



**ere to from here? A focus upon yield, price, cost & risk to
ure the future profitability of Australian Grain Growers**

on Emms –Weeds Manager - Adelaide Office

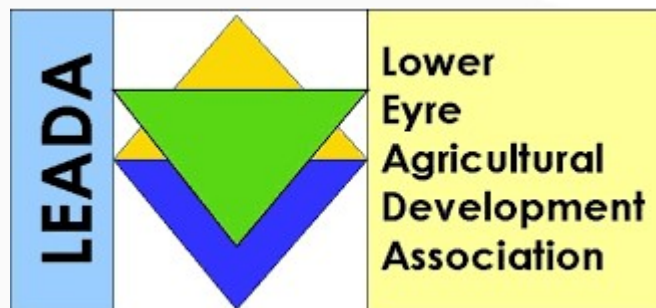


GRDC™
GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

The Stubble Initiative 2013-18

RESEARCH ↔ DEVELOPMENT AND EXTENSION

10 Farming System Groups including:



A revised purpose & strategic plan focused upon grower profitability
Targeted investment in grains R,D&E to ensure on-ground impact

GRDC's Purpose:

To invest in research, development and extension to create enduring profitability for
Australian grain growers

R,D&E Plan 2018-23:

Profit = [Yield x Price – Costs (on farm + post farm)] x Risk

A strategic **framework** for future investment in R,D&E

Ensuring **investment focus** and **delivery on purpose**
identifies **key investment priorities** under 4 key profit drivers



Resourcing the organisation to deliver upon purpose

A new GRDC Southern team ensuring local relevance & impact of R,D&E

- Regional delivery with national coordination & leverage
- Southern panel & Regional Cropping Solutions Network as 'check and balance'
- Regionally based staff with expertise in soils & nutrition, farming systems, agronomy & crop protection
- National Variety Trials transitioned in-house and managed locally
- Regional business development & commercial expertise
- Grower relations managers to ensure effective translation & extension of R&D outcomes

A shift to a continuous investment cycle

Greater responsiveness of investments, from planning through to delivery



GRDC Investment Cycle
rolled-out multiple times per
annum



Recent new investments in the GRDC Southern Region

Responding to major profitability constraints & opportunities

1. Optimising plant establishment, density and spacings to maximise crop yield and profit in the Southern and Western regions
2. Increasing the effectiveness of nitrogen fixation in pulse crops through development of improved rhizobial strains, inoculation and crop management practices
3. Publications and extension to mitigate the risks of herbicide residues damaging following crops in the Southern Region
4. Extension of knowledge and resources to manage risk and exploit opportunities to improve whole farm profit through successful integration of cropping and livestock enterprises in the GRDC Southern Region

The **implementation** gap is frequently bigger than the knowledge gap

So what will **you** do differently?

LEADA research

LEADA



Stubble Guidelines

Managing Yellow Leaf Spot in Stubble Retained Systems on Lower Eyre Peninsula

Local Management Guideline for the GRDC Stubble Initiative Project (LEA0002)

Continuous wheat crops and retaining stubble significantly increase the risk of Yellow Leaf Spot. Early sown susceptible varieties and extended wet conditions can result in an increased disease severity. It survives on wheat stubble.

On Lower Eyre Peninsula, yellow leaf spot has been observed in areas typically defined by soil type, even after a 12 month break. This is thought to be due to the slow breakdown of stubble on sandy soils and prolonged dewy mornings that occur through autumn.

Economic Importance - When is it a problem worth worrying about?

Generally, yellow leaf spot infections cause yield losses of less than 15%, however in years with high spring rainfall and on susceptible varieties this can increase to 30%. Heavy infestations of yellow leaf spot can increase yield loss especially when the flag and upper leaves become infected. In most years, yellow leaf spot only infects the lower leaves and is generally regarded as causing limited yield loss.

The use of varieties with at least MRMS resistance is the most cost-effective strategy in combating yellow leaf spot under high disease pressure situations.

What are the solutions?

Stubble management

Practices that reduce stubble density (tillage, burning or grazing) on the surface will reduce the level of inoculum.

Stubble management will not reduce disease caused by spores blown in from other paddocks later in the growing season.

High levels of disease in spring will increase the risk to future crops. It is important to ensure spring inspection accurately identifies yellow leaf spot, and does not mistake it with either Septoria blotch or nutrient deficiencies.

Rotating susceptible crops with non-host crops.

One year planted to a break crop is typically enough to reduce the risk of yellow leaf spot on LEP to negligible levels. However in situations where an MS or worse variety has been planted in the paddock previously in a year of favorable spring conditions and on soil types that don't favour stubble breakdown then a two year break or implementing other management practices to aid yellow leaf spot control may be necessary.

Using resistant wheat cultivars

Currently there are around 20 wheat varieties that may be suitable to grow on LEP. These have a wide range of resistance ratings to yellow leaf spot. Research conducted by LEADA and AGT concluded that varietal selection was a very effective method of reducing the risk of yield loss from yellow leaf spot. Many of the high yielding wheat varieties currently available have MRMS or better resistance to yellow leaf spot. Disease ratings are updated annually in the SARDI Cereal Disease Guide: http://www.pir.sa.gov.au/_data/assets/pdf_file/0010/276841/Cereal_Variety_Disease_Guide_2016_web.pdf

Applying foliar fungicides.

