Fact Sheet

Climate Smart Agriculture for Soil Health and Productivity Benefits

A regional partnership of Mallee Catchment Management Authority, Agriculture Victoria, Birchip Cropping Group and Mallee Sustainable Farming is working with dryland farmers across the Victorian Mallee to identify and validate management practices that can support sustainability, productivity and profitability improvements under a variable and changing climate.

Commencing in 2024, this four-year project is focusing on addressing a key challenge for Mallee farmers; maintaining groundcover at the level required to protect their most valuable resource: soil.

Implementing changes that support increased groundcover and overall soil stability has always been a priority for farmers managing the region's light sandy soils, particularly in dry years when the risk of wind erosion increases and careful management is required to ensure that on-farm (e.g. soil health) and broader community (e.g. dust storm) impacts are minimised.

As the impacts of climate change become more evident (i.e. increased rainfall variability and temperatures), identifying alternative or modified practices that provide for climate-ready systems and effective responses to seasonal conditions will be critical to achieving regional groundcover targets and to the long-term sustainability of Mallee farming.

Project delivery will help address this challenge by focusing on two key drivers of groundcover and associated soil health outcomes in low rainfall cropping systems: stubble and legume management, while also monitoring how current management practices are influencing groundcover levels across the region.

Sustainable Soils and Stubbles

Birchip Cropping Group

Crop residue stubbles are the primary source of groundcover on Mallee cropping soils over Summer and Autumn. While retaining stubble can conserve moisture and reduce erosion risk, high stubble loads can also present challenges when sowing the next crop. Practices such as burning to manage heavy stubble loads may however contribute to greenhouse gas emissions and pose risks to environmental sustainability, with detrimental effects on soil health, biodiversity and air quality.

Working with local farmers, Birchip Cropping Group (BCG) is seeking to identify stubble management practices that support both productivity and soil health improvements, regardless of the season, while also understanding any associated implications for carbon emissions.

Soil core sampling at a Birchip demonstration site (Photo by BCG)

Key activities include:

- Reviewing existing stubble management methods to better understand what drives decisions (e.g. environmental impact, economic value) and key knowledge gaps.
- Establishing ten on-ground demonstration sites across the region to identify, validate and promote alternative practices that improve the sustainability, productivity, and profitability of low rainfall farming systems.
- Extending project findings to the wider faming community through field days, workshops, and publications, ensuring growers have access to locally relevant, tested strategies.

Legume Based Cropping Systems

Mallee Sustainable Farming

As the diversity of Mallee cropping systems continues to expand with increased use of legume 'break crops' to disrupt pest, disease and weed cycles; key questions remain for many farmers over which rotations are most profitable and their associated impacts on soil fertility and groundcover.

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Growing legume crops on sandy soils can be particularly challenging, with sub-optimal yields and vegetative groundcover an ongoing risk that may negate any potential benefits to soil condition and productivity and increase the soils vulnerability to ongoing erosion - impacting subsequent crops.

To help address these questions, Mallee Sustainable Farming is comparing a range of different rotations with high legume intensity over four seasons (2025-28).

Key activities include:

- Establishing a long-term trial site to identify, validate and promote legume-based rotations and associated management practices that provide for profitability and sustainability gains within high-risk landscapes (i.e. rainfall deficits x sandy soils).
- Undertaking comprehensive monitoring of soil moisture and soil health indicators to compare and inform crop choices and inputs.
- Promoting project findings through workshops, field days, digital products and media articles.

Sowing the long-term trial site in 2025 (Photo by MSF)

Wind Erosion and Land Management

Agriculture Victoria

The Mallee Soil Erosion and Land Use Monitoring Framework incorporates data from roadside transect surveys with remote sensing applications to identify long-term and within-season changes in both management practice and groundcover levels across the region.

Delivered by Agriculture Victoria, ongoing implementation of this Framework is supporting the development and delivery of targeted engagement and communication activities to reduce the incidence and impact of wind erosion in the Victorian Mallee.

Key activities include:

- Undertaking a roadside survey of over 1,000 representative paddocks in Spring and Autumn each year to collect land use and groundcover data.
- Utilising remote sensing technologies to identify changes in crop extent/type and fractional groundcover.
- Developing decision support tools (e.g. maps, statistics) and associated extension materials to increase awareness of regional groundcover observations, thresholds and trigger points for managing groundcover on farm to reduce soil erosion risks.

Wheat stubble from 2024, Ultima, 3 April 25 (Photo by Agriculture Victoria)

How can I learn more?

For more information on this or any of the Mallee CMA's projects:

Follow @MalleeCMA on Facebook or Instagram

Visit our website at www.malleecma.com.au

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