

NEWSLETTER



05

WCDa RESEARCHERS WIN
AT COMBINED CONGRESS

12

WILDFIRES: CHANGING RISKS
AND ADAPTIVE RESPONSES

15

WESTERN CAPE AGRICULTURE
SECTOR PROFILE UNDERSCORES
RESILIENCE

19

BREACHING THE TIPPING
POINTS OF CLIMATE CHANGE

21

FARMING WITH
BIODIVERSITY

CONTENTS

4	NEWS SNIPPETS AND MEDIA LINKS
11	SMARTAGRI IMPLEMENTATION
14	NEWS FROM OUR PROVINCE
16	NATIONAL NEWS
18	INTERNATIONAL NEWS
20	NEWS FROM OUR PARTNERS
22	SHOWCASING RESEARCH AND YOUNG SCIENTISTS
26	UPCOMING CONFERENCES



EDITOR'S NOTE

SMARTAGRI BAROMETER 4 - 2024/2025

As we publish this newsletter, the winter rainfall region of the province has just received the first autumn rains, with noticeably cooler temperatures. This is a relief to farmers focusing on post-harvest crop management, or preparing to plant, and to our busy firefighting teams.

We hope that the winter season will be a good one – neither too hot nor too cold (and neither too dry nor too wet), but just right!

This edition highlights the strength of the Conservation Agriculture research programme, and the productive partnership between researchers at the Western Cape Department of Agriculture, and the Department of Agronomy (and other departments) at Stellenbosch University. Scientific outputs, technology development and awards are testimony to this.

We also cover water and fire – two critical elements of the Western Cape climate reality. The country's Water User Associations gathered in Wellington to deliberate on modern approaches to water resource management, and a PhD degree on groundwater resource opportunities was awarded.

There has also been much activity in the "fire space", with preparations underway to share Western Cape learnings on integrated fire management with 35 international MCAP [Mediterranean Climate Action Partnership] delegates convening in Stellenbosch in May.

Purposeful and positive actions must continue, especially in view of the critical need to make faster progress on national and international greenhouse gas emissions reductions targets. Failure to do so will have dire consequences.

Enjoy the read, and please feel free to send your feedback and ideas, and to disseminate to other interested parties.

For those who have not read about the SmartAgri plan, or seen our previous editions of the SmartAgri Barometer, please visit www.greenagri.org.za and click on SmartAgri.

Prof Stephanie Midgley
Editor



NEWS SNIPPETS AND MEDIA LINKS

WCDoA RESEARCHERS WIN AT COMBINED CONGRESS, POLOKWANE



Prof Johann Strauss (left) and Lisa Smorenburg (right) of the WCDoA won three awards between them

Awards

Three prestigious awards were won by WC-DoA researchers. We congratulate them for this achievement!

Prof Johann Strauss:

- Best Oral Presentation on Conservation Agriculture
- Trophy for Best Conference Paper (shared with Dr Elmarie van der Watt)

Lisa Smorenburg:

- Best Poster Presentation on Conservation Agriculture

In January 2025, a strong contingent of researchers from the Western Cape Department of Agriculture (WCDoA) made their way to Polokwane for the Combined Congress 2025. We were warmly welcomed by our hosts from the University of Limpopo, and a full and varied scientific programme attracted one of the highest number of delegates in recent years.

PRESENTATIONS

The WCDoA researchers showcased the high quality of research being conducted in field crop systems, with emphasis on Conservation Agriculture for grains and vegetables, canola production systems and climatic drivers, disease monitoring and management, weed management, and integrated crop-livestock systems. One presentation focused on reproductive responses to shade netting in apples.

Table 1. List of oral and poster presentations by WCDoA researchers at the Combined Congress

