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SECOND EDITION 2025

VOLUME 43



● Litchi: Cultivars from Asia to Africa



● Mango: Overview of pests and diseases



● Avocado: Use traps more efficiently



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JULY - OCTOBER 2025  
Volume 43



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SAAGA



SAMOA



SALGA



SA Subtropical Growers' Association

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2024 has been a landmark year for SAAGA's market access achievements. Through persistent effort and strategic engagement, we have successfully established protocols for exports to China, Japan, and India. Particularly noteworthy is our success in China, where we not only gained market access but also achieved a substantial permanent reduction in import tariffs from 25% to 7%. This remarkable development significantly improves the competitiveness of South African avocados in the Chinese market and demonstrates the effectiveness of our market access initiatives.

~ See page 3



## IMPORTANT DATES



6- September 2027 World Avocado Congress  
2027, Cape Town

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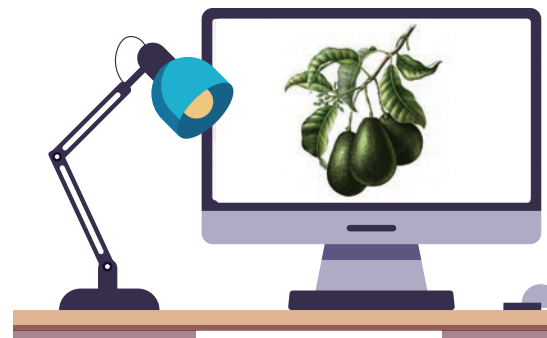
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# SAAGA Research Symposium 2025



# SAAGA *Chairman's Report* 2025



At the start of the new year for our organisation, I am privileged to present this report highlighting the significant developments and achievements of our association over the past year.

I am pleased to report that SAAGA has maintained a strong financial position throughout 2024. This robust performance was supported by export volumes exceeding our budget by over 1 million cartons, demonstrating the growing strength of our industry. Our prudent financial management has ensured we maintain adequate reserves while continuing to invest in critical industry initiatives.

## Market access and international trade

2024 has been a landmark year for market access achievements. Through persistent effort and strategic engagement, we have successfully established protocols for exports to China, Japan, and India. The first shipments to these markets mark a significant milestone in our industry's growth. Particularly noteworthy is our success in China, where we not only gained market access but also achieved a substantial permanent reduction in import tariffs from 25% to 7%. This remarkable development significantly improves the competitiveness of South African avocados in the Chinese market and demonstrates the effectiveness of our market access initiatives.

We are also especially proud of our successful entry into the Japanese market, achieved through a collaborative trial shipment between SAAGA and Westfalia Marketing. This collaborative approach exemplifies how industry cooperation can lead to significant breakthroughs. The successful arrival and positive reception of our first shipment to Japan demonstrates the high quality of South African avocados and opens up exciting opportunities in this premium market. SAAGA and the Citrus Growers' Association's joint initiative in hosting Japanese officials for pre-clearance inspections further illustrates the value of inter-industry collaboration in achieving market access goals.

In India, our engagement with QuikRelations proved highly effective in facilitating access to the Indian market, with their



**Edrean Ernst, Chairman South African Avocado Growers' Association**

work significantly contributing to the finalisation of import conditions. While certain markets, such as India with its 30% tariff, still maintain restrictive trade barriers, our success in China provides a possible model for future negotiations. SAAGA continues to work closely with Fruit SA and the Department of Trade, Industry, and Competition to explore agricultural value chain Preferential Trade Agreements as a potential solution for reducing remaining barriers in other markets.

## Quality management and industry standards

A significant challenge we faced in 2024 was the growing concern about the perception of South African avocado quality in our export markets, particularly in Europe. While shipping delays emerged as a major contributing factor, we recognized the need for a comprehensive industry response.

To address this, SAAGA commissioned an independent quality assessment study in European markets and, based on these findings, developed strategic guidelines that address the entire value chain - from orchard practices through to shipping procedures. These guidelines provide practical standards for pre-harvest management, post-harvest handling, packhouse procedures, and logistics.

Implementation is being supported through our technical team, study groups, and direct communication with growers, exporters, and packhouses. This coordinated approach demonstrates our commitment to maintaining South Africa's reputation as a supplier of premium avocados, and we will continue to monitor progress as these measures are implemented.

I urge all members to recognise that the reputation of South African avocados in international markets rests on our collective commitment to quality. Your individual adherence to these guidelines not only benefits your operations but strengthens our industry's position globally. The retention of

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## SAAGA Chairman's Report 2025

>> FROM PAGE 3

our current markets and the future success of our market access initiatives depends heavily on our ability to consistently deliver premium quality fruit to all markets.

### Research and technical support

SAAGA continues to invest significantly in research that directly benefits our members. Our research portfolio, with a budget of R6 million, covers essential areas including disease management and pest control, post-harvest handling improvements, climate adaptation strategies, and rootstock development. The breadth of this research reflects our commitment to addressing both immediate industry challenges and long-term sustainability concerns.

Our technical team has enhanced its support to members, with each horticulturist now conducting twelve farm visits monthly, ensuring coverage of 65% to 80% of grower members annually and 80% to 90% within a two-year cycle. This increased on-the-ground presence allows us to provide more immediate and practical support to our members while ensuring the effective transfer of research findings into practice.

### Transformation and industry development

Our commitment to industry transformation remains strong through several key initiatives. We continue to provide targeted technical assistance to emerging farmers while maintaining productive collaborations with LDARD<sup>1</sup> and NAMC<sup>2</sup> on the AAMP<sup>3</sup> initiative. The ongoing support for the RecruitAgri programme continues to foster new talent in both the farming and processing sectors. We have also seen encouraging progress in strategic partnerships between established companies and emerging farmer communities.



These initiatives collectively demonstrate our industry's commitment to inclusive growth and development.

### Local market development

Our commitment to developing the domestic market remains steadfast and strategic. Throughout 2024, we maintained a focused approach to local market development through our partnership with Protactic. The timing of our promotional activities was carefully aligned with peak harvest periods, particularly during March to May, when South African growers are preparing for export markets and volumes are highest.

Recognising the strategic importance of the domestic market, the Board has demonstrated flexibility in providing additional funding when opportunities arise to maximise impact. This approach has allowed us to capitalise on strategic opportunities throughout the year, ensuring consistent market presence and consumer engagement. The Local Market Development Committee maintains active oversight of these initiatives through regular meetings and strategic planning sessions.

Looking ahead to 2025, we are strengthening our consumer engagement with initiatives such as a media launch event planned for Cape Town. This continued investment in local market development reflects our understanding of the domestic market's vital role in our industry's sustainability and growth. As production volumes continue to increase, particularly in regions like the Southern and Western Cape, a strong domestic market becomes increasingly important for our industry's long-term success.

### Organisational development and staff enhancement

A significant development this year has been our progress toward converting SAAGA from a voluntary association to a non-profit company (NPC). This transition, targeted for March 2025, will strengthen our governance structures and enhance our ability to serve members effectively.

A key strategic development has been the evolution of our Websites and Publications Administrator role into a new Communication and Information Specialist position. This restructuring reflects our recognition that effective communication is crucial for our industry. The new role goes beyond traditional information management, focusing specifically on how we present and deliver technical information, research findings, market updates, and industry developments to our members. By transforming complex information into clear, actionable insights, this enhanced communication capability will enable members to make more informed decisions and better utilise SAAGA's resources and services. The position represents our commitment to not just collecting and sharing information, but ensuring it reaches our members in the most effective and valuable format possible.

<sup>1</sup> LDARD - Limpopo Department of Agriculture and Rural Development

<sup>2</sup> NAMC - National Agricultural Marketing Council

<sup>3</sup> AAMP - Agriculture and Agro-processing Master Plan



### World Avocado Congress 2027

I am delighted to report that South Africa's preparations to host the World Avocado Congress in September 2027 are advancing with remarkable momentum. Under the guidance of our appointed professional conference organisers, Scatterlings of Africa, we have already secured commitments from several major sponsors, including our conference partner. The enthusiastic response reflects the global industry's recognition of South Africa as a leading avocado producer.

This prestigious event presents a unique opportunity to showcase our industry's advancement and innovation to the world. Coming at a time when South African avocados are gaining prominence in new markets, the congress will not only demonstrate our technical and research capabilities but also create valuable networking opportunities for our members. We look forward to hosting the global avocado community and showing them why South Africa is becoming an ever increasingly important player in the international avocado industry.

### Personal reflection

As this marks my final report as Chairman of SAAGA, I would like to take a moment to express my profound gratitude for the privilege of serving this organisation and its members. Over my tenure, I have witnessed the remarkable resilience and innovative spirit of our industry, as we have collectively navigated challenges and seized new opportunities. The progress we have achieved together - from expanding into new markets to strengthening our research capabilities and industry support structures - reflects the commitment and collaborative spirit of our membership. I am indeed fortunate to work within an industry such as this one.

### Acknowledgments

I extend my sincere gratitude to our Board members, management team, and staff for their dedication and hard work throughout the year. Your support has been invaluable in steering SAAGA through both challenges and opportunities. To our members, thank you for your trust, engagement, and continuous commitment to excellence in our industry. As I hand over the chairmanship to Hans Boyum, I am confident that SAAGA will continue to grow and thrive under his capable leadership, building on our shared foundation of cooperation and innovation. ♦

With gratitude and best wishes,

*Edrean Ernst*

Chairman South African Avocado Growers' Association

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# Pregnancy in the workplace and what employers should think about

What to expect when your employee is expecting ... Life is full of firsts, and this might be the employer's first time having an employee who is pregnant. Naturally, one may wonder, "What should I expect and what is expected of me as an employer?"

**Meyer Louw**

LWO EMPLOYERS ORGANISATION

That is where the Code of Good Practice on the Protection of Employees During Pregnancy and After the Birth of a Child provides essential guidelines for employers to support and protect pregnant or breastfeeding employees. It outlines the employer's general responsibilities, including risk assessments, reasonable accommodations, and maternity leave provisions. Note, however, that the Code may be reasonably adapted depending on the specific business' workplace circumstances and occupational health requirements.

## LEGAL SAFEGUARDS AND THE EMPLOYER'S RESPONSIBILITIES

### Zero tolerance for discrimination

Employers are legally prohibited from discriminating against, or dismissing employees, due to reasons relating to pregnancy. This protection is reinforced by both the Labour Relations Act and the Employment Equity Act.

Take note: Employees who are unfairly dismissed on this ground can refer the matter to the Commission for Conciliation, Mediation and Arbitration (CCMA) or an applicable Bargaining Council. Such a dismissal would be considered automatically unfair and would put the onus on the employer to prove the contrary. The compensation awarded in such a case can be up to 24 months' worth of the employee's salary.

### Creating a safe and healthy work environment

Employers are obligated to maintain a workplace free from health risks, including those affecting reproductive health.

Key responsibilities include:

- Comprehensive risk assessments: Identify and address potential hazards that could affect pregnant or breastfeeding employees.
- Proactive adjustments: adapt workstations, modify schedules, or supply specialised equipment as necessary.
- Employee education: Provide clear information and training on workplace risks and protective measures.
- Collaborative safety measures: Engage health and safety

representatives in both the assessment and management of risks.

- Shared responsibility: Encourage all employees to take active steps in ensuring a safe work environment.

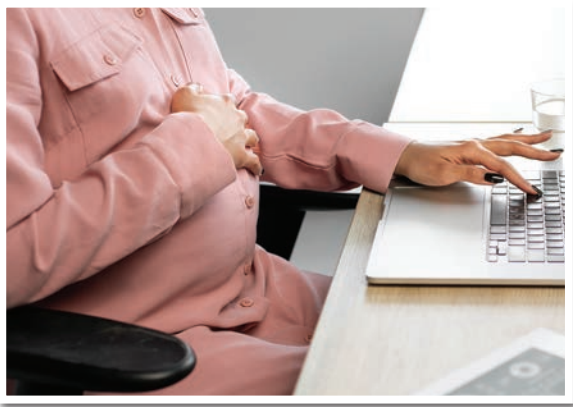
### Prioritising health for expecting and nursing employees

Employers must prioritise the health and safety of pregnant and breastfeeding employees under Section 26 of the BCEA, which prohibits hazardous work. Key responsibilities include:

- Risk assessment: Identifying workplace risks specific to pregnant or breastfeeding employees and implementing necessary protective measures and adjustments to mitigate these risks effectively.
- Alternative employment: Offering suitable alternative roles if current work poses health risks during pregnancy or breastfeeding, ensuring terms are fair.
- Notification and evaluation: Encouraging early pregnancy notification to promptly assess workplace risks, including evaluating physical conditions and job tasks to determine appropriate accommodations.
- Risk mitigation: Informing employees of identified risks, consulting on preventative measures, providing necessary training, and considering occupational health consultations for uncertain adjustments.
- Health monitoring: Maintaining ongoing risk assessments throughout pregnancy and breastfeeding, supporting clinic attendance and necessary breaks for breastfeeding employees.

