

Maintaining profitable farming systems with retained stubble in the Riverine Plains region — project overview

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Introduction

The *Maintaining Profitable Farming Systems with Retained Stubble in the Riverine Plains Region Project* is managed by Riverine Plains Inc, supported by FAR Australia and funded by the Grains Research and Development Corporation (GRDC) as part of an overarching national initiative focussed on maintaining the profitability of stubble-retained systems. This project started during 2013 and will run until June 2018.

Objectives

The project seeks to:

- investigate, demonstrate and extend cultural practices that will assist growers to adopt no-till stubble retention (NTSR) in medium and high-rainfall environments;
- build on findings from the previous Riverine Plains Inc (RPI) *Water Use Efficiency (WUE)* project; and
- extend the frontier of agronomic knowledge for crops grown in NTSR systems.

Background

It is widely accepted that as rainfall increases across cropping landscapes, the amount of stubble retention decreases. This often is because growers perceive that growing high-yielding crops in stubble-retained systems is more difficult than growing them in paddocks where the previous crop residue is removed (mainly through burning). It is also true to say that much agronomic knowledge has been gleaned from trials not carried out under a modern NTSR system, leaving a potential knowledge gap. These issues ring true for growers in the Riverine Plains area.

By addressing the negative impacts and perceptions of NTSR systems, advancing the agronomic frontier and building the capacity of growers and advisors working in these systems it is anticipated more growers across the Riverine Plains area will adopt them, and the WUE of these systems will increase. Adoption of an NTSR system,

or improving an existing NTSR system, is estimated to result in at least \$50/ha of extra income from cropping each year. Additionally, a cost saving of about \$60/ha/yr can be achieved through either reduced nutrient loss, normally seen in stubble removal, and/or a more appropriate allocation of inputs under an NTSR system.

Research

The research component of the Riverine Plains Inc *Maintaining Profitable Farming Systems with Retained Stubble in the Riverine Plains Region Project* is comprised of a series of large and small plot trials. The first trials were established during 2014.

Using large-scale trials (focus farms) the research team is evaluating the impact of a single-year, one-off change in stubble management. The result of these trials will help to determine if periodic active management of stubble in an NTSR system increases the sustainability and profitability of the system across the rotation. As different stubble management approaches are likely to perform better under different seasonal conditions, the four years of trials (2014–17) will provide information on crop performance under a range of seasonal climatic conditions.

The focus farm trials in 2014 were located at Henty, Coreen/Redlands and Yarrawonga, New South Wales and Dookie, Victoria (Figure 1). The only change in 2015 was that a site near Corowa was used rather than Coreen/Redlands, in order to maintain the same rotation position, moving back to Coreen in 2016.

As a key component of this project is identifying the long-term impact of a one-off change in management, the sites used in 2014 were returned to the farmer for commercial cropping, with new sites (in the same rotation position) established in 2015 and 2016. These are referred to as 'time replicate 1 (2014 sites)' 'time replicate 2 (2015 sites)' and 'time replicate 3 (2016 sites)'.

As 2016 is the third year of the project, the trial reports include both the experimental results from the 2016 trials, with selected yields also measured on the 2015 and 2014 sites, to understand if the change in stubble management has influenced the performance of the following commercial crop.

The results from the focus farm trials can be found on page 12.



FIGURE 1 Locations of large block (focus farm) trials

A series of small plot trials has been established to address specific aspects of management in a NTSR system, in order to optimise the NTSR production system in the Riverine Plains region. The results from these trials have also been reported in this publication.

The small plot trials carried out during 2016 were:

1. early sowing and the interaction with row spacing and variety in first wheat under full stubble retention (Barooga, Yarrowonga), page 40;
2. interaction between fungicide program and in-crop nitrogen timing for the control of yellow leaf spot (YLS) in early-sown wheat (Coreen), page 46.
3. the interaction between plant growth regulator (PGR) and nitrogen application in early-sown first wheat (Yarrowonga), page 54; and

4. monitoring the performance of nitrogen application to wheat under full stubble retention (Dookie, Corowa), page 58.

Outcomes

The overarching outcome from this project will be to increase the adoption of NTSR systems across the Riverine Plains region. This will be achieved through increasing the profitability and sustainability of NTSR cropping systems by developing regional guidelines specific to the region, enabling growers and advisers to use rotational cultural control measures to enhance the sustainability of their NTSR farming systems. ✓

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