Oral/Poster	Authors	Title
Oral	Johann Strauss	Testing shortened canola production intervals
Oral	Jade Andrews, Johann Strauss and Willem Hoffman	Conservation Agriculture in a vegetable system: soil health and crop yield effects
Oral	Lizette Nowers, Gert van Coller, Johann Strauss and Marieta van der Rijst	Exploring the incidence of Sclerotinia stem rot in different crop rotation systems
Oral	Louise Bestbier, Johann Strauss, Charné Viljoen and Pieter Swanepoel	Herbicide use and weed density in Conservation Agriculture systems
Oral	Andries le Roux, Stephanie Midgley, Pieter Swanepoel and Johann Strauss	Impact of rainfall and temperature on canola yield in the Swartland
Oral	Stephen Jordaan, Stephanie Midgley, Elmi Lötze and Sebinasi Dziki	The impact of protective netting on reproductive bud development, flowering and fruit set in apple trees
Poster	Lisa Smorenburg, Piet Lombard and Johann Strauss	Investigating the profitability of utility crops with weaner lambs under ultra-high density grazing in the Western Cape
Poster	Rebecca Ellerbeck, Johann Strauss and Pieter Swanepoel	The effects of utilising a cover crop under different grazing pressures within a Conservation Agriculture setting
Poster	Pieter Lombard, Johann Strauss, Lisa Smorenburg and Mardé Boooyse	Advances in canola yields in the Rûens production area of the Western Cape
Poster	Jade Andrews, Johann Strauss and Willem Hoffmann	Conservation agriculture in a vegetable system: soil health and crop yield effects
Poster	Gert Conradie, Johan Labuschagne, Johann Strauss, Pieter Swanepoel and Chloe MacLaren	Do cover crops management affect weed management efficiency in the Mediterranean climate of South Africa?



Karen van der Westhuizen, owner of MuddyBoots (consulting business), presenting at the Special Session on Irrigation at the Combined Congress.

SPECIAL SESSION ON IRRIGATION

The WCDa (Prof Stephanie Midgley) teamed up with the University of Pretoria (Dr Nicky Taylor) to host a Special Session on Irrigation: Challenges and Advances in Crop Irrigation across South Africa. There was an emphasis on irrigation during drought and water scarcity. Private practitioners from the north (Stephan Shoeman) and the south (Karen van der Westhuizen and Emma Karkeek) were invited to share their insights and experiences in sub-tropical and Mediterranean fruit crop systems. In the afternoon, the group were shown

several irrigation innovations and challenges in avocado orchards, hosted by Westfalia Fruit (Tzaneen - Modjadjiskloof). The session was funded by the remaining funds from the ISHS IXth Symposium on Irrigation of Horticultural Crops hosted in Stellenbosch in 2023, and Westfalia Fruit.

LAUNCH OF THE SMART AGRITECH INITIATIVE

At a function in Stellenbosch on 18 February 2025, the Smart AgriTech initiative was launched by South Africa Wine in collaboration with Aizatron, Telkom, and Stellenbosch University. This groundbreaking project will focus on innovation and cutting-edge technologies in the pursuit of the advancement of the South African wine industry.

Artificial Intelligence (AI), the Internet of Things (IoT) and 5G connectivity in commercial vineyards and at research sites are transforming data gathering, on-farm intelligence and the development of more adaptive and sustainable farming practices. The industry must embrace these tools to become more competitive and resilient.

A program packed with interesting talks by representatives of the funding partners, implementers, and supporting government units, explained the initiative and its goals. Mr Arie van Ravenswaay of the Western Cape Department

of Agriculture gave an excellent overview of the many technological initiatives he and his collaborators are working on in the broader agricultural space.

Some of the technologies that were showcased include smart sensors for real-time monitoring of plants and micro-climate and for advanced security solutions. AI-driven analysis can guide efficiency gains and on-farm decision-making. Many of the solutions have the potential to reduce costs.

Mr Rico Basson, CEO of South Africa Wine, stated that "this collaboration will empower our industry stakeholders with the tools they need to adapt to climate challenges, optimise resource use, and maintain our global competitiveness. It strengthens our industry's innovation ability and reinforces South Africa's position as a world-class wine-producing nation."





SMARTAGRI ENGAGEMENT WITH EMERGING SMALL- SCALE FARMERS AND AGRI-PROCESSORS

A flagship programme of the Western Cape Department of Agriculture (WCDoA) is the support provided to black smallholder farmers and emerging commercial farmers, one of the focus areas of the WCDoA Directorate Agricultural Producer Support and Development (APSD).

The purpose of the directorate is to facilitate, coordinate and provide support to these farmers through sustainable development within agrarian reform initiatives in the province. In this way, funding received from the national government (through the Comprehensive Agricultural Support Programme, CASP) is employed for the development of agriculture.

All farmers are facing growing challenges linked to climate change. For smallholder farmers and those just starting out, climate-related damages and losses are hard to absorb and recover from. Climate resilience

must be built into the support provided and can be developed through careful planning and climate-smart farming practices.

