

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

# CHIPS

VOL 36 NO 2 • MARCH / APRIL 2022

**LIMPOPO-KULTIVARPROEF  
ONDER BESPROEIING  
OP DENDRON IN 2021**

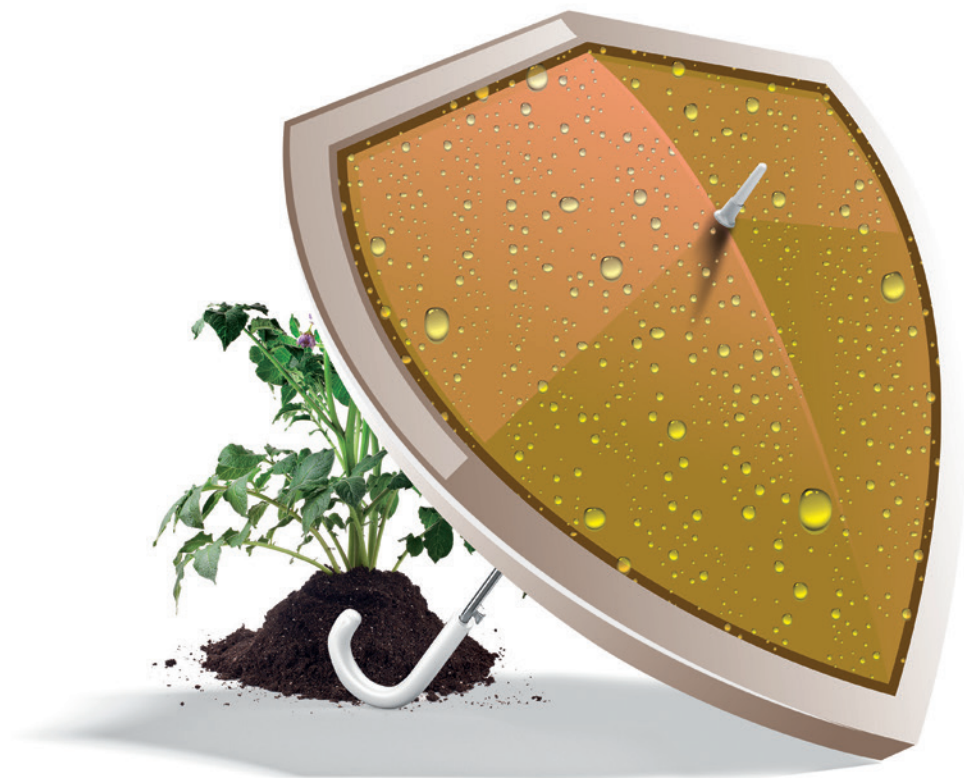
**DIE AARTAPPELBLAARMYNER:  
BEHEEROPSIES  
TEEN DIE PAPIES**

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**Potatoes  
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## Voorspoedige Nuwejaar - of is dit steeds geseënde Kersfees?

Deur Willie Jacobs, HUB van Aartappels SA

**G**oediedag, aartappel-familie. Die opskrif roep 'n ouerige raaisel op wat so klink: In watter jaar het Kersfees en Nuwejaar saamgeval? Wel ... elke jaar?

Dan luister ek na gesprekke in die gange waar ons familieledede vir mekaar sê dat hulle eerste in die produksiejaar is, dat die markspasie op 'n sekere plek en tyd aan 'n sekere omgewing of produksiegebied behoort, en dat ons mekaar se markpryse benadeel (en partykeer klink dit sommer doelbewus).

Waarvan praat ek? Aartappelmarkte begin nie in Januarie en eindig dan in Desember nie – net soos Nuwejaar aan die begin van dieselfde jaar is as daardie jaar se Kersfees. Daar sal altyd iemand wees wat die mark betree en iemand wat klaarmaak.

Die belangrikste punt bly: Persone wat die mark betree moet altyd weet wat gebeur in die produksiegebied wat vóór hulle in die mark is. 'n Oningeligte markdeelnemer gaan iewers in die mark vóór hulle of ná hulle voete val as hulle nie weet wat aangaan nie. Dit dra by tot waarskynlik die grootste faktor van onsekerheid en skade in die bedryf.

### Verstaan bepalende faktore

Dit is 'n uiters moeilike konsep om baas te raak. Dit is so dat selfs die mees gesofistikeerde

kettingwinkel-groepe dit uiters moeilik vind om die rakspasie vir groente op hul winkelrakke te bestuur, en dit deur sentrale bestuur. Die verwagting is dus nie dat alle aartappelprodusente skielik moet weet wanneer daar te min of te veel aartappels in die mark beskikbaar is nie, maar die versoek is dat ons baie meer tyd sal spandeer om te verstaan watter faktore in 'n gegewe tyd tot die prys bydra.

Faktore wat op enige gegewe tyd 'n invloed op prys kan hê, sluit onder andere in:

- Voorraad op die markvloer.
- Tendens van voorraadbeweging.
- Tyd van die maand.
- Tyd van die week.
- Kwaliteit van die produk op die mark.
- Kwaliteit van jou eie gelewerde produk vs. die mark.
- Logistieke situasie van verkopers.
- Logistieke situasie van kopers (klimaat, beskikbaarheid van vervoer).
- Regulatoriese invloede.
- Finansiële posisie van die kopers in die mark.

Die ingewikkeldheid van die faktore hierbo genoem, skep meer as net geleenthede vir 'n misplaaste prysvorming. Met ander woorde, die werklike waarde van die onderliggende produk word nie in die prys weerspieël nie.

Wat wel soos 'n paal bo water uitstaan is dat die grootste

invloed op hierdie faktore vanuit 'n aanbodperspektief uitgeoefen word. Ons as produsente het dus 'n groter invloed op die prys as enige ander faktor hierbo genoem.

### Mik vir aanvaarde waardeproposisie

Ons is almal uiters kundige boere/produsente. Ons spandeer ure daaraan om die boerdery-insette te meet en pas ten einde maksimum produksiemarges te realiseer. Dis egter so dat oordeelkundige bemarkings- en leweringsbeplanning, selfs oor die kortste tydperk, die grootste impak op daardie winslyn het.

Aartappels het hulself reeds as 'n uiters waardevolle en veelsydige produk bewys. Markpryse het ook aangedui dat verbruikers waarde in aartappels sien wat selfs ver bo die norm vir prysvorming is. Kopers sal dus altyd gelei word deur hierdie beginsel.

Vanaf bedryfskant sal ons voortdurend werk aan 'n 'aanvaarde waardeproposisie' vir aartappels. Vir julle, ons produsentefamilie, versoek ek dat meer vrae gevra word en dat meer inligting met ons familieledede gedeel word, sodat die verwysingswaarde vir almal realiseerbaar kan wees.

Kom ons maak Kersfeesvieringe en 'n nuwe winslynjaar van nou af sommer 'n daaglikse gebeurtenis. 🍎

# Climate change and food security: Potatoes up for the challenge!

**C**limate change is here to stay, and whether we are interested in the science behind it or not, it does affect us all. The term 'climate change' conjures up images of heat waves, thirst and desert landscapes. However, the concept is far more encompassing and its consequences far reaching.

Essentially, climate change means that dry periods will become drier and wet periods will become wetter. It is the intensity of climate factors that will increase. While this might still seem manageable to a normal household, the situation on the farm is very different and this is where the greatest concern lies – being able to produce food under hugely challenging climate conditions.

As it stands now, an estimated 821 million people are undernourished, and 151 million children under five years of age are stunted. Imagine the impact in a truly food-insecure world.

## Arm yourself with information

Working through this issue of *CHIPS*, I was once again reminded

of how important it is to farm crop varieties that are adapted to their environments and can withstand what nature throws at them. Worldwide, a body of researchers are studying ways in which potatoes can thrive in water-restricted environments, how rice paddies in China can be utilised for potato production, and how late blight can be combatted through resistant varieties. The list goes on.

Here at home, our researchers are constantly exploring new, more resistant cultivars that can withstand natural enemies and eventually be prepared for consumption in different ways.

Climate change, in my mind, hovers around the concepts of either too much or too little. Too much rain (flooding) equals drowned vegetation, excessive run-off, soil erosion and rotting crops. Too little rain (i.e., too much heat or drought) equals dry spells, dead vegetation, infertile soil and failing crops. Both have the same outcome – no food.

The content in this issue of *CHIPS* was specially written and compiled to equip our country's potato producers, big and small, with the knowledge necessary to produce the best potatoes under all circumstances. Everything written here is the culmination of someone's hard work and it needs to be celebrated and thoroughly absorbed in the face of the climate challenge that looms. Be sure to read every page.

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## China looks at potatoes in rice paddies

With approximately 19% of the global population and just 9% of the world's arable land, China has long sought to improve food production and in recent decades, potatoes have played an increasingly important role.

As farmland is lost to urbanisation and soil degradation threatens yields, the cultivation of potatoes in southern China's rice paddies in winter – when that land might otherwise lie fallow – has the potential to boost food security, farmer incomes and sustainability, according to recent research. A recent article published by the International Potato Center (CIP) found that integrating potato into rice farming systems in southern China, can yield some benefits for smallholder farmers.

In addition to improving food production and incomes, potato-rice rotations can have a lighter environmental footprint than most farming systems, improving soil health and input use efficiency. This happens in part because potato produces more calories on less land and with less water than most staples. – *International Potato Center*

## Europatat celebrates 70th anniversary

In 2022 Europatat, or the European Union (EU) for the Wholesale Trade in Potatoes, is celebrating its 70th anniversary. The association was established on 12 January 1952 in Paris and included members from Belgium, Denmark, France, Germany, Italy, the Netherlands and Switzerland. Seventy years later, the association has 63 members in 20 countries in the EU and beyond.

To mark this important milestone, Europatat is hosting the Europatat Congress 2022 in Dublin. It will be hosted within the framework of the World Potato Congress. This year's Europatat Congress will take place on 29 to 30 May 2022 at the Royal Dublin Society. – *Europatat*

## Research on potatoes in water-restricted environments

Strong evidence for the value of foliage or canopy temperature (CT) as a key indicator for improving yield predictions for potatoes grown in water-restricted environments gathered in a study by the International Potato Center's (CIP) experts, was recently published in the *Agronomy* journal.

CIP researchers' findings indicate that CT can be reliably used to predict how spud varieties will perform in water-stressed environments – a condition that will become more common under future climate change scenarios.

"Not only can we predict future potato yields better, but using CT in prediction modelling gives us the power of anticipation to improve the management of our resources," says David Ramírez, leader of CIP Crop Ecophysiology and Modelling lab in the crop and systems science division.

The promise of using CT in field trialling of new potato varieties, extends beyond more reliable yield predictions. In this respect, Ramírez also mentioned that this technique would enable farmers to make more informed real-time decisions to improve their water use with irrigation. – *Potato Business*

## US backs biotech potato research for Asia, Africa

Late blight is one of the major potato diseases that can cause crop and income losses for farmers. The United States (US) has pledged funds to address this problem in Bangladesh, Indonesia, Kenya and Nigeria.

The Feed the Future Global Biotech Potato Partnership led by Michigan State University (MSU) aims to bring late blight resistant (LBR) potatoes to the four countries, and possibly to other Feed the Future target countries, through funds provided by the United States Agency for International Development (USAID) in the next five years.

The award will help bring the LBR potato to the most challenged potato-producing regions and provide millions of farmers with a safe product with the potential to increase yield and lower production costs while contributing to the attainment of food security. – *ISAAA*.

## KFC in Kenya will support local industry

KFC Kenya has initiated plans to source potatoes locally after many Kenyans questioned why the franchise was importing its raw materials. The National Potato Council of Kenya CEO, Wachira Kaguongo, encouraged the franchise to work with Kenyan farmers to meet their needs gap.

Chief executive for KFC East Africa, Jacques Theunissen, explained that some of the corporate rules and procedures don't allow the firm to source the key ingredient locally. "The reason we cannot buy local at the moment is all suppliers need to go through the global QA approval process and we cannot bypass that, even if we run out, to ensure that our food is safe for consumption by our customers," he said. – *Pulse Live*



**New hybrid potato saves on roasting time**

A hybrid potato named after the cartoon fish in Finding Nemo could save on roasting time. Dr David Nelson said it had been a “real labour of love” to work with the new Nemo variety of potato, which looks like the clownfish due to its unusual markings, for the last six years.

Dr Nelson, who is the agronomy director of Lincolnshire-based growers Branston, one of the UK’s largest potato suppliers, exclusively for Tesco, said: “We were looking at a variety that would not only taste superb but would also save on roasting time.

“Nemo is a natural hybrid that has been developed through carefully crossing an exceptionally wonderful-tasting fast-cooking Peruvian variety called Inca Bella and a popular red-skinned salad variety called Franceline which grows well in the UK climate.”

The variety requires less water and fertiliser to grow than other varieties, and is 25% faster to cook, saving energy in the home, according to the supermarket giant. – *Wharfedale Observe*



The new Nemo variety of potato looks like the clownfish due to its unusual markings. (Photograph: Wharfedale Observe)

**Potato brown rot threatens African crops**

The International Potato Center (CIP) has drawn attention to the considerable spread at which potato brown rot (*Ralstonia solanacearum* or *Rs*) has been spreading in African countries. According to a survey in ten sub-Saharan Africa countries in 2018 this is the most serious threat to the region’s potato crops. CIP studies of its prevalence in several African countries confirmed its considerable spread.

Whereas potato farmers commonly control fungal diseases by spraying fungicides, there is no comparable agrochemical option for brown rot management. It poses an acute threat to potato production because it is spread by infected seed tubers. Brown rot is responsible for an estimated US\$1 billion in economic losses globally each year, and *Rs* has been declared a high-risk quarantine organism in Europe and the Mediterranean region.

Infected tubers are likely being disseminated in the region with informal potato trade among countries. In the absence of potato seed tuber certification and regional quarantine measures, brown rot will become an increasingly serious problem and threaten the region’s rapidly expanding potato industry.

CIP is promoting the use of molecular diagnostic technology (loop-mediated isothermal amplification; LAMP) to ensure pathogen-free planting stock. Educating farmers and decision makers about the threat severity and available management options is also considered vital. – *Potato News Today*

**Risk of potato shortage for Russia in 2022**

Russia might face a potato shortage in 2022. The capacity for processing tubers is expected to increase by 50%, while the production of potatoes on personal subsidiary plots will be reduced. A lower yield due to local droughts will also affect this.

Market participants told the Ministry of Agriculture that without subsidising production, only imports can halt the impending shortage. Sergei Lupekhin, chairperson of the Union of Potato and Vegetable Market Participants, stated that in 2021 about one million tons of potatoes were processed in Russia. This number will, however, go up to 1.5 million tons in 2022 and by 2026 the number will be three million tons.

In turn, the Ministry of Agriculture stressed that the preconditions for increasing the harvest of potatoes have already been created. – *Fresh Plaza*

**Environmentally friendly Pringles in the pipeline**

Ten spud growers from Belgium and France will receive help from snack manufacturer Kellogg Company, to diminish their greenhouse gas emissions, as part of a sustainability programme for Pringles.

These farmers who supply to Clarebout, the brand’s regular supplier of potato flakes, are having their farms’ carbon emissions assessed. Consequently, the growers can monitor and reduce their greenhouse gas emissions based on the evaluation and will receive further support to reduce their footprint and improve productivity in future. The aim is also that farmers eventually obtain carbon certificates, which they can then sell on the free carbon market.

Kellogg Company already has a similar programme elsewhere, but this is the first for Pringles. Even though this is only the third project in Europe, and the only one concerning potatoes, the company already supports more than 433 000 farmers in five continents. – *Potato Business*

# OVS-werkgroep spog met nuwe Aartappelboer van die Jaar tydens Groentoeer

Deur dr Fienie Niederwieser, Aartappels SA

**V**roeg in Februarie vanjaar het die Oos-Vrystaatse (OVS) Aartappelwerkgroep 'n interessante aartappel-dag in die vorm van 'n Groentoeer aangebied. Die hoogtepunt van die dag was die aankondiging van die OVS Aartappelboer van die Jaar deur die voorsitter van die OVS-gebiedsbestuur, Nicolaas Lourens.

Manie Grové van HG Grové Aartappels van die plaas Bankies, is as die wenner aangewys. Hy sal later vanjaar in die Nasionale Aartappelboer van die Jaar-kompetisie meeding, wanneer die algehele wenner tydens die Aartappelkongres in September aangewys word.

Die dag het op die plaas Middelpunt van C Fick in die

Daniëlsrus-omgewing afgeskop, met die OVS-werkgroepvoorsitter, Nant Yzel, wat almal verwelkom het. Daarna is die proefpersele van verskeie kultivars besoek. Dié seisoen se droëlandkultivarproef het uit altesaam 17 kultivars van die vier deelnemende saadverskaffers, GWK, FPD, Wesgrow en die RSA-groep, bestaan.

## Groep 'toer' deur proewe

Soos gebruiklik word opbrengs en ander resultate met oesdag bepaal en word dit daarna in *CHIPS* gepubliseer. 'n Interessante hommeltuigdemonstrasie is deur Anjali Boerderydienste uitgevoer, om aan produsente te wys hoe die apparaat gebruik kan word om landerye te bespuit.

Hierna het die groep na die Asearch Agri-Tech-proefperseel net



Manie Grové se gesin ontvang die OVS Aartappelboer van die Jaar-toekenning namens hom van Nicolaas Lourens en Nant Yzel.

buite Bethlehem in die Kromkloof-klein-hoevegebied vertrek, om na produk- en kunsmisproewe daar te kyk. Deelnemers aan die proewe, naamlik AECI Plant Health, FMC, Adama, Villa, MBFi, Syngenta, Real IPM en Bayer (produkproef), asook Atlas en Kynoch (kunsmisproef) het die geleentheid gekry om saam met die produsente en ander besoekers deur hul aanplantings te loop en die resultate te bespreek.

Hierdie droëlandproduk- en kunsmisproewe wat vir die OVS-werkgroep, in noue samewerking met Asearch Agri-Tech wetenskaplik uitgevoer word, verseker dat toedienings akkuraat en onafhanklik geskied. Omdat die proef op die Asearch Agri-Tech-perseel uitgevoer word, verseker dit ook kontrole oor die proefperseel.

Die produkproef beslaan 'n wye verskeidenheid van elf behandelings, wat produkte van chemiese gewasbeskerming tot biologiese produkte insluit. So ook bevat die kunsmisproef vier behandelings met 'n verskeidenheid van chemiese



Die span verantwoordelik vir die uitvoer van produkproewe. Van links is Leante de Jager, Heinrich Odendaal, Dixon Odendaal, André Odendaal en Enrike Verster.

sowel as meer biologiese benaderings.


Dié proewe word op dieselfde wyse geëvalueer as die kultivarproewe, maar bykomende siekte-assesserings word ook gedoen soos nodig. Die proewe is tans in hul tweede seisoen van drie, waarna die resultate in *CHIPS* gepubliseer sal word.



Produkproewe is ook tydens die Groentoeer besoek.



Die toer is deur ongeveer 150 produsente en belanghebbendes bygewoon.

Die toer is deur ongeveer 150 persone, wat uit produsente en ander belanghebbendes bestaan het, bygewoon. 'n Gesellige middagete en algehele opgeruimde atmosfeer het op die dag geheers, nadat daar weens Covid-19-inperkings in 2020 laas so 'n byeenkoms was. 

Vir navrae, kontak dr Fienie Niederwieser by 083 634 4848 of besoek [www.potatoes.co.za](http://www.potatoes.co.za).



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# Sandveld verwelkom nuwe voorsitter tydens AJV

Deur Chantel du Raan en Soreen Gouws

**J**annie Basson van Zandrug Boerdery naby Clanwilliam is in November 2021 tydens die Sandveld Aartappelkwekers-organisasie (Sako) se algemene jaarvergadering in Lambertsbaai, as die nuwe voorsitter aangewys. Hy neem die leisels by Jan van Zyl van die plaas Goergap in die Redelinghuys-gebied oor.

Een van die sprekers van die dag was Julian Conrad van GEOSS, wat oor die nuutste watermoniterings-inligting wat in die Sandveld versamel is, uitgebrei het. Piet Brink van Yara, wat ook 'n werkgroepvoorsitter is, het resultate van die mees onlangse kultivarproef wat in Aurora uitgevoer is, deurgegee.

Die hoofspreek, Pieter Geldenhuys, 'n bekende futuris, akademiese en innovasiekenners, het



Van links is Pieter Geldenhuys, Marciel Hopkins, Piet Brink en Julian Conrad.




Jannie Basson, die nuwe voorsitter van die Sandveld Aartappelkwekersorganisasie.

as 'toergids' na die toekoms van landbou opgetree. Die dag was met 'n motiveringspraatjie deur Marciel Hopkins afgesluit.

Die volgende borge word hartlik bedank:

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Lamberts Bay Foods, RSA Group, International Agriculture Chemicals, Bayer en Weskus Meganisasie.

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# Markmonitor: Wat het in 2021 met aartappels op die varsproduktemarkte gebeur?

Deur Janó Bezuidenhout en FP Coetzee; Aartappels SA

In *Figuur 1* in hierdie artikel word 2021 se daaglikse beskikbare voorraadvlakke (alle markte en alle klasse) met die daaglikse gemiddelde prys (alle markte en alle klasse) vergelyk.

Aan die begin van Januarie het pryse skerp gedaal, onder andere weens nat sakkies en groter voorrade. Die prystendens vir Januarie tot Maart was meestal sywaarts. Vanaf April het die tendens begin styg en het dit bly styg, totdat dit teen einde September 2021 'n rekordprys bereik het met 'n daaglikse gemiddelde prys van R101.92 per 10 kg-sakkie.

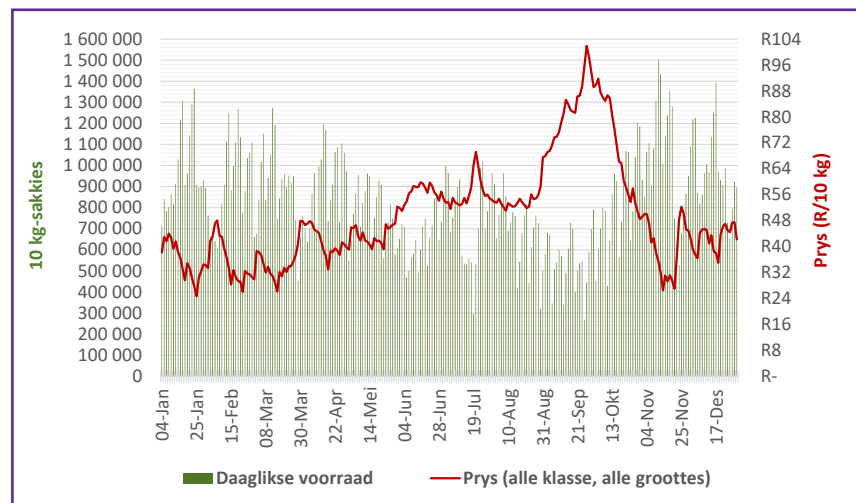
Daarna het die prys binne sewe weke met R75.44 per 10 kg-sakkie gedaal. Die gemiddelde daaglikse voorraadvlakke het die afgelope vier jaar gedaal en daar was gemiddeld 825 000 10 kg-sakkies per dag op die varsproduktemarkte (VPM'e) beskikbaar.

## Vier-jaar gemiddelde daaglikse voorraad

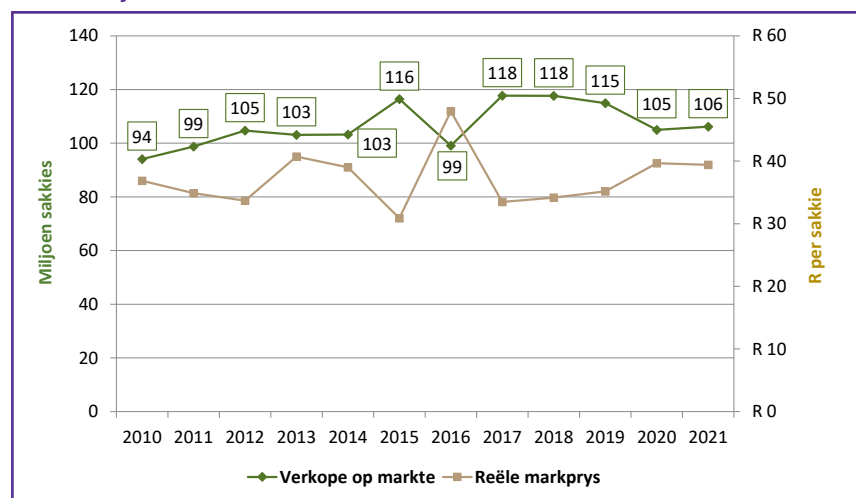
Gedurende Mei tot Oktober was daar 'n afwaartse tendens in die gemiddelde daaglikse voorraad gedurende die jaar, oor die laaste vier jaar. Gedurende die eerste twee maande asook die laaste twee maande van die jaar, was daar 'n opwaartse tendens in die gemiddelde daaglikse voorraadvlakke van die laaste vier jaar.

*Figuur 2* illustreer die negatiewe verband tussen verkope op die

**Figuur 1: Daaglikse beskikbare voorraad vs. daaglikse gemiddelde prys in 2021 (alle klasse en alle markte).**



**Figuur 2: Verkoopsvolume vs. reële pryse vir aartappels op VPM'e (kalenderjare).**

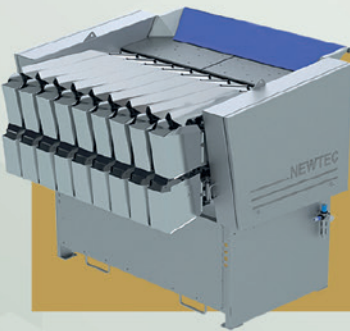




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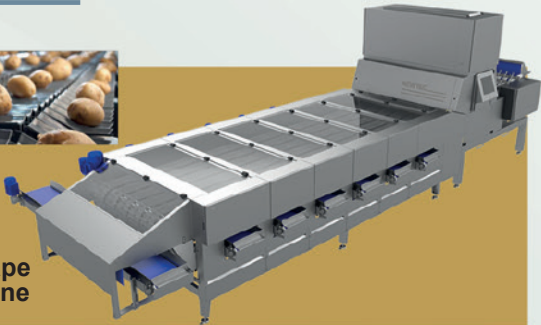
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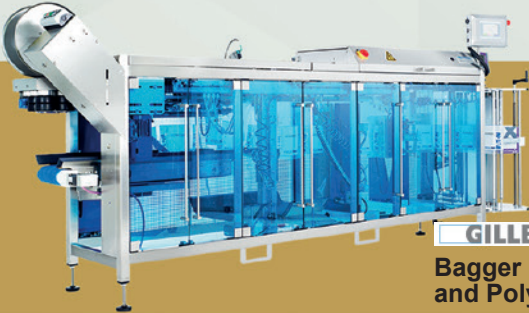
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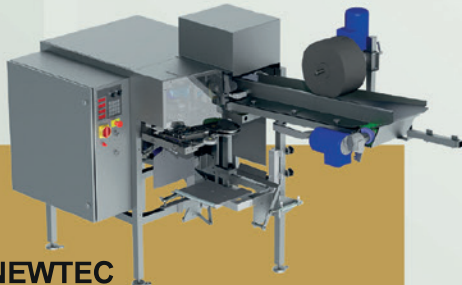
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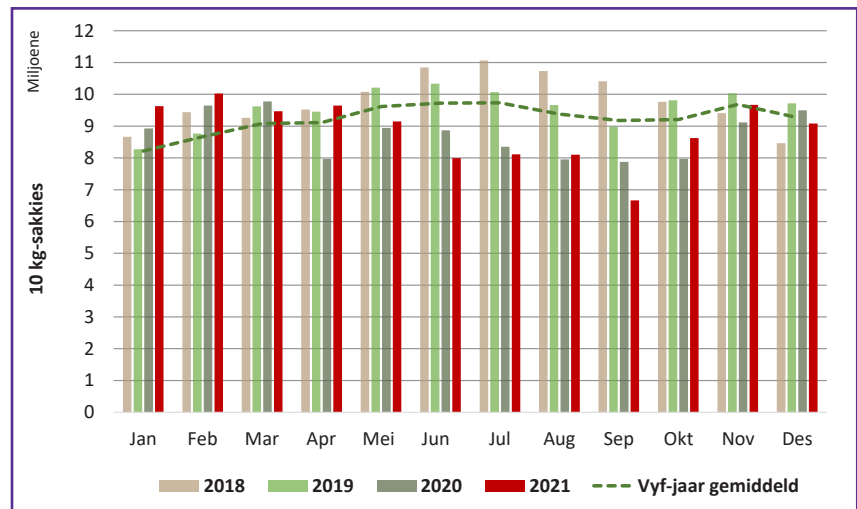


nasionale VPM'e en die gemiddelde reële markprys, nadat daar vir inflasie voorsiening gemaak is. Elke keer wanneer 'n groter oes bemark word, daal die reële prys, of andersom. Let op die groot styging in reële pryse in 2016, wat met redelike groot volumedalinge gepaardgegaan het. Dit is ook duidelik uit die figuur dat die reële prys oor tyd sywaarts beweeg. Markpryse sukkel om inflasie oor die lang termyn te klop.

