

## Spring into RD&E updates

### Julianne Hill, RCSN western region coordinator

The season has been tossing some very curly ones at us this year. After big rainfall events throughout the grainbelt during February, it seemed as though stored soil moisture would have carried most growers through the season and this encouraged many to get an early crop in the ground.

In some areas of the State, there were little or no follow-up rains and any that did come were pretty late in the season. Pasture for stock-feed was also compromised.

Other parts of the state experienced a high degree of early waterlogging, which - in some instances - has limited yield potential of crops. On top of that we've experienced frosts during September in some parts.

Some of the issues to arise from our recent rounds of open RCSN local forums, GRDC spring tours, field days and other events reflect this diversity in our season and the resourcefulness of growers in managing variable conditions.

At GRDC there have been some changes, with several new Western Regional Panel members being appointed. This month they toured the Esperance and central grainbelt areas to inspect crops and RD&E sites first-hand.

Their purpose was to get insight into some of the innovative crop research trials taking place across WA with GRDC investments, as well as meet growers to discuss production challenges and opportunities for future RD&E.

The new Western Region Panel members are Fiona Gibson, a Mingenew grower and applied economist, agronomist Michael Lamond, and Binu grower Rohan Ford.

They join those panellists who have been reappointed for another term - chairman and Dunn Rock grower Peter Roberts, agronomic and agribusiness advisor Chris Wilkins, Ravensthorpe grower Andy Duncan, Mingenew grower Darrin Lee, Munglinup grower Gemma Walker, Merredin grower Jules Alvaro and wheat geneticist Greg Rebetzke from CSIRO.

In this edition of the RCSN newsletter we take a look at some of the many areas of GRDC investment in agronomy, farming systems, soils, nutrition, pests, weeds and diseases that each RCSN group has identified as important to delivering value and sustained profitability to growers in their region.



Further details of RCSN priority areas and specific GRDC investments in the regions can be found in the newly-released RCSN Annual Report for 2016-17 via [this link](#); via the RCSN's dedicated [website](#); and through the [GRDC's Online Farm Trials \(OFT\) website](#).

RCSN members have enjoyed catching up with so many growers and industry stakeholders during the past couple of months. Harvest is just around the corner for some, so we wish you all the best and look forward to seeing you all soon somewhere around the traps.

You can contact me for news and information about the western region RCSNs - Julianne Hill: 0447 261 607, [email](#), or [Twitter](#).

**Photo caption:** You know it's spring when the field days get underway and GRDC Western Regional Panel, staff and RCSN members have been out and about talking to growers at these key WA agricultural events. PHOTO: GRDC

## Around the port zones



### Esperance port zone RCSN

Crop nutrition tactics better tailored to local soil types and seasonal conditions and the implications of plant nutrient availability and uptake after soil amelioration are RD&E priorities identified by the Esperance RCSN group.

They were also raised by grain growers attending recent RCSN open forum meetings in this port zone.

GRDC is addressing these issues with planned investments into a suite of new crop nutrition research projects (across the western region) for the coming five years.

These will build on work undertaken in WA through the GRDC's More Profit from Crop Nutrition (MPCN) phase two national initiative, which started in 2011 and finished in June this year.

Some of the regionally-specific priorities identified by GRDC for investment to 2020 that are likely to impact on Esperance growers include:

- Increasing profit from nitrogen (N), phosphorus (P) and potassium (K) fertiliser inputs in a range of emerging WA crop sequences
- Nutrient re-distribution and availability in ameliorated and cultivated soils
- Improved soil sampling methods for better predicting soil nutrient availability and supply.

Projects will be overseen by GRDC agronomy, soils and farming systems west manager Dr Julia Easton.

She says through the N, P and K project, researchers will further investigate N in the WA farming system - with a focus on N cycling and availability, crop specific responses to N in a range of seasonal conditions and economics of N application.

Outcomes for P research include improved knowledge and quantification of soil P storage, sources of supply, responsiveness of crops to P, economics of using P and methods of fixing P deficiencies in subsoils.

Dr Easton says new research will also be carried out into refining work into understanding nutrient re-distribution after soil renovation - such as ploughing, ripping and delving - and the impact of soil mixing on crop nutrient supply across a range of typical WA soil types.

For information specific to crop nutrition RD&E in the Esperance zone, contact Julia Easton, GRDC, at: 0427 451 228, [email](#).

**Photo:** Crop nutrition research projects in the western region are being overseen by GRDC's agronomy, soils and farming systems west manager Dr Julia Easton. PHOTO: GRDC

## Geraldton port zone RCSN - Exploring herbicide efficacy after soil inversion

Trials with GRDC investment into the efficacy of a range of herbicides at label rates after mouldboard ploughing are showing significant differences in crop emergence so far in 2017.