On 4-5 March 2025, Prof Stephanie Midgley was invited to engage with some of the beneficiaries in the Cape Winelands District Municipality to provide background on climate change for their local farming context. Workshops were held in Stellenbosch, Robertson and Paarl.

Good discussions were held on why climate change may be important to them and what the main risks may be. The participating farmers are farming with vegetables and herbs, livestock and bees.

Knowledge of climate-related risks will help them to recognize and respond to these risks before they cause preventable damages.



Prof Midgley engaging with Ms Dawn Noemdoo, an emerging bee farmer, at the Paarl workshop



Participants of the Robertson workshop with emerging small-scale farmers

SAAFWUA MEMBERS GATHER IN WELLINGTON

On 12-13 March 2025, the South African Association for Water User Associations (SAAFWUA) gathered in Wellington from all parts of the country for the 2025 Conference. The theme was "Water security in action: resilience through collective effort". Ms Eurica Scholz, Chief Executive Officer of the Berg River Water Users' Association, was the Convenor.

A technical bus tour on 12 March set the scene and introduced many of the themes covered in the presentations on the next day. The tour's first stop was at the Berg River Dam and the pumphouse, where the unique facility for ecological flow releases was pointed out. This was followed by a visit to a rehabilitation site on the Berg River north of Wellington. Specialists in river ecology, invasive alien plant clearing and rehabilitation of rivers shared their knowledge and practical experiences. The flood damages in 2023 and 2024 were of particular interest.

The Keynote Speaker on 13 March was Prof Paul Oberholster, Dean: Natural and Agricultural Sciences, University of the Free State. He presented a fascinating overview of South Africa's water security challenges, with a deep dive into the massive collaborative project on the Olifants River in the Limpopo Basin. Using ecological engineering approaches, the project focused on pollution control, water quality rehabilitation, and other components of sustainable water resource management.

Further presentations were given by officials of the Western Cape Department of Agriculture and private environmental practitioners, all focusing on tried and tested solutions. The day concluded with an exploration of the potential for small-scale hydropower projects within WUAs. The conference reinforced the growing awareness that strong collaborations and joint action really can make a difference on-the-ground.



The unique gantry that allows for regular ecological water releases out of the Berg River Dam into the river.



SMARTAGRI IMPLEMENTATION

WILDFIRES: CHANGING RISKS AND ADAPTIVE RESPONSES

By Prof Stephanie Midgley



Photo of a burnt area following the 2024 wildfires

The 2024-2025 wildfire season in the Western Cape has been extremely busy. It was not unusual for the Fire Services to be battling multiple fires simultaneously at the peak of the season. Climate change is one reason, although by no means the only reason, why wildfires are occurring more frequently. Rising temperatures, high wind speeds and a dry environment increase the wildfire risk.

The Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector (the SmartAgri Plan) devotes one Strategic Focus Area (SFA2) to "Strengthen effective climate disaster risk reduction and management for agriculture".

One of the Objectives is to build local capacity in firefighting and fire risk reduction. This requires resourcing, training, the building of effective Fire Protection Associations and other forms of integrated joint planning.

Integration of MCAP Wildfire Working Group into the Provincial Veld Fire Committee

Given the complexity of wildfire management, it is essential to align various wildfire initiatives strategically and as efficiently as possible. The Provincial Veld Fire Committee (PVC), previously the Provincial Veld Fire Working Group, is a well-established platform for collaborative wildfire and landscape management that has met regularly for over ten years.

The Mediterranean Climate Action Partnership (MCAP), consisting of 16 sub-national governments across the world, was launched in 2023 with three priority risk areas: drought, wildfire, and extreme heat. An important step was taken in late 2024 to integrate the Western Cape MCAP Wildfire Technical Working Group into the PVC. Progress on MCAP is now a standing item on the PVC agenda.

The shared objectives between the PVC and MCAP include wildfire risk reduction, response coordination, and resilience-building. This alignment supports a cohesive approach, maximizing impact and fostering integrated provincial wildfire management.

CapeNature to host wildfire project site visit during the MCAP second convening

The second annual convening of the Leadership Council of MCAP will be taking place in Stellenbosch and Cape Town on 6-9 May 2025. A full-day technical excursion on 7 May will include the Amandel River burn site (Du Toit's catchment) on the Franschhoek Pass. The proof-of-concept prescribed burning project launched by CapeNature, in partnership with the Greater Cape Town Water Fund and Working on Fire, covers an area of about 2 513 ha that suffers from severe invasion of pine trees.

