop rotation and act timeously, so that the soil will remain in good condition.

No-tilling farming

Farmers observed the system of no-tilling, which has proven to be one of the more profitable production methods in potato farming. It can be applied after harvesting and grass or cereals can be planted without using soil preparation implements.



A facilitator from McCain Foods (left) with Johnny Maponya, and Aubrey and Petrus Ratjomane.



The enterprise development farmers attending a demonstration by a facilitator from McCain Foods

improved machinery demonstrated during the course. They were fascinated by the different types of crops that can be planted for crop rotation to improve the physical and chemical status of soil, such as soya bean (legumes), maize (grass), wheat (cereal), and cover crops such as clover and hay, which are known for adding organic material.

Malakia Motibane, one of the farmers who attended the training, encouraged emerging farmers to not underestimate the programmes provided by organisations such as PSA, saying the programmes can be used as a tool to build a sustainable farming operation. 🌱

Advantages of the no-tilling method include:

- Not disturbing the soil structure.
- Organic material added to the soil.
- Conserving oil moisture.

Reaping the rewards of training

Through the training course, producers were able to acquire new skills to manage soil for long-term use. Some of the farmers are in the process of acquiring

For more information on PSA's transformation projects, email Nomvula Xaba at email nomvula@potatoes.co.za or visit www.potatoes.co.za.

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Hats off to the Qumbu small farmer development project

By Louis Pretorius

During May 2020 Potatoes SA (PSA) met with officials of the Department of Agriculture in Mthatha, to determine the details of seasonal projects relating to small-farmer development in the OR Tambo region. Nine projects were identified, including the Mhletywa project near Qumbu.

The small town of Qumbu is situated 40 km from Mthatha on the N2 highway heading towards East London. Planting was done at the Mjikweni village co-operative situated at Balasi, which falls under the jurisdiction of the Mhlonlolo local municipality.

A female hand

This co-operative's main objective is to fight poverty and enhance food security in the local community. The co-op is mostly female-led by women who are passionate about cultivating vegetables. This well-organised farming community forms part of the Qumbu Potato Farmers' Organisation. The region is very poor with very few job opportunities, a situation that was of course compounded by the Covid-19 pandemic.

Given its circumstances, the community embraced the opportunity to participate in Potatoes South Africa's (PSA) small farmer development project, showing real determination to uplift the community in terms of food security during difficult times.

The project was planted on 26 October 2020, during which the small farmers in the community were able to witness the soil



Planting for the Qumbu project was done at the Mjikweni village co-operative situated at Balasi.



Farmers taking notes during the information day in March this year, to discuss the yield and production process.

preparation, fertilisation using soil sample results, and the planting process. Everyone worked diligently on the land that day and the entire 0.2 hectare project was fully planted by 11:00.

The Department of Agriculture's regional extension officer, Benedict Mhletywa, played a pivotal role in the success of this project by assisting the farmers in following the spraying programme provided by PSA, to control pests and blight. PSA monitored the progress of the

project and provided advice during the production season.

A joyful harvest

The potatoes were harvested on 10 March 2021. An information day was held at the site to discuss the project and to evaluate the yield and quality of the potatoes. The cultivar planted was Valor. Just before the information day, the yield on the land was determined at 31.3 tons per hectare under dryland production. The quality was



The cultivar planted was Valor and a high-quality yield of 31.3 tons per hectare under dryland production was realised.

also examined and found to be excellent.

Department officials as well as local small farmers attended the proceedings. The production process was discussed in detail, especially regarding the spraying process to control blight and pests. Farmers diligently recorded notes during the meeting for future reference.



Farmers listening attentively as Ms Zangqa discussed potato cooking processes, nutrition and value addition.

The issue of food security was also addressed by department officials, along with the important role these projects play in local communities. One of the highlights of the meeting was a talk on value addition with potatoes by Ms Zangqa. Her talk also addressed the nutritional value of and cooking methods used for potatoes.

Those present had many questions that were answered

during the proceedings, after which a very fitting lunch mainly focussing on potatoes, was served and enjoyed by all. 🍴

For more information on this and other PSA small-farmer projects, contact Louis Pretorius at email louis@potatoes.co.za.



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Potatoes South Africa's bursary recipient achievements: Talana Cronjé

By Rotondwa Rathogwa

Talana Cronjé was born and bred in Port Elizabeth (now Gqeberha). At school she excelled in her studies, particularly Biology and Mathematics, and was also actively involved in activities such as netball and leadership. She was the editor of the school magazine and was also a leader in the Christian society.

In 2012 Talana moved to Bloemfontein to pursue her studies in B.Sc. Agriculture (Agronomy and Animal Science) at the University of the Free State. After completing her degree, she decided to move back to Port Elizabeth to be closer to her family, as she was already



Talana at her undergraduate degree graduation in 2016.

married at the time. Another reason that made her to move back to her hometown, was to be closer to the sea – she loves going to the beach and enjoying the outdoors with her son. She is an active member of Christian Revival Church where she leads the children's church ministry.

The PSA bursary programme

Talana joined Potatoes South Africa's (PSA) bursary programme in 2014, while completing the third year of her undergraduate degree. She received funding for different degrees over a period of five years. She first learned about PSA's bursary opportunities on the internet. With PSA's assistance she managed to bag herself three degrees, a B.Sc. Agriculture degree in Agronomy and Animal Science, a B.Sc. honours degree in Agronomy and an M.Sc. Agriculture in Agronomy.

The topic of her masters' study was *Metham sodium for the control of volunteer potatoes in South Africa*. Talana indicated that further research is still required in different regions, as climate and soil properties differ.

Building a career

While on the bursary programme, Talana's life was impacted in different ways as far as her career was concerned. Above all, she was given the opportunity to complete her degrees and enter the industry as a specialist. Through the induction programme and symposiums she attended, she was able to learn more about the industry and broaden her knowledge in this regard. She



Talana Cronjé.

also got the opportunity to liaise with industry stakeholders, other researchers, and students.

