



HORTGRO SCIENCE

Annual Report 2023



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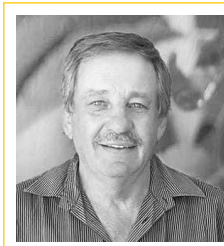
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Hortgro Science

ADVISORY COUNCIL



**STEPHEN
RABE**
Chairman



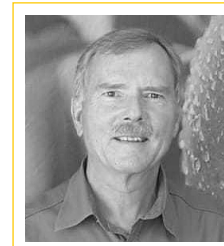
**GRANT
SMUTS**
Vice Chairman



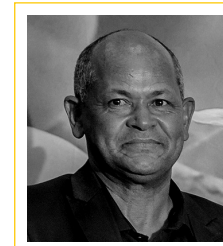
**LINDE
DU TOIT**



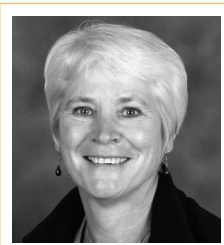
**FRIKKIE
JACOBS**



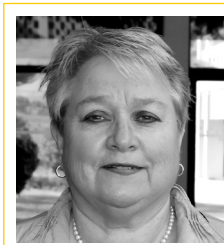
**CHARL
STANDER**



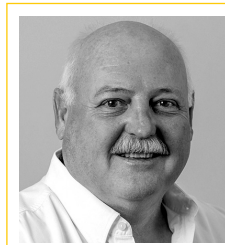
**RAYMOND
KOOPSTAD**



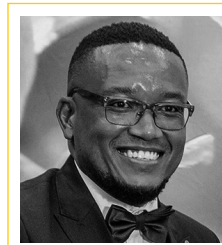
**PROF KAREN
THERON**



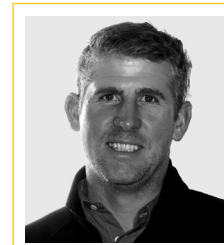
**DR ILZE
TRAUTMANN**



ANTON RABE
Non-voting,
ex-officio member



**DIBESHO
SERAGE**
Observer



**JAMES
HUTTON-
SQUIRE**
Observer



**GERRIT VAN
DER MERWE**
Observer

Chairman's report

STEPHEN RABE

Hortgro Science Chairman

Where did that one go? Another year ticked off. What has stood out for me, from a grower's perspective, was the quantity of hail damaged fruit in harvest 2023, the September storm experienced in the Western Cape and its permanent scars on the mountains surrounding us, the localised snow event in the Eastern Free State, all extreme weather events aptly described in climate change literature. We are indeed facing changing circumstances that need future planning and mitigating initiatives. It makes me more aware of the work Hortgro Science together with the Western Cape Department of Agriculture are funding and doing. Prof S Midgley and team completed a draft final Climate Change Strategy for the Deciduous Fruit Industry. The document was reviewed by Hortgro management, and the final version will be shared with the Hortgro board and producer councils. Arising out of this we will need to generate practical action plans that mitigate the impact of these extreme events on our industry going forward.

In my opinion, one of the key measures of research success, is the transfer of relevant practical research results to the levy paying producer. With this in mind, the biennial Pome and Stone Fruit Research Showcase and Post Harvest Symposium was created. It was held in June 2023 and the following feedback was received from a respected technical advisor:

"I am sending this email to congratulate Hortgro Science on today's research showcase event. I found the topics relevant, the content valuable and the research generally high quality and important to industry. I think the above mentioned is, at least partly, a result of industry-inclusive (through many committees and PWG's) management processes well implemented and run by the Hortgro Science team and leadership. It gives me great comfort to know that the sometimes-scarce research levies are well managed and allocated with positive outcomes."

I am indeed indebted to this individual for echoing what I believe we are achieving following our inclusive, transparent management of industry research funds.

And once again my heartfelt thanks to all those involved in directing, managing, and measuring our success as Hortgro Science. You know who you are. In a country where service delivery is so often missing, what you do for us, the levy paying producer, is service delivery par excellence.

Stephen

General Manager's report

WIEHANN STEYN

Hortgro Science General Manager

GOVERNANCE AND FUNDING

Hortgro Science is guided in its strategies and operations by the Hortgro Science Advisory Council that reports to the Hortgro Board and the Pome and Stone Producer Councils. The Hortgro Science Advisory Council members are Stephen Rabe (Chairman), Grant Smuts (Vice-chair), Linde du Toit, Frikkie Jacobs, Charl Stander, Raymond Koopstad, Prof Karen Theron and Dr Ilze Trautmann. Anton Rabe (Hortgro executive director) is a non-voting, ex-officio member. Three young growers participating in the Hortgro industry leadership programme, James Hutton-Squire, Dibesho Serage and Gerrit van der Merwe, were invited to attend council meetings as observers.

To increase the competitiveness of South African deciduous fruit farming, research and development align with a strong efficiency drive throughout the entire value chain, address key risks to the sustainability of the industry, and provide information to access, develop and maintain export and local markets. Research and development are focused and capacity and infrastructure clustered within the following areas: Market access and management of phytosanitary and invasive pests and diseases, production

efficiency (volume of exportable fruit per unit area) through use of rootstocks, technology and data systems, climate change mitigation and water productivity, plant material quality and availability, and the maintenance of postharvest quality and reducing risk throughout the value chain.

Research questions are identified through 13 research workgroups. The industry remains indebted to the 200 odd individuals who participate in these workgroups. The research questions form the basis of the new project proposals submitted to Hortgro and evaluated by four peer workgroups and three technical advisory committees for, respectively, scientific merit and industry relevance. The workgroups and advisory committees also review the progress and final reports of each of the research projects funded by the pome and stone fruit industry. In addition, the technical advisory committees advise Hortgro Science on the dissemination of results to industry.

The leverage of external funding and access to government funding remains a challenge. Hortgro is currently co-funding two projects with the Water Research Commission (WRC) while we are also participating in the fifth round of the Postharvest Innovation Fund co-funded by the Department of Science and Innovation and administrated by the Fresh Produce Exporter's Forum. Sixteen research facilities and private researchers were utilized to conduct 121 research projects during 2022/23 with 41% of the project budget being spent at seven departments of Stellenbosch University. We have observed an increase in multidisciplinary projects and a broadening of the research scope in alignment with our research strategy.

The first phytosanitary trials have commenced in the Phytosanitary Facility (PHYLA) at Welgevallen Experimental Farm of Stellenbosch University under management of Dr Renate Smit, PHYLA manager and phytosanitary researcher. Dr Nanike Esterhuizen was appointed as entomology technician to support the research programme of Hortgro entomology researcher Dr Minette Karsten.



RESEARCH PROGRAMMES

CROP PRODUCTION

The main research driver of the Crop Production Programme is to increase the production of high-quality fruit in order to maximise profits per hectare. Main risks addressed through research are water quality and availability, climatic extremes, and plant material availability and quality. A climate change strategy was developed during 2023 and will be overseen by Hortgro's newly appointed Sustainability manager. A water availability strategy was commissioned for 2024.

READ MORE
ON PAGE

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CROP PROTECTION

The Crop Protection Programme is multidisciplinary and focuses on nematology, entomology and plant pathology. There is a strong focus on the effective management of various phytosanitary pests and diseases. A major driver is to find biological alternatives for pest and disease control in light of the increasing market resistance to chemical use and the decreasing availability of acceptable chemical control options. Soil health and regenerative agriculture are becoming increasingly important themes. Various new projects were initiated to address the risk posed by the polyphagous shot hole borer (PSHB). A comprehensive strategy to combat PSHB was developed.

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POSTHARVEST

Research within this programme is aimed at ensuring that product integrity is maintained and that a quality product is available to the end-consumer in local and distant markets. A new logistics and packing workgroup was established to identify research gaps in this increasingly important field.

READ MORE
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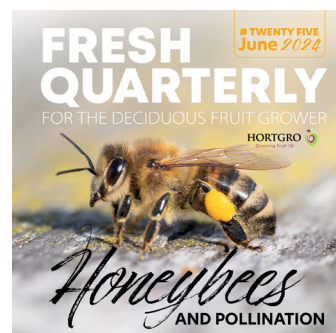
COMMUNICATION

PLATFORMS

FRESH QUARTERLY

www.freshquarterly.co.za

The Fresh Quarterly is going from strength to strength with a steady increase in downloads. Articles can be found by keyword search and downloaded individually.



APPS

The Stone Fruit App has a dedicated following and is updated annually. A climate change forecast App is in development.