The aim is to use fire to destroy the pines, the cost of which is estimated to be only around 25% of the cost of conventional manual and mechanical clearing methods. Benefits include reducing the fire risk linked to dense stands of invasive trees, restoration of biodiversity

and ecological functions, and increasing mountain catchment water yield in the Strategic Water Source Areas, thus increasing water security for Cape Town and the region. This catchment feeds water into the Theewaterskloof Dam which is a critical water source for the area's intensive fruit production. Unfortunately, a portion of the area burnt naturally in March 2024 but it did not burn the entire catchment. The prescribed burn was still going to go ahead until the remainder of the catchment burnt naturally in December 2024 / January 2025. However, the project's intensive monitoring and scientific focus will continue, and follow-up burns are being considered to achieve the project aims.

The appropriate use of prescribed (planned) burning as a biomass and fire risk management tool is of great interest in other regions with a Mediterranean climate. If the costs and benefits of this risk reduction approach can be shown to be more favourable than those of fighting wildfires (including human loss of life, huge costs associated with aerial support, destruction of infrastructure, and liability), this approach could become more favoured by decision makers.



Satellite image showing the burnt area in the Du Toit's catchment. The Theewaterskloof Dam can be seen at the bottom, and Villiersdorp on the right.



Map of the area showing the outline of the original planned burn area (white line), and the areas burnt in March 2024 and December 2024 by wildfires.



NEWS FROM OUR PROVINCE

WESTERN CAPE AGRICULTURE SECTOR PROFILE UNDERSCORES RESILIENCE

One of the trickiest questions in the field of climate change adaptation in agriculture is how to know whether we are making any difference to the farmers' situation and food production. Many sets of indicators have been proposed. At the end of the day, it all comes down to whether production is at a minimum stable, preferably increasing, that investment and trade figures are positive, and that year-on-year variability in production and profitability is kept within reasonable bounds.

How will we know? Our agricultural economists play an important role here, to rigorously monitor, track and analyse trends over time. We are, therefore, very pleased to see the publication of the next Western Cape (WC) agricultural sector profile report based on the 2023 statistics.

The report covers key statistics on population and macro-economic trends, changes in agricultural production from 2013 to 2023, changes in land use, trends in agricultural trade (exports and imports), fluctuations in employment in the sector, support to subsistence farming, investment in agriculture and infrastructure, and agri-tourism development.

Underpinning the health of the agricultural sector is the health of natural resources and the state of the climate. A chapter on trends in the water sector is included, as well as a special focus on climate change.

The province has seen a recent expansion in land under crop production, an annual average sectoral growth rate of 2.7% over the past decade, stability in agricultural employment since COVID-19, and a high (49%) and stable share of South Africa's total primary agricultural exports. This strongly suggests that the sector is resilient, despite the climatic and other challenges experienced in the last decade.

Nevertheless, we must continue to collaboratively implement climate change responses to prepare for further climate shifts in the province.

The report can be access [here](#).

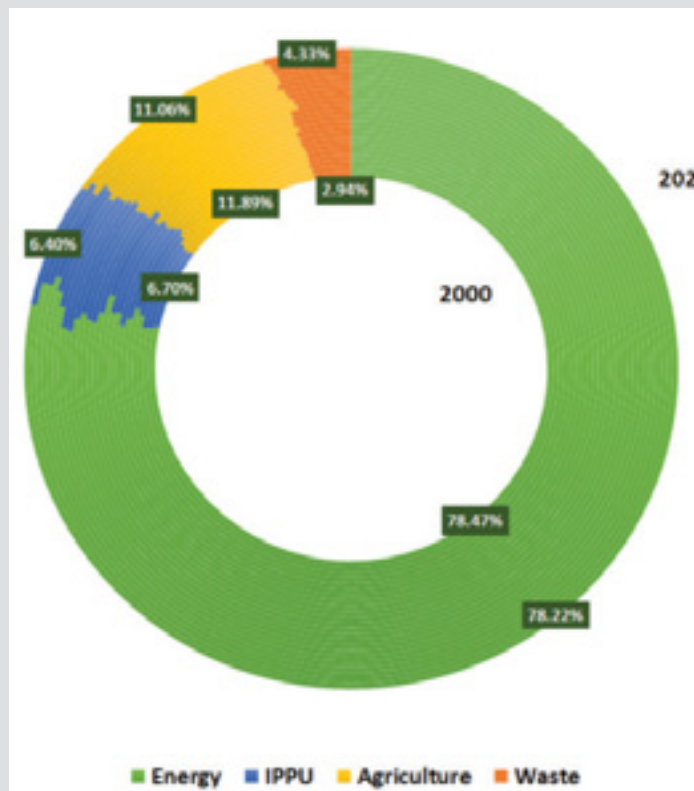
For more information, please contact Mr Tshepo Morokong, Deputy Director: Macro and Resource Economics at the Western Cape Department of Agriculture: tshepo.morokong@westerncape.gov.za