She describes her experience while funded as being out of this world. She especially appreciated the staff she worked with at PSA, saying they were very friendly, always helpful and made the application process and administration very easy. "I would like to encourage other students who need assistance to apply to PSA for a bursary, as the organisation not only gives financial assistance, but affords you exposure to the industry and presents you with opportunities to connect with other industry stakeholders."

Why agriculture?

In response as to how her interest in agriculture came about, Talana explains that the industry encompasses her love of both nature and people. "Agriculture offers me the best of both worlds. It affords me the opportunity

to work outside in nature, while applying scientific principles, and to work with people. It allows me to empower people through job creation as well as food production.” She believes that because agriculture supplies us with food, forms the basis of every society.

During her postgraduate studies, she was able to study and work at the same time. From March 2016 to June 2017, she worked for the Department of Agriculture, Forestry and Fisheries’ inspection services as a technician. Her main responsibilities were to enforce phytosanitary regulations for the export of fresh products. In June 2019, she was appointed to the post of production manager on a farm near Port Elizabeth, where she is currently still working.

This farm focusses on the production of cucumbers and brinjals in a hydroponic system.

Hydroponic systems are a method of growing plants, usually crops, without soil, using mineral nutrient solutions in an aqueous solvent. On the external fields they produce various fresh herbs. They supply to major retailers such as Pick n Pay, Freshmark, Spar and many more.

Talana’s perfect day

When asked what her perfect day at work looks like, she replies: “When I see the smiles of the workers after I complimented them on the good work that they have done, and when we pick a record yield!” It is evident that she loves working with people and it gives her joy when people are passionate about learning, asking questions, acquiring new skills and succeeding.

Although she is employed, her dream is to start her own farm where she will be able to employ and uplift people by teaching

them new skills and where she can contribute to the country’s food production. She will also continue conducting research to find new and innovative ways to increase yields and farm sustainability.

Talana encourages young people who are interested in agriculture to simply go for it, get their degree and start their farming enterprises. They must embrace what they would like to be and use all the opportunities presented to them. “The road is not always easy. It takes hard work, but there is never a dull moment, and there is something new to learn every day. The results are worth it! Luke 16:12 in the Bible reads: Be faithful in what is another man’s, then God can trust you with your own.”

PSA would like to wish Talana all the best on her journey in the Agriculture industry! 🍀

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Deserving bursary recipients get a glimpse at the potato industry

By Nomvula Xaba

Every year, the Potato Industry Development Trust (PIDT) awards bursaries to academically deserving undergraduate and postgraduate students from various tertiary institutions throughout South Africa. These students, who are engaged in agricultural studies, are invited to a bursary induction programme. The 2020 academic year came with unprecedented challenges as Covid-19 restrictions and regulations prevented the induction from taking place.

This unfortunate matter was rectified this year as Potatoes SA (PSA) decided to host two groups of students on different dates for the induction. Twenty students in two groups of ten attended this year's induction programme. The 2020 intake group attended their induction on 29 March 2021, while the 2021 intake group attended on 12 April 2021.

First stop: Joburg market

This year's programme started with an early morning visit to the Joburg Fresh Produce Market, where the students were welcomed by Lesego Pooe, the potato hall manager, who shared some exciting information on how the market operates. After a short, intense presentation, Pooe gave the group an informative tour of the market, detailing the roles of the producers, market agents and retailers, and how these function in relation to one another.



The 2020 intake group with PSA's chief executive officer, Willie Jacobs, seated in the middle.



This year's programme commenced with a visit to the Joburg Fresh Produce Market, where the students were welcomed by Lesego Pooe, the potato hall manager.

After concluding the market tour, the group was whisked off to the Potato House where they were treated to a well-deserved breakfast. PSA's chief executive officer, Willie Jacobs, welcomed the students and congratulated them on their bursaries.

Jacobs then gave a clear overview of the potato industry, explaining the different divisions and their roles. This was followed by a string of presentations from all the core business managers, ensuring the students had a clear understanding of the different roles and services within PSA. Potato Certification Service, which always supports this good cause, also had an opportunity to present its role and responsibilities.

"As a plant pathology and genetics student, I thoroughly enjoyed the outings to Plantovita and the ARC's gene bank. I also gained valuable insight into the potato industry and the opportunities it offers, especially in the field of plant pathology ... I can confidently say I now have a greater appreciation for the work and research taking place in the potato industry."

– Anika Keuck, fourth year BSc Plant Pathology, University of Stellenbosch.

"The visits to the Joburg market, Plantovita and the ARC reignited the love and passion for the career I have chosen. It was a pleasure to have the executives from the Potato House address us as well. I learned a lot from the expertise and information they shared with us." – Londeka Mbatha, MSc Plant Pathology: University of KwaZulu-Natal.

Getting to know the top brass

The second group of students were welcomed by Bernice Manana, PSA's chief operating officer, who gave an overview of the potato industry on behalf of Jacobs. They had the pleasure of meeting the bursary committee chairperson, Dr Ben Pieterse, who shared some words of wisdom. The next visit was to Plantovita where the technical

manager, Anel Espach, gave a brief tour of the laboratory and discussed seed testing and disease control.

The 2021 bursary induction ended on a high note with a tour to the Agricultural Research Council's (ARC) gene bank at Roodeplaat. The students were warmly welcomed by the gene bank manager, Zanele Noqobo, and learned about how the gene bank contributes to the entire potato industry, and why it is important to produce disease- and virus-free potato seed that meets market and consumer standards.

The students undoubtedly found this experience informative and it gave them an opportunity to think carefully about a career in the



The 2021 intake group, with bursary committee chairperson, Dr Ben Pieterse, seated in the middle.

potato industry. PSA and the PIDT wish the students every success with their studies. 🍀

For more information, contact Nomvula Xaba at nomvula@potatoes.co.za.