FRESH NOTES, TIMELY HINTS + www.hortgro-science.co.za

Visit the Hortgro Science website to gain information on the research process and who is involved in the different workgroups, peer workgroups and technical advisory committees or to obtain an understanding of the different research programmes and the projects that are part of each programme. 'Fresh Notes' or the latest 'Stone fruit timely hints' can be downloaded from the website.

Our website also has a subdomain (<https://pshb.hortgro.science/>) dedicated to PSHB with information provided on the occurrence, tree symptoms, identification, and management of this devastating pest.

A subdomain was developed for an online library of all completed research projects and will be activated during 2024 once all projects have been uploaded.

CAPACITY DEVELOPMENT



The development of the next generations of scientists and technical people who can service the industry is an important product of the research process. Thirty-three post-graduate students were funded during 2022/23 of which there were 22 MSc's, eight PhD's and three Postdocs. Fifty-two percent of the students are female and 33% of the students are black. One quarter of the research budget is directed towards funding research posts seconded to Stellenbosch University.



One of the key measures of research success is the transfer of relevant practical results to the levy paying producer.

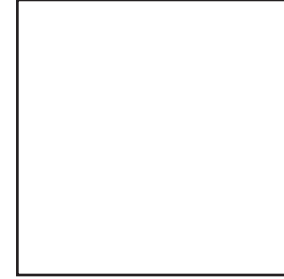
Stephen Rabe



CROP

PRODUCTION

RESEARCH PROGRAMME



INTRO

Research within the crop production programme addresses current problems experienced by fruit growers but is also future-directed – research has a long lead time and it is important to start building the capacity and conduct the research for the solutions that will be needed in the future. In this sense, the crop production research strategy is directed and aligned with the requirements and key risks to the orchard of the future. Hence, increasing orchard productivity and efficiency as well as improving fruit quality are the main drivers of the crop production programme while climate change, extreme weather, plant

material quality and water availability and quality are key risks that are addressed.

The crop production research programme is structured into six themes, namely dormancy, farming technology, irrigation and nutrition, rootstocks and nursery tree quality, growing season climate, and reproductive biology. The research strategy for each theme is determined by a workgroup (one workgroup per theme) consisting of fruit growers, technical advisors and researchers. When considering research strategy, the workgroups always keep in mind the changes we need to make to our orchards to remain internationally competitive as well as profitable. They also consider the major future risks, as identified within the overarching research strategy, which may jeopardise our profitability.



DORMANCY

EXPERTISE

- Dormancy workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Crop production programme leader

Researchers
Dr Esmé Louw
Dr Nigel Cook
Dr Tara Southey
Dr Iwan Labuschagne
Mr Tristan Dorfling
Mr Chad van Wyk

Students
Ms Portia Solomon – MSc student
Ms Cara du Toit – MSc student

PROJECTS:

NEW PROJECTS:

- Rest breaking alternatives to hydrogen cyanamide (C van Wyk)

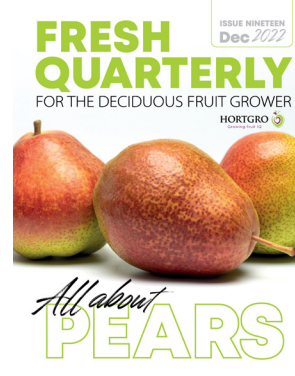
CURRENT PROJECTS:

- Climate profiling and change analysis of the Elgin-Grabouw-Vyeboom-Villiersdorp (EGVV), Koue Bokkeveld (KBV) and Langkloof (LK) production areas specific to Pome fruit (T Southey) – [see Growing season climate](#)
- Historic and future modelling and mapping of early season temperature patterns and extremes, and impacts for pome and stone fruit production in South Africa (S Midgley) - [see Growing season climate](#)
- Adaptability indexing of new pome (apple and pear) and stone fruit (plum and cherry) cultivars in diverse South African growing areas (I Labuschagne, E Louw, P Solomon, C du Toit and T Dorfling) – [see Growing season climate](#)

- Investigating the significance of temperature on flowering phenology by establishing a South African apple and plum phenophase-temperature database (E Louw and I Labuschagne)
- Growth synchronisation of stone fruit rootstocks and scions with different chilling requirements (C van Wyk) – [see Rootstocks and nursery tree quality](#)
- Apple rootstock influence on Granny Smith scion growth, productivity and fruit green colour (T Dorfling) – [see Rootstocks and nursery tree quality](#)

COMPLETED PROJECTS:

No completed projects.



PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Mouton, A. Pear research rundown.
- *SAFJ* Apr/May 2023: Mouton, A. The Pro-Hort Ecophysiology Platform: p. 52.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023

02

FARMING TECHNOLOGY

Research in this theme focuses on orchard mechanization and technology drivers such as big data, remote sensing, robotics, and GIS that will all contribute to changing the way we produce our fruit in our orchards of the future

EXPERTISE

- Farming technology workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Crop production programme leader

Mr Marno van der Westhuizen –
research implementation manager
in charge of the orchard of the
future programme

Researchers
Dr Iwan Labuschagne
Dr Willem Hoffmann
Mr Matthew Addison

Student
Ms Marezé Smit

PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- An economic analysis focused on income or loss to the fruit producer related to new deciduous fruit cultivar choice (W Hoffmann, I Labuschagne and M Smit)

- Developing a centralised industry-driven industry/area-wide geographic database supporting the information needs of the pome & stone fruit industries (M Addison) –

[See IPM](#)

COMPLETED PROJECTS:

No completed projects.



PUBLICATIONS:

- SAFJ Apr/May 2023: Mouton, A. Welcome to the digital orchard: p. 50.
- SAFJ Aug/Sep 2023: Mouton, A. Die Hortgro Science Konsepboordprogram: p. 66.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
- Langkloof Seminar – 23 November 2022

IRRIGATION & NUTRITION

Water availability was identified as one of the top five risks facing our industry in the future. The Western and Eastern Cape provinces are water scarce; climate change is driving a drying trend and competition for water is increasing.

The crop production water strategy involves 1) determining how much water highly productive deciduous fruit trees use, 2) conducting research on various water-saving technologies and 3) conducting research to show growers the negative effects of over-irrigation on production and quality.

We are currently co-funding two projects with the Water Research Commission to determine the water requirements of high-yielding plum and pear orchards. Another co-funded project on the effect of fixed and draped nets on the water use of apples was completed. A reduction in orchard level transpiration of

between 3% and 15% was found under netting compared to the open control across three orchards. Netting increased the economic water productivity ($R\ m^{-3}$) by 3.4% to 30%.

A new project was established to characterize groundwater availability and groundwater use within the main Hortgro production areas, including recharge and run-off assessments.

EXPERTISE

- Irrigation and nutrition workgroup



RESEARCH TEAM

Prof Wiehann Steyn – crop production programme leader

Researchers
Prof Stephanie Midgley
Prof Nebo Jovanovic
Dr Johan van Zyl
Dr Eduard Hoffman
Dr Sebinasi Dziki
Dr Elmi Lötze
Mr Daniël Viljoen
Mr Julian Conrad

Students
Mr Edward Lulane – PhD student
Ms Lindsay Muchena – PhD student
Mr Stephen Jordaan – MSc student
Mr Ubaidullah Mathews – MSc student

PROJECTS:

- NEW PROJECTS:**
- Characterization of groundwater availability and groundwater use within the main Hortgro production areas, including recharge and run-off assessments (J Conrad)

CURRENT PROJECTS:

- Response of apple tree performance and root development to low-flow drip irrigation (J van Zyl and E Hoffman)
- Water use of high-performing full-bearing Japanese plum (*Prunus salicina*) in two major production regions of the Western Cape (South Africa) (N Jovanovic and U Mathews)
- The effect of a water deficit on fruit tree phenology, fruit production, fruit quality and storability of Fuji and Cripps' Pink apples (D Viljoen) – [See Quality management](#)

COMPLETED PROJECTS:

- Investigating the potential of fixed and draped netting technology for increasing water productivity and water savings in full-bearing apple orchards under micro-irrigation (S Midgley, S Dziki, E Lötze, E Lulane and S Jordaan)
- Sensitivity of various apple rootstocks to water stress (S Midgley and L Muchena) – [see Rootstock and nursery tree quality](#)

CROP PRODUCTION

Can shade nets reduce water use?

Research shows that netted apple orchards need less water – but growers should read the fine print. By Anna Mouton.

Deciduous-fruit growers are adopting nets to protect their crops against everything from hailstorms to sunburn. Can nets also help trees use less water? And how much less? A project funded by Hortgro and the Water Research Commission provides some answers.