NATIONAL NEWS

SOUTH AFRICA'S GREENHOUSE GAS EMISSIONS PEAKING



Sector contribution to total emissions (excluding LULUCF) in South Africa between 2000 and 2022. From the South Africa BTR 2024 (Figure ES 1.2 1).

South Africa is expecting to reach peak emissions of greenhouse gases (GHGs) in 2024, followed by a general decline in emissions. By 2030, the country will have reached its lowest annual emissions in this decade.

This is the key message of the draft first Biennial Transparency Report (BTR) published by the Department of Forestry, Fisheries and the Environment (DFFE) on 7th October 2024.

The purpose of the BTRs is to transparently track the progress made in implementing and achieving South Africa's Nationally Determined Contribution (NDC) under the Paris Agreement of the UNFCCC (United Nations Framework Convention on Climate Change).

Although the energy, transport and industrial sectors are central to achieving emissions reductions, the agricultural sector is also regarded as important in this regard. Specifically, the implementation of Conservation Agriculture (CA) and grassland restoration are estimated

to have reduced emissions by 2.1-million tonnes a year of CO₂e (carbon dioxide equivalent) from 2010 to 2022. The BTR indicates that total GHG emissions for South Africa in 2021 were 488.32-million tonnes of CO₂e, which came down slightly in 2022 to 478.89-million tonnes. However, when negative emissions (more carbon removals from the atmosphere into soils and trees) associated with land use, land-use change and forestry (LULUCF) are factored in, total emissions in 2022 were 435.83-million tonnes of CO₂e.

South Africa needs to leverage the opportunities for greater carbon removals (through CA and LULUCF) to assist in achieving its emission reduction goals, especially in the short- and medium-term before long-term transitions in energy, transport and industry sectors can take effect.

Click here to read the South Africa BTR: <https://unfccc.int/documents/645057>



INTERNATIONAL NEWS



BREACHING THE TIPPING POINTS OF CLIMATE CHANGE

Prof Dr Johan Rockström is Director of the Potsdam Institute for Climate Impact Research and Professor in Earth System Science at the University of Potsdam, Germany. He is an internationally renowned scientist on global sustainability and Earth resilience, with a specific expertise also in global water resources.

Prof Rockström is best known for developing the [Planetary Boundaries framework](#): nine processes – including climate, biodiversity and biogeochemical flows – that define what humanity needs as a “safe operating space”.

We have already exceeded some of these boundaries, also termed tipping elements, as a result of rapid global change. These are critical parts of the Earth system that are at risk of changing irreversibly if pushed too far. Examples include the Greenland ice sheet, the Amazon rainforest and tropical coral reef systems.