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PSA 'personalises' mass media

By Immaculate Zinde and Phindiwe Nkosi
(Photographs by Dzuguda Productions and Phindiwe Nkosi)

Hallie Flanagan certainly said it all: "The power of radio is not that it speaks to millions, but that it speaks intimately and privately to each one of those millions." At the time of writing this article, Potatoes South Africa (PSA) was preparing to roll out its second radio campaign for 2021 on Radio Sonder Grense or RSG (translated as Radio Without Borders) and Metro FM.

One can only hope that Peggy Noonan was right in stating that "TV gives everyone an image, but radio gives birth to a million images in a million brains." While the power of radio cannot be understated when it comes to marketing, it is important to note that these PSA campaigns that we are embarking on, are not based on what we 'hoped' to achieve, but rather on solid research which gives a good indication of what we can achieve.

Powered by research

According to the findings of the *Consumer Usage and Attitude Study, 2019* – a study on potato consumption in South Africa conducted on behalf of PSA – television and radio were among

the top two ways that potato consumers preferred to hear and learn about potatoes. The study revealed that most people watch television or listen to the radio at least once a week or more.

According to the study, while only 16% of respondents had seen, read or heard any advertising relating to potatoes in the past year covered by the study, 75% of consumers thought of potatoes as being versatile after having viewed

the advertisement. Furthermore, an astounding 72% of consumers said that they felt motivated to eat more potatoes after having viewed the advertisement.

Research indicates that radio and television are still among the top mediums used to influence consumers to consume more potatoes. It is against this backdrop that PSA's marketing division decided to engage in a television campaign in December



Some images captured while busy with on-farm shoots for the television commercials.

2020, and two radio campaigns in 2021. Plans are underway for another television campaign and a new social media campaign, especially with the Covid-19 pandemic shifting the scope of global interaction to digital spaces.

To measure is to know

The world as we know it is no more, particularly with regard to the way marketers reach out to consumers. It is imperative to consider the impact of digitisation as brought on by the pandemic. It is also, therefore, crucial to measure and research how we can tug at the heartstrings of consumers and spur them to action. We must know which mediums are most effective and need to be prioritised.

Several changes were implemented following the findings of the afore-mentioned *Consumer Usage and Attitude Study*. However, thorough


research and education are still needed to evaluate consumer reactions. This will allow researchers to compare the first and second round of mass media advertisements for both English and Afrikaans audiences, and come up with specific findings regarding consumer perceptions, attitudes, what worked well, and areas of improvement. This is crucial as, while mass media lives up to its name of reaching the masses, it often comes with a hefty price tag compared to social media initiatives.

Scope of work

A service provider has been appointed to ensure that PSA's radio and television commercials meet their set objectives and perform as intended. PSA is in the process of testing the different commercials through focus groups to gauge and build intelligence. One of the service provider's responsibilities is to identify which

television and radio commercial immediately caught viewers' and listeners' attention. This will enable the marketing division to measure the impact of all above-the-line efforts in a scientific manner.

By testing PSA's recently produced and launched television and radio commercials, we are opening ourselves up for a growth spurt. Slight nuances differentiate one advertisement from the other, but they all have an overarching theme. The researchers will also report on points of interest in the discussions, including but not limited to, body language of viewers and listeners, along with other critical findings relating to the commercials that were not covered by the brief specifications.

The detailed qualitative and quantitative report on key findings will assist PSA in better understanding and more effectively targeting consumers. 

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Loaded family fries

Serves: 4

Ingredients:

- 8 large potatoes, washed.
- Sunflower or vegetable oil, for frying.
- 1 large tomato, chopped.
- 1 small red onion, chopped.
- 1 avocado, chopped.
- Small handful of fresh coriander, washed and chopped.
- ½ cup (125 ml) sour cream.
- A squeeze of lemon juice.
- Salt and pepper, to season.

Method:

1. Heat the oil in a large pot over medium-high heat.
2. While the oil is heating, cut the potatoes into fries and pat dry with absorbent kitchen paper towels.
3. Carefully drop a fry into the oil to test if it is hot enough. If it floats to the top, the oil is just right.
4. Carefully place the fries into the oil. It is best to do this in two batches to not overcrowd the pot.
5. Fry the potatoes for 8 to 10 minutes, or until cooked through and golden. Remove from the oil using a slotted spoon and drain on absorbent paper towels. Repeat with the second batch.
6. Place the fries on a large baking tray. Top with tomato, onion, avocado, coriander, and sour cream.
7. Add a squeeze of lemon juice and season with salt and pepper to taste.



Top potato tip

For those who like things even cheesier, add some grated cheese to the fries beforehand and pop under the grill for 1 to 2 minutes to melt. Then add the additional toppings. Serve warm for melty, cheesy goodness!

Afwesigheid in die werksplek

Deur Christo Bester, LWO Werkgewersorganisasie

Afgesien van nie by die werk wees nie, sluit afwesigheid ook in: Laatkommery (solank as wat die werknemer nie by die werk is nie, is dit afwesigheid); vroegloop; ongemagtigde breuke; verlengde breuke (rook, kleedkamer, ete, ensovoorts); geveinsde siekte; en ander onverklaarde afwesigheid vanaf die werkstasie of perseel.

Die dissiplinêre kode sit die werksplek se reëls met toepaslike sanksies uiteen. Hierdie reëls moet met werknemers bespreek en op skrif gestel word. Slegs dan kan werkgewers bewys dat werknemers bewus is van die reëls asook die gevolge wanneer dit oortree word.

Hantering van afwesigheid

Bespreek die afwesigheid met die oortreder en skryf neer wat gesê word. Die werknemer moet bewys dat die afwesigheid regverdigbaar was. Die werknemer mag (geldige) redes aanvoer vir die afwesigheid, maar selfs dan kan dit steeds onaanvaarbaar wees. Pas die dissiplinêre kode toe.