The study was conducted by a team of researchers, including Dr Theresa Volschenk of the ARC Soil and Water Science Programme and Dr Elmi Lötze of the Department of Horticultural Science at Stellenbosch University, among others from Stellenbosch University, the CSIR Hydrosocieties Research Group, and the Western Cape Department of Agriculture. Edward Lulane was the PhD and Stephen Jordaan was the MAgriC student on the project.

It was initially led by Dr Stephanie Midgley, currently Climate Change and Risk Scientist at the Western Cape Department of Agriculture. Dr Sebinasi Dzikiti of the Department of Horticultural Science at Stellenbosch University led the project in its final year. Fresh Quarterly spoke to Dzikiti about their results.

Draped nets over Golden Delicious.

SUPPLIED BY STEPHANIE MIDGLEY | WESTERN CAPE DEPARTMENT OF AGRICULTURE

PUBLICATIONS:

- *Fresh Quarterly* Jun 2023: Mouton, A. Can shade nets reduce water use?
- *SAFJ* Feb/Mar 2023: Mouton, A. Besproeiings-tegnologie: p. 78.
- *SAFJ* Feb/Mar 2023: Mouton, A. Soil-water potential and plants at work: p. 82.
- *SAFJ* Feb/Mar 2023: Mouton, A. Grondwater: p. 90.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
- Langkloof Seminar – 23 November 2022

Finding more precocious and productive rootstocks adapted to South African conditions is integral to our orchard of the future vision. For this reason, various pome and stone fruit rootstocks are evaluated in an increasing number of industry trials in commercial orchards. New apple rootstock evaluation sites were planted to dwarfing rootstocks at three locations in the Highveld region where Western Cape results are not applicable due to the milder summer climate, planting under nets and fertile soils. Louerwater Granny Smith trees on rootstocks varying in vigour were planted in two production regions with warm winters to assess their effect on bud break and flower synchronization. Together with a Granny Smith trial planted in 2022 in the Langkloof, these plantings will also be used to assess the effect of rootstock on green colour development.

Other rootstock research is aimed at characterising new rootstocks in terms of adaptation and disease and pest tolerance. Various projects are evaluating the susceptibility of rootstocks to *Phytophthora*, *Rosellinia*, woolly apple aphids, plant parasitic nematodes and replant disease. A new project was initiated to study the cause of galls on apple nursery trees and rootstock susceptibility to crown gall. Another new project will be comparing the performance of tissue culture-derived apple and stone fruit trees against those produced from layers or cuttings, respectively.

Prof Stephanie Midgley determined that trees on dwarfing apple rootstocks are not necessarily more sensitive to water deficit than trees on more vigorous rootstocks. Trees on dwarfing rootstocks had a much lower water requirement on a hectare basis and had a much higher water productivity,

i.e., Rand income generated per cubic meter water transpired.

Dr Xolani Sibozza finalized a report on a rootstock evaluation trial consisting of adjacent more dwarfing and less dwarfing plantings at three locations with Fuji as scion. Rootstocks from the Cornell Geneva programme like G.778, G.228 and G.202 outperformed industry standard rootstocks.

Chad van Wyk completed two peach/nectarine and two plum rootstock evaluation trials. The results of these trials will be incorporated into the stone fruit rootstock tables first published in issue 6 of the *Fresh Quarterly* (www.freshquarterly.co.za).

EXPERTISE

- Rootstock and nursery tree quality workgroup
- Rootstock evaluation committee

RESEARCH TEAM

Prof Wiehann Steyn –
crop production programme leader

Researchers
Dr Xolani Sibozza
Dr Iwan Labuschagne
Prof Stephanie Midgley
Dr Nigel Cook
Mr Tristan Dorfling
Prof Adele McLeod
Mr Chad van Wyk
Mr Wouter Visser
Mr Matthew Addison

Students
Ms Lindsay Muchena – PhD student
Ms Buhle Ngidi – MSc student
Mr Anton Broeksma - MSc student
Dr Lindani Moyo – Postdoctoral
research fellow





PROJECTS:

NEW PROJECTS:

- Evaluation of apple rootstocks representing three vigour classes in three growing areas of South Africa (T Dorfling)

CURRENT PROJECTS:

- Evaluation of apple rootstock cultivars for woolly apple aphid resistance (M Addison)
- Evaluation of apple rootstocks against apple replant disease on 'fumigated' and 'non-fumigated' soil (T Dorfling and A McLeod)
- Evaluation of pear rootstocks on different scions (T Dorfling)
- Evaluation of pear rootstocks for Packham's Triumph at Jackal River Farm, Vyeboom, for Forelle at La Plaisante, Wolseley, and for Cape Rose at La Plaisante, Wolseley (T Dorfling)
- Evaluation of new apple rootstocks representing three vigour classes (Môrester and Oak Valley) (T Dorfling)
- Evaluation of new apple rootstocks representing two vigour classes in two growing

areas (Molteno, Bokveldskloof & Oewerzicht) (T Dorfling)

- Apple rootstock influence on Granny Smith scion growth, productivity and fruit green colour (T Dorfling) – [see Dormancy](#)
- Growth synchronisation of stone fruit rootstocks and scions with different chilling requirements (C van Wyk) – [see Dormancy](#)
- New apple rootstock plantings in the Highveld region (T Dorfling)
- Evaluation of apple rootstocks tolerance against specific apple replant disease (SARD) (T Dorfling and A McLeod) – [see Pathology](#)
- Tolerance of apple rootstocks against Phytophthora root rot (A McLeod and L Moyo) – [See Pathology](#)
- Effect of mulching, compost and rootstock genotype on white root rot of apple (A McLeod) – [See Pathology](#)

COMPLETED PROJECTS:

- Evaluation of peach and nectarine rootstocks for the

South African fruit industry in association with IP owners at Vaalwater (C van Wyk)

- Evaluation of plum rootstocks for the South African fruit industry in association with IP owners at Simondium (C van Wyk)
- Evaluation of plum rootstocks for South African industry: Robertson planting (C van Wyk)
- Evaluation of peach rootstocks for South African industry: Rawsonville planting (C van Wyk)
- Sensitivity of various apple rootstocks to water stress (S Midgley and L Muchena) – [see Irrigation and nutrition](#)
- Apple rootstock evaluation and interstem combinations at Helderwater in the Langkloof and at Oak Valley and Breëvlei in Grabouw (X Sibozza and B Ngidi)
- Calculating the projected profits for an orchard planted to different rootstocks based on actual tree costs and fruit prices as well as production data collected for a rootstock evaluation trial conducted within the orchard (M van der Westhuizen)

PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Mouton, A. Pear research rundown.
- *Fresh Quarterly* Jun 2023: Mouton, A. Can dwarfing rootstocks cope with drought?
- *Fresh Quarterly* Sep 2023: Mouton, A. South African apple-rootstock trends.
- *Fresh Quarterly* Sep 2023: Mouton, A. Rootstock research rundown.
- *Fresh Quarterly* Sep 2023: Mouton, A. Apple-rootstock evaluation trials at Hortgro.
- *SAFJ* Oct/Nov 2022: Mouton, A. Hortgro Technical Symposium pome-fruit field day: p. 65.
- *SAFJ* Dec/Jan 2023: Mouton, A. Boordprofyte begin by die regte onderstam: p. 66.
- *SAFJ* Aug/Sep 2023: Mouton, A. Kan dwergende onderstamme droogte hanteer: p. 74.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023

GROWING SEASON CLIMATE

Of the “serious” pome fruit producers, South Africa, together with Brazil, has the production areas closest to the equator. This means higher summer temperatures and generally, altogether more plant stress and more fruit downgraded for processing compared to our major competitors.

The great inefficiency of caring for fruit that ultimately ends up in a juice bin significantly impacts the profitability of the South African industry, especially under the serious cost squeeze conditions that the industry is experiencing. It should not be surprising that research under this theme is predominantly aimed at decreasing sunburn and internal fruit quality defects brought about by climatic stress.

Building on a project that modelled climate change into the future at a regional level, Prof Stephanie Midgley developed a

climate change strategy for the deciduous fruit industry. The output of the aforementioned project is currently being incorporated into an App that will assist growers and technical advisors in long-term planning and site selection for new orchards. The implementation of the climate change strategy will be the responsibility of a sustainability manager who will join Hortgro in January 2024 to oversee the newly established sustainability and resource management programme. New projects were initiated to evaluate the effect of drape nets on the overall fruit quality of plums. It follows a similar project initiated in 2022 to evaluate drape nets on pears.