Let egter op die gemiddelde markpryse vir 2015, 2017, 2018 en 2019 wat die vier grootste oeste tot dusver verteenwoordig. Dit is duidelik dat 2017, 2018 en 2019 se reële pryse opwaarts beweeg het. Indien daar slegs na die laaste vyf jaar in *Figuur 2* gekyk word, is daar 'n opwaartse tendens in die reële prys waar drie van die vyf jare groot oeste behels het.

Maandelikse verkoopsvolumes op markte word in *Figuur 3* aangedui. Die laaste twee jaar het maandelikse verkope gedurende Mei tot Oktober onder die vyf-jaar gemiddeld inbeweeg. Die hoogste verkope vir 'n maand was

**Figuur 3: Maandelikse verkoopsvolumes op markte vir die laaste vier jaar.**



in Februarie, waar net meer as tien miljoen sakkies verkoop is. Die laagste verkope was gedurende September 2021 toe slegs 6.7 miljoen sakkies verkoop is, wat ook die laagste verkope in die laaste vier jaar was. Die hoogste verkope per maand tot dusver gedurende Julie 2018, met net oor die elf miljoen sakkies wat verkoop is.

**Produksiestreke se voorsiening aan VPM'e**

In *Tabel 1* word die verskillende produksiestreke se verkope op die markte vir die 2021-kalenderjaar uiteengesit, alhoewel sommige streke oor verskeie kalenderjare bemark. Die drie grootste produksiestreke naamlik Limpopo, Oos-Vrystaat en Wes-Vrystaat, het in

**Tabel 1: Voorsiening aan VPM'e in die 2021-kalenderjaar.**

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
Limpopo	32 773 061	31%	R55.63	87%	10%	3%	22%
Oos-Vrystaat	18 468 355	17%	R42.48	67%	21%	12%	14%
Wes-Vrystaat	16 663 560	16%	R49.07	69%	22%	9%	22%
Sandveld	8 197 322	8%	R49.17	76%	22%	2%	22%
Suidwes-Vrystaat	6 898 717	6%	R38.63	78%	13%	8%	23%
Noordwes	6 589 538	6%	R40.05	82%	11%	7%	18%
KwaZulu-Natal	5 624 300	5%	R42.21	77%	18%	6%	18%
Noord-Kaap	4 150 961	4%	R49.31	60%	22%	18%	18%
Gauteng	2 893 586	3%	R36.36	85%	11%	4%	27%
Noordoos-Kaap	1 614 348	2%	R41.35	68%	23%	9%	22%
Mpumalanga	937 725	1%	R35.40	71%	24%	5%	14%
Ceres	785 581	1%	R44.53	85%	8%	7%	29%
Oos-Kaap	472 953	0.4%	R51.14	78%	13%	8%	26%
Suidwes-Kaap	45 422	0.04%	R41.12	83%	16%	1%	23%
Suid-Kaap	41 565	0.04%	R45.57	50%	43%	6%	18%
Loskopvallei/Marble Hall	690	0%	R29.86	100%	0%	0%	71%
<b>Totaal</b>	<b>106 157 684</b>	<b>100%</b>	<b>R47.75</b>	<b>77%</b>	<b>16%</b>	<b>7%</b>	<b>20%</b>



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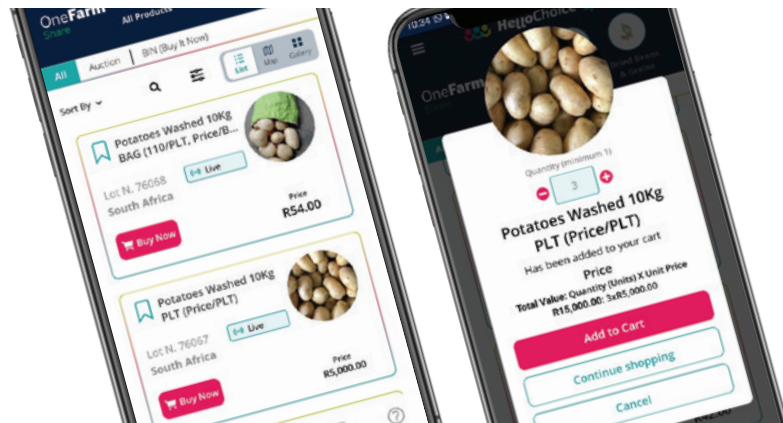
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Tabel 2: Verkope op VPM'e in die 2021-kalenderjaar.

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	43 211 100	41%	R47.43	82%	13%	5%	21%
Tshwane-mark	20 099 133	19%	R47.86	74%	19%	7%	18%
Durban-mark	9 362 498	9%	R48.90	79%	13%	9%	26%
Kaapstad-mark	8 809 614	8%	R49.30	74%	22%	4%	22%
Springs-mark	5 561 591	5%	R44.97	72%	19%	8%	17%
Klerksdorp-mark	3 351 571	3%	R45.04	69%	22%	10%	17%
Oos-Londen-mark	3 086 899	3%	R52.30	74%	18%	8%	24%
Bloemfontein-mark	2 761 635	3%	R50.48	68%	22%	11%	18%
Pietermaritzburg-mark	2 557 228	2%	R43.95	65%	21%	14%	18%
Port Elizabeth-mark	2 328 052	2%	R46.35	70%	20%	10%	24%
Welkom-mark	2 191 942	2%	R49.23	72%	16%	12%	16%
Vereeniging-mark	1 027 156	1%	R44.39	78%	15%	7%	16%
Witbank-mark	613 271	0.58%	R51.01	75%	18%	7%	16%
Mpumalanga-mark	352 362	0.33%	R48.73	68%	24%	8%	7%
Nelspruit-mark	347 683	0.33%	R54.75	66%	26%	8%	10%
George-mark	253 499	0.24%	R47.93	65%	22%	13%	14%
Kimberley-mark	159 044	0.15%	R46.69	79%	13%	8%	21%
Kei-mark (Umtata)	83 406	0.08%	R34.91	34%	30%	36%	5%
<b>Totaal</b>	<b>106 157 684</b>	<b>100%</b>	<b>R47.75</b>	<b>77%</b>	<b>16%</b>	<b>7%</b>	<b>20%</b>

2021 'n totaal van 64% van alle aartappels aan die markte voorsien teenoor 2020 se 60%.

Limpopo se verkope het met 17% jaar-op-jaar verhoog en was verantwoordelik vir 31% van alle verkope op die VPM'e, teen 'n gemiddelde prys van R55.63 per 10 kg-sakkie. Indien ons kyk na die klasverspreiding is dit duidelik dat 77% van alle verkope vir 2021, eersteklas aartappels is. Limpopo, Noordwes, Gauteng en die Suidwes-Kaap se persentasie Klas 1-verkope is almal meer as 80%.

Die nasionale gemiddelde prys van R47.75 per 10 kg-sakkie vir 2021, is bykans R1.91 per sakkie hoër as die vorige jaar. Ongeveer 1.2 miljoen meer sakkies is gedurende 2021 markte toe gestuur as in 2020. Die Oos-Vrystaat was in 2021 die tweede-grootste voorsiener van aartappels aan die markte, met 'n gemiddelde prys

van R42.48 per sakkie. Dit is R8.74 meer per sakkie as die vorige jaar, wat effens laer is as die gemiddelde prys vir alle VPM'e. Die Wes-Vrystaat was die derde-grootste voorsiener van aartappels aan die markte. 'n Gemiddelde prys van R49.07 per sakkie is behaal – dit is R6.14 meer per sakkie as die vorige jaar, wat weer effens hoër is as die gemiddelde prys vir alle VPM'e.

### Verskillende VPM'e se verkope

In Tabel 2 word 17 VPM'e se ontvangste en gevolglik verkope van aartappels vir die 2021-kalenderjaar aangetoon. Johannesburg-mark het vir dieselfde tydperk die meeste aartappels verkoop, met 41% van die totaal vir sowat 43 miljoen sakkies. Die vier grootste markte verkoop steeds sowat 77% van alle aartappels wat na die markte gekanaliseer word.

Johannesburg het die meeste aartappels verkoop, maar die gemiddelde prys van R47.43 per sakkie is effens laer as die nasionale gemiddeld van R47.75 (Tabel 2). Uit die top vyf markte was drie markte, naamlik Tshwane-, Durban- en Kaapstad-mark, se gemiddelde prys hoër as die nasionale gemiddeld.

### Ten slotte

Die jaar 2021 was 'n jaar van uiterstes met nuwe rekordpryse en baie lae pryse. Weersomstandighede het vir die tweede opeenvolgende jaar aangedui dat ons in 'n nat siklus is. Met insetkoste wat die hoogte inskiet, raak dit al hoe belangriker dat produsente goeie prysbestuur toepas en hul bemarkingstrategieë moet evalueer. **C**

Vir enige navrae, kontak  
Janó Bezuidenhout by  
jano@potatoes.co.za.

# Kultivarprestasie op varsprduktemarkte gedurende 2021

Deur Janó Bezuidenhout en Dikgetho Mokoena, Aartappels SA

**D**ie keuse van watter kultivar om te plant is een van die belangrikste besluite wat 'n aartappelproducent moet neem. Hierdie besluit word deur baie faktore beïnvloed, soos kultivareienskappe, klimaat, die produksiegebied, verbruikersvoorkeure en insetkoste. Baie kultivareienskappe word deur die kultivarproewe wat deur Aartappels SA (ASA) se navorsingsafdeling uitgevoer word, geïllustreer.

In hierdie artikel word daar na die prestasie van verskillende kultivars op varsprduktemarkte (VPM'e) gekyk.

## Verkoopspersentasies

Die afgelope paar jaar domineer Mondial aartappelverkope op VPM'e. Mondial is vir ongeveer 55% van alle aartappels wat op VPM'e verkoop word, verantwoordelik. In *Figuur 1* word die top vier kultivars van die laaste ses jaar uitgebeeld.

Uit hierdie vier kultivars is Sifra die enigste een wat oor tyd 'n opwaartse tendens toon. Die ander drie toon sywaartse of effens afwaartse tendense. Lanorma het oor die afgelope jaar marktaandeel verloor. Waar dit die laaste paar jaar 7% se verkope op VPM'e verteenwoordig het, maak Lanorma slegs 3% van verkope oor die afgelope jaar uit.

## Markaandeel van kultivars

Mondial en Sifra het regdeur die jaar 'n gemiddelde marktaandeel van onderskeidelik 56 en 29% op VPM'e gehad (*Figuur 2*). Lanorma, die derde-grootste kultivar op VPM'e, se marktaandeel het in Januarie begin toeneem, totdat dit in September geleidelik begin daal het.

Hierdie afname in marktaandeel van Lanorma is merendeels streeksgebonde. Tussen Junie en

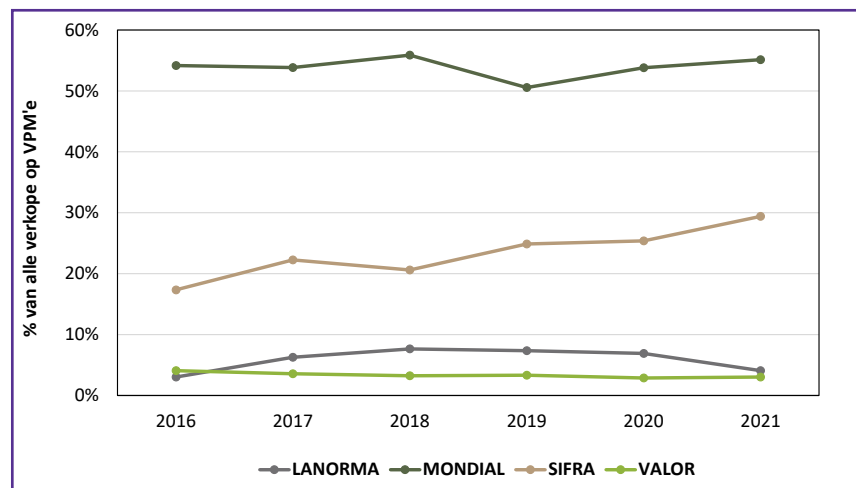
Julie 2021 het Lanorma 10% van die marktaandeel geniet. Valor, aan die ander kant, het vanaf September tot Desember ongeveer 7% van die VPM'e se verkope verteenwoordig.

Panamera se marktaandeel het vanaf Junie tot September 'n piek bereik, waar die kultivar 'n maksimum van 3% van die VPM'e se verkope verteenwoordig het.

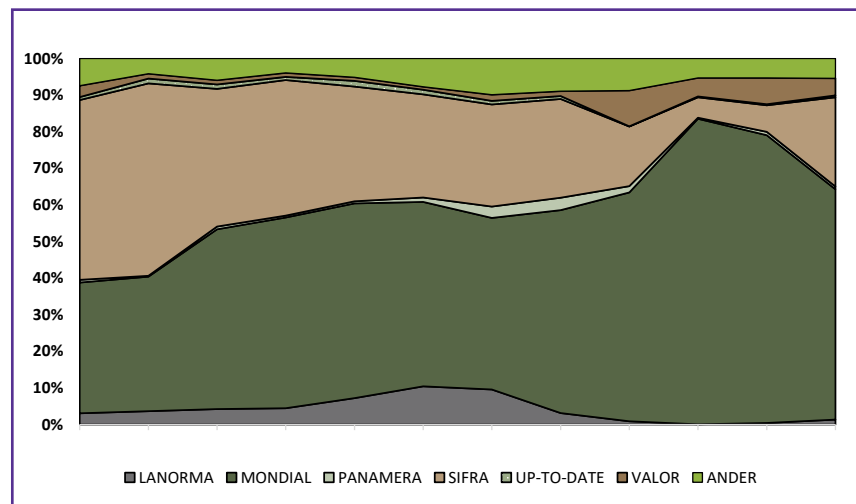
Up-to-Date het vir nege maande minstens 1% van die verkope verteenwoordig.

*Figuur 3* dui die marktaandeel van die kultivars in 2020 aan. Indien 2020 met 2021 vergelyk word, kan gesien word dat Sifra se marktaandeel vanaf Maart tot September 2021 vergroot het. Mondial, Lanorma en UTD se markandeel het in 2021 gedaal, in

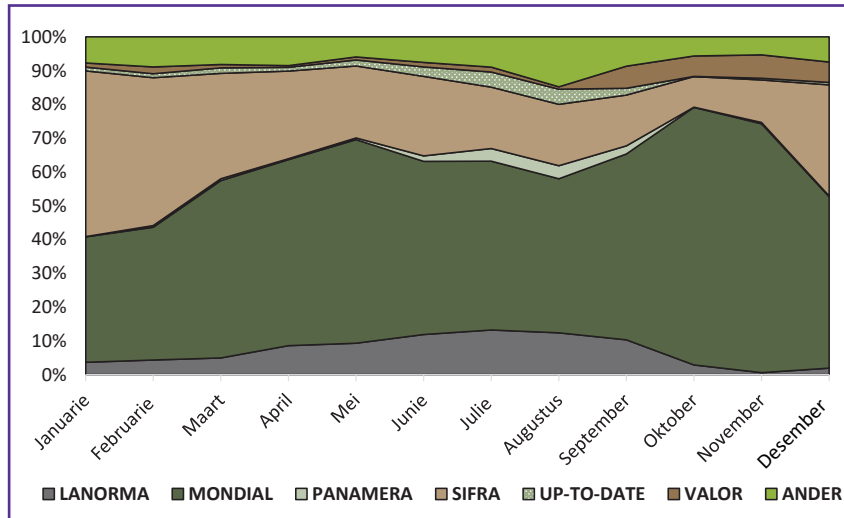
**Figuur 1: Top vier kultivars, gebaseer op persentasie verkope op VPM'e sedert 2016.**



**Figuur 2: Die marktaandeel van verskeie kultivars op VPM'e gedurende 2021.**



Figuur 3: Die markaandeel van verskeie kultivars op VPM'e gedurende 2020.



Tabel 1: Jaarlikse gemiddelde prys per 10 kg per klas vir alle groottes in 2021.

Kultivar	Gemiddelde prys per 10 kg (Klas 1, alle groottes)	Gemiddelde prys per 10 kg (Klas 2, alle groottes)	Gemiddelde prys per 10 kg (Klas 3, alle groottes)
Sifra	R46.09	R37.33	R29.30
Mondial	R51.63	R43.85	R34.97
Lanorma	R49.66	R45.68	R35.93
Valor	R53.87	R36.24	R37.41

Tabel 2: Klasverspreiding van verkope vir elke kultivar.

Kultivar	Klas 1 (alle groottes)	Klas 2 (alle groottes)	Klas 3 (alle groottes)	Klas 4 (alle groottes)	Ongeklas (alle groottes)
Sifra	76.67%	16.58%	6.32%	0.35%	0.08%
Mondial	74.97%	17.9%	6.78%	0.18%	0.16%
Lanorma	71.49%	17.64%	10.25%	0.34%	0.28%
Valor	86.17%	10%	3.36%	0.25%	0.22%

vergeelyking met 2020. Gedurende September 2021 was daar 'n styging in Valor se markaandeel.

**Hoe lyk die pryse van kultivars?**

Die jaarlikse gemiddelde pryse vir die kultivars word in Tabel 1 uiteengesit. Valor het die hoogste gemiddelde jaarlikse prys per 10 kg vir Klas 1 (alle groottes) behaal, gevolg deur Mondial. Beide Mondial en Sifra het min of meer 'n R8 verskil tussen klasse, terwyl Lanorma se verskil tussen Klas 1 en Klas 2 slegs R4 is.

In Tabel 2 kan waargeneem word hoe die onderskeie kultivarverkope op VPM'e saamgestel is met betrekking tot die verskillende klasse. Valor se verkope het uit 86% Klas 1 bestaan, teenoor die ander kultivars wat tussen 71 en 77% was.

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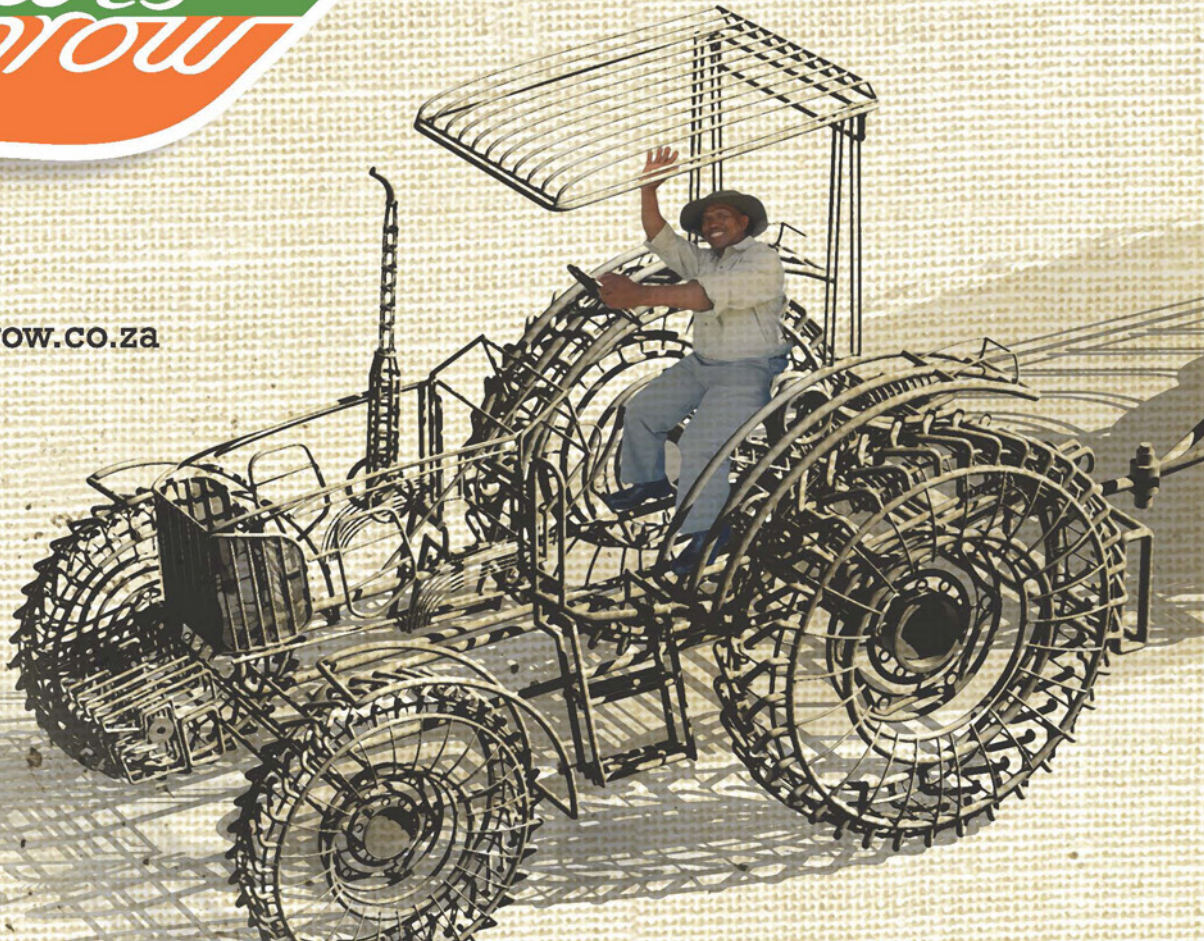
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# VARIETY

of

# SOLUTIONS

---

## SABABA

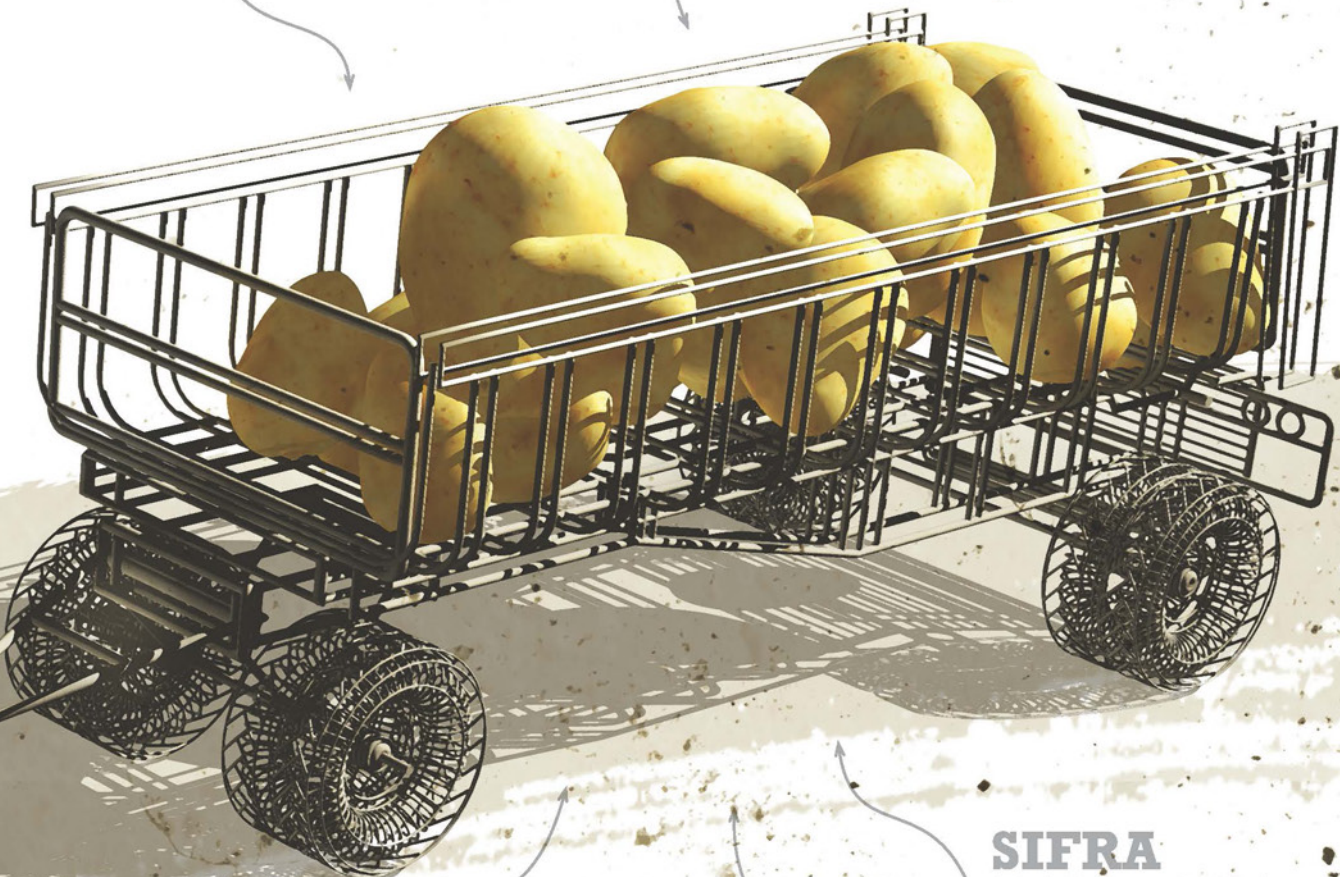
- \* big size tubers
- \* powdery scab resistant
- \* very strong foliage
- \* blight resistance

## 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

FOXY | VALOR



AARTAPPELSAAD BEURS  
POTATO SEED EXCHANGE

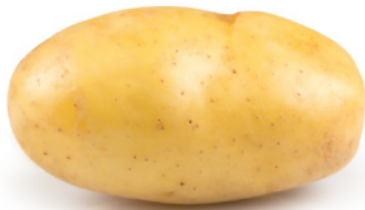
Landswye Verskaffers Van : Gesertifiseerde Moere | Aartappelsakkies | Plakkers | Paletnet | Polipropsakke

Countrywide Suppliers Of : Certified Seed Potatoes | Potato Pockets | Labels | Pallet Netting | Polyprop Bags

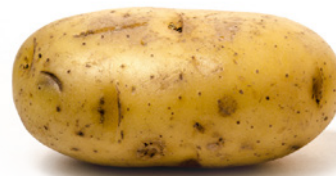
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# New technology available for fingerprinting of potato cultivars in South Africa

By Dr Inge Gazendam, researcher: Plant Breeding, ARC-VIMP

**T**rueness-to-type information of cultivars is essential for seed potato growers to provide true varieties to the potato industry. DNA fingerprinting is a molecular technique applied in the identification of genetic differences between cultivars or lines (clonal identity) and used for genetic purity testing (trueness-to-type).

The advantage of potato DNA fingerprinting is that it can be done at very early developmental stages, such as on mini-tuber or in vitro leaf material, and it is less resource intensive than morphological methods. Accidental mix-ups can therefore be identified at an early stage, before in vitro multiplication, to prevent costly mistakes later on. Cultivar genetic identity is important in the protection of plant breeders' rights.

The in vitro laboratory of the ARC-VIMP (Vegetable, Industrial and Medicinal Plants) is also dependent on DNA fingerprinting, and the laboratory cannot release material to the industry unless trueness-to-type is confirmed.

## SSR fingerprinting method

The DNA fingerprinting method previously applied at the ARC-VIMP is based on the polymerase chain reaction (PCR) of simple sequence repeat (SSR) markers, and the resulting mixtures of DNA fragments are separated according to their size by denaturing polyacrylamide gel electrophoresis (PAGE) on a large gel system.

The fingerprint fragments are then stained and scored for their presence and size (Figure 1). Differences are observed as the presence or absence of a particular

fragment. The results are also visually compared with a known cultivar fingerprint as reference.

The SSR fingerprinting method has low throughput, is labour intensive, incurs a high cost per data point, and scoring is highly subjective due to the indirect method of determining fragment sizes.

## SNP genotyping technology

Recently, single nucleotide polymorphism (SNP) became the marker of choice for applications in plant breeding and genetics as they are abundant, stable, amenable to automation, efficient, and increasingly cost-effective.

A new protocol was therefore developed for potato fingerprinting, using SNP genotyping. An SNP is the variation in a single nucleotide

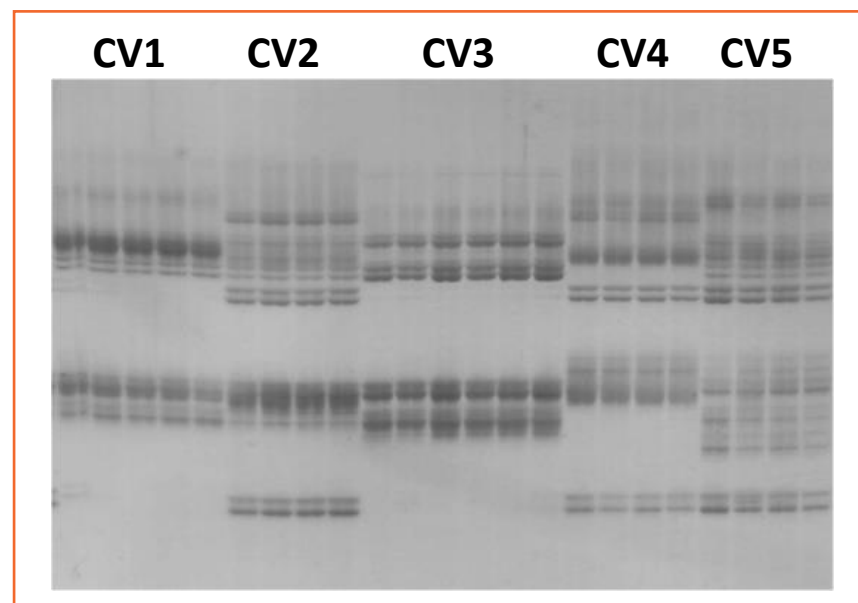
that occurs at a specific position in the genome of any organism. SNPs are highly abundant in plants and are spread out evenly over the genome. In the potato genome, large numbers of SNPs have been identified, and one SNP is found on average in every 20 base pairs (bp).

