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Grains Research UPDATE
NORTHERN REGION

ROW SPACING IN WINTER CROPS – THE COST OF WIDER ROWS

In a recent GRDC workshop looking at the impact of weeds on the future farming system in the north, NSW DPI Research Manager, Guy McMullen asked the question, "Can we afford to continue with wide row spacings in winter crops to manage stubble?"

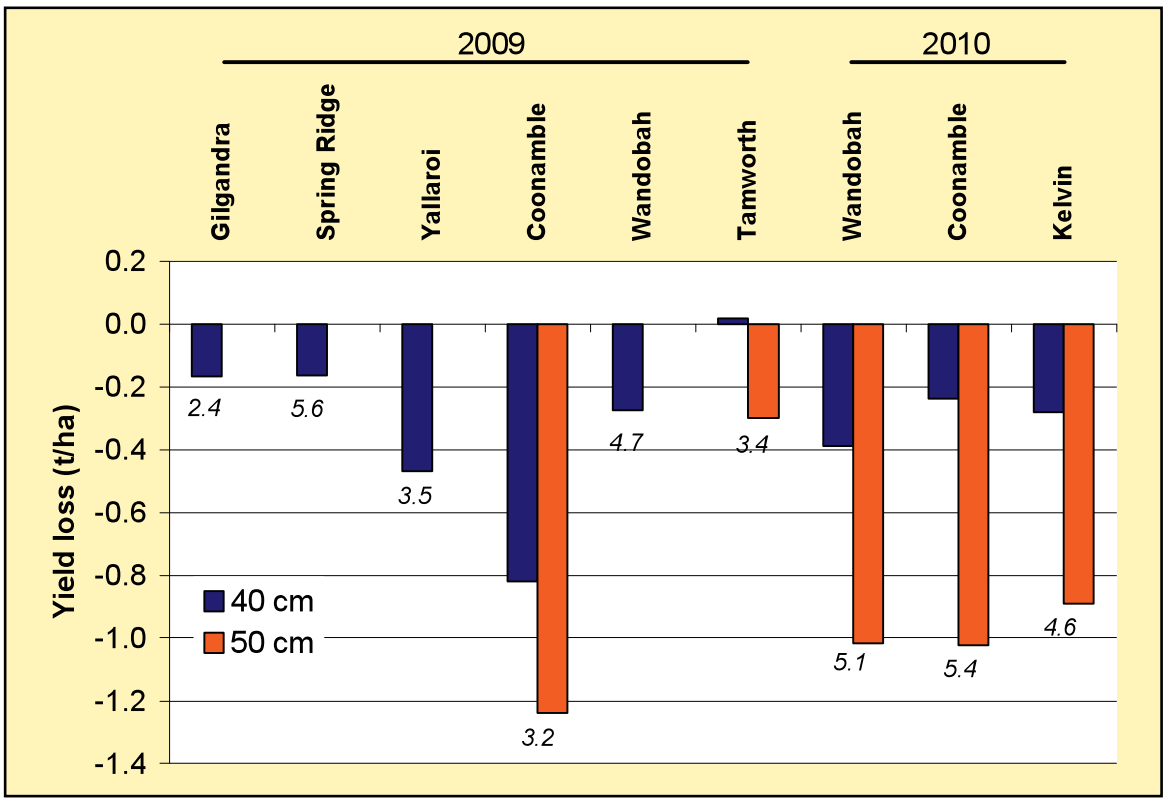
In a review by Charles Sturt University of work done in the southern region, cereal yield was reduced by ~ 1% for every 2.5 cm increase in row spacing. To read this review, go to http://www.csu.edu.au/research/grahamcentre/research/publications/row-spacing-monograph.htm

It has been widely demonstrated that crops sown in wide rows are less competitive with weeds and suffer more yield loss in the presence of weeds, while allowing weed survivors to set a lot more seed than would occur in a more competitive crop.

"In the north, data also confirms yeild losses are associated with wide row spacings", said Dr McMullen. "Wider rows, not only lose competitive advantage against weeds, they also impact on the bottom line. With increasing prevalence of herbicide resistance, any gain in controlling weeds in crop is a gain well worth capturing and the yield benefits can be significant."