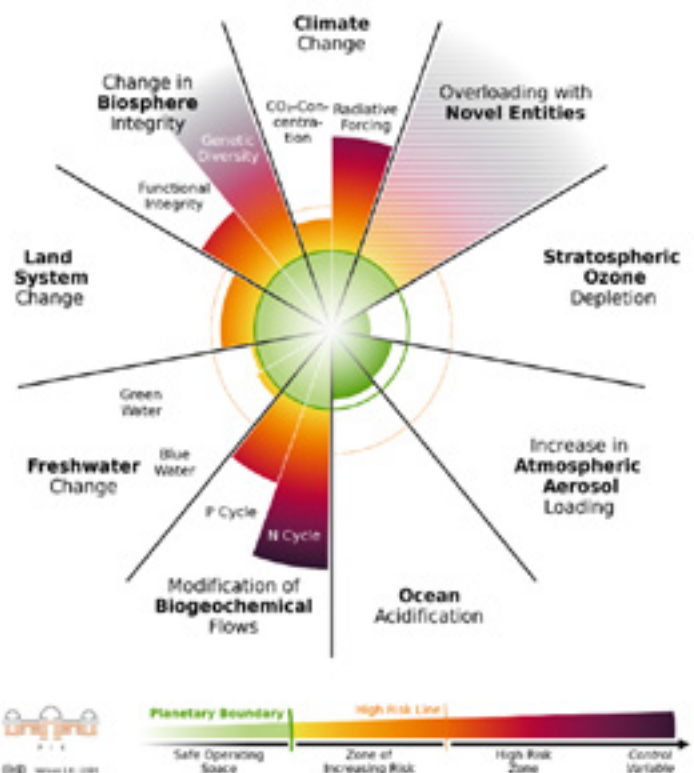
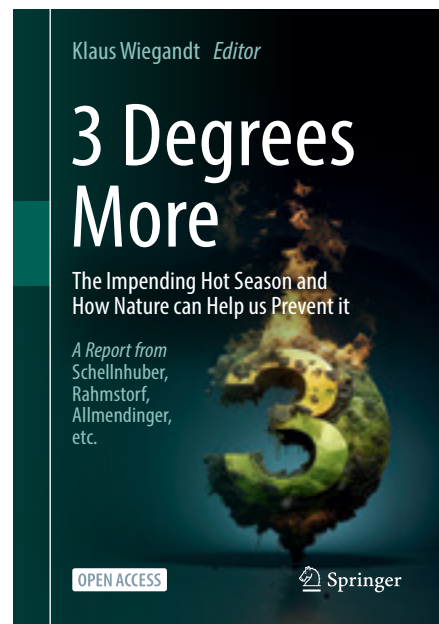
Prof Rockström recently assessed where we currently stand on the tipping points of climate change in a widely acclaimed TED talk. He offers the most up-to-date scientific assessment of the state of the planet and explains what must be done to preserve Earth’s resilience to human pressure. Click here to view the video: <https://youtu.be/Vl6VhCAeEfQ?si=Eh4Yplw53v8xV38q>

Other climate researchers at the Potsdam Institute for Climate Impact Research (PIK) have assessed the expected impacts of a world that is heading for 3°C of global warming by the end of the century. An Open Access book entitled “3 Degrees More - The Impending Hot Season and How Nature can Help us Prevent it” was compiled by Prof Hans Joachim Schellnhuber (director emeritus of PIK), Prof Stefan Rahmstorf (one of the most renowned climate researchers worldwide) and other expert scientists, and was made available in English in 2024.

A key message is that the effects of global warming are not linear. A “3-degree world” is not twice a “1.5-degree world” but would involve catastrophic impacts everywhere on the globe affecting all living beings. Children and young adults now under 20 years of age will be living and working and raising families in this hot era.

The book can be accessed here: <https://link.springer.com/book/10.1007/978-3-031-58144-1>

The good news is that, in both the video and the book, the authors paint a picture of what this new world would likely look like, but also that it is still in our power to prevent such a scenario. This would require limiting global warming to 2°C at least, as required by the 2015 Paris Agreement. We must do everything possible to follow that path, and not the 3-degrees path that we are currently on.





**NEWS FROM OUR
PARTNERS**



**SHOWCASING RESEARCH
AND YOUNG SCIENTISTS**



EXPLORING MANAGED AQUIFER RECHARGE AS A NATURE-BASED SOLUTION TO WATER DIVERSIFICATION IN THE GOUKOU RIVER CATCHMENT

Dr Marlene de Witt

Doctor of Philosophy in the Department of Conservation Ecology and Entomology in the Faculty of AgriSciences at Stellenbosch University, 2025

Supervisor: Prof Francois Roets
Co-supervisor: Dr Andrew Watson

THESIS ABSTRACT

This study aimed to assess the potential of diverting flood peaks for Managed Aquifer Recharge in a data-deficient catchment. An interdisciplinary approach was employed to evaluate if this could overcome some of the hydrological modelling challenges caused by limited hydroclimatic input data.

The data-deficient Goukou River catchment of South Africa was used as a case study, where water managers face a complex task of ensuring water security for residents, industry, farmers and the environment, against the backdrop of climate change and anthropogenic impacts, as well as a ten-fold increase in population numbers over peak tourist seasons.