The LWO assist employers to comply to labour law. The organisation is registered with the Department of Employment and Labour and as such is authorised to represent its members (employers) at the CCMA, bargaining council and Court of Labour. Contact the LWO Employers Organisation, available 24/7, for more information or assistance: Tel. 0861 101 828; e-mail [info@lwo.co.za](mailto:info@lwo.co.za); visit the website <https://www.lwo.co.za>





### Understanding the workplace challenges of pregnancy

Aspects of pregnancy affecting work: Both employers and employees should consider these common aspects of pregnancy impacting work:

- Morning sickness: Employees may struggle with early shifts and heightened sensitivity to strong smells exacerbating nausea.
- Physical strain: Prolonged standing or sitting can lead to backache and varicose veins, while manual handling tasks can also contribute to discomfort.
- Increased toilet needs: Ensuring access to suitable toilet facilities is crucial, especially considering challenges in leaving work unattended.
- Fatigue: Tiredness may limit overtime and evening work capability, necessitating consideration of rest periods for adequate recovery.

### Additional resources

For further details, including a comprehensive list of hazards and recommended best practices, please refer to the Code of Good Practice on the Protection of Employees During Pregnancy and After the Birth of a Child, which contains more detailed information and schedule of hazard examples and best practices to mitigate risks effectively. 



Kelsi Davson

## New Subtrop team member

Derek Donkin  
SUBTROP

**K**elsi Davson has joined the Subtrop team as our Communication and Information Specialist.

Kelsi has an MSc in Clinical Anatomy from the University of Pretoria and is busy with an MSc in Analytics. She previously worked in the orthopaedic industry doing data analysis and visualisation, research protocol development, website design and management, social media management, and project management.

We look forward to her contribution to Subtrop's focus on communication to its members and other stakeholders. 



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# Subtrop and Fruit SA host successful 2025 transformation showcase in Venda

Subtrop, in partnership with Fruit South Africa (Fruit SA), proudly hosted the 2025 transformation showcase at Tshivhase Agridam Farm, outside Thohoyandou in Venda.

This significant industry event provided a platform to reflect on progress made and challenges still faced in the journey toward a transformed and inclusive fruit sector, aligned with the industry's 2038 transformation goal.

**Stephen Mantsho**  
SUBTROP

The event brought together a diverse mix of stakeholders from across the agricultural value chain, including government officials, parastatal representatives, policymakers, financial institutions, commodity bodies, developmental organisations, and both commercial and emerging farmers. Their presence underscored the collective responsibility required to create a thriving, inclusive fruit industry.

## Sector challenges and opportunities

In her opening address, Fruit SA CEO Fhumulani Ratshitanga acknowledged the sector's progress but noted that transformation has been slowed by systemic barriers such as limited access to finance, skills development, infrastructure, water rights, and land. These constraints, she emphasised, must be addressed to unlock the full potential of inclusive growth.

Echoing these sentiments, Subtrop CEO Derek Donkin pointed to the specific issue of land ownership as a major hurdle for many growers. Without secure land tenure, farmers often struggle to qualify for financing or acquire water use licenses, which are essential for scaling up production.

A high-profile panel discussion, moderated by Leona Archary, CEO of the Agricultural Development Agency (AGDA), brought together leading voices in agriculture:

- Derek Donkin, CEO, Subtrop
- Themba Rikhotso, CEO, Land Bank



Derek Donkin  
opening the  
showcase.

- Desry Lesele, Agricultural Manager, Nedbank
- Zander Ernst, Director of Marketing and Production, Al-lesbeste
- Dr Madime Mokoena, Director, BBBEE Charter Compliance
- Vusi Ndlozi, Director, Agribusiness Support and Development Services, Limpopo Department of Agriculture and Rural Development.

The panellists collectively agreed that, while progress is evident, transformation is a long-term commitment requiring continued collaboration. They emphasised that public-private partnerships, targeted financial support, and knowledge-sharing platforms are key to ensuring inclusive participation throughout the value chain.

Stephen Mantsho, Transformation Coordinator at Subtrop, showcased the effectiveness of structured transformation initiatives. He presented measurable results from 2020 to 2025,



The panellists at the showcase were Leona Archary (moderator), Derek Donkin, Themba Rikhotso, Desry Lesele, Zander Ernst, Dr Madime Mokoena and Vusi Ndlozi.



# The legacy of growth: A farming journey through the Madima family

The story of Rembander Agribusiness is a story of legacy, resilience, and reinvention. It begins in 2004 when Khuliso Madima's father established the farm with a vision to cultivate high quality fruit on the fertile lands of Venda in Limpopo. At the time, it was a modest operation with a strong focus on litchi as the main crop, supported by mangoes and avocados.

**Stephen Mantsho**

SUBTROP

**W**hen he passed away, his wife, Khuliso's mother, stepped in to manage the farm, acting as a regent and custodian of his vision. She carried the family dream forward with dedication, but as the years passed and her energy waned, it became clear that the next generation needed to step up. In 2020, Khuliso officially took over the reins, ready to transform the farm into a modern, thriving agribusiness.

With fresh energy and bold ideas, Khuliso introduced new ways of thinking. She brought innovation into operations, streamlining post-harvest handling, updating packaging techniques, exploring value-added products, and opening new market channels. She embraced technology, improved logistics, and made record-keeping central to her operations.

Today, Rembander Agribusiness spans 52 hectares of litchi orchards and 46 hectares of mangoes. The farm has built a reputation for producing top-tier litchis that are sold fresh in

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## Subtrop and Fruit SA host successful 2025 transformation showcase in Venda

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**Themba Rikhotso, CEO of Land Bank (middle), participated in the panel discussion.**



**Some of the growers attending the transformation showcase.**

such as increased participation in training programmes, farmer study groups, industry symposia, and summits. Notably, many emerging farmers who previously lacked market access are now integrated into supermarket supply chains or export programmes which are clear signs of meaningful advancement.

### Grower stories and farm development

Several notable growers attended the event, including:

- Edrean Ernst, Director at Allesbeste and former SAAGA Chairman
- Carl Henning, from Mununzu Farm in Elim
- Khathutshelo Matika, an emerging grower from Venda
- Khuliso Madima, a semi-commercial mango and litchi grower.

Attendees also toured Tshivhase Agridam Farm, guided by General Manager Philip Mulaudzi. Established in 2001, the farm currently grows bananas on 130 hectares and is expanding into avocados. It also features litchi (4 ha) and macadamia (8 ha) orchards. The tour gave participants a tangible look at what long-term investment in infrastructure and skills can yield.

### Looking ahead: Urgency and intentionality

In his closing remarks, Derek Donkin called on all stakeholders to move beyond complacency: "We cannot afford to remain in our comfort zones. Our decisions must be deliberate, informed, and aligned with the vision for an inclusive sector."

The 2025 transformation showcase not only celebrated progress but also reignited momentum for the journey ahead. As the sector marches toward its 2038 goal, the event served as a powerful reminder that collaboration, investment, and commitment remain the cornerstones of transformation. 💎



## The legacy of growth: A farming journey through the Madima family

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**Aerial view showing a part of Rembander Agribusiness.**

the local market. Mangoes are supplied both to the fresh produce market and to achar manufacturers, with varieties like Tommy Atkins, Kent, Sensation, and Peach in high demand. Kent mangoes, with their late-season availability, have given Khuliso a strategic edge in meeting market gaps after other suppliers taper off.

### Building markets and supporting others

One of Khuliso's most notable achievements has been her ability to forge market linkages, not only for her own produce but also for fellow local growers. Through informal partnerships with local and regional retailers, she ensures a steady demand for her fruit during the harvest season. Clients from KwaZulu-Natal, Gauteng, and across Limpopo often send trucks to the farm gate during peak periods, a testament to the strong trust and reputation she has cultivated.

By actively linking neighbouring farmers to her supply networks, Khuliso is strengthening the local agricultural economy and empowering others, particularly women and youth, in surrounding communities.

Running a farm of this scale comes with its share of challenges. The recent heatwaves in 2023 and 2024, combined with frost damage in 2024, significantly impacted fruit quality and yields. Like many emerging-to-medium growers, Rembander has also experienced financial pressures, sometimes delaying seasonal activities.

Still, the farm maintains its commitment to its 10 permanent employees, and additional seasonal labour is hired during peak times. Khuliso ensures that operational costs are covered, though market prices often remain low despite high volumes of fruit leaving the farm.

### Training, records, and sustainability

Through mentorship and training provided by Subtrop, Khuliso has developed robust business and technical skills. She is an active member of the Litchi and Mango Study Groups, where she

continues to learn, share knowledge, and innovate.

She now keeps meticulous operational records, tracking fuel consumption per implement, lubricant and oil use, equipment repairs, and all utility expenses. These records are audited annually and are instrumental in her planning and budgeting process for future seasons.

Khuliso is also increasingly mindful of environmental sustainability. Though not yet fully certified, she is exploring practices such as integrated pest management, efficient irrigation systems, and soil conservation to make the farm more climate resilient.

### A return to export ambitions

Before his passing, Khuliso's father had built export relationships in Europe. However, without maintaining certifications such as GlobalG.A.P., the farm was no longer eligible for export. This is now changing. Khuliso is in the process of updating compliance and quality assurance systems with the intention to re-enter the export market in the near future.

Subtrop continues to support her with training in export readiness, technical compliance, and business development - laying the foundation for future expansion into regional and international markets.

### A vision for the future

Khuliso envisions Rembander Agribusiness not only as a thriving commercial enterprise but as a centre for rural development and empowerment. She hopes to one day open a training and mentorship centre for aspiring farmers, especially women and youth, and to explore agro-processing opportunities to increase value addition.

Her story is not just one of personal success - it is a story of generational resilience, community upliftment, and the power of vision backed by hard work. Through her leadership, the Madima legacy continues to flourish - and its roots are only growing deeper. ♦

# Prokon inspections: reduction of immature fruit on local market

As the South African avocado season begins each year, the early weeks play a critical role in shaping market quality and consumer trust. This period, typically marked by the risk of immature fruit entering markets, demands rigorous oversight. In response, Prokon assumes a vital regulatory role at major fresh produce markets, including Johannesburg, Tshwane, Springs, and Cape Town through systematic dry matter testing, compliance monitoring, and enforcement measures to uphold quality standards.

**Mukondeleli Munzhedzi**  
SUBTROP

**D**ry matter percentage (DM%) is the primary metric used to determine avocado maturity. Prokon performs both random and targeted sampling of local and imported fruit to ensure minimum dry matter thresholds are met. Non-compliant consignments are seized, returned, or held, depending on the test results. This prevents sub-standard fruit from entering circulation, safeguarding both consumer satisfaction and the reputation of the avocado industry.

This article explores the scope and impact of Prokon's inspection efforts during the early avocado season and highlights feedback on inspections from week one to nine of 2025.

In 2025, the avocado season began on 6 January with the Johannesburg market receiving fruit from two suppliers. During inspections, one sample tested at a high 83,73% moisture level. Unfortunately, the second supplier's consignment was sold before it could be seized. Some consignments could not be located during inspection. Week 2 saw another failed test at 84,7% but again, not all reported fruit was available for sampling.

From Weeks 1 to 3 of 2024, 27 moisture tests were conducted, leading to five seizures. In the same period in 2025, 19 tests were conducted on local fruit, with two seizures due to high moisture content (82,26%). Three consignments of imported Tanzanian Hass avocados tested within the acceptable range (70,37 to 72,66%).

Two consistent suppliers from 2024 again delivered in 2025, with all consignments compliant. Additionally, 16 new suppliers entered the 2025 market, and their fruit also passed testing (71,76 to 80%).

