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

CHIPS

VOL 38 NO 4 • JULY / AUGUST 2024

POTATOES SA CONGRESS & SEED POTATO GROWERS' FORUM PROGRAMME 2024

KULTIVAR- EN VERWERKINGSPROEWE ONDER BESPROEIING OP PETRUSBURG EN MARBLE HALL IN 2023

Precision breeding for resilient spuds

Empowering small-scale producers through the EDP

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The potential of potatoes in South Africa

By Willie Jacobs, CEO, Potatoes SA

This preface was written while I was attending the World Potato Congress in Australia, where I gradually came to realise the true capacity of the South African potato producer. Quite a number of issues discussed at the congress related to generic problems arising from the most common pests and diseases occurring in potatoes globally. It became clear, though, that South Africa stands out as one of the highest-yielding countries worldwide, judging by yield per hectare.

Seed quality and availability were high on the congress agenda with bacterial wilt, blackleg or soft rot (*Erwinia*), late blight and tuber moth proving to be the major yield and quality influencers.

Listening to the issues at hand, I simply had to formulate a list of what sets our producers apart from the rest.

South Africa's success recipe

- The commercial mindset of our producers is of entrepreneurs whose product is aimed at achieving the highest sales value at any given time.
- Our producers own up to their conditions, bringing a solution-driven attitude to agricultural production.
- South Africa benefits from a solid seed industry, allowing for the capacity to have plant-ready materials available so that we can have fresh potatoes on the shelf every day.
- Excellent quality is assured, both in seed and commercial deliveries.
- Our interactive agro-chemical industry and crop input solutions are in tune with the challenges that producers face.
- Interactive market agent support can create swift responsiveness to pricing changes. However, this needs to be managed, because it also drives pricing volatility and resultant buffering in downstream transactions.
- Trading facilities that provide critical mass at the off-taker level, enabling the system to contain true price discovery. We have not come across similar-scale trade environments.

Levelling the playing field

This all begs the question: What can we do to improve the competitiveness of the South African producer on the world stage?

Firstly, let us acknowledge that the average potato producer in South Africa already ranks in the top 20% globally in terms of quality and yield. This means that any enhancement of productivity beyond this level will be extremely difficult to adopt, and the cost and risk barriers to entry are high.

The focus of Potatoes SA and its producers should be on further yield improvements at reduced cost. This, alongside the opening of marketing opportunities, should enable us to be among the top 20 potato-producing countries in the world. In order to do this, a few things must be in place.

Practical steps

We need to enhance our capacity to align production practices with the productive capacity of the field, especially in respect of variations in yield, nutrients and water requirements. This can only be achieved by setting up and utilising interactive monitoring systems and recording production progress and results. This data should be the starting point for each new crop, linking available resources with the planned process, thus optimising seasonal inputs. The same should apply to chemical applications, using proactive monitoring systems and spot applications to improve chemical efficiency.

Potatoes SA recognises the importance of supporting the value enhancement of quality potatoes. There is a significant volume of higher quality potatoes than the local market can accommodate or recognise. This product should find its way to overseas markets, thus improving the profitability of producers of quality product, while not adding to the burden of local consumers. At the lower quality end, we should work on alternative uses to create value for generally discarded products.

Combined, the aforementioned initiatives could significantly enhance the value proposition of potato production, ensuring that our producers remain on their farms, and that potatoes are positioned as a priority crop in our country.

To subscribe
CHIPS is the official magazine of Potatoes SA. It aims to address issues that are relevant to the potato industry.
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TABLE OF CONTENTS

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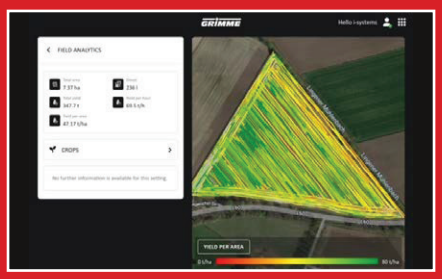

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The ins and outs of unity

At the time of going to print with this issue of *CHIPS*, we still did not know how the widely discussed government of national unity or GNU would look. The only certainty is that it will differ from what we have grown accustomed to over the past few decades. We hope that things will be different and better, and that our country can finally start repairing the damage done over a long period. History teaches more stories of damage than of reparation, both here and elsewhere in the world. Hence, we can only hope for the best.

All this GNU speak got me wondering about unity – what it truly signifies and what it should look like in practice. Unity, according to the Oxford Dictionary, is:
1 [uncountable, singular] the state of being in agreement and working together; the state of being joined together to form one unit;
2 [uncountable] (in art, etc.) the state of looking or being complete in a natural and pleasing way;
4 [singular] (formal) a single thing that may consist of a number of different parts (If society is to exist as a unity, its members must have shared values.)

Unity in action

I recently had the 'privilege' of landing in our new local hospital's emergency ward after falling down a flight of stairs at my home. I had quite a few injuries that needed quick attention and I dreaded what was to come. Yet my experience of this small hospital and its staff was nothing but wonderful from the get-go.

I was struck not only by the friendliness and helpful nature of every single person there, but also the pride each team member took in their work and the respect they have for each other. All of the staff wore smiles on their faces and happy socks on their feet in support of children's health. The receptionist was helpful, friendly, and sympathetic. The porter was dressed to the nines and looked like a businessman on his way to a meeting. He took great pride and care in wheeling patients to and from their tests and scans, and the practitioners all thanked him for this at every station.

The doctors spoke to the nursing staff respectfully while patiently explaining what steps needed to be taken and how. The atmosphere was one of calmness. An assistant nurse was walking up and down the ward, checking with doctors and nurses where he could be of help while greeting patients and asking if they were okay.

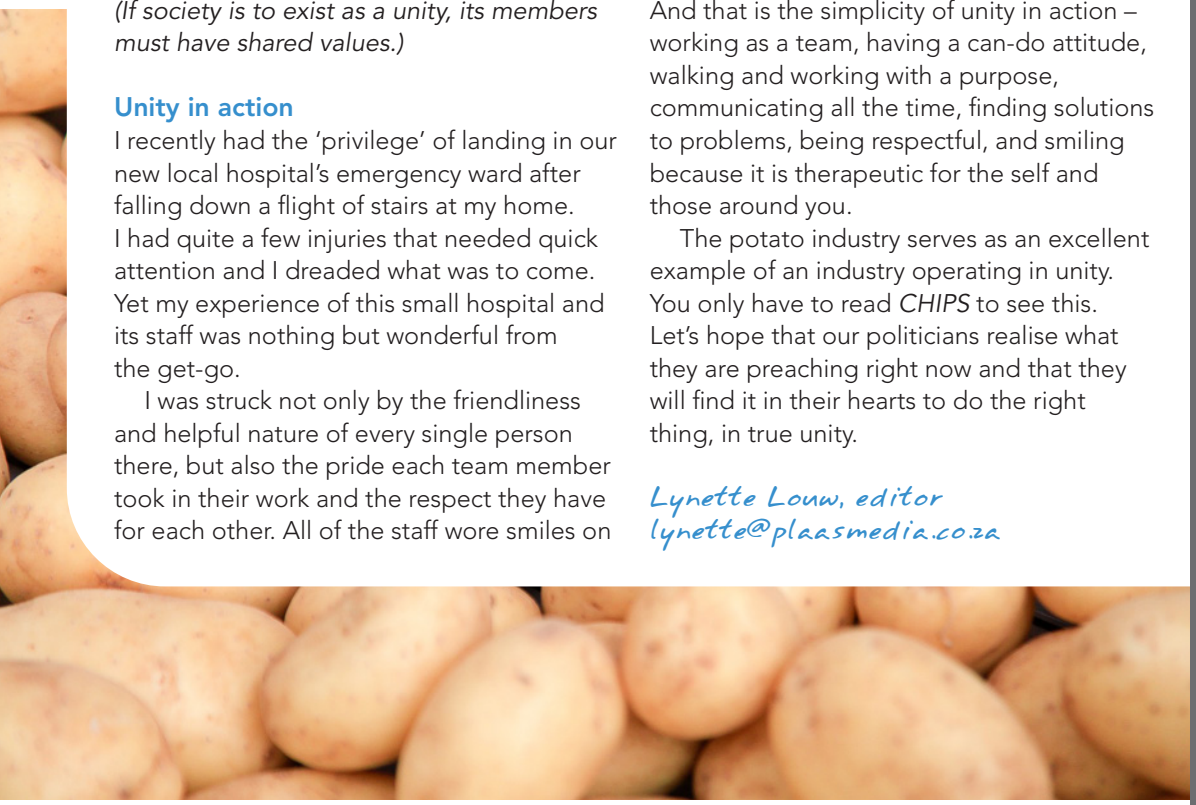
Doctors and nurses were laughing and chatting with each other and with patients, explaining treatment and giving assurances where needed. There wasn't a slouched shoulder (except for my injured one) or sour pout anywhere to be seen. I remember thinking: "Oh, just give me some pain medication and leave me here. Here, I will get better."

Don't overthink it

And that is the simplicity of unity in action – working as a team, having a can-do attitude, walking and working with a purpose, communicating all the time, finding solutions to problems, being respectful, and smiling because it is therapeutic for the self and those around you.

The potato industry serves as an excellent example of an industry operating in unity. You only have to read *CHIPS* to see this. Let's hope that our politicians realise what they are preaching right now and that they will find it in their hearts to do the right thing, in true unity.

Lynette Louw, editor
lynette@plaasmedia.co.za



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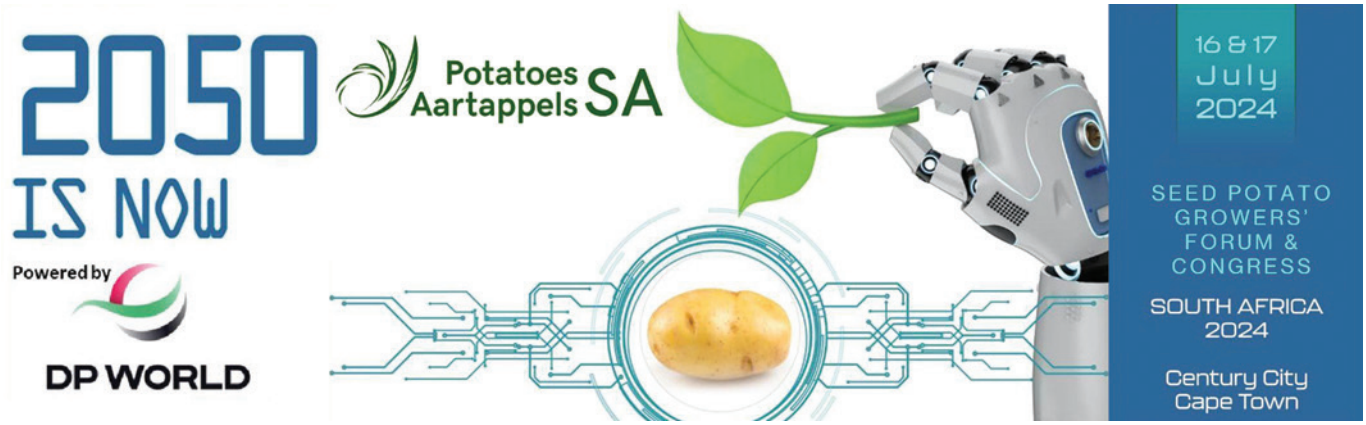

DAY 1 PROGRAMME: 16 July 2024

Seed Potato Growers' Forum *for delegates and producers* **Venue: Hall B & C** NOTE: All forum delegates are to attend this session for decision-making purposes			Parallel industry session *for input suppliers* **Venue: Hall A** Programme director: Pieter Möller (MC, team builder, brand ambassador, consultant)		
			Absa		
08:30	09:30	**Registration**	08:30	09:30	**Registration**
09:30	09:35	**Forum comes to order.**	09:30	09:40	**Opening and welcome:** Gert Bester, chairperson, Potatoes SA.
09:35	09:45	**Scripture reading and prayer.**	09:40	10:00	**Economic value of innovation:** Willie Jacobs, chief executive officer, Potatoes SA.
09:45	09:50	**Welcoming:** Gerhard Posthumus, chairperson, Seed Potato Growers' Forum.			
09:50	10:00	• Constituting, order arrangements and motions. • In memoriam.			
10:00	10:05	**Independent Certification Council for Seed Potatoes (ICCSP):** Adv Les Kügel, chairperson.	10:00	10:20	**Industry insights:** FP Coetzee, manager of industry information, Potatoes SA.
10:05	10:10	**National Seed Potato Committee (NSPC):** Gerhard Posthumus, chairperson.			
10:10	10:15	**Potato Laboratory Services/Plantovita:** Gavin Hill, chairperson.			
10:15	10:20	**Potato Certification Service (PCS):** Gerhard Posthumus, chairperson.			
10:20	10:50	**Other matters:** • **Procedural rules:** Seed Growers' Forum, National Seed Potato Committee and regional seed potato committees. • **Election and appointment of representatives on National Seed Potato Committee:** ▪ Seed potato growers (regions and production areas). ▪ Forum for Nuclear Material Providers (NUMPRO). ▪ Processing Forum. ▪ Table potato producers. • **Nomination and election of chairperson:** National Seed Potato Committee/Seed Potato Growers' Forum.	10:20	10:50	• **Innovation focus:** Dirk Uys, manager of research and innovation, Potatoes SA. • **Financing and innovation:** Loffie Brandt, head of sales enablement, AgriBusiness, Absa.
10:50	10:58	• **Announcement of chairperson:** National Seed Potato Committee and Seed Potato Growers' Forum. • **Composition of ICCSP and PCS board of directors.**	10:50	11:00	Question and answer session.
10:58	11:00	**Two-minute video of tea break sponsor**	**Sponsored by SQM**		
11:00	11:30	**Recess (tea/coffee)**			

Congress NOTE: All congress delegates are to attend this session for decision-making purposes			Parallel industry session *(continued)*		
11:30	11:40	**Welcoming:** Gert Bester, chairperson of Potatoes SA Congress.	11:30	11:50	**Agronomic efficiency:** Prof Martin Steyn, Agronomy, University of Pretoria.
11:40	11:50	• Constituting, order arrangements and motions. • In memoriam.	11:50	12:10	**Risk management in agriculture.**
11:50	12:00	**Reports:** • Potatoes SA chairperson, Gert Bester. • Potatoes SA chief executive officer, Willie Jacobs. • Potatoes SA Annual Report.			
12:00	12:15	Discussion of future amendments of the constitution.			
12:15	12:27	**Nominations:** • Chairperson of Potatoes SA (voluntary). • Member of the Audit Committee.	12:10	12:30	Question and answer session **Note: All Potato Industry Forum members to join Congress after lunch.**
12:27	12:30	**Three-minute branding video of lunch sponsor**	**Sponsored by Corteva Crop Protection**		
12:30	13:30	**Lunch**			
13:30	13:40	• **Potato Industry Development Trust (PIDT) report:** Deon van Zyl, Potato Industry Forum (PIF) chairperson. • **PIF nomination of a trustee on PIDT:** ▪ An auditor. ▪ A person to represent the PIF.			
13:40	13:50	**Audit Committee Report:** Bernhardt du Toit, chairperson.			
13:50	13:55	**Potatoes SA (voluntary):** Approval of financial statements.			
13:55	14:10	**Administrative matters:** • Announcement of appointment of auditors. • Introduction of National Council.			
14:10	14:28	**Election and announcement of chairperson, Potatoes SA (voluntary). Also serves as trustee on PIDT.**			
14:28	14:30	**Two-minute branding video of tea break sponsor**			
14:30	15:00	**Recess (tea/coffee)**			
15:00	15:25	**Main sponsor keynote and video:** William Sears, commercial officer, DP World SA.	**Sponsored by DP World SA**		
15:25	16:55	**Industry matters: Session 1 – Setting the scene, sponsored by InteliGro** ***Facilitator: Janet Lawless, InteliGro*** 1.1. **World's worst predictions and … why:** Pieter Geldenhuys, director, Institute for Technology Strategy and Innovation. 1.2. **Future of logistics:** William Sears, chief commercial officer, DP World SA. 1.3. **Shaping crop protection:** Chris Pienaar, head of Global Fruit and Vegetable Incubator, Digital Farming Solutions, Bayer. 1.4. **Future of breeding:** Dr Hennie Groenewald, CEO, Biosafety Africa. 1.5. **Panel discussion.**			
16:55	17:00	**Networking evening main sponsor video: Villa Crop.**			
	17:00	**Proceedings adjourn**			
		Meetings to follow: • NSPC. • PCS board of directors. • ICCSP board of directors.			
19:00	23:15	**Networking evening: Sponsored by Villa Crop.**			

DAY 2 PROGRAMME: 17 July 2024

Programme director: Pieter Möller (MC, team builder, brand ambassador, consultant)

08:00	09:30	**Industry matters: Session 2 – Efficiency in production (the biome), sponsored by CosmoCel** ***Facilitator: Lindi Botha*** 2.1. **Soil:** Prof Martin Steyn, professor in Agronomy, Horticulture and Pasture Science, University of Pretoria. 2.2. **Climate:** Prof Stephanie Midgley, specialist scientist for climate change at the Western Cape Department of Agriculture. 2.3. **Nutrition:** Blas Rios, global technical coordinator, Rovensa. 2.4. **The grower experiences:** Dr André Meiring, potato producer. 2.5. **Panel discussion.**
09:30	10:58	**Industry matters: Session 3 – Logistics: route to your customer, sponsored by RSA Market Agents** ***Facilitator: Anlie Hattingh*** 3.1. **DP World:** Mathys Enslin, executive vice president, contract logistics and 4 PL. 3.2. **AL3 Boerdery:** CT van der Merwe, potato producer. 3.3. **Market agent:** Jaco Oosthuizen, RSA Market Agents. 3.4. **Economy of logistics:** (TBC). 3.5. **Panel discussion.**
10:58	11:00	**Two-minute branding video of tea break sponsor** — **Sponsored by GWK**
11:00	11:30	**Recess (tea/coffee)**
11:30	12:57	**Industry matters: Session 4 – Customer, sponsored by PepsiCo** ***Facilitator: Lindi Botha*** 4.1. **Informal market:** Michelle Thackwray, CEO, AmakoneKxin. 4.2. **PepsiCo:** Gareth Haarhoff, general manager, snacks category, PepsiCo SA. 4.3. **Grower:** James Lesley, potato producer. 4.4. **Panel discussion.**
12:57	13:00	**Three-minute branding video of lunch sponsor** — **Sponsored by InteliGro**
13:00	14:00	**Lunch**
14:00	15:28	**Industry matters: Session 5 – Biosecurity and sustainability, sponsored by Corteva Biologicals** ***Facilitator: Adv Les Kügel, chairperson, ICCSP*** 5.1. **Plant health:** Jan-Hendrik Venter, director of Plant Health, Department of Agriculture, Land Reform and Rural Development (DALRRD). 5.2. **Innovation in crop enhancement:** Venessa Moodley, Biologicals Commercial lead, Corteva. 5.3. **Valskuil Boerdery (Pty) Ltd:** Monique Vlok, producer. 5.4. **Crop protection:** Rod Bell, CEO CropLife and Jonathan Mudzunga, director: Registrar *Act 36 of 1947*, DALRRD. 5.5. **Panel discussion.**
15:28	15:30	**Two-minute branding video of tea break sponsor** — **Sponsored by AECI**
15:30	16:00	**Recess (tea/coffee)**
16:00	17:00	**Industry matters: Session 6 – 2050 is now! sponsored by Adama** ***Facilitator: Willie Jacobs*** 6.1. **Langrivier Boerdery:** Bernhardt du Toit, potato producer. 6.2. **Avocado industry learnings:** Lindie Stroebel, country manager, Mission Produce. 6.3. **AgriSA lessons from other industries:** Johan Kotze, CEO AgriSA. 6.4. **Dreams to reality:** Pieter Geldenhuys, director, Institute for Technology Strategy and Innovation. 6.5. **Panel discussion.**
	17:00	**Proceedings adjourn**
19:00	23:00	**Prestige Gala Awards Ceremony** ***MC: Anlie Hattingh, content producer, Brand Republic*** • Announcement of Bayer Seed Potato Grower of the Year 2024. • Announcement of the Syngenta National Potato Farmer of the Year 2024.

DAY 3 PROGRAMME: 18 July 2024

08:00	10:00	**National Council Potatoes SA** • Appointment of board of directors of Potatoes SA (NPC). • Election of vice-chairperson. • Election of chairpersons of committees. • Election of Potatoes SA representatives on National Seed Potato Growers' Committee.

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Diseases:
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Diseases:
Early blight
Late blight
Powdery scab

TebuCure 250 EW
FRAC: 3
Dosage rate: 75 mℓ/
100 ℓ water
Minimun of 375 mℓ/ha
Diseases:
Early blight

Bostrin 380 WG
FRAC: 7 & 11
Ground and Aerial application:
300 g/ha
Ground application: 600 g/ha
Diseases:
Early blight

Obstructo 250 SC
FRAC: 11
Dosage rate: 300 mℓ/ha
in-furrow 20 mℓ/100 m row
Diseases:
Early blight
Black dot
Black scurf
Silver scurf

Tutor 500 SC
FRAC: 29
Dosage rate: 150 mℓ/
100 ℓ water
Minimum of 750 mℓ/ha
Diseases:
Early blight
Grey mould

Constrictor 250 EC + Protector 400 SC
FRAC: 9 & 11
Dosage rate: 80 mℓ Constrictor 250 EC + 120 mℓ
Protector 400 SC / 100 ℓ water
Minimum of 400 mℓ Constrictor 250 EC/ha
Minimum of 750 mℓ Protector 400 SC/ha
Diseases:
Early blight
Grey mould

CopperKill SC
FRAC: M01
Dosage rate: 150 mℓ/
100 ℓ water
Diseases:
Early blight
Late blight

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Potato NEWS

Irish potato prices improve

The Central Statistics Office (CSO) in Ireland has revealed that the price of outputs for potato producers have increased by 73.6% over the 12 months to April 2024.

The CSO also detailed that "the most significant" decreases in the prices paid to producers for their produce in the 12 months to April 2024 were recorded in industrial and forage crops which dropped by 26.4% and in relation to pigs which declined by 6.2%. While increases were recorded for output prices for potato growers, they were also seen for vegetables, which rose by 11.7%.

On the input side, the CSO stated that the price of fertilisers has fallen by 31.4% in the year to April, while the price of motor fuels has increased by 10.1%. On the output side, the price of cereals (including seeds) has fallen by 31.4% in the year to April 2024. – *Agriland*

Climate change impacts South Korea

A study published in the journal *Potato Research* presents results on the response of spring and summer potatoes to climate change in South Korea. The study, conducted by scientists from the Leibniz Centre for Agricultural Landscape Research (ZALF) and the Brandenburg University of Technology Cottbus, investigates the effects of global warming on the potato crop and presents adaptation strategies.

"Our results show that the CO_2 fertilisation effect can offset the negative effects of rising temperatures and increase yields of spring potatoes by up to 60% if planting times are adjusted," explains Dr Yean-Uk Kim, the main author of the study and scientist at ZALF. The CO_2 fertilisation effect describes the phenomenon that higher CO_2 concentrations in the atmosphere can improve the photosynthetic performance of plants, leading to faster growth and higher yields.

Research shows that earlier planting is recommended for spring potatoes under mild climate change conditions. Under more severe climate change conditions, the researchers suggest breeding heat-tolerant varieties as an adaptation strategy. For summer potatoes, the focus would be on increasing tolerance to high temperatures, regardless of the climate scenario. – *Phys.org*

Nuwe besturende direkteur vir ASD

Die Aartappelsertifiseringsdiens (ASD) het onlangs aangekondig dat dr Ansa van Vuuren vanaf 1 Julie vanjaar as besturende direkteur sal aansluit. Dr Van Vuuren het haar nagraadse kwalifikasies in plantteling aan die Universiteit van die Vrystaat verwerf en ook later 'n senior bestuurskwalifikasie aan die Universiteit van Pretoria verwerf.

Dr Van Vuuren het uitgebreide praktiese ervaring in 'n wye verskeidenheid gewasse en verskeie wetenskaplike dissiplines wat konvensionele plantteling, gewasbeskerming, die uitvoer van veldproewe en die ontwikkeling van navorsingsprotokolle insluit. Haar bestuurservaring sluit in die operasionele bestuur van 'n weefselkultuurlaboratorium, die bestuur van plantteling- en navorsingspanne en, meer onlangs, die bestuur van die kampus vir Plantgesondheid en -beskerming by die Landbounavorsingsraad vir agt jaar.

Sy het op verskeie advies- en bestuurskomitees gedien met betrekking tot strategiese navorsing, infrastruktuurontwikkeling en regeringsinisiatiewe.
– *Aartappelsertifiseringsdiens*

Dr Ansa van Vuuren, nuwe besturende direkteur van die Aartappelsertifiseringsdiens (ASD).

Sunlight impacts Scottish yields

The potato planting season in Scotland has been sporadic as producers have seized every available moment to get tubers in the ground.

This inconsistency in planting times is likely to cause challenges for those aiming for a rolling harvest, as uneven planting leads to uneven harvesting schedules. The weather has played a significant role, with frequent rain causing start-stop planting conditions. Although the ground appeared dry on the surface, it remains soaked underneath, complicating planting efforts.

Despite these challenges, most crops were in the ground in early June. This year, more producers are planting later into the season than usual, which will extend the Scottish harvest period.

Seed potatoes have been in tight supply this year. Some producers have resorted to using farm-saved seed, although this practice is not recommended due to potential disease risks. As the weather warms up, potato growth has been promising. However, low sunlight levels suggest that a bumper crop is unlikely, potentially impacting yields and seed maturity.

There is also concern that later-planted crops may bolt due to stress from suboptimal conditions, resulting in a wider range of tuber sizes and posing challenges for the seed sector.
– *The Scottish Farmer*

Potato NEWS

Researcher develops new potato

Michigan State University (MSU) potato breeder, Dave Douches, has genetically finessed a breed that will store longer, stay fresher and even make potato chips taste better, researchers said. This means, according to MSU researchers, a more stable spud. The potato can also reduce the environmental impact of the growing process because it does not need as many fertilisers and pesticides.

Douches, the creator of the Kal91.3 potato, is the director of MSU's potato breeding and genetics programme in the Department of Plant, Soil and Microbial Sciences. He has been looking for ways to correct the sugar imbalance in some potatoes used to make potato chips, which can make the chips brown.

"When glucose and fructose accumulate in the tubers, it gives you a brown potato chip," Douches said. "There is too much sugar. If the sugar stays at sucrose, you get a nice white chip. There are only a few people who like dark potato chips. Most people prefer a chip with a nice clean taste rather than that burnt taste."

"The new genetically modified potato has been approved by the United States Department of Agriculture's Animal and Plant Health Inspection Service for commercial use," Douches said. The Kalkaska potato was created years ago and had a lot of promise, but it was not able to handle large commercial storage conditions.
– *The Detroit News*

Fresh leadership for InteliGro

InteliGro entered an exciting new chapter, as they recently welcomed AJ Griesel as their new managing director. Griesel fills the position after Gideon Hefer stepped into a new role in the WinField United South Africa Group. Griesel most recently led the South African Table Grape Industry as chief executive officer and with over 20 years of experience in the agricultural industry, brings a wealth of knowledge and experience to the team.

He emphasises leading people so that business performance, operational excellence, and profitable growth are achieved and accelerated. "I am excited to join this team of experts and innovators," says Griesel. "Together we will continue to build upon the strong foundation and seize new growth opportunities."

Griesel will be travelling across the country to meet with the respective InteliGro teams and stakeholders.
– *InteliGro*

AJ Griesel, new managing director of InteliGro.

Robust surge in US potato sales

In a promising start to the year, the United States (US) retail market for potatoes experienced a significant uptick, with sales volumes increasing by 5.6% in the first quarter of 2024 compared to the same period in the previous year. Dollar sales also saw a healthy rise of 4.4%, reaching nearly US$4.6 billion, according to a recent report from Potatoes USA.

The growth was uniform across all potato categories, reflecting a robust demand from consumers. Fresh potatoes led the charge with a notable 7.6% increase in volume sales, complemented by a modest 0.6% rise in dollar sales. Frozen potatoes enjoyed a 10.5% surge in dollar sales, despite a smaller 3.3% increase in volume. The chip segment also performed well, with dollar sales up by 3.3% and volume sales by 1.7%.

Among the various categories, deli-prepared sides and fresh potatoes recorded the highest sales volume increases at 7.8 and 7.6%, respectively, underscoring their popularity among consumers.

Fresh potatoes alone accounted for nearly US$1.1 billion in dollar sales, marking a 0.6% rise from the previous year. This growth was driven by increases in almost all types of potatoes, except for red and white varieties, which saw declines of 3.3 and 3.1%, respectively. Notably, purple potatoes led the way with an 18.9% surge in sales volume, followed by medley potatoes (11.5%), yellow potatoes (11.2%), and russet potatoes (10.8%). The significance of these increases is amplified considering that russet and yellow potatoes together constitute 79% of the fresh potato volume sales. – *Potatoes USA*

FPMI report slams Simba's potato seed strategy

The Competition Commission's Fresh Produce Market Inquiry (FPMI) has found that at retail level, fresh produce pricing is not transparent enough, citing instances of high markups, as well as slow and very low integration of smallholder producers. The inquiry also alleges problematic potato seed hoarding by Simba, a subsidiary of PepsiCo.

The FPMI Inquiry provisional report release was held on 18 June. The inquiry was initiated on 31 March 2023, according to the *Competition Act, 1999 (Act 89 of 1999)*. It is considering if adverse effects are present in the fresh produce value chain arising from any feature or combination of features that may impede, restrict or distort competition.

"The inquiry found that the state of the national fresh produce market's infrastructure is concerning," said chairperson of the FPMI, deputy commissioner of the Competition Commission, Hardin Ratshisusu.

"The inquiry also considered the usage of plant breeders' rights (PBRs) in relation to Simba. The inquiry noted an apparent strategy by Simba, who develops its own varieties, and discontinues use of a closed variety before expiry of its PBR. It seemingly replaces that variety with its new (fully protected) variety. This strategy means that access to a variety (which will imminently be open) may be limited through the removal of the genetic material.

"The inquiry engaged Simba, which denied that it stops a variety before the expiry of PBRs. The inquiry considered Simba's submission but remains unconvinced, particularly because as it stands, there is no access to this cultivar even if producers may try to obtain it. In light of this, the inquiry makes a provisional finding that Simba's decision to discontinue the FL2006 without making this cultivar available to the market distorts competition. This is mainly because the competitors of Simba or new entrants will not have access to this variety," explained Ratshisusu.

"Linked to this is the challenge where the Agricultural Research Council (ARC) is facing funding challenges following withdrawal of some industry associations who previously played a key role in funding the organisation, particularly with the potato gene bank." The inquiry says the defunding of the ARC has "wider implications".

The inquiry has also made 29 recommendations, comprising nine remedial actions and 21 recommendations. For the full provisional report, visit *www.compcom.co.za*. – *Daily Maverick*

Sandveldboere bespreek aartappelsake

Deur Hugo Lochner, Plaas Media, en Francois Strauss, Aartappels SA

Die Sandveld Aartappelkwekersorganisasie (SAKO) se algemene jaarvergadering is in Mei vanjaar by die Riviera Hotel in Velddrif aangebied. Die lewering van aartappels op varsproduktemarkte, die bestuur van ondergrondse water in die Sandveld, en aartappelsiektes is van die sake wat bespreek is.