Two overarching methods were employed in the effort to overcome challenges related to deficient hydroclimatic data: 1) Exploring the parameter space through four different optimization solutions to constrain groundwater flow to realistic proportions; and 2) Using stable isotopes and stakeholder inputs to validate model results and provide clarity on catchment hydrology.

These methods were implemented in the fully-distributed conceptual rainfall-off model J2000 to generate natural recharge and percolation maps of the catchment to inform where MAR efforts should be focused to maximize impact. In addition, the model was used to investigate flood peaks and to assess inflow to the estuary against the published ecological flow requirements, to determine if and where flood water can be diverted for MAR. Stakeholder input was used to assess MAR potential in terms of public acceptance. The efforts to constrain groundwater flow proved useful, and the Differential Evolution Adaptive Metropolis (DREAM) optimization solution performed best to find parameter sets

with realistic groundwater flow proportions, while maintaining sufficient Nash-Sutcliffe efficiencies around 0.38. Non-evolutionary optimization methods require high numbers of model runs, even when considering few objectives, and therefore less suitable for timely applications.

Evidence was provided that the choice of optimization solution used in data-scarce circumstances does have an impact on the ability of the model to overcome the uncertainty of model parameters. The J2000 simulated annual inflow into the estuary is between 63.7 and 72 million m³/annum, lower than the required inflow in the published ecological reserve determination study for the catchment.

This discrepancy is a major barrier to the possibility of using flood peaks for MAR in this catchment. However, the integrated assessment of J2000, isotopes and stakeholder results helped clarify hydrological processes and provided insights into MAR site selection across the catchment, showing potential for two MAR schemes in the lower part of the catchment.

The results from this interdisciplinary and holistic approach to MAR potential assessment provides a more objective decision-making process on where to invest in detailed, site-specific geohydrological assessments and cost-benefit analyses.

The approach also proved useful in identifying various potential barriers to uptake upfront, which could now be addressed concurrently with the more in-depth technical investigations. Partnerships with residents and local associations, who expressed interest in collaboration through this study's stakeholder engagement efforts, may be central to make MAR more implementable.



LEGUMES AND LIVESTOCK IN NO-TILL CROP ROTATIONS: EFFECTS ON NITROUS OXIDE EMISSIONS, CARBON SEQUESTRATION, YIELD, AND WHEAT PROTEIN CONTENT

LISA MATTHEWS, JOHANN A. STRAUSS, THORSTEN REINSCH, HENDRIK P.J. SMIT, FRIEDHELM TAUBE, CHRISTOF KLUSS, PIETER A. SWANEPOEL (2025)

Agricultural Systems 224 (2025) 104218. <https://doi.org/10.1016/j.agsy.2024.104218>

Abstract:

Context: Crop rotation is seen as a 'Climate-Smart Agriculture' practice, but there are knowledge gaps around their climate impacts. This is the first direct measurement of nitrous oxide emissions (N_2O) from cropland soils in South Africa.

Objective: Assess the production performance, soil greenhouse gas emissions, and soil carbon sequestration of different crop rotations.

Methods: Continuous measurement over one year of direct soil N_2O and methane fluxes and analysis of 20 years of historical data on soil carbon sequestration, yields, fertiliser applications, and wheat (*Triticum aestivum*) protein content.

Results and conclusions: Rotations that contained legumes and livestock produced higher wheat (3.5–3.6 vs 3.1 t ha⁻¹ year⁻¹) and canola yields (1.5–1.8 vs 1.3 t ha⁻¹ year⁻¹) with superior wheat protein contents, while the cash crop only system's protein content decreased

by 0.085 absolute % points annually (compared to 0.01–0.05%). The results suggest a strong crop rotation legacy effect on the accumulation and availability of nitrogen in the soil profile, for both crop growth and N_2O production, where systems which integrated legumes and livestock vs. cash crops only had 0.31–0.42 vs. 0.14 kg N_2O -N ha⁻¹ year⁻¹. All systems showed a significant increase of soil organic carbon of 0.24–0.30 Mg C ha⁻¹ year⁻¹ over the 20-year period.