Inspectors were advised to monitor for Pinkerton avocados, with some suppliers beginning to deliver around Week 4. Historical data show that during Weeks 4 and 5 of 2024, 50 consignments were seized, primarily in Johannesburg (34), Pretoria (13), and Springs (3). In the corresponding 2025

period, 40 dry matter tests were performed on local Fuerte avocados; eight consignments failed, with four seized and four missed due to early sale.

By Week 6, Cape Town began receiving fruit. Early consignments met moisture requirements, although one pre-test indicated immaturity. Prokon encouraged continued pre-testing, which led to a delayed shipment from one market agent. A second pre-test from a flagged supplier also failed, reinforcing the need for shipment postponement. Thirteen imported Hass and 50 local Fuerte consignments were tested - slightly fewer than the 57 tested in the same week of 2024.

In Week 7, imported Hass avocados from Tanzania and Kenya continued to meet maturity standards. With no concerns reported, routine testing for this variety was suspended, although inspections of new arrivals continued.

Prokon oversaw over 147 000 containers across 46 loads. Locally, 59 consignments were tested over the first seven weeks, with 11 failures and seven seizures. Eight Fuerte consignments passed dry matter tests in Week 7, and 12 imported Hass loads were inspected without issue. Week 8 mirrored Week 7, with strong performance from both imported Hass and local Fuerte varieties.

By Week 9, inspection activity had eased. Only one dry matter test was performed at the Springs market. Repeat suppliers to Johannesburg, Tshwane, and Cape Town required no further testing. Inspections of imported avocados had officially ended in Week 8. Compared to 2024, 2025 saw slightly lower early-season volumes, but a higher rate of compliance, indicating improved fruit maturity and handling.

The early avocado season of 2025 showed marked improvement in fruit quality, with fewer immature consignments reaching local markets. Prokon's continued vigilance through dry matter testing and enforcement has been instrumental in reducing immature fruit early in the season over the years. These efforts not only protect the market's integrity but also enhance consumer confidence and the reputation of South Africa's avocado industry. ♦





# Mmmmm mangoes ... promotions

Generic mango images were shot for press releases, social media platforms and advertising.

The 2024/25 mango season kicked off early in December 2024 with a number of different promotional activities.

**Glynnis Branthwaite**

PROTACTIC STRATEGIC COMMUNICATIONS

In preparation for each upcoming mango season, a series of recipes were developed and accompanying images shot to be used for the next season. The recipes and images created during the 2023/24 season were utilised during this past season and new recipes and images were developed this year to be used for 2025/26 season.

Recipes developed this past season range from *Mango Hummus Platters* to *Mango and Granadilla Cheesecakes*, *Cupcakes* to *BBQ Chicken Skewers* and *Mango Piccalilli Sarmies* to *Meatballs in Spicy Mango Sauce*. Generic mango images were also shot and will be used for press releases, social media platforms and advertising.

Six press releases were distributed to the South African media during the peak season. Each article included one or two recipes specifically developed for the local market, along with a matching set of recipe visuals to create appetite appeal. Numerous print and online media as well as social media influencers published these articles and recipes.

Five well-known social media influencers, including Zola Nene, Sifo the Cooking Husband, Dine with Neo, and The Lazy Makoti, posted videos of delicious mango festive pork roasts plus a mango dessert cup recipe during the second half of December 2024 and the first week of January 2025. These influencers have a combined following of just under 2,8 million.

The videos of the roasts were co-sponsored by the South African Pork Producers Organisation (SAPPO). The joint collaboration with SAPPO also included a full-page advertorial in the February issue of My Kitchen magazine which has a circulation of 76 235.

A double page spread advertorial was placed in the December 2024 issue of Heita My Friends magazine which is distributed to 40 000 Gauteng taxi rank commuters.

Digital ads were placed in the online publication, Crush, which boasts 80 000 unique monthly visitors. Posts were also placed on their social media platforms with a following of over 80 000 and an article was placed in their newsletter which reaches 35 000 subscribers. Similarly, an article was published in Get It magazine's online publication which has over 149 000 online readers. Their Facebook page, which featured a mango post, has over 110 000 followers.

Videos of the mango festive pork roasts were co-sponsored by the South African Pork Producers Organisation (SAPPO). The joint collaboration with SAPPO also included a full-page advertorial in the February issue of My Kitchen magazine.





Numerous print and online media as well as social media influencers published articles and recipes from press releases distributed to the South African media during the peak season.



During the main mango season period (1 December 2024 to 31 March 2025), the Facebook and Instagram page following grew by a collective 1 525. The Facebook and Instagram pages now have followings of 9 786 and 2 411, respectively. Over the same time period the pages collectively reached over 344 000 South Africans who in turn interacted with the pages over 26 500 times.

A total of 24 educational sessions were held at various market agencies on the Joburg and Tshwane Markets from

the first week of January 2025, where promoters spoke to between 30 and 100 traders daily, reaching approximately 1 200 traders over the two-week period.

In addition, promotions were held with 20 traders at stands at transport hubs and in townships where approximately 1 800 consumers were reached. The objective of these promotions was to educate the informal sector about mangoes, including the start of the new season and the different mango cultivars. 🍌



Educational sessions were held at various market agencies on the Joburg and Tshwane Markets, where promoters spoke to between 30 and 100 traders daily.



# Avocado tree sales statistics



The Avocado Nurserymen's Association (ANA), established in 1983 under the Avocado Plant Improvement Scheme (APIS), ensures the supply of high-quality avocado nursery trees through annual audits and certification. In collaboration with SAAGA, ANA promotes plant health and genetic standards across accredited nurseries.

**Mukondeleli Munzhedzi**  
SUBTROP

Each season (July to June), ANA compiles national nursery sales data, capturing trends in cultivar types, rootstocks, and regional distribution. This article analyses tree sales data from 2014 to 2024, with forecasts to 2026, highlighting industry growth, and shifts in planting practices and production regions.

N.B. The total tree sales and forecasts are from ANA nurseries and one major non- ANA nursery. Data and interpretations for cultivar types, rootstocks, and regional distribution

are from ANA nurseries annual tree sales reports only.

There was a very small and insignificant change in tree sales from 915 446 in 2022/23 to 915 632 in 2023/24 with an increase of 186 trees sold (Fig. 1), suggesting plateauing of tree sales in this period. A decline of 2,7% is expected in 2024/25 from the forecast with a significant rebound of 5,73% projected in the 2025/26 season. This plateau pattern has been observed post-2021 after the major growth surge that happened between 2016/17 (275 825) and 2020/21 (906 632) where the average annual growth was 30%.

Over the past decade, there has been a dynamic shift in the distribution patterns of trees sold locally and trees sold for

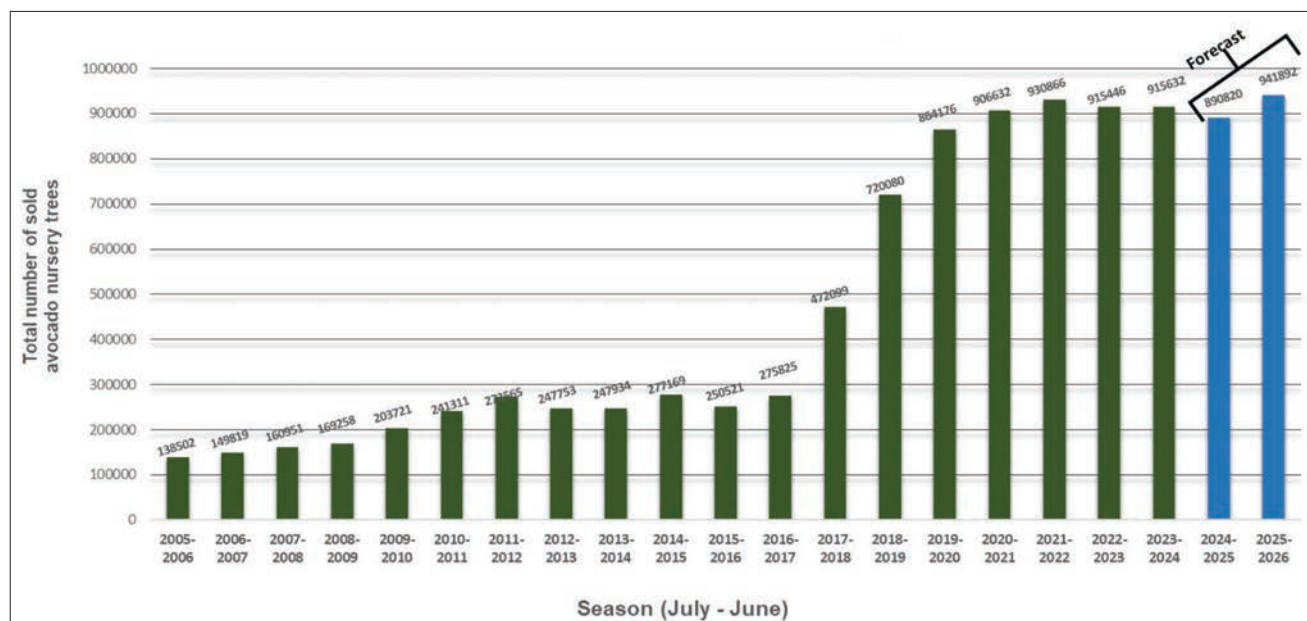
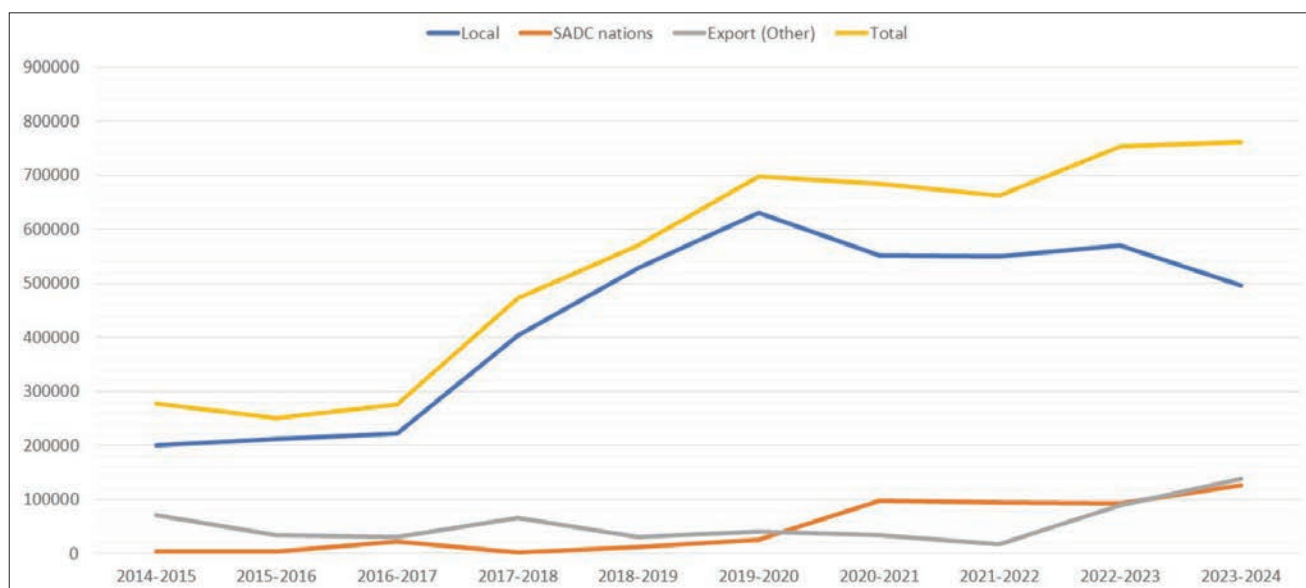


Figure 1. Tree sales and forecast (2005-2026).



**Figure 2. Tree sales Local vs Export (2014-2024).**

exports. From the 2014/15 to 2023/24 seasons, total production has nearly tripled, from approximately 277 000 to 762 000 trees sold

In the earlier years, a large majority of trees were sold locally (Fig. 2). For instance, in 2015/16 and 2017/18, over 85% of trees were sold locally. The peak was reached in 2018/19, where a staggering 92,6% of trees were sold within the country. However, a noticeable decline in the percentage sold locally has occurred in recent years. By 2023/24, only 65% of the total trees were sold locally, a significant drop of nearly 28% in just five years.