Inversion of the soil profile using mouldboard ploughing, or other deep cultivation, is of increasing interest to growers in the Geraldton port zone - who raised the issue at recent RCSN open forum meetings.



The idea is to help manage soil water repellence, compaction, incorporate nutrients and amendments and reduce weed seed viability. But local growers are seeking more RD&E into how soil structure and attributes change, the potential implications of this for pre-emergent herbicide efficacy and if herbicide toxicity is likely to be a problem for some crop conditions.

Department of Primary Industries and Regional Development (DPIRD) research officer Tom Edwards is working on the 'Delivering enhanced agronomic strategies for improved crop performance on water' project through GRDC's 'Soil Constraints - West' investment.

His first year of trials this winter is finding significant differences in crop emergence on some mouldboard ploughed sites in the West Midlands, Great Southern and near Esperance.

At Corrigin and Esperance he has noted barley and wheat emergence differences for all herbicides used compared to the control and complex interactions in canola at Esperance.

Tom says past research in WA indicates deep ripping inversion tillage, such as with a mouldboard plough, potentially makes standard label rates of pre-emergent herbicides more active and is conducive to herbicides reaching the root zone of the crop at higher concentrations.

He says this risk is likely to be further increased when the rainfall intensity of the first rains following application is high. Tom says other factors that may also be contributing to poor crop emergence in these cases include increased erosion of topsoil or rate of higher losses of topsoil moisture, surface crusting or reductions in soil strength that create difficulties with seeding depth.

Using a logarithmic sprayer in several of the field trials is allowing him to compare crop performance more directly to the rate of herbicide applied.

His trials for the next three years will include a range of crop types and active herbicide constituents, with the aim to uncover better agronomic options and practical guidelines to improve herbicide efficiency on a range of soil types post-inversion tillage.

He will also explore the breakdown of sulfonylurea and glyphosate applied prior to the inversion of the soil. It is early days, but for more information about this research, contact Tom Edwards, DPIRD, at: 08 9083 1151, [Tom.Edwards@dpiird.wa.gov.au](mailto:Tom.Edwards@dpiird.wa.gov.au) or Rowan Maddern, at GRDC, on [rowan.maddern@grdc.com.au](mailto:rowan.maddern@grdc.com.au).

**Photo:** Herbicide trials being conducted with GRDC investment on a mouldboard ploughed area at Corrigin are showing significant barley crop emergence differences in 2017. PHOTO: GRDC



## Kwinana East port zone RCSN - Soil benefits of controlling the traffic

At the Kwinana East RCSN group's recent series of open forum meetings, grain growers identified a need to further explore controlled traffic farming (CTF) options for this region's specific soils and conditions.

The zone's RCSN group has also consistently ranked CTF as a priority RD&E issue, particularly in the ability of traffic systems to maintain soil benefits following deep cultivation and topsoil amelioration practices.

GRDC invests in RD&E into CTF through the 'Managing the impact of soil compaction on crop yield' project as part of the 'Soil Constraints - West' investment and recently produced a booklet of case studies to identify and extend information about practical CTF systems being adopted by WA growers right across the grainbelt.

Featured in this '[CTF - Case studies of growers in Western Australia](#)' publication are growers Gary and Sue Lang, who farm in Wickiepin in similar conditions to parts of the Kwinana East port zone - with 400mm average annual rainfall and sandy loam over clay duplex soil types.

Gary started implementing CTF in 2007 - replacing machinery as required according to a pre-determined plan - and says it has improved soil moisture retention and boosted crop yields by up to 0.2 tonnes per hectare on the property in drier years.

He says initial machinery modifications to meet CTF specifications included increasing the width of seeding equipment from 10 metres to 11.9m.

He removed the dual wheels from his four-wheel drive tractor to replace with cotton reel wheel spacers (steel and shaped like a cotton reel). These widened the wheels out to meet 3m wheel track centres, compared to a standard wheeled tractor that has wheel track centres of 2.2m.

Gary believes the family's grain business is in front by using CTF due to improved economies of scale, consistent yield benefits and better soil health and structure.

However, he says the ability of the soil to withstand and retain moisture does create some particular difficulties in some seasons.

As a sheep farmer he misses run-off to fill dams in some years and catching a lot of water in the soil during the past two summers has resulted in a lot of seepage appearing and created bogging issues.

As part of CTF integration into the whole farm system, in the past two years Gary has started using chaff decks for placing harvest residue (including weed seeds) on to tramlines.

The idea is to control weed seeds and restrict weed and crop regrowth to one area for minimising crop competition issues in the following year. The weeds and regrowth on the tramlines can be selectively targeted with herbicides.