Significance: Legumes and livestock incorporation in crop rotations interact with nitrogen management. Most N_2O emissions occurred after precipitation in the otherwise dry summer, making reduction difficult as minimal management activities occur over this fallow period. A significant challenge in designing N_2O mitigation strategies is the lack of existing N_2O flux datasets needed to develop specific, regional emission factors.



INTEGRATION OF LIVESTOCK INTO CONSERVATION AGRICULTURE SYSTEMS IN THE MEDITERRANEAN CLIMATE REGION OF SOUTH AFRICA.

PIETER A SWANEPOEL & HENDRIK PJ SMIT (2025)

AFRICAN JOURNAL OF RANGE & FORAGE SCIENCE, DOI: 10.2989/10220119.2024.2435884

To link to this article: <https://doi.org/10.2989/10220119.2024.2435884>

Abstract:

Within the Mediterranean climate region of South Africa, the livestock sector constitutes a substantial contributor to the regional economy.

Livestock integration is prevalent in conservation agriculture systems in this region. Crop rotation involving small grains and canola is combined with lucerne and annual medics (among other forage crops) that are grazed by sheep.

However, challenges exist due to high land footprints of livestock. Furthermore, there is concern about competition between animal feed and human food production, nitrogen flows, on-farm nutrient balance, water pollution, soil acidification, biodiversity loss and impacts on climate change.

There is a growing demand and interest for sustainable livestock production systems, and we explore efficient use of local feed resources with low opportunity costs (e.g. crop residues, sacrificial crops, food waste) to create circular farm and food systems. Conservation agriculture systems serve as a good example of farming practices that address sustainability while simultaneously offering ecosystem services.

This paper highlights the need for integrated agricultural systems that could also serve as a buffer against environmental degradation caused by conventional agricultural systems. Integrated crop-livestock systems create synergies between crops and livestock that ensure the recycling of nutrients, minimise by-product waste, reduce external inputs and encourage sustainable resource management.



UPCOMING CONFERENCES

1



60th Annual Congress of the Grassland Society of Southern Africa (GSSA)

21-25 July 2025

ANEW Hilton Hotel, Hilton, KwaZulu-Natal

Congress 60 will be a hybrid event. Delegates have the option to attend in person or virtually.

Abstract submissions are open (deadline 9 May 2025):

[Submit abstract](#)

[Abstract Submission Guidelines](#)

For more information visit the [conference website](#) or email info@grassland.org.za

2



Adaptation Futures 2025 (AF2025)

13-16 October 2025

Te Pae Christchurch Convention Centre
Ōtautahi Christchurch
NEW ZEALAND

Hybrid (in-person and virtual)

[Adaptation Futures Conference 2025](#)

AF2025 is a unique opportunity to share new ideas, network with 1500 people from around the world and online and inspire action to accelerate climate adaptation!

AF2025 will recognise the vital role of Indigenous and local knowledges and insights from Oceania.

AF2025 aims to support Global South, Indigenous and youth leadership at this global event.

AF2025 will offer innovative, inclusive and interactive discussion formats, face to face and online. Alongside welcoming traditional papers/panels and posters to ignite action and share new insights we encourage 'co-creation' sessions including workshops/ talanoa-wānanga opportunities for rich discussion, feedback and new knowledge creation.

AF2025 will intentionally stimulate inclusive, disruptive and challenging conversations to accelerate adaptation.

3

Technical Field Days presented by the Western Cape Department of Agriculture in partnership with farmers and industry bodies

Registration details for these events will be made available later in the year. Please SAVE-THE-DATES!

- Conservation Agriculture Western Cape (CAWC) Jack Human Week
- 6-7 August 2025, Elsenburg and Langgewens Research Farm
- SSK Winter Cereal Information Day, 27 August 2025, Uitkyk, Riversdale
- SKOG Information Day, 28 August 2025, Langgewens Research Farm
- Outeniqua Information Day, 17 September 2025, Outeniqua Research Farm
- Hopefield Information Day, 19 September 2025, Waterboerskraal, Hopefield

4

30th United Nations Climate Change Conference 2025 (UNFCCC COP30)

10-21 November 2025

Belém, Brasil

<https://cop30.br/en>



BECOME PART OF THE SMARTAGRI DRIVE



Interested persons who would like to get more information on SmartAgri and its related actions, are invited to contact Prof Stephanie Midgley: stephanie.midgley@westerncape.gov.za. Please subscribe to the SmartAgri Barometer if you would like to be updated on a regular basis.



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