The data show a clear expansion in exports; especially to Southern African Development Community (SADC) countries and other international markets. In 2020/21, tree exports to SADC nations spiked dramatically to nearly 98 000 trees sold, compared to just 2 186 trees sold in 2017/18.

## Regional distribution and rootstocks

The regional distribution of tree sales in South Africa per season and 10-year average are reported in Table 1. Total tree sales increased significantly until 2019/20 (peaking at over 630 000 trees sold) before gradually declining to 497 011 trees in 2023/24. Letaba consistently had the largest share of tree sales, dominating the distribution in nearly all years. It peaked at 263 106 in 2019/20 and has since declined to 128 863 in 2023/24.

KwaZulu-Natal emerged as a strong contributor in recent years, growing from 15 939 in 2014/15 to over 107 000 by 2023/24, becoming the second-largest region where avocado trees are sold in the country by the end of the period. The Western Cape has shown steady growth, from 15 500 in 2014/15 onward to 101 115 trees by 2023/24.

Dusa has been the dominant rootstock throughout the

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**Table 1: Tree sales area distribution South Africa 2014 - 2024**

| Year      | Levubu | Letaba | Kiepersol | Nelspruit | KwaZulu-Natal | Western Cape | Eastern Cape | Other | Total  |
|-----------|--------|--------|-----------|-----------|---------------|--------------|--------------|-------|--------|
| 2014-2015 | 14783  | 70873  | 9601      | 5001      | 15939         | 15500        | 0            | 69469 | 201166 |
| 2015-2016 | 17331  | 71651  | 21781     | 18330     | 28563         | 11030        | 0            | 44435 | 213121 |
| 2016-2017 | 59854  | 72790  | 15113     | 6157      | 20475         | 24359        | 0            | 24294 | 223042 |
| 2017-2018 | 27788  | 216179 | 27883     | 34996     | 54694         | 19549        | 0            | 22324 | 403413 |
| 2018-2019 | 44863  | 236143 | 46080     | 58256     | 62819         | 44700        | 0            | 35594 | 528455 |
| 2019-2020 | 54943  | 263106 | 58130     | 68330     | 76488         | 63883        | 1200         | 44852 | 630932 |
| 2020-2021 | 58815  | 217753 | 18011     | 55502     | 88878         | 69409        | 1495         | 42652 | 552515 |
| 2021-2022 | 30544  | 153128 | 24110     | 53828     | 125817        | 62500        | 19707        | 80467 | 550101 |
| 2022-2023 | 48262  | 158194 | 28594     | 34684     | 103366        | 112979       | 21637        | 62708 | 570424 |
| 2023-2024 | 39566  | 128863 | 52225     | 4410      | 107851        | 101115       | 7577         | 55404 | 497011 |

## Avocado tree sales statistics

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**Table 2: Tree sales by rootstock 2014 – 2024**

| Year      | Dusa   | Duke 7 | Bounty | Edranol | Velvick | Zutano | Other<br>(Possible<br>Seedling) | Total  |
|-----------|--------|--------|--------|---------|---------|--------|---------------------------------|--------|
| 2014-2015 | 145476 | 38874  | 45982  | 29786   | 13902   | 3149   | 0                               | 277169 |
| 2015-2016 | 125457 | 31942  | 57709  | 26242   | 4261    | 4910   | 0                               | 250521 |
| 2016-2017 | 154115 | 28035  | 48451  | 26532   | 9485    | 6327   | 2880                            | 275825 |
| 2017-2018 | 309937 | 35670  | 68879  | 34377   | 4598    | 4884   | 13754                           | 472099 |
| 2018-2019 | 327688 | 34180  | 56955  | 57613   | 2810    | 9233   | 78340                           | 566819 |
| 2019-2020 | 379487 | 47167  | 93749  | 110757  | 1051    | 5270   | 62205                           | 699686 |
| 2020-2021 | 371924 | 23300  | 99270  | 94554   | 6438    | 4838   | 98187                           | 698511 |
| 2021-2022 | 404205 | 20599  | 132095 | 103148  | 1893    | 5930   | 77018                           | 744888 |
| 2022-2023 | 430868 | 49197  | 148449 | 61761   | 2025    | 5125   | 68021                           | 765446 |
| 2023-2024 | 410077 | 41695  | 174046 | 41996   | 3212    | 12139  | 87856                           | 771021 |

**Table 3: Tree sales by cultivar 2014 – 2024**

| Year      | Fuerte | Pinkerton | Maluma-<br>Hass | Hass   | Lamb Hass | Reed  | Ryan  | Other | Total  |
|-----------|--------|-----------|-----------------|--------|-----------|-------|-------|-------|--------|
| 2014-2015 | 45146  | 20720     | 22629           | 146435 | 3540      | 4907  | 4014  | 29778 | 277169 |
| 2015-2016 | 31907  | 5898      | 23840           | 124554 | 10918     | 10682 | 2050  | 40672 | 250521 |
| 2016-2017 | 33990  | 11209     | 35032           | 133508 | 6096      | 2953  | 2709  | 50328 | 275825 |
| 2017-2018 | 77894  | 36019     | 30277           | 245935 | 13249     | 1794  | 4933  | 61998 | 472099 |
| 2018-2019 | 62545  | 27159     | 80099           | 277527 | 13393     | 3045  | 13057 | 89994 | 566819 |
| 2019-2020 | 80344  | 46588     | 85180           | 363981 | 30118     | 2412  | 7758  | 83305 | 699686 |
| 2020-2021 | 52100  | 63218     | 58854           | 390283 | 27527     | 977   | 8345  | 97207 | 698511 |
| 2021-2022 | 108760 | 44852     | 43701           | 443912 | 19066     | 5556  | 6722  | 72319 | 744888 |
| 2022-2023 | 92824  | 36293     | 48900           | 459913 | 49488     | 5511  | 5290  | 56396 | 765446 |
| 2023-2024 | 55618  | 38907     | 34402           | 483853 | 66022     | 12109 | 16121 | 63989 | 771021 |

period, rising from 145 476 in 2014/15 to over 430 000 in 2022/23 before a slight drop to 410 077 in 2023/24 (Table 2). Bounty has shown steady growth; increasing from 45 982 to 174 046. Duke 7 experienced a gradual decline from 38 874 in 2014/15 to 41 695 in 2023/24, indicating a shift away from its use despite occasional rebounds.

'Hass' has been the dominant cultivar throughout the decade, growing from 146 435 in 2014/15 to 483 853 in 2023/24 (Table 3). 'Lamb Hass' has also seen substantial growth, particularly in recent years, reaching 66 022 in 2023/24. 'Fuerte', once a leading cultivar, showed fluctuating tree sales, peaking at 108 760 in 2021/22 but dropping significantly thereafter. 'Pinkerton' and 'Maluma Hass' showed moderate but stable contributions to total sales, with occasional spikes.

In conclusion, the long-term analysis of avocado nursery tree sales from 1999 to 2024, along with projections to 2026, reveals a dynamic and maturing industry. However, since 2021, tree sales have plateaued at historically high levels. While local markets still account for most of the tree sales, the balance is shifting, with rapid growth in trees being exported, particularly in recent years.

The data underscores the dominance of 'Hass' type cultivars in South Africa's avocado industry, probably driven by export potential and consumer preference. Furthermore, the significant rise of 'Lamb Hass' suggests increasing interest in late season harvesting, expansion in new production areas and export flexibility. The declining share of 'Fuerte' may reflect a shift away from older cultivars toward more commercially favourable cultivars. ♦



# Market access update



*Protect your markets because that's all you have to carve out a place for yourself in the competitive world of the international economy.<sup>1</sup> – Theo de Jager*

*This country (USA) can become rich with the use – the proper use – of tariffs. – Donald Trump*

*What do tariffs do? They raise costs. – Sean Peche*

**James Mehl**  
SUBTROP

Unquestionably the world is now more aware of how tariffs influence trade. Tariffs, or import taxes, are imposed by a government on goods/commodities that are imported into a country. Tariffs are intended to protect a local industry and help it develop and thrive, thereby contributing to the economy of a country, by discouraging consumers from purchasing foreign commodities.

In the context of this article, tariffs are a non-SPS (Sanitary and Phytosanitary Measures) barrier to trade, and have to be addressed if we want to GROw (Gain, Retain, Optimise) market access. Fortunately, work is being done behind the scenes where government-to-government engagements with those especially of the USA and India to address market access issues, particularly tariffs.

## AVOCADOS

**USA:** Comments on the draft Pest Risk Assessment (PRA) were submitted in June 2023. After finalising the PRA, the USDA-APHIS<sup>2</sup> will consider the proposed Systems Approach. The technical bilateral meeting between the DOA and USDA-APHIS scheduled for end-February 2025 was postponed. The DOA continue to follow up with the USDA-APHIS on this and the other two applications noted below.

**Other markets:** Applications have also been submitted for access into Taiwan, South Korea, Vietnam, Thailand, Israel, Mexico, Pakistan, and Malaysia. Information on the progress of these applications is available to our members upon request and in the avocado app.

<sup>1</sup> Translated directly from the Afrikaans: Beskerm jou markte want dis al wat jy het om vir jouself 'n plek oop te skrop in die mededingende wêreld van die internasionale ekonomie.

<sup>2</sup> USDA-APHIS – United States Department of Agriculture Animal and Plant Health Inspection Service

<sup>3</sup> MAFW – Indian Ministry of Agriculture and Farmers Welfare

## MANGOES

**USA:** Comments on a draft work plan were sent to the USDA-APHIS in July 2023.

**China:** Access for SA plums and SA blueberries are to be granted before the application for SA mangoes can be processed. The Pest Information Package (PIP) has already been submitted.

**Japan:** Extended access for SA table grapes (the Crimson Seedless variety – current access into Japan only allows for imports of the Barlinka variety) and SA citrus need to be finalised before the PRA for SA mangoes can be processed. A systems approach proposal to ensure that production areas are free of mango seed weevil, is being finalised for submission to DOA.

**Other markets:** Applications for access into Vietnam and Thailand have also been submitted.

## LITCHIS

**USA:** Two cold treatments are under consideration here, and feedback from the USDA-APHIS is pending on both:

- A protocol for trial work supporting the initial cold treatment (1 °C for 19 days) and addressing the concerns of the USDA-APHIS, was sent mid-October 2021.
- The alternative cold treatment (-0,55 °C for 22 days – T-107e): while the USDA-APHIS have accepted the proposal to use this treatment, they confirmed in the bilateral end-October 2022 that they are still reviewing the Quarantine Pest List to decide if additional mitigation treatments will be needed.

**India:** A verification visit was done mid-December 2024. The MAFW<sup>3</sup> requested additional information on the industry and a response was provided.

**China:** The PIP for SA litchis has been submitted.

**Other markets:** Applications for access into South Korea and Vietnam have also been submitted. 💎



The Subtrop Journal is the official Subtrop mouthpiece, specifically created to reach active members, producers, processors and exporters as well as other role players in the subtropical fruit industry.

## Publishing Dates & Deadlines

| Issue                        | Bookings         | Material & Payment | Published       | Technical Requirements                                                                                                                                               |
|------------------------------|------------------|--------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Volume 43: Jul-Oct '25       | 12 May 2025      | 26 May 2025        | 3 July 2025     | <b>Paper Format:</b> Glossy Colour Magazine<br><b>Page Size:</b> A4 (297 x 210 mm)<br><b>Advertisement Material:</b> PDF Format, 300dpi & CMYK, e-mail or e-transfer |
| Volume 44: Nov '25 - Feb '26 | 11 August 2025   | 1 September 2025   | 9 October 2025  |                                                                                                                                                                      |
| Volume 45: Mar - Jun '26     | 14 November 2025 | 28 November 2025   | 27 January 2026 |                                                                                                                                                                      |

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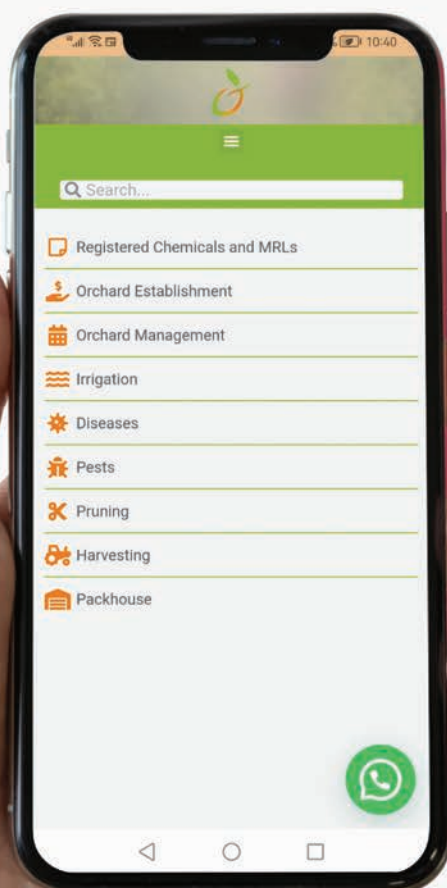
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To install the app you need to access the following web address on Google Chrome on your Android device: [app.mango.co.za](http://app.mango.co.za)



If you don't have Google Chrome installed on your device, go to Google / Android Playstore and download the Chrome Internet App.