In a series of trials conducted in 2009 and 2010 in the Northern Grains Region, a consistent trend to higher yield loss was seen as row spacing increased from 30 cm to 40 and 50 cm (see Figure 1).

Figure 1: *Yield loss in wheat at 40 and 50 cm row spacing compared to 30 cm rows*



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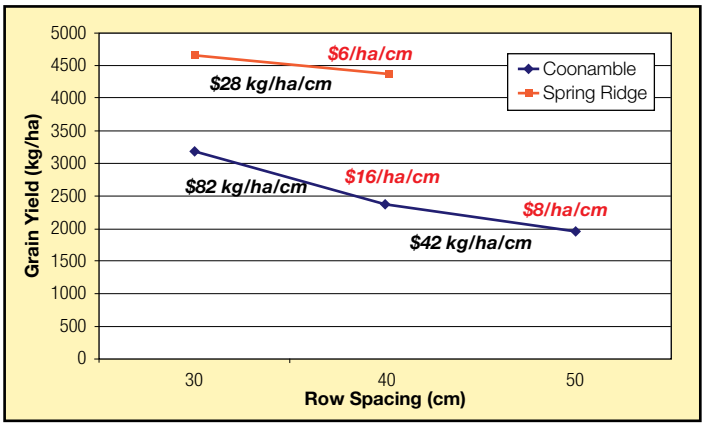
In 2009 in two locations, Coonamble and Spring Ridge, there was between $6-$16/hectare loss per centimetre increase in row spacing (Figure 2).

Figure 2: *Grain yield at different row spacing at Coonamble and Spring Ridge (2009)*



"The benefits of wider rows are several fold and include easier stubble clearance and lower cost per metre of planter width. This enables more money to be spent per row on accurate seed and depth placement. Too narrow and the ability to moisture seek is lost.

"Unfortunately, bush myth has also added the concept that wider rows also assist yield stability in drier seasons. In the range up to 50 cm, there is no compelling data to support this with winter crops. Its only when you move to very wide row configurations such as single and double skip rows in summer crops, where inter-row areas are very wide that such effects occur," said Dr McMullen.

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FLEABANE SPRAY TIMING IN WINTER CEREALS - EARLY CAN BE BETTER!

The application of picloram based herbicides (i.e. FallowBoss™ Tordon™) can be an effective tool to provide both knockdown and residual control of fleabane and other weeds in winter cereals.

When it comes to the timing of residual herbicides, a question that is often asked is should the application be made at early tillering or be delayed to get better residual control of any late emergences?

A trial conducted by Northern Grower Alliance at Bowenville in 2012 compared applications at different spray volumes and timings for knockdown and residual control of fleabane.

A picloram based product was applied at early tillering (T1) on the 24/7/12 in a carrier volume of 50, 70 and 100L/ha and then again two weeks later (T2) on 7/8/12 at the 70L/ha carrier volume only. Fleabane counts were conducted 36 days after the second application to measure knockdown control of seedlings present at application. A second count was also taken in late November (108 days after T2) to measure residual performance.

Table 1: *Knockdown and residual control of fleablane by spray timing and carrier volume in winter cereals*

Application timing	Water rate / ha	Knockdown 36 Days after T2 plants/m²		Knockdown + Residual 108 Days after T2 plants/m²	
Untreated		2.85/m²	a	6.38/m²	a
		% reduction versus untreated			
T1	50	100 %	d	93.3 %	d
	70	99.3 %	d	96.6 %	de
	100	100 %	d	99.5 %	ef
T2	70	91.2 %	c	61.9%	b

Delaying application by two weeks in this trial caused a slight but significant reduction in knockdown of fleabane seedlings, presumably via some shading from the cereal crop during application at the later application timing.

This difference was far greater when knockdown and residual impacts were measured late in the season. At this time considerably more fleabane had emerged in the later applied treatment, which had only a 62% reduction in total fleabane numbers compared to the untreated.

All of the applications applied at T1 had significantly lower new fleabane emergences than the later applied treatment. This suggests that more herbicide was intercepted by the larger crop canopy at the T2 application, leading to less uniform soil coverage.

There was also a strong trend towards increasing water rate providing higher levels of residual control. Again this would indicate that higher water rates are more likely to get more consistent deposition of herbicide down to the soil surface, where it is required to provide residual control of new germinations.

