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Voorwoord /Preface

Hallo almal

'n Verhaal van twee seisoene is dalk die mees gepaste manier om die huidige produksieseisoen te beskryf. Die opbrengspotensiaal in die Suid-Kaap lyk heelwat anders as dié van die Swartland.

Goedverspreide reënval in die Suid-Kaap het die grondslag vir die opbrengspotensiaal gevorm, terwyl die gebrek aan middel-seisoenreënval in die Swartland groot probleme veroorsaak het. In die meeste gevalle was die totale reënval gedurende Julie en Augustus minder as 15 mm.

Die gebrek aan reënval sal beslis 'n groot impak hê wanneer oestyd aanbreek.

Op 'n meer positiewe noot was die jaarlikse CAWC Jack Human-week 'n reuse-sukses. Ons hoop om die praatjies binnekort op die webtuiste beskikbaar te stel.

Alles van die beste.

Hello everyone

A tale of two seasons might be the apt way of describing the current production season. The southern Cape yield potential looks very different from that of the Swartland.

Well-distributed rainfall in the southern Cape has formed the backbone of the potential, while the lack of mid-season rainfall in the Swartland has played havoc. In most cases, total rainfall across July and August was less than 15 mm.

The lack of rainfall definitely will have a huge impact come harvest time.

On a happier note, the annual CAWC Jack Human Week was a roaring success. We hope to have the talks up on the website soon.

All the best.

LINKS OF THE MONTH



Does weed detection and spot-spraying machinery pay off?



Effective fleabane double-knocks tested in Western Australia



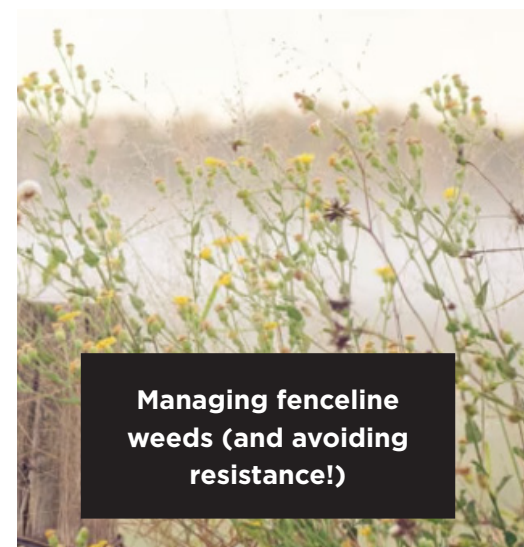
Can I retain stubble and keep weeds under control?



Boosting knockdown efficacy against hard-to-kill weeds



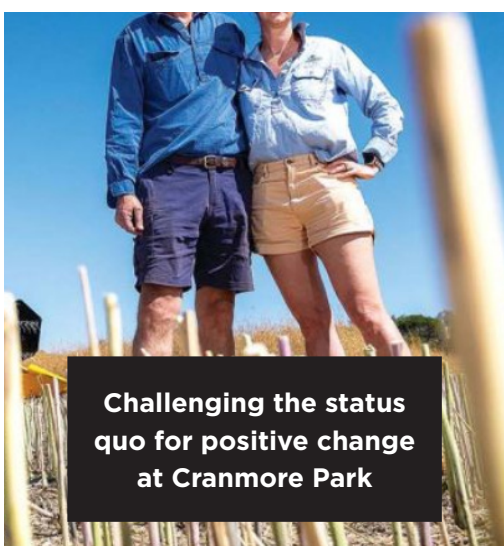
Keeping crops clean and productive with disease management in faba and broad beans



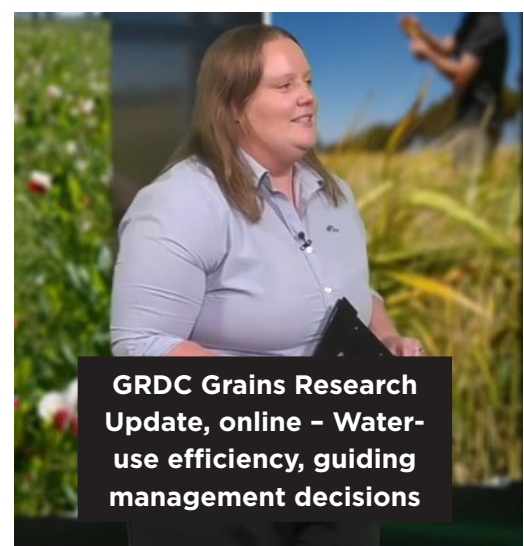
Managing fenceline weeds (and avoiding resistance!)