1. When the link opens (on Chrome), you will:
2. Wait for a popup on the bottom of the phone that reads: "Add SAMGA-App to Home Screen", and click / press it. Click on the "Install" pop up that will appear on the screen. Installation takes about 1 minute depending on internet speed.
3. A notification will pop up to inform you that the app has been installed.
4. Look for the SAMGA Logo on your Home Screen and press / click it to open the SAMGA App.

Please note: The App can only be downloaded on Android devices using the Chrome Internet App.

To install the app you need to access the following web address on Safari Web Browser on your iOS device: [app.mango.co.za](http://app.mango.co.za)



To download the app, scroll down to get the popup bar and click on the box with the arrow in the middle.

A new popup screen with options will appear.

Swipe the bottom section until you find the option: "Add to Home Screen"

A new popup screen will now appear to give you the option to add the Mango-App to your Home Screen.

You can click the "ADD" option on the top right side of the screen, or click on DONE on the bottom of the Screen.

The App will then be stored on the home screen of your device.

Go to your device home screen / app screen and look for the SAMGA / Mango Logo Icon. This will open the APP.



# Avocado maturity: which test is best?

Maturity in avocados is determined based on the percentage dry matter in the fruit. To determine when to harvest, growers routinely sample fruit through an orchard to determine what the dry matter (DM) content is amongst the fruit samples.

**James Mehl**  
SUBTROP

As DM content increases, the anticipated date of harvesting gets nearer and a grower can start organising one or more picking teams. But, which test is best to determine dry matter content, and is DM content the only measure of avocado maturity? These questions are the subject of an ongoing research project led by Dr Asanda Mditshwa at UKZN.

Growers have three options to determine the DM content of an avocado:

- the oven drying method: determine the moisture lost from 100 g of avocado pulp by weighing the sample then placing it in a pre-heated oven at 65 °C for 24 hours.
- the microwave drying method: determine the moisture lost from 100 g of avocado pulp by weighing the sample then placing it in a microwave at 800 W power along with a container of water, and heating both until there is no subsequent change in the weight of the sample of pulp.
- the moisture analyser method: determine the moisture lost from 50 g of avocado pulp by weighing the sample then placing it into a moisture analyser which is present in many packhouses.

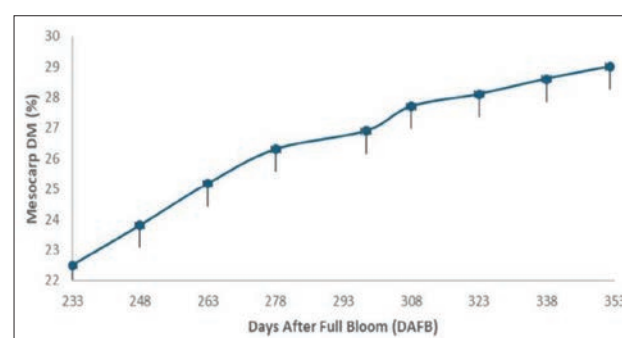
Of the three methods, samples subjected to the microwave method had lower DM content. For 'Lamb Hass', the standard error and therefore variance are higher for samples subjected to the oven drying method, raising doubts about its accuracy and reliability. Similarly for 'Hass', samples subjected to the moisture analyser method also had high standard error and variance. More tests will be done at different harvest maturities to validate the accuracy and reliability of these methods and determine which is the best to use.

Alternative maturity indices were also tested against DM content determination; specifically Total Soluble Solids (TSS) and pH. DM content was determined by freeze drying samples. As expected, DM content increases linearly over time and eventually begins to flatten off (Fig. 1). The minimum DM content required for harvesting is 27%, but in this study the fruit were deemed ready for harvest at 28.1% DM content (323 DAFB).

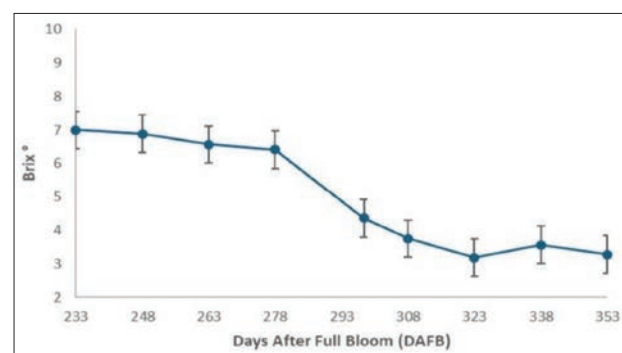
**Table 1. Results from the analyses of avocado pulp samples subjected to the three methods to determine DM content. Results are presented as mean  $\pm$  standard error, n = 10.**

| Cultivar  | Harvest period | Oven drying method | Microwave drying method | Moisture analyser method |
|-----------|----------------|--------------------|-------------------------|--------------------------|
| Hass      | H1             | 28.56 $\pm$ 0.89   | 27.25 $\pm$ 0.05        | 29.72 $\pm$ 2.77         |
| Lamb Hass | H1             | 29.16 $\pm$ 1.39   | 28.68 $\pm$ 0.49        | 29.71 $\pm$ 0.70         |
|           | H2             | 29.98 $\pm$ 1.21   | 28.96 $\pm$ 0.51        | 30.31 $\pm$ 0.68         |

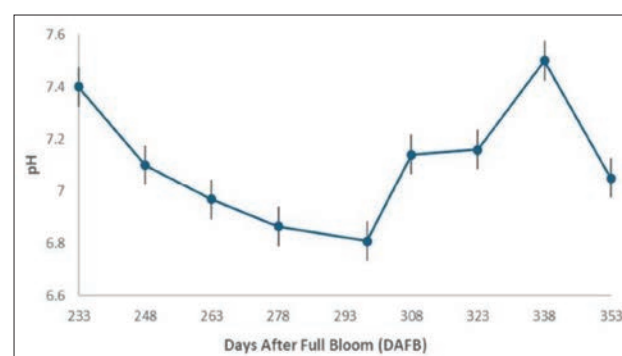
TSS decreased over time with fruit deemed ready for harvest at 3.18 Brix° (Fig. 2). Initially pH decreased over time but after 293 DAFB there were significant fluctuations in the pH values, indicating that pH should not be used. Potentially TSS can be an alternative measure of avocado maturity, but more testing will be done. ♦



**Figure 1. DM content of 'Lamb Hass' avocado mesocarp harvested at different days after full bloom (DAFB) for maturity indexing. Data presented as mean  $\pm$  standard error; n = 10.**



**Figure 2. TSS/Brix of 'Lamb Hass' avocado mesocarp harvested at different DAFB for maturity indexing. Data presented as mean  $\pm$  standard error; n = 10.**



**Figure 3. pH of 'Lamb Hass' avocado mesocarp harvested at different DAFB for maturity indexing. Data presented as mean  $\pm$  standard error; n = 10.**



# How to use traps more efficiently

Effective pest management is crucial for avocado growers especially for those aiming to export to new markets such as China, Japan, and India. Regular scouting not only helps in early detection and control of pests but also ensures compliance with phytosanitary requirements.

This article outlines practical scouting methods, thresholds, and actions to manage key pests in avocado orchards.

**Franco Stander**

SUBTROP

## Why scouting matters

**S**couting is the systematic monitoring of pest populations and damage levels in orchards. It enables growers to make informed decisions about pest control interventions, ensuring they are timely and cost-effective. Moreover, maintaining detailed scouting records is a prerequisite for exporting avocados to certain countries, as it demonstrates adherence to pest management protocols.

## KEY PESTS AND SCOUTING METHODS

### Fruit flies

- **Trap type:** Bucket traps (e.g. McPhail traps) baited with protein attractants.
- **Threshold:** 10–15 flies per trap per week.
- **Action:** If thresholds are exceeded, implement area-wide control measures, including bait sprays and sanitation practices.

### False codling moth (FCM)

- **Trap type:** Delta traps equipped with pheromone lures.

- **Threshold:** 2–3 moths per trap per week.
- **Action:** Exceeding thresholds necessitates targeted interventions such as the application of biological control agents or selective insecticides.

### Sucking bugs (including avocado bug)

- **Trap type:** No set trap – visual inspection
- **Threshold:** No fixed numerical threshold; action is based on observed fruit damage.
- **Action:** Spot treatments in areas where damage is evident, focusing on outbreak hotspots.

### Other insects

- **Trap type:** Sticky traps (yellow or white) and visual inspections.
- **Threshold:** No fixed numerical threshold; action is based on observed fruit damage.
- **Action:** Spot treatments in areas where damage is evident, focusing on outbreak hotspots.

## SCOUTING CALENDAR

Scouting should commence in July with the onset of flowering and continue weekly until May, coinciding with the end

Table 1. Scouting timing: A general guideline for pest activity and scouting focus during different phenological stages.

| Phenological stage | Months  | Fruit flies          | False codling moth   | Sucking bugs                                                         | Other insects        |
|--------------------|---------|----------------------|----------------------|----------------------------------------------------------------------|----------------------|
| Flowering          | Jul–Aug | Deploy bucket traps  | Deploy delta traps   | Inspect visually on a weekly basis for avocado bug                   | Install sticky traps |
| Fruit set          | Sep–Nov | Monitor traps weekly | Monitor traps weekly | Inspect visually on a weekly basis for avocado bug & early stink bug | Visual inspections   |
| Fruit development  | Dec–Feb | Intensify monitoring | Intensify monitoring | Inspect visually on a weekly basis for fruit damage                  | Assess fruit damage  |
| Harvest            | Mar–May | Maintain monitoring  | Maintain monitoring  | Final inspections                                                    | Final inspections    |

of the harvest season. Table 1 provides a general guideline for pest activity and scouting focus during different phenological stages.

SCOUTING TIPS

- Trap placement: Install traps at a height of approximately 1,5 m within the canopy, preferably on the cooler side of the tree to avoid direct sunlight.
- Trap density: Use one trap per 20 hectares for fruit flies and one trap per hectare for FCM.
- Monitoring frequency: Check traps weekly, recording the number and type of pests captured.
- Lure replacement: Replace protein baits and pheromone lures every 6–8 weeks, or as recommended by the manufacturer.
- Record keeping: Maintain detailed records of trap counts, dates, and locations. These records are essential for tracking pest trends and are required for export certification.

ACTION THRESHOLDS AND RESPONSES

- Fruit flies: If trap counts exceed 15 flies per week, implement area-wide control measures, including bait sprays and removal of fallen fruit to reduce breeding sites.
- False codling moth: Exceeding 3 moths per trap per week

indicates the need for targeted interventions, such as the application of biological control agents or selective insecticides.

- Sucking bugs: Since there are no fixed thresholds, action should be based on the presence of fruit damage. Spot treatments should be applied to affected areas to manage outbreaks effectively.

EXPORT COMPLIANCE

For growers aiming to export avocados to countries with stringent phytosanitary requirements, maintaining comprehensive scouting records is mandatory. These records demonstrate proactive pest management and are often reviewed during audits. Failure to provide adequate documentation can result in the rejection of export consignments. This is extremely important for new markets such as China and India.

CONCLUSION

Consistent and accurate scouting is vital for effective pest management in avocado orchards. By adhering to the outlined practices, growers can minimise pest-related losses and meet the phytosanitary standards required for export markets. Implementing these strategies will contribute to the sustainability and profitability of avocado production. ♦



(Source: Insect Science).