FallowBoss Tordon can be applied from the 3-4 tiller growth stage to the start of jointing / formation of first node on the main stem in winter cereals.

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FROST RISK MANAGEMENT STARTS AT SOWING

Sow too late and yield potential declines fast, sow to early and frost risk increases with the potential to destroy yield. The risk can be managed by matching variety selection and sowing times.

Dr Peter Martin from Howqua Consulting, said "It is critical to match variety and sowing date so that flowering occurs early enough to allow a long grain filling period before the high evaporative demands and soil water deficit of early summer but additionally, the flowering period must also be late enough to avoid damage by frosts in early spring."

"Different varieties have differing maturities. Understanding how each variety responds to the environment will help target varieties to their best sowing time."

Based on the response of varieties to vernalisation (vernalisation being a requirement for a certain amount of cold weather before the plant can move from vegetative to flowering phase) and photoperiod, wheat varieties are categorised as either a winter, facultative spring or spring, and within each category there is a range in flowering dates between varieties.

"When sown in a period of the year with long days and warm temperatures, when vernalisation is not being satisfied, spring varieties and some facultative varieties flower very early. Winter wheats, however, will not initiate flowering until their vernalisation requirement is met," Dr Martin said.

"As sowing is progressively delayed into the cooler period of the year, varieties requiring vernalisation, that is winter varieties as well as the facultative and spring varieties, flower much more closely together.

"For example when sown at Temora on 10/3/2006 Janz flowered 115 days before EGA Wedgetail$^{(\phi)}$, but when sown on 10/5/2006 Janz flowered 6 days before EGA Wedgetail$^{(\phi)}$.

"Understanding how and why varieties fall into certain classifications and then matching sowing date accordingly can have a significant impact on frost risk management and therefore crop production and profitability," said Dr Martin.

The National Variety Trials website includes a large amount of information on the performance of individual varieties including links to useful guides such as the NSW DPI sowing guide. It can be found at http://www.nvtonline.com.au

To read Dr Martin's full paper on this topic from the March Updates, please go to http://www.grdc.com.au/ What is driving flowering time differences of wheat varieties between years.

Further information:

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GRDC GROWNOTES - A NEW RESOURCE FOR NORTHERN GROWERS AND ADVISERS

The Grains Research and Development Corporation (GRDC) has launched a comprehensive set of crop information modules, called 'GRDC GrowNotes'.

GrowNotes are an entirely new initiative for the organisation and for the first time provide a one-stop shop for northern region trial results and recommendations.

The GrowNotes are digital documents, available online, so they are able to use the very best e-publishing technology available to make the information easy to find and navigate.

The GrowNotes constantly link to further information. In the wheat GrowNotes alone there are more than 900 hyperlinks.

Feedback on GrowNotes is appreciated. There is a feedback button on every page that sends your comments, good or bad, directly back to GRDC.

Access the GRDC GrowNotes via www.grdc.com.au/GrowNotes.

WIDE ROWS KILLING YIELD IN HIGH YIELD CHICKPEAS

Speaking at the recent GRDC Updates, NSWDPI researcher Andrew Verrell said that; "wide row spacings were killing yields in high yielding chickpea crops. Losses in older varieties of the order of 0.5t/ha were commonplace, when moving from 40 to 80 cm rows in crops that yield over 2t/ha."

"Varieties such as Hattrick$^{(\phi)}$ were somewhat more forgiving and suffered less yield loss at wider rows than older varieties such as Amethyst. Using the wrong sowing rate was also an issue costing unnecessary and totally avoidable yield loss for some growers. In high yielding crops (>1.5t/ha) on 40 cm rows or narrower, a sowing rate of greater than 30 plants per square metre is needed – and higher again if sowing late. Where virus is present, it is critical that sowing rates are maintained above critical levels," said Dr Verrell.

This update paper can be read and downloaded from the GRDC website at: www.grdc.com.au/2014-VerrellEtAl-PlantDensityChickpeas

Further information:

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GRDC codes: DAN00116 and DAN00171

ADVANCES IN WEED MANAGEMENT - A SERIES OF NATIONAL WEBINARS TARGETED AT GRAIN GROWERS AND ADVISERS.