Jannie Basson, die uittredende voorsitter van SAKO, het in sy voorsittersverslag gesê die aanplanting en pryse van aartappels is nou meer stabiel as net na die uitbreek van die oorlog in Oekraïne, toe hoë kunsmispryse en kragonderbrekings 'n demper op aartappelaanplantings geplaas het.

"Die stabilisering van die prys hang steeds van die hoeveelheid aartappels af wat op die varsproduktemarkte aangebied word, maar daar is nou weer 'n geleentheid om wins te maak. Met 'n oes van 50 ton/ha kan jy geld maak. Ongelukkig val dié opbrengs in die boonste gedeelte van die Sandveld-oes. Die streek se gemiddelde oes is 40 tot 45 ton/ha," het Basson gesê.

Minder aartappels na markte

Volgens Basson het die tendens dat minder aartappels na varsproduktemarkte gestuur word, die laaste paar jaar toegeneem. Dieselfde tendens word ook by ander groente en vrugte opgemerk, waar al hoe meer produkte direk na kleinhandelaars gestuur word.

Alles gaan oor kostebesparing. Varsproduktemarkte het duur geword en tesame met hoë insetkoste, kyk boere waar hulle kan spaar. "Direkte bemarking bring 'n besparing in bemarkingskoste mee. Maatskappye, groothandelaars of vrugte- en groentehandelaars wat direk by boere koop, bied dieselfde dienste as markagente, koop die boer se hele oes net soos dit van die land af kom, en die boer hoef nie kommissie of die vervoer van die produkte te betaal nie. Die instansies ding dus direk met markagente mee en dit is hoekom die tendens toeneem," het Basson uitgewys.

"Ons het vandag gehoor dat kommissie op varsproduktemarkte onderhandelbaar is, maar vir my as produsent is dit nuus. Ons het dit al in die verlede voorgestel, maar dit is nie gunstig ontvang nie." Basson het ook gesê die stelling dat varsproduktemarkte 'n prysbepalingsmeganisme vir varsprodukte in Suid-Afrika is, is nie meer heeltemal geldig nie. "Daar is baie kommoditeite in Suid-Afrika wat nie meer op varsproduktemarkte gelewer word nie. As 'n produsent nie meer 'n gewas plant nie gaan die prys klim, met of sonder 'n mark."

Waterverbruik kort aandag

Die Sandveld is van ondergrondse water vir besproeiing afhanklik en die droogtesiklus vóór 2023 se bogemiddelde reënval, het watervlakke en watergehalte onder druk geplaas. Verlede jaar se goeie reënval het wel 'n positiewe uitwerking op watervlakke gehad.

"Die watervlakke van rustende en gepompte boorgate, het onderskeidelik met 2.8 en 4.5 m gestyg, wat

Van links is die gasspreker, dr Ivan Meyer, Wes-Kaapse minister van landbou, saam met Jolandi Vermeulen, programbestuurder van die jaarvergadering, en Jannie Basson, uittredende voorsitter van SAKO.

Van links is Etienne Booyens, hoof uitvoerende beampte van Prokon, saam met Dirk Uys, navorsingsbestuurder, en Willie Jacobs, hoof uitvoerende beampte van Aartappels SA.

Geo van Zyl, bestuurder van die RSA Groep in Kaapstad.

te wagte was na die hoë reëns. Die water se pH het 'n bietjie gedaal van 5.7 na 5.3, en die nitrate van 6.4 na 5.2. Die elektriese geleidingsvermoë (EC) van die water het egter van 1.1 na 1.2 gestyg. Die styging is klein, maar onrusbarend, gegewe die hoeveelheid reën wat ons gehad het," het Basson gesê.

"Hoewel die statistieke meestal positief is, is ons steeds bekommerd daaroor omdat laasjaar 'n goeie reënjaar was. Ons het beter resultate verwag. Die skrif is aan die muur. Ons sal beslis na ons waterverbruik in die Sandveld moet kyk om volhoubaar te boer," het hy gemaan.

Markte bly relevant

Geo van Zyl, bestuurder van die RSA Groep in Kaapstad, het die relevansie van varsproduktemarkte in die verhandeling van grootmaat-aartappels verduidelik. Hy het gesê daar is van 2019 tot 2023 altesaam R14.6 miljard se aartappels (3.114 miljard kg) op die vier grootste varsproduktemarkte in Suid-Afrika (Johannesburg, Tshwane, Durban en Kaapstad) verkoop. Johannesburg se mark is verantwoordelik vir byna 50% van die totale verkope.

"Die varsproduktemarkte is betroubaar, maklik bereikbaar, met onbeperkte toegang. Alle transaksies op die markte is deursigtig, die markte bied waarde vir geld, het 'n realistiese prysformuleringsproses en daar is vinnige reaksie op prysbepalende faktore. Daarby is 'n produsent se geld gewaarborg," het Van Zyl uitgewys. Hy het ook aangedui dat varsproduktemarkte aartappels van alle grade en gehalte hanteer teenoor privaatmarkte of direkte verkope wat meer selektief is.

Vestig Sandveld as primagebied

Etienne Booyens, hoof uitvoerende beampte van Prokon, het gesê aartappelprodusente in die Sandveld moet die streek as 'n prima aartappelverbouingsgebied vestig. Die Sandveld en Limpopo is die enigste streke met primêre aartappelprodusente. "As julle die streek as 'n primagebied vestig, is dit belangrik dat julle geloofwaardig optree. Gehalte produkte moet bemark word en die regte gehalte produkte moet, soos die etiket aandui, in die verpakking wees." Hy het verder beklemtoon dat akkreditasie op beide nasionale en internasionale vlak plaasvind.

Dr Ivan Meyer, die Wes-Kaapse minister van landbou, het daarop gewys dat Suid-Afrika se aartappeluitvoere met 34% gegroei het van R324 miljoen in 2014 na R434 miljoen in 2023. Oor dieselfde tydperk het die Wes-Kaap se aartappeluitvoere met 46% gedaal, van R126 miljoen na R67 miljoen. Die Wes-Kaap se aandeel in totale aartappeluitvoere het van 39% in 2014 na 16% in 2023 gedaal (*Figuur 1*).

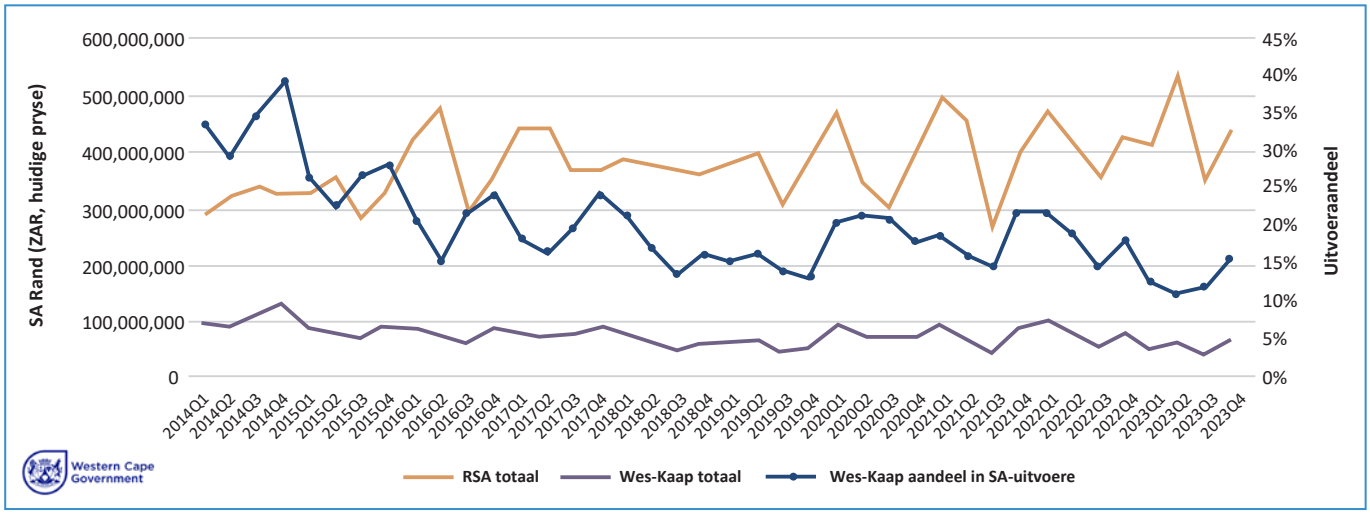
"My doelwit is om die uitvoer van landbouprodukte noemenswaardig te laat toeneem. Daarom moet ons hierdie tendens in die Wes-Kaapse aartappelbedryf omkeer," het dr Meyer gesê.

Bedryf tel kop op

Willie Jacobs, hoof uitvoerende beampte van Aartappels SA, het gesê die afgelope 12 maande se gemiddelde produsenteprys was definitief hoër as in die verlede. Die optimisme waarmee nuwe projekte aangepak word vloei hieruit.

"Die prys van prosesseringsaartappels het definitief gelig,

Figuur 1: Tendense in Suid-Afrikaanse aartappeluitvoere – Wes-Kaapse aandeel, 2014 tot 2023.



Van links na regs is Terence Brown, bestuurslid van SAKO, saam met Franco Strydom en Pierre van Vuuren, albei van Prokon.

Monique Vlok (regs) is na afloop van die vergadering tot voorsitter verkies. Saam met haar is Jannie Basson, die uittredende voorsitter.

wat gewoonlik 'n aanduiding is dat daar marge in die ekonomie ontstaan. Koopkrag, gehalte en produkaanvraag is relatief goed. As ons dit kan regkry om die gehalte van die produk wat nou markte toe gaan konstant te hou, kan ons 'n billike seisoen in die volgende ses maande verwag."

Hoër produksie moontlik

Jacobs het gesê die oppervlakte wat vir aartappelverbouing in Suid-Afrika beskikbaar is, is redelik versadig. Al wat produsente kan doen om produksie te verhoog, is om doeltreffender op beskikbare grond te boer. Produsente moet opbrengs per hektaar verhoog, beter gehalte produseer, en sodoende die winsgewendheid van aartappelverbouing verbeter.

"Ons moet grondbiologie en grondsiektes beter verstaan en bestuur, en die gebruik van chemiese middels verminder deur chemikalieë minder breedwerpig aan te wend. 'n Direkte behoeftebepaling van chemikalieë en die toepassing van biologiese beheer saam met chemikalieë, kan 'n groot verskil aan die insetkant maak," het hy gesê.

As produsente die insetkant en grondbiologie beter bestuur en die draaityd (siklus) van aartappels op dieselfde land verkort, kan hulle op dieselfde hektare nog 'n substansiële verbetering in produksie kry.

Jacobs twyfel nie dat daar in Suid-Afrika 'n groter geleentheid is om aartappels te bemark nie, maar die bedryf moet verseker dat waar aartappels gelewer word, 'n gesonde afname daarvoor bestaan. 'n Beter raklewe en goeie logistiek sodat almal in die waardeketting 'n idee het van hoeveel produk op watter tyd aan 'n spesifieke mark gelewer word, kan voorkom dat markte oorvoorsien word, het hy uitgewys.

Virus kan die bedryf knou

Die voorkoms van die *pepper ringspot*-virus (PepRSV) in 'n kommersiële aartappelaanplanting in Suid-Afrika, is vir die eerste keer in Oktober 2022 aangemeld. Jacobs het gewaarsku dat die virus aartappelverbouing in Suid-Afrika kan ontwrig en 'n groot probleem kan word as dit nie reg bestuur word nie.

Die bedryf werk tans hard om die voorkoms van PepRSV te isoleer en sodoende die siekte te beperk. Die virus kan voorkom word deur gesertifiseerde saad te plant, goeie onkruidbestuur en wisselbou toe te pas, verskillende kultivars van verskillende bronne te plant en vir die teenwoordigheid van stompwortelaalwurm te toets. "Dit is ook belangrik om 'n goeie verhouding met jou saadverskaffers op te bou," het Jacobs gesê.

Chrizelda Klasen, Adrian de Villiers en Omar Allie het die Kaapstad Varsproduktemark verteenwoordig.

Vir meer inligting, kontak Monique Vlok by 083 610 7320 of besoek *www.potatoes.co.za*.

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Market monitor: The first 22 weeks of 2024 at fresh produce markets

By Dikgetho Mokoena, Anjé Erasmus and FP Coetzee, Potatoes SA

The average weekly price of potatoes in the first 22 weeks of 2024 reflected an overall downward trend for most of the period, which is the opposite of the 2023 production year. Price increases were, however, observed in weeks 15, 18, 19, 21 and 22. The average weekly price over this period was R2.40 higher than in 2023.

Figure 1 indicates the weekly average prices at all markets for all classes and sizes. By the end of week 22, the average weekly price was R61.02 per 10 kg bag, representing a 5% increase week on week. *Figure 2* reflects the daily average stock levels and daily average price. It is clear that, towards the end of May, stock levels had started to decrease, resulting in a higher daily price. Maintaining stable delivery patterns – especially in times of high demand – and delivering good quality products to the fresh produce markets (FPMs) are some of the reasons that ensured that the average daily price remained high.

Figure 3 indicates the average stock levels in each month as opposed to levels during the same month a year ago. April and May 2024 reflect an increase of 349 800 and 522 063 bags, respectively, compared to April and May 2023. This resulted in a price drop in mid-April. Sales in April and May 2024, however, led to the relatively stable average weekly price fetched during the last two weeks of April, and the first two weeks as well as the last two weeks of May 2024.

A decrease in sales

During the first 22 weeks of 2024, sales at the FPMs decreased by 1% from 2023's corresponding figure, according to *Figure 4*. The average price for the first 22 weeks is also

Figure 1: Weekly average prices at all FPMs of all classes and sizes. (Source: RSA file)

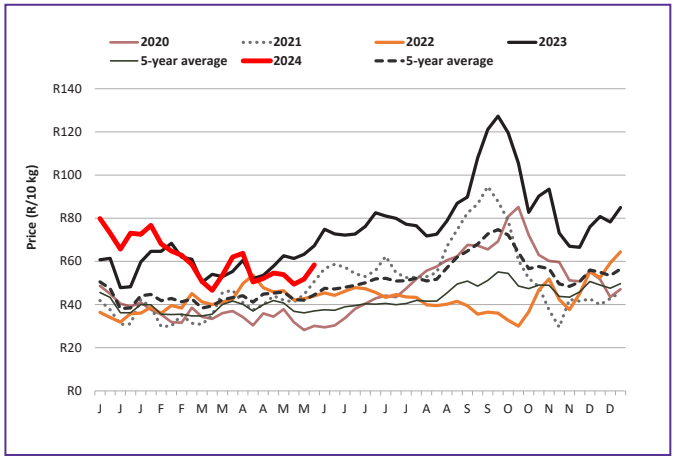


Figure 2: Daily average stock levels compared to the daily average price of all classes and sizes. (Source: Joburg daily price and stock)

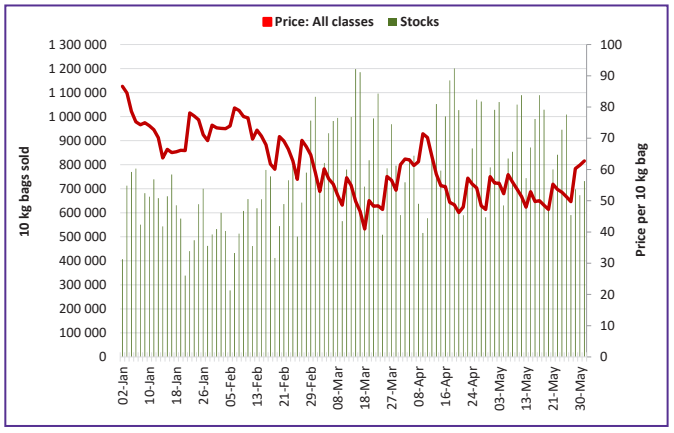


Figure 3: Average daily stock levels per month in 2023 versus 2024.

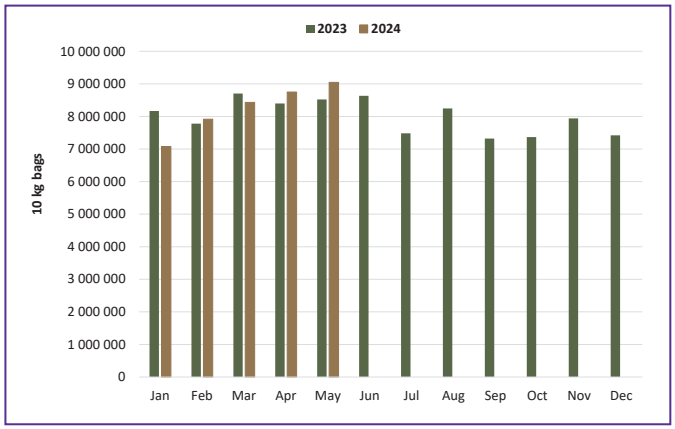
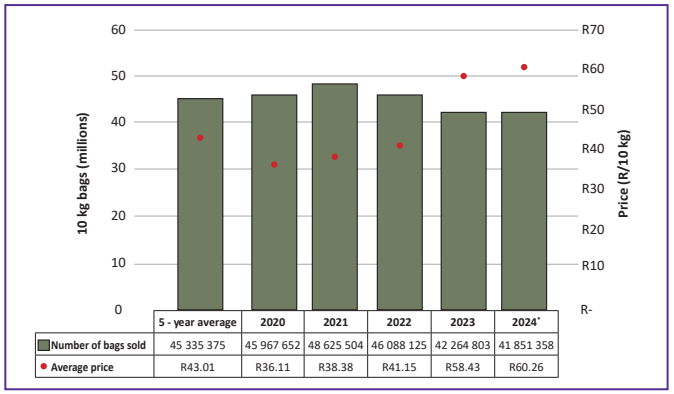


Figure 4: Cumulative number of 10 kg bags sold at FPMs until week 22 of every year (average price). (Source: RSA file)



	5 - year average	2020	2021	2022	2023	2024*
Number of bags sold	45 335 375	45 967 652	48 625 504	46 088 125	42 264 803	41 851 358
Average price	R43.01	R36.11	R38.38	R41.15	R58.43	R60.26

Table 1: Sales at FPMs up until week 22 of 2024.

				Percentage of sales at FPMs			
Market	Number of bags 10 kg	% of total	Avg price (R/10 kg)	Class 1	Class 2	Class 3 & 4	Class 1 M
Johannesburg	17 381 328	41.5%	60.22	75%	16%	9%	17%
Tshwane	7 945 981	19%	58.65	63%	23%	14%	15%
Durban	4 018 412	9.6%	60.32	73%	18%	9%	24%
Cape Town	3 381 697	8.1%	69.01	69%	25%	6%	21%
Springs	2 169 439	5.2%	55.6	60%	23%	17%	13%
Bloemfontein	1 102 841	2.6%	61.24	55%	29%	16%	14%
East London	1 149 455	2.7%	63.14	67%	23%	10%	20%
Klerksdorp	1 101 647	2.6%	55.6	65%	20%	15%	15%
Welkom	1 027 961	2.5%	56.09	49%	33%	18%	9%
Port Elizabeth	1 081 003	2.6%	60.99	67%	23%	10%	23%
Pietermaritzburg	846 818	2%	56.25	61%	25%	14%	15%
Vereeniging	224 464	0.5%	56.15	66%	24%	11%	13%
Witbank	224 579	0.5%	59.4	62%	24%	14%	12%
Nelspruit	184 404	0.4%	73.1	73%	21%	6%	8%
Kei (Umtata)	10 206	0%	–	0%	0%	0%	0%
Total	41 850 235	100%	60.26	69%	20%	11%	17%

Figure 5: Monthly sales at FPMs from 2020 to 2023 (all packaging converted to 10 kg bags).

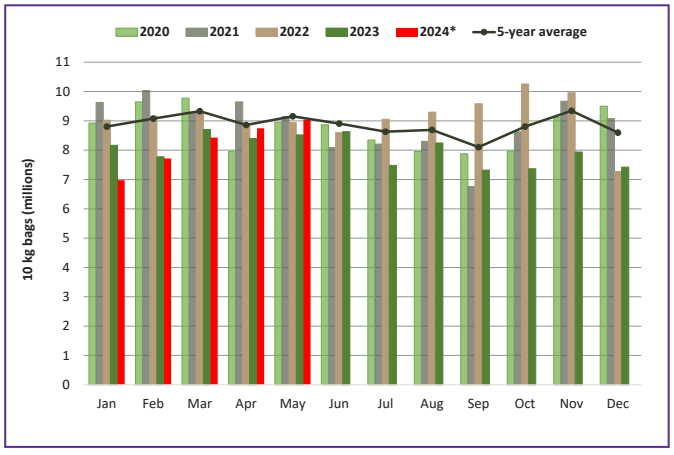


Figure 6: Year-on-year change at the top five markets from 2023 to 2024.

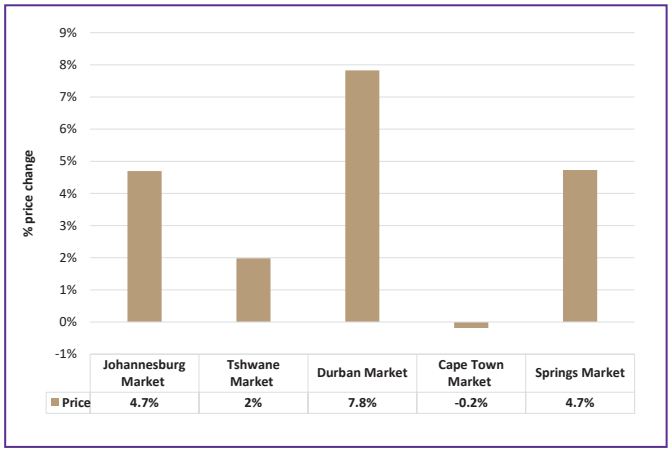


Figure 7: Top five markets year-on-year change in bag sales.

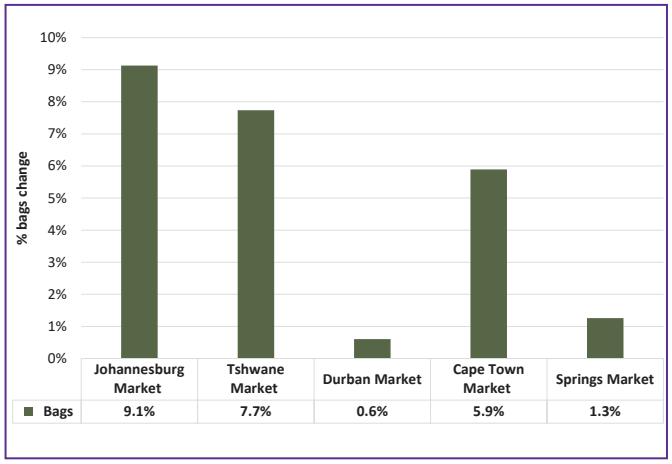


Figure 8: Sales performance across regions during the first 22 weeks in 2023 compared to 2024.

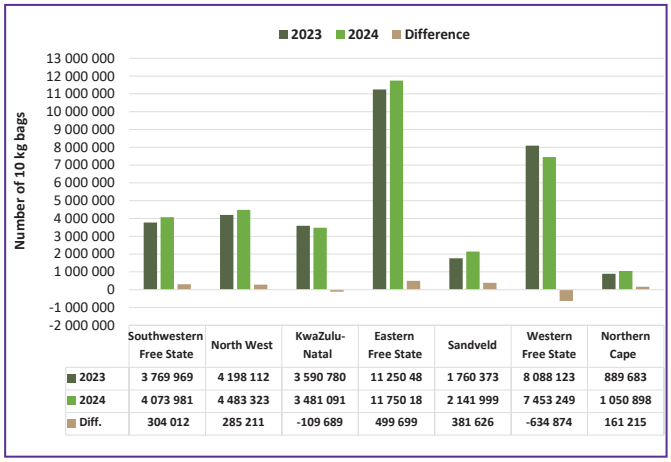


Table 2: Sales per region at FPMs until week 22 of 2024.

				Percentage of sales at FPMs			
Region	Number of bags 10 kg	% of total	Avg price (R/10 kg)	Class 1	Class 2	Class 3 & 4	Class 1 M
Southwestern Free State	4 073 981	10%	69.63	78%	13%	**9%**	22%
North West	4 483 323	11%	67.19	78%	14%	8%	16%
KwaZulu-Natal	3 481 091	8%	65.05	72%	21%	7%	12%
Limpopo	1 225 805	3%	65.71	83%	15%	3%	21%
Gauteng	2 343 038	6%	61.33	86%	10%	3%	24%
Eastern Free State	11 750 187	28%	55.06	61%	23%	16%	12%
Sandveld	2 141 999	5%	66.87	67%	29%	3%	20%
Western Free State	7 453 249	18%	56.67	70%	19%	11%	21%
Other regions	1 102 793	3%	45.59	46%	38%	17%	13%
Mpumalanga	581 619	1%	67.52	80%	16%	4%	17%
Northeastern Cape	1 350 858	3%	56.83	58%	32%	10%	19%
Eastern Cape	178 385	0%	58.27	56%	35%	10%	16%
Southern Cape	397	0%	56.85	76%	24%	0%	0%
Northern Cape	1 050 898	2.51%	48.84	55%	21%	24%	15%
Ceres	632 612	1.51%	71.83	0%	0%	0%	0%
Total	**41 850 235**	**98%**	–	**69%**	**20%**	**11%**	**17%**

depicted in *Figure 4*, with 2024's average price at its highest compared to the previous four years. Sales at FPMs after the first 22 weeks of the year stood at 3.48 million 10 kg bags less than the five-year average.

Figure 5 illustrates monthly sales at FPMs since 2020. During the first 22 weeks of 2024, sales exceeded the 40 million 10 kg bag mark. During February, sales increased to 7.72 million 10 kg bags compared to January's sales of 6.97 million 10 kg bags. Sales rose in March 2024 but remained at the eight million bags mark, as was the case during March 2023. In April 2024 sales slightly increased but were still below the nine million bags mark. In May 2024 sales were roughly 500 000 bags more than in May 2023 – just over nine million bags sold.

Table 1 contains the number of bags sold at the various FPMs during the first 22 weeks of 2024. The five biggest markets during this period were collectively responsible for 83.4% of the country's sales. The average price (all classes and sizes) for each market also appears in *Table 1*. Out of the five largest markets, Springs market's average price was R4.66 lower than the country's average price of R60.26. Johannesburg and Durban markets' total sales consisted of 75 and 73% Class 1 bags respectively – the highest of the top five markets.

Year-on-year prices

Figure 6 reflects the year-on-year price change at the top five markets, with prices at all five showing an increase. Durban Market's price showed the greatest percentage expansion with a price increase of 7.8%. The volumes sold at this market increased by 0.2% year-on-year, as is shown in *Figure 7*; this increase in volume supported the price increase.

The volumes sold at the Johannesburg Market increased by 9.1% year-on-year. A comparison of the seven biggest regions' sales during 2024 and 2023, shows that only the KwaZulu-Natal region sold fewer 10 kg bags; the others all sold more 10 kg bags during the first 22 weeks of 2024 than in the previous year (*Figure 8*).

The three biggest regions in the market during the first 22 weeks of 2024, sold 29% of the potatoes available at FPMs (*Table 2*). *Table 2* also illustrates the percentage composition of each region's Class 1, 2, 3 and 4 potatoes supplied during this period.

The regions that had a percentage of Class 1 sales above 60% from January to May 2024 include Limpopo, Mpumalanga, Southwest Free State, Northwest, South Cape, KwaZulu-Natal, Western Free State, Sandveld, and the Eastern Free State. The region with the highest percentage of Class 1 potatoes was Gauteng at 86%.

For more information, email FP Coetzee at fp@potatoes.co.za,
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World potato markets at a glance

By Francois Strauss, Potatoes SA

The United States (US) experienced its best month for frozen fry exports in the past 16 months during March. It also proved to be a strong month for US fry exports, marred only by continued resistance from Middle Eastern markets due to the US's position on the war in Gaza. March's total exports of 84 450 tonnes were the highest for the last 12 months and 10.8% up on a year ago.

But, apart from March 2023, it was also the lowest March export volume for the past five years. Average export prices remained steady at US$1 704/t (€1 582/t), which was 5.1% higher than in March 2024, but also remained US$320 higher than those of Canadian and European Union (EU) competitors.

The biggest boost to sales figures came from demand in Japan which increased by 6 300 tonnes to 25 565 tonnes, 21.9% higher than a year ago. The price was US$22 higher than in February at US$1 686/t (€1 565/t), which was 9.9% up on a year ago. Annual purchases by Japan were still 6.6% lower for the year up to March, as lower-cost imports continue to be a growing option in the country.

Sales and imports

In March, Mexico experienced a bigger price rise – a US$115 increase on February's price to US$1 667 (€1 548/t). Even so, this was 2.2% lower than a year ago. Sales were 2 900 tonnes lower at 19 187 tonnes, but still 21.7% higher than a year ago. Annual sales to Southeast Asian customers across the Pacific were still lower for 2023/24 than for the previous year, but March also saw improvements in sales to South Korea and the Philippines. South Korea bought 7 619 tonnes, 2 400 tonnes more than in February and 57.2% up on a year ago. The price was only US$4 up on the previous month at US$1 777/t (€1 650/t), and 4.4% higher than a year ago.

The Philippines had to contend with a US$26 price increase to US$1 724 (€1 600/t), 16.1% up on a year ago. The March order was 2 300 tonnes higher at 6 847 tonnes, 48.2% up on a year ago. Elsewhere in the Pacific, there was little change in demand from countries such as Malaysia, Indonesia, Singapore and Taiwan, but Malay buyers had to cope with a 27.9% higher price than a year ago, paying US$1 802/tonne (€1 673/t) for their 2 396 tonnes. They doubled their February order, buying 784 tonnes and paying US$1 547/t (€1 436/t), which was 5% less than a year ago when they bought 1 807 tonnes.

March's Canadian price was US$26 lower at US$1 359/t (€1 262/t). This was 11.4% lower than the year before – the biggest discount enjoyed by any of the US's main customers. They purchased an additional 1 600 tonnes, making their March order 5 092 tonnes, which was 13.8% higher than a year ago.