# The small fruit problem in 'Hass' avocado production

The occurrence of small fruits in 'Hass' avocado production has become a persistent challenge across many regions. These undersized fruits significantly reduce packout percentages and result in major financial losses due to unmarketable yields.

**Ulrich Koster**  
SUBTROP

**T**his article explores the underlying causes of the small fruit phenomenon and offers an integrated management approach; including pruning, irrigation, flower manipulation, and the use of plant growth regulators (PGRs) to minimise its occurrence and improve fruit size distribution.

In the competitive global avocado market, fruit size plays a pivotal role in profitability. Large-to-medium-sized fruit dominate consumer preference and command premium prices. In contrast, small fruit (typically below size count-22 in export markets) are often discarded or sold at a fraction of their value, if at all. The "small fruit problem" in dark-skinned cultivars such as Hass is thus not just an agronomic concern but an economic one (see *Loss factor Benchmark* later in the document).

## CAUSES OF SMALL FRUIT IN 'HASS' AVOCADO

Multiple interacting factors contribute to small fruit development, many of which are physiological responses to stress or

imbalance in tree management. Key causes include temperatures, excessive flowering and fruit set, poor pollination, fertilisation, nutritional imbalance, water stress, and light penetration and canopy management.

### Temperatures

During early fruit development, high temperatures can accelerate fruit drop and limit cell division, resulting in smaller fruit sizes. Additionally, elevated temperatures can decrease photosynthetic efficiency, reducing the energy available for fruit growth.

Protective measures against extreme weather can mitigate adverse effects, leading to improved fruit size and overall yield. For instance, fine gauze shields/netting can help protect against cold breezes (cold damage), wind damage, and hot evening sun on exposed young branches of a young tree. Overhead sprinklers, although used by very few growers, have also proved to be a good combatant against very high temperatures as well as help mitigate frost damage on cold nights/mornings.



### Excessive flowering and fruit set

Avocado trees, especially 'Hass', are known for their prolific flowering. When too many fruit set, resources are spread thinly, resulting in competition and a higher percentage of undersized fruit. Without adequate thinning or management, this leads to carbohydrate competition and energy shortages, resulting in undersized fruit. Excessive cropping also depletes tree reserves, weakening the following season's bloom - a trait of alternate bearing.

### Poor pollination and fertilisation

Inadequate cross-pollination or poor timing during flowering can produce parthenocarpic (seedless) or poorly seeded fruit, which tend to remain small. Temperatures below 12 °C can hinder pollination by reducing the overlap between male and female flower phases and slowing pollen tube growth, leading to poor fertilization. Conversely, temperatures exceeding 28 °C can cause floral abscission and reduce the viability of flowers, adversely affecting fruit set.

Boron is a vital micronutrient in avocado cultivation, significantly influencing pollen fertility and overall fruit set. Spraying boron directly onto developing inflorescences, especially at the early expansion stage, has been shown to increase the number of pollen tubes reaching the ovules and improve ovule viability.

### Nutritional imbalance

Poorly managed fertilization - particularly nitrogen, potassium, calcium, and boron - can impair fruit development.

- Boron is critical for cell division and elongation, affecting both fruit size and shape. It plays a critical role during flowering and fruit set, influencing pollen viability and fertilization success. Boron deficiency can lead to poor fruit set and smaller, misshapen fruits. However, boron must be managed carefully, as the range between deficiency and toxicity is narrow.
- Excess nitrogen, particularly in low crop years, promotes vegetative growth at the expense of fruit development. This imbalance can result in smaller fruit sizes and reduced yields. Excessive nitrogen can also lead to internal fruit disorders, such as grey pulp and increased susceptibility to postharvest rot.
- Potassium plays a significant role in fruit development, influencing fruit size, taste, and shelf life. Adequate potassium levels are essential for the accumulation of sugars and other solutes in the fruit, contributing to cell expansion and overall fruit growth. However, an imbalance, either deficiency or excess, can adversely affect fruit quality.
- Calcium is crucial for cell wall formation and stability, impacting fruit firmness and resistance to physiological disorders. Adequate calcium during the early stages of fruit development ensures strong cell walls, which are essential to fruit size and quality. Deficiencies can lead to weaker cell structures, resulting in smaller fruit.

Regular soil and leaf analyses, along with tailored fertilization programmes, can help maintain the appropriate levels of N, K, Ca, and B, thereby mitigating the small fruit problem.

### Water stress

Inadequate or inconsistent irrigation, particularly during

critical growth phases, leads to fruit abortion or reduced cell expansion. During flowering and fruit set, consistent soil moisture is crucial, as water deficits at this time can lead to poor pollination, reduced pollen viability, and increased fruitlet abscission. Water stress during this period can cause premature fruit drop and negatively affect yields. During early fruit development, fruit set involves rapid cell division and expansion. Water stress can reduce sap flow to the fruit, leading to decreased fruit volume and size.

### Light penetration and canopy management

Dense, unpruned canopies reduce light availability, particularly in the tree interior. Shaded limbs contribute to poor bud development and small fruit due to reduced photosynthesis and carbohydrate flow. Over time, inner canopy dieback leads to fruit being set farther from the main stem, increasing the energy cost of fruit development.

### MANAGEMENT STRATEGIES TO REDUCE SMALL FRUIT

Effective management requires a holistic approach. Key interventions include the following:

#### Pruning and canopy management

Regular pruning improves light distribution, enhances flower bud initiation, and reduces fruit positioned too far from the nutrient transport system. Younger branches have more efficient "food transport" for avocados, thus younger bearing branches have larger fruit than older branches.

Regular thinning of crowded branches encourages stronger shoots and better allocation of carbohydrates to fewer, well-positioned fruit.

#### Flower thinning and fruit load management

Selective removal of early flowers can reduce fruit set density, allowing the remaining fruit to size better.

Strategic thinning e.g., early-season hand thinning when fruit are pigeon egg sized involving removal of unwanted fruit like severely sunburnt fruit, insect, wind and mechanical damaged fruit, prevents carbohydrate drain and focuses tree energy on fewer fruit.

#### Plant growth regulators (PGRs)

Sunny® (Uniconazole): Applied during the latter part of flowering, Sunny has shown positive effects on fruit size in healthy, vigorous trees. It should not be used on trees with clear and strong signs of Phytophthora root rot, as it may exacerbate stress and yield losses.

#### Irrigation management

Consistent, well-timed irrigation is vital, especially during fruit set and early growth stages (spring to early summer). Please refer to SAAGA irrigation guidelines on the [SAAGA website](#) and/or Avocado MIBs.

Use of soil moisture monitoring and evapotranspiration-based scheduling can optimise water availability.

#### Nutrient management

Balanced fertilization, particularly during flowering and early

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## The small fruit problem in 'Hass' avocado production

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fruit growth, is essential as it directly affects fruit size, tree reserves, and alternate bearing cycles. A robust supply of N, K, Ca, S, and P supports fruit development, especially during the fruit swelling and postharvest periods. Please refer to grower MIBs and consultant recommendations.

Focus on: (also refer to *SAAGA norms*)

- **Nitrogen:** Avoid excess post-fruit set to prevent vegetative dominance. Excessive nitrogen in low crop years leads to overly vigorous trees, because excessive amounts can divert resources away from fruit development, resulting in smaller fruit. Conversely, insufficient nitrogen in high crop years contributes to small fruit and depleted reserves. Late summer nitrogen applications are important for starch build-up before flowering.

- **Potassium:** Supports fruit size and quality.

- **Calcium and boron:** Important for cell division and fruit structure.

**Boron:** Crucial for cell division, boron must be applied carefully due to its narrow window between sufficiency and toxicity. Avoid toxicity by evenly spreading applications, mixing with other fertilizers or sand, and using mulch. Soil applications are more effective than foliar sprays. Deficiencies can lead to poor fruit development and deformities. Adequate boron levels in avocado flowers are positively correlated with increased pollen germination rates and pollen tube growth, leading to improved fruit set.

**Calcium:** Calcium is vital during the early stages of fruit development, especially within the first 6–8 weeks after fruit set. Adequate calcium levels contribute to cell wall strength and overall fruit quality. Insufficient calcium during this critical period can lead to smaller fruit sizes and increased susceptibility to postharvest disorders.

- **Zinc:** Plays a role in auxin production, influencing cell divi-

sion and expansion. Zinc deficiencies are associated with smaller, misshapen fruit.

### ECONOMIC IMPACT OF SMALL FRUIT

The economic cost of small fruit is twofold:

- direct loss of income due to unmarketable or low-value fruit;
- increased harvesting and sorting costs for minimal return.

For example, in export-driven systems, fruit smaller than size 26 may be excluded from cartons entirely. In some seasons, small fruit can account for over 20% of total yield – representing a significant waste of production inputs.

For growers operating on thin margins, a single season with excessive small fruit can risk profitability.

Adapted from the SAAGA Loss factor Benchmark:

**Small fruit** in 'Hass' accounted for 15,83% of the loss factor distribution across all avocado-producing regions in SA surveyed, which means these fruits were not being packed for grade 1 or 2 but were sent for processing, resulting in a loss to all industry stakeholders. For 2024 the 'Loss % of Total Crop by Season' was 5% for small fruit of 11 709,621 tonnes (total loss 2024) which accounts for 58 548 105 tonnes.

### CONCLUSION

The small fruit problem in 'Hass' avocado production is complex but manageable. It stems from physiological stress, marginal management of crop load, poor light penetration, and environmental imbalances. Through an integrated approach involving canopy management, targeted flower and fruit thinning, precise PGR use, balanced nutrition, and soil moisture control, growers can significantly improve their fruit size profile and profitability. Investing in these practices is not just about maximising yield – it is about ensuring that what is harvested meets market standards and contributes positively to the grower's bottom line. ✦





# Mango cultivar evaluation days

The past season was upon everyone without much warning: fruit started to ripen quicker than expected and this resulted in a much earlier season than was initially anticipated.

**André Botha**  
SUBTROP

This was also the case with the SAMGA / ARC mango breeding programme and the timing of the evaluations had to be moved forward so as not to miss any promising selections. Cultivar days were held in Hoedspruit (6 February 2025), Malelane (30 January 2025), and Clanwilliam (26 March 2025). In Letaba, the selections that did bear fruit were evaluated individually.

A lot of new promising selections were identified out of the Phase I blocks on Mohlatsi in Hoedspruit.

We are still hoping for a promising early selection out of the programme, but in this season only mid-season to late season selections have been identified that could have a future in the industry, especially in the later areas.

There is a lot of excitement and interest for A4-N1 and B2-

C38, as these two selections show great promise being a bit later in season than 'Keitt'. All the data will be presented at the SAMGA symposium on 24 July 2025. ♦



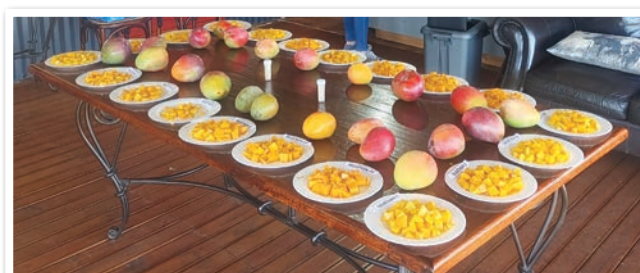
A mid- to late season selection.



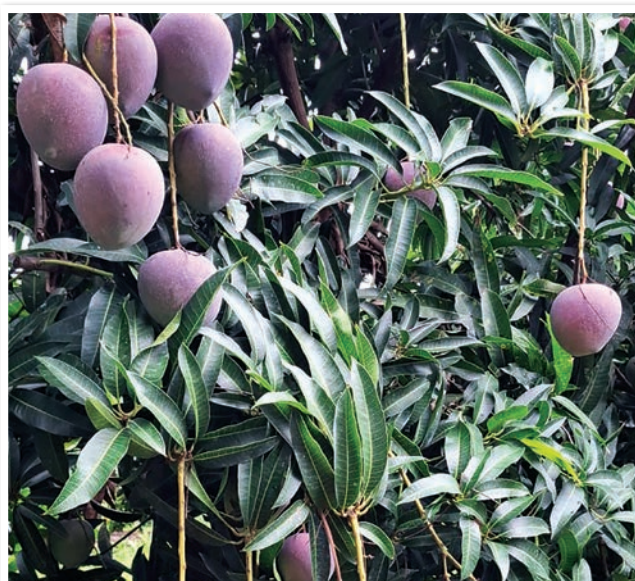
Promising selection A4-N1.