Due to advances in SNP genotyping technology, it has become easier and more affordable to use SNP assays than ever before. Panels of SNP markers are therefore employed instead of SSRs for varietal identification at the institute.

## An SNP panel for local cultivars

An SNP panel was developed and optimised to fingerprint potato cultivars locally, using highly efficient competitive allele-specific PCR (KASP) assays. The purpose of

**Figure 1: DNA fragments generated by PCR of SSR sequences, separated on a large PAGE gel and stained with silver staining.**



\* The SSR fingerprints of five cultivars, indicated by CV 1 to 5, are presented for the same SSR marker.

this development was to replace the outdated SSR markers currently being used. The aim is to better serve the South African potato industry through the deployment of an efficient, reliable and cost-effective genetic fingerprinting method for clonal identification and trueness-to-type determination of potato cultivars.

All commercial potato cultivars have four copies of each chromosome. A specific potato cultivar can therefore have one of five SNP genotypes, indicated by the number of times one of the SNP alleles occurs, also referred to as the dosage number. For example, if 'A' and 'B' are the different alleles of a given SNP and 'A' is the reference allele, then the allele dosage classes are 0 (BBBB), 1 (ABBB), 2 (AABB), 3 (AAAB) or 4 (AAAA), as shown in Figure 2.

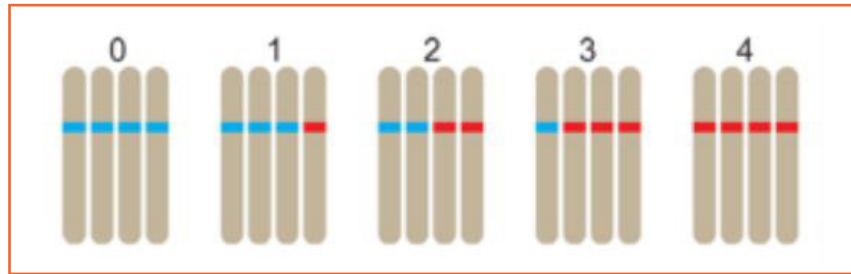
Dissimilarity between potato varieties can be caused by one dosage difference, suggesting that allele dosage is useful for variety identification. SNP markers are able to estimate allele dosage, therefore the nucleotide genotype as well as the copy number can be determined in a polyploid genome. In contrast, it is nearly impossible to determine the copy number of a fragment produced using an SSR marker.

### Method development

Initially, during method development, a collection of 190 potato cultivars and breeding lines were genotyped at 500 SNP sites using SeqSNP from LGC Genomics. All major potato varieties planted during the 2018/19 growing season were included in this study. An optimal panel of 25 informative SNP markers that can discriminate the 173 unique potato cultivars on a genetic allele dosage basis were identified.

SNPs were carefully selected to have a balanced allele frequency, resulting in a high polymorphism information content. The SNPs in this small panel were then

**Figure 2: Dosage of alleles in tetraploid potato. (Adapted from Bourke et al., 2018)**



\* In a tetraploid species, five distinct allele dosage classes are possible at a bi-allelic marker position, ranging from 0 to 4 copies of the reference allele. Here, the reference allele is coloured red, with the alternative allele coloured blue.

validated with KASP assays in the laboratory.

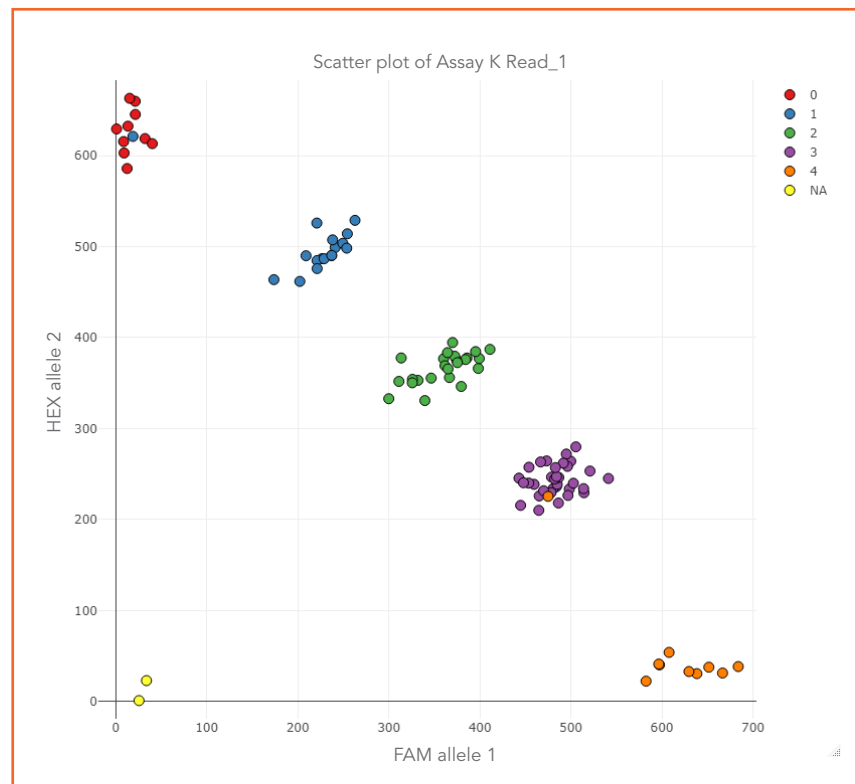
Results were plotted to see how the genotypes cluster into the five dosage classes (Figure 3). Only two of the 25 SNPs failed to cluster into the five dosage classes (results not shown). The final selected and successfully validated panel of 21 SNPs was able to distinguish

among all 173 unique potato cultivars used during method development, including those currently important in South Africa.

### Output and application

One of the most important outputs of the project has been setting up an SNP genotype database.

**Figure 3: Scatter plot constructed with KASP data points in the colour of the expected SeqSNP allele dosage.**



\* An example of a successful KASP SNP assay using marker 'K', which was able to cluster potato genotypes into the five gene dosage classes (colours according to the expected dosage). The yellow samples at the origin are no-template or water controls.

The subjective and sometimes inaccurate sizing of the SSR allele database makes comparisons of fragments from different potato profiles difficult. On the other hand, SNP genotypes simplify the germplasm genotype database, enabling automatic comparisons to determine the suggested identity of an unknown cultivar.

The SNP panel has been validated and is ready for application to potato samples submitted for fingerprinting or purity requests. All private farmer customers and public or private laboratories will have access to the service.

### Purity tests

Purity tests can be performed objectively and with higher throughput using KASP SNP assays to resolve identity or mixing issues of potato production stakeholders. If two cultivars are suspected to be mixed, a minimum number of appropriate SNPs can be applied to confidently discriminate between them.

A flexible selection of the most appropriate SNPs can also be made when a list of cultivars need to be distinguished. This minimises the analysis costs. When three SNP markers are applied for scientific robustness, the price break-even point of SNP fingerprinting compared to the current SSR prices is at four samples, and almost half of the

current price for fingerprinting twelve samples.

### Identification of samples

The probable identity of an unknown sample can be determined by comparing the SNP genotypes of the individual to the germplasm SNP genotype database. Possible hits with the lowest genetic differences will be identified and reported to the client.

### Genotyping new cultivars

If a new cultivar needs to be added to the SNP genotype database, it needs to be genotyped with all the 21 successful KASP SNP assays. There is a slight possibility that the KASP SNP panel cannot discriminate new cultivars from the ones used during method development. However, this panel of SNPs were chosen for their high polymorphism information content, and they should therefore be useful to discriminate between wider sets of potato germplasm.

Previously, five SSR markers were traditionally used to genotype a new cultivar to be added to the database. In reality we cannot size the SSR alleles anymore due to the discontinuation of the sizing ladder. For the full SNP panel, the price break-even point compared to the current SSR prices is at twelve samples. So rather than submitting one or two samples at

a time, it is advisable to submit twelve or more samples at a time to expand the database.

### Mixed samples

Mixes of plant material cannot be tested, since DNA fingerprinting tools are designed to treat one sample as one individual, and to assure the identity of an individual and not a group of individuals. Each individual has a unique genetic signature and has to be assayed separately. Any fingerprinting technique will simply try to find a match to the complex mix of genotypes.

One could find a match to the database, but you wouldn't be able to say if it was from one or more cultivars. Therefore, pooling of samples cannot be used as a cost saving approach. It is recommended to randomly select a set of individual plants to identify the identity of a cultivar within a varietal mix.

### Conclusion

This new method enables the ARC-VIMP to continue to serve the South African potato industry by providing a more effective and accurate genetic fingerprinting service for the purpose of clonal identification and trueness-to-type determination of potato cultivars. 🍅

For more information, send an email to Dr Inge Gazendam at IGazendam@arc.agric.za.

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# Motte maak amok: Deel 2

Deur dr Fienie Niederwieser, Aartappels SA

**A**artappels Suid-Afrika (ASA) het in 2021 begin met 'n reeks werksinkels oor die beheer van aartappelmot. Die eerste drie werksinkels het in Limpopo plaasgevind en terugvoer is in *CHIPS* se Julie/Augustus 2021-uitgawe gepubliseer.

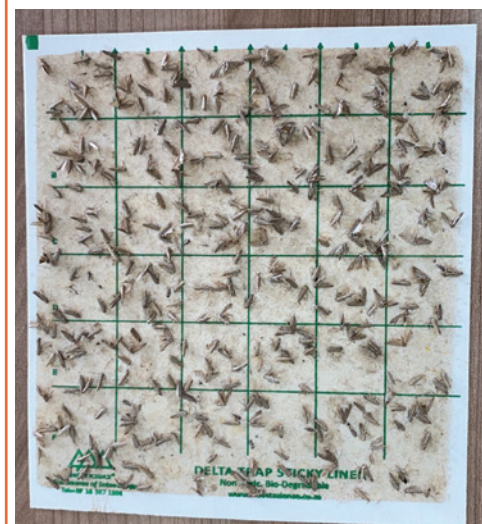
Nog vier werksinkels is in 2021 in die Oos-Vrystaat, Noord-Kaap, Wes-Vrystaat en Sandveld gehou. In hierdie artikel word nog 'n paar relevante gedagtes van persone wat die werksinkels bygewoon het weergegee. Onder hulle is prof Hannalene du Plessis van Noordwes-Universiteit en dr Diederich Visser van die Landbounavorsingsraad se LNR – Groente, Industriële en Medisinale Plante. Dit is opwindend om te sien hoeveel insig die eerste resultate van monitoring met feromoonlokkvalle aan die lig gebring het.

**“Kan aartappelmot met biologiese middels beheer word?”**

Daar is biologiese middels geregistreer vir die gebruik om aartappelmot en *Tuta absoluta* te beheer en daar is 'n plek vir hulle. Hulle kan egter nie saam met enige chemiese produkte gebruik word nie.



Persone van verskillende streke, en wat verskillende produksiepraktyke toepas, het bymekaargekom om hulle kennis oor aartappelmot te verfris en nuwe insigte te kry oor die bestuur van die insek. Hier is 'n groep in WesGrow se raadsaal bymekaar.



Al hierdie motte is in een week in 'n delta-val met feromoon gevang langs 'n land wat die vorige seisoen geoes is en waar opslag voorgekom het. Op hierdie stadium het die streek nog nie begin om aartappels te plant nie. Dit was dus duidelik dat die boer nie eers 'n paar weke na opkoms kon begin met 'n spuitprogram in 'n nuwe land nie, aangesien die motpopulasie baie vinnig sou opbou.

**“Hulle is maar hier, sonder dat ons daarvan weet.”**

**Covid 19 het ons geleer dat dinge op 'n afstand gedoen kan word.**



Aartappelboere van die Sandveld kon op kort kennisgewing hul kennis verfris deur te luister na die opnames wat deur dr Diedrich Visser gemaak is oor aartappelmot en *Tuta absoluta*. Elke bywoner het 'n geheuestokkie ontvang met al die opnames, en nog baie ander inligting, sodat elkeen op sy tyd hersiening kon doen, en dit met kollegas kon deel.

**“Ontwerp 'n spuitprogram wat gebaseer is op die IRAC-groep waaraan insekdoders behoort, om weerstand te vermy.”**

'n Middel van 'n spesifieke groep moet vir die duur van 'n lewensiklus aangewend word, en dan vir 60 dae nie weer gebruik word nie. Die IRAC-groep van elke produk word op die etiket aangedui.

A suspension concentrate stomach and contact insecticide for the control of various insect pests as listed.

'n Suspensie-konsentraat maag- en kontakinsekdoder vir die beheer van verskeie insekplae soos gelys.

**IRAC INSECTICIDE GROUP CODE 22 IRAC INSEKDODER GROEPKODE**

**ACTIVE INGREDIENT / AKTIEWE BESTANDEEL:**

indoxacarb (oxadiazine)

.....150 g/l

indoksakarb (oksadiasien)

**“Feromoonvalle help 'n mens om te sien wat aangaan.”**

Hieronder is 'n rekord van motgetalle van twee lande wat 300 m uitmekaar is. Motte is van die begin van die seisoen af in die ou land met opslag aangeteken, maar na slegs twee weke is groot getalle motte ook in die nuwe land aangeteken. Soos die plante gegroei het, het dit al hoe meer motte gevang. Motte van die opslagland het heel waarskynlik na die nuwe land gevlieg vanaf die opslagland.

Datum	DW3.1 (opslagland)	N1.2 nuwe aartappelland (300 m weg van opslagland)
11/10/2021 (een week)	68	5
25/10/2021 (drie weke)	202	79
08/11/2021 (vyf weke)	<b>396</b>	<b>155</b>
21/11/2021 (sewe weke)	160	220
05/12/2021 (nege weke)	498	482

**Knolle wat in die winter in grond geberg word, is 'n sagte teiken vir aartappelmot.**

Aartappelmot oorwinter nie. Die duur van die lewensiklus is net heelwat langer in die winter as in die somer. Monitoring op Roodeplaat het gewys dat motte regdeur die winter gevang word, ten spyte van die feit dat minimumtemperatuur dikwels onder vriespunt daal. Indien knolle geberg word in grond, moet die boer seker maak dat hulle nie bereikbaar is vir die larwes wat in die winter uitbreei nie.

**Deltavalle met feromoonlokaas is 'n veilige, eenvoudige en goedkoop manier om motgetalle te monitor.**

Feromoon is baie spesifiek vir 'n bepaalde spesie. Dit is dus ook 'n manier om vas te stel of *Tuta absoluta* in 'n streek voorkom en of dit in groot getalle voorkom.

*Feromoonkapsule*

Vervangbare taai strook waaraan motte vassit.



**“Hoe ver vlieg motte?”**

Hierdie aspek van aartappelmot is nog nie in Suid-Afrika bestudeer nie, maar uit die VSA word berig dat motte sowat 240 m ver kan vlieg. Dit is moontlik dat hulle nog verder kan vlieg as 'n mens die resultate in die gedeelte '*Feromoonvalle help mens sien wat aangaan*', in aanmerking neem.

Motvlugte sal deur wind beïnvloed word, maar hulle word nie in hoë-lugstrome opgeneem om oor lang afstande te migreer nie. Aartappelmot en *Tuta absoluta* word oor lang afstande in knolle en saailinge (*tuta*) versprei. 📍

Vir meer inligting, kontak dr Fienie Niederwieser by [fienie@potatoes.co.za](mailto:fienie@potatoes.co.za) of 083 634 4848.

# Laatroes

## op aartappels

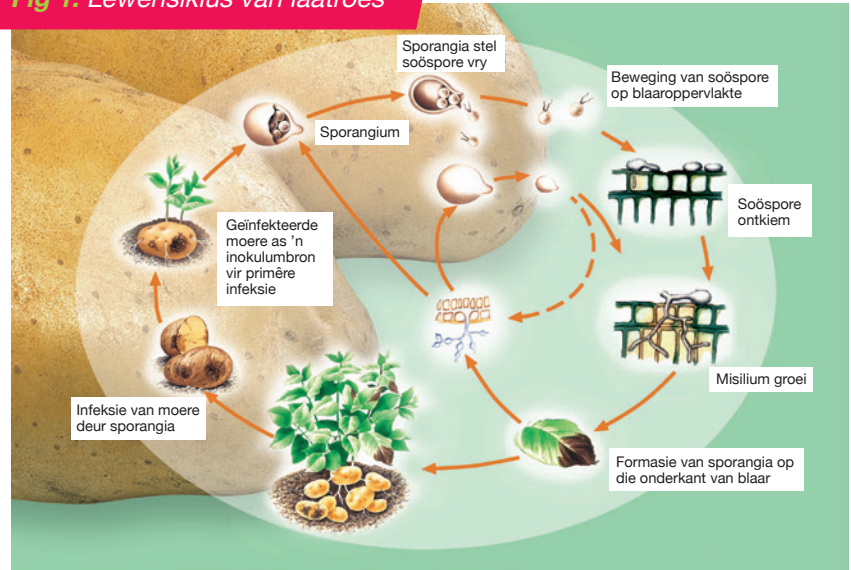
### Laatroes

Die patogeen *Phytophthora infestans* "laatroes" is een van die grootste bedreigings vir die aartappelproducent regoor Suid-Afrika. Indien laatroes nie korrek beheer en bestuur word nie, kan die siekte geweldige groot opbrengsverliese meebring. Die implementering van 'n geïntegreerde swamdoderprogram is daarom van kardinale belang, ten einde jou aartappelgewasse die beste moontlike beskerming te bied en 'n suksesvolle oes te verseker.

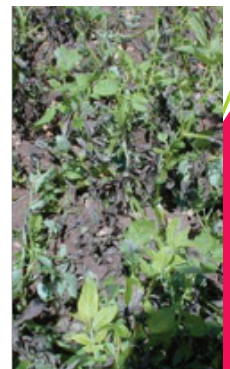
### Die lewensiklus

Die laatroes-patogeen kan seksueel en aseksueel voortplant. In Suid-Afrika is slegs die aseksuele fase geïdentifiseer. Die aseksuele fase is bekend om vinnig weerstand op te bou.

Fig 1. Lewensiklus van laatroes



### Tipiese laatroessimptome



## Ideale laatroeskondisies

- // Dagtemperatuur tussen 15 °C en 24 °C.
- // Nagtemperatuur nie minder as 10 °C nie.
- // Vog moet op die oppervlakte van die plant teenwoordig wees.
- // Relatiewe humiditeit van 90% en hoër.
- // Hoë humiditeit en vog moet teenwoordig wees vir die patogeen om te ontwikkel en om infeksie te veroorsaak.

## Weerstandbestuur ([www.frac.com](http://www.frac.com))

Weerstandbestuur is baie belangrik in die samestelling van 'n spuitprogram. Dit is bewys dat laatroes weerstand teen aanhoudende gebruik van produkte met dieselfde metode van werking ontwikkel. Weerstand is reeds aangeteken teen sekere aktiewes in Suid-Afrika en dit is raadsaam om die volgende in ag te neem met die keuse van laatroesprodukte:

- // Monitor siektevoorkoms, voorspelling en waarskuwingstelsels.
- // Waar weerstand geïdentifiseer is, moet 'n strategie wat die gebruik van produkte met verskillende metodes van werking insluit, geïmplimiteer word.
- // Wisseling tussen 'n sistemiese produk soos **INFINITO**® en 'n kontakwerkende produk soos **ANTRACOL**® is 'n belangrike aspek om weerstandsbestuur toe te pas.
- // Swamdodgebruik en siektedruk moet professioneel benader word en gereeld hersien word, om korrekte weerstandsbestuurpraktyke toe te pas.
- // Produktetikette dui die verskillende metodes van werking van die produkte aan. Die produkte moet afgewissel word om weerstandsbestuur toe te pas. Meer inligting is beskikbaar by <https://www.frac.info/>

## Eienskappe van laatroesswamdoders

Swamdoders speel 'n belangrike rol in die geïntegreerde beheer van laatroes. Die drempelwaarde vir laatroes is nul om infeksie te vermy.

## Swamdoder metode van werking:

- // **Kontakswamdoder** – Spore word gedood voor of met ontkieming voor penetrasie. Die swam moet teenwoordig wees op die blaar- of stamoppervlakte voordat die spore ontkiem of penetrasie plaasgevind het.
- // **Kuratiw swamdoder** – Die swamdoder is effektief teen die patogeen gedurende die onmiddellike na-infeksie periode, maar voor simptome sigbaar word m.a.w. die latente periode.
- // **Anti-sporulante swamdoder** – Letsels word geïmpak deur die swamdoder wat die spoorformasie laat afneem en/of die lewensvatbaarheid van die spore verminder.

Laatroesbeheerstrategieë is primêr voorkomend deur kontakswamdoders soos **ANTRACOL**® te spuit. Wanneer weersomstandighede gunstig is vir laatroes, kan 'n kuratiw en anti-sporulant soos **INFINITO**® gebruik word. Hou in gedagte dat die simptome twee tot drie dae neem om te verskyn. Kuratiw produkte moet toegedien word voor simptome waargeneem word.

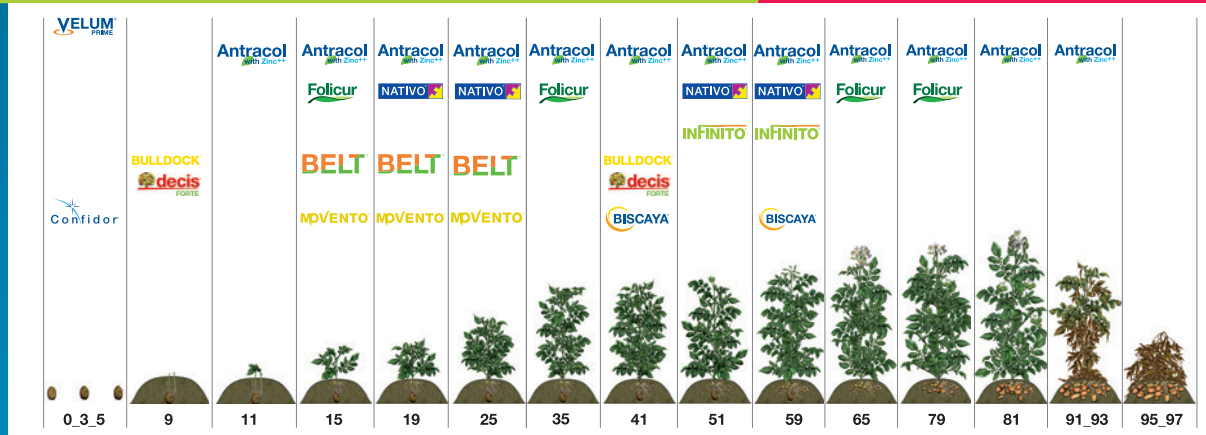
## Kontak beheer met Antracol®:

- // **ANTRACOL**® is 'n meerdoelige swamdoder wat vroeë- en laatroes voorkomend beheer.
- // Wanneer toegedien word op plante, versprei die aktiewe bestanddeel en bind op die oppervlakte van die plant, maar dit penetreer nie die plantweefsel nie.
- // Net behandelde plantdele word beskerm.
- // Die mikro-voedingstof sink in Propineb is teenwoordig in 'n komplekse vorm wat maklik deur die plant opgeneem word. Sink speel 'n belangrike rol in biochemiese bane van die plant.
- // **ANTRACOL**® is 'n WP-formulasie en los goed op in water. Slytasie op spuitstukke word drasties verminder in vergelyking met ander meerdoelige swamdoders.

## Sistemiese beheer met Infinito®:

- // Dit is 'n formulasie met twee aktiewe bestanddele, Fluopikolied en Propamokarb. Hierdie bestanddele werk hand aan hand om elke deel van die aartappelplant te beskerm – blare, stam en moere.
- // **INFINITO**® val die laatroespatogeen aan op elke stadium van die lewensiklus, soos beklemtoon in **Fig 2**.

Fig 2: Voorbeeld van 'n Gewasbeskermingsprogram op Aartappels



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## Limpopo-kultivarproef onder besproeiing op Dendron in 2021

Deur Chantel du Raan, Aartappels SA

Die Limpopo-produksiegebied produseer sowat 22% (2019-oesjaar) van die land se totale aartappelproduksie – die hoogste in Suid-Afrika. Hierdie streek plant aartappels onder besproeiing vir tafelgebruik en verwerking, en die hoofkultivars vir tafelaartappels sluit Mondial, Valor en Sifra in.

Proewe word op Dendron uitgevoer, 'n klein Bosvelddorpie op die R521, ongeveer 61 km noordwes van Polokwane. Dendron is geleë in 'n tropiese somerreënvalgebied met 'n jaarlikse gemiddelde reënval van 403 mm (Figuur 1).

Baie lang, warm en gedeeltelik bewolkte somers kom voor, terwyl die winters kort, koel en droog is. Een rede vir dié streek se groot

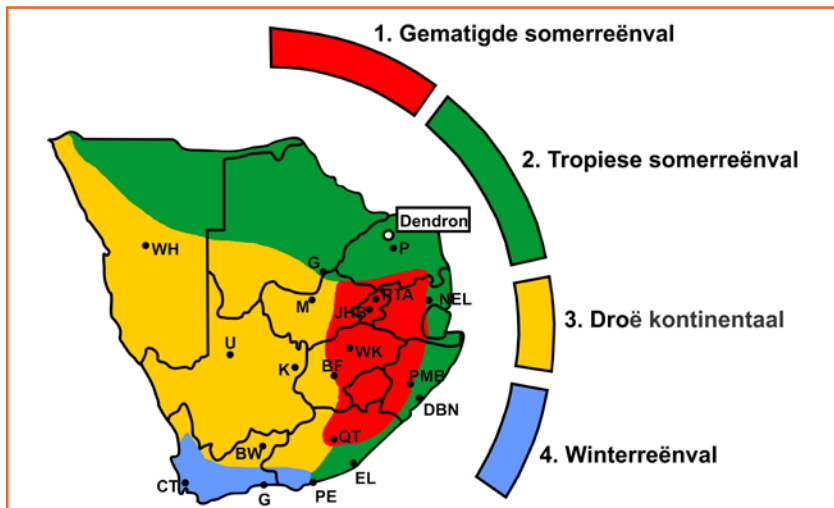
bydrae tot die bedryf, is die feit dat dit twee produksieseisoene het. Dit sluit 'n vroeë aanplanting wat gedurende Januarie tot Maart geplant word in, terwyl die hoof aanplanting vanaf April tot en met Julie geplant word.

Die 2021-proef is in sandleemgrond in 'n ewekansige blok-ontwerp met drie herhalings uitgevoer. Verdere tegniese inligting rakende die proefperseel en uitleg, word in Tabel 1 opgesom.

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 van die omgewing en bestuurspraktyke af, wat wissel tussen lokaliteite asook kultivars, onder andere as gevolg van die verskillende groeitydperke.

Die kultivars, plantgereedheid van moere, standpersentasie en halmtelling van hierdie proef word in Tabel 2 aangedui.

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



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

Plaas	Zandput Boerdery
Boer	Mossie Jongbloed
Plantdatum	11 Mei 2021
Oesdatum	30 September 2021
Besproeiing/droëland	Besproeiing
Dubbel- of enkelrye	Twee enkelrye per kultivar
Loofafsterwe	Natuurlik
Tussenry-spasiëring	0.9 m
Inry-spasiëring	0.30 m
Proefperseel per eenheid	18 m <sup>2</sup>
Plantestand	37 037 plante/ha

**Waarde van abiotiese faktore**

Temperatuur, dagliglengte en water is die belangrikste abiotiese faktore wat die groeipatroon, opbrengs en gehalte van aartappels beïnvloed. Om die aanpassingsvermoë van nuwe kultivars in die Dendron-omgewing te bepaal, moet hierdie faktore in aanmer-

king geneem word 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 langtermyn-weerdata (laaste vyf jaar) is vanaf die

Zandput-stasie op die proefperseel verkry. Ondergemiddelde reënval is regdeur die groeiseisoen van 2021 ondervind. Kumulatiewe reënval vir die groeiseisoen (1.8 mm) was laer in vergelyking met die gemiddelde kumulatiewe langtermynreënval van 6.2 mm (Figuur 2).













Wat die maksimum- en minimum-temperature betref, het die weerstasie egter 'n tegniese probleem ondervind en is 'n gedeelte van Mei se minimum- en maksimumtemperatuur nie beskikbaar nie.

Beide die minimum- en maksimumtemperatuur (Figuur 3) was regdeur die 2021-groeiseisoen laer in vergelyking met vorige jare (langtermyn-data), veral gedurende Julie, toe die temperatuur tot -1.18 gedaal het. Die maksimumtemperatuur was ook relatief laag in vergelyking met vorige jare en daar was slegs 17 dae bo 30°C, en twee dae bo 35°C.