Die moeilikste vorm van afwesigheid om te hanteer, is wanneer 'n werknemer glad nie opdaag vir werk nie. Die werknemer is verplig om die werkgever in kennis te stel van sy/haar afwesigheid – dit is selde dat daar geen manier is waarop die werknemer die werkgever kan laat weet nie. Daar rus ook 'n verpligting op die werkgever om die werknemer in kennis te stel van sy/haar afwesigheid en dat dit sonder toestemming is.

Let egter daarop dat wanneer die werknemer die werkgever in kennis stel van sy/haar afwesigheid, dit nie die afwesigheid regverdig en toestemming daarvoor gee nie. Die werkgever het drie opsies op grond waarvan die situasie hanteer kan word, afhangend van die omstandighede: Versoek die werknemer om werk toe te kom; hanteer die afwesigheid as jaarlikse verlof en betaal die werknemer vir die tydperk van afwesigheid; of hanteer die afwesigheid as onbetaalde verlof.

Afwesigheid kan wissel van 'n minder ernstige tot 'n baie ernstige oortreding. Dit word beïnvloed deur die werknemer se tipe werk en verantwoordelikheid, die (moontlike) gevolge van die oortreding, asook die impak van die oortreding op die werknemer-werkgever vertrouensverhouding.

Wanneer die werknemer herhaaldelik dieselfde reël oortree en die werkgever progressiewe dissipline toepas, kan die werkgever 'n ernstiger waarskuwing uitreik indien die vorige waarskuwing steeds geldig is, of voortgaan met 'n dissiplinêre verhoor wat moontlik tot ontslag kan lei. Dit is noodsaaklik om alle dissiplinêre rekords en rekords

van gesprekke met 'n werknemer in die personeëlleer te hou, wat as verswarende omstandighede voorgelê kan word indien nodig.

Dros

Wanneer 'n werknemer langer as vyf dae afwesig is sonder om die werkgever in kennis te stel, word dit beskou as dros. Die werkgever moet kan bewys dat die werknemer geen intensie gehad het om terug te keer nie. Daarom moet die werkgever poog om die werknemer te kontak, en bewys lewer van hierdie pogings – 'n SMS of brief wat na die werknemer se laaste bekende adres gestuur is, is voldoende.

Na afloop van die aanvanklike pogings om die werknemer te kontak, kan die werkgever dissiplinêre stappe neem deur 'n kennisgewing van dissiplinêre verhoor te stuur na alle laasbekende kontakbesonderhede van die werknemer. 'n Dissiplinêre verhoor moet dan gehou word en mag voortgaan in die afwesigheid van die werknemer, wat tot ontslag kan lei. 📞

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During March/April 2021, a total of 13 potato producing regions as well as non-producing suppliers delivered potatoes nationally to fresh produce markets.

Average percentage downgraded: **10.81%.**

Total number of bags delivered from 13 regions and non-producing suppliers and inspected on the fresh produce markets: **17 953 832**

Figure 1: Classes inspected during March/April 2021 at all fresh produce markets.

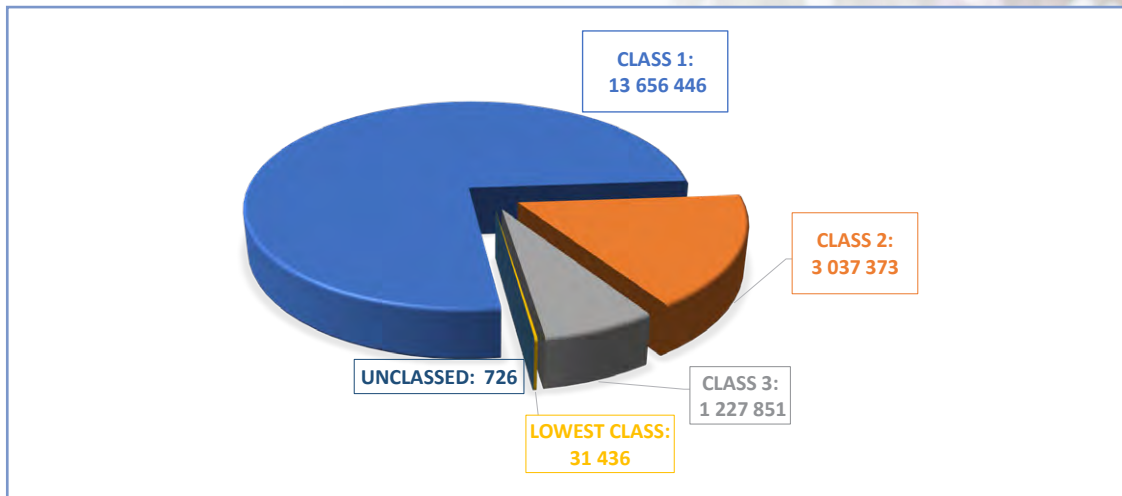


Figure 2: Potatoes downgraded in percentage (%) at all fresh produce markets during March/April 2021.