Cultivar evaluation day at Malelane.



The evaluation at Clanwilliam on 26 March 2025.



Promising selection B2-C38.



# Mango pests and diseases – an overview

Pre- and postharvest diseases are some of the main factors affecting mango production all over the world. The intensive use of fungicides has resulted in serious problems of resistance against commercial fungicides. Fruit susceptibility to postharvest diseases during storage is related to the decrease in concentration of the preformed antifungal 5-substituted resorcinols present in the peel of mango fruit.

**André Botha**  
SUBTROP

Several pests, diseases, and disorders have been recorded on various mango varieties, ultimately resulting in severe losses to all mango producing areas of the world. Approximately 260 major and minor pest species have been recorded from seedlings to mature trees. This includes the postharvest stages. Diseases recorded worldwide consist of 52 fungal, 3 bacterial, and 3 plant parasitic nematodes on the mango tree and fruit.

Anthraxnose is the most important disease in all mango producing areas worldwide. Some growers have experienced problems controlling this disease with fungicides not providing acceptable levels of control from flowering to postharvest. Anthraxnose is best controlled by a combination of preventative measures, field fungicide sprays, and

postharvest treatments with fludioxonil, for example, in the packhouse.

Worldwide restrictions on chemicals and reduced MRLs continue to put enormous pressure on growers to cultivate an acceptable end product. There seems to be a public shift towards non-chemical strategies in protecting trees and fruit from pest and diseases.

Other diseases of importance include the following: powdery mildew (*Oidium mangiferae*), malformation (*Fusarium* spp.), bacterial black spot, and blossom blight.

Harmonising efforts at every mango management level as well as combining different approaches are necessary to control and mitigate the destructive effects of pests and diseases on mango production worldwide. Strict quarantine and regulatory measures should be enforced at entry points of countries in which mango is produced to prevent the introduction of new pests

and diseases. This can be achieved by collaboration between Government and the Mango Growers' Association.

At a farm level, mango growers should be trained to adopt good agricultural practices that include integrated pest and disease management, reduction in the use of chemicals, and the implementation of a good monitoring and surveillance system. In addition, coordinated research, development, and innovation efforts should be implemented to find effective responses and proper management approaches to the extant pests and diseases and be prepared for new threats.

Although chemical management of mango pests and diseases is widespread, non-chemical measures such as the selection of disease and pest tolerant/resistant varieties are most desirable. The development of those varieties can be made through conventional breeding and selection programmes and empirical selections made by growers, but also, in recent years by biotechnological approaches. Ideally, effective mango pest and disease management will involve a holistic combination of management approaches.

Significant advances have been made in the last decades in optimising the control of different pests and diseases combining chemical, biological, and management approaches. However, new pests and diseases are constantly appearing in different countries and globalisation is helping the spread of pests and diseases to new areas. Consequently, internationally coordinated efforts are required to optimise



**Anthraxnose on mango fruit.**



Powdery mildew on mango flowers.

pest and disease control along different areas and lines of research.

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## Targeted Phytophthora injections in October: Focusing on sick trees

**Mukondeleli Munzhedzi**

SUBTROP

In many South African avocado orchards, *Phytophthora cinnamomi* continues to be a serious root pathogen, attacking feeder roots leading to canopy decline, poor yields, and, in severe cases, tree death. While preventative measures remain the foundation of disease control, October presents a vital opportunity to carry out curative phosphonate stem injections on sick or declining trees, especially as spring growth reaches its peak.

By October, avocado trees are in active spring root flush, developing new feeder roots essential for nutrient and water uptake. This period of high physiological activity allows for better absorption and translocation of phosphonates throughout the tree's vascular system. For trees already showing symptoms of stress or decline, this moment can be decisive. An injection in this period helps deliver the active ingredient to where it is most needed: the developing root system under attack from the pathogen.

Unlike blanket injections done across the entire orchard, focusing only on visibly affected trees ensures that time and resources are directed efficiently to where the disease pressure is highest.

Only trees showing early to moderate decline should be injected in October. Watch for the following symptoms:

- reduced leaf size or pale foliage,
- thin canopy or excessive fruit drop,
- poor spring shoot flush,

- wilting under mild water stress, and
- dark, brittle or missing feeder roots (if root inspection is possible).

It is important, however, to avoid injecting trees that are already too far gone. Completely defoliated trees, or those severely stressed by drought or other factors, are unlikely to respond well to treatment. These trees may not absorb the injected chemical effectively, and the treatment could result in further damage.

Once appropriate trees are selected, the injection process must be carried out with care and registered phosphonate products should be used.

Injection alone will not reverse decline unless other limiting factors are addressed. Trees recovering from *Phytophthora* require careful aftercare to re-establish a healthy root system. Good practices include managing irrigation to avoid waterlogging, applying a coarse organic mulch around the drip line to support microbial activity, and avoiding further root disturbance. Balanced nutrition, especially with trace elements like zinc and boron, can also support canopy recovery.

October is a critical window for intervening in the health trajectory of declining trees. When *Phytophthora* symptoms are caught early and addressed promptly with targeted phosphonate injections, even compromised trees can be brought back into production. For growers facing increasing disease pressure, this focused and practical approach remains one of the most effective tools available.



# Pest control officers: What every grower needs to know

The responsible use of pesticides is critical in modern agriculture, not only to ensure effective pest control but to protect human health, the environment, and comply with export market requirements. With this in mind, the South African government has implemented strict regulations around the handling of certain agricultural remedies, especially those classified as “restricted.” For growers, this means understanding when the grower or staff need to be registered as a Pest Control Operator (PCO), and what this registration entails.

**Franco Stander**  
SUBTROP

## What is a Restricted Agricultural Remedy?

The Regulations Relating to Agricultural Remedies (25 August 2023) define a “restricted agricultural remedy” as one that, due to human health or environmental concerns, must include extra label information on its use, display, distribution, or who may use it. These remedies must meet the following criteria:

- Criterion 1: Falls under WHO Hazard Class 1a or 1b.
- Criterion 2: Falls under GHS acute toxicity categories 1 or 2.
- Criterion 3: Listed in Annex III of the Rotterdam Convention.
- Criterion 4: Linked to severe or irreversible harm to human health or the environment.

## Who may purchase and apply these products?

Only registered Pest Control Operators may legally purchase and apply restricted agricultural remedies. This includes farm managers, employees, or crop advisors. Anyone who mixes or sprays these products must be certified or directly supervised by someone who is.

It is important to note that if a farm does not use restricted products, there is no legal requirement to register as a PCO. However, if a grower uses restricted remedies, even occasionally, at least one person on the farm must be registered. That person must be physically present during application to supervise or apply the product themselves.

## What is a PCO?

A Pest Control Operator is a person registered under Act 36 of 1947 to administer agricultural remedies for their intended use. PCOs are trained to safely store, handle, mix, and apply these products. Registration ensures that users understand the risks and follow the correct safety protocols.

PCOs are registered in specific fields, such as agriculture and forestry, fumigation, or structural pest control. The registration field must match the use listed on the pesticide label. For example, if a remedy is registered for agricultural use, the PCO registration must be in the field of “agriculture and forestry”.

Table 1 lists possible restricted chemicals in avocado, litchi, and mango that may require PCO supervision or registration

due to toxicity concerns.

## How to become a PCO

There are two main pathways to become a PCO:

### For applicants without a tertiary qualification:

- Complete an accredited pest control course; it must be AgriSETA, SAQA, or QCTO approved.
- Gain 6 to 12 months of supervised practical experience under a registered PCO. Submit an application to the Department of Agriculture (DOA), along with proof of training, experience, a medical report, and a registration fee (currently R2 986).

### For applicants with a relevant diploma or degree:

- If the applicant has a tertiary qualification in a biological field (e.g., entomology, crop protection, or plant pathology), he/she may be exempt from the course and/or the supervised experience.
- The applicant's prior experience must be documented in a sworn affidavit, and DOA may decide if the exemption applies.

## Why does it matters?

Beyond legal compliance, PCO registration is a vital part of sustainable agriculture. Improper use of toxic remedies can harm workers, consumers, and export reputation. South Africa's export partners demand evidence of responsible pesticide use. By following PCO regulations, the grower protects his/her farm, people, and market access. 💎

**Table 1. Products that are declared a restricted chemical.**

| Crop    | Chemical         | Product name(s)          | Target pest/disease |
|---------|------------------|--------------------------|---------------------|
| Avocado | Abamectin        | AgriSec Gold             | Thrips              |
| Avocado | Diquat dibromide | Parody 200 SL, Preeglone | Herbicide           |
| Avocado | Paraquat         | Multiple products        | Herbicide           |
| Litchi  | Cadusafos        | Rugby 10G, Rugby 10ME    | Nematodes           |
| Litchi  | Chloropicrin     | Pic Plus, Tri-Form 60    | Herbicide           |
| Litchi  | Fenamiphos       | Nemacur 100GR            | Nematodes           |
| Mango   | Paraquat         | Multiple products        | Herbicide           |



# Copper sprays for pre-harvest control of avocado fungal fruit diseases

Fungal diseases remain one of the most persistent and damaging challenges in avocado production. Copper fungicides are widely used in avocado orchards for their broad-spectrum efficacy against a range of fungal pathogens.

**Mukondeleli Munzhedzi**  
SUBTROP

As protectant fungicides, copper products work by forming a thin layer on the plant's surface, which inhibits the germination and development of fungal spores. In South Africa, copper remains the most used pre-harvest fungicide in avocados, largely because of its proven effectiveness.

Among the fungal diseases threatening avocado production, *Cercospora* spot (*Pseudocercospora purpurea*) has emerged as the most significant pre-harvest target of copper fungicide programmes. Copper sprays are also effective in controlling other critical pathogens such as anthracnose and pepper spot (*Colletotrichum gloeosporioides*), and stem-end rot (caused by a complex of fungi). These diseases often establish in the orchard and only manifest during ripening, making early and consistent protection to reduce postharvest losses necessary.

A key factor in the success of copper programmes is the correct timing of the first spray. One of the most useful tools to guide this decision is the Z-factor, a weather-based risk index developed to signal conditions favourable for infection. The model is used to predict the number of *Pseudocercospora purpurea* conidia. It uses an arbitrary Z value which tells the grower when to apply the first spray copper.

$$Z = -58.99 - 3.22X + 0.18Y$$

Where: Z = conidia number, X = mean weekly air temperature using daily (min+max)/2, Y = total weekly rainfall (mm).

According to this formula, spore release occurs when  $Z > 0$ . *Cercospora* infection takes place when Z value is  $\geq 15$  and fruit are larger than pigeon egg size. The first copper spray should be applied when fruit are bigger than pigeon egg size and the Z value  $> 5$ . The potential for *Cercospora* spot infection is high when  $Z > 20$ .

*Cercospora* spot development on avocados is highly de-

pendent on temperature and moisture conditions, particularly rainfall and leaf wetness. The optimal temperature range for spore germination, fungal growth, and infection lies between 22 °C and 28 °C, with little to no activity occurring below 15 °C or above 30 – 32 °C.

For infection to occur, leaf surfaces must remain wet for an extended period, typically 8 to 12 hours, which is often the result of rainfall, heavy dew, or overhead irrigation. As little as 1 mm of rain can trigger infection risk by facilitating spore splash and sustaining leaf wetness, while 5 - 10 mm of rainfall over several days creates ideal conditions for disease spread. Under these warm and moist conditions, infection risk is high, and monitoring or preventative treatments may be necessary. Conversely, cool, dry, or excessively hot weather generally suppresses disease development.

After the initial spray, subsequent applications are generally repeated every 28 days, though intervals may be shortened slightly during peak wet periods or high disease risk windows. Copper fungicides are protectants, not curatives. This means they must be applied before infection occurs, as they cannot eradicate existing infections.

The protective barrier formed by copper particles remains effective for a limited time. Fruit growth, rainfall, wind, and mechanical handling all reduce the persistence of the copper layer, exposing fresh tissue to potential infection. The total number of applications required can vary by cultivar and regional conditions. For example, 'Fuerte' generally benefits from four applications over the season, while 'Hass' often requires only two.