**Hitte-eenhede volg langtermyn-tendens**

Hitte-eenhede is nog 'n belangrike

**Tabel 2: Karaktereïenskappe rakende groeitydperk, plantgereedheid, stand (%) en halmtellings vir elke kultivar in 2021.**

Agente	Kultivar	Groeitydperk (dae) <sup>1</sup>		Plant-gereedheid <sup>2</sup>	Stand (%)	Halms per plant	Halms per ha
 First Potato Dynamics	Abalone	Medium	(90-110)	3	94	2.2	76 688
 First Potato Dynamics	Adato	Medium tot lank	(110-115)	2	100	2.9	107 407
 Zytem	El Mundo	Kort tot medium	(90-100)	1	100	1.9	69 959
 RSA	Foxy	Kort tot medium	(95-100)	2	97	7.4	266 013
 GWK	Lanorma	Kort	(80-90)	2	97	1.9	68 301
 Zytem	Mondeo	Medium	(90-110)	2	100	2.4	88 889
 LUCI grow	Mondial	Kort tot medium	(95-100)	2	100	3.4	125 926
 LUCI grow	Panamera	Kort tot medium	(95-100)	2	100	1.4	51 852
 LUCI grow	Sababa	Medium tot lank	(110-115)	2	97	1.9	68 301
 LUCI grow	Sifra	Kort tot medium	(90-100)	3	85	3.7	116 884
 First Potato Dynamics	Sound	Medium	(100)	2	85	4	126 362
 GWK	7 Four 7	Kort	(80)	2	97	3	107 843
 LUCI grow	Tyson	Kort tot medium	(90-100)	3	88	2.1	68 627

<sup>1</sup>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 dae; Lank: 90 tot 140 dae.

<sup>2</sup>Plantgereedheid van moere: 1 - vars, 2 - effens vars, 3 - plantgereed, 4 - effens oud, 5 - oud.

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 2021-groei seisoen het dieselfde tendense getoon as langtermyn data en word in *Figuur 4* aangedui. Aan die einde van die seisoen was die kumulatiewe hitte-eenhede 11.4% laer as die kumulatiewe langtermyn hitte-eenhede.

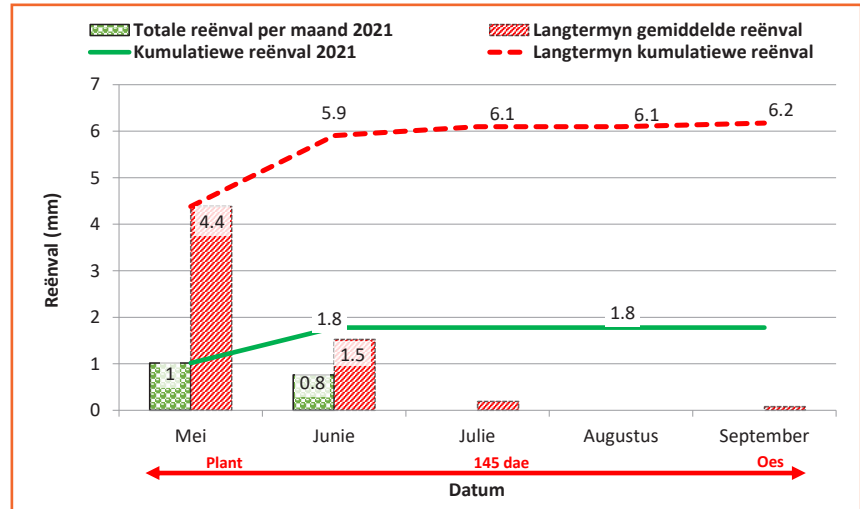
Die opbrengsdata is statisties verwerk met behulp van die GenSta<sup>®</sup>-program, en die gemiddelde geskei deur die Tukey-toets van kleinste betekenisvolle verskille (KBV) te gebruik. Die kultivareffek gedurende die 2021-proewe (*Figuur 5*) was statisties beduidend ( $p < 0.05$ ) ten opsigte van opbrengs, terwyl die koëffisiënt van variasie (KV) laag (10.2%) was. Dit dui aan dat die proewe goed uitgevoer en die resultate betroubaar is.

Die gemiddelde opbrengs vir die kultivarproef was 70.4 t/ha. Gedurende die 2021-proewe (*Figuur 5*) het die kultivars Foxy, Mondial, Sababa, Mondeo, Sound, Sifra, El Mundo en Panamera die hoogste opbrengste gelewer. Kultivars Foxy, Mondial, Sababa, Mondeo, Sound en Sifra het 'n hoër opbrengste as die proefgemiddeld (70.4 t/ha) bereik.

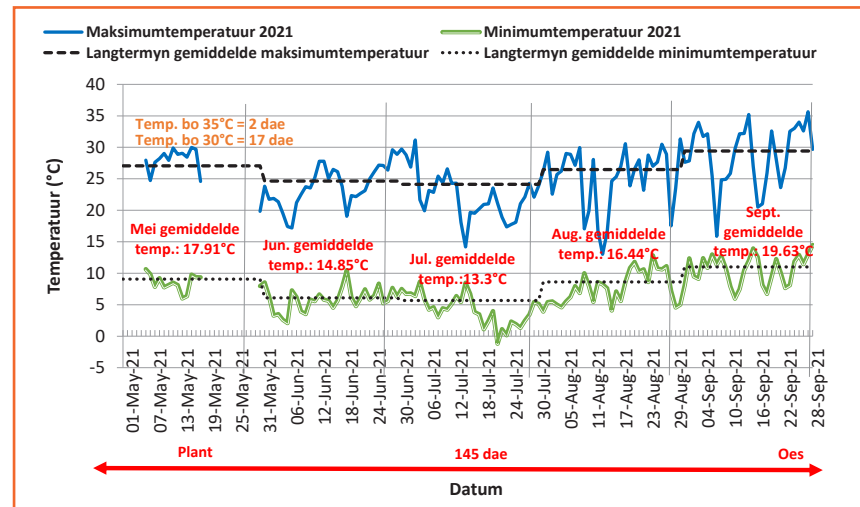
Ten einde kultivarprestasie in terme van opbrengs en gehalte te bepaal, is die opbrengs, grootte-groepverspreiding en klas gebruik om 'n bemarkingsindeks teen die gemiddelde markprys vir die betrokke dag te bereken. Die opbrengs, vermenigvuldig met die heersende prys wat deur die grootte-verspreiding en gradering bepaal word, gee die bemarkingsindeks (*Figuur 5*).

Mondeo het die hoogste bemarkingsindeks behaal, wat aan 'n kombinasie van hoë persentasie groot knolle (*Figuur 6*) en 'n hoë persentasie Klas 1-aartappels (*Figuur 7*) wat die kultivar gelewer het, toegeskryf kan word.

**Figuur 2: Reënval gedurende die groeiseisoen (2021) asook die langtermyn gemiddelde reënval.**

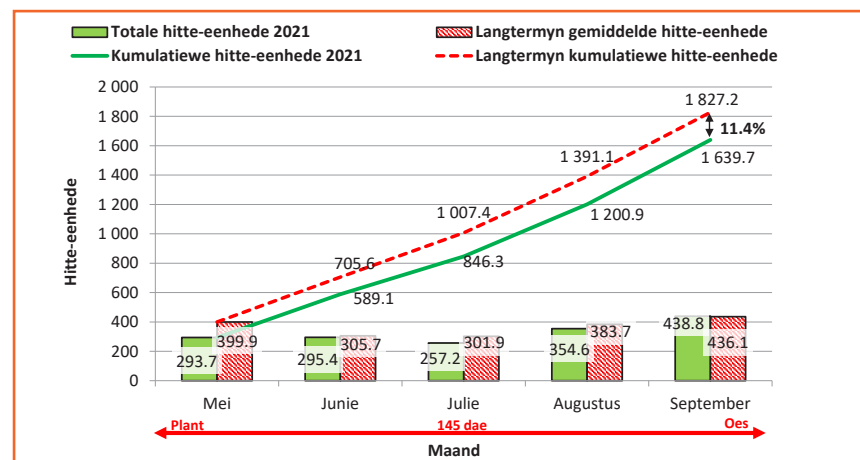


**Figuur 3: Minimum- en maksimumtemperatuur (°C) gedurende die groeiseisoen (2021) asook die langtermyn temperatuur.**



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

**Figuur 4: Hitte-eenhede gedurende die groeiseisoen (2021) asook die langtermyn gemiddeld.**





Duimnaelkrake ontstaan na 'n ligte besering aan die skil, sonder kneusing van die onderliggende weefsel. Koeler weer tydens oes kan veroorsaak dat knolle geneig is om te kraak. Sommige kultivars is meer sensitief hiervoor, en vier kultivars in die Dendron-proef het duimnaelkrake getoon. Genoegsame kalsium en magnesium help om duimnaelkrake te voorkom.

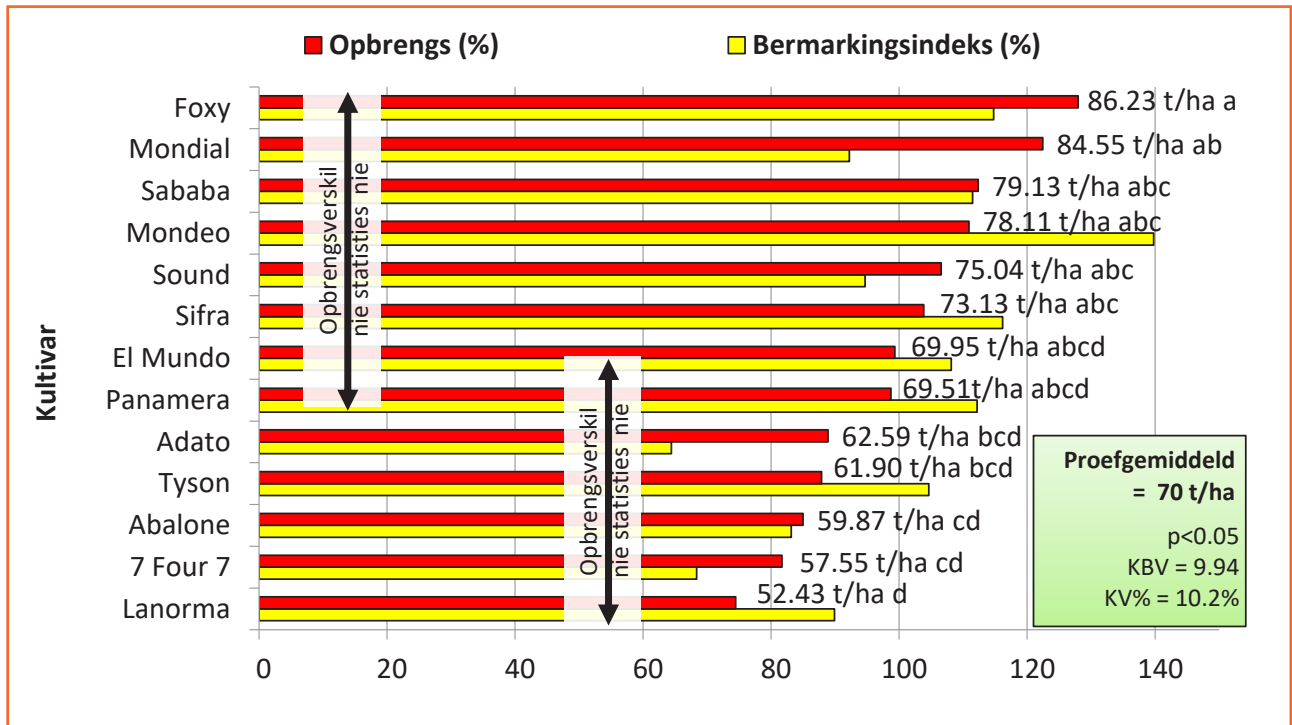
Tabel 3: Hoofredes vir afgradering tydens die Dendron-oes in 2021.

Kultivar	Bruinskurf	Duimnaelkrake	Sekondêre groei	Insekskade	Misvorming	Motskade	Rhizoctonia	Sandspleet	Vergroening
Abalone	X			X					
Adato		X							
El Mundo			X		X				X
Foxy	X								X
Lanorma	X			X	X				
Mondeo		X	X						X
Mondial			X						X
Panamera		X	X						X
Sababa		X							
Sifra						X			X
Sound					X				X
7 Four 7	X			X				X	X
Tyson							X		



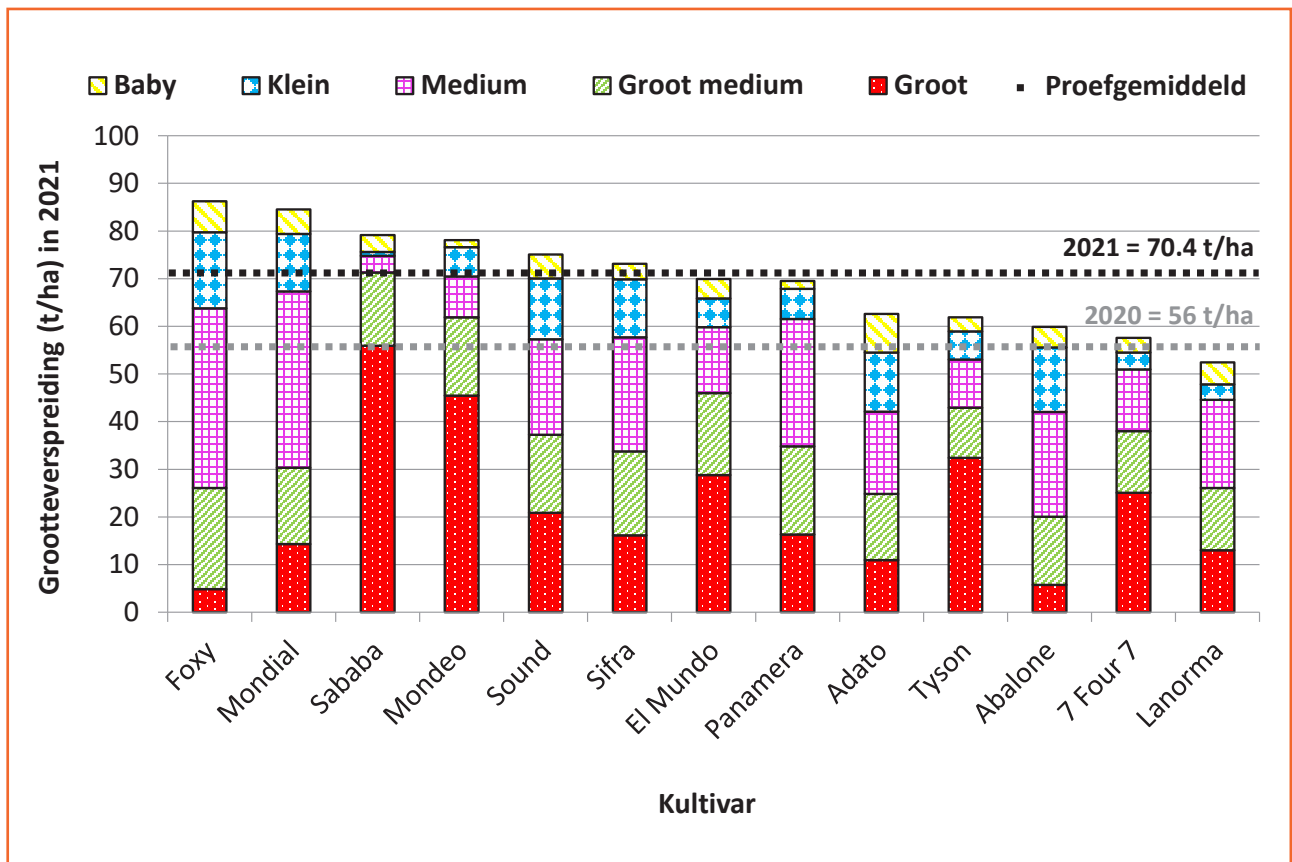
Een rede vir dié streek se groot bydrae tot die aartappelbedryf, is die feit dat dit twee produksieseisoene het.

Figuur 5: Totale opbrengs en bemarkingsindeks per kultivar as persentasie van die proefgemiddeld vir 2021.

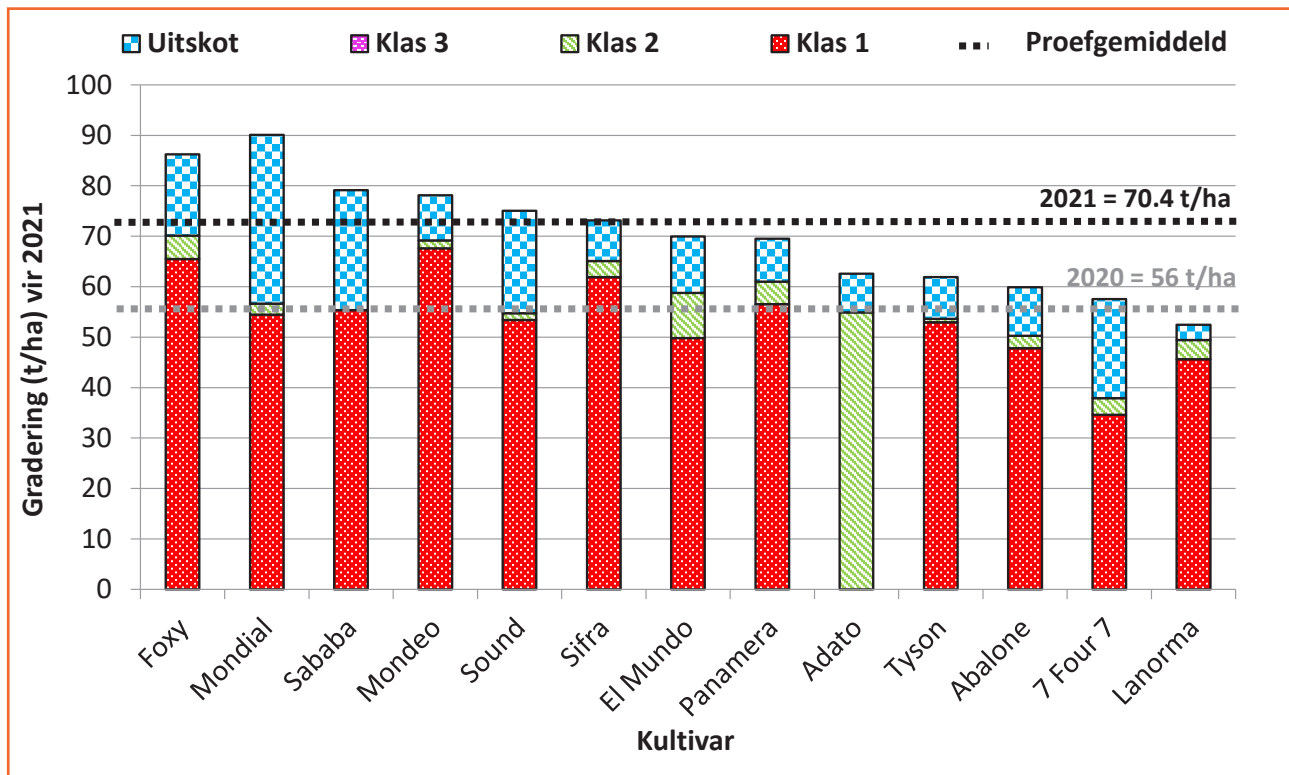


\*Waardes gevolg deur dieselfde letter is nie beduidend verskillend van mekaar nie.

Figuur 6: Groottegroepverspreiding van elke kultivar tydens finale oes.



Figuur 7: Gradering van elke kultivar tydens finale oes.



Tabel 4: Prosseringseienskappe en interne gehalte van die kultivars in die 2021-proef. (Uitgevoer deur die Landbounavorsingsraad Roodeplaat)

Kultivar	Skyfkleur <sup>1</sup>	SG <sup>2</sup>	Droëmateriaal (%) <sup>3</sup>	Holhart	Bruinplek
Abalone	43	1.067	17.49	0	0
Adato	63	1.072	18.48	0	0
El Mundo	47	1.060	16.04	0	0
Foxy	42	1.059	15.85	0	0
Lanorma	58	1.066	17.34	0	0
Mondeo	44	1.064	16.85	0	0
Mondial	57	1.062	16.47	0	0
Panamera	58	1.064	16.92	0	0
Sababa	53	1.064	16.91	0	0
Sifra	60	1.066	17.29	0	0
Sound	55	1.066	17.27	0	0
7 Four 7	49	1.060	15.92	0	0
Tyson	46	1.065	17.06	0	0
≥ Norm (Aanvaarbaar vir prossering)			< Norm (Onaanvaarbaar vir prossering)		

<sup>1</sup>Skyfkleur met waarde >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.<sup>2</sup>Soortlike gewig van >1.075 is aanvaarbaar vir die prosseringsbedryf.<sup>3</sup>Die persentasie droëmateriaal is 'n berekende waarde:  $DM\% = 24.182 + 211.04 * (SG - 1.0988)$ . Die werklike persentasiewaarde sal effens verskil tussen kultivars uit hierdie berekeningswaarde.

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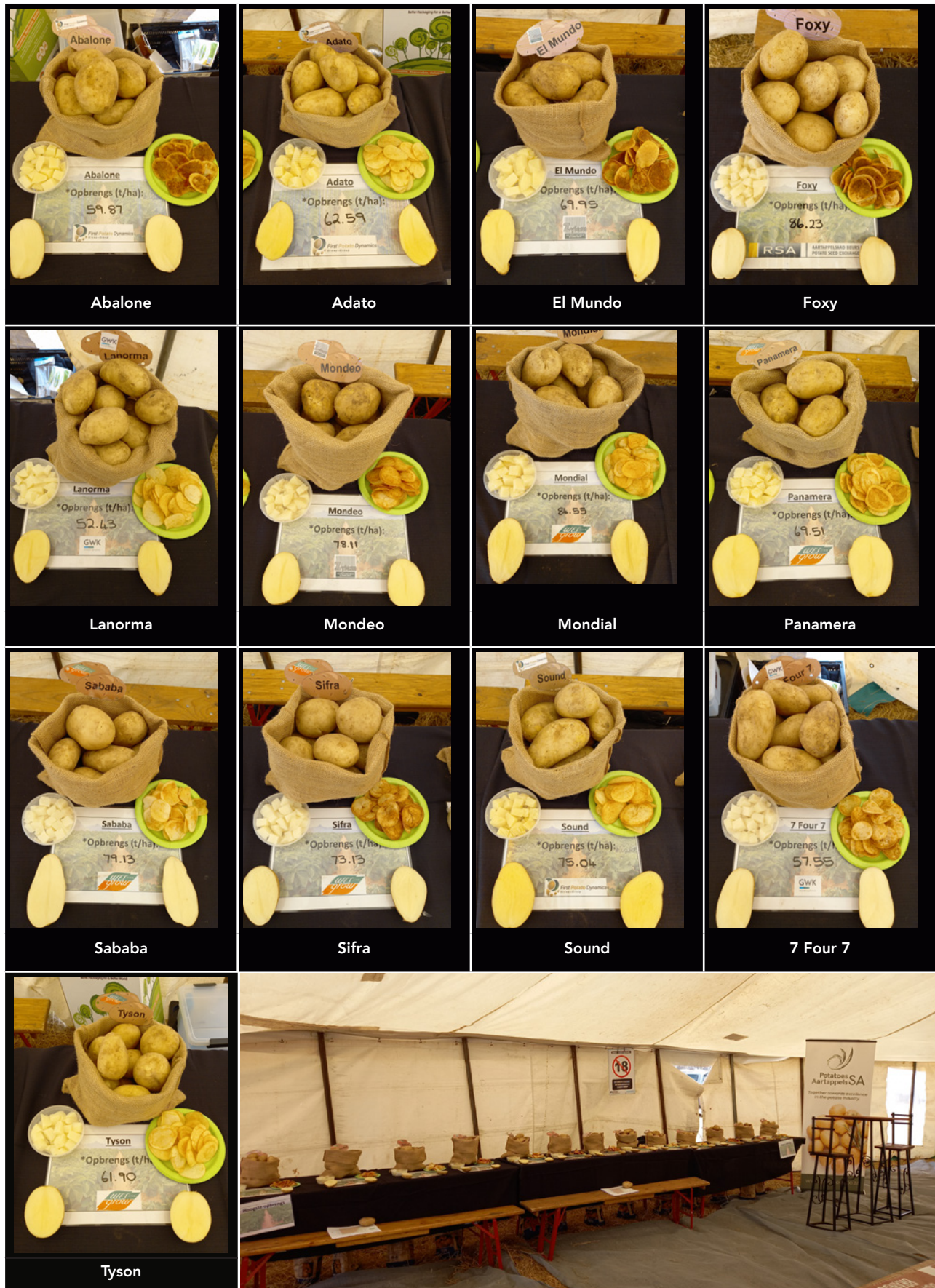
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Tabel 5: Vleeskleur en interne gehalte van die opbrengs vir 2020/2021 in Ceres/Koue Bokkeveld.



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

### Evaluasie van opbrengs

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. Dié inligting maak dit moontlik om die werklike opbrengs behaal in die proef, met gesimuleerde potensiële opbrengste te vergelyk.

Die verskil tussen die potensiële en werklike opbrengste is die opbrengsgaping. Dit illustreer hoe doeltreffend produsente hul omgewing en beskikbare hulpbronne gebruik om 'n hoë opbrengs te behaal.

Die verhouding tussen werklike opbrengs (70.14 t/ha) en potensiële opbrengs (82.0 t/ha) van die proef was 85.5% – 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, gegewe die klein opbrengsgaping.

Aangesien die kultivarproef vir die tweede keer in Dendron uitgevoer is, kan daar nog nie terugvoer oor die prestasie van die kultivars



*In die Limpopo-produksiegebied word aartappels hoofsaaklik vir tafelgebruik en verwerking geproduseer. Die vernaamste kultivars vir tafelaartappels sluit Mondial, Valor en Sifra in.*

oor die afgelope drie jaar gegee word nie.

Verder is 'n fokus op die interne gehalte van die produk nodig om ekonomiese, optimaal bemerkbare opbrengs en dus winsgewendheid te verseker. Dit sluit belangrike faktore soos prosesseringseienskappe, soortlike gewig (SG) en inwendige defekte (holhart en bruinvlek) in, wat in *Tabel 4* en *5* opgesom word.

Gedurende die 2021-groeiseisoen het al die kultivars, behalwe Abalone, El Mundo, Foxy, Mondeo, 7 Four 7 en Tyson, aan die skyfieleurnorm van >50 vir verwerking voldoen. Die SG, aan die ander kant, het geensins aan die norm van  $\geq 1.075$  vir verwerking voldoen nie. Rakende inwendige defekte, het holhart en bruinvlek by geen kultivar voorgekom nie (*Tabel 5*). 📍

### Met dank aan die volgende medewerkers:

Mossie Jongbloed, produsent, Schalk Grobbelaar, werksgroepvoorsitter, Schalk van Niekerk, RSA Potato Seed Exchange, Jeanine van Jaarsveld, First Potato Dynamics, Chris Prinsloo, Wesgrow, Michelle Lombard, RSA Saadbeurs, Renier Fourie, GWK, Evert van Staden, Yara.

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# Die aartappelblaarmyner: Beheeroopsies teen die papies

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In 'n vorige artikel in *CHIPS* het ons besonderhede van ons navorsing oor die oorsprong van die eerste blaarmyners vir die seisoen, verskaf. Ons bevindinge het aangedui dat blaarmyners vanuit papies wat dormant in geoeste aartappellande agtergebly het, uitbroei. Papies mag ná oes op of net onder die grondoppervlak voorkom, en ontwikkel dan tot volwasse vlieë gedurende die volgende plantseisoen.

Aangesien die ligging van die dormante papies altyd bekend sal wees (voorheen-geoeste lande), kan die verskynsel in geoeste lande uitgebuit word in 'n poging om vlieëgetalle daar te beperk. Indien papies beheer (doodgemaak) of verminder word, kan die eerste infestasies vir die seisoen beperk of vertraag word, wat weer tot beter insekdoderbeheer tydens die seisoen kan bydra.

Ons het drie potensieële strategieë ondersoek om papies in geoeste lande te beheer. Eerstens het ons geregistreerde insekdoders teen papies in die laboratorium geëvalueer. Tweedens het ons die moontlikheid ondersoek dat papies doodgemaak kan word deur hulle onder 'n grondlaag te begrawe, en dertens het ons na die doeltreffendheid van parasitiese nematodes (aalwurms) en fungi onder laboratoriumtoestande gekyk.

## Beheer met behulp van insekdoders

Tien geregistreerde insekdoders is in die laboratorium vir hul doeltreffendheid teen papies geëvalueer. Papies is tussen twee lae filtreerpapier, wat in 'n velddosis van insekdoder vir twee minute geweek is,



*Aartappelblaarmynerpapies (links), met die sterk papiedop wat die papie binne-in beskerm, duidelik sigbaar. Regs is blaarmyners wat uit hul papies, wat deur die papiedoppe beskerm word, kruip.*

geplaas, waarna hulle vir drie weke in skoon, droë Petri-bakkies gelaat is om uit te broei. Vergeleke met die onbehandelde papies, was geen van die insekdoders doeltreffend om die papies dood te maak nie.

Een rede vir die onvermoë van insekdoders om die papies te dood kan wees dat vlieg-papies binne 'n sterk omhulsel, wat as buitelaag dien om die papie te beskerm, gevorm word (Foto 1). Insekdoders mag dus onsuksesvol wees om die papiedop binne te dring, tensy 'n bymiddel vir indringing daarby gevoeg word.

Die meeste insekdoders bevat reeds benatters en bymiddels vir indringing in hul formulering om toediening op blare te bevorder. Agrochemiese maatskappye behoort dus die moontlike insluiting van 'n indringings-bymiddel in samestellings te ondersoek, wat die binne-dringing van die blaarmynerpapiedop moontlik sal maak. Indien so 'n middel

ontwikkel kan word, kan dit in nuwe samestellings of as 'n byvoeging tot bestaande insekdoders gebruik word, en kan dit tot nuwe, doeltreffende beheermiddels teen aartappelblaarmynerpapies lei.