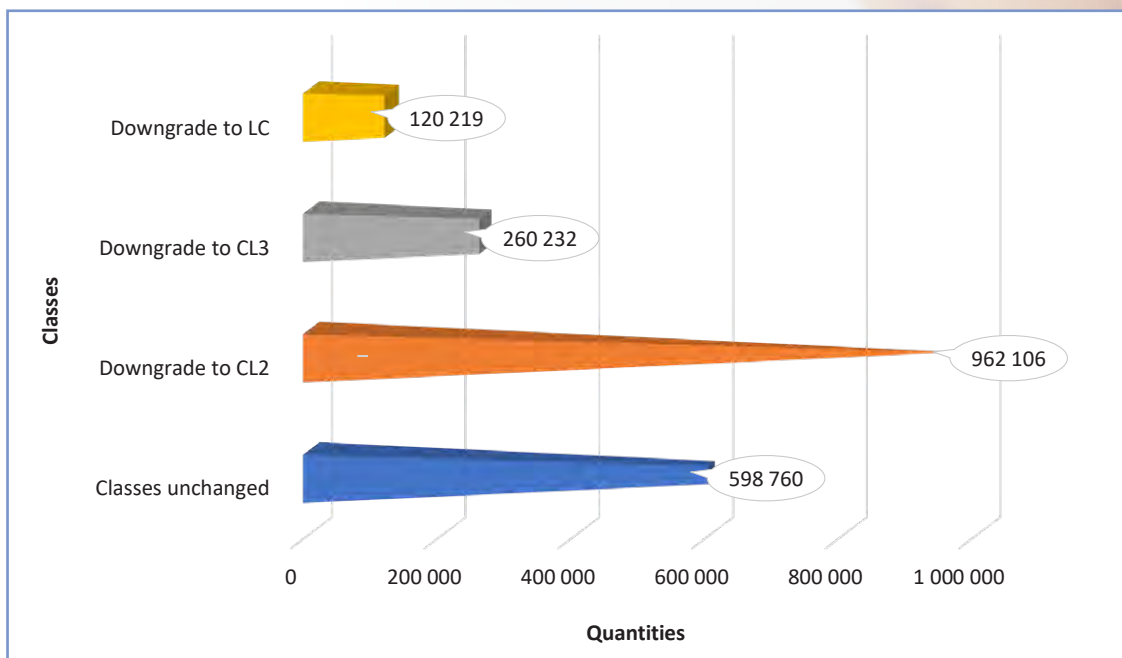


Figure 3: Potatoes downgraded (%) in all regions at fresh produce markets during March/April 2021.