In summary, copper fungicides remain a cornerstone of effective pre-harvest disease control in avocado production. When applied strategically, based on cultivar, crop stage, and known fungal disease load from previous seasons and guided by weather-based tools like the Z-factor, copper sprays can significantly reduce the incidence of key fungal diseases such as *Cercospora* spot, pepper spot, anthracnose and stem-end rot. 🌱



# From Asia to Africa: how four litchi cultivars are adapting and performing under South African conditions

Litchi (*Litchi chinensis* Sonn.), a tropical to subtropical evergreen fruit tree belonging to the Sapindaceae family, has been cultivated for over 2 000 years, with origins tracing back to Southern China and Northern Vietnam (Menzel & Waite, 2005). Historically highly prized in Chinese imperial courts, litchi has evolved into a commercially significant fruit crop, with global production exceeding 3,8 million tonnes annually (FAO, 2023). Cultivation is now spread across more than 20 countries, including China, India, Vietnam, Thailand, Brazil, Mexico, Australia, and South Africa.

**Andani Mmboyi, Regina Cronje, Elliosha Hajari and Pabalelo Mothoa**

ARC-TROPICAL AND SUBTROPICAL CROPS

**A**lthough South Africa contributes only a small percentage to global litchi production, it plays a vital role in supplying premium-quality litchis to European markets. Key production areas include Mpumalanga, Limpopo, and KwaZulu-Natal, where subtropical conditions, such as warm, humid summers and cool winters, are ideal for litchi cultivation. The harvest season extends from mid-October for 'Early Delight' to mid-February for 'Wai Chee', with regional peaks dependent on altitude and varietal selection.

Historically, South African orchards have been dominated by the Mauritius cultivar due to its reliability and market familiarity. However, evolving market demands and the need for improved quality, earlier, later or staggered harvesting,

and enhanced fruit attributes have led to the introduction of new cultivars.

Among the expanding portfolio of litchi cultivars evaluated under South African growing conditions, 'Hung Long' (Fig. 1a), 'Chakrapad' (Fig. 1b), 'Shuijinqui' (Fig. 1c), and 'Maguli' (Fig. 1d) are emerging as promising alternatives to traditional varieties. These cultivars, each originating from distinct breeding backgrounds, exhibit a range of unique morphological and phenological traits including aril texture, flavour profile, skin characteristics, and growth habit that may enhance both production efficiency and market diversification.

In this article, we explore the distinct phenological development patterns and climatic adaptability of these four cultivars, offering insights into their potential roles in advancing varietal innovation within South Africa's subtropical fruit sector.

## A closer look at the cultivars

'Hung Long' is an early-mid maturing cultivar, originating from Vietnam (Fig. 1a). This cultivar is as vigorous as 'Mauritius' with a rounded canopy. It produces fruit (24 g to 26 g) with a mildly sweet flavour, a floral aroma, and pinkish-red skin. Its milky white flesh contains a total soluble solids (TSS) content around 17%, making it suitable for fresh consumption. In Mpumalanga, 'Hung Long' responds well to warm, humid conditions. It is a high-yielding cultivar with low chilling requirements, making it well-suited for regions with mild winters.

'Chakrapad' is a mid-season cultivar (Fig. 1b), maturing about one week later than 'Mauritius'. This Thai cultivar is valued for its well-balanced sweetness and acidity, which gives the fruit (22 g to 28 g) a refreshing flavour profile. It features a deep red, spiky-textured skin and opaque white flesh with TSS ranging from 16% to 18%. While seed size is variable, most fruit exhibit chicken tongue seeds.



**Figure 1. Fruit appearance of the four evaluated litchi cultivars: (a) 'Hung Long', (b) 'Chakrapad', (c) 'Shuijinqui', and (d) 'Maguli'.**



# New research investigates factors leading to SO<sub>2</sub> residue exceedances in litchi fruit

The South African litchi fruit industry has effectively utilised postharvest application of sulphur dioxide (SO<sub>2</sub>) to meet export standards. Over the years, SO<sub>2</sub> fumigation, with or without acid dip, and modified atmosphere packaging have successfully preserved the quality and shelf life of litchi fruit. Despite these advancements, the industry continues to encounter challenges related to SO<sub>2</sub> residues and exceeding Maximum Residue Limits (MRLs).

**Lucia Ntsoane, Sihle Mavunge, Regina Cronje and Elliosha Hajari**

ARC-TROPICAL AND SUBTROPICAL CROPS

In South Africa, the acceptable MRL for litchi fruit aril is 55 mg/kg prior to export. This standard is in place to meet the stringent requirements of the European Union (EU) market, which has set an even lower MRL of 10 mg/kg. During the 2023/24 litchi season, some packhouses reported exceeding SO<sub>2</sub> MRLs, leading to fruit rejection and significant financial implications.

This has had a negative impact on the country's export market. Therefore, a postharvest trial was conducted during the 2024/25 season to investigate factors contributing to the SO<sub>2</sub> residues and MRL exceedances focusing on evaluating the effectiveness of various sulphur products to maintain reliable concentrations during fumigation.

The results indicated that granular sulphur products from various suppliers produced slightly higher concentrations of SO<sub>2</sub> (ranging from 725 to 1203 ppm), compared to powder products (ranging from 820 to 855 ppm). These findings

»» TO PAGE 32

## From Asia to Africa: how four litchi cultivars are adapting and performing under South African conditions

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'Chakrapad' trees are moderately vigorous with an upright growth habit and are capable of producing high yields under proper management. As a cultivar with low chilling requirements, it performs consistently well in both Mbombela and the Letaba area.

'Shuijinqui', a late maturing cultivar, was originally developed in China (Fig. 1c). The Chinese name means "crystal ball" alluding to its translucent crispy white flesh, with an exceptionally sweet, floral-flavoured aril. The fruit (29 g to 32 g) is enclosed in a smooth, bright red skin and has a TSS content ranging from 18% to 20%, making it highly suitable for fresh consumption due to its delicate texture and flavour.

'Shuijinqui' has a range of small- to medium-sized seeds. This cultivar displays moderate tree vigour and a spreading canopy. As a high-chill requirement cultivar, it performs well in cooler areas like Mbombela, showing consistently good fruit set. In Letaba, it demonstrates moderate adaptability, and frost protection may be necessary in colder microclimates.

'Maguli', developed in China, stands out for its rich, fragrant aroma, sweetness and high sugar content (TSS 19% to 21%) (Fig. 1d). It has a thick, leathery yellowish to red skin and creamy white flesh. The tree is slow-growing with a compact canopy and has leaves with prominent ripped veins. Although yields are generally lower than other cultivars, the

fruit quality is exceptional, producing large, premium fruits (25 g to 29 g).

In addition, 'Maguli' is late-maturing, providing the opportunity to extend the harvesting season. This cultivar is a high-chill requirement cultivar that requires prolonged exposure to low winter temperatures for uniform floral induction and optimal fruit set.

### Conclusion

As new litchi varieties become more important to the industry, the characteristics of 'Hung Long', 'Chakrapad', 'Shuijinqui', and 'Maguli' suggest they could be valuable additions to South Africa's litchi sector. Their good performance across key regions shows potential for broadening the available cultivar range, supporting diversity in production, and offering premium fruit quality for discerning customers.

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## New research investigates factors leading to SO<sub>2</sub> residue exceedances in litchi fruit

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underscore the significance of understanding the sulphur product content, which will play a major role in optimising the SO<sub>2</sub> fumigation protocol. Additionally, the trial aimed to investigate the impact of postharvest treatments on the levels of SO<sub>2</sub> residues in litchi fruit grown in Malelane.

The findings (Fig. 1) revealed that the SO<sub>2</sub> residues in the 'Mauritius' fruit aril decreased over time during storage and varied depending on the postharvest treatments applied. Notably, by day 3, the residues were below the acceptable MRL of 55 mg/kg in all samples. Interestingly, fruit treated with standardised commercial SO<sub>2</sub> fumigation and acid dip treatments (T4: SO<sub>2</sub> + Acid + MAP; T3: SO<sub>2</sub> + Acid + Carton) exhibited higher SO<sub>2</sub> residues in the fruit aril compared to T2: SO<sub>2</sub> + MAP and T1: SO<sub>2</sub> + Carton, respectively.

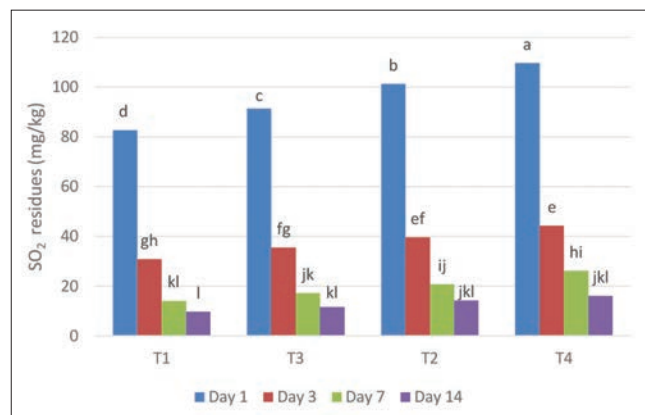
Furthermore, the trial assessed the impact of different packaging types used for sampling of fruit for SO<sub>2</sub> residue analysis and the discrepancies observed across various laboratories. Observations in Figure 2 indicated that non-perforated bags (thickness: ~ 40-micron, provided by PPECB) resulted in higher SO<sub>2</sub> residues compared to perforated bags (thickness: ~ 15-micron, vegetable bags with perforation) across all the three laboratories.

This discrepancy was attributed to the non-perforated bags trapping water vapour, leading to high relative humidity and slower dissipation of SO<sub>2</sub>. In contrast, perforated bags facilitated quicker dissipation of SO<sub>2</sub>, resulting in reduced residues in all the laboratory results. It is important to note that the size of perforations in the bags may have led to excessive dissipation of SO<sub>2</sub> compared to commercial packaging such as modified atmosphere packaging (MAP).

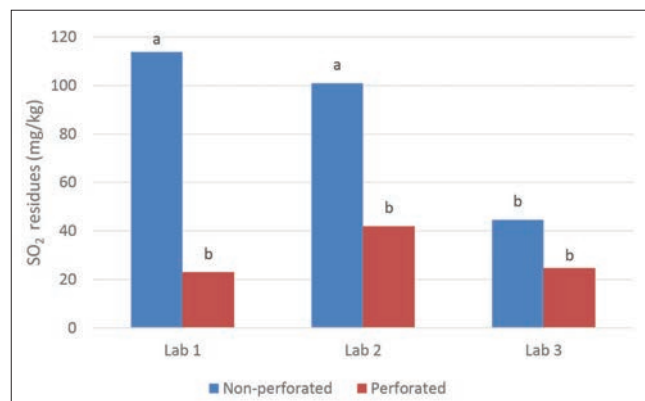
The variations in SO<sub>2</sub> residue results among laboratories could be attributed to factors such as sample preparation, laboratory analysis techniques, and pre-analysis storage conditions. These findings emphasise the significance of using appropriate sampling bags for SO<sub>2</sub> residue analysis to mimic the commercial situation, whether fruit are packed in ventilated boxes for the EU or in micro-perforated MAP bags combined with ventilated boxes for the USA market.

### Conclusion

- Improvement of the SO<sub>2</sub> fumigation protocol focusing on optimisation of sulphur products utilised, fumigation duration, chamber/tent size, and packhouse practices such as acid dipping and drying duration. This protocol should



**Figure 1.** SO<sub>2</sub> residues in the aril of 'Mauritius' fruit following various postharvest treatments (T1: SO<sub>2</sub> + Carton; T2: SO<sub>2</sub> + MAP; T3: SO<sub>2</sub> + Acid + Carton and T4: SO<sub>2</sub> + Acid + MAP) and storage durations of 1, 3, 7, and 14 days.



**Figure 2.** SO<sub>2</sub> residues in the aril of 'Early Delight' fruit subjected to commercial treatment (SO<sub>2</sub> + Acid), analysed after 3 days.

be tailored for specific fruit maturity, cultivar, and climate conditions (particularly considering climate change).

- Improvement of the SO<sub>2</sub> residues sampling protocol is essential in order to accurately mimic commercial conditions. Samples should be analysed in accredited laboratories to reduce discrepancies.
- Considering the challenges associated with SO<sub>2</sub> residues, it is imperative that research shifts its focus towards exploring alternative solutions to preserve the quality and extend the shelf life of litchi fruit. ♦





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