EXPERTISE

- Growing season climate workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Crop production programme leader

Researchers
Dr Elke Crouch
Dr Tara Southey
Prof Stephanie Midgley
Dr Esmé Louw
Dr Iwan Labuschagne
Ms Chantelle Smit
Mr Daniël Viljoen
Ms Heleen Tayler
Mr Handré Viljoen
Mr Tristan Dorfling
Mr Jason Ladegourdie

Students
Ms Portia Solomon – MSc student
Ms Cara du Toit – MSc student
Ms Ineke de Jong – MSc student



PROJECTS

NEW PROJECTS:

- Evaluate the effect of drape nets on the overall plum fruit quality (H Viljoen)

CURRENT PROJECTS:

- Evaluation of the effect of drape nets on pear quality and productivity (J Ladegourdie)
- Quantification of the effect of near-harvest temperatures on pitburn and heat damage in cold stored plums and prediction method development (H Viljoen)
- Climate profiling and change analysis of the Elgin-Grabouw-Vyeboom-Villiersdorp (EGVV), Koue Bokkeveld (KBV) and

Langkloof (LK) production areas specific to Pome fruit (T Southey)

– [See Dormancy](#)

- Confronting climate change (C Smit)
- Historic and future modelling and mapping of early season temperature patterns and extremes, and impacts for pome and stone fruit production in South Africa (S Midgley)
- Internal browning of 'Cripps Pink' apples – effect of growing region temperature on radial browning and effect of canopy position on long-term storage quality (E Crouch, H Tayler and I de Jong)

- Adaptability indexing of new pome (apple and pear) and stone fruit (plum and cherry) cultivars in diverse South African growing areas (I Labuschagne, E Louw, P Solomon, C du Toit and T Dorfling) – [See Dormancy](#)

COMPLETED PROJECTS:

- Climate change response strategy for the deciduous fruit industry of South Africa (S Midgley)
- Enabling the calculation of carbon sequestration in the Confronting Climate Change Initiative's online carbon calculator (C Smit)



ANNA MOUTON

PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Mouton, A. Red colour in pears.
- *Fresh Quarterly* Dec 2022: Mouton, A. Pear research rundown.
- *SAFJ* Dec/Jan 2023: Mouton, A. Is nette nuttig vir steenvrugte: p. 63.
- *SAFJ* Apr/May 2023: Mouton, A. The Pro-Hort Ecophysiology Platform: p. 52.



EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023

REPRODUCTIVE BIOLOGY

Research in this field is aimed at obtaining regular high yields of good quality fruit. Hence, projects tend to investigate flower initiation, pollination, fruit set, fruit thinning and alternate bearing.

EXPERTISE

- Reproductive biology workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Crop production programme leader

Researchers
Dr Xolani Siboza
Mr Matthew Addison
Ms Louisa Blomerus
Mr Marnes Gouws

Student
Mr Aldo Horne – MSc student



PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- Study on the effect of dry matter content on storability and eating quality of Bigbucks and Cripps Red apples to facilitate better postharvest decision making (M Gouws) [See Quality management](#)
- Evaluation of managed bees and pollination efficiency in the pome and stone fruit industry in the South Western Cape, South Africa (M Addison) [See IPM](#)
- Reproductive Biology: Screening mainstream plum cultivars for the duration of the effective pollination period and other factors influencing successful fruit set (L Blomerus)

COMPLETED PROJECTS:

- The effect of prohexadione-Ca application on regrowth, crop load and yield alternation in 'Fuji' apple (X Siboza and A Horne)



EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
- Pollination Best Practices Webinar – 25 August 2023





The development of the next generations of scientists and technical people who can serve the industry is an important product of the research process.

Wiehann Steyn

CROP

PROTEC

RESEARCH PROGRAMME

INTRO

The crop protection programme includes both applied and basic research on nematology, entomology and plant pathology. The crop protection technical advisory committee assesses research outputs and research priorities. Entomology and pathology peer workgroups assess proposed and current research projects and provide guidance to the researchers involved in the programme. Various workgroups including groups dealing with current crop protection issues aid in identifying research needs and prioritising research projects.

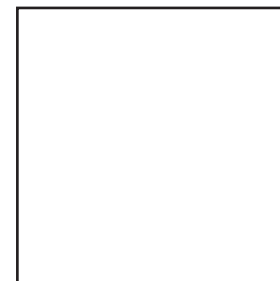
Ensuring the sustainability of the fruit production process is a critical aspect of

crop protection research and emphasis is placed on biological control, orchard ecology, phytosanitary threats and precision agriculture.

Crop protection research during this season has again been challenging. A number of projects were completed during the season, and the phytosanitary research facility (PHYLA) is now fully functional. Research on invasive insects, including polyphagous shot hole borer was initiated. Research is focused on monitoring and finding preventative treatments.



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PHYTO-SANITARY AND MARKET ACCESS

EXPERTISE

- Phytosanitary and biosecurity workgroup
- Integrated pest management group

RESEARCH TEAM

Mr Matthew Addison – Crop protection programme leader

Researchers

Dr Renate Smit

Dr Julia Meitz-Hopkins

Prof Pia Addison

Dr Shelley Johnson

Prof Gerhard Pietersen

Dr Annika Pienaar

Dr Marelize de Villiers

Technical Assistance

Mr Terence Asia

Dr Nanike Esterhuizen

Students

Ms Marehette Liprini – PhD student

Mr Nicolaas Basson – MSc student

PROJECTS:

NEW PROJECTS:

- Ozone fumigation as a post-harvest phytosanitary treatment for insect pests and plant pathogens (R Smit)

CURRENT PROJECTS:

- Improving integrated control measures against the grain chinch bug, *Macchiademus diplopterus* (S Johnson)
- Postharvest treatment using ultra low oxygen environment to control external pests in pome and stone fruit (R Smit)
- Ethyl formate as postharvest treatment to control banded fruit weevil and red spider mites on pome fruit (R Smit and M Liprini)
 - Updating the quick identification guide for phytosanitary pests of South African deciduous fruit (S Johnson)

COMPLETED PROJECTS:

- Rearing technology and taxonomy of the Cape fly *Ceratitis quilicii* (P Addison and N Basson)



ANNA MOUTON



PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Mouton, A. Pear research rundown.
- *Fresh Quarterly* Jun 2023: Mouton, A. PHYLA focuses on phytosanitary research.
- *SAFJ* Aug/Sep 2023: Mouton, A. PHYLA fokus op fitosanitiere navorsing: p. 80.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023

The research programme on nematodes is scaling down as Prof. A Malan is due to retire.

The development of several potential biological control agents has resulted in private investment in developing the commercial production of entomopathogenic nematodes. Applied research on the mass production of EPN's was completed. Negotiations are underway regarding the supply of the agents and the registration thereof.

Both plant parasitic and entomopathogenic nematodes are being researched. The research on the integration of entomopathogenic fungi continued and is nearing completion. The completed research on entomopathogenic nematodes and fungi on mealybug and fruit weevils is an example of this.

EXPERTISE

- Integrated pest management group
- Soil health workgroup

RESEARCH TEAM

Mr Matthew Addison –
Crop protection
programme leader

Researchers
Prof Antoinette Malan
Dr Nomakhholwe Stokwe
Dr Rinus Knoetze
Mr Sonwabo Boo
Dr Annika Pienaar
Dr Caro Kapp

Students
Mr Louis Fourie – MSc student
Mr Andriko Fourie
– MSc student
Mr Murray Dunn – PhD student

PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- Investigating the use of marigolds (*Tagetes* spp.) and brassicaceous cover crops as a tool for the management of lesion nematodes in apple orchards. Phase I - Pot trials (R Knoetze and L Fourie)
- A survey to determine the occurrence, diversity and pathogenicity of *Pratylenchus* species in South African stone fruit orchards (R Knoetze)
- Dorylaimid nematodes as a vector for stony pit virus in pear nurseries and orchards in South Africa (C Kapp)
- The potential of organic soil amendments for the management of plant-parasitic nematodes and woolly apple aphid in apple orchards (N Stokwe and A Fourie)
- Ring nematode (*Criconeimoides xenoplax*) resistance of South African-bred rootstock selections in potted plant trials and high-pH soils (S Boo)
- Evaluating the ability of

entomopathogenic nematodes (EPNs) for their ability to control populations of the obscure mealybug (*Pseudococcus viburni*) on apple foliage in field conditions (A Pienaar)

COMPLETED PROJECTS:

- Control of the mealybug, *Pseudococcus viburni*, using entomopathogenic fungi in deciduous fruit orchards (N Stokwe)
- Mass culture and formulation of entomopathogenic nematodes for improved field application against key insect pests (A Malan and M Dunn)

PUBLICATIONS:

- *Fresh Quarterly* Jun 2023: Rensburg, K. Are cover crops hosts for lesion nematodes?