## Begrawing van papies

Eksperimente met die begrawing van papies het getoon dat 'n laag van minstens 16 cm nodig is om papies in die grond dood te maak (Figuur 1). Teen dieptes van 8 cm en minder het van die vlieë daarin geslaag om uit te broei en



*Entomopatogeniese nematodes wat ná 72 uur uit dooie, geïnfecteerde papies te voorskyn kom.*

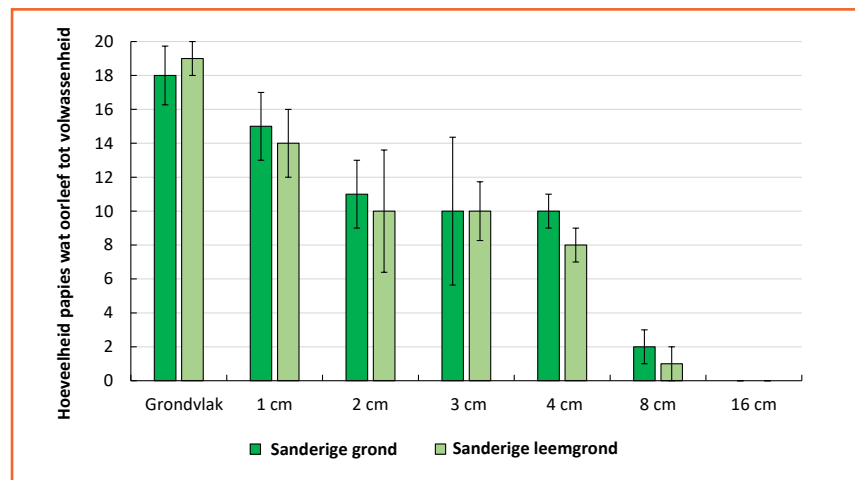
die grondoppervlak te bereik. 'n Aanbeveling kan dus wees om lande so gou as moontlik nadat dit geoes is, maar vóór winter, diep te ploeg om die aantal vlieë wat ná die oorwinteringstydperk kan ontwikkel, te beperk. Hierdie aanbeveling word tans in 'n opvolgprojek getoets, waarvolgens 'n geoes land in blokke verdeel en verskillende bewerkingsaksies daarop toegepas sal word.

### Entomopatogeniese nematodes en fungi

Die gebruik van twee patoogentipes, naamlik entomopatogeniese nematodes (EPN'e) en entomopatogeniese fungi (EPF's), om die papies van die aartappelblaarmyner te beheer, is in laboratorium-eksperimente ondersoek. Foto 2 toon 'n blaarmynerpapie wat deur nematodes geïnfecteer is.

Behandelings het nematodes van die genera *Heterorhabditis* en *Steinernema* ingesluit, terwyl behandelings met fungi die genera *Beauveria* en *Metarhizium* bevat het. Alle behandelings het wesenlike sterftes ( $p < 0.05$ ) tot gevolg gehad in vergelyking met die onbehandelde kontroles, wat daarop dui dat patogene in staat is om blaarmynerpapies te besmet en vrektes

**Figuur 1: Die gemiddelde getal vlieë wat in twee tipes grond uitgebroei het, naamlik 'n sanderige grond en 'n sanderige leemgrond, nadat papies teen dieptes van soveel as 16 cm (n = 20) begrawe is.**



in die laboratorium te veroorsaak (Figuur 2).

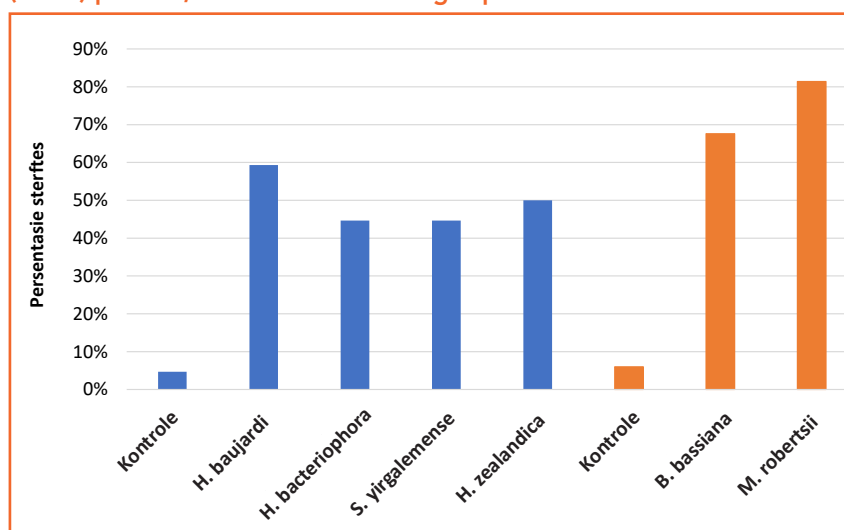
Hierdie patogene kan dus 'n belangrike instrument wees om blaarmynerpapies gedurende die seisoen te beheer, asook in geoes lande. Die resultate van die laboratoriumstudie moet wel in die veld bevestig word, aangesien patogene spesifieke toestande benodig (nabyheid van gasHERE, vog, beskerming teen UV-strale) om doeltreffend te wees. Aanvanklike resultate oor hul vermoë om papies binne te dring, blyk egter belowend te wees.

In die toekoms behoort 'n inokulasie-benadering van in vivo-gekweekte *Heterorhabditis baujardi* en die doeltreffendste lyn van *Metarhizium robertsii* ondersoek te word. Die hipotese is dat hierdie biologiese middels, in terme van ekostelseldienste, saam kan werk om papievrektes in die grond te verhoog en dus tot verlaagde infeksies deur papies in die volgende aartappelgroeienseisoen kan lei.

Die opsie bestaan ook om die doeltreffendheid van reeds geregistreerde produkte (nematodes en fungi wat teen ander peste geregistreer is) teen blaarmynerpapies in die grondongewing te ondersoek.

Uit ons voorlopige resultate is dit duidelik dat meer as een opsie om aartappelblaarmynerpapies in aartappellande te verminder, wel bestaan. Opvolgnavorsing van sommige van hierdie opsies word tans uitgevoer as deel van ons pogings om aartappelboere te help om infestasietydens die vroeë seisoen hok te slaan. Wanneer vroeë seisoeninfestasiedaal, sal blaarmynerreproduksie in lande beperk word en sal insekdoders moontlik meer doeltreffend wees om blaarmyner te beheer. 🍷

**Figuur 2: Blou: Mortaliteitspersentasie van vlieg papies weens nematodes (EPN'e) teen konsentrasies van 200 infektiewe larwes/50 µl water en water sonder nematode as kontrole. Oranje: 1x10<sup>7</sup> spore fungi (EPF's) per ml<sup>-1</sup>, en water sonder enige spore as 'n kontrole.**



Vir enige navrae, kontak dr Diederich Visser by 082 416 3340 of [Dvisser@arc.agric.za](mailto:Dvisser@arc.agric.za)

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Application: 150 ml/  
100 l water

Minimum of 750 ml/ha

Pathogen: Early blight  
(*Alternaria* spp.)  
and Grey mould  
(*Botrytis cinerea*)



# Tutor 500 SC

## EARLY BLIGHT AND GREY MOULD FUNGICIDE

Tutor 500 SC is a translaminar and contact suspension concentrate pre-harvest fungicide for the control of various diseases on onions, peppers, pomegranate, potatoes, strawberries, stone fruit (apricots, nectarines, peaches and plums), table and wine grapes and tomatoes.



Tutor 500 SC (pyrimethanil (aniline derivative) 400 g/l & fludioxonil (phenylpyrrole) 100 g/l)  
Reg. No. L9948 of Act 36 of 1947 Caution

ICA International Chemicals (Pty) Ltd. Reg No: 2001/013319/07

Tel: +27-21-886-9812

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# Minimise fungicide resistance risk: Include Tutor 500 SC in potato early blight programmes



Resistance, or a shift in fungicide sensitivity in early blight and other *Alternaria* spp. populations, can occur in potatoes (Fairchild *et al.*, 2013). A recent study initiated by Potatoes South Africa (PSA) indicated a shift in fungicide sensitivity to several frequently used fungicide groups in *Alternaria* populations in South Africa. This is cause for concern to fungicide suppliers and potato producers alike.

Recommendations by the Fungicide Resistance Action Committee (FRAC) to minimise the risk of fungicide resistance in *Alternaria* blights were published in *CHIPS*, Vol 36 No 1. It lists quinone outside inhibitors, succinate dehydrogenase inhibitors, and

demethylation inhibitors as commonly used fungicide groups for *Alternaria* spp. control. FRAC principles to be adhered to and examples of fungicide mixtures with different FRAC groups are indicated.

A doctoral study by Budde Rodriguez of the North Dakota State University, titled *Sensitivity of Alternaria Species to Ten Single-site Mode of Action Fungicides* and published this year in *Crop Protection*, again highlighted the issue of resistance.

In this thesis, the two anilinopyrimidine fungicides (cyprodinil and pyrimethanil) and fludioxonil are addressed, concluding that all three fungicides provided high levels of disease control, but that

fludioxonil provided the highest level of disease control to the eight *Alternaria solani* isolates assessed. This suggests that fludioxonil would be a strong mixing partner in early blight management application programmes.

## Tutor 500 SC for blight control

Tutor 500 SC (400 g/ℓ pyrimethanil + 100 g/ℓ fludioxonil) (reg. no. L9948, Act 36 of 1947) has already found its niche in potato production areas plagued by *Botrytis*. The recent label extension to include early blight control was only approved after the PSA study and therefore not included. Tutor 500 SC contains two FRAC groups in its

formulation which are not frequently applied for early blight control, namely pyrimethanil FRAC 9 and fludioxonil FRAC 12.

Besides the additional FRAC groups for resistance management, Tutor 500 SC showed excellent early blight control in registration trials, compared to other registered products containing two actives (Figure 1).

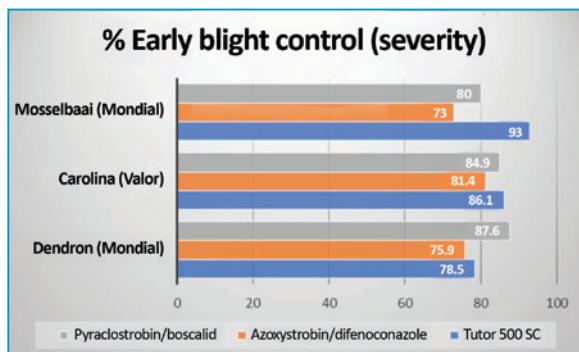
## Mode of action and recommendations

Fludioxonil is a contact fungicide that binds to the outer layers of leaves, preventing spore germination and pathogen growth on the leaf surface. Pyrimethanil is a contact and translaminar fungicide that penetrates plant tissue rapidly, with preventative and curative actions that interfere with the fungi enzymes needed during infection, thereby blocking the ability of fungi to degrade and digest plant tissue.

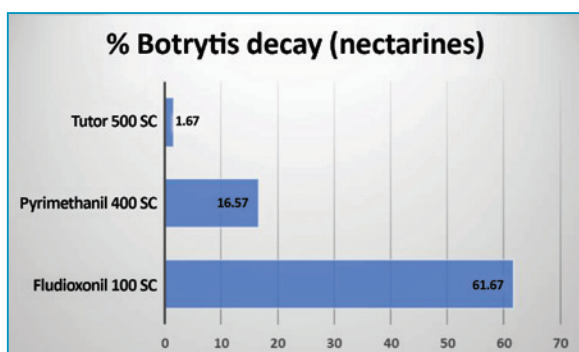
The highly synergistic effect of the two actives in Tutor 500 SC is demonstrated in improved efficacy for *Botrytis* control on nectarines, compared to the single active applications (Figure 2).

It is recommended to commence with preventative fungicide applications prior to disease presence. Always adhere to label recommendations and do not exceed the number of prescribed applications. Include multi-site fungicides in programmes to support the mainstay systemic fungicides and rotate with products that have different modes of action, such as TebuCure 250 EW (tebuconazole FRAC 3; reg. no. L7992, Act 36 of 1947) and Obstructo 250 SC (azoxystrobin FRAC11; reg. no. 9323, Act 36, 1947).

**Figure 1: Efficacy of Tutor 500 SC in controlling early blight of potatoes, compared to registered fungicides containing two actives.**



**Figure 2: Trial on nectarines demonstrating the increased efficacy (synergism) of Tutor 500 SC compared to that of the single active formulations against *Botrytis* decay on inoculated fruit.**



For more information, contact ICA International Chemicals at 021 886 9812 or email [info@icaonline.co.za](mailto:info@icaonline.co.za).

# Wes-Vrystaatse kultivarproef onder besproeiing op Bultfontein in 2021

Deur Enrike Verster en Herman Haak, Aartappels SA, en Izak Cronjé, produsent

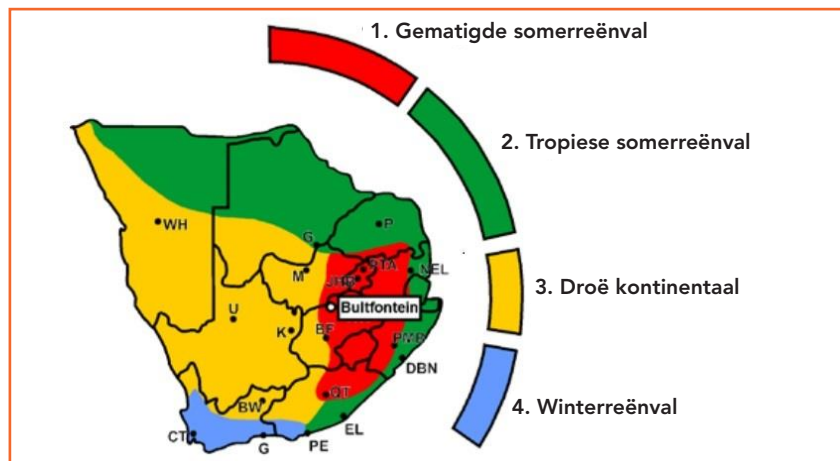
Die Wes-Vrystaat is 'n groot aartappel-produksiestreek met 40 produsente wat sowat 14% van die land se aartappels op ongeveer 7 372 ha produseer. Die mees prominente kultivars vir kommersiële verbruik (tafel- en verwerkingsaartappels) geproduseer, is Mondial (33%), Sifra (39%) en Lanorma (18%).

Bultfontein val in Suid-Afrika se somerreënvalgebied (*Figuur 1*) en het die afgelope 22 jaar 'n gemiddelde jaarlikse reënval van ongeveer 507 mm tussen Oktober en April ontvang.

Die matige klimaat van die streek sluit in baie warm somers (warmste in Desember en Januarie) tot koue winters met ryp wat vanaf April tot Augustus kan voorkom.

Die kultivarproef by Bultfontein is in sandleemgrond uitgevoer en in 'n ewekansige blokontwerp met drie herhalings per kultivar uitgelê. In *Tabel 1* word relevante tegniese inligting rakende die proef uiteengesit. Ingesluit in die kultivarproef is kultivars met kort tot lang groeitydperke. Derhalwe kan groeitydperke die uiteindelijke opbrengs van sekere kultivars beïnvloed.

**Figuur 1: Ligging van Bultfontein in die Wes-Vrystaatse produksiestreek.**



## Groeitydperke

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 2* dui die verskil in groeitydperke tussen kultivars aan. Omgewingsfaktore en bestuurspraktyke beïnvloed ook die verskillende groeitydperke en wanneer hulle 'n aanvang neem.

Stand en aantal halms per moer beïnvloed knol grootte en opbrengs. Die aantal ogies per knol is kultivar-afhanklik en bepaal die hoeveelheid spruite wat per knol voortgebring kan word. Plantgereedheid



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

<b>Plaas</b>	<b>Oasis</b>		
<b>Boer</b>	Izak Cronjé		
<b>Plantdatum</b>	15 Januarie 2021		
<b>Oesdatum</b>	10 September 2021		
<b>Besproeiing/droëland</b>	Besproeiing		
<b>Dubbel- of enkelrye</b>	Dubbelry in een wal		
<b>Loofafsterwe</b>	Natuurlik		
<b>Tussenry-spasiëring</b>	1 m		
<b>Inry-spasiëring</b>	37 cm		
<b>Proefperseel</b>	20 m <sup>2</sup>		
<b>Plantestand</b>	27 000 plante/ha		
<b>Bemestingsprogram</b>			
	<b>Voedingswaarde</b>		
	<b>N (kg/ha)</b>	<b>P (kg/ha)</b>	<b>K (kg/ha)</b>
<b>Totaal</b>	265	88	150

van moere is baie belangrik in hierdie verband, aangesien moere wat plantgereed is gewoonlik daartoe lei dat moere beter spruit en die ideale aantal stamme per spruit voortbring in vergelyking met knolle wat nog nie plantgereed is nie.

Moere wat te oud is maak baie stingels en vorm klein knolle. Die plantgereedheid van moere ten tye van plant van die proef, sowel as standpersentasie en halmtelling wat later in die groeitydperk waargeneem is, word in *Tabel 2* aangedui.

Verteenwoordigende grondmonsters is vóór plant geneem en ontleed om die grondvoedingstatus van die proefperseel te bepaal (*Tabel 3*).

**Opbrengs- en bemarkingsindeks**

Die evaluering van kultivars soos in die Bultfontein-kultivarproef, bied resultate rakende onder meer die opbrengs- en bemarkingsindeks. Die bemarkingsindeks van die betrokke kultivars word bereken deur elke kultivar te klas en sorteer volgens gehalte en grootte-groepe (byvoorbeeld Klas 1 Groot of Klas 2 Groot tot Medium).

Dienooreenkomstige prysvergelings word dan gemaak, met markpryse soos verkry ten tye 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 die volgende kan wissel. Juis daarom word kultivars verkieslik oor 'n aantal seisoene getoets.

Soos met enige gewas is temperatuur, beskikbaarheid van water

**Tabel 2: Karaktereïenskappe rakende groeitydperk, plantgereedheid, stand (%) en halmtellings vir die betrokke kultivars.**

Kultivar	Groeitydperk (dae) <sup>1</sup>		Plantgereedheid <sup>2</sup>	Stand (%)*	Halms per plant	Halms per ha
7 Four 7	Kort	(80)	4	53	4	57 240
Allison	Medium tot lank	(120)	3	94	4.6	116 748
Belmonda	Medium	(100-110)	3	75	2.4	48 600
Connect	Lank	(120)	3	97	5	130 950
Lanorma	Kort	(80-90)	3	83	2.8	62 748
Mondial	Medium tot lank	(110-115)	3	72	4.6	89 424
Noya	Medium tot lank	(120)	3	78	4.8	101 088
Panamera	Medium	(90-110)	3	78	3.6	75 816
Prada	Kort	(70)	3	83	4.2	94 122
Sababa	Medium tot lank	(110-115)	3	64	3.4	58 752
Sifra	Kort tot medium	(90-100)	3	78	4.8	101 088
Sound	Medium	(110)	3	78	5.8	122 148
Taisiya	Kort tot medium	(90)	3	78	4.2	88 452
Tyson	Kort tot medium	(90-100)	3	67	3.6	65 124

<sup>1</sup>Algemene 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.

<sup>2</sup>Plantgereedheid van moere: 1 - vars, 2 - effens vars, 3 - plantgereed, 4 - effens oud, 5 - oud.

\*Standpersentasie is bepaal op een herhaling van elke kultivar wat bestaan uit 18 plante per ry per 10 m, dus 36 plante per plot (dubbelry).

(hetsy goeie besproeiingskedulering of reënval), sowel as hitte-eenhede belangrike faktore wat 'n wesenlike invloed uitoefen gedurende die aartappelplant se groeitydperk. Hierdie faktore word dus in aanmerking geneem wanneer die prestasie van kultivars geëvalueer word.

Toepaslike daaglikse weerdata is vanaf 'n Hortec-weerstasie wat naby die proefperseel opgerig is, verkry. Ongelukkig was resultate slegs vanaf 16 Februarie 2021 beskikbaar, aangesien die stasie eers sedert daardie datum operasioneel was en die naaste Landbounavorsingsraad-weerstasie se temperatuurmetings foutief was vir die betrokke tydperk. Langtermynweerdata is wel vanaf die betrokke LNR-weerstasie verkry.

Die reënval vir die seisoen in Augustus (ná groeitydperk, terwyl aartappels onder die grond geberg was vóór oes) was ongewoon hoog (Figuur 2). Verskeie gehalteprobleme wat ten tye van oes aangeteken is, kan moontlik hieraan toegeskryf word.

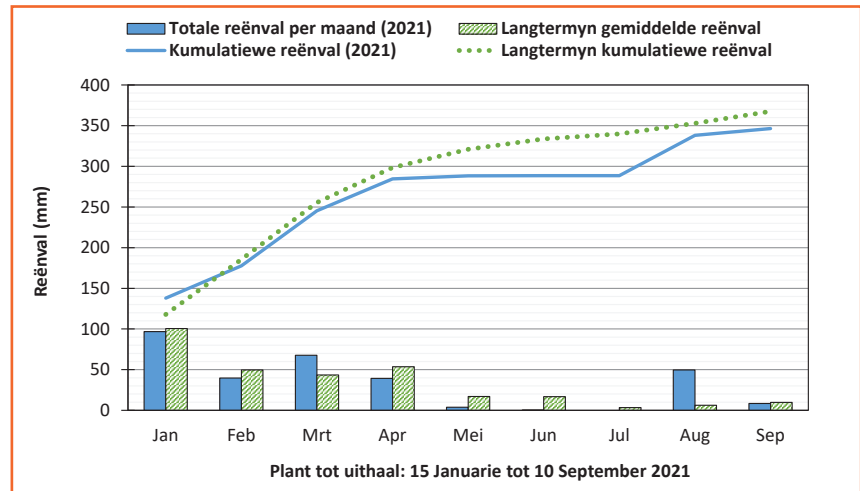
Minimum- en maksimumtemperatuur word in Figuur 3 uiteengesit. Altesaam 23 dae met maksimumtemperatuur bo 30°C is vanaf Februarie tot April aangeteken. Temperature onder vriespunt het in 2021 vanaf ongeveer middel Mei begin, en daarmee saam natuurlike loofafsterwe.

### Hitte-eenhede en opbrengsdata

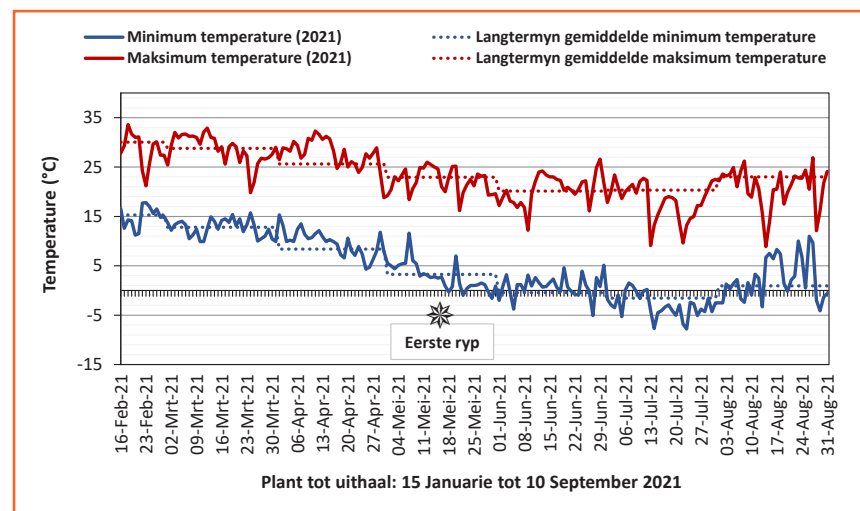
Die versameling van hitte-eenhede gedurende 'n groeitydperk is 'n belangrike faktor in die ontwikkeling van 'n plant. Die tendens van hitte-eenhede beskikbaar vir die kultivarproef van die betrokke seisoen, blyk baie na aan die langtermyndata-tendens te wees tot en met April, met 'n aansienlik hoër versameling van hitte-eenhede vanaf Mei tot September (Figuur 4).

Opbrengsdata wat tydens oesdag versamel is, is aan statistiese verwerking met behulp van die GenStat®-program onderwerp. Die Tukey-toets van kleinste betekenisvolle verskille (KBV) is gebruik om die gemiddelde te skei. Die kultivareffek gedurende die betrokke proef (Figuur 5) was statisties beduidend

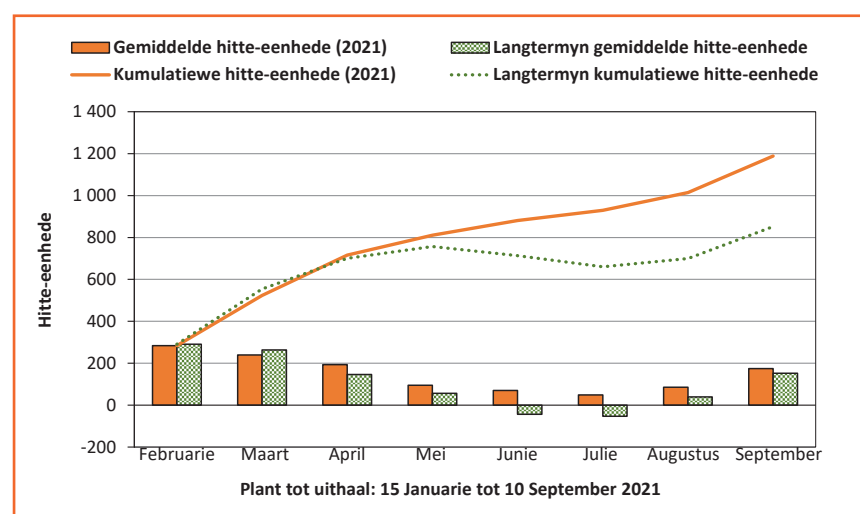
Figuur 2: Reënval (2021-seisoen) en langtermyn gemiddelde reënval.



Figuur 3: Minimum- en maksimumtemperatuur (2021-seisoen) sowel as langtermyn temperature.



Figuur 4: Hitte-eenhede (2021-seisoen) asook langtermyn gemiddelde hitte-eenhede.



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



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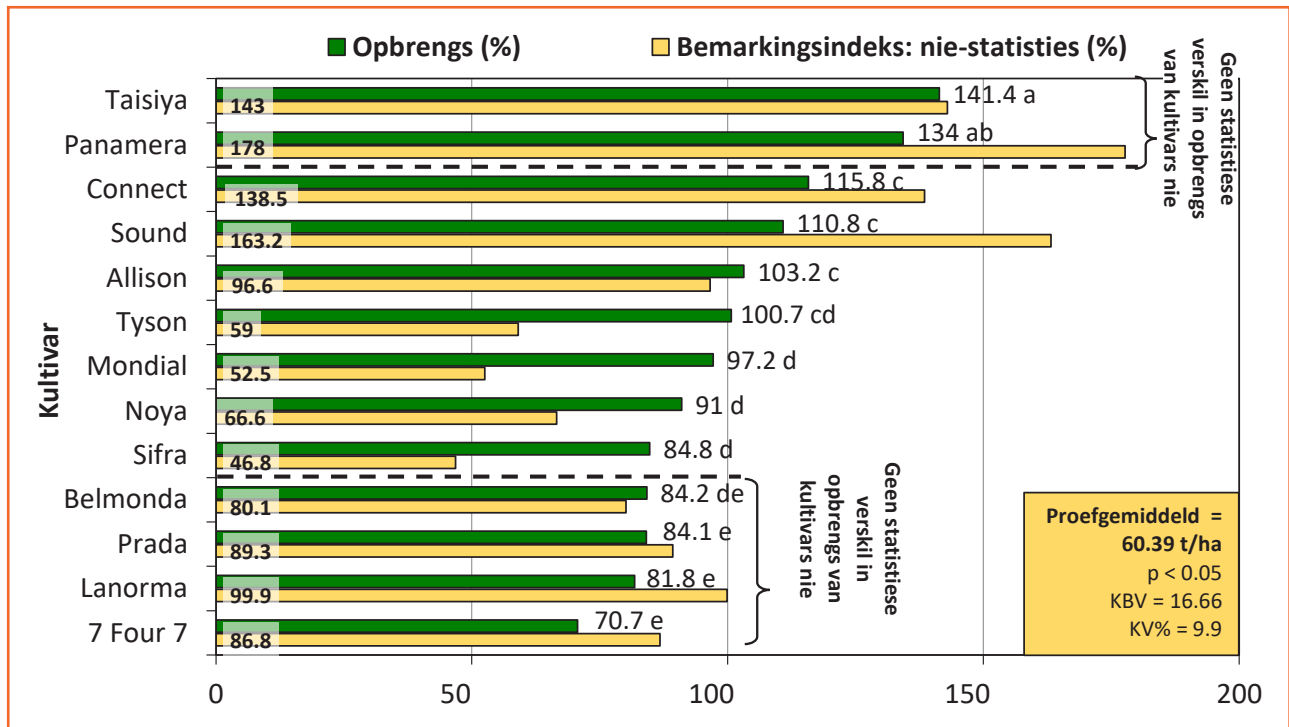
Yara Noord – Petro Gnäde 082 376 3715  
Yara Suid – Jurie de Kock 083 628 9331

Tabel 3: Grondvoedingstatus van proefperseel vóór plant.

pH (KCl)						% KUK <sup>1</sup>			
	P (P-Bray)	K	Ca	Mg	Na	K	Ca	Mg	Na
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	(%)
5.6	35	175	315	60	10	20	58	20	2

<sup>1</sup>KUK = Kation-uitruilkapasiteit.