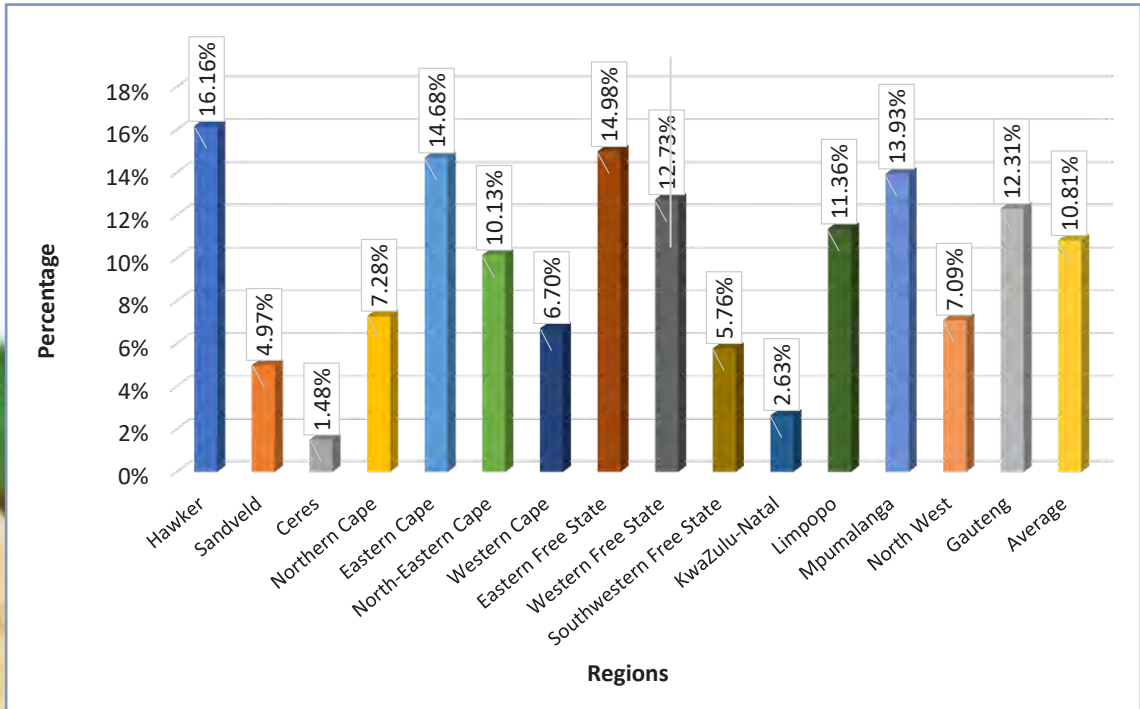
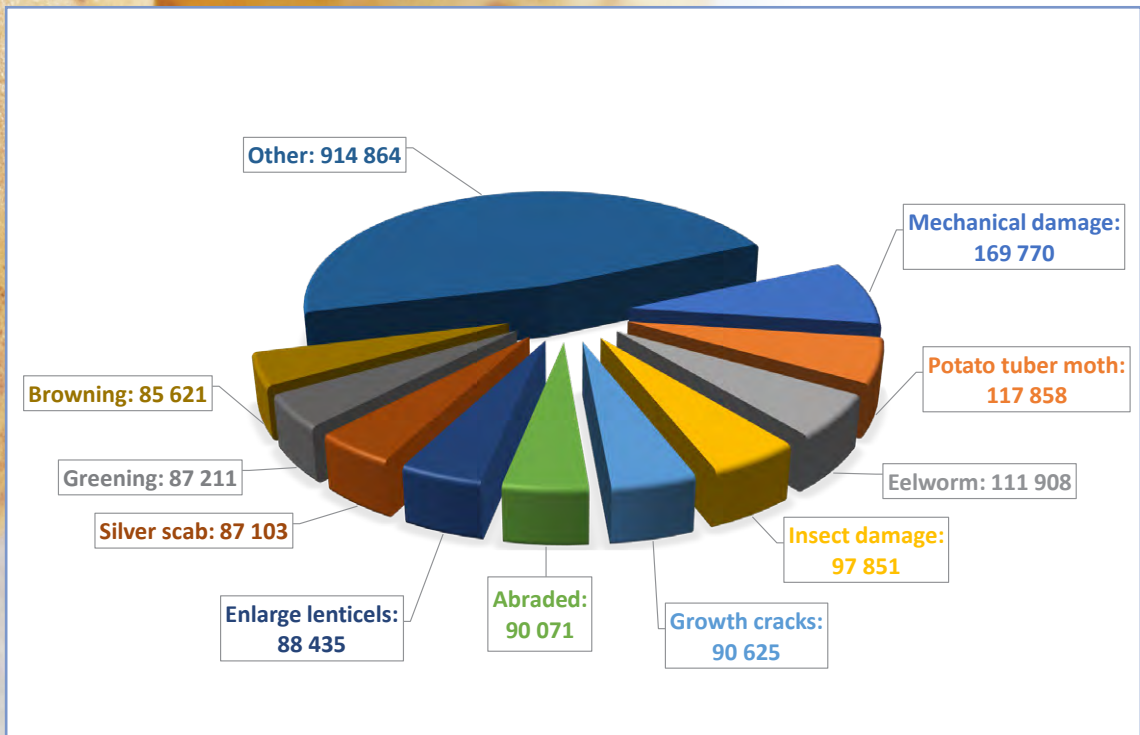
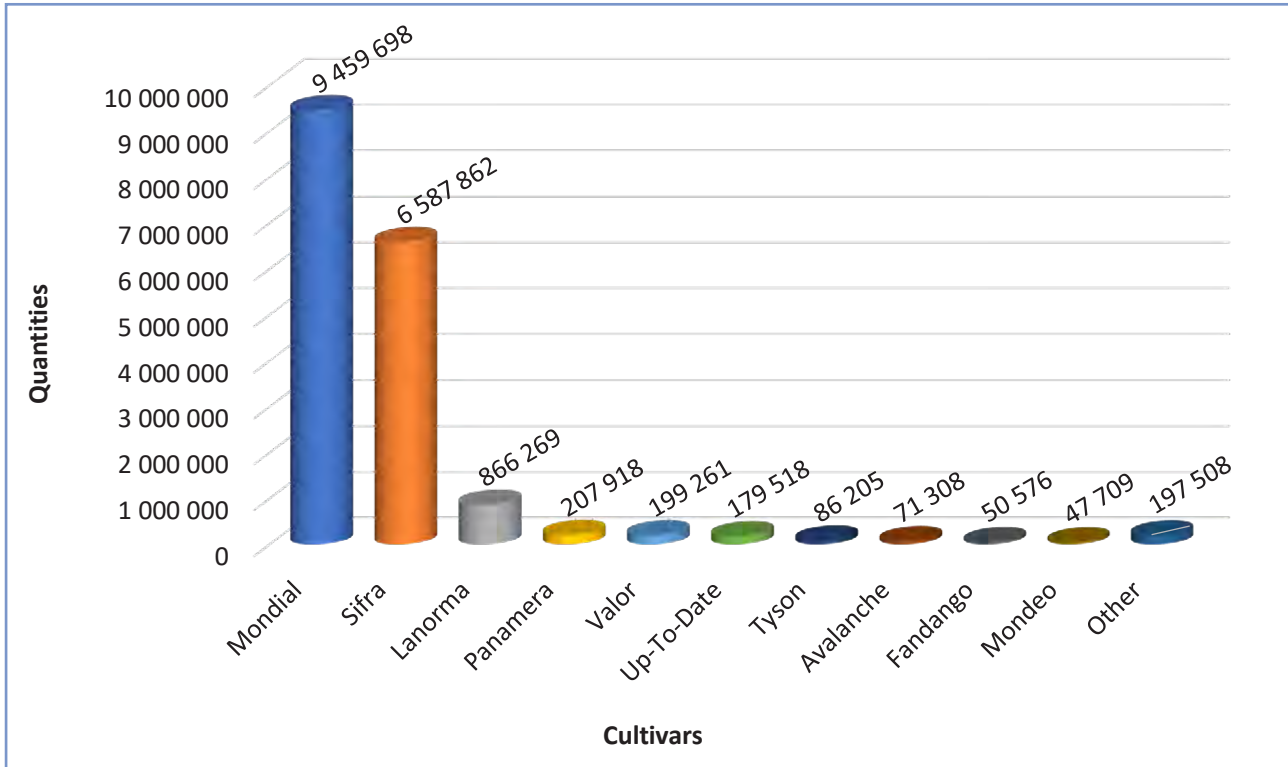