ICAN will be hosting the next series of GRDC sponsored webinars on weed management topics in June 2014. Jump on the net on Tuesday afternoons to link into a short 30 minute presentation from industry experts in their field, followed by approximately 15 minutes for questions. Start times are: WA 1.00 pm; SA 2.30 pm; Qld, NSW, Vic, Tas 3.00 pm

Webinars are free of charge however participants will be required to pre-register for the webinar(s) of interest to receive a link to the webinar software.

Topics, dates & presenter:

Webinar 1 – Weed control on paddock boundaries and fencelines - *Tuesday 10th June, 2014, Chris Preston, University of Adelaide*

Webinar 2 - Managing wild radish, the latest research - *Tuesday 17th June, 2014, Peter Newman, AHRI*

Webinar 3 – A beginner's guide to harvest weed seed control - *Tuesday 24th June, 2014, Michael Walsh (AHRI) & Maurie Street (GOA)*

To register for an upcoming webinar or for further information visit http://icanrural.com.au/iwm.html

Further information:

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GRDC code: ICN00016

DATES SET FOR THE JULY/AUGUST NORTHERN GRDC GRAINS RESEARCH UPDATES

GRDC Grains Research Updates are planned in the Northern region in July and August 2014. These Updates will provide the latest research information to improve your farming system. There will be a fantastic line-up of speakers on topics selected by local growers and advisers. Save the dates in your diary!

All Updates have registration at 8:30am for a 9:00am start and will finish by 3-4pm. Cost $45pp and $40 for subsequent people from the same farm. This includes morning tea, lunch and a copy of the proceedings. Agendas and registration page coming soon to http://www.icanrural.com.au/updates.html

Location	Venue	Date
Wellington	Wellington Civic Hall	Monday 28 July 2014
Spring Ridge	Spring Ridge Country Club	Tuesday 29 July 2014
Warialda	Warialda Golf Club	Wednesday 30 July 2014
Burren Junction	Junction City Hotel	Thursday 31 July 2014
Warra	Warra Memorial Hall	Tuesday 26 August 2014
Condamine	Condamine Sports Club	Wednesday 27 August 2014

Further information:

Erica McKay or John Cameron on 02 9482 4930, erica@icanrural.com.au or visit http://www.icanrural.com.au

GRDC code: ICN00014

CHECK FALLOWS FOR WEED ESCAPES – GLYPHOSATE RESISTANCE ON THE RISE

Advisers and growers are urged to be on the lookout for weed escapes in fallows heading to summer crops after recent rain. If glyphosate resistance is suspected, discuss management options with their adviser/client.

Consultant John Cameron of ICAN said "glyphosate resistance is rapidly increasing in areas that have been using no-till for over 10 years, with properties having a high reliance on glyphosate for 15 or more years at greatest risk. Testing is showing an increase in both the distribution of glyphosate resistant weeds as well as the number of weed species affected.

"The table below shows which species are confirmed as resistant to glyphosate in Australia. Alarmingly, 6 new weeds have been confirmed resistant to glyphosate since 2010. While the number of sites confirmed may appear low, there are likely to be many more sites with resistance where no testing has been conducted or where resistance levels are only a season or two from commercial failure.

Grower groups or advisers who would like assistance to run short workshops to discuss practical issues of managing herbicide resistant weeds, are encouraged to call John Cameron, Mark Congreve or Peter McKenzie for assistance.

Table 2: *Weed species resistant to glyphosate and the year first documented in Australia with the number of sites confirmed by tests*

Weed species	Year first documented	Number of confirmed populations May 2014
Annual ryegrass *(Lolium rigidum)*	1996	574
Barnyard grass *(Echinochloa colona)*	2007	98
Liverseed grass *(Urochloa panicoides)*	2008	4
Fleabane *(Conyza bonariensis)*	2010	58
Windmill grass *(Chloris truncata)*	2010	11
Great brome *(Bromus diandrus)*	2011	5
Wild radish *(Raphanus raphanistrum)*	2013	2
Sowthistle *(Sonchus oleraceus)*	2014	4
Red brome *(Bromus rubens)*	2014	1

Source: Chris Preston, Chair Australian Glyphosate Sustainability Working Group

Further information:

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AGSW website: http://glyphosateresistance.org.au

GRDC code: ICN00016

VISIT AUSTRALIA'S GRAINS RESEARCH WEB PAGE www.grdc.com.au

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