To read more about the Lang's CTF set-up - and tactics used by other WA growers - see the GRDC's '[CTF - Case studies of growers in Western Australia](#)' booklet or request a copy through the GRDC's Perth office by phoning: 08 9230 4600.

**Photo:** Gary Lang, of Wickiepin and member of Kwinana West RCSN, is a long-term adopter of controlled traffic farming (CTF) and says it is benefitting his whole business. PHOTO: GRDC

## Albany port zone RCSN - Sclerotinia management

Grain growers attending Albany port zone RCSN open forums raised management options for sclerotinia as a big issue effecting their canola crop productivity and profits.

Of particular interest is determining the best timing of fungicide applications to achieve a good return on investment, fungicide options available and alternative management tactics.



GRDC invests in canola production issues for the high rainfall zone through a range of projects with CSIRO and DPIRD, including those carried out by its national canola pathology program.

DPIRD research officer Dr Ravjit Khangura is part of this group and is investigating the optimum timing, number and economics of fungicide applications for sclerotinia in the western region.

She is also looking at the pre-requisite factors for developing disease forecasting tools and agronomic control measures to help manage this disease.

Key findings from this research to date are outlined in a GRDC 'Know More' video, which can be seen on the [GRDC YouTube channel](#). It is a short, simple guide to managing sclerotinia stem rot in WA in 2017.

Dr Khangura says current foliar fungicides registered for sclerotinia include iprodione, procymidone and - more recently - prothioconazole/tebuconazole-based products.

She says 2016 was particularly bad for ground (or basal) sclerotinia stem infection at the pre-flowering stage across southern (and parts of central) WA, making fungicide spray decisions very difficult.

To address this, DPIRD trials, with GRDC investment, aimed to control the secondary/further spread of the ground infections with fungicides when the disease appeared in the crop.

Sites at Darkan and Arthur River found there was good sclerotinia disease control and higher yields when fungicides were used to control disease occurring from ground infections.

For more information about this research, contact Ravjit at: 08 9386 3333, [ravjit.khangura@agric.wa.gov.au](mailto:ravjit.khangura@agric.wa.gov.au) or access the [DPIRD Sclerotinia hub](#).

**Photo:** DPIRD research officer Ravjit Khangura is assessing the aggressiveness of a range of WA field isolates of *Sclerotinia sclerotiorum* as part of GRDC's national canola pathology program. She discusses sclerotinia management options for growers in a GRDC 'Know More' video that can be found via the [GRDC Youtube Channel](#). PHOTO: GRDC



## Kwinana West port zone RCSN - Frost a forefront issue for growers

Frost research and variety tolerance are ranked as high RD&E priorities by Kwinana West port zone RCSN members and created discussion at their recent local open forum and closed group meetings.

Frost heavily impacts on cropping profitability over many years in this region and growers recognise the value of GRDC's current and long-term investments in addressing this problem.

Most recently, as part of GRDC's National Frost Initiative (NFI), DPIRD has compiled a resource called '*Frost - Frequently asked questions*', which can be found via the [GRDC website](#). This will also be distributed in the Sept/Oct edition of GroundCover™ to growers and agronomists in selected areas of GRDC's western and southern cropping regions.

GRDC Informatics manager Dr Hollie Webster says the new publication provides guidance to growers and advisers seeking information about management issues relating to frost damage to cereal crops.

It incorporates diagrams, detailed images and descriptions to help determine whether plants are frost damaged or not, as well as links to further information and findings from projects conducted through the NFI. The NFI is an integrated program combining frost management, environment and genetics research, development and extension (RD&E) programs.

DPIRD development officer Kelly Ryan says '*Frost - Frequently asked questions*' was produced in response to concern from growers across the grainbelt who experienced widespread crop damage from multiple frost events in 2016.

Dr Webster says recent research had found that a frost event is often preceded by a rapidly developing blocking anticyclone, or an area of high pressure.

She says this finding was established by an NFI investment project conducted by CSIRO and the South Australian Research and Development Institute (SARDI).

More information about this can be found in the July/August edition of GroundCover™ available via the [GRDC GroundCover webpage](#). For more information about GRDC's frost investments, contact Dr Hollie Webster, GRDC, at: 08 9230 4600 [hollie.webster@grdc.com.au](mailto:hollie.webster@grdc.com.au)

**Photo:** A new publication compiled by DPIRD as part of the GRDC's National Frost Initiative, contains information addressing frequently asked questions about frost - such as 'what does frost damage look like?' PHOTO: GRDC

## Hot Topics for September

### Harvesting short, patchy crops

Help is at hand for WA growers facing challenges when preparing to harvest patchy cereal, lupin and canola crops of variable heights.