Faba beans: how deep and early can you go?



Challenging the status quo for positive change at Cranmore Park



GRDC Grains Research Update, online – Water-use efficiency, guiding management decisions

CONSERVATION AGRICULTURE: THE WESTERN CAPE'S RECIPE FOR CLIMATE-RESILIENT GRAIN FARMING

Prof Johann Strauss
Rens Smit
Dr Willem Hoffman

A short summary of research outputs and postgraduate studies



For grain farmers in the Western Cape, farming has always been a balancing act between rainfall, soil health and profitability.

The region's Mediterranean climate, with cool, wet winters and hot, dry summers, creates ideal conditions for producing wheat, barley and canola—but it also makes farming vulnerable to drought, erosion and increasingly unpredictable rainfall.

Over the past four decades, conservation agriculture (CA) has emerged as one of the most significant changes in the province's grain industry.

Rather than focusing on a single practice, conservation agriculture is a complete farming system built around healthier soils, more efficient water use and greater resilience.

Today, the Western Cape leads South Africa in CA adoption, thanks to a combination of farmer innovation, long-term research, and strong collaboration across the agricultural sector.

A DIFFERENT WAY OF FARMING

Conservation agriculture is based on three connected principles:

- Minimal soil disturbance through no-till or zero-till planting.
- Permanent soil cover using crop residues or living plants.
- Diverse crop rotations rather than continuous monoculture.

These principles work together. Simply adopting no-till without retaining residues or diversifying crops does not deliver the full benefits of CA.

Instead, conservation agriculture requires farmers to manage their production systems differently, with the goal of improving soil function over time.

In the Western Cape, adoption has been driven as much by economics as by environmental concerns. Rising fuel prices, expensive machinery and narrow crop margins have encouraged producers to reduce unnecessary field operations while making every millimetre of rainfall count.

BUILDING RESILIENT CROPPING SYSTEMS

One of the biggest questions farmers ask is whether conservation agriculture can maintain yields. The answer from Western Cape research is clear: yields often remain stable during the transition period and frequently improve as systems mature.

During the first few years after conversion, farmers may experience neutral or slightly lower yields while soils adjust to the new management system. Residue management, weed control and fertiliser placement all require refinement during this phase.

As conservation agriculture systems become established, however, several important advantages emerge:

- Better rainfall infiltration.
- Reduced runoff and erosion.
- Lower evaporation from the soil surface.
- Improved seedling establishment.
- Greater water availability during dry periods.

These improvements become particularly valuable in seasons with below-average or poorly distributed rainfall. Long-term evidence from the Western Cape shows a remarkable improvement in water-use efficiency over time.

Even in very dry seasons, mature conservation agriculture systems have continued producing competitive wheat yields while making much better use of limited rainfall.

WHY CROP ROTATION MATTERS

Crop rotation is one of the strongest drivers of conservation agriculture success. Instead of planting wheat continuously, Western Cape farmers increasingly rotate cereals with canola, legumes and pasture phases.

Each crop contributes something different to the system. Legumes improve nitrogen availability for following crops. Canola helps break pest and disease cycles. Pasture phases contribute organic matter and improve soil biological activity.

The result is more than just higher yields. Wheat following legumes often produces better grain protein and a higher proportion of bread-grade wheat than wheat grown continuously.

Diversified rotations also reduce production risk by disrupting weed, insect and disease cycles that tend to build up under monoculture.

HEALTHY SOILS PAY DIVIDENDS

Soil health sits at the centre of conservation agriculture. Years of intensive tillage historically reduced soil organic matter across much of the Western Cape. Low organic matter limits infiltration, weakens soil structure and reduces biological activity.

Conservation agriculture helps rebuild these functions by keeping residues on the soil surface and reducing disturbance. Crop residues become food for soil organisms, while roots help improve soil aggregation and pore structure.

THE BENEFITS DEVELOP GRADUALLY:

- improved soil structure,
- better infiltration,
- reduced erosion,
- increased biological activity,
- and greater soil organic carbon near the surface.

Because these changes happen slowly, long-term trials have been essential for measuring the cumulative benefits of conservation agriculture.

FARMING SMARTER, NOT HARDER

For many producers, the strongest argument for conservation agriculture is financial.