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



\*Waardes gevolg deur dieselfde letter is nie beduidend verskillend van mekaar nie.



Die kultivarproef by Bultfontein is in 'n ewekansige blokontwerp met drie herhalings per kultivar uitgelê.

( $p < 0.05$ ) en die koëffisiënt van variasie (KV) was laag (9.9%). Hierdie faktore dui daarop dat die proef goed uitgevoer is en die resultate derhalwe betroubaar is.

Die opbrengs van elke kultivar word deur die proefgemiddeld gedeel (die proefgemiddeld van al die kultivars word as 100% geneem). Hierdeur word 'n opbrengsindex geskep en elke kultivar se prestasie in terme van opbrengs, as 'n persentasie van die proefgemiddeld geles.

**Taisiya en Panamera presteer**

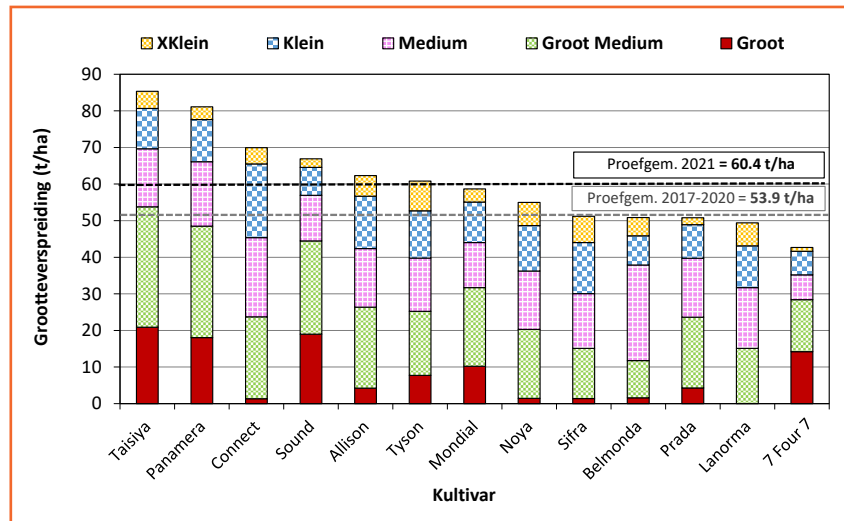
Die gemiddelde opbrengs van die proef vir die 2021-seisoen is 60.39 t/ha, wat aansienlik hoër is as die 2020-proefgemiddeld van 46.77 t/ha. Die kultivars Taisiya en Panamera het die hoogste opbrengs gelewer. Die bogemiddelde opbrengs vir die betrokke seisoen kan moontlik aan goeie weerstoestand toegeskryf word.

Vir die tydperk wat deur die weerstasie aangeteken is, is geen dae met temperature wat 35°C oorskry het aangeteken nie, en die aktiewe groeiseisoen se maksimumtemperatuur het skynbaar ook minder hewig gefluktueer. Oor die algemeen het maksimumtemperatuur meer konstant tussen 25 en 30°C gebly, wat 'n goeie hoeveelheid tyd in optimale groeitemperatuur beteken.

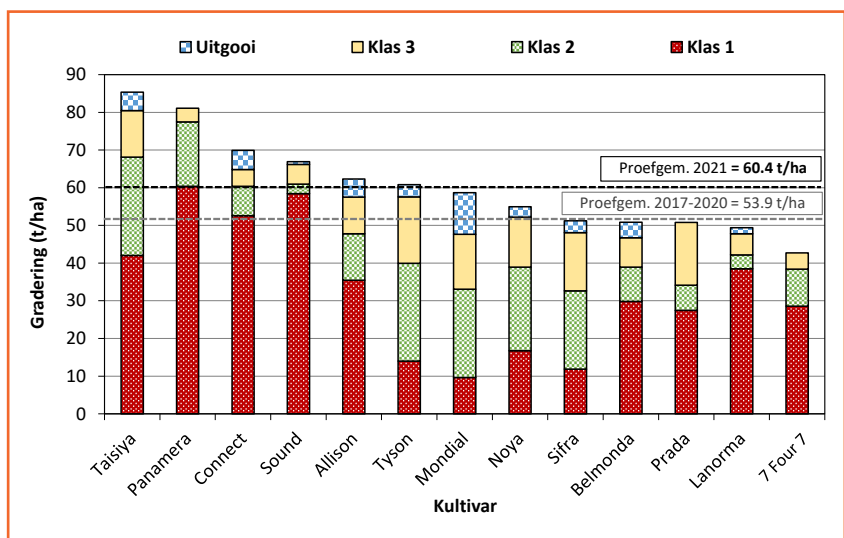
Reëndata dui aan dat ontvangs redelik goed verspreid was vir die waargenome tydperk in die groeiseisoen. Al die bogenelde faktore het gelei tot meer Groot-, Groot-medium- en Medium-aartappels as in die vorige seisoen.

Panamera, Sound, Taisiya en Connect het die hoogste bemarkingsindex behaal en dit kan aan die goeie opbrengs in Groot- en Klas 1-knolle (Figure 5, 6 en 7) toegeskryf word. Groottegroepverspreiding en gradering is onontbeerlike evaluasies wanneer daar na 'n kultivar se bemarkbaarheid gekyk word. Sababa is van groottegroep- en graderingsevaluasies onttrek,

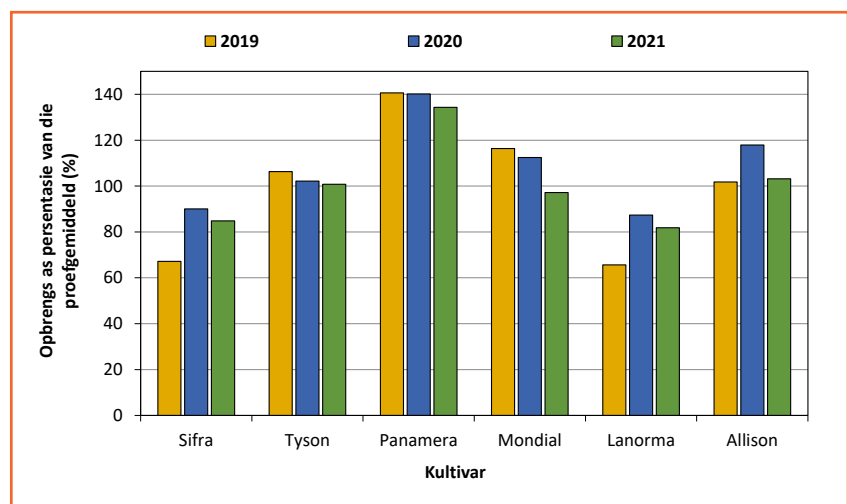
**Figuur 6: Groottegroepverspreiding van elke betrokke kultivar.**



**Figuur 7: Gradering van elke betrokke kultivar.**



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



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Tabel 4: Hoofredes vir afgradering.

Kultivar	Sandspleet	Antraknose	Bruinskurf	Mot	Sagtevrot	Misvorming	Vergroening	Olifantvel	Holhart
7 Four 7	X			X			X		
Allison				X			X		
Belmonda		X		X	X				
Connect				X					
Lanorma				X	X				
Mondial	X		X	X	X	X			
Noya	X	XX	X	X					X
Panamera		X		X					X
Prada	X	XX							
Sifra	X	X	X	X					
Sound				X					
Taisiya	X			X					
Tyson	X			X		X		X	X

aangesien saadvermenging in die kultivar plaasgevind het.


Hoofredes vir afgradering van elke kultivar (Tabel 4) asook interne gehalte is alles belangrike faktore en moet dus ook geëvalueer word. Motskade en relatiewe lae soortlike gewig soos aangeteken in hierdie

proef, is probleme wat kan intree wanneer knolle so lank onder die grond lê vóór uithaal.

Volgens die beskikbare weerdata, is meer hitte-eenhede aangeteken oor die wintermaande as die langtermyn gemiddeld, wat moontlik tot 'n hoër motdruk op die

aartappels wat onder die grond lê, bygedra het.

Soos die aard van seisoene is, fluktueer die prestasie van kultivars van seisoen tot seisoen. Dit is omdat die klimaat eenvoudig nooit eenders is van een seisoen na 'n volgende nie. Derhalwe is dit belangrik om konsekwente prestasie van kultivars oor 'n aantal seisoene in ag te neem. Tyson en Panamera toon tans die minste variasie vir die Bultfontein-proef vanaf 2019 tot 2021 (Figuur 8).

Laastens, wanneer daar na die interne gehalte van aartappels gekyk word, kan kook- en proseseringseienskappe ook geëvalueer word. Om aan proseseringsvereistes te voldoen, moet kultivars aan 'n skyfiekleurnorm van >50 en 'n soortlike gewig (SG) van  $\geq 1.075$  voldoen. Die meeste kultivars het aan die voorgeskrewe skyfiekleur voldoen, maar slegs Belmonda het aan die voorgeskrewe SG (Tabel 5) voldoen. 

Tabel 5: Kook- en proseseringseienskappe van kultivars (uitgevoer deur LNR-Roodeplaas).

Kultivar	Skyfiekleur <sup>1</sup>	DM <sup>2</sup>	SG <sup>3</sup>
7 Four 7	56	16.6	1.063
Allison	48	17.14	1.065
Belmonda	53	20.09	1.079
Connect	53	17.56	1.067
Lanorma	52	17.33	1.066
Mondial	56	15.81	1.059
Noya	57	18.17	1.07
Panamera	47	16.06	1.06
Prada	53	16.86	1.064
Sifra	49	16.85	1.064
Sound	56	18.02	1.07
Taisiya	51	17.56	1.067
Tyson	58	16.44	1.062

<sup>1</sup>Skyfiekleur met 'n waarde van >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.

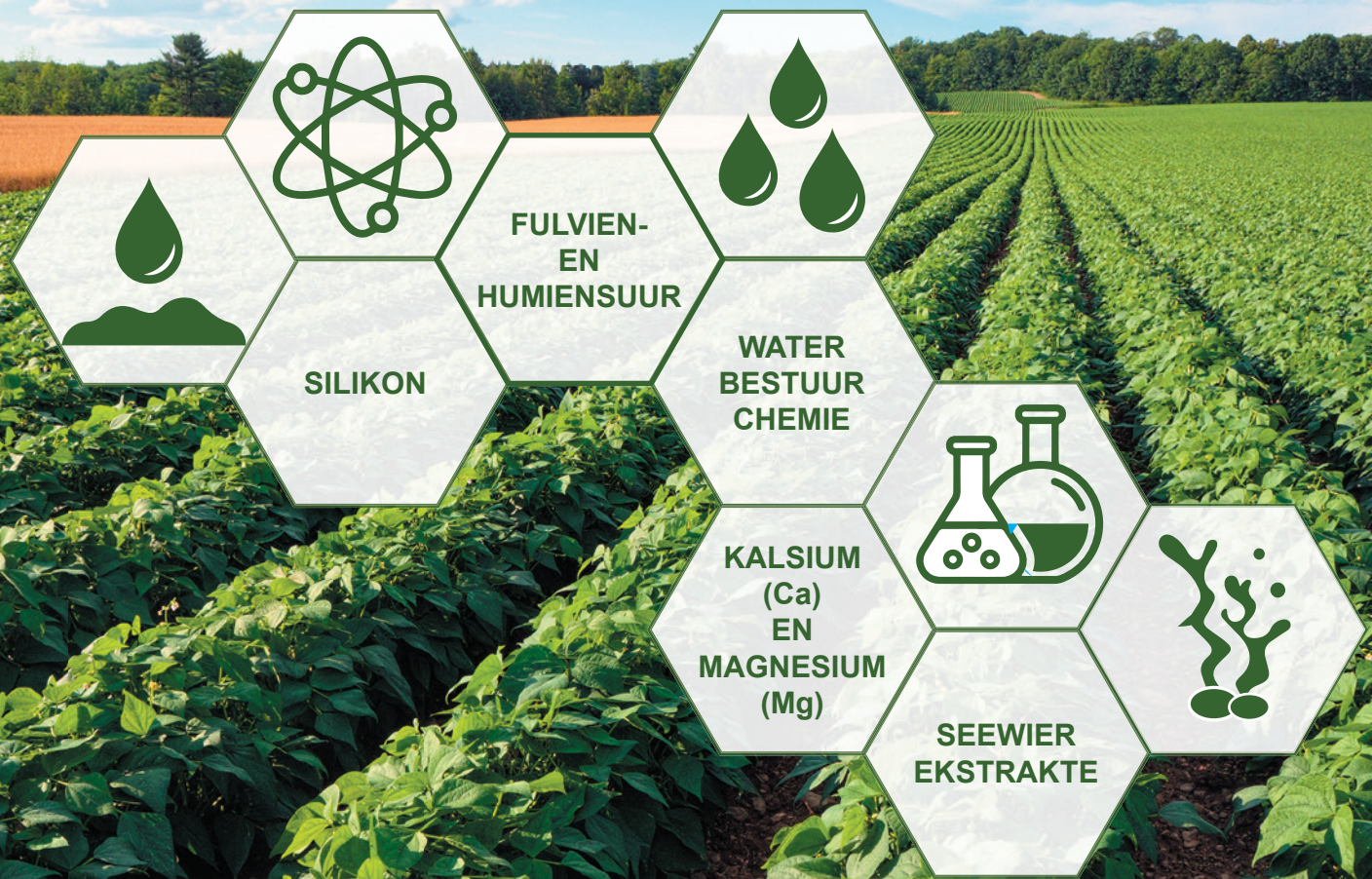
<sup>2</sup>Die persentasie droëmateriaal is 'n berekende waarde:  $DM\% = 24.182 + 211.04 * (SG - 1.0988)$ . Die werklike persentasiewaarde sal effens tussen variëteite verskil.

<sup>3</sup>Soortlike gewig van  $\geq 1.075$  is aanvaarbaar vir die proseseringsbedryf.

Vir meer inligting,  
kontak Enrike Verster by  
[enrike@potatoes.co.za](mailto:enrike@potatoes.co.za)  
of Herman Haak by  
[herman@potatoes.co.za](mailto:herman@potatoes.co.za).

# VERMINDER WATERGEBRUIK EN VERHOOG OPBRENGSTE

Nutrico is 'n plaaslike vervaardiger van grond kondisioneerders en biostimulante en gebruik die nuutste tegnologie om waterinfiltrasie, retensie en die effektiewe gebruik daarvan te bevorder, asook om optimale grondbiologie en wortel gesondheid te fasiliteer.



Kry die Nutrico-toepassing vandag!



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# Beter besproeiings- en grondwaterbestuur met TOLERO™

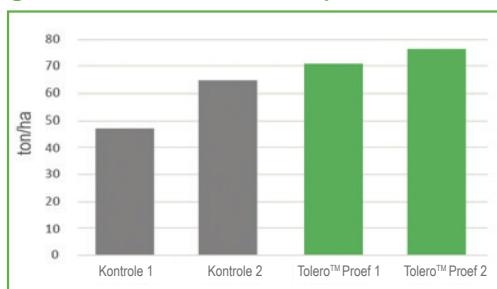
**W**aterlogging en grondversouting is twee belangrike omgewingsprobleme wat in lande regoor die wêreld voorkom, veral in droë en semi-droë lande soos Suid-Afrika. Hierdie probleme het 'n groot impak op grondvrugbaarheid, wat op sy beurt die sukses van gewasopbrengste beïnvloed.

## Versouting van landbougrond

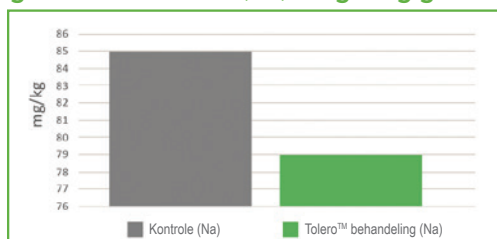
Soutbesproeiingswater bevat opgeloste stowwe bekend as soute, wat chloriede, sulfate, karbonate en bikarbonate van kalsium, magnesium, natrium en kalium insluit. Die soutgehalte van grondwater is afhanklik van grondtipe, klimaat, watergebruik en besproeiingskedules.

Soutgehalte raak 'n probleem wanneer soute in die wortelsone van die grond ophoop. 'n Oormaat soute in die wortelsone verhoed plantwortels om water uit omliggende grond te onttrek. Dit verlaag die hoeveelheid water wat vir die plant beskikbaar is en verhoed uiteraard ook die opname van noodsaaklike voedingstowwe.

**Figuur 1: Die toediening van TOLERO™ op aartappels het 'n verhoging van 32% in opbrengs gehad, gemeet as 'n gemiddelde van die twee proewe.**



**Figuur 2: Die toediening van TOLERO™ op aartappels het 'n verlaging van 7% in grondnatriumvlakke (Na) tot gevolg gehad.**



'n Lugfoto van die TOLERO™-proef op aartappels.

Grond met hoë vlakke van uitruilbare natrium en lae vlakke van totale soute, word sodiese gronde genoem. Swak-gehalte besproeiingswater is die primêre oorsaak van natriumversameling in die grond. Sodiese gronde gee aanleiding tot swak grondstruktuur en waterdreinerings, wat die plant se waterinname belemmer. Swak plantegroei en ontkieming is ook algemeen.

Die goeie nuus is dat sodiese gronde positief reageer op die voortgesette gebruik van goeie besproeiingswater en -metodes, en slim grondbestuurspraktyke, soos die doeltreffende dreinerings van grondvog.

## Waterbestuurstechnologie

Die toediening van grondkondisioneerders deur besproeiingsstelsels is 'n relatiewe nuwe, innoverende waterbestuurstechnologie wat die doeltreffendheid van water optimaliseer en aspekte van die grondstruktuur se gehalte, soos soutinhoud, stabiliseer.

Twee fundamentele groepe grondkondisioneerders vir besproeiing is beskikbaar, naamlik indringings- en retensiemiddels. Indringingsmiddels bevorder indringing in die grondprofiel en verminder waterafloop, -erosie en -verdamping. Retensiemiddels bevorder die waterhouvermoë van die grond en stel water aan plantwortels beskikbaar. Eenvormige en beskikbare grondvog kan plantgesondheid, gewasopbrengste en -gehalte, voedingstofopname en besproeiingsdoeltreffendheid optimaliseer. TOLERO™ (reg. nr. M90, Wet op Misstowwe, Veevoedsel, Landboumiddels en Veemiddels, 1947 [Wet 36

van 1947]) is 'n unieke samestelling van besproeiingsbestuurstechnologieë, en kombineer die eienskappe van indringings- en retensie-grondkondisioneerders. Dit verhoog die behoud van besproeiingswater regdeur die plantwortelsone en bevorder die gewasgroeiomgewing, insluitend die grondsoutvlakke deur middel van doeltreffende waterindringing in die grondprofiel.

## TOLERO™ op die proef gestel

TOLERO™ se doeltreffendheid om gewasopbrengste te verhoog (Figuur 1), asook om grondsoutvlakke te stabiliseer (Figuur 2), is in 'n onlangse proef op aartappels gedemonsteer.

TOLERO™ is tydens plant deur besproeiingsstelsels tesame met ander chemiese middels toegedien. Die eerste toediening teen 2,5 l/ha, is deur drie addisionele toedienings van 1,5 l/ha, ses weke uitmekaar, gevolg. Die resultate van grond- en blaarontledings, gewasgesondheid, besproeiingswaterverbruik en gewasopbrengs is met 'n onbehandelde kontrole vergelyk.

Die proef wys dat toedienings van TOLERO™ konsekwente opbrengste en hoër aartappelgehalte tot gevolg het. Daarby is waterverbruik met soveel as 10% in behandelde gronde verminder, tesame met 'n daling van 7% in grondnatriumvlakke.

Die verbeterde waterretensie en verhoogde opname van voedingstowwe wat die toediening van TOLERO™ teweeg bring, lei tot sterker plantegroei en verbeterde wortelontwikkeling, veral in die vroeë stadia van gewasontwikkeling.

Vir navrae, kontak Nutrico SA by 011 392 4072 of besoek [www.nutrico.co.za](http://www.nutrico.co.za).

# ASA bring mini-simposium na Ceres/Koue Bokkeveld-boere

Deur Chantel du Raan, Aartappels SA

**A**angesien Aartappels SA (ASA) se navorsings-simposium verlede jaar deur die Covid-19-pandemie in die wêreld gery is, is besluit om mini-simposiums in elke produksiestreek te hou. Nie net skep dit 'n unieke geleentheid om meer op streeks-gebonde uitdagings te fokus nie – dit gee ook aan daardie produsente wat nie die jaarlikse navorsings-simposium kan bywoon nie, die geleentheid om aan die interaksie deel te neem.

ASA se navorsings- en ontwikkelingsafdeling het die voorreg gehad om op 24 November 2021 die dag saam met produsente van die Ceres/Koue Bokkeveld in die Wes-Kaap te spandeer. Die nuutste beskikbare inligting asook huidige navorsingsprojekte is toegelig, en geleentheid is gebied vir bespreking van die resultate en die uitruil van idees. Die kultivarproewe in die gebied het egter die meeste bespreking uitgelok.

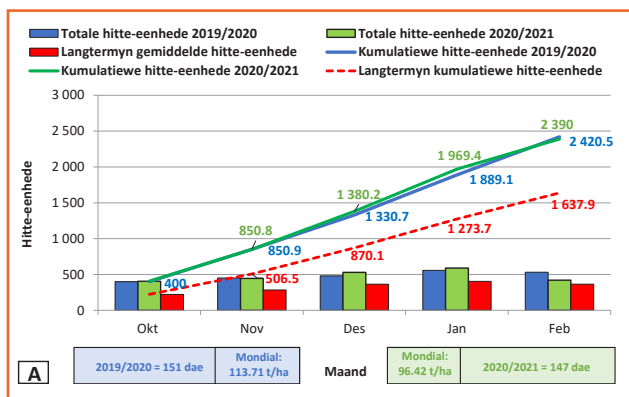


Aartappels SA se Ceres/Koue Bokkeveld-mini-simposium het op 24 November 2021 by die Citrus Fruit Growers-bedryfskantore in die Wes-Kaap plaasgevind.

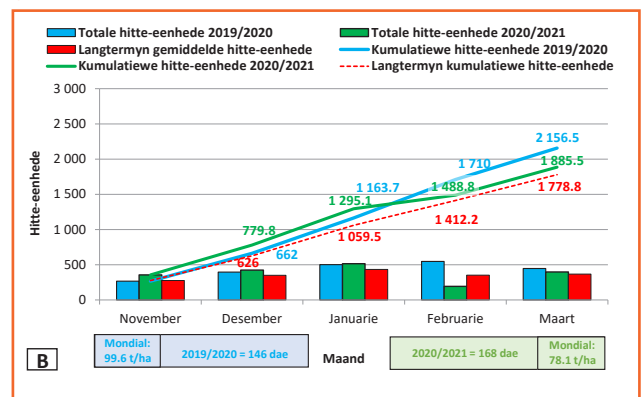
Die gemiddelde opbrengs van 75.1 t/ha vir die 2020/2021-groei-eisoen was 19.5 t/ha laer as die proefgemiddeld van die vorige drie jaar (94.6 t/ha). Die laer opbrengs is in diepte ondersoek en vergelyk met die

Sandveld se resultate, waar daar nie 'n noemenswaardige daling in opbrengs was nie. Die lae opbrengs in Ceres kan moontlik toegeskryf word aan sekere klimaatsomstandighede, wat in dié artikel bespreek word.

**Figuur 1a: Hitte-eenhede vir die Aurora-gebiede gedurende die 2019/2020- en 2020/2021-groei-eisoene.**



**Figuur 1b: Hitte-eenhede vir die Ceres-gebiede gedurende die 2019/2020- en 2020/2021-groei-eisoene.**



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

**Tabel 1: Opsomming rakende kumulatiewe hitte-eenhede en opbrengs vir die Aurora- en Ceres-kultivarproewe vir die laaste twee jaar.**

	Aurora-kultivarproef		Ceres-kultivarproef	
	Kumulatiewe hitte-eenhede aan einde van seisoen	Opbrengs (t/ha)	Kumulatiewe hitte-eenhede aan einde van seisoen	Opbrengs (t/ha)
2019/2020-groeiseisoen	2 420	113.71	2 156.5	99.6
2020/2021-groeiseisoen	2 390	96.42	1 885.5	78.1

**Hitte-eenhede tydens groeitydperk**

Temperatuur is 'n sleutelfaktor in die aktivering van biologiese prosesse en gevolglik die groei en ontwikkeling van plante. Hitte-eenhede is 'n temperatuurrespons van ontwikkeling wat tussen dag en nag verskil, en 'n manier is om 'n hittewaarde aan elke dag toe

te ken. In *Figuur 1a* en *b* word die Aurora- en Ceres-kultivarproewe se hitte-eenhede vir die laaste twee jaar vergelyk.

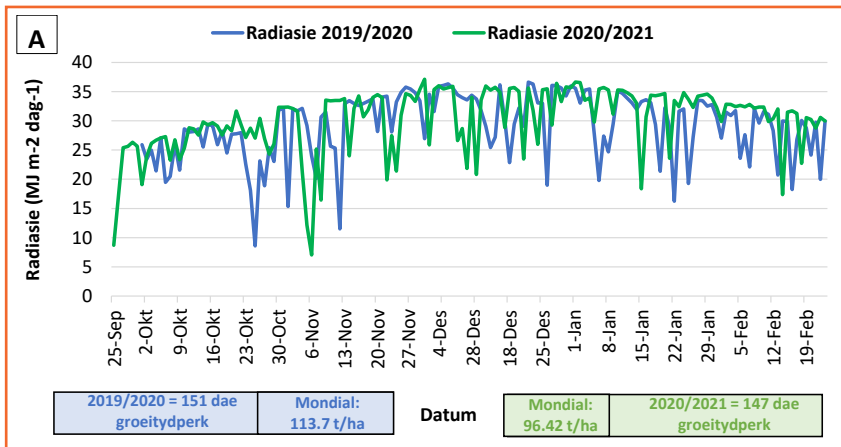
In *Figuur 1a* verteenwoordig die blou lyne die 2019/2020-groeiseisoen se hitte-eenhede, terwyl die groen lyne die 2020/2021-groeitydperk se hitte-eenhede voorstel. Die rooi lyne dui die

langtermyn gemiddelde hitte-eenhede van die onderskeie gebiede aan. Hier kan duidelik gesien word dat die 2020/2021-groeiseisoen in Ceres (*Figuur 1b*, groen lyn) se hitte-eenhede dieselfde patroon gevolg het as vorige jare tot en met Januarie.

Gedurende die laaste twee maande (Februarie en Maart) was die 2020/2021-seisoen se hitte-eenhede egter aansienlik laer in vergelyking met die vorige jare se gemiddelde hitte-eenhede. Dus het die Ceres-proef se kumulatiewe hitte-eenhede slegs 1 885.5 bereik, wat moontlik die rede kan wees vir die laer opbrengs.

Wanneer Aurora se kultivarproef (*Figuur 1a*) en Ceres se vorige seisoen (2019/2020) se hitte-eenhede vergelyk word, is dit duidelik dat 'n hoër kumulatiewe hitte-eenheid 'n hoër opbrengs tot gevolg gehad het (*Figuur 1* en *Tabel 1*)

**Figuur 2a: Radiasie vir die Aurora-gebiede gedurende die 2019/2020- en 2020/2021-groeiseisoene.**

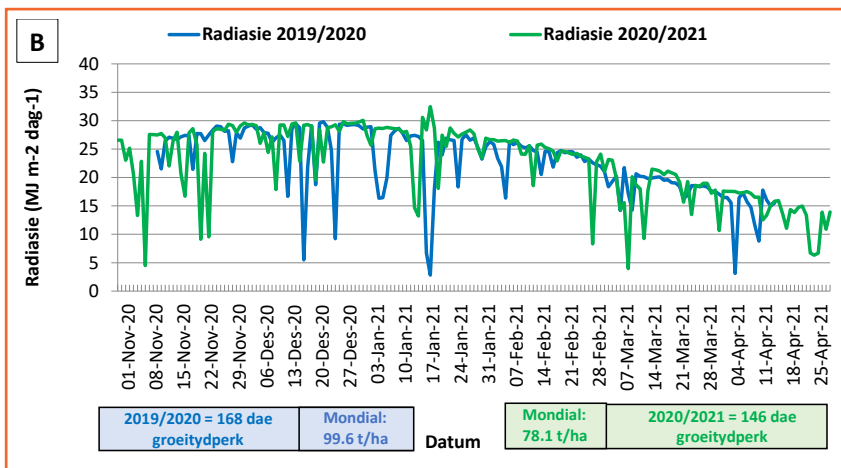


**Radiasievlakke**

Radiasie is die energiebron vir gewasgroei sowel as vir die proses van ophoping, verspreiding en oordrag van fotosintetiese produkte wat opbrengs bepaal. Daarom is dit veral belangrik om die uitwerking van verskillende radiasie-hoeveelhede op groei in ag te neem. Dit was veral opvallend uit die data dat die radiasie verlaag wanneer daar 'n skerp daling in maksimum temperatuur is.