DPIRD development officer Glen Riethmuller has compiled guidelines for adjusting and modifying machinery settings and header fronts to minimise grain losses.

Called '*How to successfully harvest short patchy crops*', this resource can be found on the [DPIRD website](#).

Glen says some modifications can be made easily and cost-effectively to cleanly cut, pick-up and clear low crop material from the knives and convey it - with a high proportion of heads (or pods) - from the cutter bar into the header.

He says the easiest changes to make are attaching black plastic (such as Corflute® corrugated polypropylene) to the finger tine reel to sweep cut material back onto the table or belt and checking that knife sections are in good repair.

Glen says knife section hold-down clips should be adjusted to have a maximum 2mm of clearance and advises to check the operator's manual when making any knife guard adjustments.

Other harvest machinery modifications can include using extension fingers that extend forward from the knife to help catch the cut material on conventional open front headers and adding air reels to help blow short material clear of the knife back into the table auger or belt.

Without making changes, Glen says growers dealing with short and patchy crops risk significant harvest losses.

In 2003, a survey of 41 paddocks within 50 kilometres of Merredin, found wheat harvest losses averaged 61 kilograms/ha (from 2.3 tonne/ha crops).

About 90 per cent of lost grain was still in heads on the ground and Glen says (at a wheat price of \$300/t), this was an \$18.30/ha loss - or total of about \$72,000 for a 4000ha cropping program. He says assessments at Merredin in the drier 2002 season found harvest losses were exacerbated due to short crops.

For wheat that year, the harvest loss was 70kg/ha in one paddock for a 0.6t/ha harvested crop.

For lupins, the harvest loss was more than the harvested yield - with up to 390kg/ha of grain on the ground in one paddock after the machine harvested just 0.3t/ha.

More information about this research and harvesting short crops this season is available from Glen Riethmuller, DPIRD, at: 08 9081 3111 or [glen.riethmuller@agric.wa.gov.au](mailto:glen.riethmuller@agric.wa.gov.au)

### Preparing for harvest weed seed control

Early spring can be a good time to start planning harvest weed seed control (HWSC) tactics to reduce future weed burdens, help conserve valuable soil moisture from any summer rain and slow evolution of herbicide resistance.

Common HWSC tactics that are being used successfully across the WA grainbelt include:

- Narrow windrow burning
- Chaff carts
- Bale direct
- Seed destruction technology
- Chaff tramlining
- Chaff lining.

How to get the best out of each tactic is covered by a range of industry experts in a new online course offered through WeedSmart, which is supported by GRDC, the Australian Herbicide Resistance Initiative (AHRI), several Australian universities and grains industry stakeholders.

Registration is free and the two-hour course can be completed at any time and at leisure.

For more information and to register, see [this link](#).

Chaff lining is one of the easiest and most cost effective HWSC tactics to adopt and has the added benefits of high residue retention and no need for post-harvest management, such as burning, according to AHRI's Peter Newman.

This is a relatively new practice that makes a narrow windrow of chaff only down the middle of the harvester. Weed seeds are concentrated in that zone and straw is spread as usual.

The chaff line is not burned, but left on the soil surface for weed seeds to rot and/or for emerging weed plants to compete with each other in a narrow row, leaving the remainder of the subsequent crop area clean.

Peter says WA grower experience of this system is finding that the chaff lines are often not weedy, helped by the harvester not running over the seeds to stimulate germination.

Esperance and Three Springs grain growers Mic and Marnie Fels have successfully been using chaff lining for several years in their controlled traffic farming (CTF) system.

They are finding that (similar to the experience of growers using a chaff deck) the chaff and weed seeds dropped on the line - in the middle of the CTF runs - simply rot away.

Mic says chaff lining cost him only \$200 to implement by simply adding a plastic chute to the harvester and there were no moving parts to break or slow the harvest down.

He outlines the practicalities of adopting chaff lining in a WeedSmart case study that can be found via [this link](#).

## Swathing tips for spring

While on the topic of weeds, AHRI researcher Dr Michael Walsh advises that weeds will eventually shed their seed or lodge if left in a standing crop and swathing is a good option to cut them off.

He says the weeds will retain their seed while lying in the swath, even if the swathed crop is left for several weeks while other standing crops are harvested - leading to an overall reduction in weed seed shedding across the property.

But he says swathing can be risky as growers lay their income on the ground and he has prepared some tips for when this strategy can be worthwhile.

These can be found in an AHRI Insight video via [this link](#) and include (for barley and canola) starting seven to 14 days before crops could otherwise be direct harvested.

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