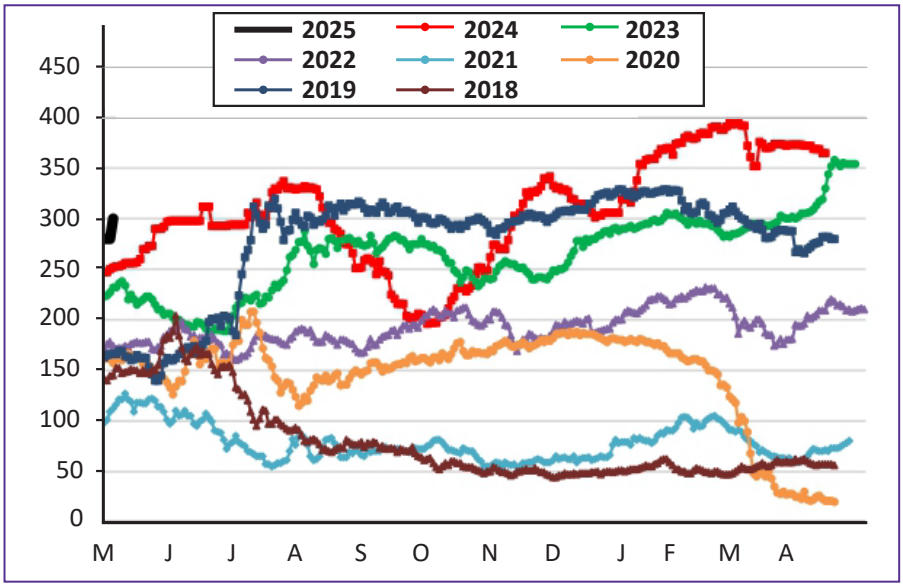
March's imports hit an all-time high of 137 900 tonnes, 19 300 more than in February and 5% higher than a year ago. Average prices were US$26 higher at US$1 473/t (€1 367/t), which was 7.3% higher than a year ago but still US$231 less than the price the US sold its fries abroad for in March.

Fry prices increased

The Canadian fry price rose US$33 to US$1 455/t (€1 351/t), which was 5.6% up on a year ago. Still, sales rose by 15 000 to 114 390 tonnes, the largest monthly consignment ever to cross the 49th parallel. The price of Dutch fries rose by US$40 in March to US$1 451/t (€1 347/t), 19.2% higher than last year. Imports rose by 1 688 to 4 324 tonnes, 29.1% higher than a year ago.

At US$1 560/t (€1 448/t), the Belgium price was 17% higher than a year ago, and still looking expensive compared to its main competitors. Egypt lowered its import price by US$32 to US$1 387/t (€1288/t), 4.6% lower than last year, but its sales slipped by 363 to 1 155 tonnes, making it the only major importer to

Figure 1: EEX settling prices, April processing contracts (€/tonne). (Source: *www.eex.com*)



record lower sales in March than last.

German products priced at US$1 242/t (€1 153/t) sold just 902 tonnes, 480 tonnes less than in February and down by nearly half on a year ago. Brazilian fries, priced similarly at US$1 292/t (€1 199/t), continue to spark interest with sales of 198 tonnes, taking their annual imports up to 2 452 tonnes.

March's imports further pushed up the US import bill for the year which now stands at US$2.074 billion (€1.93bn), some US$582 million more than the country's export earnings from frozen processed potatoes of US$1.492 billion (€1.39bn).

Ware potato exports

There is still a need to buy raw material. A record volume of ware potatoes did not cross the 49th parallel into the US in March, but at 55 208 tonnes, it was still the highest amount for the past 12 months, although 20% lower than a year ago. Annual fresh potato import costs were still 10.9% lower at US$369.366 million (€342.9bn). Ware export earnings for the year were 11.8% higher at US$328.684 million (€305.12m) but still in deficit, like the fry trade. March exports of 18 081 tonnes were 8 800 lower than February, but still 58.1% higher than in March 2023.

Record sales for Canada

Canada fry exports and earnings hit record levels. Canada made the most of last year's bumper crop with record March fry exports of 133 196 tonnes, earning the country C$253.462 million (US$185.28m; €172.05m), which was further supplemented by C$53.645 million (US$39.22m; €36.41m) from the sale of 55 157 tonnes of fresh potatoes to the US, its biggest ware consignment of the year.

As well as record fry sales, Canada was also able to lift the average fry export price by C$33 to C$1 903/t (US$1 391/t; €1 292/t), getting it back closer to January's all-time high. Despite the firmness of the March price, it is only 3.1% higher than a year ago, while the US price is 5.2% higher.

The US ordered 114 460 tonnes of fries, which was 1 136 tonnes less than March 2022's epic order. This March it paid an average of C$1 995/t (US$1 458/t; €1 354/t), C$50 more than in February, but C$53 less than January's peak US trade. March's order cost the US C$228.382 million (US$166.95m; €155.0m), 15.8% more than it spent a year ago, and means the US has spent C$2.310 billion (US$1.69bn; €1.57bn) on importing Canadian fries over the past year, despite the size of its own 2023 potato harvest.

With a price of C$1 394/t (US$1 019/t; €946/t), the price just 1% more than a year ago, they bought 4 642 tonnes. Buying at C$1 511/t (US$1 104/t; €1 026/t), which was slightly less than the year before, Japan bought 2 562 tonnes, 730 tonnes more than February and 10.4% higher than March 2023.

Sales and ware exports

Canada's sales were overtaken by Panama which bought 2 947 tonnes in March, an increase of 145% on a year ago. Its price was an unrepeatable C$1 208/t (US$883/t; €820/t), C$42 lower than in February and 19.3% less than in 2023. Its March price of C$1 187/t (US$868/t; €806/t) was 14.7% less than in 2023.

Although Australian sales prospects continue to recede (March saw it buy just 481 tonnes, which was better than the previous two months), Canada's annual exports are still 3.7% higher at 1.383 million tonnes, another all-time high. Annual exports of fresh potatoes are 15% lower than last year at 557 257 tonnes, with annual earnings 8.1% lower at C$548.034 million (US$400.6m; €372m).

March ware exports were 17.2% lower at 60 330 tonnes, but there was still strong demand from the US taking 55 157 tonnes and paying an average of C$969/t (US$708/t; €658/t), 1.4% higher than a year ago. Canada's imports of fries rose by 1 374 to 4 746 tonnes in March, the highest volume since last June. Some 77%, 3 677 tonnes, came from the US, at an import price of C$2 394/t, (US$1 750/t; €1 625/t), C$142/t up on February's price and 6% higher than a year ago.

European potato scarcity

A break in the weather allowed European growers to make significant progress in planting, but subsequent rainfall has caused delays. Germany made the most progress in planting, having avoided the worst of recent rain that affected other parts of Europe. Despite this, Germany was still behind its usual planting schedule. In contrast, Belgium had only planted a fraction of its crop.

European processors are actively seeking more potatoes, willing to

Figure 2: Canadian fry exports in tonnes.

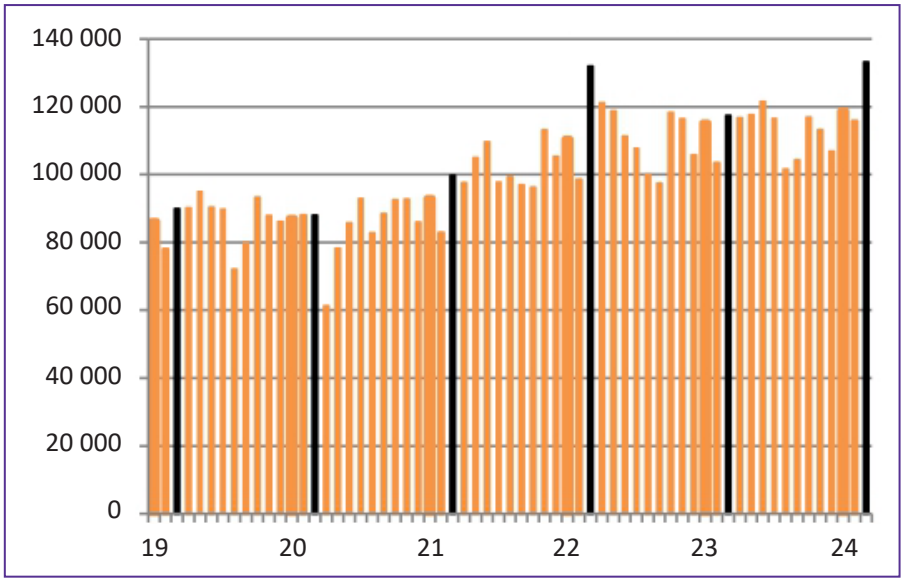


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Figure 3a: French monthly ware exports (tonne).

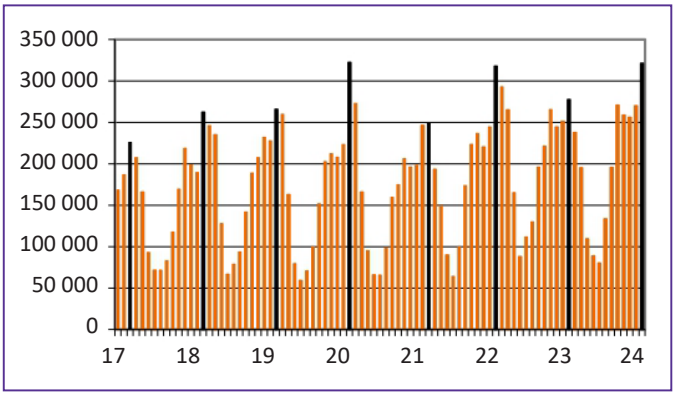


Figure 3b: French monthly ware exports (€ million).

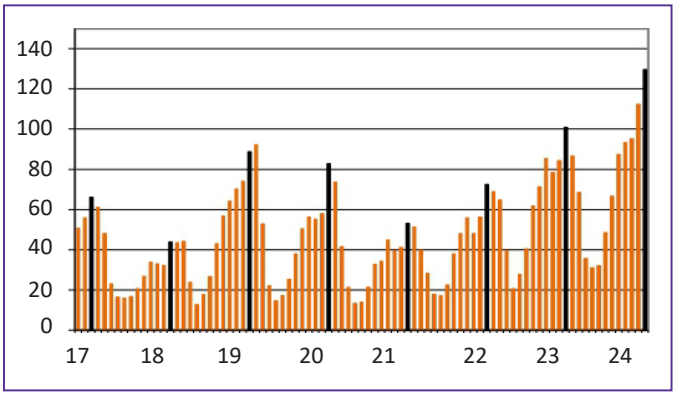
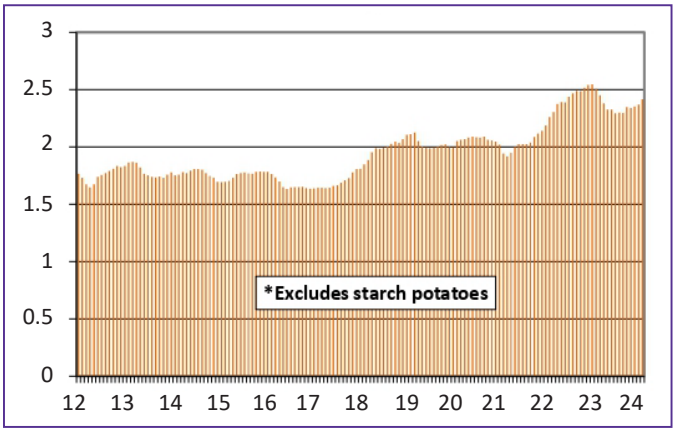


Figure 3c: Unit value of French ware exports (€/t).

Figure 3d: French ware* exports, 12-month period (million tonne).



pay between €400 and €500/t. The European Energy Exchange futures market reflects this demand, with June values exceeding €430/t. The scarcity of potatoes in Europe has led to a surge in French ware potato exports. Additionally, there has been a notable increase in the value of Brazilian fry imports, reaching €44 million in April, an 83% rise from the previous year. Mexican imports also showed signs of recovery, with positive developments for US shippers in the Philippines and Indonesian markets.

France saw surge in market

In March, France achieved a new monthly record in ware potato exports, sending out 321 145 tonnes of consumption potatoes, marking a 6.3% increase from March 2023. This export volume is almost a record high, with only March 2020 surpassing it at the onset of the Covid-19 pandemic.

The surge in exports is driven by high demand from other countries facing shortages, as France traditionally exports the most potatoes in March when stocks are still sufficient. However, the record export volumes have led to a strain on supply, putting pressure on sales. Exports reached a new monthly record value of €129.479 million, marking only the third instance where sales exceeded €100 million. This achievement follows the previous milestones set in February of the current year and March 2023. The average price of French potato exports in March stood at €403/t, reflecting a substantial 55.1% increase compared to the same period last year.

Spain emerged as the primary market in March, importing 100 079 tonnes of French potatoes, representing a 4.3% growth from March 2023. Conversely, sales to Belgium decreased to 77 754 tonnes compared to the previous year. Notably, there was heightened demand from the Netherlands, with significant increases observed in shipments to Eastern European countries and Greece.

The overall demand from regions further east and south contributed to a 6.5% rise in total French potato exports over the nine months leading up to the end of March, totalling 1.983 million tonnes. In March, the demand for French seed potatoes decreased due to late planting in Belgium, resulting in a 14% decline in exports compared to the same month last year, with only 23 503 tonnes exported. However, despite this drop in demand, total seed potato exports for the nine months leading up to the end of March increased by 0.4% to 168 346 tonnes.

Seed export price increase

The value of these exports also rose significantly by 19.6% to €106.677 million. Furthermore, the average price of seed exports increased by 19.2% over the season to reach €634/tonne. Sales of French potatoes to Belgium saw a notable

Figure 4a: UK monthly ware exports (tonne).

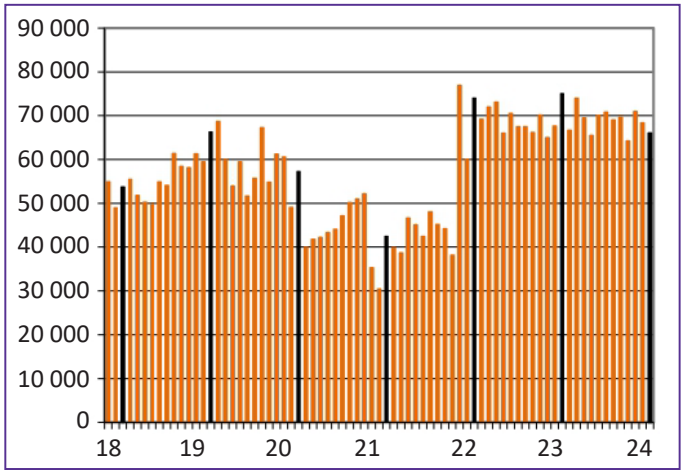


Figure 4b: UK monthly ware exports (£ million).

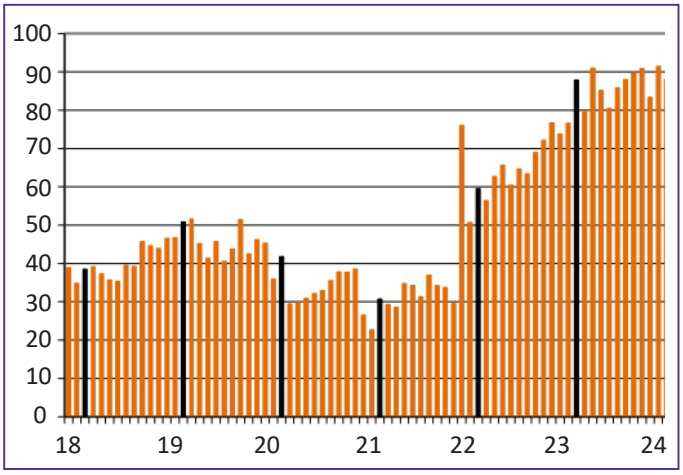


Figure 4c: Unit value of UK fry exports (£/t).

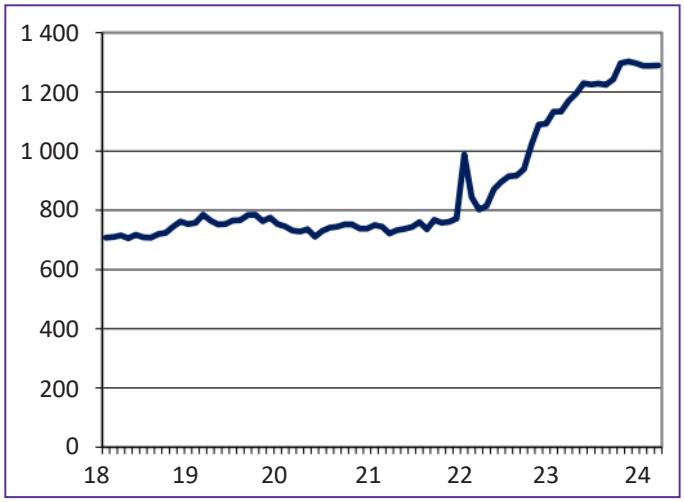
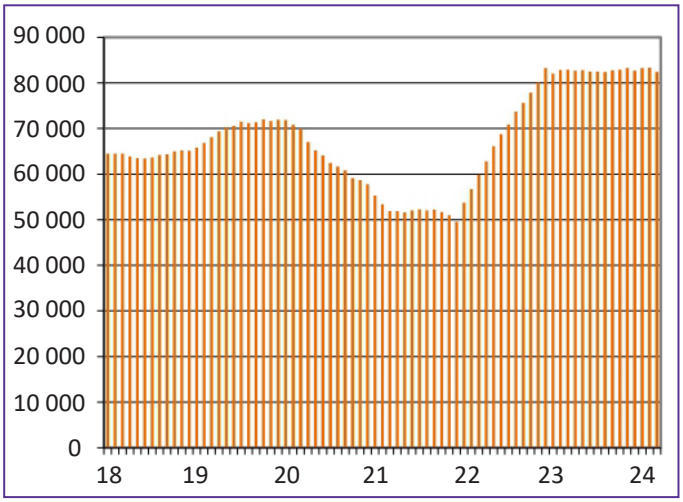


Figure 4d: UK imports of fries, 12-month period (tonne).



decline of 39.2% compared to March 2023, amounting to 8 106 tonnes. Over the nine months leading up to March, sales to Belgium were 25.8% lower, totalling 22 177 tonnes. Despite this decrease in sales to Belgium, there has been an improvement in sales to other EU markets, with a significant 21.9% increase in demand.

Regarding potato prices, there were no export quotations available from RNM. However, table potato prices experienced an increase due to a tightening of supply. The benchmark Category I Nord Basin price rose by €10/t to €580, maintaining the same value as at the beginning and end of the previous season.

Other Category I and II potato types also saw price increases. In terms of processing potatoes, there was no change in price during the week, with Innovator maintaining a €10/t premium over Fontane and Challenger. Processors are eager to secure supplies, but growers are reluctant to release potatoes unless the price meets their expectations.

Planting progress in France indicates that around two-thirds of the national crop has been planted, slightly lagging behind last year's progress but significantly behind previous years.

Drop in UK exports

The United Kingdom (UK) is experiencing a decline in fresh potato exports and an increase in imports due to supply pressures. In March 2024, the UK exported 10 704 tonnes, a 47.8% reduction from March 2023, but higher than February 2024. Over the nine months to the end of March, exports were a third lower at 99 139 tonnes. Despite lower demand, higher prices have partially offset the decline, with the average export price in March at £673/t, a 63.4% increase from March 2024. The total value of exports for the nine months was £58.371 million, down by 4.1%.

Ireland, facing its own potato shortage, increased its imports from the UK by 8.5% to 7 514 tonnes in March compared to the previous year. Over the nine months, Irish imports from the UK were 1.5% higher at 48 835 tonnes. Among major importers, only Norway and Poland saw an increase in demand in March. Spain, the UK's second-largest market, experienced a 37.9% decrease in shipments over the nine months. UK imports of potatoes exceeded exports by 2 576 tonnes in March, totalling 13 280 tonnes, a 130.2% increase from the previous year.

Table 1: Mexico imports of fries and other HS 200410 products (tonnes, MXN million, MXN/t). (Source: Trade Data Monitor LLC)

	February				March to February			
A. Tonnes	**2024**	**% change**	**2023**	**2022**	**2023/24**	**% change**	**2022/23**	**2021/22**
Total	**22 621**	**+2.5**	**22 060**	**19 683**	**259 669**	**-3.8**	**270 016**	**248 031**
US	12 759	+4.6	12 197	11 256	148 596	-9.1	163 432	131 792
Unidentified	0	-100	9 365	1 779	62 329	+4.3	59 783	2 700
Canada	6 439	–	0	6 647	30 969	-13.2	35 664	91 912
Belgium	3 144	–	0	0	15 742	+115.6	7 303	17 969
Netherlands	64	-87.1	498	0	1 534	-60	3 835	1 495
Germany	0	–	0	0	276	–	0	166
B. MXN millions								
Total	**695.442**	**+71.5**	**405.611**	**479.675**	**6 169.181**	**+6.9**	**5 770.899**	**5 457.819**
US	419.955	+7.7	389.979	310.245	4 800.491	+6.3	4 516.815	3 437.630
Unidentified	0.00	–	0	0	0	–	0	0
Canada	192.691	–	0	169.430	912.068	-7.2	982.360	1 594.409
Belgium	74.677	–	0	0	398.584	+133.4	170.743	345.470
Netherlands	1.617	-89.7	15.632	0	43.679	-56.7	100.982	32.203
Germany	0	–	0	0	7.857	–	0	3.517
C. MXN/tonne								
Total	**30 743**	**+67.2**	**18 387**	**24 370**	**23 758**	**+11.2**	**21 372**	**22 005**
US	32 914	+2.9	31 973	27 563	32 306	+16.9	27 637	26 084
Unidentified	0	–	0	0	0	–	0	0
Canada	29 968	–	0	25 490	29 451	+6.9	27 545	17 347
Belgium	23 752	–	0	0	25 320	+8.3	23 380	19 226
Netherlands	25 262	-19.5	31 389	0	28 474	+18.2	24 083	21 541
Germany	0	–	0	0	28 467	+27	22 406	21 189

Note: Products covered by Harmonised System code 200410.

The nine-month total was 50 088 tonnes, up by 31.8%.

In terms of seed exports, the UK saw a 21.4% increase in March shipments to 3 457 tonnes, with total exports up by 0.5% to 92 150 tonnes over the season. The value of seed exports for the nine months was £66.676 million, a 4.9% increase from the previous season. The average price of seed exports rose by 41.3% to £725/t. Egypt remained the largest buyer of UK seed despite a 4% drop in seasonal demand. Morocco and Saudi Arabia showed demand increases, while Spain reduced its demand. Import of seed increased slightly by 3.9% in the nine months to the end of March.

Expectations exceeded in Portugal

In Portugal, the early potato harvest has commenced in Peninsula de Setúbal, located south of Lisbon. Producers in the region have reported good quality and regular yields for the crop, which have exceeded expectations despite heavy rains and disease attacks in March. The yield is approximately 50t/ha, and the potatoes are of exceptional quality, fetching prices ranging from €550 to €600/t for the initial plots.

The average ex-farm price of new potatoes in Portugal was €770/t in the week ending 5 May, remaining stable

compared to the previous week. However, this price reflects a 17.2% decrease from the same period last year and a 17.6% increase compared to the same week in the triennium 2021 to 2023.

Good weather benefits Germany

In Germany, the planting rate for potatoes was higher than that of other countries due to favourable weather conditions. More than three-quarters of the planned area has already been planted, with the rate likely higher than the previous year. Both the northern and southern regions of the country were expected to avoid the heavy rain forecasted for western countries, allowing planting to continue uninterrupted.

The shortage of potatoes from the 2023 harvest, coupled with increased demand from processors, has led to a rise in free-buy potato prices in Germany. The average price quoted by the Rhineland organisation, REKA, is currently at €415/t, which falls within a range of €400 to €430/t. This price level is slightly lower than the prices seen at the same time last year, which were as high as €600/t in May and June.

Dutch hopeful after late planting

In the Netherlands, rain returned after a period of drier weather that facilitated planting, with temperatures around 20°C expected to aid in the development of the planted crops. The planted area surpassed 40% at the time, with a significant increase in planting observed.

However, this planting rate is still lower than that of the previous year, which was characterised by late planting. In typical years, most of the crop would already be in the ground by mid-May. Late planting poses risks as the crop may need to remain in the ground longer, increasing exposure to wetter weather conditions. This scenario occurred last year when a late-planted crop faced challenges during a wet autumn, leading to some crops being abandoned due to harvesting difficulties.

The scarcity of the 2023 crop and the delayed planting of the 2024 crop continue to impact free-buy prices in the Netherlands. The latest average potato price surged by €40/t, reaching €430/t. This price was €10/t higher than the same period last year, although it remains lower than the end-of-month price in May 2023. Additionally, other prices have also increased, with lower-grade flaking potatoes fetching almost €200/t. Growers are hopeful for a price trend similar to that of the previous year, where end-of-season values reached almost €600/t.

Old-crop market strong in Belgium

In Belgium, planting progress accelerated, with more than a third of the national crop now in the ground, similar to the planting area at this time last year. However, this progress was hindered by rainfall in May, causing the planting rate to fall behind compared to the previous year. In 2023, growers were still planting into June to compensate for the late start.

Organisations such as PCA and Fiwap reported that almost all early-planted crops were sown in May, but only 25 to 35% of the main crop was planted. Progress varied regionally, with some areas at 50% planted while others are at 20%.

The old-crop market remains strong in Belgium, with processors re-entering the market. However, growers with free-buy potatoes were hesitant to sell as they expected further price increases in May due to delays in the 2024 crop's arrival.

In line with expectations, the free-buy prices for Fontane and Challenger rose by €50 to €400/t last week. The price gap between free-buy and contract prices is currently at its widest this season, reaching almost €140/t. Limited price increases were observed in the PCA/Fiwap quotations, with Innovator regaining its €10/t premium over Fontane and Challenger, priced at €410/t.

Despite a 3.5% decrease in price compared to the previous year, Belgian fries were relatively expensive at US$1 503/t (€1 393/t). India, with reduced prices at US$1 243/t (€1 152/t), saw its fry sales surpass those of the US.

Record imports for Brazil

Brazil's ambitions to reduce its reliance on imported fries appear to be over as April saw it record its highest ever imports for April of 34 998 tonnes, with monthly spending reaching an all-time high of BRL247.153 million (US$47.93m; €44.42m), 83% higher than April 2023. April's average import price of BRL7 062/t (US$1 370/t; €1 269/t) was just 3.9% higher than a year ago.

The price of April's largest supplier, Argentina, was BRL50 lower than in March at BRL8 073/t (US$1 566/t; €1 451/t) as the continuation of that country's currency controls continued to aid its exporters. Imports from Belgium were only 1 100 tonnes higher than in March at 12 861 tonnes, but this was 153.2% more than a year ago. The Belgian price of BRL6 180/t (US$1 198/t; €1 111/t) was almost BRL180 higher than in March, but 11.4% lower than what it had been a year ago.

Twelve-monthly imports from Argentina were still 18.5% lower than the previous year at 139 400 tonnes, while Belgian imports for the same period were 15.4% lower at 102 879 tonnes. Sales were more than 1 200 tonnes higher in April at 2 352 tonnes, which was its best month for imports.

The Egyptian price was BRL5 382/t (US$1 044/t; €967/t), BRL82 higher than a month ago. Brazilian buyers also tested the water with other suppliers in April: The US sold 46 tonnes at BRL10 013/t (US$1 942/t; €1 800/t), Poland sold 49 tonnes at BRL8 716/t (US$1 690/t; €1 567/t) and China sold 24 tonnes at an inviting BRL4 771/t (US$925/t; €857/t). May's import bill of BRL247.153 million follows March's import bill of BRL207.536 million, 22.5% higher than a year ago and BRL36.656 million more than December's bill.

Mexico's transparency pays off

Mexico experienced an increase in import volumes of processed potatoes during the first two months

of 2024. February saw imports of 22,621 tonnes, which was 2.5% higher than the previous year but 2 350 tonnes less than January's 24 970 tonnes, the highest monthly figure since October 2022. The average prices recorded by WPM were MXN4 000/t higher than in December, mainly due to the Mexican Economy Ministry's decision to stop listing some imported fries as 'unidentified'. This move towards greater transparency is a positive development for the market.

With no unidentified volumes recorded, January and February witnessed higher fry imports from both the US and Canada. In January, the US imported 15 538 tonnes, up from 19 346 tonnes in December, while Canada imported 7 274 tonnes, up from 5 656 tonnes in December. February's imports from both countries were slightly lower, with the US importing 12 759 tonnes.

The US reduced its price by MXN2 000/t in January to MXN30.123/t, helping secure a large order. However, by February, the import price rose again to MXN32.915/t. Canada's prices also fluctuated, with January seeing a rise to MXN30.198/t and a decrease to MXN29.968/t in February.

Compared to their main EU competitors, Belgium and the Netherlands, both the US and Canada are currently more expensive. In February, Belgian fries were priced at MXN23.752/t, while Dutch fries were priced at MXN25.262/t. Germany was absent from the Mexican sales roster, with Poland making an entrance by selling 224 tonnes at a price of MXN29.071/t.

The annual cost of importing fries into Mexico appears to be increasing, partly due to the absence of value for 'unidentified' imports in the official statistics in 2023, leading to lower averages. The agreement allowing greater access for US fresh potatoes into the Mexican market resulted in a significant increase in shipments, with February 2024 seeing a 147% rise in fresh US potato imports compared to February 2023.

Indonesian imports increase

In March, Indonesia experienced a slight improvement in fry imports, with sales increasing by 1 150 tonnes to reach 5 134 tonnes. However, this figure still represents a 42% decrease compared to the previous year. Despite the growth of the Indonesian economy by 5.1% in the first quarter of 2024, annual fry imports have declined by 12.7% to 81 470 tonnes compared to the previous year.

The average import price for fries in Indonesia in March was US$1 524/t (€1 412/t), which is 2.7% lower than the previous year. The decline in prices might have contributed to the increase in demand during the month of Ramadan. Notably, China was the largest seller in March, with sales of 1 552 tonnes. Although this represented a 24.7% decrease compared to the previous year, China managed to lower its price to US$1 234/t (€1 144/t), making its fries more competitive in the market.

The US increased its price in May by US$55 to US$2 120/t, while India reduced its price by US$27, selling at a much lower US$1 243/t, 19% less than a year ago. India has seen its annual sales increase by 44.8% to 8 747 tonnes.

FAO values small-scale producers

The Food and Agriculture Organization of the United Nations (FAO) emphasises the crucial role of small-scale family producers, particularly women, in preserving the diverse spectrum of potato crops. The FAO International Day of the Potato, celebrated on 30 May, served as an opportunity to raise awareness about the importance of this versatile crop and its contributions to global food security and sustainable agriculture. Additionally, the cultural and culinary aspects of potato cultivation and consumption are celebrated on this day.

The FAO provides a brief history of the potato:

- Originating in the Andes, the potato was vital to the Inca civilisation and revered as the 'flower of ancient Indian civilisation.'
- Introduced to Europe in the 16th century, the potato contributed to urbanisation and fuelled the Industrial Revolution.
- During the Qing Dynasty, the potato played a key role in alleviating famine in China, establishing itself as an essential crop.
- In times of conflict, such as World War II, the potato's high yield and resilience ensured food security during shortages.
- The Great Famine in Ireland during the 1840s serves as a stark reminder of the consequences of a lack of genetic diversity in potato crops and cropping systems.
- Today, the potato is recognised as a symbol of food security and a cornerstone of sustainable agriculture. With over 5 000 potato varieties available, they offer a rich genetic resource to combat pests, diseases, and the impacts of climate change, guiding sustainable agricultural practices.

World Potato Congress

The World Potato Congress held in Adelaide, Australia in June 2024, focussed on the theme "Old world meets new". This theme aimed at highlighting the historical significance of potatoes as a staple food, the innovative technologies applied to their production, and the substantial investments in research and development. The event addressed global changes in sustainability, climate, culture, and population dynamics.