Yellow leaf spot fungus feeds on dead plant cells. This effects the way that fungicides will work to control yellow leaf spot. The process of killing plant cells in advance of where it feeds gives the yellow spot fungus the added advantage prevents the movement of fungicides into that region of the leaf. Consequently, fungicides have difficulty accessing an established yellow spot infection to kill it. For an applied fungicide to control an existing infection, it needs to be applied almost immediately after the infection started. This issue is compounded by potentially continual release of spores from primary and secondary infections on stubble and on the lower leaves of the plant.

Cont.

LEADA



Stubble Guidelines

Managing Pre-emergent Herbicides in Stubble Retained Systems on Lower Eyre Peninsula

Local Management Guideline for the GRDC Stubble Initiative Project (LEA0002)

High rates of stubble retention have the potential to reduce herbicide efficacy through intercepting the herbicide on its pathway its target at the soil surface.

Across the region there are many combinations of seeders, row spacing, tined and disc implements as well as differing harvest patterns and stubble heights, all of which will need specific consideration to maximise herbicide efficacy. This guideline provides a range of techniques to improve pre-emergent herbicide efficacy.

Stubble management

Pre-emergent herbicides require contact with the soil. At harvest, it is important to manage stubble to ensure the soil contact is achievable. Trash needs to be spread evenly across the entire harvester width, paying attention to the efficacy of the straw spreader. Weed seedbank reduction practices that reduce stubble load, such as windrow burning and chaff dumping, will also improve the following season's pre-emergent herbicide efficacy.

Retaining tall stubble standing and inter-row sowing may allow herbicides to be applied more directly to the less-covered soil between rows. However tall standing stubble can accumulate quickly over successive seasons, particularly where rainfall and warm temperatures do not align, reducing stubble breakdown. Similar results can occur where summer weeds are not controlled or managed late.

Spray techniques to aid herbicides reaching the soil surface

The negative effects of the herbicide being caught within the stubble canopy are twofold:

- Some products require incorporation or direct soil contact to activate and protect them from volatilisation.
- Uneven coverage of the soil surface.

Many small adjustments to the sprayer setup can improve soil contact and minimise losses.

The heavier the stubble load, the greater the need for larger spray droplets which require higher application volumes (more than 80 L/ha) to ensure uniformity of the deposit, particularly for pre-emergent herbicides with a low solubility in the soil.

Keep your water rates high

The trade off with increasing droplet size is a large reduction in droplet numbers. Increasing water rates from 50 L/ha to 100 L/ha will significantly improve Ryegrass control.

Table 1. Ryegrass density across all herbicides/all stubble types for the three application volumes, with average control given as a percentage reduction from control, LEADA herbicide efficacy trial 2015.

Water Rate (L)	Ryegrass (plants/m ²)	Reduction from control (%)
50	21 ^a	52
100	12 ^b	73
150	11 ^b	75

Trifluralin and Sakura® herbicides have different solubility and adsorption properties. Trifluralin has low solubility and is highly adsorbed to organic matter whilst Sakura® is the opposite. For both products Ryegrass control on susceptible populations and increasing water rates gave similar responses.

Use rear facing nozzles where the angle can offset the travel speed.

The aim is to have the droplets moving predominately downwards through the stubble or travel at slower speeds.

To cover large areas in a timely manner many boom sprays in the region operate at speeds of 16 km/h or higher. At these speeds spray droplets carry the momentum of the sprayer and do not travel straight down towards the soil surface. This increases the chances of the droplet not reaching its target destination.

Development of brome grass RIM (BRIM) –
web available now (Jan 2018)

<https://ahri.uwa.edu.au/research-brome-rim/>

Development of barley grass RIM (BARIM)
– still in progress



A tool to evaluate the profitability of brome grass control methods in the no-till broadacre cropping systems of the Southern Australian grainbelt, on the short, long-term and at paddock scale, in 3 simple steps:

1. Define your paddock 2. Build your strategy 3. Compare your results



Initiative Survey of impact



GRDC Stubble Initiative Survey

grdc.com.au

Andrew

Do you grow grain on your property? Do you provide advice to growers? If so, we would like to hear from you.

We are interested to find out about the approach grain growers take to manage stubble, the advice given by advisors about stubble management, and if these have changed in recent years.

For the chance to win an Engel's Chest Fridge Freezer valued at \$1500, please go to <https://www.surveymonkey.com/r/managingstubble> and fill out our short, 10 minute survey before 5pm, 29 March 2018.

Stubble Initiative – The Future Legacy

- Continue to build upon learnings at farm level
 - Weeds
 - Nutrition
 - Pests
- CSIRO developed models for Brome & Barley Grasses
- Understand system changes take time to adapt in the paddock

A new GRDC focused upon grower profitability
Targeted investment in grains R,D&E to ensure on-ground impact

A revised purpose & strategic plan

Profit driver framework for R,D&E investment

Regional delivery with national coordination & leverage

Leveraging strong networks from the ground-up

Addressing major profitability constraints & opportunities

Desire to improve translation and adoption of research outcomes



Thank you.



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