Figure 4: Reasons for downgrading in percentage (%) at all fresh produce markets during March/April 2021.



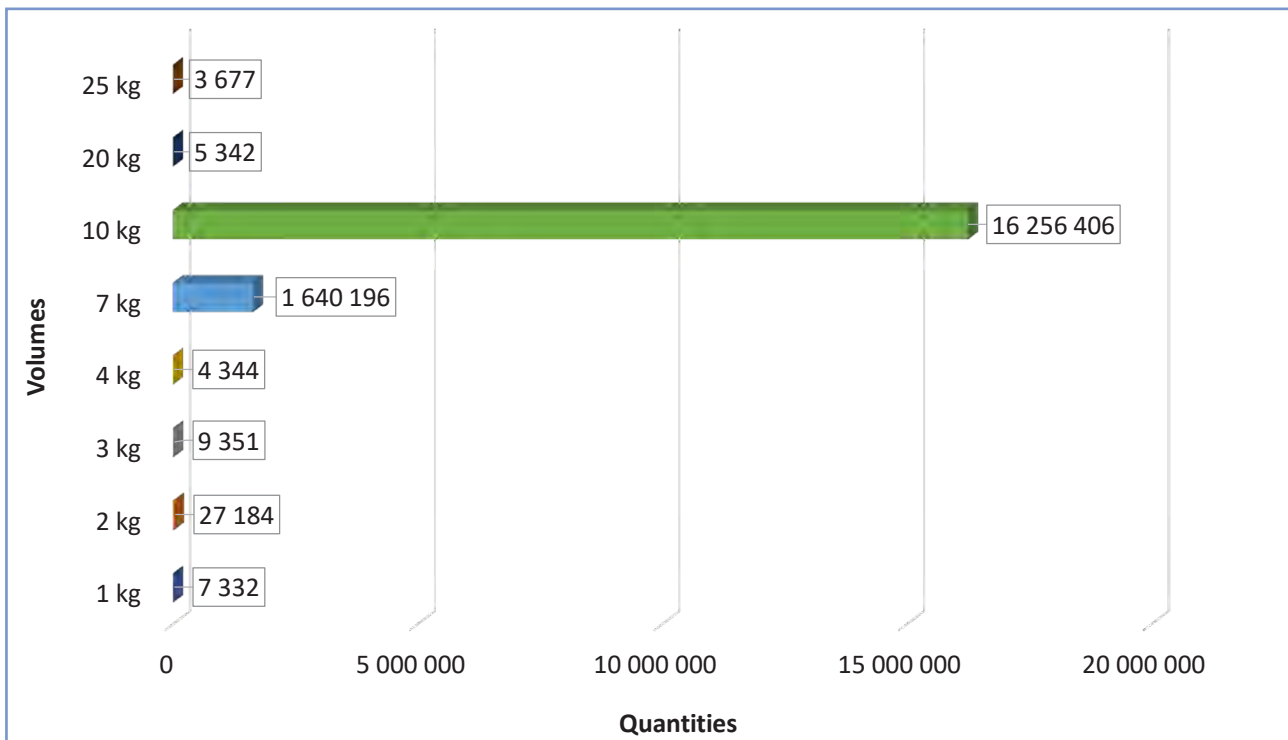
*Other causes include: Common scab, holl heart, soiled, malformed, dry rot, broken tubers, skin eelworm, too small, wilted, stem-end rot, watergrass, cold cracks, appearance, soiled by decay, heat damage, too big, glassiness, unspecified defects, sprouted, rhizoctonia, foreign matter, cold damage, vascular browning, powdery scab, and anthracnose.

Figure 5: Cultivars inspected (%) at all fresh produce markets during March/April 2021.



*Others include: Savana, Taisya, Almera, Hertha, Inovator, Markies, BP1, Alison, Ami, El Mundo, Nicola, and Daisy.

Figure 6: Volumes inspected on all fresh produce markets during March/April 2021.



Gemeenskaplike samewerking om veld- en bosbrande te bekamp

Deur HJ Moolman, Moolman & Pienaar Ingelyf

Winter is die tyd van die jaar wanneer grondeienaars in landelike gebiede hul asems ophou en wag vir berigte op die tweerigtingradio of WhatsApp van 'n veldbrand wat op pad is. Die gevolge van die brande, waarvan die ontstaan en verspreiding nie betyds voorkom kan word nie, is skielik en brutaal. Dit is, sonder twyfel, hierdie vernietigende gevolge wat die stigting van brande so 'n aantreklike opsie vir boosdoeners maak.

Terwyl dit 'n werklikheid is dat die ontstaan en verspreiding van bos- en veldbrande nie altyd voorkom kan word nie, is daar wel omstandighede waar die ontstaan en verspreiding van brande voorkom kon word en waar 'n versuim om op te tree, regs aanspreeklikheid vir skadevergoeding vir grondeienaars of huurders kan veroorsaak.

Wetgewing rondom brande

Die *Nasionale Wet op Veld- en Bosbrande, 1998 (Wet 101 van 1998)* is spesifiek daarop gerig om die reg rondom veld- en bosbrande te hervorm en, by wyse van regulering, 'n stelsel in plek te hê om hierdie brande te bestry. Die *Wet* het nie net standaard vir die voorkoming van brande ten doel nie, maar het ook die reg ten opsigte van aanspreeklikheid vir skadevergoeding as gevolg van die ontstaan en verspreiding van brande hervorm.

Onderliggend tot die oogmerke van die wet is die totstandkoming van goedgekeurde brandbestrydingsverenigings vir al die onderskeie geografiese en klimaatstreke binne die grense van Suid-Afrika. Die doel van geregistreerde brandbestrydingsverenigings is om deur 'n lys voorgeskrewe verpligtinge en reëls, wat teen lede van die vereniging afdwing kan word, die

ontstaan en verspreiding van veld- en bosbrande te voorkom.

As gevolg van die diversiteit van die verskillende klimaat- en ekologiese streke in ons land, word hewig staatgemaak op brandbestrydingsverenigings om unieke en spesifieke strategieë en beleide te ontwikkel vir brandbestryding in elke streek.

Eise vir skadevergoeding

'n Eis waarvolgens iemand vir skadevergoeding aanspreeklik gehou sou word, berus op wat regtens beskryf word as 'n delik. 'n Delik bestaan uit 'n sekere aantal elemente of 'n lys van regsvereistes, wat in hofstukke beweer moet word en by wyse van bewyslewering in 'n hof voorgelê moet word. In die algemeen sou die bewyslas of plig om 'n eis te bewys, op die persoon berus wat die skadevergoeding eis.

Ten opsigte van die ontstaan en/of verspreiding van brande, sal die eiser normaalweg en buiten die ander elemente van 'n delik, moet bewys dat die persoon wat vir skade aanspreeklik gehou word, versuim het om sekere pligte en voorkomende verpligtinge na te kom.

Die standaard wat die inhoud van hierdie pligte bepaal sal, buiten die vereistes wat die *Wet* self oplê, tot 'n groot mate deur die beleid van die plaaslike brandbestrydingsvereniging bepaal word.

Dit maak gevolglik sin vir grondeienaars of -huurders om enersyds by 'n brandbestrydingsvereniging aan te sluit en andersyds die standaard van die vereniging vir die streek na te kom. Die alternatief sou wees om hierdie standaard te ignoreer en die risiko te loop om in die toekoms regtens aanspreeklik gehou te word vir skadevergoeding, indien dit bewys kan word dat 'n versuim om enige van die standaard na te kom, die oorsaak vir die ontstaan of verspreiding

van 'n brand na 'n aangrensende plaas is. In dié verband kan iemand aanspreeklik gehou word vir brande op 'n ander eiendom omdat, byvoorbeeld, geen of onvoldoende brandbane gemaak is.