For more information, email Francois Strauss at francois@potatoes.co.za or visit *www.potatoes.co.za*.

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Precision breeding for resilient spuds

By Dr Hennie Groenewald, CEO, Biosafety

Genetic variation refers to variability between the DNA sequences or genomes of individual living organisms and is the basis of the biodiversity we see around us. Even within a single species, DNA sequence variation between individuals can result in them having diverse genetic traits. Moreover, mutations (changes in DNA sequences) occur constantly which means the genetic traits of a population can evolve over time.

In agriculture, naturally occurring genetic variation has been harnessed over millennia, through conventional breeding, to combine the most desirable traits in distinct crop cultivars and livestock breeds.

Genome editing is a revolutionary scientific technique that allows scientists to make precise changes to an organism's DNA sequences, to alter the associated genetic trait in a specific manner.

Genome editing techniques are based on naturally occurring cellular mechanisms that include the following:

- The identification of a specific DNA sequence within the genome of the target organism.
- Breaking the DNA strand in that position.
- Allowing the cell to repair the break again.

In doing so, mutations, identical to those that form the basis for natural genetic variation, may be introduced, which in turn could increase, decrease, or modify the activity of the targeted gene. Genome editing is a form of genetic engineering, however, because the character, scope, and precision of such introduced genetic change are designed and controlled, the process is also called precision breeding.

Genome editing tools

One of the most popular and effective genome editing tools is the clustered regularly interspaced short palindromic repeats (CRISPR) plus Cas system (CRISPR/Cas). Watch this easy-to-follow video for an overview at *www.rb.gy/73ro2q*. It is used in more than 90% of the current genome editing research and development work done in agriculture. Because of its accuracy, simplicity, and efficiency, CRISPR/Cas-like systems have reduced the technical and cost barriers associated with genetic engineering.

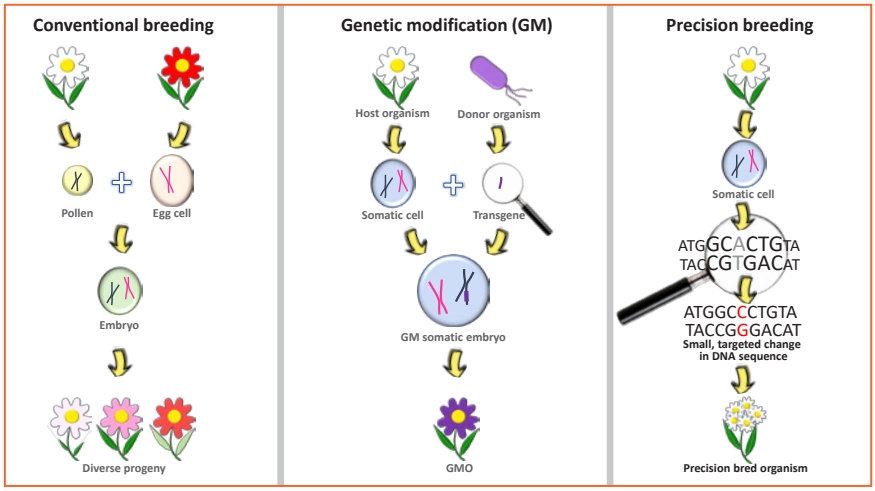
As a result, a wider spectrum of bio-innovators now has effective access to these technologies, and it is economically viable to improve a broader range of crops, than previously possible using older genetic modification (GM) techniques.

In addition, unlike GM which introduces novel DNA sequences that are typically derived from other species and result in the creation of a genetically modified organism (GMO), genome editing methods are rather used to alter the existing genetic material of an organism. Such targeted and precise modifications can enhance endogenous traits without introducing foreign genes.

Table 1: Potato genome editing R&D as listed on EUSAGE on 16 May 2024.

Type	Trait category	Number
Input	Biotic stress	9
	Abiotic stress	2
	Herbicide tolerance	3
	Plant yield and growth	2
Output	Improved food quality	14
	Colour or flavour	2
	Storage and post-harvest	3
	Industrial use	2
Total		**37**

Figure 1: Conventional breeding is based on sexual reproduction and combines the genetic traits of two parents in a range of diverse progeny. Genetic modification allows the direct transfer of a specific genetic trait from a non-compatible organism to any other. Precision breeding uses genetic engineering techniques to introduce specific changes (mutations) to the target organism's DNA.



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Current potato genome editing

Genome editing in potatoes has been reported as early as 2014 (using an older technique called transcription activator-like effector nucleases [TALEN]), with a significant increase in reports from 2017 when CRISPR/Cas systems were first developed. Currently, the best source for agricultural-relevant crop genome editing data is the European Sustainable Agriculture Through Genome Editing (EUSAGE, *www.eu-sage.eu*) database. It only lists peer-reviewed research articles that use genome editing to develop market-oriented traits for crops. However, no information regarding the stage of development is supplied.

The EUSAGE database currently lists a total of 892 reports of which 37 (4%) are for potatoes, making it the seventh most genome-edited crop. Target traits can be divided into eight different categories of which half (four) represent input traits, generally important to the producer, and the other half, output traits, generally important to the consumer.

Forty-three percent (16) of the potato projects targeted input traits while 57% (21) targeted output traits. This tendency to favour output traits is typical for most crop-focussed genome editing research and development (R&D) and contrasts with historical GMO traits that are almost exclusively input traits. For example, the only three GM traits commercialised in South Africa over the past three decades, are insect resistance, herbicide and drought tolerance.

Developing genome-edited crops that offer a direct benefit to the consumer will contribute directly towards positive risk-benefit perceptions among consumers, which in turn could help ensure market acceptance of these products.

Research endeavours

Biotic stress tolerance R&D focussed on viral, fungal and bacterial resistance mechanisms, while drought and cold tolerance were the focus of the abiotic work. Yield and growth research investigated starch granule size and plant architecture. Food quality trades that have already been edited in potatoes include starch composition, anthocyanin synthesis, reduced browning, acrylamide, glycoalkaloid synthesis, and improved cold storage.

Researchers from 19 countries are represented in these publications with the United States, China, Sweden and Japan being the most prolific. To date, no directly market-orientated, agricultural genome editing R&D from South Africa has been published.

Plant genome editing techniques still require a tissue culture stage and edited genotypes must often be subjected to back-crossing to segregate the edited phenotype from the CRISPR/Cas molecular machinery. Although genetic engineering technologies for potatoes are well-established (Nahirñak *et al.*, 2022), significant challenges remain.

Potato tissue culture protocols are notoriously genotype-dependent, and the final regeneration step is often the biggest bottleneck in the process and can also introduce undesirable somaclonal variation. Recent advances in improving the transformation efficiency of diverse potato cultivars and the development of diploid cultivars, amenable to sexual reproduction and allowing for back-crossing and segregation are set to unlock genome editing as an effective and viable precision breeding tool for potatoes.

Precision breeding for SA

The South African potato industry faces significant hurdles. Pests such as the potato tuber moth and diseases such as early blight take their toll, while postharvest wastage due to sprouting, greening, and bruising further impacts producers' incomes. In addition, changing rainfall patterns and rising temperatures threaten well-established production areas. Genetics and precision breeding could provide a lifeline through:

- **Pest and disease resistance:** Enhancing South African cultivars' natural defences against pests and diseases can increase resilience and reduce agricultural inputs.
- **Enhanced shelf-life:** Potatoes that resist sprouting and greening could dramatically cut losses during storage and transport.
- **Resilient to climate stress:** Potatoes bred to withstand drought or heat spells could safeguard harvests, boosting food security.

The regulatory hot potato

The potential benefits of precision breeding techniques for the South African potato industry and its consumers can only be realised if the South African regulatory framework aligns with international best practices. Most importantly this includes distinguishing precision-bred organisms, which do not contain any transgene or novel sequences, from GMOs, which do contain novel DNA sequences.

This would significantly reduce the barriers to genetics-based innovation, allowing a wider array of local innovators to develop locally relevant products. GMOs, in contrast, are difficult and expensive to develop and commercialise because of the stringent regulatory processes associated with them – born from the fact that no South African-developed GMOs have been commercialised over the past 30 years since their introduction into the country.

In conclusion, precision breeding, particularly through CRISPR/Cas technology, holds significant promise for the South African potato industry. However, realising this potential requires not only scientific and technological advancements but also a supportive and forward-looking regulatory environment.

For more information, email the author at hennie@biosafety.org.za.

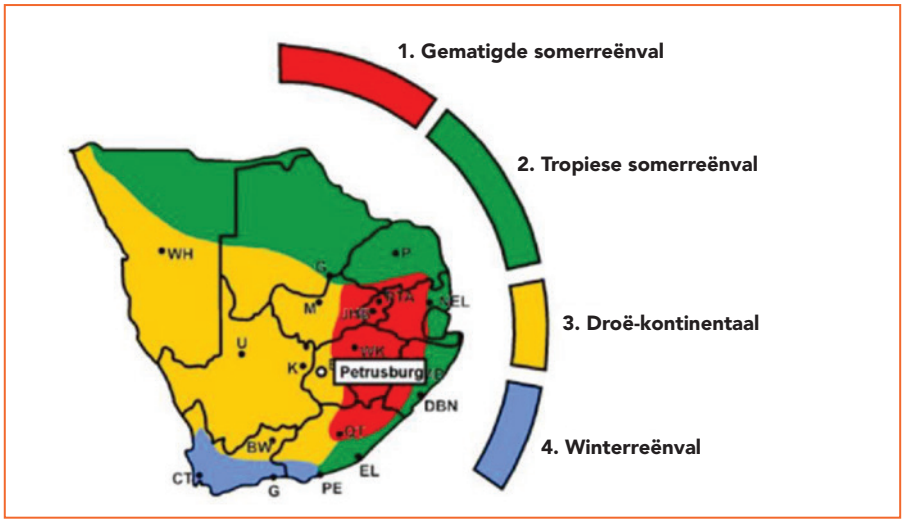
Suidwes-Vrystaat kultivarproef onder besproeiing op Petrusburg in 2023

Deur Enrike Verster en Laryssa van der Merwe, Aartappels SA, en Johan Odendal, produsent

Die Suidwes-Vrystaat aartappelproduksiestreek produseer ongeveer 1.7% van die land se kommersiële aartappels op 954 ha (2023/24-oesjaar). Die mees prominente kultivars wat vir kommersiële verbruik (tafel- en verwerking) in die streek se hoofoes geproduseer word, is Sifra (89%), gevolg deur Mondial, Panamera en Innovator.

Petrusburg val in Suid-Afrika se droë kontinentale gebied (*Figuur 1*) en die plaas waarop die proef geplant is, ontvang die afgelope 24 jaar 'n gemiddelde jaarlikse reënval van 570 mm. Hierdie streek word gekenmerk aan baie warm somers en koue winters, met ryp wat vanaf Junie tot Augustus kan voorkom. In 2017 is ryp selfs tot in November aangeteken.

Figuur 1: Ligging van Petrusburg in die Suidwes-Vrystaat produksiegebied.



Die kultivarproef by Petrusburg is uitgelê in 'n ewekansige ontwerp met drie herhalings per kultivar. In *Tabel 1* word relevante tegniese inligting rakende die proef gegee. Grondmonsters is voor plant geneem om die grondvoedingstatus van die proefperseel te bepaal (*Tabel 2*).

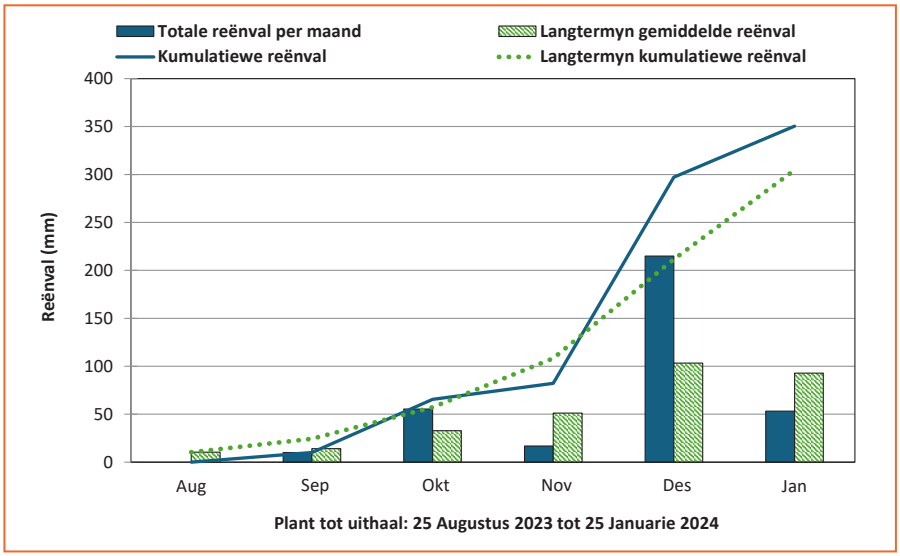
Ingesluit in die kultivarproef is kultivars met kort- en lang groeitydperke. Derhalwe kan groeitydperke die uiteindelike opbrengs van sekere kultivars beïnvloed. Die lengte van groeitydperke is onderhewig aan die aard van die seisoen, maar word gesien as die hoeveelheid tyd wat verloop vanaf opkoms tot natuurlike loofafsterwe.

Neem kennis dat *Tabel 3* uiteensit hoe hierdie groeitydperke van kultivar

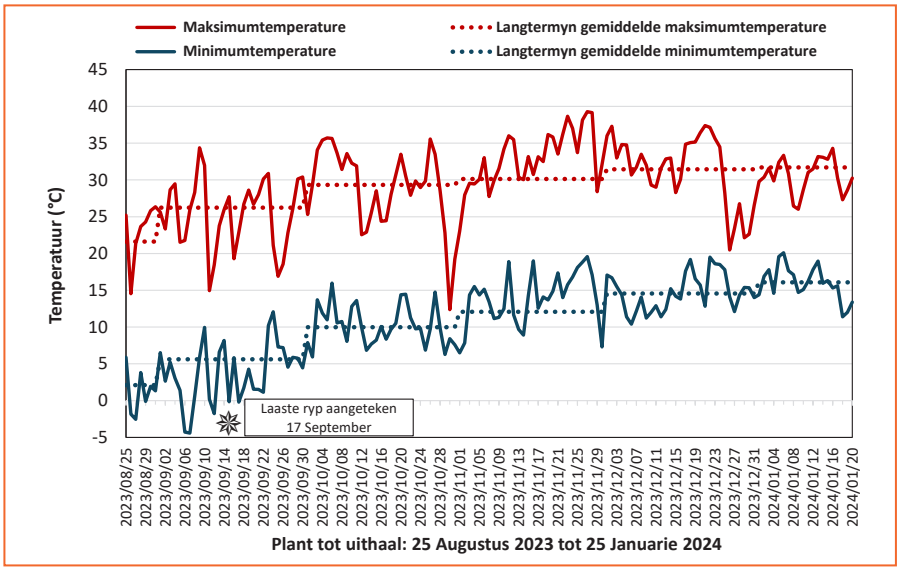
Tabel 1: Opsomming van tegniese inligting rakende proefperseel en -uitleg.

Plaas	**Lushof Boerdery – Theronskop**				
Produsent	Johan Odendal				
Plantdatum	25 Augustus 2023				
Oesdatum	25 Januarie 2024				
Besproeiing/droëland	Besproeiing				
Dubbel- of enkelrye	Dubbelrye				
Loofafsterwe	Chemies				
Tussenry-spasiëring	0.75 m				
In-ry spasiëring	28 cm				
Plantestand	39 685 plante/ha				
Bemestingsprogram	**Voedingswaarde**				
	N (kg/ha)	P (kg/ha)	K (kg/ha)	Ca (kg/ha)	S (kg/ha)
Totaal	284.75	137	143.5	222.75	166.5

Figuur 2: Reënval van die 2023/24 seisoen en langtermyn gemiddelde reënval.



Figuur 3: Minimum- en maksimumtemperature van die 2023/24-seisoen asook langtermyntemperature.



tot kultivar verskil. Plantgereedheid van moere ten tyde van die plant van die proef, sowel as standpersentasie en halmtelling wat later in die groeitydperk waargeneem is, word in *Tabel 3* aangedui.

Bemarkingsindeks

Die evaluering van nuwe kultivars, soos in die Petrusburg-kultivarproef, verskaf resultate rakende onder andere opbrengs- en bemarkingsindeks. Die bemarkingsindeks van die betrokke kultivars word bereken deur elke kultivar te klas en sorteer volgens gehalte en groottegroepe (byvoorbeeld: Klas 1 Groot of Klas 2 Groot medium). In hierdie proef word al drie herhalings bymekaargegooi, gewas en deur die pakstoor geklas en sorteer. Dienooreenkomstige prysvergelykings word dan gemaak met markpryse soos verkry ten tyde van oes.

Die prestasie van nuwe kultivars kan nie net op die resultate van een bepaalde seisoen geskoei word nie, aangesien klimaat en moergehalte van een jaar na 'n volgende kan wissel. Juis daarom word die kultivars verkieslik oor 'n aantal seisoene getoets.

Weerdata

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

Toepaslike daaglikse data oor die betrokke seisoen vir hierdie proef, word verkry vanaf 'n Hortec-weerstasie wat geïnstalleer is op die plaas waarop die proefperseel geleë is. Langtermyndata word egter steeds verkry vanaf 'n Landbounavorsingsraad (LNR)-weerstasie, omdat die Hortec-weerstasie op die proefperseel nog nie lank genoeg funksioneer om langtermyndata weer te gee nie. Die betrokke LNR-weerstasie waarvan die langtermyndata verkry is, is 9 km vanaf die proefperseel geleë.

Tabel 2: Grondvoedingstatus van proefperseel voor plant.

Brutodigtheid (kg.m^{-3})	pH (KCl)	P (P-Bray I)	K	Ca	Mg	Na	% of KUK[1] K	Ca	Mg	Na
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	%
1 210	4.7	9	191	265	88	6	19	52	28	1

[1]*KUK = katioon-uitruilkapasiteit*

Die kultivarproef by Petrusburg is in 'n ewekansige ontwerp met drie herhalings per kultivar uitgelê.

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

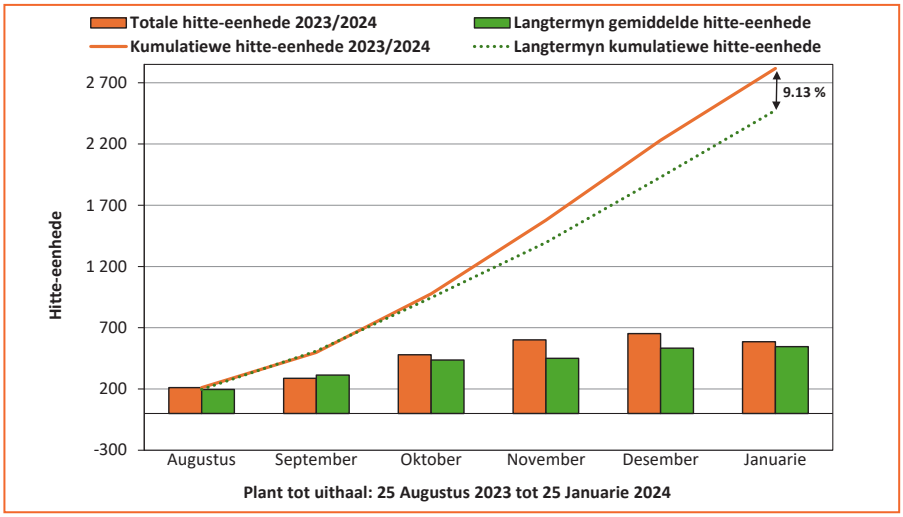
Kultivar	Groeitydperk (dae)[1]		Plantgereedheid[2]	Stand[3] (%)	Halms per plant	Halms per ha
11Z49A1	Medium	(100)	1	94	3	111 912
11Z55A5	Medium	(100)	1	83	1.4	46 114
Amany	Medium tot lank	(110)	2	94	2.3	85 799
Cayman	Medium	(100 –110)	3	85	7	236 126
Connect	Medium tot lank	(120)	2	94	3.3	123 103
Foxy	Kort tot medium	(90 – 100)	3	94	6	223 823
Lanorma	Kort	(80 – 90)	3	99	4.4	172 868
Lilly	Medium	(100)	1	94	3.2	119 372
Mondial	Medium tot lank	(110 –115)	1	91	2.4	86 672
Noya	Medium	(90 –110)	1	90	1.8	64 290
Panamera	Medium	(90 – 110)	3	92	3.7	135 088
Sababa	Medium tot lank	(110 – 115)	3	92	5	182 551
Sifra	Kort tot medium	(90 – 100)	3	96	3.1	118 103
Sound	Medium	(110)	2	94	2.6	96 990
Tyson	Kort tot medium	(90 – 100)	2	96	2.2	83 815

[1]*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.*
[2]*Plantgereedheid van moere: 1 = Vars; 2 = Effens vars; 3 = Plantgereed; 4 = Effens oud; 5 = Oud.*
[3]*Standpersentasie is bepaal deur te kyk na die herhaling van elke kultivar wat bestaan uit 36 plante per 10 m ry per plot.*

Tabel 4: Hoofredes vir afgradering.

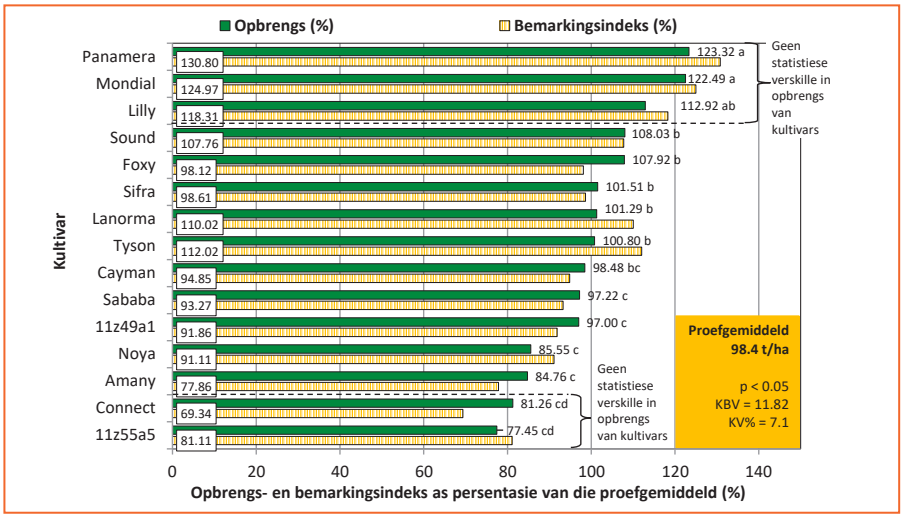
Kultivar	Mot	Vergroening	Puntjievrot	Bruinskurf	Sagtevrot	Ystervarkskade	Holhart	Bruinvlek
11Z49A1	x	x			x			
11Z55A5	x	x			x			
Amany	x		x	x				x
Cayman	x	x	x					
Connect	x	x	x	x				
Foxy	x	x	x				x	
Lanorma	x	x	x			x		x
Lilly	x				x			
Mondial			x					
Noya	x	x	x					
Panamera	x			x	x			
Sababa	x	x	x					
Sifra	x				x	x		
Sound	x		x					
Tyson	x	x	x					

Figuur 4: Hitte-eenhede van die 2023/24-seisoen asook langtermyn gemiddelde hitte-eenhede.



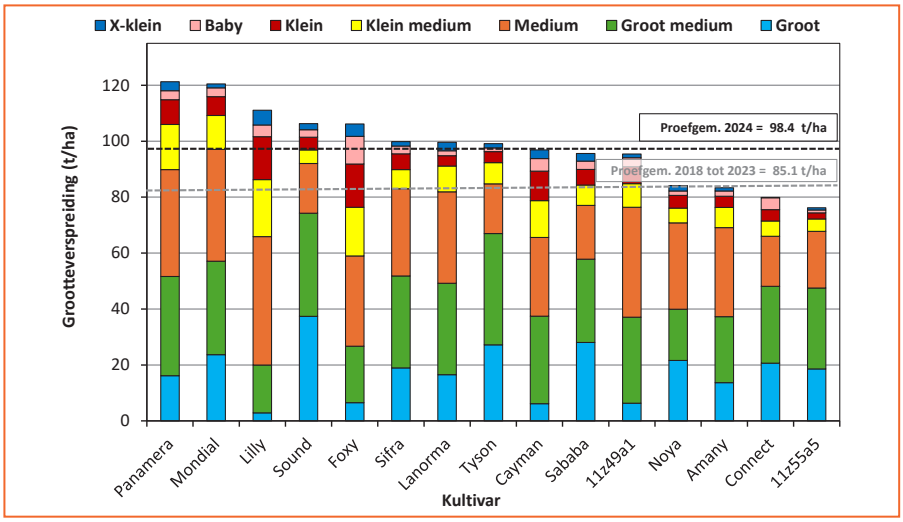
**Totale hitte-eenhede spesifiek bepaal vir aartappels (drumpeltemperatuur = 5°C) as gewas, bereken vanaf uurlikse data.*

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



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

Figuur 6: Groottegroepverspreiding van elke betrokke kultivar.



Die reënvaltendens vir die 2023/24-seisoen (*Figuur 2*) het, soos wat die seisoen verloop het, uiteindelik kumulatief aansienlik meer reënval ervaar as die langtermyn gemiddelde reënval. In Desember is meer as dubbel die gemiddelde langtermyn reënval ervaar na 'n droër Novembermaand.

Minimum- en maksimumtemperature word in *Figuur 3* uiteengesit. Die laaste sarsie ryp is op 17 September aangeteken. Daar is vroeër in dieselfde maand hewige ryp aangeteken met minimumtemperature laer as -4°C vir twee agtereenvolgende dae. In November en Desember is altesaam 44 dae met temperature bo 30°C en 18 dae met 'n maksimum temperatuur van hoër as 35°C aangeteken.

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 hierdie kultivarproef, was aansienlik hoër as die tendens ten opsigte van die langtermyndata van hitte-eenhede (*Figuur 4*). Dit is toe te skryf aan die bogemiddelde warm dae tydens veral November en Desember wat meer akkumulasie van hitte-eenhede meebring.

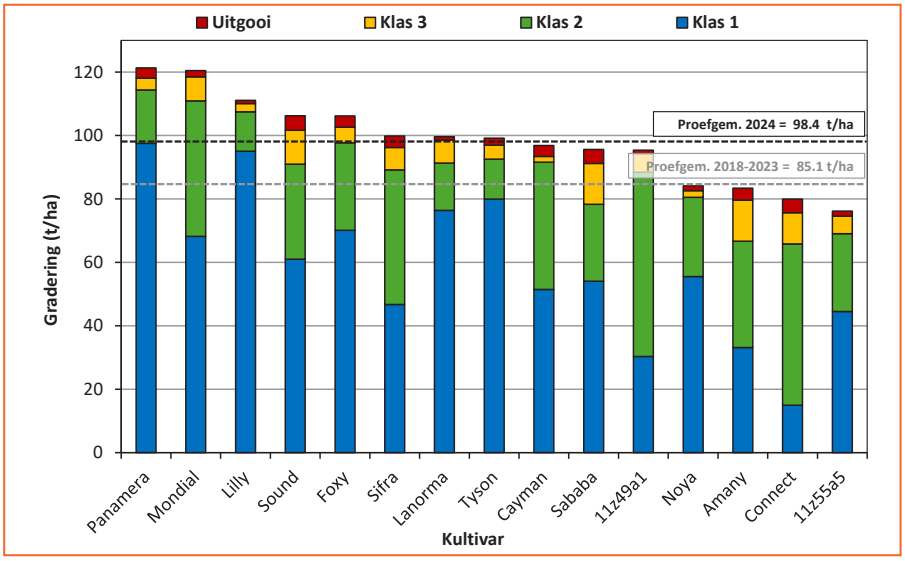
Opbrengsgemiddelde

Opbrengsdata versamel tydens oesdag word onderwerp aan statistiese verwerking met behulp van die GenStat®-program. Die Tukey-toets van kleinste betekenisvolle verskille (KBV) is gebruik om die gemiddelde te skei. Die kultivareffek gedurende hierdie betrokke proef (*Figuur 5*) was statisties beduidend ($p<0.05$) en die koëffisiënt van variasie was laag (7.1%). Hierdie faktore dui daarop dat die proef baie goed uitgevoer is en die resultate is derhalwe betroubaar.

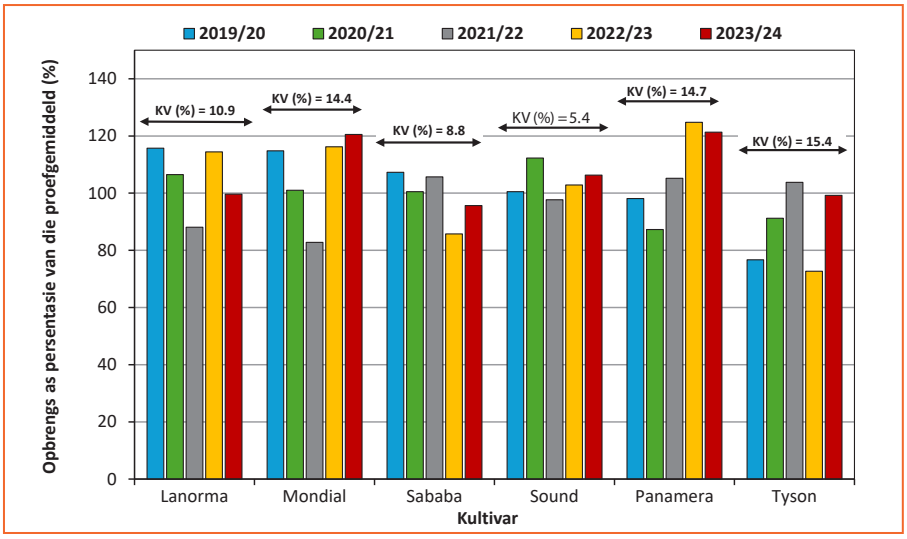
Die opbrengs van elkeen van die kultivars word deur die proefgemiddeld gedeel (die proefgemiddeld van al die kultivars word as 100% geneem). Hierdeur word 'n opbrengsindeks geskep en word elke kultivar se prestasie in terme van

Die kultivarproef by Petrusburg is in 'n ewekansige ontwerp met drie herhalings per kultivar uitgelê.

Figuur 7: Gradering van elke betrokke kultivar.



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



Koeffisiënt van variasie (KV%) is ingesluit op die grafiek: 'n Waarde wat in essensie die mate van verskil in prestasie in die spesifieke kultivar oor die aantal jaar voorstel. Hoe groter die KV%-waarde, hoe meer wissel die kultivar se prestasie oor die aantal jare aangedui op die grafiek.

opbrengs as 'n persentasie van die proefgemiddeld gelees.

Die gemiddelde opbrengs van die proef vir die 2023/24-seisoen is 98.4 t/ha, wat hoër is as die proefgemiddeld van die vorige vyf kultivarproewe (85.1 t/ha) te Petrusburg (2018 tot 2023). Goeie besproeiingskedulering en watergehalte kan onder die faktore gereken word wat goeie opbrengs meebring.