EVENTS

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023

ORCHARD FLOOR ECOLOGY

Research on soil health and orchard floor ecology remains an important emerging theme in agriculture. Current research is focused on cover crops and mulches and their effects on soils, soil biota and fruit production.

EXPERTISE

- Soil health workgroup
- Integrated pest management group

RESEARCH TEAM

Mr Matthew Addison –
Crop protection programme leader

Researchers
Mr Matthew Addison
Dr Nomakhholwe Stokwe

PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- Integrated use of organic mulches in pome fruit orchards in the Southwestern Cape, South Africa (M Addison)

COMPLETED PROJECTS:

No completed projects.

PUBLICATIONS:

- *SAFJ* Oct/Nov 2022:
Mouton, A. Cover crops in apple orchards: p. 61.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023



PLANT PATHOLOGY

The plant pathology research programme continues to address several important industry issues. Ongoing research on the incidence and distribution of fungal pathogens in young trees is highly relevant, and research was completed on the integrated management of apple scab and post-harvest rots. Apple replant disease and various aspects of post-harvest pathology, including the development of alternative fungicides, are also receiving attention.

EXPERTISE

- Pre- and postharvest pathology workgroup
- Integrated pest management group

PRE-HARVEST PATHOLOGY RESEARCH TEAM

Mr Matthew Addison –
Crop protection programme leader

Researchers
Prof Lizél Mostert
Prof Adele McLeod
Dr Pieter Louw
Mr Tristan Dorfling
Dr Yolanda Petersen
Prof Adriaan van Niekerk
Dr Rachelle Bester

Students
Mr Anton Boeksma
 – MSc student
Ms Reshika Kallideen
 – PhD student
Ms Anika Keuck
 – MSc student
Ms Rochelle Janse van Rensburg
 – PhD student

PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- The potential of organic amendment for managing apple replant disease (A McLeod and A Broeksma)
- Etiology of crown gall of apple in South Africa and potential for biocontrol (Y Petersen)
- Evaluating the potential of hyperspectral imaging for remote detection of plum marbling viroid infested nursery and young orchard trees (A van Niekerk)

COMPLETED PROJECTS:

- Characterisation of the association of apple stem pitting virus (ASPV) with pear stony pit disease. (R Bester)
- The effect of organic amendments on the severity of apple replant diseases in subsequent apple orchard replantings (A McLeod and R Janse van Rensburg)

PUBLICATIONS:

- *Fresh Quarterly* Mar 2023: Mouton, A. Crown gall.
- *Fresh Quarterly* Mar 2023: Mouton, A. Pseudomonas and Xanthomonas.
- *Fresh Quarterly* Mar 2023: Mouton, A. Phytophthora.
- *Fresh Quarterly* Mar 2023: Mouton, A. Rosellinia necatrix.
- *Fresh Quarterly* Jun 2023: Mouton, A. Management of apple replant disease.
 - *SAFJ* Aug/Sep 2023: Mouton, A. Bestuur van appelherplantsiekte: p. 70.
- *Fresh Notes* 200 – 26 October 2022: An update on the *Fresh Notes* 197 on galls on apple nursery trees.
- *Fresh Notes* 203 – 6 March 2023: An update to the *Fresh Notes* 200 on galls on apple nursery trees.

EVENTS:

- Langkloof Seminar – 23 November 2022
- Hortgro Pome Fruit Research
- Hortgro Stone Fruit Research Showcase – 7 June 2023



POST-HARVEST PATHOLOGY RESEARCH TEAM

Mr Matthew Addison –
Crop protection programme leader

Researchers
Dr Cheryl Lennox
Dr Julia Meitz-Hopkins
Dr Pieter Louw
Dr Zinash Belay
Dr Ian Crouch

Students
Ms Inge Block – MSc student

PROJECTS:

NEW PROJECTS:

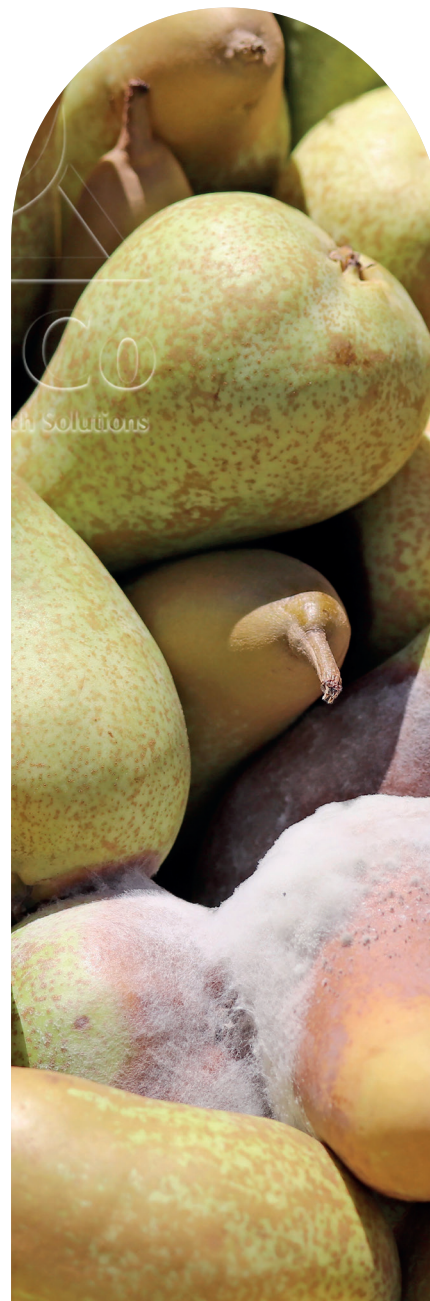
No new projects.

CURRENT PROJECTS:

- Postharvest mould of pome fruit stems and calyx sepals – an investigation into the incidence, cause and management (C Lennox & I Block)
- Compilation of a photographic compendium of deciduous fruit diseases in a South African context (I Crouch)
- Atmospheric cold plasma (CP) treatment as an alternative non-thermal fruit surface decontamination (Z Belay)
- Thermal and non-thermal treatments of stone and pome fruit: Towards efficient phytosanitary measures (Z Belay)

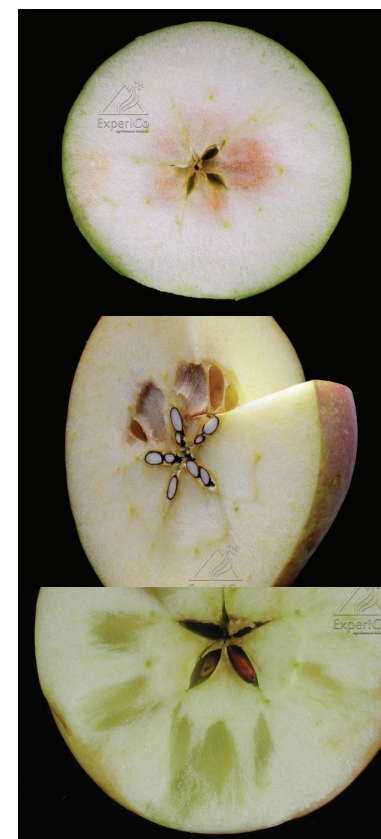
COMPLETED PROJECTS:

- Continued pursuit of sanitiser products for potential use in the apple and pear industry. (P Louw)



EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023



INTEGRATED PEST MANAGEMENT

The IPM research programme deals with a wide variety of crop protection issues. The basic research aim is to ensure the sustainable control of pests and diseases. Invasive insects and phytosanitary concerns have influenced the research programme significantly during the year. Invasive polyphagous shot hole borer research is seen as a priority. Various research projects are nearing completion including applied research on fruit weevils and the application of biological control agents.

