



5-year project to investigate nitrogen use efficiency in the Albany high rainfall zone

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KEY MESSAGES:

- SCF will be part of an exciting 5-year national GRDC project investigating risk and reward in relation to nitrogen management decisions.
- The SCF component will establish a long-term trial that will investigate the role of rotations and nitrogen strategies (high to low risk) in nitrogen use efficiency.
- It will also include a carbon emissions component, whereby each trial treatment is run through the PICCC calculator, developed by Melbourne University.

BACKGROUND

The high rainfall zone (HRZ) of Western Australia is a unique environment, where the vast majority of cropping is conducted on sandy soil types with low nutrient and water holding capacity. As a result, there is a significant yield gap between the WA HRZ and those in the eastern states.

Additionally, the nitrogen use efficiency in the WA HRZ poses a significant risk and challenge to farmers. The low conversion rate of applied nitrogen to grain yield and grain protein, which is likely the result of losses through high rates of leaching and denitrification, coupled with the inability to bank nutrients in the typical WA soils, has led to some risk adversity in nitrogen decisions.

In 2023, Stirlings to Coast Farmers will establish a longitudinal field trial to examine the impact of crop rotation and grower appetite for nitrogen risk on nitrogen use efficiency. In addition, APSIM models and carbon emissions calculations will be utilised to expand upon the field research by utilising the field trial data to model different cropping scenarios and management strategies to broaden the scope of the project.

PROJECT OBJECTIVES

In 2023, Stirlings to Coast Farmers will establish a comprehensive small plot trial that will continue through 2027. Along with auxiliary models, results from the trial will measure the impact of crop rotation and nitrogen strategies on nitrogen use efficiency, carbon emission efficiency, and profitability to increase grower nitrogen decision-making confidence and ultimately improve grain productivity and sustainability in the HRZ of Southwest WA.

METHODOLOGY

The small plot trial was sown in Kendenup on the 24 May 2023 and will be hosted by the Webster family (thank you!) for over four years. The trial will contain three crop sequences and three nitrogen management strategies within the paddock, replicated three times. The crop rotations will be fully phased i.e., every crop planted in every year.

An intense soil and plant nitrogen regime will be followed in each year of the trial to determine accurate nitrogen use efficiency data for each treatment. All input and yield data will be captured to inform APSIM simulations, and carbon emission and profitability calculations.

GOING FORWARDS

There will be plenty of opportunity to engage with the project, with numerous field walks planned over the five years. Being part of a larger national project, SCF will also be able to share results from numerous nitrogen trials spread across Western Australia and interstate.