Eliminating multiple tillage operations reduces:

- fuel consumption,
- tractor hours,
- machinery wear,
- labour requirements,
- and maintenance costs.

Although specialised no-till equipment requires an initial investment, operational savings become increasingly important over time. Conservation agriculture also helps reduce financial risk.

More stable yields during dry seasons mean fewer severe production losses, while diversified crop rotations spread income across different commodities.

Where livestock are included, farms gain additional income streams through wool, meat or grazing enterprises, making businesses more resilient to climate and market shocks.

LIVESTOCK HAVE A PLACE IN CONSERVATION AGRICULTURE

Mixed crop-livestock farming remains common across the Western Cape, and conservation agriculture provides opportunities to integrate livestock without sacrificing soil health.

Livestock graze:

- annual pastures,
- cover crops,
- and crop residues.

This returns nutrients to the soil through manure and urine while making productive use of biomass. The key is careful grazing management.

Excessive grazing removes protective residue cover and increases erosion risk, while grazing wet soils can cause compaction.

Successful conservation agriculture systems therefore use planned grazing with controlled stocking rates, grazing duration and residue thresholds to ensure sufficient soil cover remains after livestock leave the field. When managed correctly, livestock strengthen nutrient cycling and improve whole-farm resilience.

COVER CROPS: KEEPING LIVING ROOTS IN THE SOIL

Cover crops are becoming an increasingly important tool for conservation agriculture in Mediterranean environments.

Rather than leaving soil bare between crops, cover crops keep living roots active longer, adding biomass both above and below ground.

Different species provide different functions:

- legumes contribute nitrogen,
- grasses produce high biomass,
- cereals improve ground cover,
- brassicas develop deep taproots that improve soil structure.

Cover crops also suppress weeds by shading the soil and creating mulch that limits weed germination.

In the Western Cape, water availability remains the biggest limitation. Terminating cover crops at the correct time is essential to avoid using moisture needed by the following cash crop. Successful cover crop systems therefore depend on careful species selection, planting dates and termination timing.

CONSERVATION AGRICULTURE AND CLIMATE RESILIENCE

Climate variability is becoming an increasingly important challenge for Western Cape grain producers. Conservation agriculture helps farms adapt

by improving the soil's ability to capture and store rainfall. Residues reduce evaporation, while healthier soil structure allows more water to infiltrate rather than run off the surface.

These improvements make cropping systems more resilient during drought years and seasons with erratic rainfall distribution. Conservation agriculture also reduces greenhouse gas emissions by lowering diesel use through fewer tillage operations. Over time, increasing soil organic carbon can help store more carbon in agricultural soils, contributing to a more favourable whole-farm carbon balance.

THE WESTERN CAPE'S CONSERVATION AGRICULTURE STORY

The success of conservation agriculture in the Western Cape is not the result of a single technology or practice. It is the product of decades of farmer experimentation, long-term research and continuous adaptation to local conditions.

The lessons learned from the Langgewens and Tygerhoek Research Farms together with farmers across the Swartland, Overberg and Southern Cape show that conservation agriculture is a long-term investment rather than a quick fix. Its greatest rewards come from consistently applying all three principles as an integrated farming system.

As rainfall becomes more variable and input costs continue to rise, conservation agriculture offers Western Cape grain producers a practical pathway towards more profitable, resilient and sustainable farming—protecting the province's most valuable asset: its soil.

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LIVESTOCK INTEGRATION IN CONSERVATION AGRICULTURE

Sjoerd W. Duiker and
Nouhoun Zampaligre

Livestock and Conservation Agriculture: Partners, Not Competitors

For many years, one of the biggest debates in Conservation Agriculture (CA) has been whether livestock and crop residues can coexist. Across Africa — and in South Africa's grain-producing regions — livestock are often seen as the greatest obstacle to Conservation Agriculture because animals graze crop residues that are needed to protect the soil. But what if livestock are not the problem? What if they are part of the solution?

Research increasingly shows that well-managed livestock can strengthen Conservation Agriculture systems, improving soil health, nutrient cycling, crop diversity and farm resilience. The challenge is not whether livestock belong in CA, but how they are managed.

THE RESIDUE DILEMMA

Conservation Agriculture is built on three principles: minimum soil disturbance, permanent soil cover and diversified crop rotations. Maintaining soil cover is often the most difficult principle to achieve where livestock are integrated into farming systems.