EXPERTISE

- Integrated pest management workgroup

RESEARCH TEAM

Mr Matthew Addison –
Crop protection
programme leader

Researchers
Prof Pia Addison
Prof Robbie Pott
Prof John Terblanche
Prof Francois Roets
Dr Minette Karsten
Dr Karel Kruger
Prof Adriaan van Niekerk
Dr Shelley Johnson

Technical Assistants
Mr Terence Asia
Dr Nanike Esterhuizen

Students
Ms Liana de Araujo – PhD student
Mr AC Kleynhans – MSc student
Ms Karyn Engelbrecht
– MSc student
Ms Emma Neethling
– MSc student
Ms Mia Vermaak – PhD student
Mr Stefan Hansen – PhD student

PROJECTS:

NEW PROJECTS:

- Exploring integration of parasitoids in an integrated pest management system for the obscure mealybug in pome fruit in the Western Cape Province (M Karsten and L de Araujo)
- Taxonomic and molecular revision of parasitoid wasps attacking false codling moth *Thaumatotibia leucotreta* (Meyrick), with emphasis on *Trichogrammatoidea* (P Addison)
- Towards the development of an integrated pest management system for sucking insects in deciduous fruit orchards (M Karsten and AC Kleynhans)
- Assessing the threat of the Polyphagous Shot Hole Borer beetle (PSHB, *Euwallacea fornicatus*) and its symbiotic fungus (*Fusarium euwallaceae*) to deciduous fruit trees in the Western Cape Province of South Africa (F Roets and K Engelbrecht)

- Sources and impact of the Polyphagous Shot Hole Borer beetle (PSHB, *Euwallacea fornicatus*) and its symbiotic fungus (*Fusarium euwallaceae*) on deciduous fruit trees in the Western Cape Province of South Africa (C Crous and E Neethling)
- Towards the monitoring and management of polyphagous shot hole borer, *Euwallacea fornicatus*, in deciduous fruit orchards (M Addison)

CURRENT PROJECTS:

- Trophic ecology of predaceous mites in apple and pear orchards (J Terblanche and M Vermaak)
- *Phlyctinus callosus* species complex and post-harvest control (S Johnson)
- Bio-fermentation of an insect chemical-attractant (R Pott)
 - Establishing a barcoding database of local pests of deciduous fruit (P Addison)



- Developing a centralised industry-driven industry/ area-wide geographic database supporting the information needs of the pome & stone fruit industries (M Addison) – [See Farming technology](#)
- Phylogeny and biological control of weevils (*Curculionidae*) in the Western Cape Province (P Addison and S Hansen)
- Evaluation of managed bees and pollination efficiency in the pome and stone fruit industry in the Southwestern Cape, South Africa (M Addison) – [See Reproductive biology](#)



ANNA MOUNTON

PUBLICATIONS:

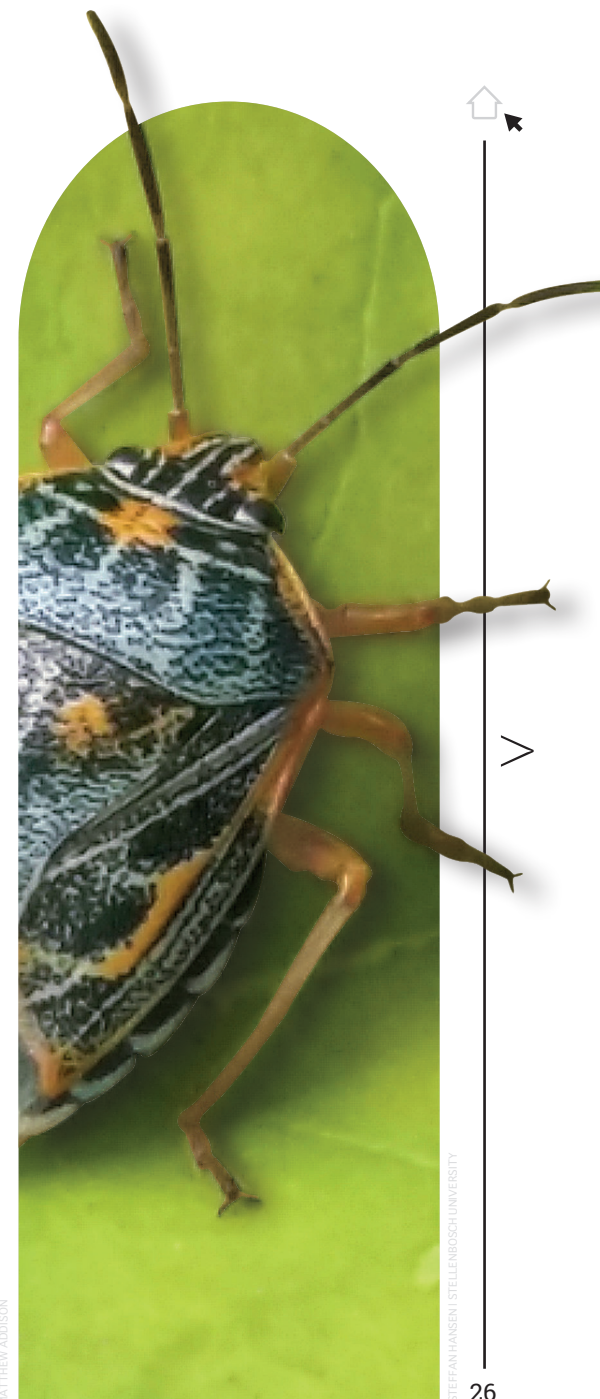
- *Fresh Quarterly* Sep 2023: Smith, C. Red bugs shifting into fruit trees.
- *Fresh Quarterly* Sep 2023: Oelofse, R. New project explores link between antestia and fruit damage.
- *Fresh Quarterly* Sep 2023: Mouton, A. Polyphagous shot-hole borer.
- *Fresh Quarterly* Sep 2023: Mouton, A. The response to PSHB.
- *Fresh Quarterly* Sep 2023: Mouton, A. Best practices for PSHB.

EVENTS:

- Langkloof Seminar – 23 November 2022
- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023



MATTHEW ADDISON



STEFFAN HANSEN / STELLENBOSCH UNIVERSITY

PRECISION AGRICULTURE

The development and application of new technology in the industry is vital. Aspects such as the development of more efficient spray application and evaluation methods are central to pest and disease control. Coupled with this is the use of artificial intelligence and advanced analytical methods.

Current research addresses a number of these issues and new technologies are emerging. The integration of industry data into an industry-wide database is an example of this.

EXPERTISE

- Spray application workgroup
 - Integrated pest management group
 - Database group

RESEARCH TEAM

Mr Matthew Addison –
Crop protection
programme leader

Researchers
Dr Pia Addison
Dr Gideon van Zyl
Dr Francois Bekker

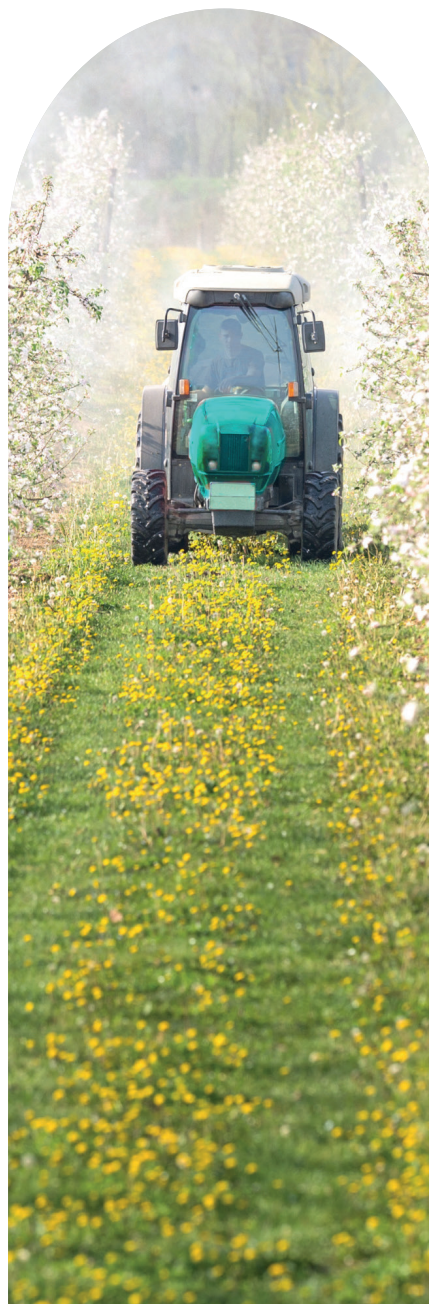
PROJECTS:

NEW PROJECTS:
No new projects.

CURRENT PROJECTS:
No current projects.

COMPLETED PROJECTS:

- Evaluation of spray application techniques on pome and stone fruit trees for improved spray deposition parameters for the control of late-season red spider mite (G van Zyl)
- Evaluating the influence of drape netting on spray deposition and disease control in apple orchards using apple scab as a model pathogen (G van Zyl)



EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023





A major driver is to find
biological alternatives for pest
and disease control.