Gehalte en afgradering

Die kultivars Panamera, Mondial en Lilly het almal statisties die hoogste opbrengs gelewer (*Figuur 5*). Dieselfde drie kultivars het ook die hoogste bemarkingsindeks behaal en dit kan toegeskryf word aan 'n hoër opbrengs van goeie gehalte aartappels by hierdie betrokke kultivars.

Groottegroepverspreiding en gradering is belangrike evaluasies wanneer gekyk word na 'n kultivar se bemarkbaarheid (*Figure 6* en *7*). Redes vir afgradering word in ag geneem wanneer die aartappels geklas word (*Tabel 4*). Die grootste redes vir afgradering was mot en puntjievrot wat gelei het tot 'n groter hoeveelheid Klas 2- en Klas 3-aartappels. Bruinvlek en holhart is in enkele kultivars opgemerk.

Soos die aard van seisoene is, wissel die prestasie van kultivars van seisoen tot seisoen – bloot omdat klimaat van een seisoen na 'n volgende nooit eenders is nie. Derhalwe is dit belangrik om konsekwente prestasie van 'n kultivar oor 'n aantal seisoene

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

Kultivar	Skyfiekleur[1]	SG[2]	DM[3]
11Z49A1	49	1.072	18.6
11Z55A5	47	1.064	16.8
Amany	56	1.077	19.7
Cayman	52	1.082	20.5
Connect	43	1.066	17.3
Foxy	41	1.058	15.5
Lanorma	47	1.070	18
Lilly	48	1.060	16.1
Mondial	50	1.063	16.5
Noya	43	1.071	18.3
Panamera	41	1.073	18.7
Sababa	43	1.071	18.4
Sifra	40	1.068	17.6
Sound	44	1.063	16.5
Tyson	43	1.066	17.3

[1]Skyfiekleur met waarde >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.
[2]Soortlike gewig (SG) van ≥1.075 is aanvaarbaar vir die prosesseringsbedryf.
*[3]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.*

in ag te neem, pleks daarvan om besluite te skoei op een seisoen se goeie prestasie. Sound toon tans die minste variasie vir 2020 tot 2024 in die Petrusburg-kultivarproef (*Figuur 8*).

Laastens, wanneer gekyk word na die interne gehalte van aartappels, kan prosesseringseienskappe ook geëvalueer word. Om te voldoen aan prosesseringsvereistes, moet kultivars aan 'n skyfiekleurnorm van >50 en 'n soortlike gewig (SG) van ≥1.075 voldoen (*Tabel 5*). Amany en Cayman het aan skyfiekleur- en SG-vereistes voldoen, maar ongelukkig is bruinvlek by eersgenoemde aangeteken.

Spesiale dank aan die medewerker, Lushof Boerdery, die Suidwes-Vrystaat-werkgroepse betrokkenes, die deelnemende saadhuise (FPD, GWK, RSA en Wesgrow), en Anjé Venter en Laryssa van der Merwe van Aartappels SA.
Vir navrae, kontak Enrike Verster by enrike@potatoes.co.za of Laryssa van der Merwe by laryssa@potatoes.co.za.

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Why standardised testing is an important industry tool

By Anel Espach, technical manager, Plantovita

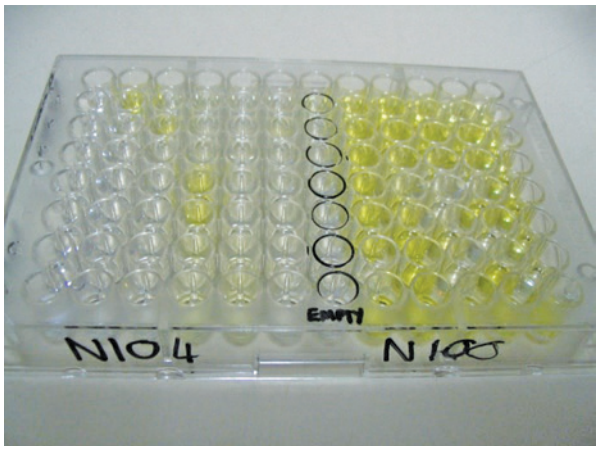
When potato certification started in South Africa in the 1990s, one of the strategic decisions of the potato industry to ensure the cost-effectiveness of certifying seed potatoes, was the establishment of Potato Laboratory Services (PLS). PLS consists of five regional laboratories currently situated in Piketberg, Douglas, Christiana, Pietermaritzburg and Pretoria, to facilitate testing of samples destined for certification.

The core function of PLS is the testing of official, statistical field samples from registered units, for the presence of *Ralstonia* spp. (causal of bacterial wilt of potato), as well as potato virus Y (PVY) and potato leafroll virus (PLRV).

The inclusion of additional functions at Plantovita in Pretoria (previously the Coen Bezuidenhout Seed Testing Centre or CBS) that could not be replicated cost-effectively at the other regional laboratories, made the certification process even more affordable without compromising the requirements set by the South African Seed Potato Certification Scheme (the Scheme).

To best serve the potato industry, standardising conduct and test methods within PLS is crucial. This is achieved *inter alia* through rigorous testing, adherence to approved methods, regular assessment and auditing, identifying and managing risks to impartiality and undue pressures, and applying a strict code of conduct. Monitoring standardisation is the responsibility of Plantovita as the controlling laboratory in PLS. Scheme requirements and the approved code of conduct restrict laboratories from testing potato samples intended for the certification process.

Methods and procedures employed for certification purposes are based on European and Mediterranean Plant Protection Organization principles and current International Standards for Phytosanitary Measures. The accuracy of the outcome of any test method is determined not only by the properties of the test and the pathogen, but also by the representation of sampling.



Five tubers are pooled per well and the results are interpreted in a statistical manner, where the wells with yellow colouring are calculated using intricate formulas, as the percentage of tubers infected.

Regulatory requirements

Because PLS fulfils regulatory functions in the potato industry and are service providers in agriculture, all laboratories are required to be registered at the Department of Agriculture, Land Reform and Rural Development (DALRRD) as laboratories testing for plants. In compliance with *Regulations R110*, if a regulated pathogen in a sample has been confirmed by testing, or is suspected to occur in a unit, DALRRD must be informed.

Laboratories registered with DALRRD may apply to the Independent Council for the Certification of Seed Potatoes (ICCSP) for approval to function as testing laboratories under PLS, generating results that may be used in the certification process of seed potatoes. Only upon approval by the ICCSP may test results be accepted and applied for certification purposes.

ICCSP-approved laboratories must comply with a code of conduct approved and endorsed by the ICCSP. The code of conduct supports the integrity of laboratories, limits undue pressure, gives guidance to personnel to achieve compliance with the Scheme and requirements from the ICCSP, and promotes the role of PLS in advancing the use of seed potatoes.

All laboratories are involved in the testing of statistically taken tuber field samples, leaf samples and diagnostic samples for the presence of PVY, PLRV and *Ralstonia* spp. by the execution of pathogen-specific enzyme-linked immunosorbent assay (ELISA) methods.

Field samples

Field samples are defined in the Scheme as "a representative sample of seed potatoes taken in accordance with the provisions of the protocol (of the Potato Certification Service or PCS) for the determination of the occurrence of *Ralstonia* spp. and viruses listed in *Table 1*, once the top growth on the unit concerned has

died off or has been destroyed but before the seed potatoes have been removed from the soil".

Certification officials sample separate sets of tubers (samples) from fields registered for certification. The number of tubers sampled is mostly determined by factors such as the generation of seed potatoes planted, the size of the field or unit and the status of the pathogen tested for.

However, the authority may determine otherwise. Samples for virus testing from fields planted with G0 to G2 (G1 to G3 outcome) seed tubers are 400 tubers in size, while samples taken from fields planted with G3 to G6 (G4 to G7 outcome) and certified commercial seed tubers are 200 tubers in size. Samples for testing for the presence of *Ralstonia* spp. consist of 4 605 tubers.

After receiving these samples at the respective laboratories (Plantovita, KwaZulu-Natal Laboratory Services, Sandveld Laboratoriumdienste, GWK Aartappellaboratorium, Wesgrow Potato Laboratory), they are tested using the approved standardised methods. All tubers contained in these samples are processed and tested. The enormity of the samples makes it unique for the participating laboratories to apply all the methods employed.

Pooling of a pre-determined number of tubers in virus determinations is done for practical and financial purposes. Statistical methods are subsequently used to calculate the number of virus-infected tubers in a quantitative test process, while the regulatory status of *Ralstonia* spp. necessitates a qualitative test process to determine the presence or absence of the pathogen.

For field sample testing, pathogen-specific ELISA methods are applied by all laboratories. Per implication, since the inception of PLS, all laboratories have been equipped to execute the ELISA method on field samples. The robust method and specificity and sensitivity make it a simple and cost-effective method to use on a high throughput scale.

Leaf samples

Leaf samples for the determination of PVY and PLRV infection levels in planting were implemented by the authorities in 2004 as a management tool for growers, allowing a grower to sample a statistical number of leaves from a registered unit and submit the sample to a participating laboratory for testing.

The result of a leaf sample indicates the risk of virus presence in the tubers from the associated unit. However, accurately predicting the virus content in the tubers using leaf samples is not possible. Leaf samples are not considered official samples in the certification process, since the results cannot and are not used for certification purposes.

Diagnostic samples

These are samples from any kind of potato planting, taken on an *ad hoc* basis for testing at participating laboratories for the presence of PVY and PLRV. These samples may consist of leaves or tubers, with a maximum number of 20 leaves or tubers. If tubers are to be tested using ELISA, they must first sprout to enable accurate testing.

Diagnostic samples serve to facilitate the diagnosis of symptoms and the subsequent management of the identified disease. These samples are generally used to confirm the identification of symptoms.

Additional testing methods

In addition to the core functions of participating laboratories, Plantovita has also been equipped since the start of PLS, to test samples with

Table 1: Current testing services rendered to the potato industry by Plantovita.

Conventional methods – the target is bacteria and fungi	ELISA-based methods – the target is viruses	PCR-based methods – targets may be bacteria, fungi or viruses
Official sample types; determine the certification outcome – 200/400/4 605 tubers; may be quantitive testing (% tubers infected) and qualitative testing (YES/NO)		
• ***In vitro*** (micro-propagative material – imported or locally produced). • Bacteria (*Ralstonia* spp.; soft rot causing enterobacteria; general microbial contamination) and fungi.	• ***In vitro*** (micropropagative material – imported or locally produced). • PVY, PLRV, tomato spotted wilt virus (TSWV), potato virus A (PVA), potato virus M (PVM), potato virus X (PVX), potato virus S (PVS).	• ***In vitro*** (micropropagative material – imported or locally produced). • PVY, PLRV, PepRSV.
• **Minitubers/G0** (imported or locally produced). • Bacteria (*Ralstonia* spp.; soft rot causing enterobacteria) and fungi.	• **Minitubers/G0** (imported or locally produced). • PVY, PLRV, TSWV, PVA, PVM, PVX, PVS.	• **Minitubers/G0** (imported or locally produced). • PVY, PLRV, PepRSV.
	• **Field samples** (*Ralstonia* spp.; PVY; PLRV; TSWV).	• **Field samples** (PVY; PLRV; TSWV). • **Identification and phylotyping** of *Ralstonia* spp. as part of the confirmation process.
Unofficial sample types; do not determine the certification outcome – only qualitative testing (YES/NO)		
• **Diagnostic samples** – all plant parts. • Fungi and bacteria.	• **Diagnostic samples** – leaves and tubers. • Viruses.	• **Diagnostic samples** – leaves and tubers. • Viruses and bacteria.

In conventional testing methods, artificial growth media is used to plate macerated sample material onto and allow bacteria or fungi to grow. If present, the target bacteria/fungi will show unique growth. Selective and differential media will exclude or limit non-target bacteria and will only allow the growth of the target organisms. Typical growth on artificial media provides easy recognition of suspect isolates for the identification of pathogens.

conventional microbiological methods for the presence of bacterial and fungal pathogens.

Conventional methods are employed for testing *in vitro* plantlets, mini tubers (generation 0, G0), and diagnostic samples for bacterial and fungal pathogens, as well as confirming the presence of *Ralstonia* spp. in field samples that tested positive during the execution of the ELISA. These sample types and the conventional methods require equipment different from that used in the ELISA. Interpreting the method outcomes requires additional competence that cannot be duplicated in all laboratories due to the limited number of samples.

In 2014, a validated quantitive reverse transcription polymerase chain reaction (qRT-PCR) method was implemented at Plantovita for testing field samples for the presence of PVY and PLRV. The validation work was funded by Potatoes SA and the outcome was a method established in PLS available to participating laboratories. The validation of this method was extensive due to the use thereof in the certification process on official samples, the size of samples, and the fact that it is not only used for diagnostic purposes.

The validated PVY and PLRV-specific qRT-PCR was subsequently extended for use in *in vitro* samples; G0 samples and diagnostic samples. qRT-PCR methods were also developed and implemented for the detection, identification and phylotyping of *Ralstonia* spp. and corky ringspot (CRS) causal viruses (tomato spotted wilt, potato mop-top virus, tobacco rattle virus and pepper ringspot virus [PepRSV]).

Plantovita funded the development of the *Ralstonia* spp. assays, while PSA contributed funding to the CRS project. Further development of PCR-based methods is ongoing to the benefit of the potato industry and its growers.

For more information, contact Plantovita at info@plantovita.co.za or phone 012 819 8100.

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Mycorrhizae's contribution to soil health

By Jaco Marais, product manager of row crops and biorational products, Philagro

Soil health is defined as the ability of soil to sustain a living ecosystem conducive to high productivity and environmental quality. Soil health is determined by physical soil characteristics, chemical properties, and biological processes.

Integrating suitable practices and products contributes to forming a successful soil health strategy that may take years to fully develop and implement.

Biological processes are a key factor that contributes to soil health. Micro-organisms facilitate up to 90% of all biogeochemical processes occurring in soil. Many soil-related functions are supported by micro-organisms, including nutrient cycling and retention, degradation of pollutants, plant health, disease suppression as well as decomposition and stabilising of soil aggregates. Soil micro-organisms are easily affected by changes in the soil environment, thus serving as a good indicator of overall soil health.

The role of mycorrhizae

Many types of micro-organisms contribute to soil health. Mycorrhizae play a key role since it can affect all three components of the soil health definition.

Mycorrhizae produce a glycoprotein called glomalin that aggregates soil particles and improves soil structure. It can gain access to potential nutrient sources in the soil due to it being able to reach where plant roots physically cannot.

Mycorrhizae also add to the biodiversity in soil, benefiting plant and soil health along with other beneficial micro-organisms. Certain beneficial soil bacteria are considered to be 'mycorrhizae helpers' and may benefit mycorrhizal spore germination, mycelial growth, establishment on roots and reduce environmental stress.

Mycorrhizae can be described as beneficial soil fungi having a symbiotic relationship with host plants via the root system. Host plants supply the fungus with carbon-rich nutrients while receiving water and/or plant nutrients in return. They also play a key role in alleviating abiotic stress conditions that plants may face.

Mycorrhizae can be classified into two main types, mainly due to the location of fungal hyphae in relation to plant roots:

- **Endomycorrhiza:** The most common example of this type is arbuscular mycorrhizal fungi (AMF). Its hyphae elongate into the cortex root cells and form vesicles. This type of mycorrhiza can be associated with most plant species on earth.
- **Ectomycorrhiza:** This type of mycorrhizal fungi forms a thick mantle of hyphae (mycelium) surrounding the surfaces of the root system. This type of mycorrhiza is mostly associated with woody plants.

A powerful application

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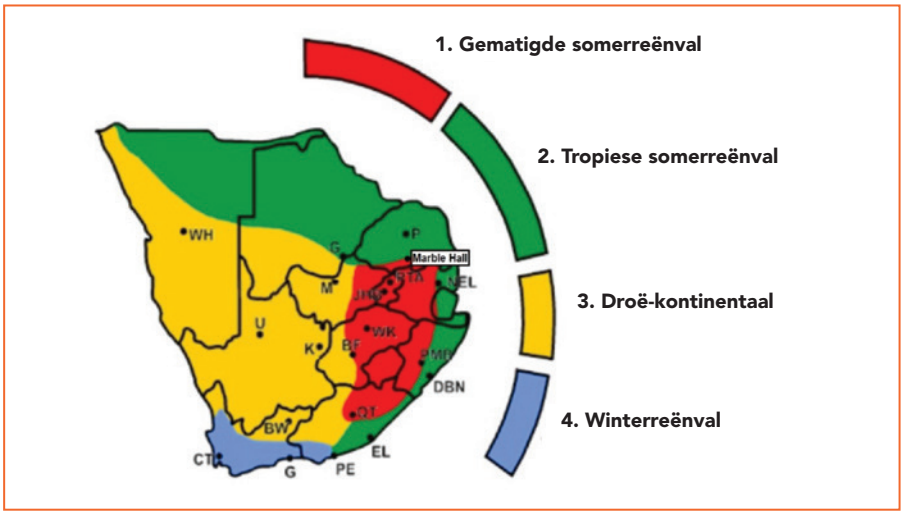
Verwerkingsproef onder besproeiing op Marble Hall in 2023

Deur Enrike Verster, Aartappels SA

Die Marble Hall/Groblersdal-omgewing is 'n aartappel-produksiestreek waar sowat 3% van die land se kommersiële aartappels (hoofsaaklik vir verwerkingsdoeleindes) op ongeveer 1 702 ha produseer word (2023 oesjaar). Die mees prominente kultivars wat vir verwerkingsdoeleindes in die omgewing geproduseer word, is FL2108, Hertha, Markies en Innovator.

Die proef is uitgevoer tussen Marble Hall en Groblersdal. Die gebied val in Suid-Afrika se gematigde somerreënvalgebied (*Figuur 1*) en het die afgelope 21 jaar 'n gemiddelde

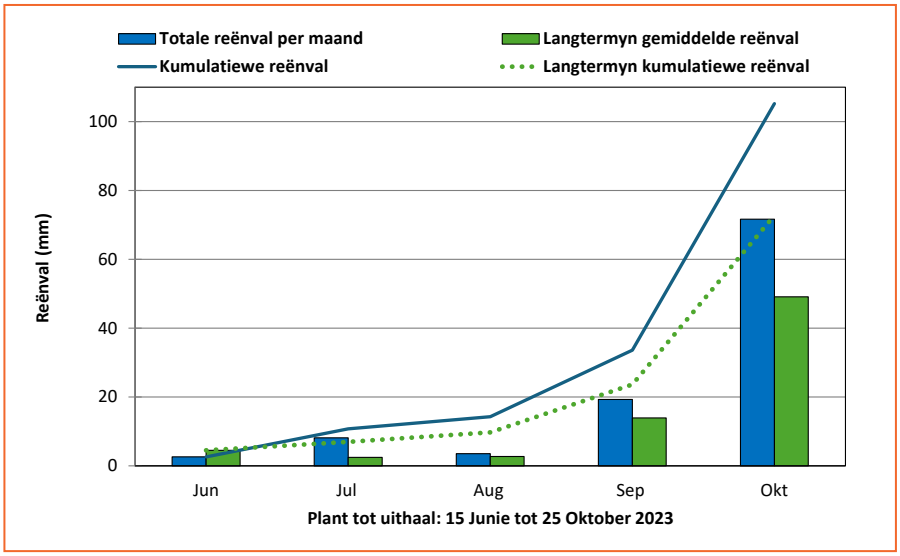
Figuur 1: Ligging van Marble Hall in die Limpopo produksiegebied.



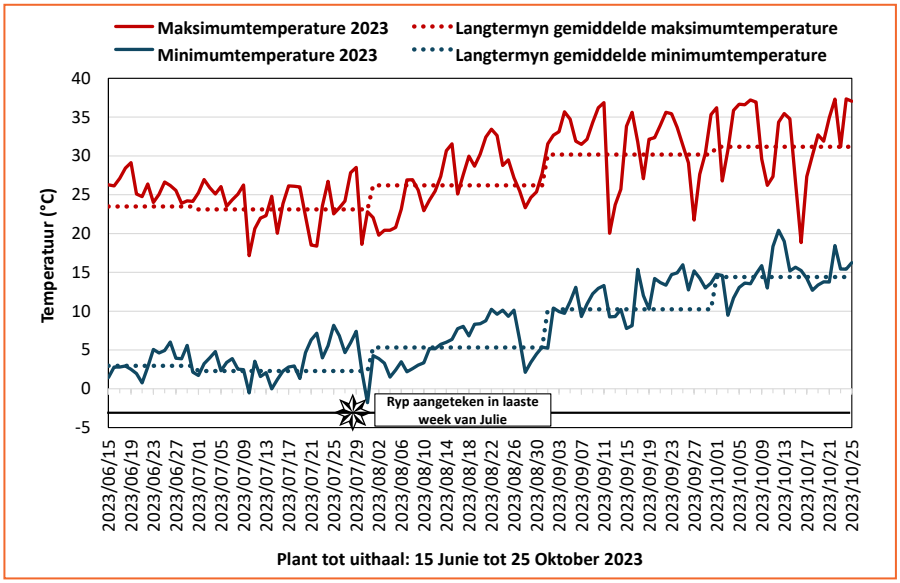
Tabel 1: Opsomming van tegniese inligting rakende proefperseel en -uitleg.

Medewerker	**Jaco van den Heever (JFD Boerdery)**			
Plantdatum	15 Junie 2023			
	Ryp: 25 Julie 2023			
Oesdatum	25 Oktober 2023			
Besproeiing/droëland	Besproeiing			
Moergrootte	220 telling			
Dubbel- of enkelrye	Enkelrye			
Rywydte	0.8 m			
Plantestand	44 000 plante/ha			
Bemestingsprogram	**Voedingswaarde**			
	N (kg/ha)	P (kg/ha)	K (kg/ha)	Ca (kg/ha)
Totaal	205	75	148	180

Figuur 2: Reënval vir die 2023 seisoen en langtermyngemiddelde reënval.



Figuur 3: Minimum- en maksimumtemperature gedurende die 2023-seisoen sowel as langtermyn-temperature.



jaarlikse reënval van 463 mm ontvang. Die streek word gekenmerk aan baie warm somers en winters, met die moontlikheid van ryp wat vanaf Julie tot Augustus kan voorkom.

Die kultivarproef is in 'n ewekansige blokontwerp met drie herhalings per kultivar uitgelê. *Tabel 1* bevat relevante tegniese inligting rakende die proef. Grondontledingsresultate word in *Tabel 2* weergegee.

Groeitydperke en stand

Ingesluit in die kultivarproef is kultivars met medium tot lang groeitydperke; derhalwe kan groeitydperke die uiteindelike opbrengs van sekere kultivars beïnvloed. Die lengte van groeitydperke is onderhewig aan die aard van die seisoen, maar word gesien as die hoeveelheid tyd wat verloop vanaf opkoms tot natuurlike loofafsterwe. *Tabel 3* toon hoe hierdie groeitydperke van kultivar tot kultivar verskil.

Stand en aantal halms per moer beïnvloed knolgrootte en opbrengs. Die aantal ogies per knol is kultivarafhanklik en bepaal die hoeveelheid spruite wat per knol voortgebring word. Plantgereedheid van moere is baie belangrik in hierdie verband, aangesien die ideale plantgereedheid gewoonlik veroorsaak dat moere beter spruit en meer stamme per spruit voortbring. Plantgereedheid van moere ten tyde van die plant van die proef, sowel as standpersentasie en halmtelling wat later in die groeitydperk waargeneem is, word in *Tabel 3* aangedui.

Bemarkingsindeks

Die evaluering van nuwe kultivars soos in die Marble Hall-kultivarproef verskaf resultate rakende onder andere opbrengs en bemarkingsindeks. Die aartappels is in groottegroepe gesorteer op 'n tafel wat sorteer vir prosesseringsmarkte. Groottes is uiteengesit as Groot (70+ mm in diameter), Groot-medium (70 mm), Medium (55 mm), Klein (50 mm) en Ekstra-klein (45 mm). Die gehalte van die aartappels was baie goed en geen noemenswaardige redes vir afgradering is opgemerk of aangeteken nie.

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Tabel 2: Grondvoedingstatus van die proefperseel voor plant.

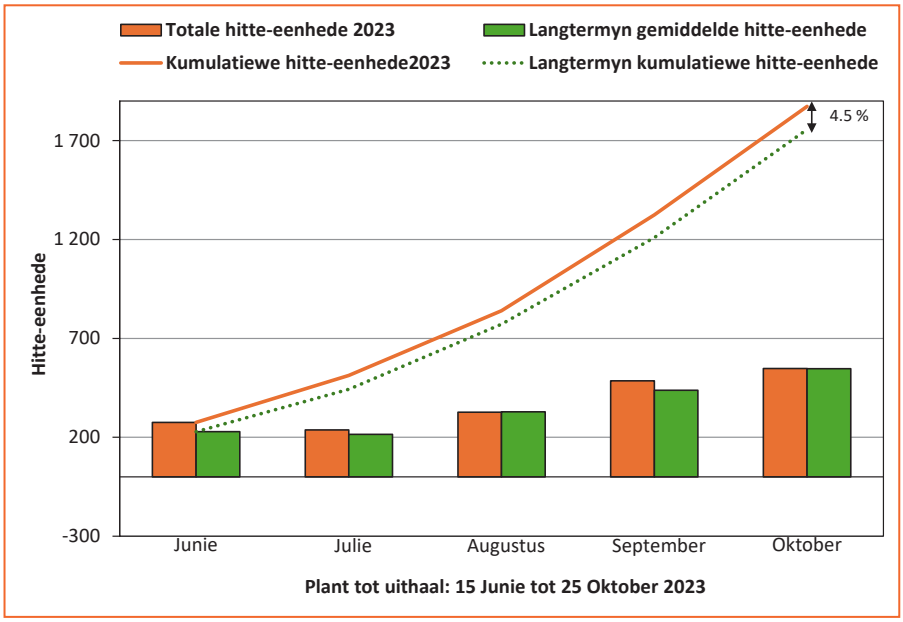
Digtheid (g.cm^{-3})	pH (KCl)	Katione					Basisversadiging			
		P-Bray 1	K	Ca	Mg	Na	K	Ca	Mg	Na
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	%	%	%	%
1.14	4.89	97	166	389	93	17	13.27	60.75	23.69	2.29

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

Kultivar	Groeitydperk (dae)[1]		Plantgereedheid[2]	Stand (%)	Halms per plant	Halms per ha
Alverstone Russet	Medium	(100)	2	77	2.8	94 864
Cayman	Medium	(100-110)	1	80	5.2	183 040
Markies	Medium tot lank	(110)	2	94	4.5	186 120
Moonlight	Medium tot lank	(110-120)	1	83	1.5	54 780
Norman	Medium	(90-100)	1	31	1.3	17 732
P1	Medium tot lank	(110)	2	94	4.1	169 576
P3	Medium	(95)	3	100	4.2	184 800
Satin King	Medium	(100-110)	2	97	4.1	174 988
Taurus	Medium tot lank	(110-120)	3	91	5.6	224 224

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

Figuur 4: Hitte-eenhede van die 2023-seisoen asook langtermyn gemiddelde hitte-eenhede.



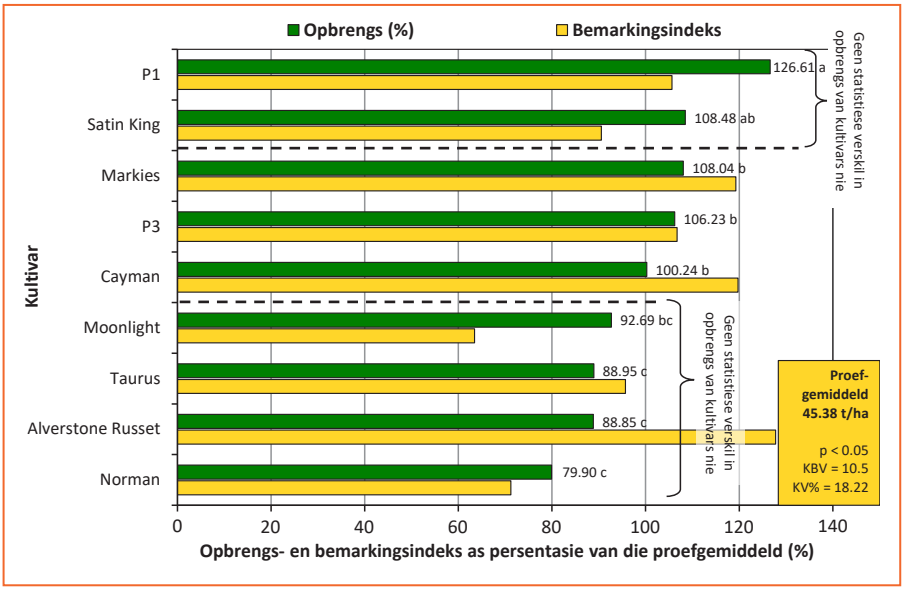
**Totale hitte-eenhede spesifiek bepaal vir aartappels (drumpeltemperatuur = 5°C) as gewas, bereken vanaf uurlikse data.*

Dienooreenkomstige prys-vergelykings is met gemiddelde mark-pryse gemaak ten tyde van oes. Die prestasie van nuwe kultivars kan nie net op die resultate van een bepaalde seisoen geskoei word nie, omdat klimaat van een jaar na 'n volgende wissel. Juis daarom word die kultivars verkieslik oor 'n aantal seisoene geëvalueer.

Aansienlike reënval

Soos met enige gewas is temperatuur en waterbeskikbaarheid (hetsy goeie besproeiingskedulering of reënval) 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 en langtermyn-weerdata word verkry vanaf 'n gekose

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



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

Landbounavorsingsraad (LNR)-weerstasie wat so na as moontlik aan die proefperseel geleë is.

Die reënvaltendens vir die 2023-seisoen (*Figuur 2*) toon 'n hoër reënvalsyfer as die normale langtermyngemiddeld. Besproeiingskedulering was uiteraard goed bestuur oor die groeitydperk wat grootliks in die wintermaande val. 'n Aansienlike hoër reënval vir Oktober het gevolg (tydens laat stadiums en met loofafsterwe).

Minimum- en maksimumtemperature word in *Figuur 3* uiteengesit. In die betrokke seisoen is baie warm dae vanaf Augustus aangeteken, met altesaam 41 dae van maksimumtemperature bo 30°C en 17 dae bo 35°C vanaf Augustus tot oesdag in Oktober. 'n Dramatiese wisseling in maksimum- en minimumtemperature op belangrike groeistadiums, het 'n negatiewe invloed op knolinisiasie en ontwikkeling gehad. Die medewerker het op 25 Julie ryp aangeteken op die plaas waar die proefperseel geleë is; dit het 'n rol gespeel in uiteindelike opbrengs.

Die versameling van hitte-eenhede gedurende 'n groeitydperk is 'n kardinale faktor in die ontwikkeling van 'n plant. Die tendens van hitte-eenhede beskikbaar vir die kultivarproef van hierdie seisoen blyk ietwat hoër as die langtermyndatatendens van hitte-eenhede te wees (*Figuur 4*), met Augustus tot Oktober wat onder warm maksimumtemperature gebuk gegaan het.