Belangrikheid van lidmaatskap

Daar is egter ook, regtens, 'n verdere risiko verbonde aan die feit dat lidmaatskap van 'n brandbestrydingsvereniging nie opgeneem word nie. Soos reeds aangedui, sou die eiser die eis moet bewys, maar ingevolge die *Wet* word regtens 'n vermoede geskep, deurdat 'n persoon wat nie 'n lid van die brandbestrydingsvereniging is nie, nalatig was.

Die vermoede kan wel weerlê word, maar anders as by ander eise vir 'n delik, skuif die bewyslas, wat op die eiser rus om die elemente van 'n delik te bewys, oor na die verweerder (die persoon wat aanspreeklik gehou word). Die verweerder moet dan sy/haar onskuld bewys. Lidmaatskap van 'n brandbestrydingsvereniging verhoed dat hierdie vermoede ingespan kan word.

Verskeie versekeringsprodukte is beskikbaar om die risiko vir aanspreeklikheid vir brande te dek, maar dit bly 'n gegewe dat lidmaatskap van 'n brandbestrydingsvereniging 'n voorvereiste in die polisvoorwaardes van hierdie soort versekeringsdekking is.

Die nakoming van wetgewing het ten doel om gemeenskappe te dwing om saam te werk om veld- en bosbrande te bestry en die vernietigende effek daarvan op lewens en eiendom te voorkom. Voorkoming is, in alle opsigte, beter as genesing wanneer brande ter sprake is. 📞

Vir meer inligting,
kontak HJ Moolman by
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of hj@mmlaw.co.za.

Why #WhenHopeWhispers?

If research is the oil tanker of the potato industry, then the marketing division of Potatoes South Africa is the aircraft that zips from the world of print media to the cyber space of social media, all while skimming the waves of radio and television to carry a message of hope.

Given what South Africa and the world as a whole have gone through during the past 14 months with the Covid-19 pandemic, it is natural that the potato industry – in view of how the system works with fresh produce markets offering a platform for buyers and sellers on which to interact – was also severely impacted.

Due to travel restrictions and limitations on the number of people gathering at venues, it became increasingly difficult for markets to operate efficiently and optimally. In the potato industry, 66% of all products go to communities in the informal sector – this was disrupted as well.

Hope in the spotlight

PSA's #WhenHopeWhispers campaign aims to shed light on the resilience of the entire value chain. This starts with the producer who works relentlessly to ensure that all South Africans are fed a quality, healthy and nutritious product. #WhenHopeWhispers is about reminding people that although times are dark, in time things will improve.

The agricultural sector in South Africa is one of only two out of ten sectors that managed to grow during 2020. We are well positioned, mainly because regulations allowed potato producers to continue supplying their products.

Our responsibility is to ensure that we meet food security requirements, and to continue to highlight the importance of potatoes within a healthy diet. The Covid-19 pandemic is not only an economic crisis, but at its core it is actually a health crisis. Through #WhenHopeWhispers we are saying that, regardless of the hardships, as an industry we are committed to our strategic mission, 'Together towards excellence'.

*Potato greetings,
Hanrie Greebe*



Hanrie Greebe.

As navorsing die olietenskap van die aartappelbedryf is, dan is die bemarkingsafdeling van Aartappels Suid-Afrika die tuig wat rondrits tussen die gedrukte media-wêreld en die kuberruimte van sosiale media. Terselfdertyd sweef dié tuig oor radio- en televisiegolwe om 'n boodskap van hoop te gee.

Gegewe die uitdagings wat Suid-Afrika en die res van die wêreld die afgelope 14 maande te midde van die Covid-19-pandemie moes verduur, is die aartappelbedryf – in terme van hoe die stelsel funksioneer met varsproduktemarkte wat 'n handelsplatform aan kopers en verkopers bied – uiteraard ook swaar getref.

Weens reisbeperkings sowel as beperkings op die aantal mense wat op 'n plek mag byeenkom, het dit vir markte 'n toenemende uitdaging geraak om doeltreffend en optimaal te funksioneer. In die aartappelbedryf gaan 66% van die produkte na gemeenskappe in die informele sektor – ook dít is ontwrig.

Hoop in die kollig

Die doel van die #WhenHopeWhispers-veldtog is om die veerkragtigheid van die totale waardeketting in die kalklig te plaas. Dit begin met die produsent wat meedoënloos werk om te verseker dat alle Suid-Afrikaners van 'n hoë-gehalte, gesonde en voedsame produk voorsien word. #WhenHopeWhispers poog om mense te herinner dat hoewel die prentjie nou donker is, daar lig in die tunnel is. Die Suid-Afrikaanse landbousektor is een van slegs twee uit tien sektore wat dit reggekry het om in 2020 te groei. Ons is reg geposisioneer hiervoor, hoofsaaklik omdat inperkingsregulasies nie produsente se vermoë om aartappels te produseer, kniehalter nie.

Derhalwe is dit ons verantwoordelikheid om te verseker dat die vereistes vir voedselsekureit nagekom word, en dat ons aanhou om klem te plaas op die belangrikheid van aartappels as deel van 'n gesonde dieet. Die Covid-19-pandemie is nie net 'n ekonomiese krisis nie; dit is allereers 'n gesondheidskrisis.

Deur die #WhenHopeWhispers-veldtog benadruk ons die feit dat, ondanks die uitdagings, ons as bedryf toegewyd bly aan ons strategiese missie – 'Streef saam na uitnemendheid'.

*Aartappelgroete,
Hanrie Greebe*

Epos my gerus by hanrie@potatoes.co.za / Feel free to email me at hanrie@potatoes.co.za

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Birtie Myburgh | Suidwes-Vrystaat | 082 372 7875

Danie van Heerden | Oos-Kaap/Suid-Kaap | 082 415 3666

Johann Botes | Noord-Kaap/Direkte verkope | 082 865 7813

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