Matthew Addison



POSTHARVEST

RESEARCH PROGRAMME

INTRO

Postharvest supports and enhances the processes throughout the supply chain critical to ensuring that intrinsic product integrity is maintained and that a quality product is available to the end-consumer in local and distant global markets. Postharvest covers producers, packhouses, marketing coordination, logistics and shipping, receivers/wholesalers and end-consumers. The postharvest research programme is structured into four themes, namely quality management, physiological defects, storage techniques and packaging and logistics. The research strategy for each theme is determined by a workgroup (one workgroup per theme) consisting of exporters, pre-and postharvest technical specialists, industry consultants and researchers. Additional workgroups are formed as and when needed.

When considering research strategy, the workgroups always keep in mind the objectives of the postharvest research programme, which are the following:

- To increase the marketable tons of fruit delivered per ton of fruit loaded;
- To present clients all along the postharvest value chain extending up to the consumer with a safe product of reliable, good quality;
- To reduce wastage and losses from defects and pathogens (see the crop protection programme for postharvest pathology research);
- To increase efficiencies throughout the postharvest value chain;
- To increase the sustainability of postharvest practices;
- To reduce risk within the postharvest value chain.

Research needs relating to pre-harvest factors that affect postharvest quality and storability are addressed within the crop production programme. The postharvest and crop production programmes share a programme manager with the effect that research is very well integrated between the two programmes.

QUALITY MANAGEMENT

Quality management refers to maintaining quality throughout the logistical chain to the end consumer. With reference to stone fruit, shrivel due to moisture loss is the main postharvest defect and therefore the key research focus area.

Managing shrivel in future will require a multi-pronged approach in light of the pressure on plastic packaging. One approach being considered would be closing the vent holes of containers. This would increase the relative humidity within the container but will also result in the accumulation of carbon dioxide. Handré Viljoen of ExperiCo is evaluating plum cultivars for their ability to withstand high carbon dioxide levels. His preliminary results are very promising and the next phase of the project will entail the simulated shipping of fruit in containers with closed vents.

EXPERTISE

- Quality management workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Postharvest programme leader

Researchers
Dr Anél Botes
Mr Daniël Viljoen
Mr Matthew Addison
Dr Elke Crouch
Mr Jason Ladegourdie
Mr Marnes Gouws
Mr Handré Viljoen
Ms Heleen Tayler
Dr Zinash Belay
Prof Stephanie Midgley
Ms Feroza October

PROJECTS:

NEW PROJECTS:

- Assessment of apple starch concentration and rate of conversion during maturation at different canopy positions and the effect thereof on post storage quality (D Viljoen)
- Assessment of air temperature at time of harvest on scuff mark susceptibility of early-optimum 'Cape Rose' pears (J Ladegourdie)
 - Evaluate edible coatings on plums and nectarines currently used worldwide (H Viljoen) – [See Packaging and logistics](#)
 - Digital twin for the Hortgro phytosanitary facility (M Addison)

CURRENT PROJECTS:

- Assessment of the use of the DA meter to increase the rigour of fruit sampling for release date determination in strip-picked orchards and to generate additional information for packhouses on the maturity of select pick fruit (M Gouws)

- The use of edible coatings as a viable replacement for plastic liners to maintain pome fruit quality (H Tayler)
- Moisture loss studies in pears (A Botes and E Crouch)
- Scanning plum cultivars for CO₂ sensitivity and the effect of closed vents in shipping containers on relative humidity and CO₂ levels (H Viljoen)
 - Integrated postharvest ethylene management along the value chain (Z Belay)
- The effect of a water deficit on fruit tree phenology, fruit production, fruit quality and storability of Fuji and Cripps' Pink apples (D Viljoen) – [See Irrigation and nutrition](#)

COMPLETED PROJECTS:

- Development of a simple replacement for standard industry colour charts for Pome fruit using the NIX colour sensor (J Ladegourdie)





- The effect of relative humidity during cold storage on water loss and lenticel damage incidence of apples (D Viljoen)
- Sensitivity of various apple rootstocks to water stress (S Midgley and L Muchena) – See [Rootstocks and nursery tree quality](#)
- An impact study of the sulphur dioxide usage within the South African dried fruit industry (F October) – See [Storage techniques](#)
- The impact of relative humidity in commercial cold rooms during accumulation of pallets for shipping on shrivel with plums (H Viljoen)



PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Mouton, A. Forelle early market access.
- *Fresh Quarterly* Jun 2023: Mouton, A. Postharvest performance of Lady in Red.
- *Fresh Quarterly* Jun 2023: Rensburg, K. The plum-transport dilemma.
 - *SAFJ* Dec/Jan 2023: Mouton, A. Temperatuur en humiditeit: p. 76.
 - *SAFJ* Apr/May 2023: Mouton, A. Hi-tech postharvest research: p. 48.
- *SAFJ* Apr/May 2023: Mouton, A. Forelle vroeë marktoegang: p. 54.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
- Hortgro Postharvest Symposium – 8 June 2023



02

PHYSIOLOGICAL DEFECTS

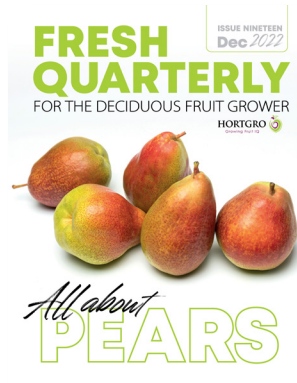
The main internal quality defects receiving research attention are heat damage in plums and lenticel breakdown, superficial scald and internal browning in apples and pears. Research is aimed at understanding the underlying causative factors (both pre- and postharvest) and biochemistry of these defects to allow the development of technology to limit or prevent their occurrence. Other aims are to generate best practice guidelines for handling fruit both pre- and postharvest and to develop indicators to predict the risk of various defects in each season.

Dr Elke Crouch and team completed a multi-disciplinary superficial scald project. The results clearly identified a treatment protocol that would very effectively control superficial scald in Granny Smith apples under long-duration storage. The researchers developed a model that can predict the risk

of developing superficial scald in Granny Smith fruit stored short-term in regular atmosphere. The model will be further refined in a new project that will commence in 2024.

EXPERTISE

- Physiological defects workgroup



RESEARCH TEAM

Prof Wiehann Steyn –
Postharvest programme leader

Researchers
Dr Elke Crouch
Dr Ian Crouch
Dr Ashwil Klein
Dr Anél Botes
Mr Daniël Viljoen

Students
Mr Alone Hlungwani – PhD student
Ms Monja Gerber – PhD student
Dr Thirupathi Pandian
– Postdoctoral research fellow

PROJECTS:

NEW PROJECTS:

- No new projects.

CURRENT PROJECTS:

- Influence of fruit micro-structure on gas exchange and tissue damage (E Crouch)
- Compilation of a photographic compendium of stone fruit disorders in a South African context (I Crouch)

COMPLETED PROJECTS:

- Superficial scald on Granny Smith - understanding the mechanisms and limitations of the storage protocols used by industry and assess risk indicators in storage for scald development (E Crouch, A Botes, A Klein, D Viljoen, T Pandian, M Gerber and A Hlungwani)
- Assessment of a lenticel breakdown prediction method for the South African pome industry (D Viljoen)
- Assessment of fruit density as an indicator for internal browning susceptibility in Fuji apples (D Viljoen)

PUBLICATIONS:

- *Fresh Quarterly* Dec 2022: Duvenage, E. Mealiness in Forelle.
- *SAFJ* Feb/Mar 2023: Mditshwa, A. Ozone and the treatment of superficial scald: p. 92.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
 - Hortgro Postharvest Symposium – 8 June 2023

STORAGE TECHNIQUES

Non-chemical scald control and prevention of internal browning are major focuses of the evaluation of storage technologies and protocols. A major outcome of research on this theme is the development of protocols to prevent or reduce the incidence of disorders and to maintain fruit quality.

EXPERTISE

- Controlled atmosphere storage group



RESEARCH TEAM

Prof Wiehann Steyn –
Postharvest programme leader

Researchers
Dr Anél Botes
Mr Daniël Viljoen
Ms Heleen Tayler
Dr Elke Crouch

Students
Mr Jason Ladegourdie
– MSc student
Ms Anmari Kriegler
– MSc student
Ms Ineke de Jong – MSc student

PROJECTS:

NEW PROJECTS:

No new projects.