'n Beduidende kultivareffek

Opbrengsdata wat tydens oesdag versamel word, word onderwerp aan statistiese verwerking met behulp van die GenStat®-program. Die Tukey-toets van kleinste betekenisvolle verskille (KBV) is gebruik om die gemiddelde te skei. Die kultivareffek gedurende hierdie betrokke proef (*Figuur 5*) was statisties beduidend ($p<0.05$) en die koëffisiënt van variasie was

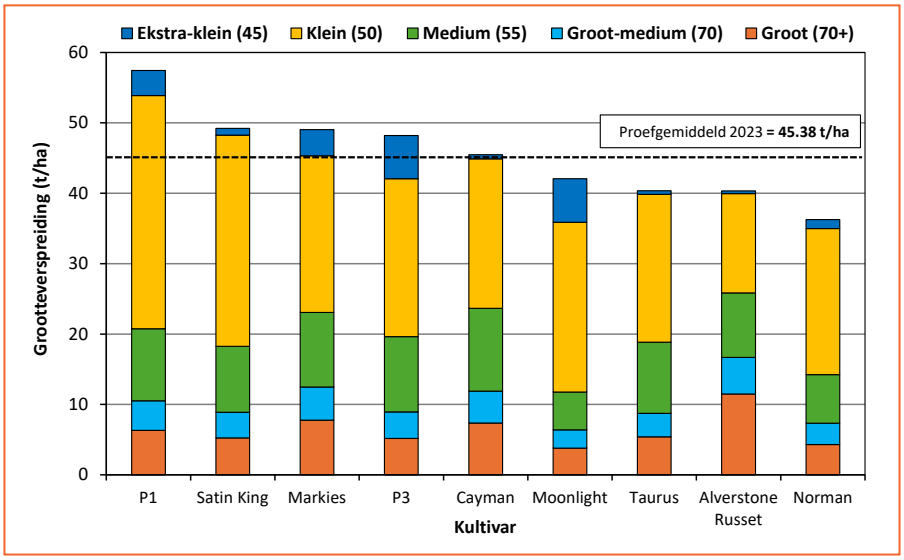
Die kultivarproef is in 'n ewekansige blokontwerp met drie herhalings per kultivar uitgelê.

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

Kultivar	SG[1]	DM[2]	Skyfiekleur[3]	Vleeskleur	Knolvorm	Kooktipe[4]
Alverstone Russet	1.087	21.7	58.1	Wit	Ovaal	30
Cayman	1.082	20.6	59.8	Room	Rond	40
Markies	1.083	20.9	65.1	Donkergeel	Rond	30
Moonlight	1.078	19.7	54.9	Wit	Rond	40
Norman	1.089	22.2	63.1	Wit	Rond	30
P1	1.088	21.9	64.3	Liggeel	Rond	40
P3	1.082	20.7	62.7	Donkergeel	Ovaal	40
Satin King	1.085	21.4	56.7	Wit	Rond	30
Taurus	1.087	21.8	58.1	Room	Rond	20

[1]*Soortlike gewig van >1.075 is aanvaarbaar vir die prosesseringsbedryf.*
[2]*Die persentasie droëmateriaal is 'n berekende waarde: DM% = 24.182 + 211.04 * (SG-1.0988). Die werklike persentasiewaarde sal effens verskil tussen variëteite uit hierdie berekeningswaarde.*
[3]*Skyfiekleur met waarde >50 en sonder defekte is aanvaarbaar vir die droëskyfiebedryf.*
[4]*Kooktipe (proe en druk): 40 = ferm aartappel met 'n fyn tekstuur; 30 = effens melerig, redelike ferm aartappel met 'n matige fyn tekstuur; 20 = melerig, krummelrig tot los; 10 = baie melerig tot los.*

Figuur 6: Groottegroepverspreiding van elke betrokke kultivar.



binne perke (18.22%). Hierdie faktore dui daarop dat die proef goed uitgevoer is en die resultate derhalwe betroubaar is.

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

Opbrengs- en gehalte-aspekte

Die gemiddelde opbrengs van die proef vir die 2023-seisoen was 45.38 t/ha. P1 en Satin King het die beste opbrengs behaal en Alverstone Russet, Cayman en Markies die beste bemarkingsindeks.

Groottegroepverspreiding is 'n belangrike evaluasie wanneer gekyk word na 'n kultivar se bemarkbaarheid in die prosesseringsbedryf (*Figuur 6*). Die grootste gedeelte van hierdie proef het Medium en Klein aartappels opgelewer. Saam met grootte is onder andere gehalte, knolvorm en SG ook beduidend vir verwerkers.

Laastens, wanneer gekyk word na die interne gehalte van aartappels, kan prosesseringseienskappe ook geëvalueer word. Met 'n prosesseringsproef is dit uiteraard belangrike data. Om te voldoen aan prosesseringsvereistes moet kultivars onder andere aan 'n skyfiekleurnorm van >50 en 'n soortlike gewig (SG) van ≥1.075 voldoen (*Tabel 4*). Alle kultivars het aan die skyfiekleur- en SG-vereistes voldoen. Vleeskleur- en knolvormevaluasie is ook gedoen. Interne gehalte was deur die bank goed, met min vaskulêre verbruining en geen wesenlike probleme soos bruinvlek of holhart wat waargeneem is nie.

Spesiale dank aan die volgende medewerkers: Jaco van den Heever, produsent, Danie Marais, Potato Seed Production, Eon Cordier, Wesgrow, Frank Osler, PepsiCo, Jeanine van Jaarsveld, First Potato Dynamics, en Damien da Cal, Dikgetho Mokoena, Laryssa van der Merwe en Billy Pholoso, Aartappels SA. Vir meer inligting, kontak Enrike Verster by enrike@potatoes.co.za.

Dripline selection: Balancing cost and performance

Supplied by Netafim South Africa

Farming success will depend on important decisions by the producer and the experts he or she consults. It will also depend on many factors beyond the producer's control.

One of the many decisions to be made is selecting the irrigation method and approach, and consequently selecting the products to be installed in the field. After the long list of variables has been considered and drip irrigation selected as the optimal irrigation system for the circumstances, another long list of choices must be made regarding the configuration of the system.

Understanding dripper data

When technical dripper data is shared, we are confronted with terms that describe certain engineering features. These features determine how well a dripper does its job. On the farm, success depends on the dripper's ability to deliver a supply of water that never varies. This, in turn, depends on the dripper's ability to stay clean. Dripper clogging must be prevented at all costs, as it is very difficult to return flow once a dripper has clogged. Clogging prevention depends on dripper design and quality, as well as efficient maintenance once it starts working.

The dripper's ability to stay clean depends on turbulence. One of the most important additions to drippers as dripper design evolved, was the addition of teeth to the flow path to create turbulent flow. This made a massive contribution to clogging resistance as particles are kept in suspension through the turbulence created.

What you need to know

A typical dripper needs to reduce its inlet pressure from 1 to 0 bar and get 1 ℓ/ha through it. A complicated mathematical equation explains the pressure difference from the inlet of the dripper flow path to the outlet. All we need to understand is that the pressure difference comprises two aspects: turbulence (measured as a turbulence coefficient) and friction loss (measured by filtration area).

On the potato farm, success depends on the dripper's ability to deliver a supply of water that never varies.

Pressure loss

Pressure loss = turbulence + friction loss. It is important to understand the interaction between these two aspects. The less turbulence the dripper creates, the more it must resort to friction loss to create the necessary pressure loss. Friction loss does not contribute to keeping a dripper clean, but the more turbulence, and the higher the turbulence coefficient, the better the dripper is at keeping clean.

Turbulence coefficient

A higher turbulence coefficient translates to a more turbulent flow path in the dripper. This, in turn, translates to lower clogging risk. The dripper will be better at keeping itself clean. This value depends on labyrinth depth, width, length (number of teeth), as well as design and manufacturing excellence.

A few engineering features contribute to a higher turbulence coefficient:

- Number of teeth – less is better.
- Flow-path length – shorter is better.
- Flow-path depth – deeper is better.
- Flow-path width – wider is better.
- Filtration area – the bigger the better.

The other important contributing factor to a dripper's ability to stay clean is the size of the effective filtration area. The larger the area

of a dripper's filter, the more area is available for contaminants to accumulate and the longer it will take for contaminants to completely cover the filtration area. Therefore, the dripper with the larger filtration area will last longer.

Cost-performance ratio

Beyond what is discussed here, a variety of factors must be considered in dripper and dripline selection. The designer and/or producer must determine which attributes are necessary for the crop and circumstances.

The important goal is to maintain a balance between dripper cost and performance. Equipment cost is a sliding scale determined by a host of factors. A comprehensive portfolio of drippers and driplines is available that cover a wide range of crops and applications.

Consider a dripline selection graph where the y-axis is cost, and the x-axis is a composite of application, durability, clogging resistance, and other factors considered in dripper comparison. Movement along the x-axis will result in movement along the y-axis, which is an increase or decrease in price. The higher the values discussed, for example, the longer the dripper will last, but the higher the cost. The thicker the pipe wall, the longer the dripline will last, but the higher the cost.

Do note that quality is not one of the items listed on the virtual x-axis. Whether selecting thin-wall or heavy-wall drip, the most advanced dripper or one with fewer features, quality cannot be compromised.

Quality and budget

Although it might not seem so, it is possible to not veer from selecting quality products, while still maintaining the optimal balance between drip irrigation performance and your budgetary restrictions. Consider the necessary specifications to truly determine which dripline can be relied on in the field. Look for a product that offers guaranteed longevity, and is designed and manufactured with the explicit goal of decreasing clogging risk and delivering water uniformly and efficiently.

It all boils down to what your crop needs. The experts would, for example, not recommend the same equipment for irrigation with hard, murky water for a single season, as for irrigation with the same water where the equipment needs to last many seasons. Similarly, the same equipment will not be used for irrigation with much better water quality.

Dripline selection boils down to selecting the correct product for the crop and circumstances, selecting a quality product that can do the job at hand in difficult conditions, and selecting the product that will offer the best return on investment.

For more information, email infoza@netafim.com

THHH-UN-DERRR: Weerstand as 'n wapen teen siektes

Deur Anneli Heyns, projek- en kommunikasiebestuurder, Nutrico

Aartappelsiektes, veral laatroes wat veroorsaak word deur die swam *Phytophthora infestans*, bly 'n beduidende bedreiging vir aartappelproduksie. Aartappelroes is 'n ou vyand, maar stel nuwe uitdagings as gevolg van ontwikkeling van nuwe patogeen-variante, moderne landboupraktyke en klimaatsverandering wat siekte-risiko verhoog. Alhoewel konvensionele bestuurspraktyke bestaan, het kommer oor swamdoderweerstand navorsing oor alternatiewe strategieë aangespoor.

Groenchemie-benaderings, wat natuurlike plant-afkomstige produkte soos antioksidante gebruik, bied 'n belowende pad vorentoe. Hierdie oplossings kan die swampatogeen direk teiken of die aartappelplant se eie verdedigingsmeganismes versterk, en bied 'n volhoubare en omgewingsvriendelike benadering tot siektebestuur in moderne landbou.

THHH-UN-DERR: 'n Groen swamdoder

THHH-UN-DERRR is 'n nuwe en unieke samestelling van plant-afkomstige antioksidante, soos askorbiensuur (vitamien C) en salisielsuur, sowel as ander unieke bestanddele. Hierdie oplosbare konsentraat is geregistreer vir gebruik as 'n voorkomende beheermiddel van aartappelsiektes wat deur die patogeen *Phytophthora infestans* veroorsaak word.

Die unieke formulasie het 'n gunstige ekologiese profiel en geen maksimum residuvlak of vooroesinterval is van toepassing nie. Dit bied dus 'n volhoubare en omgewingsvriendelike benadering tot siektebestuur tydens aartappelproduksie.

THHH-UN-DERRR is ook geregistreer vir die beheer van siektes wat veroorsaak word deur *Xanthomonas campestris* (bakteriese vlek), *Alternaria solani* (vroeë roes) en *Phytophthora infestans* (laatroes) op tamaties.

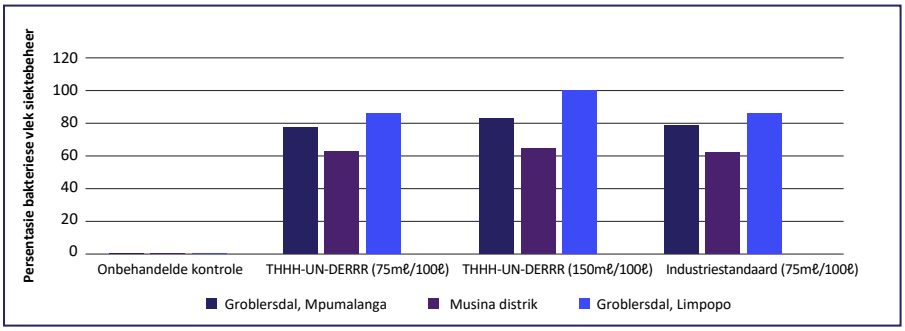
Figuur 1 toon THHH-UN-DERRR se doeltreffende gemiddelde beheer van bakteriese vleksiekte in tamaties in verskeie veldproewe en bioklimatiese sones in Suid-Afrika. Die doeltreffendheid van THHH-UN-DERRR is gemeet as die persentasiebeheer (%) van bakteriese vlek, sewe dae na vier behandelings, en vergelyk met die bedryfstandaard en 'n onbehandelde kontrole.

Die eerste blaarbespuiting is uitgevoer teen 50% volrypkleur op plante wat geen tekens van stres toon nie en kragtig groei, gevolg deur drie daaropvolgende toedienings in sewedag intervalle. THHH-UN-DERRR bied 'n gemiddelde beheer van meer as 75% teen 75 mℓ/100 ℓ water en meer as 85% teen 150 mℓ/100 ℓ water teen bakteriese vlek op tamaties.

Hoe werk THHH-UN-DERR?

Siekteweerstand in plante is afhanklik van bestaande fisiese of chemiese versperrings (soos dik selwande of

Figuur 1: Doeltreffende beheer van *Xanthomonas campestris* (bakteriese vlek) in tamaties uitgedruk as % beheer oor drie bioklimatiese gebiede.



Tabel 1: THHH-UN-DERRR se gebruiksaanwysings.

Gewas	Siekte	Dosis	Kommentaar
Aartappels (onderdrukking)	Laatroes (*Phytophthora* spp.)	75 tot 150 mℓ/100 ℓ	**Blaarbespuiting:** Eerste toediening teen vier- tot sesblaarplantstadium, gevolg deur drie daaropvolgende toedienings met sewe-dae intervalle. **Spuitvolume:** 500 tot 800 ℓ/ha spuitmengsel.
Tamaties	Bakteriese vlek (*Xanthomonas* spp.) Vroeë roes (*Alternaria* spp.) Laatroes (*Phytophthora* spp.)	75 mℓ/100 ℓ	Dien op vier- tot sesblaarplantstadium toe en herhaal toediening elke sewe dae.

groot hoeveelhede lignien of tannien) asook induseerbare verdedigingsmeganismes. As die patogeen herken word, word verdedigingsmeganismes geaktiveer op die plek van infeksie sowel as in ander onbesmette weefsel. In die afwesigheid van enige patogeen-aanval, kan hierdie meganismes fisies of chemies geïnduseer word. Antioksidante soos askorbiensuur en salisielsuur aktiveer verdediging teen verskeie plantsiektes wanneer dit ekstern op plante toegedien word.

Die THHH-UN-DERRR-swambeheermeganisme van askorbiensuur en salisielsuur sluit individuele en sinergistiese effekte in wat die plant se verdedigingsreaksies teen patogene verbeter. Studies het getoon dat die gelyktydige toediening van askorbiensuur en salisielsuur, 'n afname in die erns van siektes kan veroorsaak in vergelyking met individuele gebruik van hierdie aktiewe bestanddele.

Hierdie sinergistiese effek is waarskynlik te wyte aan die komplementêre aksies van hierdie verbindings, wat die plant se verdediging aktiveer en weerstand teen patogene verbeter. Daarby kom askorbiensuur- en salisielsuurverbindings natuurlik voor en het 'n minimale impak op die omgewing en menslike gesondheid wanneer dit volgens die aanbevole toedieningshoeveelhede gebruik word.

Kragtige antioksidante

Askorbiensuur is 'n kragtige antioksidant wat reaktiewe suurstofspesies opvang wat tydens plant-swam-interaksies geproduseer word. Deur oksidatiewe stres te verminder, help askorbiensuur om plantselle teen skade te beskerm wat deur swaminfeksies veroorsaak word. Dit toon ook antimikrobiese eienskappe deur bakteriese selwandsintese en membraandeurdringbaarheid te verander.

Daar is bevind dat askorbiensuur die uitdrukking van verdedigingsverwante gene in plante, insluitend dié wat patogenese-verwante proteïene kodeer, reguleer. Hierdie proteïene speel 'n deurslaggewende rol in die bestryding van swampatogene deur hul groei en verspreiding binne die plantweefsels te inhibeer.

Salisielsuur kan die groei en ontwikkeling van swampatogene direk inhibeer deur hul sellulêre prosesse te ontwrig. Dit belemmer swamensieme en weë wat noodsaaklik is vir infeksie waardeur die vestiging van swamsiektes in aartappelplante beperk word. Salisielsuur funksioneer as 'n seinmolekule vir plantverdediging. Tydens 'n patogeenaanval veroorsaak salisielsuur 'n menigte verdedigingsreaksies binne die plant, insluitend die produksie van antimikrobiese verbindings en die aktivering van die plant se immuunstelsel.

Salisielsuur is 'n belangrike seinmolekule in plantverdedigingsreaksies en is bekend daarvoor dat dit sistemiese verworwe weerstand (SAR) veroorsaak, 'n sistemiese immuniteit wat die hele plant voorberei om patogeenaanvalle te weerstaan. SAR behels die aktivering van verdedigingsgene en die ophoping van antimikrobiese verbindings in plantweefsels.

Praktiese toediening

THHH-UN-DERRR is 'n breëspektrum, voorkomende produk wat algemeen gebruik word vir die beheer of onderdrukking van bekende plantsiektes. Dit kan slegs as 'n blaarbespuiting toegedien word, in afwisselende spuitprogramme, of in tenkmengsels saam met ander geregistreerde gewasbeskermingsprodukte.

Vir maksimum doeltreffendheid, dien THHH-UN-DERRR toe voor of in die vroeë stadiums van siekteontwikkeling. As die toestande gunstig is vir swaar siektedruk, gebruik THHH-UN-DERRR in 'n rotasieprogram saam met ander geregistreerde swamdoders. THHH-UN-DERRR is 'n ideale instrument vir weerstandsbestuur, danksy sy unieke en veelvuldige werkingsmeganismes.

Aangesien plante met sterk immuunstelsels minder vatbaar is vir siektes, is dit noodsaaklik om optimale plantvoedingstatus te verseker en blaarvoedings sowel as aminosuurtoediening word aanbeveel as aanvullende behandelings. Verder speel grondgesondheid 'n groot rol in die onderdrukking van plantsiektes, en in die ontwikkeling van biologiese organismes soos *Trichoderma harzianum*, bekend vir hul vermoë om grondgesondheid te verbeter.

Good plant nutrition can reduce bacterial diseases

By Dirk Uys, Potatoes SA

South African soils are not always rich in nutrients and high organic content. The potato production budget always makes provision for nitrogen, phosphate and potassium but at least 17 other elements are also essential for optimal crop nutrition. Some are freely accessible in plant-available formats while others are less so.

One essential element is calcium (Ca) which is often present in soil but in an insoluble version such as lime (calcium carbonate) or gypsum (calcium sulphate). Lime requires high volumes of water (> 60 000 ℓ to dissolve 1 kg of calcium carbonate), making it difficult to become plant available. Thus, the type of Ca is important for uptake and soluble Ca such as calcium nitrate is probably the most efficient in this regard.

Preventing bacterial diseases

The global impact of bacterial diseases in potatoes is estimated at US$360 billion. In South Africa, bacterial wilt (*Ralstonia solanacearum*) is a regulated pest, while bacterial soft rot causes significant yield losses in the summer production regions.

Calcium is essential for tuber strength, with varying levels in different parts of the potato plant. The highest concentration of Ca is found in shoots and leaves with the lowest in the tubers, the part that needs protection. This is because Ca transport within the plant is slow and complicated, and older leaves tend to accumulate higher levels of Ca that cannot easily move to the tubers.

An example of soft rot indicating the location of the weak infection spot. (Photograph: Prof J van der Waals)

Inside the tuber, higher Ca concentrations are present in the tuber's outer periderm rather than in the centre (pith). The elevated content in the periderm is associated with direct movement from the soil solution into the tuber skin, which is the barrier that must be protected. This periderm (skin) regulates water, oxygen and carbon dioxide exchange. In the process it also protects tubers with Ca being a component in the cell wall's middle lamellae.

A high Ca concentration optimises the tuber's tolerance against the pectolytic enzymes produced by soft rot-causing bacteria, preventing their entry. Applying Ca, whether through foliar spray or soil drench, significantly impacts quality aspects, including specific gravity.

High soft rot incidences

In the previous season, several potato production regions were seriously affected by bacterial soft rot. This was aggravated by initial wet conditions during the bulking stage, followed by high temperatures during harvesting. Crop protection products do not have a significant effect against bacterial diseases.

A study conducted by the American Society for Microbiology shows that Ca can contribute to tolerance against bacterial diseases. Specifically, Ca contributes to resistance against bacterial wilt caused by *Ralstonia solanacearum* and soft rot caused by *Pectobacterium* sp. The study confirmed that an increase in Ca status in tubers directly impacts resistance to *Pectobacterium*.

An example of hollow heart in potatoes. Hollow heart is often associated with calcium deficiencies. It manifests in the centre of the potato where calcium levels are at their lowest.

Soft rot bacteria require an entry point into the tuber, and susceptibility is directly associated with membrane permeability. Tuber susceptibility increases at low tissue oxygen concentrations often associated with wet conditions, for example when the tuber surface is covered with moisture.

The signal for potassium to close stomata may be delayed when calcium levels are low, and the plant will lose precious moisture through transpiration. This is also a potential entry way for bacterial pathogens.

The absence of Ca during tuber initiation or bulking leads to cell degradation, resulting in physiological issues such as hollow heart or internal browning. Compromised tubers are also more susceptible to bruising. Calcium is needed most during tuber initiation and early bulking to improve the mechanical strength of tubers, which will ultimately determine their susceptibility to attack by soft rot bacteria.

Contact the author at dirk@potatoes.co.za or visit *www.potatoes.co.za.*

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Potato disease-detection technologies

By Lukie Pieterse, editor and publisher, Potato News Today

The consequences of uncontrolled potato diseases are far-reaching. Late blight, known for causing the Irish potato famine in the mid-19th century, can lead to complete crop failure. Early detection and control are crucial to prevent the spread of these diseases. If left unchecked, producers face economic losses and the loss of food supply for the consumer market, affecting food prices and availability. Disease outbreaks can lead to the overuse of chemical pesticides, which carry their own environmental and health risks.

By analysing patterns in plant growth, discolouration, and texture that might escape the human eye, disease-detecting technology offers the promise of bringing potato farming into a new era of precision agriculture, where every plant can be monitored, and every disease managed.

Traditional detection methods

Traditional methods rely heavily on human intervention, with visual inspection and laboratory testing being the two primary tactics utilised.

Visual inspection is a common method used for disease detection by producers and agronomists. It involves meticulously examining plants for visible symptoms such as spots on leaves, wilting and growth abnormalities. This method is time-consuming, subjective and prone to misdiagnosis due to similarities between disease symptoms and other factors such as pests or nutrient deficiencies. Due to the labour-intensive nature of this method, it is not feasible for producers to manage large acreages without a substantial workforce.

Laboratory testing supplements visual inspection by providing a scientific approach. Samples of affected plant tissues are analysed in laboratories using techniques like culturing, polymerase chain reaction and enzyme-linked immunosorbent assay (ELISA) to identify pathogens. Laboratory testing is expensive, time-consuming and may delay disease response. It is often reserved for cases where the disease is unknown or has already reached an advanced stage.

Emerging technologies

Deep learning, a subset of machine learning, mimics the workings of the human brain in processing data and creating patterns for use in decision-making. It is defined by its ability to learn, in an unsupervised manner, from large amounts of unstructured data.

The most common architecture of deep learning that is particularly effective in image recognition tasks is the Convolutional Neural Network (CNN). CNNs are inspired by the organisation of the animal visual cortex and are specifically designed to automatically and adaptively learn spatial hierarchies of features from visual input. Such networks are adept at managing two-dimensional data, such as images, and extracting patterns that are too subtle or complex for the human eye to discern.

CNNs consist of multiple layers of neurons that process input images and extract a hierarchy of high-level features. These features become progressively more abstract at each layer. A typical CNN architecture comprises convolutional, pooling and fully connected layers.

Convolutional layers apply a set of filters to the input image to create feature maps, which highlight regions of the image that are relevant to detecting patterns. Pooling layers then 'down-sample' these feature maps to reduce dimensionality and computational load, while preserving the most essential information. Fully connected layers interpret these feature maps and output a prediction, such as the presence or absence of a particular plant disease.

For potato producers, the implications of CNNs are profound. A trained CNN can scan images of potato leaves, capturing data that ranges from overt signs of disease to subtle variations in colour, shape, and texture. These data points might be missed by the human eye or be indiscernible through conventional disease detection methods.

Deep learning methods

Training a CNN involves several steps that must be meticulously followed to ensure that the network can correctly learn from the data provided. Gathering a robust dataset is critical. It should include high-quality images of various potato diseases, and healthy plants for comparison. Images must clearly show disease symptoms, such as colour changes, spots, or lesions on the leaves or tubers.

To assemble a comprehensive dataset, it is often necessary to source images from different locations, times of day, and under varied weather conditions to make the CNN adaptable to real-world scenarios. Once collected, these images are

annotated, a process where disease features are labelled so the CNN can learn what to look for when analysing new images. Labelling done by experts ensures accuracy.

CNNs are then fed the dataset for training, which allows the model to adjust its internal parameters through a process called backpropagation. Dataset division into training, validation, and testing subsets is essential. CNNs learn to identify disease presence, type and severity through pattern recognition and regression analysis.

The types of diseases that a CNN might learn to identify in potatoes include early and late blight and viral infections such as potato leafroll virus and potato virus Y. By training on diverse images depicting early and late blight, CNNs can learn to distinguish between them based on subtle differences.

A CNN trained on a temporally diverse dataset can learn to recognise the stages of disease progression. This is particularly important for providing actionable insights to producers. Knowing the stage of the disease helps in determining the appropriate intervention measures, which can range from targeted application of fungicides in the early stages to more drastic actions such as crop quarantine or destruction in advanced stages.

Advanced techniques

Data augmentation such as cropping, rotating, zooming, or changing the colour balance expands the training dataset. Architectural nuances such as residual networks (ResNets) or networks with inception modules improve accuracy.

The utilisation of CNNs in real-world scenarios for potato disease detection has led to several success stories that underscore their effectiveness, efficiency, and scalability. A notable example is the Potato Crop Diseases (PCD) mobile application (app). This app is free for producers and was created to facilitate early detection of potato crop diseases. Leveraging CNNs, the app enables producers to capture images of their crops using basic mobile devices, after which the images are processed to identify potential disease symptoms. In a field trial, the PCD app demonstrated an accuracy level that inspired confidence among producers, with real-time feedback enabling them to take immediate action.

Economic impact of deep learning

Economically, the most immediate effect is the potential for increased yield. Accurate disease identification enables targeted interventions, safeguarding harvests. Increased yield translates into stable income for producers and helps stabilise potato market prices worldwide.

Deep learning tools contribute to a reduction in operational costs. For instance, AI-powered systems can replace or augment traditional scouting methods, which require extensive labour and time to physically inspect crops. Automation benefits smallholder producers by easing financial demands. Labour costs decrease due to streamlined processes.

This technology-driven approach enables more precise use of pesticides and fungicides, reducing overall chemical use. It also mitigates the risk of developing resistance to pests and diseases, which could have severe long-term economic repercussions.

Environmental impact

Precision agriculture promotes a more sustainable use of resources. The minimised use of chemical treatments preserves soil health and prevents water contamination.

Deep learning technologies help maintain healthier crops and avoid the need for replanting. With land being a finite resource, any measure that can maintain or increase yield without the need for expansion into natural habitats is of significant environmental value. It also indirectly contributes to combating deforestation and biodiversity loss.

AI-driven pest and disease detection systems analyse data from weather patterns and plant imagery. This enhances climate resilience in potato farming, allowing producers to adapt to changing environmental conditions and contribute to broader climate change efforts.

Social impact

Deep learning tools hold the promise of fostering rural development. Advanced technologies have the potential to reduce rural poverty, malnutrition and lack of education.

There is a profound educational element involved in the deployment of deep learning technologies. Producers are exposed to cutting-edge methods in agronomy, engendering a skilled workforce that is conversant in both traditional farming techniques and modern technologies. By closing the digital divide, such exposure can empower producers to become innovators, driving further advancements in sustainable agriculture.

Challenges and limitations

Each of the following concerns requires thorough navigation to harness the power of AI in agriculture.

High initial costs: The sophisticated sensors, drones, computing infrastructure, and software needed to implement these technologies can be prohibitive, especially for small-scale producers. The high price tag of advanced devices and analytical tools makes them less accessible for those with limited financial resources.

The return on investment, although potentially significant, is not immediate. This delay can deter producers when it comes to new technology investments, particularly in regions where credit facilities and agricultural subsidies are lacking or insufficient to offset the initial expenditure.

Technical expertise: Operating AI-based disease detection systems, interpreting data outputs, and maintaining the technology require specialised knowledge. Training existing personnel or hiring new employees with technical skills adds to the overall cost and complexity. In regions where educational infrastructure lacks emphasis on technical proficiency

in digital technologies, this becomes a challenge.

Data privacy: Deep learning systems function optimally when fed with data, which often includes sensitive farm operations information. The apprehension over how this data might be stored, used, or potentially shared is not trivial, given the increasing global emphasis on data rights and privacy.

Agricultural data has immense value for individual producers, seed companies, agrochemical businesses and financial institutions. Producers may be reluctant to embrace systems that could expose their operational data to external parties, particularly without clear regulations and assurances on data use and ownership.

Resistance to new technology: Farming communities have long-standing practices and knowledge systems. Introducing AI-driven approaches often means disrupting established routines and traditional systems. Resistance to change, born of scepticism over new tools' efficacy, can be pragmatic. Producers might also fear that reliance on technology could lead to a devaluation of their expertise. Building trust, ensuring ease of use, and complementing traditional agricultural wisdom are key.

Drones and IoT devices

The future of potato farming is one where drones soar above fields, outfitted with high-resolution cameras and sensors that capture a wealth of data. Deep learning algorithms, operating from this rich lode of aerial imagery, have the potential to discern subtle patterns indicative of disease outbreaks long before they become visible to the human eye. The use of drones extends the spatial reach and precision of monitoring, allowing for rapid, wide-scale detection that would be impractical and costly with ground-based surveillance alone.

Deep learning's synergy with Internet of Things (IoT) devices amplifies this paradigm shift. In the fields, networks of IoT sensors could constantly monitor a range of variables such as soil moisture, nutrient levels, temperature, and more.