Crop residues have tremendous value. They protect the soil from erosion, reduce evaporation, moderate soil temperature and feed soil organisms that build healthy soils. Yet those same residues are also a valuable source of feed, particularly during the dry season.

This creates a difficult balancing act for farmers.

The answer is not to exclude livestock, but to avoid overgrazing. By controlling grazing intensity and timing, farmers can harvest the nutritional value of residues while leaving enough cover to protect the soil.

LIVESTOCK CAN BUILD HEALTHIER SOILS

Grazing animals contribute much more than meat or wool. Their manure and urine recycle nutrients back into the soil, increasing organic matter and improving soil biological activity.

In many systems, livestock help distribute nutrients more evenly across fields and improve the efficiency of applied fertilisers.



When grazing is carefully managed, hoof action can also help incorporate plant material into the soil surface without intensive tillage, although excessive trampling on wet soils should always be avoided. Healthy soils benefit healthy livestock, and healthy livestock help maintain healthy soils.

MORE DIVERSITY MEANS GREATER RESILIENCE

Integrating livestock encourages greater crop diversity — one of the cornerstones of Conservation Agriculture.

Annual and perennial pastures, forage crops, legumes and cover crops provide feed while improving soil fertility and breaking pest and disease cycles. Legume-based pastures also contribute biological nitrogen, reducing dependence on synthetic fertilisers.

In Mediterranean environments such as the Western Cape, mixed crop-livestock systems allow farmers to make productive use of cover crops through strategic grazing before terminating them for the next cash crop. This creates opportunities to increase profitability without sacrificing soil protection.

ROTATIONAL GRAZING CHANGES EVERYTHING

Continuous grazing is one of the quickest ways to damage both pasture and soil. Management-intensive rotational grazing offers a better alternative.

By concentrating animals in smaller paddocks for shorter periods, followed by adequate recovery time, pastures remain more productive and ground cover is maintained. Recovery periods allow plants to regrow, roots to develop and soil organisms to thrive.

The result is improved forage production, healthier animals and stronger soils.

TREES, PASTURES AND CROPS WORKING TOGETHER

The chapter also highlights the potential of agroforestry systems where trees, livestock and crops share the same landscape.

Trees provide shade and shelter for livestock, reduce wind erosion and improve biodiversity. Their roots access nutrients from deeper soil layers, while leaf litter contributes additional organic matter.

In dryland farming regions, these integrated systems can improve resilience during periods of drought and climatic uncertainty.

FEEDING LIVESTOCK WITHOUT SACRIFICING SOIL COVER

Farmers often worry that leaving residues in the field means less feed for livestock. However, Conservation Agriculture creates opportunities to grow more biomass overall.

Higher crop yields generate more residues, while cover crops and improved pastures provide additional grazing. Farmers can also rely on alternative feed sources such as forage crops, hay or strategically managed grazing areas, reducing pressure on crop residues.

The goal is to treat residues as one component of a broader livestock feeding strategy rather than the only source of winter feed.

LESSONS FOR AFRICAN FARMING SYSTEMS

Across Africa, livestock remain central to rural livelihoods. Rather than separating crop and livestock enterprises, Conservation Agriculture encourages their thoughtful integration.

The authors argue that stronger collaboration between crop farmers and livestock owners is essential, particularly in areas where communal grazing is common.

Better grazing agreements, fencing options and shared management practices can help ensure both livestock production and soil conservation are achieved.

A PRACTICAL MESSAGE FOR WESTERN CAPE PRODUCERS

For grain producers in the Western Cape, the message is particularly relevant. Integrated crop-livestock systems have long been part of farming in the Swartland and Southern Cape, where sheep graze medic pastures, cover crops and crop residues.

Conservation Agriculture does not require removing livestock from these systems. Instead, it encourages grazing that supports long-term soil health while maintaining profitable livestock enterprises.

When grazing is timed correctly, sufficient residue remains to protect the soil, nutrients are recycled through livestock, and diversified rotations improve both productivity and resilience.

THE BOTTOM LINE

Livestock and Conservation Agriculture do not have to compete for crop residues. With good planning and grazing management, they complement one another.

Integrated crop-livestock systems can improve soil fertility, increase biodiversity, enhance nutrient cycling and strengthen farm resilience in the face of climate variability.

The future of sustainable farming lies not in choosing between crops or livestock, but in managing both as part of one resilient agricultural system.