CURRENT PROJECTS:

- Effect of humidity control, using bin liners and bin lids, on fruit quality during long-term storage of apples and pears (D Viljoen)

- Influence of harvest maturity, storage temperature and duration and 1-MCP on postharvest physiological disorders (with special reference to internal browning) and fruit quality of the new 'Cripps' Pink' apple strain 'Lady in Red' (H Tayler)
- The effect of different post-harvest technologies on the quality of 'Golden Delicious' apple (A Botes)
- Investigate the effect of step-wise cooling on internal browning in apples (A Botes, E Crouch and A Kriegler)
- Soft scald development in new apple cultivars (A Botes, E Crouch and J Ladegourdie)
- Internal browning of 'Cripps Pink' apples – DCA-CF and long-term storage with best practice protocol (E Crouch and I de Jong)

COMPLETED PROJECTS:

- An impact study of the sulphur dioxide usage within the South African dried fruit industry (F October) – [See Quality management](#)

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
 - Hortgro Postharvest Symposium – 8 June 2023



04

PACKAGING / LOGISTICS

Logistics projects focus on the optimisation of shipping container space utilisation while packaging projects are aimed at reducing plastic packaging or finding alternatives to non-recyclable, single-use plastics without jeopardising fruit quality or the structural integrity of the packaging. The plastic workgroup of the packhouse action group provides direction in terms of where the industry needs to go regarding plastic packaging.

EXPERTISE

- Packhouse action group
- Plastics workgroup

RESEARCH TEAM

Prof Wiehann Steyn –
Postharvest programme leader

Researchers
Dr Anél Botes
Mr Daniël Viljoen
Ms Heleen Tayler
Mr Handré Viljoen

PROJECTS:

NEW PROJECTS:

- Development of knowledge to react to possible banning of single-use petroleum-based plastics that impact on post-harvest management of stone and pome fruit quality (H Tayler)
- Evaluate edible coatings on plums and nectarines currently used worldwide (H Viljoen) – [See Quality management](#)

CURRENT PROJECTS:

- No current projects.

COMPLETED PROJECTS:

- Evaluating the effects of different plastic liners on the internal and external quality of Forelle pears (A Botes and D Viljoen)

PUBLICATIONS:

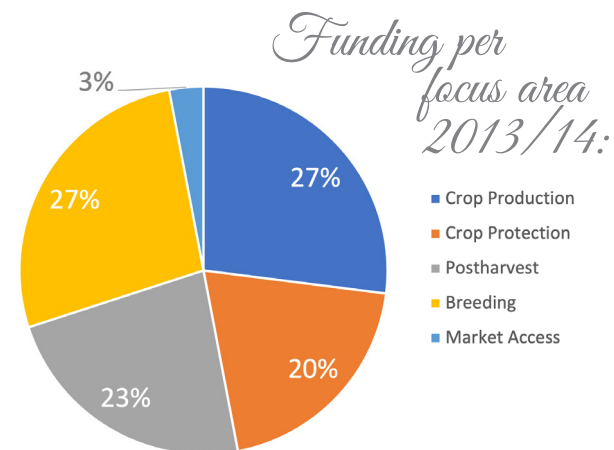
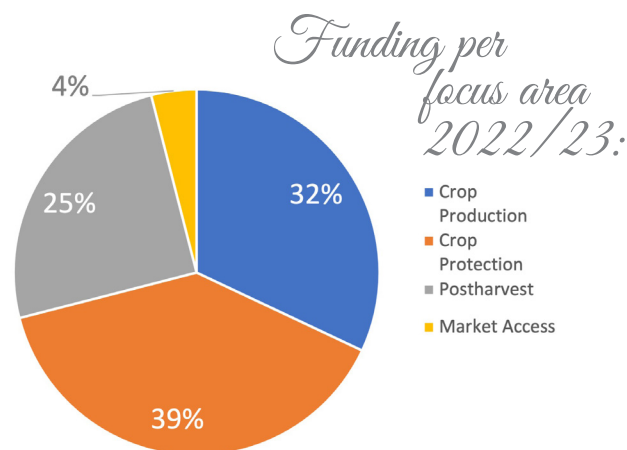
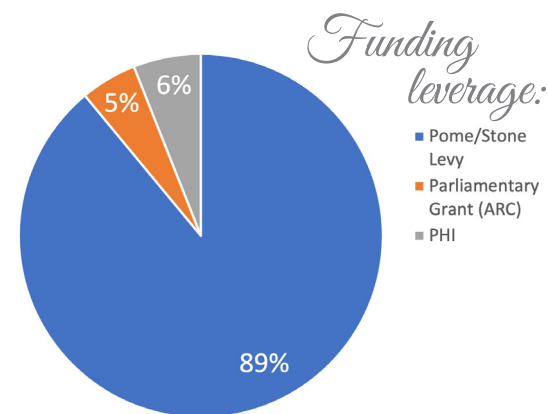
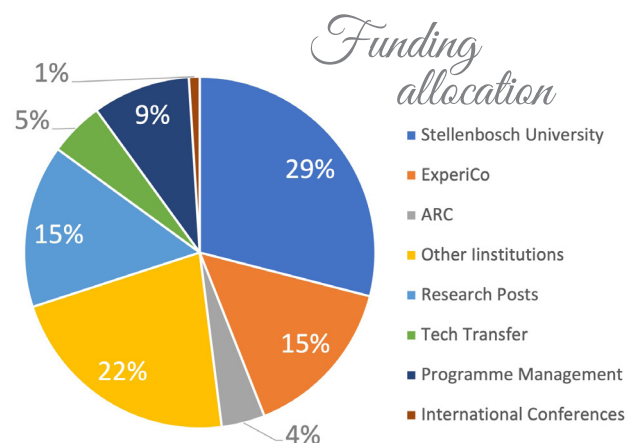
- *Fresh Quarterly* Jun 2023: Mouton, A. Piecing together the packaging puzzle.

EVENTS:

- Hortgro Pome Fruit Research Showcase – 6 June 2023
- Hortgro Stone Fruit Research Showcase – 7 June 2023
 - Hortgro Postharvest Symposium – 8 June 2023



2022/23 AT A GLANCE



Total research projects: 111
Average cost per project: R 296 717

Continuing projects:

Project	Amount
Pome	56
Stone	15
Pome & Stone	18

New projects:

Project	Amount
Pome	10
Stone	4
Pome & Stone	8

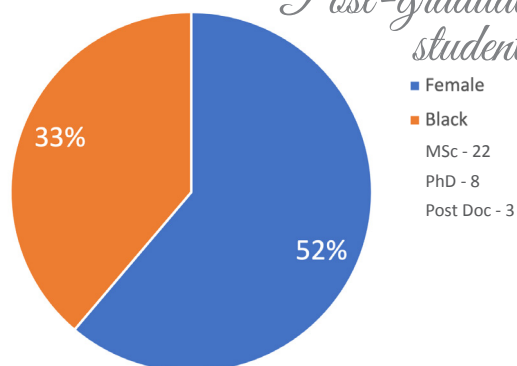
Completed projects:

Project	Amount
Pome	18
Stone	3
Pome & Stone	2

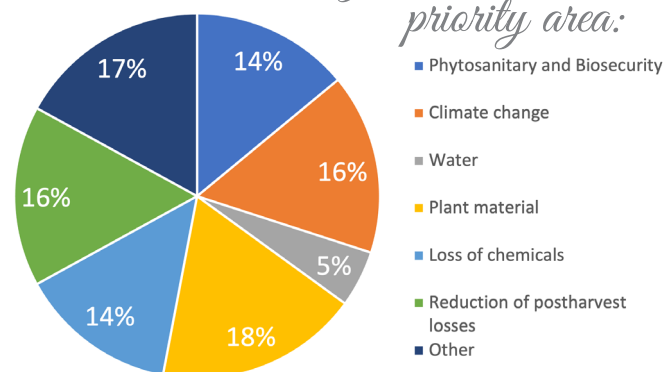
Total projects:

Project	Amount
Pome	66
Stone	19
Pome & Stone	26

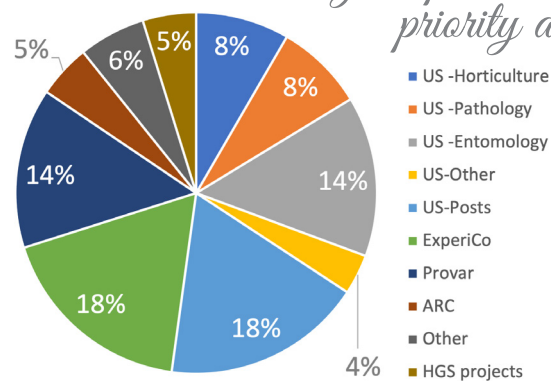
Post-graduate students:



Projects per priority area:



Projects per priority area:





HORTGRO SCIENCE TEAM

PROF WIEHANN STEYN

General Manager
Crop production and Postharvest
programme manager

MATTHEW ADDISON

Crop protection
programme manager

MARNO VAN DER WESTHUIZEN

Research implementation manager

ANITA VAN STADEN

Research administrator

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THANK YOU