Data management and analytics

With blockchain technology, producers may soon be able to securely and transparently share crop data. Coupled with smart contracts, this could lead to novel forms of co-operative disease management and resource sharing.

Predictive analytics could transform data into forecasts that predict disease outbreaks and suggest optimal planting schedules, harvest times, and market trends.

Collaboration and education

Public-private partnerships can play a pivotal role in funding research and development, while educational programmes prepare the next generation of agricultural experts. This synergistic effort can accelerate the translation of research findings into practical technologies.

Basics of deep learning

Deep learning technologies offer promise for disease detection in the potato industry, but integrating them into everyday practices requires practical steps.

Producers and consultants must first gain a basic understanding of deep learning and how it applies to agriculture. Online courses, workshops, and seminars are available, some tailored specifically to agricultural applications. Organisations such as the American Society of Agricultural and Biological Engineers host educational events for those interested in agricultural AI.

Consultants should work with producers to perform a thorough assessment of their needs. Questions to consider include: What are the most prevalent diseases affecting crop yield? What types of data are already being collected? Understanding the specific disease threats and the farm's data capacity is crucial in determining the most suitable deep-learning solution.

The next step is to select appropriate deep-learning tools and services. Producers should look for platforms that have been successfully tested in agricultural environments, ideally with a focus on potato diseases. They should also consider the comprehensiveness of the service. Some platforms offer end-to-end solutions, while others may require the integration of drones, IoT devices, and cloud computing services.

Integration, support and updates

Successful integration requires a well-defined protocol. This includes establishing when and how often data will be collected, who will be responsible for monitoring outputs, and what actions should be taken based on the insights gained. Staff training is important to ensure that everyone is comfortable using the new technology.

Keeping the system up-to-date with the latest developments is necessary. Producers should ensure they have access to ongoing support from their technology providers and remain abreast of advancements. Regular updates may be required.

Producers and consultants should consider building a network of collaboration that includes researchers, technology developers, and other producers who are also using deep learning technologies.

Monitoring the impact

Regular assessment helps in determining if the technology is meeting its goals, what improvements can be made, and how it is affecting the overall sustainability and profitability of the farming enterprise.

Producers and consultants can pave the way for enhanced crop health, yield, and sustainability. The journey to integrating these innovative solutions may require time and patience, but the benefits they offer could very well redefine the future of potato farming.

For more information, email the author at lukie@potatonewstoday.com or visit *www.potatonewstoday.com* for more news on potato developments abroad.

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Gefokus op vooruitgang

John Deere is daartoe verbind om aartappelprodusente wêreldwyd te ondersteun. Met die unieke uitdagings wat Suid-Afrikaanse produsente ondervind, fokus John Deere daarop om vooruitgang en volhoubaarheid te bewerkstellig – nie net vir individuele produsente nie, maar vir die bedryf as geheel.

Die ontwikkeling van produkte en tegnologie wat besluitneming en doeltreffendheid bevorder, kan produsente bemagtig om meer winsgewend te boer. Die beskikbare data kan ingeligte besluitneming dryf en ook insetkoste beperk. Met die ondersteuning wat John Deere se handelaarsnetwerk regoor Suid-Afrika bied, kan produsente met soveel meer gemoedsrus boer, omdat daar agter die skerms gewerk word om te verseker dat elke John Deere-kliënt se boerderybedrywighede optimaal kan plaasvind.

Alhoewel die aanvanklike beleggingskoste vir gevorderde tegnologiese toerusting hoog mag wees, maak die besparings wat produsente kan geniet deur die gebruik van die korrekte produkte, presisietegnologie, die aanwending van beskikbare data, asook die ondersteuning van die handelaarsnetwerk, vinnig daarvoor op. Verder bied John Deere Financial pasmaak-finansieringsoplossings vir elke boerdery se unieke behoeftes. Dit maak die aanskaffing van die ideale toerusting en tegnologie nóg meer toeganklik.

John Deere bied vir die aartappelprodusent 'n verskeidenheid van ideale produkte vir alle verbouingsomstandighede – van droëlande tot besproeiing.

John Deere se trekkerreeks

Die 8-reeks: Die 8RX of 8RT is geskik vir grondvoorbereiding in grootskaalse boerderye en uitstaande kenmerke sluit maklike hantering, korter draaisirkels, minder grondkompaktering en makliker vervoer tussen plase in.

Die 6-reeks: Oor die algemeen bied die 6-reeks verskillende bandeopsies, 'n kruiprat, 'n sterk en lang raam, 'n sterk driepunt, optimale hidrouliese vloei en beheer, verskeie transmissie-opsies (wat konstante revolusies en 'n konstante kragaftakkerspoed handhaaf, ongeag die terrein) asook gepaardgaande tegnologie wat nodig is vir die suksesvolle verbouing van aartappels.

Vir kleiner bedrywe is die nuwe 6B-reeks met beter hidrouliese vloei, die geskikte pasmaat vir grondvoorbereiding. Die beproefde groter 6M-reeks trekkers met hul Duitse gehalte bied verskeie kenmerke waarby die aartappelprodusent sal baat vind. Vir plant, spuit, uithaal of oes is die 6M-reeks uiters geskik vir Suid-Afrikaanse omstandighede.

Spuite

Vir spuitwerk is daar die opsie van sleep- of self-aangedrewe spuite. Die sleepspuite bied die ideale 'groen-op-groen'-oplossing (dit wil sê trekker en spuit) en die spuite is beskikbaar met verskillende balklengtes. Die tegnologie op die spuite word deur die trekker beheer deur middel van ISOBUS.

Die verstelbare agter-as maak die gebruik daarvan in verskillende ry-spasiërings moontlik en met die stuurstang-opsie tesame met die *Implement Guidance*-pakket, kan verseker word dat die spuit (of ander implemente) die trekker se wielsporing volg. Die gevolg is dat oorvleueling in die lande verhoed word en dat 'n korter draaisirkel gemaak kan word. Ander tegnologie wat spesifiek beskikbaar is op die spuite en wat insetkoste verminder en doeltreffenheid verbeter, sluit *variable rate*-toediening, *section control* en *individual nozzle control* in.

Wat self-aangedrewe spuite betref, bied ExactApply-tegnologie 'n groot besparing op insette aangesien beter akkuraatheid en doeltreffendheid moontlik is.

Tegnologie

Real-time Kimenatic of RTK-sein bied 'n akkuraatheid van 2.5 cm en is uiters belangrik tydens operding, plant en beroking. Dit verseker akkuraatheid tydens veelvuldige bewerkings en hou verskeie voordele in tydens die verbouing van aartappels.

Operation centre

Dit is 'n sentrale punt waar alle data deur JDLink-tegnologie bymekaarkom vir verskillende bewerkings – van grondvoorbereiding, plant en spuit tot oes. Vir produsente wat hul produkte uitvoer kan spuitprogramme byvoorbeeld vanaf die *operations centre* uitgedruk en vir ouditdoeleindes ingedien word.

John Deere het die grootste en mees omvattende handelaarsnetwerk in Afrika en spits hulself toe op wêreldklas naverkopediens en ondersteuning. Met hoogs bekwame tegnici en stelsels in plek wat onderdelebeskikbaarheid van 96% verseker, word staantyd tot die minimum beperk.

Die ongeëwenaarde handelaarsondersteuning dra by tot die waarde wat verkry word wanneer enige John Deere-produk aangeskaf word. Dít, tesame met die betroubaarheid, duursaamheid, gevorderde tegnologie en toewyding van John Deere om produkte te ontwikkel wat produsente se take aansienlik vergemaklik en winsgewendheid bevorder, maak John Deere een van die grootse beleggings en mees waardevolle bates in jou aartappelonderneming.

Vir meer inligting, besoek *www.deere.africa/en/index.html.*


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A notable internship experience

By Relebogile Tlomatsana, Potatoes SA intern

My name is Relebogile Tlomatsana and I come from Westonaria, a small town in the West Rand. I hold a National Diploma in Agriculture (Mixed Agriculture) from the Potchefstroom College of Agriculture. I feel honoured to be interning with Potatoes SA for a 12-month period in their transformation division. This division aims to enhance all industry participants' skills, knowledge, and capabilities, including producers, processors and other stakeholders.

By providing training, resources, and support, the division aims to empower individuals and communities to thrive and contribute to the growth and development of the potato industry. I have had the privilege of participating in many of the tasks undertaken by the transformation division.

Taking transformation seriously

Earlier this year, the transformation division hosted the Potatoes SA Transformation Symposium. This symposium had a significant impact, sparking innovation and growth among new-era producers and connecting them with industry leaders. It was a wonderful opportunity to network with other producers and agricultural professionals, gaining exposure to various agricultural sectors and drawing inspiration from the remarkable contributions our producers make to the country.

The transformation division has a significant impact on many of our potato producers nationwide. Most of these producers participate in the Potatoes SA transformation programmes, with committees formed according to regions. We recently had the opportunity to organise regional meetings where one of the main agenda points was to nominate the chairperson for each region for the year. This involved preparing agendas, minutes, and ballot papers that allowed producers to elect their designated representatives. It was incredibly fascinating to witness the unity among black potato producers within their respective regions.

Practical experience

I also had the opportunity to be part of the Mzansi Young Farmers Indaba, an event hosted by *Food for Mzansi*. Our team participated in the exhibitions, showcasing our work at Potatoes SA.

Recently, I also took part in Nampo Harvest Day alongside my colleagues, gaining exposure to various agricultural sectors. Nampo's purpose is to connect producers with the entire value chain, including inputs, machinery, food processing, precision agriculture, marketing, and financing solutions. It provided an excellent opportunity to observe the machinery, implements, and inputs that producers use daily. One of the most impressive aspects was witnessing advanced technology and tools that make farming easier and more efficient.

Potatoes SA collaborates with various stakeholders, including Prokon. Prokon offers workplace experience and imparts skills to undergraduate students, supporting the Potatoes SA tertiary pipeline bursary programme. We had the opportunity to visit a fresh produce market, where we met one of the bursary beneficiaries currently completing their experiential learning in Matlosana (previously known as Klerksdorp).

It was a fascinating experience and we gained valuable insight into the daily activities of an intern at the fresh produce market. We observed how vegetables, especially potatoes, are inspected before being distributed to external markets. This highlighted the pivotal role fresh produce markets play in distributing and marketing fresh food within South Africa. This experience underscored the importance of these markets in ensuring the quality and availability of fresh produce across the country.

Relebogile Tlomatsana at the Potatoes SA exhibition table at the Mzansi Young Farmers Indaba.

Potatoes SA's transformation programmes are making a genuine difference and it is a true honour and privilege to be learning the ropes here. I hope to learn much more, hone my abilities and expertise, collaborate with a diverse team, and work in an atmosphere that supports my development beyond the scope of my job description.

For more information on Potatoes SA's internship and other transformation programmes, visit *www.potatoes.co.za*.

Potatoes SA cultivates bright futures

By Rotondwa Raligidima, Potatoes SA

Since 2007, Potatoes SA has been dedicated to fostering the next generation of agricultural leaders through its internship and workplace experience programme. This initiative plays a vital role in bridging the gap between academic learning and practical work within the agricultural industry.

Potatoes SA has always recognised the importance of providing students with hands-on experience to complement their formal education from the start. As a result, the internship and workplace experience programmes were created to allow students to gain valuable insights and skills essential for success in the agricultural sector.

Through the internship programme, Potatoes SA assists students who require practical experience to complete their qualifications, by finding farms to place them and providing them with a stipend to take care of their daily needs. Students are placed for a total of 24 months: The first 12 months are spent completing their qualification, followed by another 12 months dedicated to acquiring workplace experience.

Collaboration creates opportunity

One of the main strengths of Potatoes SA's programme is its collaborative approach. Over the years, the organisation has partnered with various industry stakeholders to improve the programme's effectiveness. These collaborations have allowed students to access a wide range of experiences and opportunities tailored to their interests and career aspirations.

One of the current prominent collaborators is Potato Seed Production (PSP), a well-known producer of high-quality potato seeds. Since the programme began, PSP has been crucial in providing internship opportunities, enabling students to engage in seed production processes, and contributing to improvements in potato farming methods. Joel Dalamba, a student from the Potchefstroom College of Agriculture, is in his final year and requires practical experience to graduate. He has been placed with PSP.

Another integral partner is Prokon, a non-profit organisation specialising in quality assurance within the South African fresh produce industry. Through Potatoes SA's collaboration with Prokon, students have gained invaluable workplace experience, with many securing permanent positions upon completion of their internships due to their commitment and dedication to the work. Currently, a student is placed with Prokon. This successful partnership highlights the programme's effectiveness in equipping students with the skills and experience needed for their professional careers.

Monitoring progress

Potatoes SA recently visited Prokon at the Klerksdorp Fresh Produce Market. This visit was part of Potatoes SA's ongoing efforts to monitor the progress of their interns. The focus was on evaluating the challenges, experiences, and learning of the intern, Lesego Motsemme. During this visit, we evaluated Motsemme's progress in providing quality assurance services. It was evident that Motsemme is dedicated and hardworking, showing significant growth and skill development in the role.

We would like to commend Jabulani Molefe, Motsemme's supervisor, whose guidance and mentorship have been instrumental in his professional growth journey. From inspecting the finest produce to implementing robust quality control measures, Motsemme is thriving under the Prokon team's guidance. We are proud of his dedication and the strides he is making.

Francois Strauss from Potatoes SA engaging with students at the Elsenburg Agricultural Training Institute's open day.

Exhibitions and achievements

To further share our tertiary pipeline programmes, which include bursaries, internships, and workplace experience opportunities, Potatoes SA actively participates in exhibitions at various educational institutions. These exhibitions are designed to inform students about the range of

Dr Ivan Meyer, the Western Cape minister of agriculture, with Rotondwa Raligidima and Francois Strauss from Potatoes SA at the Elsenburg Agricultural Training Institute's open day.

Lesego Motsemme, Potatoes SA intern, with his supervisor Jabulani Molefe, quality control inspector at Prokon SA, at the Klerksdorp Fresh Produce Market.

programmes available to support their academic and professional growth.

On 13 April 2024, the Western Cape government invited Potatoes SA to showcase its programmes at the Elsenburg Agricultural Training Institute's open day. This event provided an excellent platform to engage with students, answer their questions, and inspire them to pursue careers in agriculture.

The success of Potatoes SA's internship and workplace experience programme is further exemplified by its alumni's achievements and contributions to the agricultural sector. Many former interns have gone on to become leaders and innovators, driving positive change and advancements in various fields related to potato farming and beyond.

Focus on the future

As Potatoes SA looks towards the future, the organisation remains dedicated to refining and expanding its internship and workplace experience programme to meet the evolving needs of students and the agricultural industry. Through ongoing collaboration and mentorship, Potatoes SA continues to cultivate futures and inspire the next generation of agricultural professionals.

Potatoes SA continuously seeks and appreciates collaboration from other industries, organisations, and producers willing to assist students and improve their lives. This support can be in the form of placements or funding. Anyone interested in collaborating with Potatoes SA is encouraged to reach out and contribute to this transformative initiative.

Potatoes SA's internship and workplace experience programme is a testament to the organisation's enduring commitment to nurturing talent and fostering excellence in the agricultural sector. By actively engaging with educational institutions and industry partners, Potatoes SA is sowing the seeds of success for future generations.

For more information on Potatoes SA's internship and workplace experience programme, email rotondwa@potatoes.co.za or visit *www.potatoes.co.za*.

Celebrating women in agriculture

By Brian Makhele, transformation specialist, Potatoes SA

South Africa's agricultural sector, long overshadowed by historical injustices and systemic exclusion, is witnessing a transformative wave driven by the increased involvement of women. As potato production emerges as a pivotal segment of this industry, the contributions of women are not only reshaping the agricultural landscape but also challenging the vestiges of the past and patriarchal policies that once marginalised them.

During the apartheid era, South African agriculture was characterised by profound inequalities and racial segregation. Land ownership and agricultural opportunities were predominantly reserved for white males, effectively sidelining women and black South Africans from meaningful participation. Policies such as the *Natives Land Act, 1913 (Act 27 of 1913)* and the *Native Trust and Land Act, 1936 (Act 18 of 1936)* restricted black ownership of land to designated reserves, comprising just 13% of South Africa's land area. This not only limited agricultural production capacity but also entrenched socio-economic disparities.

Challenge before change

Women, particularly black women, bore the brunt of these policies. Patriarchal norms confined them to subsistence farming and labour-intensive tasks on white-owned farms, with little to no access to resources, training, or land ownership. The socio-economic fabric of rural communities was thus woven with threads of inequality, limiting the potential for agricultural innovation and growth.

The end of apartheid in 1994 marked the beginning of slow but deliberate transformation within South African agriculture. The new democratic government introduced land reform programmes aimed at redistributing land and resources to historically disadvantaged communities. Policies such as the Reconstruction and Development Programme and later the Land Redistribution for Agricultural Development, sought to redress past injustices and create opportunities for black producers, including women.

These reforms laid the groundwork for greater inclusivity. However, challenges persisted. Access to finance, training, and markets remained significant barriers for women aspiring to enter commercial agriculture. Nonetheless, the seeds of change had been sown, and women's involvement in agriculture began to gain momentum.

A new landscape

Today, the landscape of South African agriculture, and potato production in particular, reflects significant progress. Women are increasingly taking on leadership roles, from smallholder producers to agribusiness entrepreneurs. Their involvement is bolstered by initiatives from both government and non-government organisations aimed at empowering female producers and agripreneurs.

The Department of Agriculture, Land Reform and Rural Development (DALRRD) has been instrumental in promoting gender equality through programmes that provide training, resources, and support specifically tailored for women. Strategic partnerships with commodity organisations such as Potatoes SA have further strengthened these efforts, creating networks and platforms for women to share knowledge and access markets.

A game changer

Over the years DALRRD has increased the involvement of women in agriculture, specifically in potato production through its transformation mandate and support programmes. One example is Cecilia Mamabolo from Bela Bela. She started producing cabbage, butternut and peppadew in 1990 after she retired from her work

Cecilia Mamabolo attending the 2023 Potatoes SA Transformation Symposium at Birchwood Hotel.

Mamabolo adopted new agricultural practices on her farm using drone technology.

as a teacher. The support of DALRRD with land and grant funds under their Land Development Support programme has seen her become one of a number of women involved in potato cultivation.

Moreover, some of Mamabolo's achievements include being named Female Entrepreneur of the Year in the commercial sector as well as being named Female Entrepreneur of the Year by the Limpopo Department of Agriculture and Land Reform.

Potatoes SA supports the farm as part of their enterprise development. Since Potatoes SA got involved, this producer has been very confident that she will become a commercial potato producer. Mamabolo will be planting potatoes for the open market for the very first time on 10 ha in July 2024 with the support of a mentor appointed by Potatoes SA. Another 10 ha will be planted in January 2025. According to Mamabolo, women should not view farming as a man's job only but, with women being the nurturers of life, as a job aimed at feeding the nation.

Another success story

One other notable example of women excelling in agriculture is the rise of female-led co-operatives. These co-operatives pool resources, knowledge and labour, enabling women to scale up production, improve quality, and negotiate better prices. The success stories of young women like Cynthia Mokgobu, who transformed her small-scale plot into a thriving agricultural enterprise, serve as powerful testimony to the potential of women in agriculture.

Mokgobu started farming in 2016 after quitting her internship and deciding to create a job for herself. She started planting cash crops such as cabbage on a small backyard plot and was allocated 2.5 ha by the Tribal Authority through a permission-to-occupy arrangement. Upon learning of the Potatoes SA support programme, she took an interest in potato production. Through the Limpopo Department of Agriculture and Land Reform and Potatoes SA, she managed to plant 0.25 ha of potatoes. This is where her potato journey began.

Currently, she produces on 19 ha of land, and aspires to plant more hectares and become part of Potatoes SA's Enterprise Development Programme. Mokgobu is appreciative of the support she continues to receive from both the Limpopo Department of Agriculture and Rural Development and Potatoes SA. She would like to see more young women getting involved in agriculture, especially potato production, since potatoes are a significant staple in food security.

Challenges and opportunities

Despite the progress, challenges remain. Access to land continues to be a significant hurdle, compounded by traditional inheritance practices and ongoing socio-economic inequalities. Additionally, climate change poses a new set of threats, demanding adaptive strategies and resilient farming practices.

However, the future holds promise. Technological advancements and increased access to information are empowering female producers with new tools and knowledge. Mobile technology, for instance, provides real-time market data and weather forecasts, enhancing decision-making and productivity. Furthermore, the growing recognition of women's contributions to food security and economic development is driving policy reforms and investment in gender-sensitive agricultural programmes.

The involvement of women in South Africa's potato production is not just a story of agricultural development but a testament to resilience and empowerment. Overcoming historical injustices and systemic barriers, women are now at the forefront of transforming the agricultural landscape.

Their contributions are vital not only for the growth of the sector but also for the broader socio-economic progress of South Africa. As the country continues to address its past and build a more inclusive future, the role of women in agriculture will undoubtedly remain central to this ongoing transformation.

Cynthia Mokgobu during potato harvesting on her farm.

Mokgobu is a hands-on producer who is very involved in the daily operations of the farm.

For more information, contact the author at BrianBrian@potatoes.co.za.

Empowering small-scale producers

By Rachici Marokane, national transformation co-ordinator, Potatoes SA

Potatoes SA has embarked on a transformative journey through initiatives such as the Smallgrower Development Programme (SGDP) and the Enterprise Development Programme (EDP), aimed at uplifting small-scale producers. Collaboration between government departments and Potatoes SA is pivotal in transforming producers' lives and enhancing agricultural productivity.

Collaboration is instrumental in enhancing agricultural knowledge and practices among producers. Government agricultural departments offer extensive expertise and resources, including research facilities, extension services and training programmes. When combined with the specialised knowledge offered by Potatoes SA, these resources provide producers with comprehensive and practical information to improve their farming techniques.

Key resources

Smallgrower Development Programme: Potatoes SA focusses on educating individuals in potato production through the SGDP. Over the years, Potatoes SA has aligned this programme with food security initiatives, resulting in the expansion of hectares under cultivation and individuals gaining an appetite for producing potatoes as private entities. Workshops on soil management, pest control, irrigation methods, and crop rotation practices cover essential topics.

Solomon Makobela, Potatoes SA Enterprise Development producer, Koena Mokgohlwa, DALRRD senior project officer, and Arnold Malema, LDARD extension officer, share some ideas.

These initiatives optimise yields, reduce losses, and promote sustainable farming practices. By equipping producers with modern agricultural practices, the SGDP enhances productivity and profitability.

Access to quality inputs and resources: Government departments and Potatoes SA can significantly improve access to quality inputs and resources essential for successful potato farming. Producers can receive improved seed varieties, fertilisers, pesticides, and other necessary inputs at subsidised rates or through organised distribution channels through joint initiatives. This ensures producers have access to high-quality resources that can enhance their crop yields and overall farm productivity.

Enterprise Development Programme: The EDP is Potatoes SA's flagship development programme, fostering partnerships with government departments. Memorandums of understanding and service-level agreements have been obtained with key stakeholders such as the Department of Agriculture, Land Reform and Rural Development (DALRRD), the Limpopo Department of Agriculture (LDA), Joe Gqabi Economic Development Agency (JoGEDA), and the Western Cape Department of Agriculture (WCDA).

The EDP has been successfully implemented in several provinces, including KwaZulu-Natal, the Free State, North West, Western Cape, Eastern Cape and Limpopo. This programme focusses on developing emerging producers into fully-fledged commercial producers. The EDP provides comprehensive support, including mentorship, access to finance, business training and market linkages. The programme aims to empower producers to scale up their operations and become sustainable agribusinesses.

Success in Limpopo

A significant factor contributing to the high concentration of producers within the EDP in Limpopo's Capricorn district, is the strategic efforts and comprehensive support geared towards developing an inclusive potato sector in the region. The DALRRD, along with the LDA, has not only provided production input support but also the necessary infrastructure for potato production.

Infrastructure and support

The support includes the provision of essential implements, irrigation systems (such as centre pivots), and backing for organised secondary co-operatives. This infrastructure is vital for optimising production and ensuring sustainability. By encouraging producers to organise themselves into secondary co-operatives, they can leverage collective resources and enjoy enhanced government support, including financial aid and technical assistance.

Over the past season, four new projects have been initiated in the Capricorn district of Limpopo, known as the 'potato belt'. The names of the producers in Limpopo who have benefited from this support are Walter Nabane, William Maseka, Andries Masoga, and Vincent Rapeta. They have received comprehensive support in the form of fertiliser, chemicals, seed, and mentorship through the collaboration of Potatoes SA with the co-operatives and Enterprise Development Directorate (CED) under director Lethabo Rakgoale of DALRRD.

Aldrin Lawrance, another producer in Limpopo, was funded by way of

a sorting and washing machine, packshed, and a forklift provided under DALRRD's AgriBEE fund and implemented in collaboration with Potatoes SA. Plans are underway to fund more producers across the country.

Eastern and Western Cape success

The EDP has shown significant progress in the Eastern and Western Cape, contributing to the growth and development of small-scale producers in these regions.

Eastern Cape

Three new producers have joined the EDP over the past season: Mzimasi Jalisa, Gedlumhlanga Co-operative, and Vumile Mzinzi. They farm on a combined area of over 50 ha, all under dryland conditions. These producers have received support under the AgriBEE fund in the form of sorting and washing machines as well as a shed.

Despite the challenges associated with dryland farming, these producers have shown resilience and adaptability, benefitting from the tailored support provided through the EDP. The collaboration between Potatoes SA and local government departments has been crucial in ensuring that these producers receive the necessary training and resources to succeed in a more challenging environment.

Western Cape

Two new projects have been initiated under the EDP. These projects focus on enhancing emerging producers' capabilities, providing them with the resources and knowledge needed to scale up their operations. The WCDA has played a significant role in this success, offering support in terms of infrastructure development, financial assistance, and market access.
The integration of new producers into the EDP in the Western Cape has bolstered regional agricultural productivity and set a precedent for future growth.

Success in KwaZulu-Natal

KwaZulu-Natal has also added one more producer, Sikh Matomane, to the EDP, reflecting the programme's ongoing expansion and success in various regions. The continuous addition of new producers into the programme highlights the EDP's effectiveness as well as the dedication of Potatoes SA and government departments in empowering small-scale producers and enhancing their productivity.

Lethabo Rakgoale, director of the Co-operatives and Enterprise Development Directorate (CED) that is part of the DALRRD.

For more information, email author at rachichi@potatoes.co.za.

Groen aartappels: Skadelik of nie?

Deur Andries Gouws, Plaas Media

Aartappels is smaaklik en voedsaam, en maak wêreldwyd deel uit van spyskaarte. As dit egter in die groenterak begin groen raak of uitloop, kan dit skadelik wees vir mense indien dit in groot hoeveelhede geëet word. In Suid-Afrika is daar streng beheermaatreëls om te voorkom dat hierdie aartappels op winkelrakke beland.

Aartappels kan in die verbruiker se groenterak ook groen word en selfs begin uitloop, en moet versigtig hanteer of eerder weggegooi word. Vergiftiging deur aartappels kom selde voor en groot hoeveelhede van die vergroende aartappels moet ingeneem word voordat nagevolge voorkom.

Dirk Uys, navorsingsbestuurder by Aartappels SA, sê aartappels is meer as net die gewildste groente onder Suid-Afrikaanse verbruikers – dit is 'n stapelvoedsel. Meer as 35 kg aartappels word jaarliks per persoon verbruik en meer as 2.5 miljoen ton aartappels word jaarliks in Suid-Afrika geproduseer. Wêreldwyd is aartappelverbruik om en by 31 kg/jaar/persoon.

Die waarde van aartappels

Aartappels het gewildheid verwerf in die 16de eeu toe dit 'n stapelvoedsel op skepe tydens lang ontdekkingsreise was. Vandag word jaarliks sowat 300 miljoen ton aartappels deur meer as 'n miljard mense regoor die wêreld geëet.

Navorsing toon dat aartappels se voedingswaarde hoër is as dié van baie ander Suid-Afrikaanse stapelvoedsels soos mieliemeel, rys, brood en pasta. Sommige aartappelkultivars se voedingswaarde vergelyk ook goed met gewilde en voedsame voedselsoorte soos tamaties en bone. Aartappels is veral ryk aan proteïene, koolhidrate en talle makro en mikro-voedingstowwe, én bevat boonop baie min vet.

Die vergroeningsproses

As aartappels egter nie reg geberg word nie, is die knolle geneig om groen te word, veral as dit aan son of lig blootgestel word. Soos wat die somer nader kom, begin die knolle ook dikwels uitloop. Vergroende aartappels moet liefs nie gebruik word nie, aangesien dit 'n toksien genaamd solanien kan bevat wat skadelik vir 'n mens se gesondheid kan wees.

Ligblootstelling sit 'n metaboliese proses aan die gang wat die knol in staat stel om te fotosinteer. Chlorofil word dan gevorm wat die groen kleur veroorsaak. Chlorofil is 'n natuurlike plantpigment wat smaakloos en skadeloos is. Die blootstelling aan lig kan al op die landery, in die pakhuis, op die winkelrak of in die groenterak plaasvind.

Solanien is 'n toksien wat normaalweg in baie klein hoeveelhede in die skil en vleis van die aartappel voorkom. Dieselfde gunstige toestande wat die produksie van chlorofil verhoog, wakker ook die produksie van meer solanien aan. Dit is waarskynlik die natuur se manier om die knol met ontkieming teen vyande te beskerm.

Vergroende aartappels dui gewoonlik, maar nie altyd nie, daarop dat meer solanien ook in die knol teenwoordig is. Die konsentrasie van die toksien hou gewoonlik verband met die hoeveelheid en intensiteit lig waaraan die aartappel blootgestel was.

Ligblootstelling sit 'n metaboliese proses aan die gang wat die knol in staat stel om te fotosinteer. Dit vorm chlorofil wat die groen kleur veroorsaak.

Solanienvlakke maak saak

Aartappels wat groen is of groen kolle het en solanien bevat, is dikwels bitter en kan die spysverteringskanaal irriteer. As genoeg solanien ingeneem word, kan dit naarheid en diarree veroorsaak, maar omdat groen aartappels bitter smaak is dit onwaarskynlik dat iemand genoeg daarvan sal eet om werklik siek te word.

In Suid-Afrika bepaal wetgewing dat aartappels nie meer as 20 mg solanien per 100 g mag bevat nie. Hoeveel vergroende aartappels met solanien 'n mens moet eet om siek te word,

Solanien is hoofsaaklik in en net onder die skil gekonsentreer. As die aartappels dus behoorlik geskil is, word die meeste solanien verwyder.

is moeilik bepaalbaar omdat die groen kleur nie 'n aanduiding is van hoeveel solanien die aartappel bevat nie.

Verskillende variëteite se solanien-inhoud kan verskil ten opsigte van dieselfde hoeveelheid vergroening. 'n Mens se natuurlike verdraagsaamheid vir solanien en die grootte van die betrokke persoon se liggaam, speel ook 'n rol in die voorkoms (of nie) van nagevolge.