Wanneer ons kyk na die radiasie van die Ceres-kultivarproef (*Figuur 2b*), kan ons waarneem dat daar gedurende die eerste twee maande (opkoms, knol-inisiasie en vegetatiewe groei) van die groeiseisoen asook gedurende Maart tydens die vullingstydperk, aansienlik laer vlakke van radiasie vir lang tydperke ondervind is. Dit kan moontlik toegeskryf word aan bewolkte dae. ☹

**Figuur 2b: Radiasie vir die Ceres-gebiede gedurende die 2019/2020- en 2020/2021-groeiseisoene.**



Vir meer inligting, stuur 'n epos aan Chantel du Raan by [chantelr@potatoes.co.za](mailto:chantelr@potatoes.co.za)

# Optimal irrigation for optimal yield

The ability to ensure yield and quality, and overcome growing obstacles such as uniformity, long and dry periods, water salinity, fungi stress and more, is pushing more producers towards drip irrigation. The most important benefit of drip irrigation is its much lower water application rate compared to other irrigation systems.

This makes it possible to better manage the root zone, the depth of irrigation and other aspects. This control is especially valuable in challenging soil.

## The perfect soil-water balance

Optimal soil-water balance, as explained above, is crucial to soil health and crop productivity. Drip irrigation creates a wetted bulb

below the dripper, with the soil water content gradually decreasing from the centre towards the outer edges of the wetted bulb. This in turn leads to a gradual increase in oxygen levels from the centre of the bulb towards the outer edges, resulting in a better soil-water balance.

With drip irrigation, it is easier to balance the soil-water balance in the root zone as the entire area is not wetted, and there is always a presence of oxygen in the soil outside and towards the edges of the root zone or wetted bulb.

From an irrigation perspective, root zone health is determined by producers' ability to manage the soil-water balance. Soil is made up of minerals, organic material, water and oxygen. The percentage of minerals and organic material in soil composition is a given, but

*Efficient irrigation contributes to a healthy root zone, which in turn ensures higher production.*



the percentage of air and water is dynamic. More water in the soil will translate to less oxygen and vice versa.

An ideal point of balance between water and oxygen at which plants will thrive, exists for each soil and crop. When farmers irrigate, their aim should be to manage the root zone with precision in order to maintain the perfect soil-water balance.

For more information, contact Netafim South Africa at 021 987 0477 or visit [www.netafim.co.za](http://www.netafim.co.za).



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# 'n Oorsig van die Oos-Vrystaatse besproeiingskursus

Deur Fienie Niederwieser, Aartappels SA

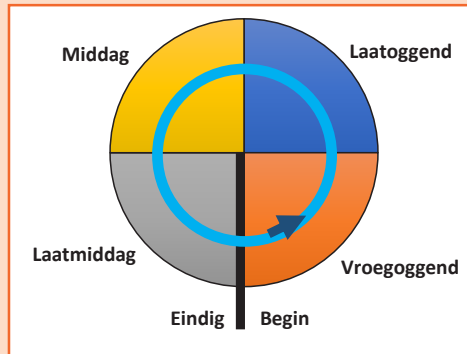
'n Kursus in besproeiingskedulering is in Januarie in die Oos-Vrystaat aangebied. Ironies genoeg was dit lanklaas só nat in hierdie deel van die land! Gevolglik is besluit om die praktiese gedeelte van die kursus tot 'n meer geleë tyd uit te stel. In hierdie artikel deel ons 'n paar gedagtes vanuit die byeenkomsgesprekke.

## Versuip is so goed as droogte

Plante wat versuip, vrek inderwaarheid van 'n watertekort. Water- en voedingstofopname is nie 'n passiewe proses waar water en voedingstowwe in die wortels diffundeer nie. Wortels het suurstof nodig om water en voedingstowwe uit die grond te onttrek. As die grond deurdrenk is met water, is daar eenvoudig nie genoeg suurstof vir die wortels om hul werk te verrig nie. 'n Tekort aan water en voedingstowwe ontstaan dus in die plant. Eers word die plant geel en sterf dan later af.

Tensy die lewering van besproeiing aangepas kan word, moet dieselfde area nie telkens op dieselfde tyd besproei word nie. *Figuur 1* toon 'n voorbeeld van die besproeiingslewering op sekere tye van die dag. Dit gebeur dat die dele van die sirkel wat telkens op die warmste tyd van die dag besproei word, nie genoeg water kry nie, terwyl die dele wat op koeler tye besproei word, optimaal groei. 🌱

**Figuur 1: Die lewering van besproeiing op sekere tye van die dag.**



Vir enige navrae, kontak  
dr Fienie Niederwieser by 083 634 4848.

## Training to distinguish aphids from other insects

By Janine Snyman, Aphid Solutions (Pty) Ltd

**D**uring January this year, four women working in the greenhouses of Potato Seed Production were trained in aphid identification. Images and diagrams of aphids as opposed to those of wasps and fruit flies, along with diagrams of their wing patterns, were provided to each of the trainees.

After allowing them some time to study the images, the trainees practiced their identification skills with samples that contained a mixture of aphids and other insects (*Photograph 1*). Initially, many small fruit flies were picked out instead of aphids. However, after pointing out the wing venation as well as other specific features unique to aphids, they were given another try.

The trainees began to pick out the aphids with the naked eye, looking

at them through the microscope and then asking the trainer to confirm whether they were indeed aphids.



*Photograph 1: A Petri dish containing various aphid species, having been identified and separated from a sample containing a variety of other insects.*

By lunchtime, only aphids had been picked out and confirmed by viewing through the microscope.

Some of the aphids picked out had lost their wings, while some were without wings and antennae, demonstrating that the trainees had successfully mastered aphid identification. It is to be expected that they will likely still miss a percentage, although their accuracy will improve with practice.

Identifying and counting of aphids will aid in aphid control in terms of knowing the number of winged aphids (alate) present in a specific field. 🌱

For more information, contact  
Janine Snyman at 076 437 1781  
or [aphidsolutions@gmail.com](mailto:aphidsolutions@gmail.com).



# die stamina vir vroeë roes beheer

**Tweeledige aksie:** difenokonasool genees bestaande vroeë roes infeksies terwyl ADEPIDYN™ tegnologie volgehoue beskerming verseker.

**Regte plek, regte tyd:** ADEPIDYN™ tegnologie se stadige sistemiese beweging deur die blaar se waslaag verleen kragtige blaarbeskerming en verseker sodoende die biomassa wat ontwikkelende knolle benodig.

**Karboksamied tegnologie, herontwikkel:** ADEPIDYN™ tegnologie is 'n nuwe klas karboksamied. Sy hoë affiniteit vir die waslaag van blare verskaf langer nawerking en verbeterde reënvastheid binne 1 uur. Slim tegnologie, ongeag die weer.

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## Deel 7: Sclerotinia-verwelk

Deur Chantel du Raan, Aartappels SA

### Sclerotium rolfsii

1

- 'n Grondgedraagte patogeen.
- Nie 'n ernstige probleem nie, maar gevalle is aangemeld waar verliese gely is.
- Hierdie siekte word versprei via draadagtige wit filamente en sklerotium (ronde, kompakte, verharde swammiselium) in plantreste en besmette grond (Foto 1 en 2).
- Besmette knolle word in warm, nat toestande opgemerk en gewoonlik aan die einde van die groeiseisoen waargeneem.



Sklerotium wat besig is om te vorm.

2

### Simptome



Sklerotium wat besig is om te vorm.

- Grondgedraagde sklerotia dring stambasisse binne en vorm waaieragtige wit miseliumgroeï wat na die knolle versprei (Foto's 1, 2, 3 en 4).
- Witterige miselium groei op die knolle en is baie kenmerkend (Foto's 1, 2, 3 en 4), so ook die teenwoordigheid van sklerotium (Foto 1 en 2).
- Die onderste blare raak chloroties, waarna die hele plant verwelk.
- Nadat knolle geoes is, droog die wit miselium uit en word dit nie werklik opgemerk nie.
- Vrot knolle kan ook skouspelagtige simptome ná oes toon, met talle swart sklerotia wat uitbars.

### Gunstige toestande vir siekte-ontwikkeling en alternatiewe gashere

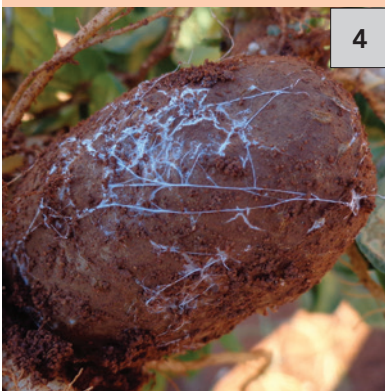
3

- Hoë temperature (28 tot 30°C) en hoë relatiewe humiditeit.
- 'n Wye alternatiewe gasheerreëks: ten minste 500 spesies in 100 families is vatbaar.
- Enkele belangrike gewasgashere sluit in tamatie, mielies, bone, patats, ui, kool, pampoen, tabak, peulgewasse, wartlemoen, spanspek, wortels, beet, mostert, sojabone, soetrissies en grondbone.
- Enkele belangrike voer- en onkruidgashere sluit in lusern, kruisvingergras, kweekgras, muggiegras, uintjies, breëblaarterpentyngas, nastergal, olieboom, misbredie, perdeblom en klawer.
- Swamme kan op reste van alternatiewe gashere oorleef.



4

### Beheermaatreëls



- Goeie bestuurspraktyke is die enigste manier om die siekte doeltreffend te beheer.
- Geen swamdoder is vir die beheer van die siekte in Suid-Afrika geregistreer nie.
- Verwyder of ploeg plantreste diep in (minstens 20 cm).
- Verwyder en vernietig besmette plante (sanitasie).
- Beheer gasheeronkruid.
- Pas wisselbou toe met nie-gasheerplante.
- Digte loofontwikkeling (bv. hoë stikstofbemesting) verhoog die risiko van skade deur 'n hoë voginhoud aan die basis van die stamme te onderhou.
- Spasieer plante wyer uitmekaar waar siekte 'n probleem is.
- Vermyn 'n digte plantestand.
- Besproeiingstydperk – verkort blaarbenuttingstydperk. 🌱

**Bronne:** • Denner FDN, Venter, SL. 2011. *Handleiding vir Aartappelproduksie in Suid-Afrika*.  
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Vir meer inligting, kontak  
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# Meshack Ndongeni: A diversified farm planning approach for greater liquidity

By Rachichi Marokane, Potatoes SA

**T**o an emerging farmer, a complex planning scenario might entail the inclusion of uncorrelated farming enterprises.

When it comes to capital injected into a diversified farm entity, an on-farm value chain approach is essential. Most importantly, retaining good cash flow remains a key factor in any successful entity.

In this context, reference can be drawn from Meshack Ndongeni, a potato producer on the verge of running a potato enterprise on a sustainable commercial scale.

## A case of bartering

Having lost his father at a relatively young age, Meshack found it a challenge to follow his dream of farming. In the village where he grew up, the majority of households were farming maize on a small scale on communal land. His mother identified an opportunity to plant potatoes on 4 ha on a rotational basis.

At the time, formal marketing channels were limited. Coupled with asymmetric information, the villagers would participate in bartering where, in Meshack's case, he would trade a 10 kg bag of potatoes for a 20 kg bag of maize. As potatoes are highly perishable compared to maize, he would store the maize once it was harvested in July and later resell it in the local villages in December when prices were relatively high. This allowed him to, unlike others, trade throughout the year.

With government shifting its focus to socio-economic development and inclusive agrarian reform, he saw an opportunity to participate in the Massive Food Production Programme launched by the Eastern

Cape Department of Agriculture in 2005. As part of the programme, Meshack joined the service providers who planted grains for other farmers, using his one tractor. From there on he expanded by purchasing more tractors and was subsequently able to offer his services at other rural development projects. He currently owns 21 tractors.

Meshack started farming at commercial level in 2013 when he received a 942 ha portion of land under the Proactive Land Acquisition Strategy of the former Department of Rural Development and Land Reform (DRDLR). Before that, he farmed on leased land where he planted grains. Obtaining land from the DRDLR enabled him to expand his production capacity and to consider other commodities for a diversified farming approach.

## An effective crop rotation plan

As a general rule, a field planted with potatoes cannot be replanted for at least four years. However, having land without any farming activity can, in economic terms, defer under-utilisation, especially where a business has the capability of diversifying production.

Access to capital, infrastructure and affordable production inputs will also enable a farming entity to unleash its diversification potential. Equipped with state-of-the-art infrastructure and having mechanised over 940 ha of arable land, Meshack has invested in various agricultural commodities which include:

- Potatoes: 50 ha.
- Maize: 600 ha dryland.
- Wheat: 100 ha dryland.
- Cabbage: 30 ha under irrigation.

- Cattle: 200 livestock units.
- Sheep: 400 livestock units.

Meshack planted 50 ha of potatoes in September 2021, and harvesting commenced in February and will continue until May this year. Cabbage that was planted on 30 ha has been staggered in such a way that only 10 ha has been harvested from January to March this year, while the remaining 20 ha will be harvested between April and August.

As far as the grains are concerned, 600 ha of maize is expected to be harvested in July. He is, however, not planning to sell all the maize at once, but rather over a period of five months, while 100 ha of wheat will be harvested in December.

## Output, revenue and KPIs

Running a diversified farming enterprise comes with a number



*Meshack started farming commercially in 2013 when he received a 942 ha portion of land under the Proactive Land Acquisition Strategy of the former Department of Rural Development and Land Reform.*



## REGISTERED FRESH PRODUCE AGENCIES

### BLOEMFONTEIN FRESH PRODUCE MARKET

Bloemfontein Market Agency  
 Modise Market Agency  
 RSA Bloemfontein Market Agency  
 Subtropico Bloemfontein Market Agency  
 Vrystaat Market Agency

### CAPE TOWN FRESH PRODUCE MARKET

Boland Market Agency  
 Fine Bros Market Agency  
 Rhoda's Market Agency  
 RSA Cape Town Market Agency  
 Subtropico/Spes Bona Market Agency

### DURBAN FRESH PRODUCE MARKET

Delta Market Agency  
 Hanly Market Agency  
 Port Natal Market Agency  
 RSA Coastlands Market Agency

### EAST LONDON FRESH PRODUCE MARKET

AA Market Agency  
 Border Farmers Market Agency  
 Martin & Scheepers Market Agency  
 Subtropico East London Market Agency

### GEORGE MUNICIPALITY

Maverick Market Agency

### JOBURG FRESH PRODUCE MARKET

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 CA-TU Fresh Market Agency  
 C L de Villiers Market Agency  
 Citi Deep Waatlemoen Market Agency  
 Citifresh Market Agency  
 Dapper Market Agency  
 DW Fresh Produce Johannesburg Market Agency  
 Exec-U-Fruit Market Agency  
 Marco Market Agency  
 Matla Market Agency  
 Metro Market Agency  
 RSA Johannesburg Market Agency  
 Subtropico Johannesburg Market Agency  
 Swartberg Market Agency  
 Uni Dev Market Agency  
 Wenpro Johannesburg Market Agency

### KEI FRESH PRODUCE MARKET

Farmers Direct Market Agency

### KING WILLIAM'S TOWN FRESH PRODUCE MARKET

RSA Eastern Cape Market Agency

### KIMBERLEY FRESH PRODUCE MARKET

Kimberley Market Agency  
 Subtropico Kimberley Market Agency

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Garfield Market Agency  
 J Frances & Son Market Agency  
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RSA Limpopo Market Agency  
 RSA Mooketsi Market Agency

### NELSPRUIT MUNICIPALITY

Fresh Pro Market Agency  
 RSA Nelspruit Market Agency  
 Whoopi Up Nelspruit Market Agency

### NOORDEINDE FRESH PRODUCE MARKET

Noordeinde Market Agency

### PIETERMARITZBURG FRESH PRODUCE MARKET

G.W. Poole Market Agency  
 Natalia Market Agency  
 Nkosi Market Agency  
 Peter & Co Market Agency  
 Subtropico Pietermaritzburg Market Agency

### PORT ELIZABETH FRESH PRODUCE MARKET

African Market Agency  
 Algoabaai Market Agency  
 Gouws & Co Market Agency  
 Lansdell Market Agency  
 W Finlayson & Co Market Agency

### SPRINGS FRESH PRODUCE MARKET

AM Meyer Market Agency  
 New Africa Market Agency  
 RSA Springs Market Agency  
 Springs Vegetable Market Agency  
 Subtropico Springs Market Agency

### TSHWANE FRESH PRODUCE MARKET

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

### VAAL MUNICIPALITY

RSA Vaal Market Agency

### VEREENIGING FRESH PRODUCE MARKET

Subtropico Vereeniging Market Agency

### WELKOM FRESH PRODUCE MARKET

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 Opkoms Market Agency  
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### WITBANK FRESH PRODUCE MARKET

Subtropico Witbank Market Agency  
 Witbank Market Agency

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 Comfy Fresh  
 Core Fruit  
 Farm Fresh Direct  
 Farm Market  
 Federated Farmers  
 Fruitways  
 Green Network  
 HL Hall & Sons  
 Multiflora  
 RSA Beyond  
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*Meshack's farming business employs approximately 40 permanent and over 200 seasonal workers.*

of risks. The output and revenue generated from each commodity are influenced by several factors, ranging from yield per hectare to the weight of livestock. For this reason, Meshack applies the prudence conceptual framework.

This implies that factors that exhaust the net profit (such as downgraded yield, mortality rate as well as variable and fixed costs) should be overestimated in the planning phase. In contrast, revenue factors (such as yield per hectare, marketable yield and selling prices) should be underestimated. A benchmark for forecasting should be informed by the producer's past experiences, current capacity and future outlook.

There are various key performance indicators (KPIs) and cashflow ratios that producers can use to understand their financial position each year. For Meshack, the business must have sufficient cashflow to support farming activities without external funding or additional loans. This will allow the farm to be regarded as a liquid entity.

By understating the liquidity of an entity, farmers may utilise the main cashflow components, namely operating, investing and financing activities.

As producers start operating at a commercial production level that requires formal financial reporting, an income statement is often used and includes non-cash expenses

such as depreciation. Meshack also values the strength of working capital in determining the liquidity of his entity. In this regard, he makes use of the balance sheet components (current assets and liabilities) to see how promptly he can generate revenue/cash.

#### **An effective labour force**

Meshack defines his labour force as effectively structured and result orientated. The secret to his consistently positive results has always been helping employees understand the benefits they derive from the collective success of the business. His farming business employs approximately 40 permanent and over 200 seasonal workers.

Working alongside him is his daughter, who studied financial economics, and two sons who both studied agriculture. This allows Meshack to have an excellent succession plan in place, and he clearly sees the need to stabilise his children's interests in the farm. Furthermore, he has employed an agricultural economist who forecasts production plans, as well as an accountant who maintains his financial records.

#### **Continuous market research**

To Meshack, staying ahead of the game and adapting to market trends is one of his key success factors. Investing in infrastructure that could be rendered obsolete

in the next few years following acquisition, might not be a wise decision. Over the years new potato cultivars have emerged that offer a competitive advantage at various levels of the value chain.


As a farmer, one must develop a thorough understanding of potato buyers' preferences and consider the costs that accompany common or niche markets. Meshack has spread the risk of cultivar correlation by planting Sifra and Valor on his 50 ha of potatoes. According to him, these cultivars are in high demand among his buyers (retailers in KwaZulu-Natal and the Eastern Cape).

Additionally, before planting, the producer needs to find out what other local farmers are planning to plant and how much they have planted, so that he does not form part of a flooded market that could yield lower prices.

#### **A 'conservative' risk appetite**

According to Meshack, the biggest risk in any farming business is not taking any risk. However, risks should be calculated, and viable mitigation measures put in place.

A diversified farming approach requires land that is not marginal. Access is needed to abundant natural resources, and their long-term availability must be well calculated. This year, he plans to expand his potato production to 70 ha. Since he has sufficient infrastructure and machinery that can be ceded as collateral for loan applications at financial institutions, he still considers equity to be the most sustainable option.

Producers should, however, develop business plans based on realistic financial forecasting of how they can accumulate capital and reinvest in a manner that will retain liquidity and limit the need for interventions through external funding. 

For more information, contact Potatoes SA on 012 349 1906 or visit [www.potatoes.co.za](http://www.potatoes.co.za).

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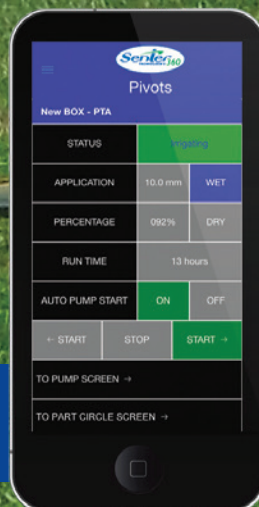
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# The untold story of Sthembiso Cele: A PSA bursary recipient

By Rotondwa Raligidima, Potatoes SA

**S**thembiso Cele spent his childhood in the deep rural area of Port Shepstone on the South Coast of KwaZulu-Natal, where his parents raised him and his five siblings. The family's livelihood was solely dependent on his mother, who earned an income by doing piece jobs.

Growing up, Sthembiso would tend to the family's home garden – ploughing, planting vegetables, and tending to the cattle after school and on weekends. Apart from his interest in farming, Sthembiso also enjoyed reading news online and watching reality shows on television. He still enjoys doing this today, and is a great fan of sports, especially soccer and cricket.

## A whole new world

Sthembiso is one of Potatoes SA's (PSA) bursary recipients. He learned about the opportunities offered



Sthembiso Cele, Potatoes SA's bursary recipient.

through the bursary programme on the PSA website and decided to apply. His application was successful, and he subsequently received funding from 2016 to 2018 for his undergraduate studies, to complete a national diploma in agriculture at the Mangosuthu University of Technology.

Sthembiso says the bursary eased his financial burden enormously, allowing him to focus on his studies and expanding his knowledge.

When asked where his passion for agriculture stems from, Sthembiso recounts how growing up in rural KwaZulu-Natal, where farming is common practice, agriculture was ingrained in him from a young age. Farming was the only thing he was really exposed to, and he was naturally passionate about it, which led him to choose agriculture-related subjects at high school and university.

Sthembiso describes the PSA bursary award as a once-in-a-lifetime opportunity. Apart from receiving the bursary, he was given an opportunity to work at a potato farm, where he learned everything about seed potato production – from soil preparation to planting, weed control, harvesting, sorting and packaging.

The PSA programme also enabled him to travel outside of the province for the first time, and visit other provinces such as Gauteng and Mpumalanga to attend PSA events. He boarded his first flight ever in 2018 to attend a PSA Transformation Symposium.


Sthembiso says his life has been positively impacted by the PSA bursary. He is now permanently employed, without having had to search for employment. He

will forever be grateful for all the opportunities PSA had awarded him, he says. He wishes to encourage other students to also apply for bursaries, since it provided much-needed support for him to complete his studies and pursue a career in agriculture.

## Levelling up

After completing his studies, PSA stationed Sthembiso at the Durban Fresh Produce Market on a twelve-month contract with Prokon SA to gain experience. Through his hard work and dedication, he was offered permanent employment by the same company in June 2021, and today he still works there as a quality control inspector. His duties include performing quality inspections of all fruit and vegetables sold on South African fresh produce markets and by retailers.

Sthembiso is grateful towards PSA, saying if it wasn't for the bursary, he would not be where he is today. He aspires to acquire his own farm one day, where he hopes to plant various vegetables and create job opportunities for other young people like him. Learning new things and coming up with new ideas to improve current situations are what drives him.

Sharing his sentiments with the PSA's Bursary Committee, he concludes: "Your generosity has inspired me to help others and give back to the community. I hope one day I will be able to help other students achieve their goals just as you have helped me." 

For more information, email  
Rotondwa Raligidima at  
[rotondwa@potatoes.co.za](mailto:rotondwa@potatoes.co.za).

# PSA small grower development programme introduces young farmers to potato production

By Masabatha Motsoeneng, Potatoes SA

**P**otatoes SA's (PSA) small grower development programme has equipped young developing farmers in Gemark Village in the Limpopo region, with much needed technical and business skills associated with producing potatoes. The community was given the opportunity to gain practical skills related to the basic principles of growing potatoes, as well as evaluating the key components of potato production.

## A helping hand

PSA encouraged the community members of Gemark to grow potatoes with limited resources after they were exposed to the planting of a demonstration trial. The youth in this community voiced their concerns over the high unemployment rate, and seized the opportunity to participate in the PSA small grower development programme.

Cynthia Mokgobu is a zealous 29-year-old developing farmer in Gemark. She currently produces spinach, baby marrows, cabbage

**Table 1: Demonstration trial information.**

	Mondial	Valor
<b>Planting date</b>	26 March	26 March 2021
<b>Harvesting date</b>	6 August 2021	6 August 2021
<b>Generation</b>	G4	G3
<b>Size of the trial</b>	0.1 ha	0.1 ha
<b>Fertilisers programme</b>	At planting: 100 kg 3:2:4 Vegetative stage: 50 kg LAN	At planting: 100 kg 3:2:4 Vegetative stage: 50 kg LAN
<b>Crop protection programme</b>	Cypermethrin – cut worm and tuber moth Acephate – tuber moth and aphids Lufenuron – tuber moth Mancozeb – early and late blight Procymidone – early and late blight	
<b>Challenges (e.g. pests, diseases, climate)</b>	White fly Tuber moth Frost damage, fast recovery rate	Whitefly Tuber moth Frost damage, slow recovery rate
<b>Yield achieved</b>	57 t/ha	47 t/ha

and tomatoes. She welcomed the PSA demonstration trial, as they were now able to gain practical experience in potato production.

As the host farmer, Cynthia contributed to the project by providing water for irrigation purposes, an irrigation system and by taking responsibility for monitoring the crop throughout

the season. This journey was made possible through the assistance of the Limpopo Department of Agriculture, which provided some of the chemicals used and encouraged community participation.

## Planting and harvesting

The trial was planted on 26 March 2021 and 40 community members attended the information session. Most of the community members who attended the information session have access to a small piece of land, some water and are planting on a small scale for food security and income generation.

The demonstration trial was planted during March, as climate conditions are conducive during this period. However, there is a risk of frost damage which was mitigated by planting a cultivar with moderate tolerance for frost.

During scouting of the trial, the community members were taught how to identify pests, diseases and



Young developing females who farm at Gemark Village were shown how to scout a planting prior to applying top-dressing fertilisers.



Community members of Gemark Village harvesting the demonstration trial.

nutrient deficiencies. Pests such as aphids, white fly and tuber moth were observed, and recommended crop protection products supplied to the host farmer were effective to control the pests. The Department of Agriculture provided the host farmer with a tensiometer which is used to schedule irrigation. It also assisted the farmer in applying the

amount of water required by the potatoes at different stages.

The trial was planted under drip irrigation which benefited the farmers, as water was saved. The system irrigated only where the potatoes are actually planted, the operating cost of the system is low, and the presence of weeds was reduced.

Harvesting took place on 6 August 2021 but due to the country being in lockdown level 4 at that stage, only a few community members attended the harvesting. The few that were present were able to observe how to manually harvest and grade the potatoes according to size.

**The way forward**

The community was excited to be part of the programme. During the June/July 2021 season, the host farmer planted 0.3 ha on her own. She has shown great interest in participating in the enterprise development programme and is currently in the process of acquiring

a bigger portion of land with a centre pivot through the local tribal authority. Through the experience she gained during the programme, she is now able to share potato production information with other small-scale farmers from neighbouring villages.

Julia Mofia, a community member in Gemark, says that the training was very informative: "It made me realise that there is still room for small-scale farmers." She added that it used to be a challenge to access proper production inputs due to a lack of information. Now, however, she is happy as organisations such as PSA are reaching out to communities, sharing information that will allow these small-scale farmers to one day become commercial producers. 🌱

For more information, email Nomvula Xaba at [nomvula@potatoes.co.za](mailto:nomvula@potatoes.co.za).

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## New partnership with development agency to develop farmers

By Louis Pretorius, Potatoes SA

There are many development agencies throughout South Africa, and to develop farmers from small beginnings into fully fledged commercial producers is the ultimate goal. This allows for selecting farmers who are passionate about what they do.

Moreover, starting small and developing into bigger enterprises also eliminates the risk of greater financial losses at the early stages due to the high input costs of potatoes and the learning curve early on for successful production.

The goal is to make a profit as passionate farmers develop into entrepreneurs and successful commercial producers. Joining development agencies makes





economic sense because a combined effort and joining of resources are very important, given the price volatility of potatoes at markets.

**Expanding commercial production**

Potatoes SA (PSA) and the Joe Gqabi Economic Development Agency (JoGEDA) signed a memorandum of understanding to develop black farmers in the Northeastern Cape, near the town of Ugie.

Mzamo Bobi from JoGEDA in Aliwal North identified four farmers near Ugie, who have the potential to develop into commercial farmers. PSA and JoGEDA embarked on a pilot programme late last year to plant two projects at Ugie to test the possibilities of expanding into commercial production in the future. The Ugie region is well suited for potatoes and is blessed with good soils and very high annual rain fall.

PSA sourced suitable cultivars for the project trials and implementation of the trials started at the farm of Ms Mkosana in November 2021. It was specifically done during this time, as rain is abundant in that month and the project was conducted under dryland conditions.