Hantering van groen aartappels

Hoewel dit raadsaam is om vergroende aartappels eerder weg te gooi, is dit ook nie altyd noodsaaklik nie. Solanien is hoofsaaklik in en net onder die skil gekonsentreer. As die aartappels dus behoorlik geskil is, word die meeste solanien verwyder. As die aartappel goed gekook of gestoom word, verlaag dit die konsentrasie van die toksien met nog 30 tot 40%. Die toksien word deur hoë temperatuur (170°C) vernietig.

Uys sê in Suid-Afrika verwyder produsente al die vergroende aartappels tydens die sorteringsproses en baie min daarvan beland in sakkies. Aartappels word verder by markte geïnspekteer om te verseker dat groen aartappels nie op die winkelrakke beland nie. As aartappels op die winkelrak vergroen het, moet verbruikers dit eerder nie koop nie.

By die huis behoort die aartappels in 'n koel, droë en donker plek geberg te word – verkieslik in 'n ondeursigtige houer om lig uit te hou. Die temperatuur in huise in Suid-Afrika is gewoonlik te hoog om aartappels lank te berg. Verbruikers word aangeraai om net genoeg te koop om dit op te gebruik voordat vergroening en solanienvorming plaasvind.

Navrae kan gerig word aan Dirk Uys by 086 185 9549 of epos dirk@potatoes.co.za.

Nothing informal about the informal market: A visit to Thembisa

By Sheila Makgato and Dirk Uys, Potatoes SA

The Potatoes SA team (including its board of directors), in partnership with Amakonekxin, embarked on a trip to the second-largest township in South Africa, Thembisa. The trip provided valuable insights into the formal organisation of the 'informal' market. The distribution channels, pricing and marketing strategies that the sellers use, are all well thought-through and customer-focussed.

The groups visited schools, street vendors, *kasi kos* outlets, *kota* outlets and homes to get a broader view of trading in Thembisa and to observe how potatoes are prepared in households. This will inform future strategies to better cater to the needs of consumers and to increase potato consumption in South Africa to an extra potato per person per week.

The distribution channels in the informal sector are organised, with hawkers that understand their markets and customers. They stock up at the Johannesburg Fresh Produce Market daily in small buying groups using bakkies to share the transport fare. Their stock planning is efficient, and they avoid waste by selling all of their potatoes in a day.

Bulk traders sell 10 kg bags of potatoes and showcase the quality of the potatoes by laying them out for the consumer to see.

School visits

The teams visited different schools in the Thembisa area, one of which was the Dulcie September Primary School which has 2 500 pupils. Principal Kgomotso Kekana said the school's surrounding area is poverty-stricken, and some children only get their meals at school via the government feeding scheme.

It was, however, noted that potatoes are not included in the feeding scheme's menu, which is curated by the Department of Education. Teachers recognise that potatoes keep children fuller for longer without affecting their concentration. Items on the scheme menu include pap and milk, samp, rice, apples, canned fish and liver (as a protein source), as well as beans, cabbage, carrots, and tomatoes.

Two of the schools visited had small vegetable gardens. This initiative encourages pupils to learn the importance of cultivating their own food and contributes to food security.

Hawker stands visits

During the visit to hawker stands in Thembisa, the team observed typical and interesting sales patterns. Bulk traders typically sell potatoes in 7 or 10 kg bags. Another sales stream sells on tabletops by splitting larger bags and decanting potatoes into smaller packages to sell at a lower price. Some vegetable sellers create a veggie combo pack that includes potatoes, an onion and a green pepper. These convenient packages cater to consumers who use them as the basis of *seshebo*.

Brand awareness is key and cultivars such as Mondial and Sifra are better known among consumers. Hawkers divide a 10 kg bag into two smaller bags. A 10 kg bag usually contains 50 potatoes. This means that they will sell 25 potatoes from the 10 kg bag at R45 per bag. A 10 kg bag sells for R96 or more while a 7 kg bag goes for R50.

Willie Jacobs, CEO of Potatoes SA, engaging with some of the bulk traders in Thembisa.

One of the hawkers reported stocking roughly 20 bags (10 kg each) daily from the Johannesburg Fresh Produce Market and selling almost all his bags in a day. The main consumers of the 10 kg bags are the *kota* outlets, while smaller bags are popular for home use.

Kota outlet

The *kota* market dominates the township eatery economy. The total value of the *kasi kos* economy is estimated at R90 billion of which the *kota* market share is substantial. A *kota* is a true township food experience. *Kotas* have *slap* chips as their base and it would not be a true *kota* without them. These outlets usually buy from the bulk vendors on the streets and are known for buying Class 3 potatoes,

A Potatoes SA focus group visited a household in Thembisa where different potato applications and preparation methods were showcased.

which are in a ready-to-eat format for consumers.

Over time, the *kota* has evolved. In the past, it would include *slap* chips, polony, a slice of cheese and achaar. Nowadays the *kota* can include beef patties, lettuce, russians, eggs and many other high-end ingredients. As a result, *kota* prices range from R25 to R250.

Kasi kos outlets

Kasi kos outlets are usually found along roadsides, near office parks or outside malls where people can easily access lunch from their workplaces. These outlets often sell a full meal which includes starch (pap or rice), two vegetables and the meat of the day (chicken, beef stew, *mogodu*, pig trotters and more).

Potatoes serve as a vegetable and as a side to these dishes. Potatoes are used in potato salad, mash or in curry. These outlets also include potatoes in their stews to use as a thickener.

An interesting snack of fried potato skins and battered fishbones is sold by some township retailers' deli sections.

Focus group: Households

The Potatoes SA team had an opportunity to visit a household in Thembisa to observe how potatoes are prepared. This is where we got to see the versatility of the spud. In one home, mashed potato was mixed with creamy samp and served along with protein and vegetables.

Potato salads were prepared in different unique ways, all delicious. Specific mayonnaise and seasoning brands were used by most home cooks.

Opportunities for Potatoes SA

The absence of potatoes from the Department of Education's school feeding scheme menus presents an opportunity. Potatoes offer a higher glycaemic index and more nutrients than most starches. Potatoes enhance the value of meals for pupils as they are both filling and nutritious.

School gardening programmes will also encourage pupils to learn self-sufficiency and food security.

An opportunity for Potatoes SA lies in establishing a visible presence at the hawkers' stands, *kasi kos* and *kota* outlets. Branded price boards, gazebos or umbrellas as well as educational flyers with recipes will create greater awareness of the potato.

Positioning potatoes effectively through recipe flyers and educating consumers in respect of minimising food waste will create value.

Future plans

Potatoes SA wants the spud to compete with *amagwinya* (*vetkoek*) in the morning and we believe that this is possible. Once thorough market research has been done and the market is understood, we believe we will make great strides in the townships.

We do understand that not all townships are the same and there won't be a one-size-fits-all strategy. Hence, a few other township visits in different provinces are in the pipeline for the rest of the year.

Key Thembisa takeaways

- Potatoes are loved, versatile, and mostly enjoyed in homes. There are growth opportunities.
- The *kota* market in South Africa is worth over R10 billion.
- Almost all the hawkers in Thembisa sell potatoes and have very loyal customers.
- Vegetables, which include potatoes, are at the heart of the township economy. Potatoes are part of every meal including meals served at church services, weddings, funerals, or graduations.
- Township households buy potatoes in the township because it is convenient, nearby, and affordable.

For more information, contact Dirk Uys at Dirk@potatoes.co.za or visit *www.potatoes.co.za.*

The Potatoes SA board of directors are, from the left, Nant Yzel, André Coetzee, Izak Cronjé and Gert Bester. With them is Alfred Ntombela, the Potatoes SA ambassador.

Work hours and rest periods on farms

By Hannes Latsky, legal advisor, LWO Employers Organisation

Sectoral Determination 13 (SD13) is mainly responsible for regulating the hours that farm workers may work. This determination was published in the *Government Gazette* in terms of the *Basic Conditions of Employment Act, 1997 (Act 75 of 1997)* or the *BCEA*, as amended.

There are other legislation and regulations that employers must take into account in order to protect the health and safety of employees. These include the *Code of Good Practice on the Arrangement of Working Time* (published in terms of the *BCEA*) and legislation pertaining to occupational health and safety.

Normal working hours

In terms of SD13, employees may work a maximum of 45 normal hours per week. There are other regulations as well, depending on the number of days the employee works per week (these working hours exclude daily meal breaks):

- If the employee works five days or less a week, the maximum permissible normal hours per day are limited to nine.
- If the employee works five or more days a week, the maximum permissible normal hours per day are limited to eight.

Meal breaks

SD13 stipulates that a farm worker is entitled to a one-hour meal break after five hours of continuous work. This break may be shortened to 30 minutes if a written agreement is in place.

Employees are not paid for meal breaks, but must receive compensation if he/she is expected to work through their lunch break if, for example, there are no other employees who can do the work and the work cannot wait. The employee must also receive compensation if he/she is expected to work during a break exceeding 75 minutes, except if he/she resides on the farm.

Overtime

Overtime is when an employee is required to work for a period of time that exceeds the employee's normal daily and weekly contracted hours. Overtime is strictly regulated. An employer may only require or allow a farm worker, as per agreement, to work a maximum of 15 hours overtime per week, and may not allow the farm worker to work more than 12 hours a day (including overtime).

Daily and weekly rest periods

SD13 also contains prescriptions relating to a daily rest period; in this regard, an employee gets at least 12 continuous hours of rest between shifts – if agreed upon, this period may be shortened to ten hours, provided the employee has a three-hour meal break and resides on the farm.

Likewise, the employer is required to give his/her farm workers 36 continuous hours per week off in which to rest, or alternatively a rest period of 60 continuous hours off every second week, if agreed upon. The rest period must include a Sunday, unless both parties agree otherwise.

In addition to the aforesaid practices, legislation does provide for other possible allocations of working hours for farm workers. For instance, it provides for the extension of normal working hours for farm workers, compressed working weeks, as well as an option allowing employers to apply for temporary exemption from the application of certain sections of the legislation.

For more information, phone Hannes Latsky on 071 485 3435, email hannes@lwo.co.za or visit *www.lwo.co.za*.

Die nuwe tweepotstelsel vir pensioenfondse

Deur Eben Rautenbach, PSG Wealth-adviseur

Daar word redelik baie in die media berig oor die nuwe tweepotstelsel vir pensioenfondse wat op 24 Februarie 2024 tydens die begrotingsrede in die parlement bevestig is, en teen 1 September vanjaar in werking moet tree. Ek kry baie navrae vanaf kliënte oor wat hierdie tweepotstelsel behels en hoe dit gaan werk.

Die huidige pensioenfondswetgewing is buitengewoon onbuigsaam en tans is werkende mense weens trae ekonomiese groeikoerse en stygende lewenskoste met skuld belaai. Op die oomblik kan werkende mense wat nog nie aftree-ouderdom bereik het nie, slegs toegang tot hulle aftreegeld kry indien hulle bedank, aftree of afgelê word.

Baie werkers besluit dan te midde van 'n geldkrisis om te bedank, sodat hulle toegang tot hul pensioengeld kan kry, en sit dan sonder werk. Baie mense wil ook nie bydraes tot uittree-annuïteite maak nie, juis omdat daar ten tye van 'n krisis geen toegang tot die fondse is nie. Vanuit 'n advies-oogpunt wil 'n mens nooit aan jou aftreefondse raak nie, maar met 'n werkloosheidsyfer van meer as 32% kan jy nie net met een oog daarna kyk nie.

Figuur 1 beeld kortliks uit wat die nuwe tweepotstelsel behels. Dit sluit alle bydraes tot uittree-annuïteite, pensioenfondse of voorsorgfondse ná 1 September 2024 in. Die huidige fondse tot en met 31 Augustus vanjaar bly in die gevestigde pot en is onderworpe aan die ou reëls. Op 1 September vanjaar sal slegs 10% (tot 'n maksimum van R30 000) hiervan oorgedra word na die spaarpot.

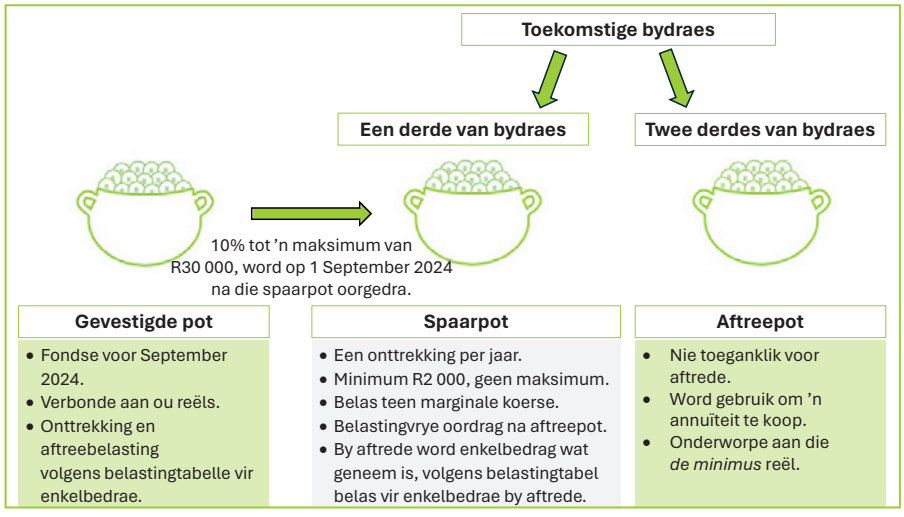
Wie kan deelneem?

Indien jy op 1 Maart 2021 'n lid was van 'n voorsorgfonds en bydraes tot daardie fonds gelewer het, op daardie datum ouer as 55 was en steeds op 1 September 2024 'n lid is, kan jy kies of jy deel wil wees van die tweepotstelsel. Indien die keuse nie uitgeoefen word nie, bly alles soos dit is, met dieselfde reëls.

Indien jy egter kies om deel van die tweepotstelsel te wees, sal jou aftreegeld in drie komponente verdeel word. Die gevestigde pot bestaan uit jou voorsorgfonds se fondswaarde op 31 Augustus 2024 plus groei daarop, minus die verpligte 10% of R30 000 van die fondswaarde wat oorgaan na die spaarpot. Die spaarpot bestaan dan uit die 10% of R30 000 wat op 1 September 2024 oorgedra is, een derde van alle bydraes tot die fonds vanaf 1 September 2024 en die groei daarop, minus enige jaarlikse onttrekkings.

Die aftreepot sal bestaan uit twee derdes van alle bydraes vanaf 1 September 2024 en alle groei daarop. Die belasting op enkelbedrae en annuïteit-inkomste vanaf die gevestigde pot en aftreepot onderskeidelik, bly onveranderd soos voorheen wat aftrede of bedanking betref. Die nuwe spaarpot se onttrekkings voor aftrede word volgens die inkomstebelastingtabelle belas. Onttrekkings uit die spaarpot by aftrede word volgens die aftreebelastingtabelle vir onttrekkings belas.

Figuur 1: Werking van die tweepotstelsel.



Vir meer inligting, kontak Eben Rautenbach (PSG Wealth Bloemfontein Deale Road) by eben.rautenbach@psg.co.za of 072 958 5228.

During April and May 2024, a total of 15 potato producing regions as well as non-producing suppliers delivered potatoes nationally to fresh produce markets.

Average percentage downgraded: **9.42%.**

Total number of bags delivered from 15 regions and non-producing suppliers and inspected at the fresh produce markets: **13 232 479.**

Figure 1: Classes of potato bags inspected during Apr/May 2024 at all fresh produce markets.

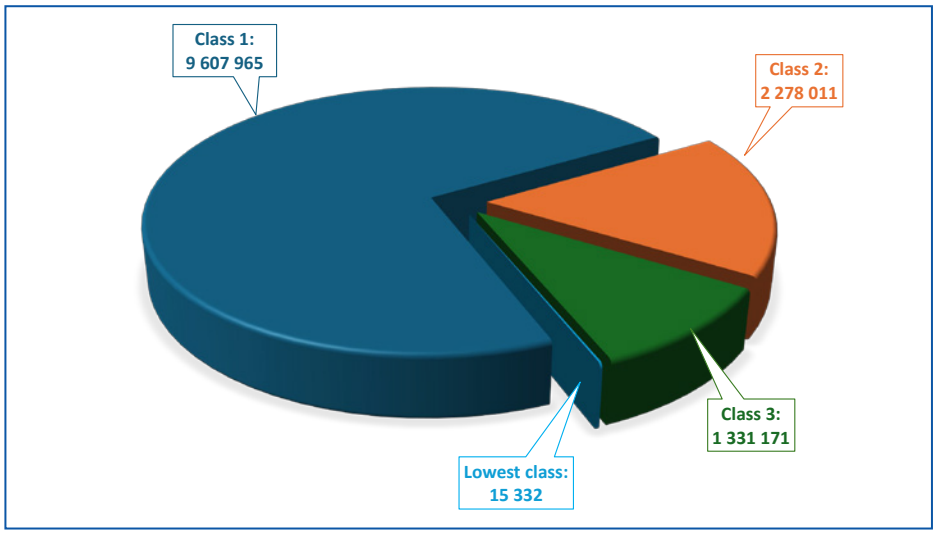


Figure 2: Classes of potato bags downgraded (total 1 246 394) at all fresh produce markets during Apr/May 2024.

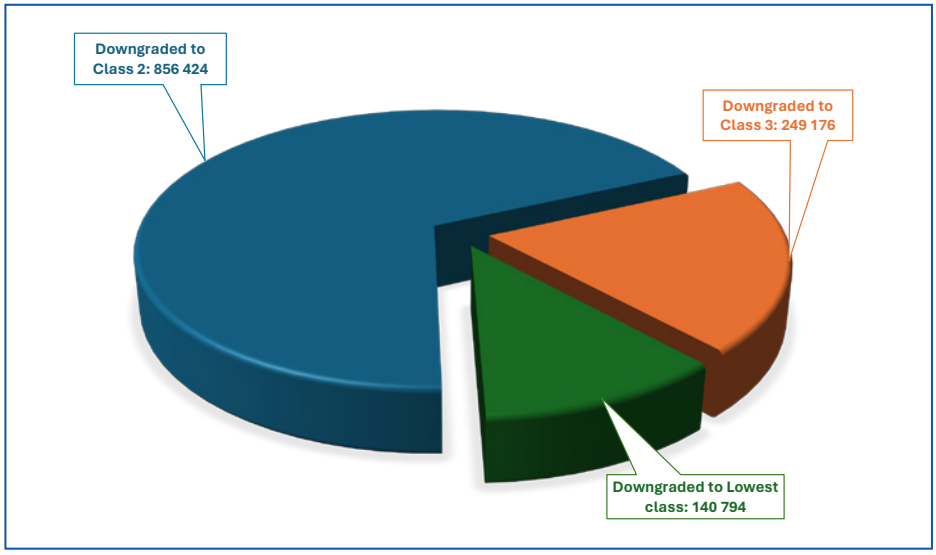


Figure 3: Potato bags downgraded (%) per region at all fresh produce markets during Apr/May 2024.

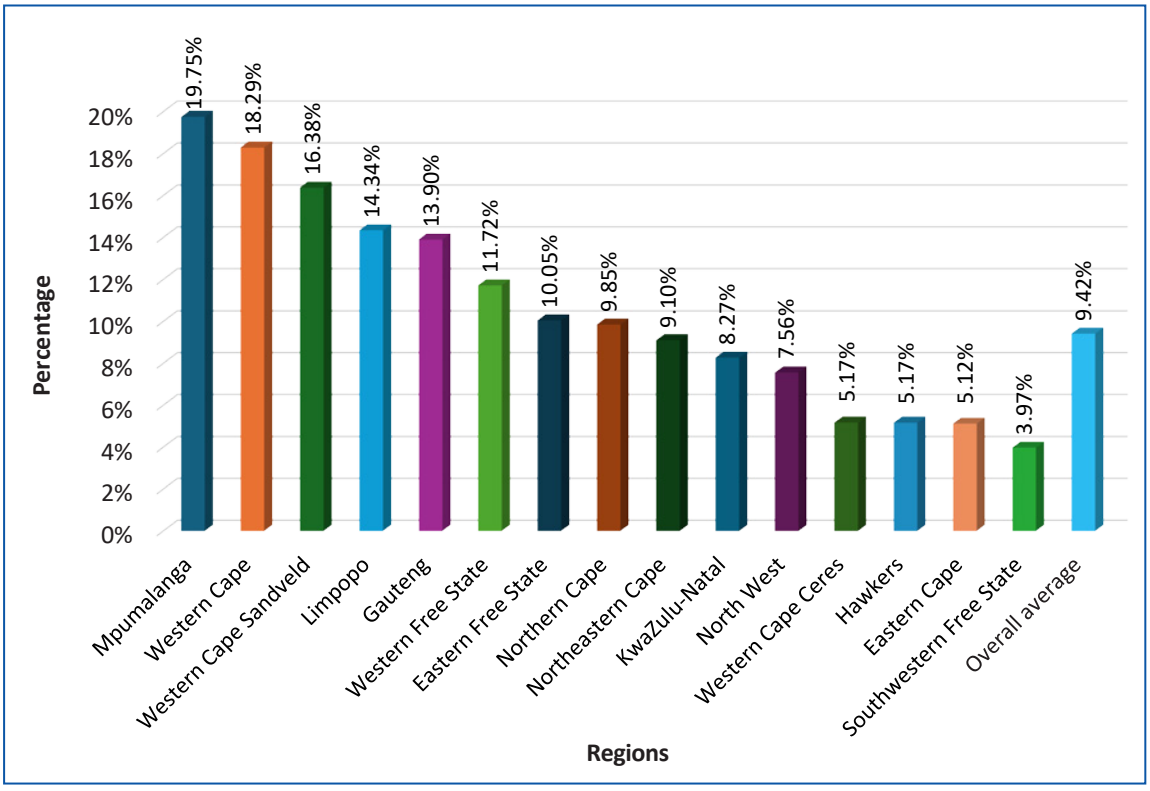
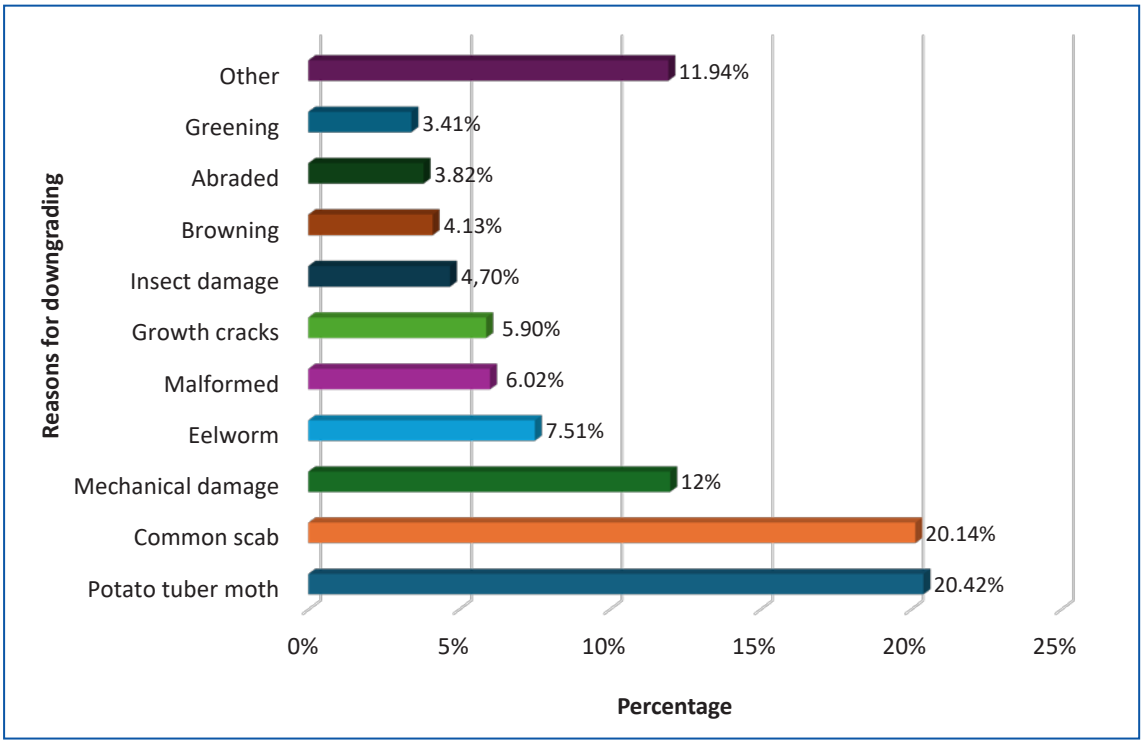
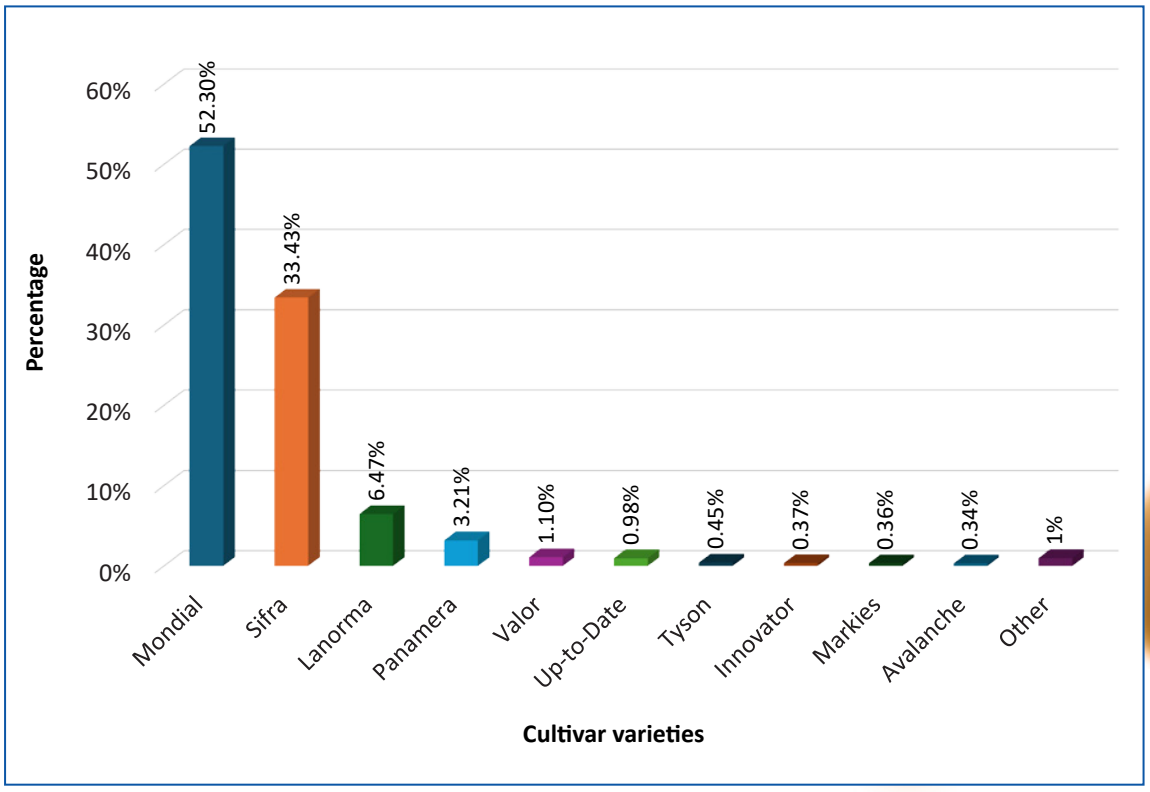


Figure 4: Main reasons for downgrading (%) at all fresh produce markets during Apr/May 2024.



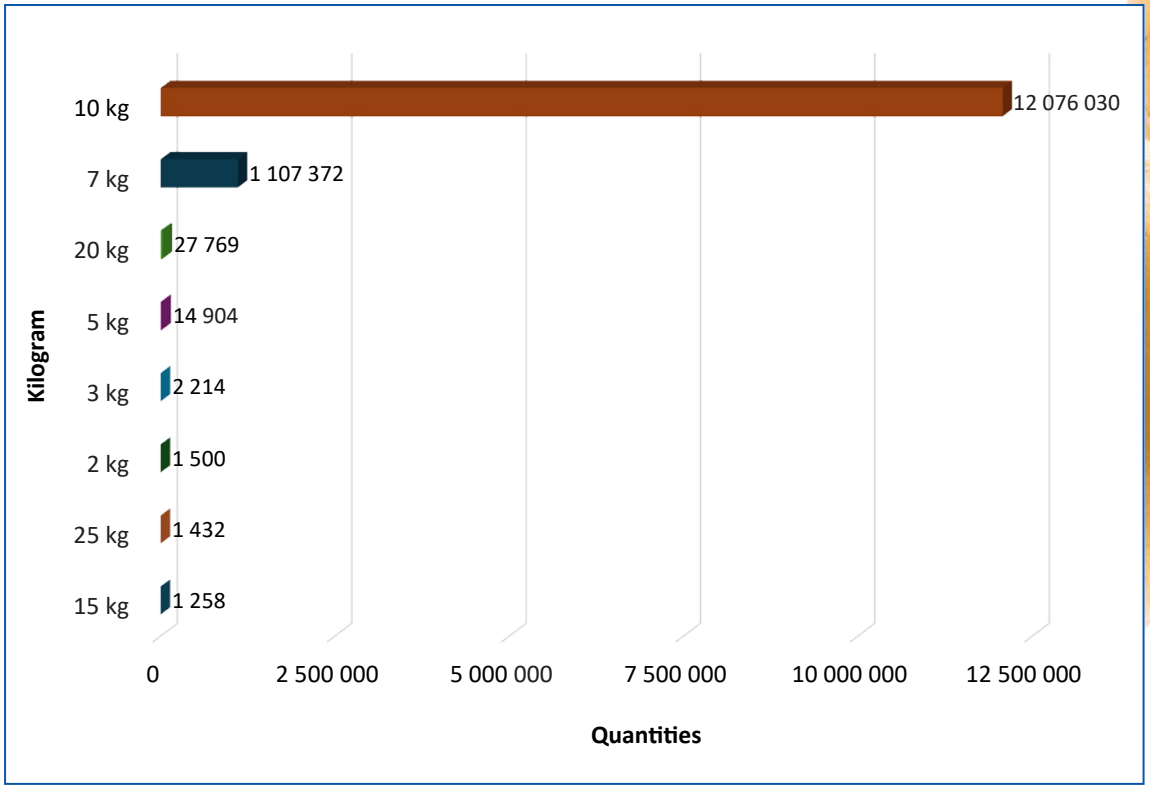
Others include: *Wet decay, skin eelworm, dry stem-end, hollow heart, too small, soiled, broken and cut tubers, wilt, sprouts, vascular browning, watergrass damage (external), wet by decayed tubers, Rhizoctonia, collectively too big and small, glassiness/watery, soiled decay.*

Figure 5: Cultivar varieties inspected (%) at all fresh produce markets during Apr/May 2024.



Others include: *Hertha, King Russet, Allison, Sababa, Fianna, Foxy, Taurus, Mondeo, BP1, Lady Rosetta, Abby, Russet Burbank, Pentland Deli, Fandango, Savanna, and Apache (POWW).*

Figure 6: Volumes of different potato bags inspected at all fresh produce markets during Apr/May 2024.



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