The training involved the following:

- **Land selection:**  
How to choose suitable land considering soil sample results as well as potential deep soils with adequate drainage. This is necessary given the high input costs of potatoes. The land must also be fenced off to prevent animals from destroying it.
- **Land preparation:**  
Demonstrating proper land preparation using a tractor and suitable implements. Potatoes need a well prepared, loose, fine seedbed with no excessive clots.
- **Planting process:**
  - o Using a suitable implement to open rows for planting by hand.
  - o Suitable cultivar selection.
  - o Correctly calibrating fertiliser application before planting, taking soil sample results into consideration.
  - o Correct seed potato spacing for the size of seed potatoes used.
  - o How to include spraying rows to prevent damage during spraying that can cause blight infection.
  - o Covering the seed potatoes with soil.
- **Use of chemicals:**
  - o Demonstrating the application pre-emergence herbicides straight after planting.
  - o Supplying all chemicals needed for the projects in terms of blight control and insecticides, with instructions for use.

PSA regularly visits the projects to assist farmers with managing the crop. After harvesting, an information day will be held to discuss the results achieved. **C**

For more information, contact Louis Pretorius at [louis@potatoes.co.za](mailto:louis@potatoes.co.za).



# #PassThePotato: Giving back is good business

By Immaculate Zinde, Potatoes SA

Against the backdrop of the country's growing food crisis, Potatoes South Africa (PSA) stepped up to the plate to donate over 4 000 kg of potatoes to feed the hungry from December 2021 to February 2022. They have also challenged businesses and the general public with their #PassThePotato campaign to make a difference in the lives of millions in food insecure households throughout the country.

Highlighting the depths of the crisis currently gripping the country, a recent Ipsos study revealed that as many as 46% of households experienced hunger as a result of the Covid-19 pandemic, following job losses, economic pressures and rising food prices. Meanwhile, the unemployment rate rose to a new record high of 34.9% in the third quarter of 2021, resulting in thousands more breadwinners losing their livelihoods, further exacerbating issues of food insecurity.

## PSA employees take the lead

Leading from the front, employees of PSA donated close to a ton of potatoes to various charitable organisations, including Eleos Community Centre in Pretoria East and The Village Safe Haven in Sandton, as well as the Thuthuzela Child Centre and Lutheran Church in Alexandra, to name a few. In addition, PSA employees took to the streets of Diepsloot, Mamelodi, Atteridgeville and Pretoria West, handing out food parcels comprising of 10 kg pockets of potatoes and basic essentials. Following suit, industry stakeholders

joined hands to #PassThePotato, thereby creating a wave of additional donations (Table 1).

The #PassThePotato campaign, mainly driven through PSA's digital platforms, was able to rally support from the general public and a variety of businesses and industry stakeholders, including Grow Fresh Produce Agents, AL3 Boerdery, Tammy Taylor at Dainfern Square, PR Worx, and Instant Pot, a brand of multi-cookers established eleven years ago.

To further enhance the reach of the #PassThePotato campaign, ten nano-influencers, all with a combined captive audience of 107 161 on their social media platforms, were sourced to help launch the campaign and create awareness by sharing images and videos of themselves donating a bag of potatoes to those in need during December 2021. The influencers tagged their friends and family members and challenged them to participate by also donating to those in need.

Furthermore, the #PassThePotato campaign engaged audiences in a fun and interactive manner by way

of a radio campaign with Kaya FM. The aim was to capitalise on the massive reach and listenership that Kaya FM boasts in Gauteng.

## Passing more than 4 000 potatoes

In the radio campaign's 'Spot the Spuddy' competition, listeners were invited to keep an eye out for a PSA-branded tuk-tuk (the Spuddy), which drove around Johannesburg from 6 to 10 December to deliver potatoes to various charity organisations. Listeners were required to spot the branded tuk-tuk, take and share a picture of it on social media, and tag both Kaya FM and PSA to stand a chance of winning a R5 000 cash prize.

A total of 150 bags of potatoes were donated to the following organisations via the tuk-tuk: Childline in Parktown, the Lutheran Church in Alexandria, the CHOC Childhood Cancer Foundation in Saxonwold, Phronesis School in Kya Sands, Community Provision and Social Services (aka Compass) in Edenvale, Johannesburg Child Welfare, The Village Safe Haven in Buccleuch, Khensani's Collections in Diepsloot, Western Orphanage in

**Table 1: The total number of bags plus individual potatoes donated by various charity organisations.**

Organisation	Number of 10 kg bags	Total number of potatoes donated
PSA CEO	50 x 10 kg	500
PSA staff	50 x 10 kg	500
Grow Fresh Produce Agents	100 x 10 kg	1 000
AL3 Boerdery	100 x 10 kg	1 000
Digital influencers	10 x 10 kg	100
Others: Tammy Taylor, PR Worx, Instant Pots, and members of the public	150 x 10 kg	1 500
<b>Total</b>		<b>4 600</b>



Sophiatown, and Stand and Shine Women in Yeoville.

While the radio campaign did not receive the envisioned attention from businesses and the general public, the #PassThePotato campaign received robust media exposure from 1 December 2021 to 31 January 2022, rendering 19 pieces of content (five broadcast plus 14 online articles), free

advertising worth just over R250 000, and a campaign reach to the tune of 2.1 million audience members within the middle-income consumer group.

As theologian John Wesley said: "Do all the good you can, in all the ways you can, to all the souls you can, in every place you can, at all the times you can, with all the zeal you can, as long as ever you can".

To learn more about the campaign, visit [www.potatonation.co.za](http://www.potatonation.co.za). You can also follow Potato Nation on Facebook, Instagram and Twitter. Alternatively, send an email to Immaculate Zinde at [immaculate@potatoes.co.za](mailto:immaculate@potatoes.co.za).

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## NEXUS<sup>AG</sup> BIED PASGEMAAKTE GEWASBESTUUR-OPLOSSINGS

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# Hoe gemaak as 'n werknemer dros?

Deur Danie Pienaar, regsadviseur, LWO Werkgewersorganisasie

## Gevallestudie:

*Johan het vir vyf dae, sonder toestemming, nie by die werk opgedaag nie. Niemand weet waar hy is en of hy van plan is om terug te keer nie. Die werkgewer is van mening dat Johan homself afgedank het en stel Simon in sy plek aan. 'n Maand later daag Johan egter op en wil sy werk hervat. Die werkgewer verduidelik dat Johan nie meer daar werk nie en dat Simon in sy plek aangestel is. Johan verwys 'n saak van onbillike ontslag na die Kommissie vir Versoening, Bemiddeling en Arbitrasie (KVBA), waar die kommissaris beslis dat die werkgewer nie die korrekte prosedure gevolg het nie. 'n Bevel van herindiensname en/of vergoeding word uitgereik.*

Afwesigheid is 'n algemene probleem in die landbousektor en het 'n groot invloed op 'n boerdery se besigheids-aktiwiteite. Die dissiplinêre kode sit die werksplek se reëls met toepaslike sanksies uiteen. Dit is uiters belangrik dat hierdie reëls met werknemers bespreek en op skrif gestel word. Slegs dán kan die werkgewer bewys dat werknemers bewus is van die reëls asook die gevolge wanneer hierdie reëls oortree word.

## Afwesigheid sonder toestemming

Die moeilikste vorm van afwesigheid om te hanteer, is wanneer 'n werknemer glad nie opdaag vir werk nie. Die werknemer is verplig om die werkgewer in kennis te stel van sy/haar afwesigheid – dit is selde dat daar geen manier hoegenaamd is waarop die werknemer die werkgewer kan laat weet nie.

Daar rus ook 'n verpligting op die werkgewer om die werknemer in kennis te stel dat sy/haar afwesigheid sonder toestemming is.

Wanneer 'n werknemer langer as vyf dae afwesig is sonder om die werkgewer in kennis te stel, word die werknemer geag om te dros. Dit is noodsaaklik dat die werkgewer moet kan bewys dat die werknemer geen intensie gehad het om terug te keer werk toe nie. Daarom moet die werkgewer poog om die werknemer te kontak, én bewys kan lewer van hierdie pogings.

'n SMS, WhatsApp-boodskap of brief wat na die werknemer se laasbekende adres gestuur is, is voldoende. Dit is natuurlik die werknemer se verantwoordelikheid en plig om die werkgewer op hoogte te hou van sy/haar nuutste kontakbesonderhede.

## Oorgang tot dissiplinêre aksie

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

Daar is verskeie mites rondom arbeidsreg in die praktyk wat veroorsaak dat werkgewers in goeie trou glo hulle tree korrek op, terwyl hulle inderwaarheid hul besigheid op risiko

plaas. 'n Slaggat waarin werkgewers dikwels trap, is om die uitgangspunt te volg dat die werknemer hom-/haarself afgedank het deur te dros. Dit is onwaar. So 'n werkgewer loop die risiko van 'n KVBA-bevel om die werknemer weer in diens te neem (moontlik terugwerkend) en/of 'n vergoedingsbevel wat aan die werknemer uitbetaal moet word.

Afwesigheid in die werksplek, en spesifiek dros, het reeds 'n groot finansiële impak en dit is belangrik dat die werkgewer deurlopend die korrekte prosedures nageset volg, om verdere (onnodige) koste en frustrasie te vermy. Belê in kundige raad en bestuur hierdie arbeidsrisiko proaktief. 📞

Die LWO help **boere as werkgewers** om aan arbeidswetgewing te voldoen.



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# Eviction of long-term occupiers following a material breach in relationship

By Clarissa Pienaar, Moolman & Pienaar Incorporated

The case of *Nimble Investments (Pty) Ltd vs Johanna Malan and Others (556/2020) [2021] ZASCA 129* (the *Nimble* case) was recently heard in the Court of Appeal. The Court had to consider whether the actions of the farm dwellers, one of whom was a long-term occupier, constituted a material breach in the relationship between the farm owner and occupiers.

Long-term occupiers (people who have lived on the farm for more than ten years and are over 60) enjoy special protection against eviction proceedings. Long-term occupiers should therefore view this ruling in a serious light before acting in a way that does irreparable damage to their relationship with the farm owner.

## Facts in the *Nimble* case

Elsie Malan (first respondent) and her late husband had resided on the farm owner's land since 1974. Mr Malan worked on the farm until his death at the age of 61 in 2005. Cottage 1 was awarded to him under his service agreement for the duration of his contract. The couple's children and grandchildren also resided in the cottage.

In 2006, the previous owner instituted eviction proceedings against the Malan family. The Stellenbosch Law Clinic assisted Elsie in arranging a lease agreement between herself and the previous owner, in terms of which Elsie would be responsible for paying the monthly rent. The current farm owner, Nimble Investments, took over the farm

and lease agreement in 2008. The Malan family never paid any rent to Nimble Investments.

In 2012, Nimble Investments needed the land on which Cottage 1 was located in order to meet their contractual obligations towards a long-term tenant. Although negotiations took place regarding Elsie vacating the farm, these negotiations failed. After further negotiations, she agreed to move from Cottage 1 to Cottage 5. However, she did not comply with this undertaking and a court order was obtained for the move to Cottage 5.

The move to Cottage 5 was not without difficulty. On 28 November 2016 members of the Malan family removed the roof tiles, roofing sheets and building materials from Cottage 1. The site manager and director of Nimble Investments, in the presence of police officers and Elsie herself, requested the family members to stop their actions, which they refused to do.

Elsie therefore knowingly, without permission and in violation of the building regulations, even after criminal charges were laid, allowed an illegal structure to be erected next to Cottage 5. She bluntly refused requests to demolish the structure and return the building materials. Furthermore, an action was instituted to have the family members evicted from the farm.


## Court findings

The Court of Appeal had to determine, among other things, whether there had been a material breach in the relationship between

Nimble Investments and the Malan family. Elsie qualified as a long-term occupier.

The Court found that, prior to the incident, a relationship of mutual trust and co-operation existed between Elsie and the farm manager. However, Elsie's sanctioning of unauthorised people erecting the illegal structure, and her persistent refusal to demolish it and return the building materials, violated the relationship to such an extent that it could not be repaired.

The Court of Appeal found that an eviction order was indeed fair, and that Nimble Investments could not be expected to keep on providing the Malan family with free housing and services. The Court confirmed that the *Extension of Security of Tenure Act, 1997 (Act 62 of 1997)*, or *ESTA*, was not promulgated to promote opportunistic farm dwellers' security of tenure at the expense of the rights of farm owners.

Farm dwellers (even long-term occupiers who enjoy special protection) who persistently refuse landowners' efforts to provide security of tenure to farm dwellers, are treading on dangerous ground. Such actions, in combination with other factors, can contribute to a material breach in relationships that could lead to eviction proceedings. 

For more information, contact Clarissa Pienaar on 018 297 8799 or [clarissap@mmlaw.co.za](mailto:clarissap@mmlaw.co.za).



During December 2021 and January 2022, a total of 13 potato producing regions as well as non-producing suppliers delivered potatoes nationally to fresh produce markets.

Average percentage downgraded: **9.98%.**

Total number of bags delivered from 13 regions and non-producing suppliers and inspected on the fresh produce markets: **16 240 855.**

Figure 1: Classes inspected during Dec 2021/Jan 2022 at all fresh produce markets.

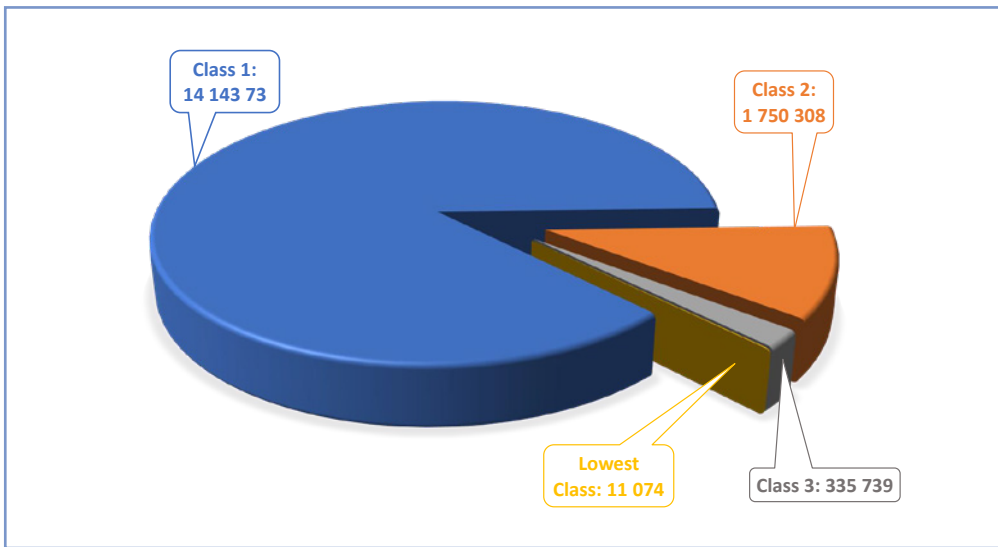


Figure 2: Potatoes downgraded (total 1 620 502) at all fresh produce markets during Dec 2021/Jan 2022.

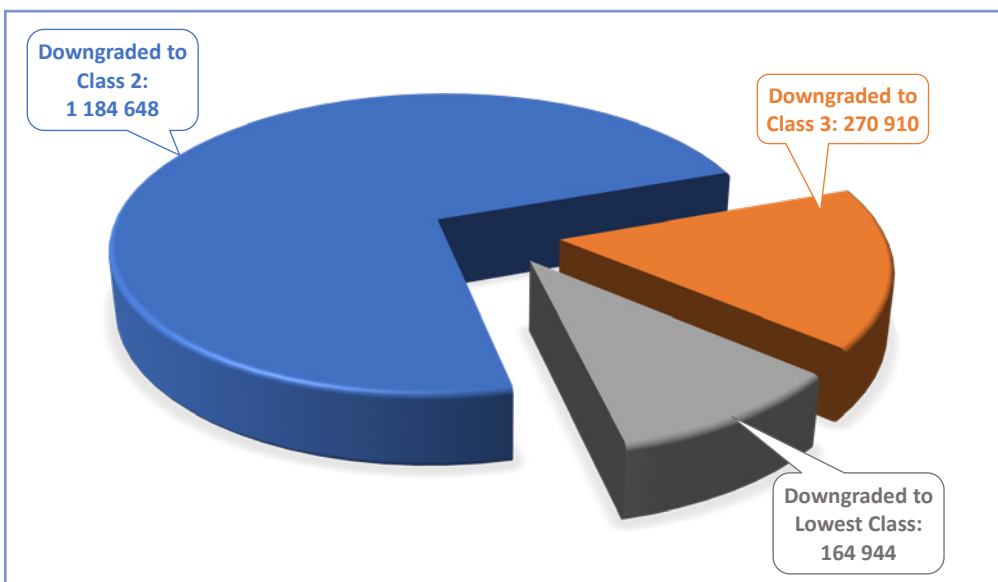
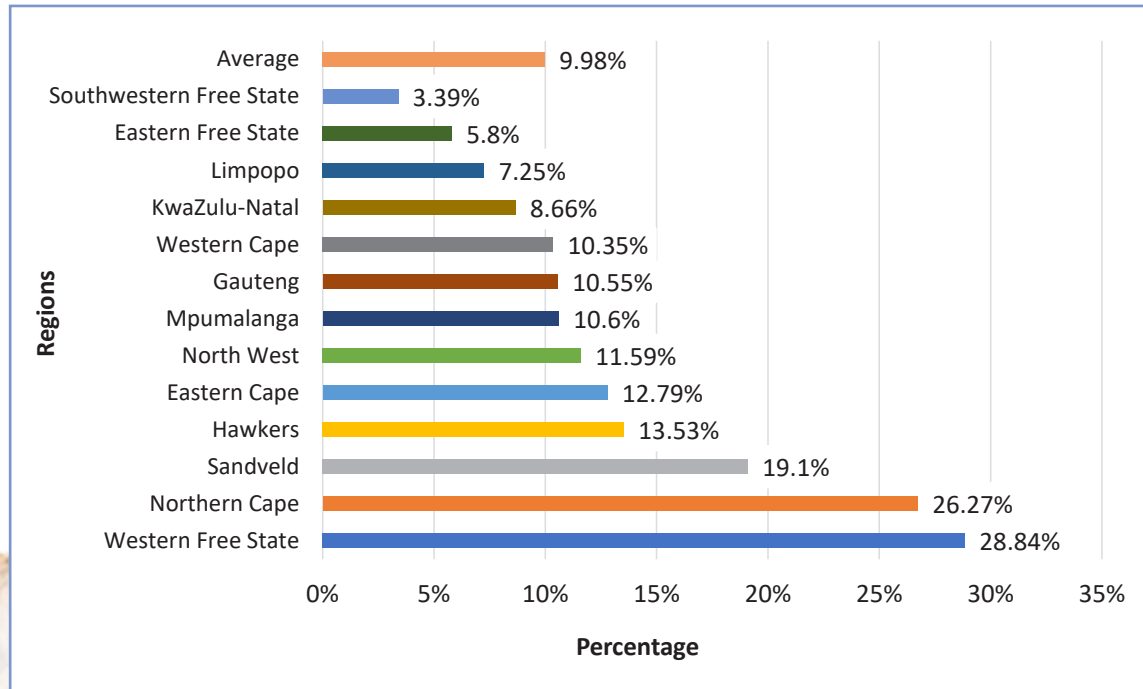


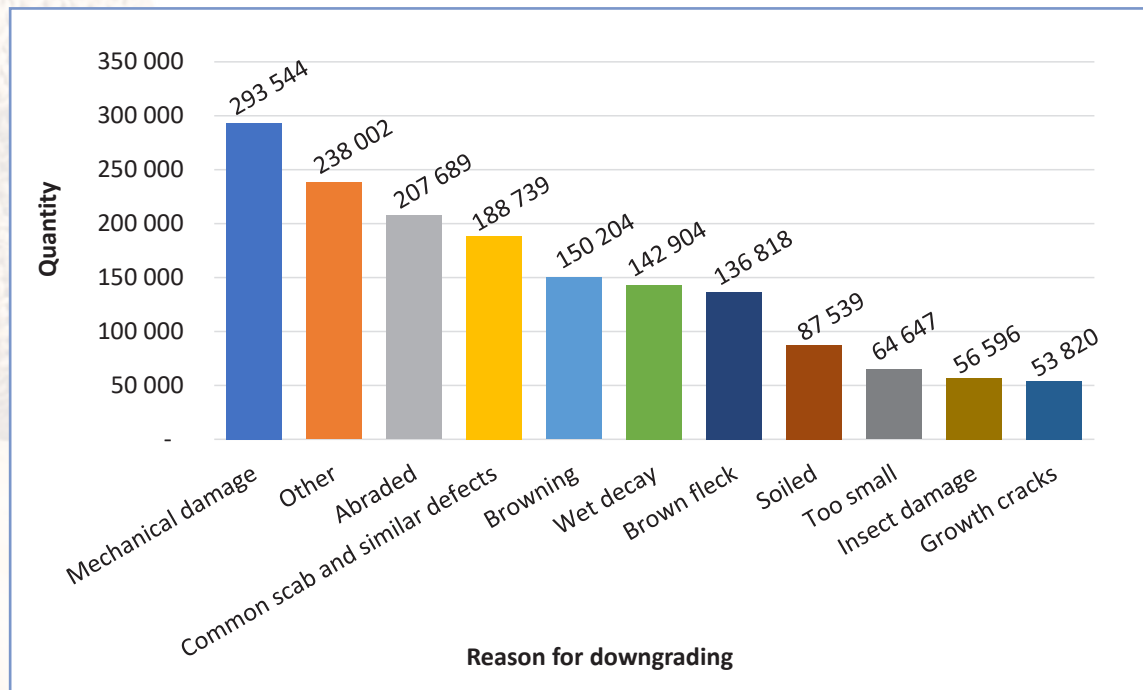


Figure 3: Potatoes downgraded (%) per region at fresh produce markets during Dec 2021/Jan 2022.



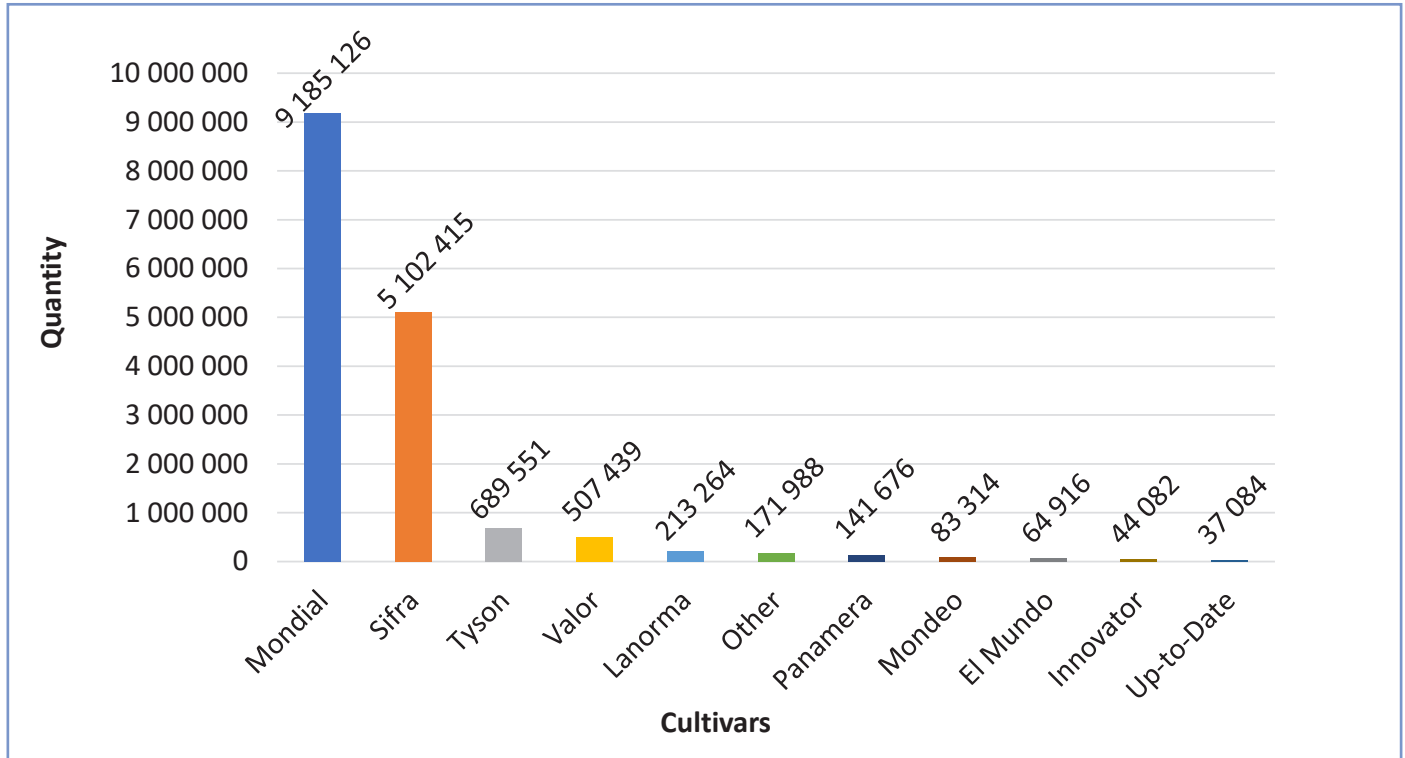
The Eastern Cape and Southwestern Free State had no downgrades.

Figure 4: Reasons for downgrading at all fresh produce markets during Dec 2021/Jan 2022.



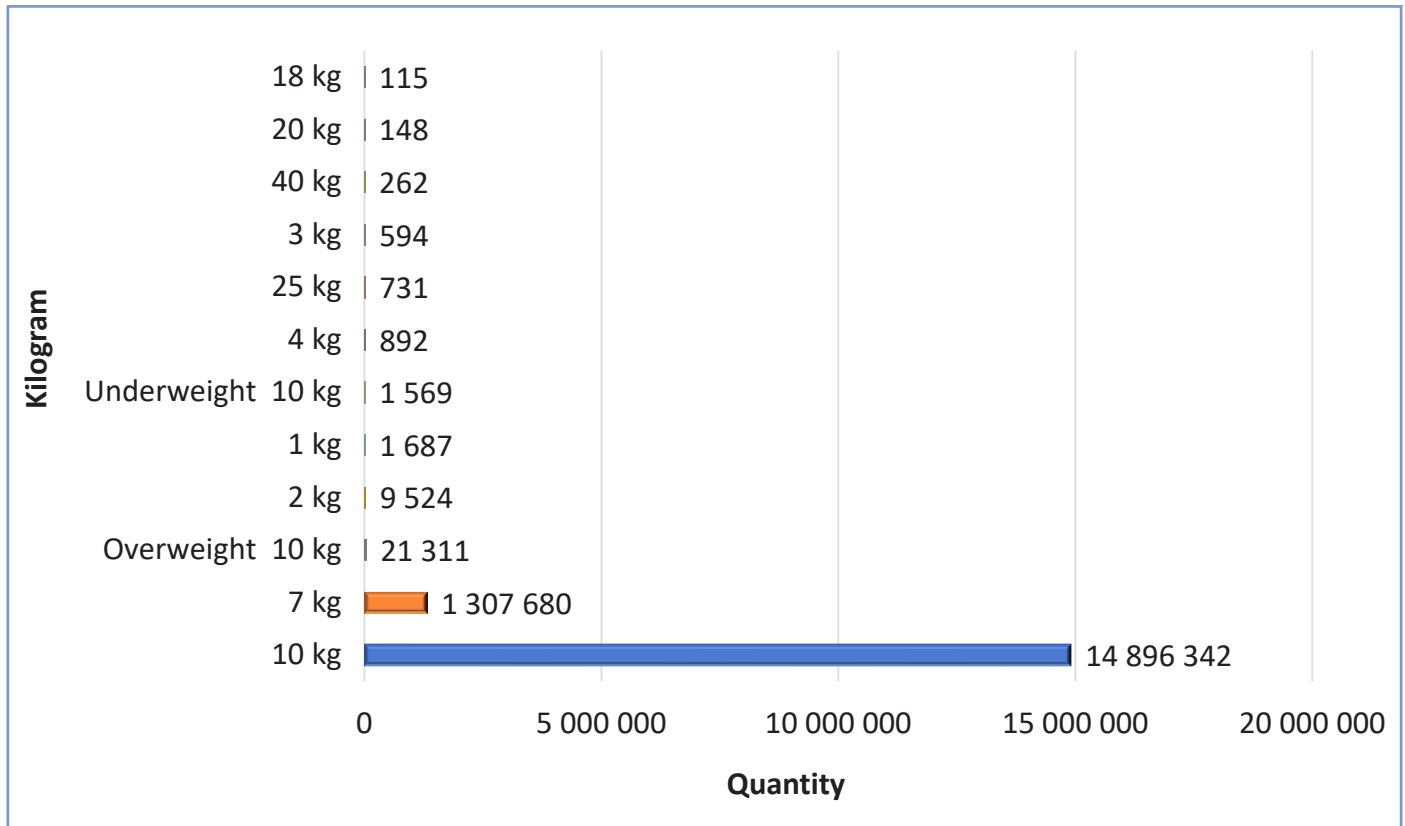
Others include: Cold damage, wilt, skin eelworm, broken and cut tubers, eelworm, too small, dry stem-end, malformed, brown fleck, watergrass damage (int) rhizoctonia, heat damage, hollow heart, wet by decayed tubers, and vascular browning.

Figure 5: Cultivar varieties inspected at all fresh produce markets during Dec 2021/Jan 2022.



Others include: Up-to-date, Labadia, Avalanche, Vanderplank, Sandvelder, Markies, Apache (POWW), Almera, Fabula, Savanna, Nicola and Hertha.

Figure 6: Volumes inspected on all fresh produce markets during Dec 2021/Jan 2022.





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