



FIELD WALK

MAXIMISING THE BENEFITS OF EARLY SOWN BARLEY & WHEAT

Friday 8 July 2022
9.30am – 11.30am

Finley Irrigated
Research Centre
2431 Newell Highway,
Finley, NSW 2713



Project Partner:



Trial site courtesy of:



SOWING THE SEED FOR A BRIGHTER FUTURE

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VISITOR INFORMATION

We trust that you will enjoy your morning with us at our Finley Research Centre Field Walk where we will be discussing how we can maximise the benefits of early sown barley and wheat. Your health and safety is paramount, therefore whilst on the property we ask that you both read and follow this information notice.

HEALTH & SAFETY

- **COVID-19: Please ensure you practice social distancing rules, and if required, wear a face mask and use the hand sanitiser provided.**
- All visitors are requested to follow instructions from FAR Australia staff at all times.
- All visitors to the site are requested to stay within the public areas and not to cross into any roped off areas.
- All visitors are requested to report any hazards noted directly to a member of FAR staff.

FARM BIOSECURITY

- Please be considerate of farm biosecurity. Please do not walk into farm crops without permission. Please consider whether footwear and/or clothing have previously been worn in crops suffering from soil borne or foliar diseases.

FIRST AID

- Should you require any assistance, please ask a member of the FAR Australia team.

LITTER

- We ask that you dispose of all litter considerately.

VEHICLES

- Vehicles will not be permitted outside of the designated car parking areas. Please ensure that your vehicle is parked within the designated area(s).

SMOKING

- There is No Smoking permitted inside any marquee or gazebo.

Thank you for your cooperation, enjoy your morning.

WELCOME TO THE FINLEY IRRIGATED RESEARCH CENTRE FIELD WALK

FEATURING THE GRDC'S 'MAXIMISING THE BENEFITS OF EARLY SOWN BARLEY & WHEAT' INVESTMENT

On behalf of the project team welcome to this FAR Australia field walk at the Southern Growers Irrigation Complex. Today's field walk is centered on a new regional GRDC Initiative entitled 'Maximising the Benefits of Early Sown Barley & Wheat'.

This GRDC's NGN initiative is led by FAR Australia in collaboration with AgGrow Agronomy and Research at Finley and Griffith.

Today you will be joined by Nick Poole, Ben Morris, Tom Price and Rebecca Murray of FAR Australia along with Barry Haskins and Rachael Whitworth from AgGrow Agronomy and Research who will guide you through the trials to discuss and chat about the key building blocks to achieving higher yields with early planting of long cereals (both winter and in season spring type wheat and barley cultivars). **We also want to hear first-hand from you, the growers what is and what isn't working on your farm.**

Should you require any assistance throughout the day, please don't hesitate to contact a member of the team who will be more than happy to help.

If you would like to be kept up to date on the results from this GRDC investment, and our other projects, please contact Rachel Hamilton at rachel.hamilton@faraustralia.com.au.

Thank you once again for taking the time to join us today; we hope that you find the field walk useful, and as a result, take away new ideas which can be implemented in your own farming business. Have a great morning and we look forward to seeing you again at future project events.

Nick Poole
Managing Director
FAR Australia



Funding Acknowledgements

The project team would like to place on record their grateful thanks to the Grains Research & Development Corporation (GRDC) for their funding support for this event and featured project.

Other Acknowledgements

Thank you to our trial site host Southern Growers for their support throughout the season.

Your current practices:

At specific times throughout this morning's field walk we will look to gauge your opinion on various aspects of early sowing. We will be using the following QR code in order to access these questions online.



NGN Maximising the benefit of early sowing barley and wheat cultivars in low rainfall & high temperature environments

Ben Morris, Dr Kenton Porker, Nick Poole, Tom Price, (Field Applied Research (FAR) Australia)
Barry Haskins, Rachael Whitworth (AgGrow Agronomy & Research)

Background

Barley can often have higher yields compared to wheat in many low to medium rainfall environments, and as such can be a more profitable crop than wheat in many parts of western NSW. The proportion of barley grown annually in LRZ has increased and is often viewed as a risk mitigation management decision compared with other crop options. Similarly, in recent years there has been the release of early sowing wheat varieties that finish fast post flowering (Vixen, Nighthawk etc). The diversity of new fast finishing wheat and barley cultivars offers growers new prospects to take advantage of early sowing rain opportunities as opposed to growing traditional winter growth types, that have a disadvantage of late maturity.

Here we introduce a new GRDC Investment from National Grower Network (FAR2206-003RTX): Maximising the benefit of early sowing barley and wheat cultivars in low rainfall & high temperature environments. The project is conducted in collaboration with FAR Australia and AgGrow Agronomy and Research at Finley and Griffith.

Project aim

To determine the value of slow vegetative/fast maturing wheat & barley cultivars to growers in central west NSW and to establish if there is any yield (kg/ha) benefit in the absence of seasonal impacts (frost and heat) on grain production.

Current understanding

There has been considerable research into the benefits of early sown winter cereals (figure 1), and release of slow developing cultivar options for earlier planting (particularly in Wheat) such as Illabo, DS Bennett, Denison, Valiant CL, and less so in barley. Flowering date is a key driver of yield, and sowing date and crop development speed should be matched to environment to achieve the most appropriate flowering date for the region. Since the release of the first generation of winter wheats there has been release of new higher yielding quick spring wheats and barley, and new slower developing springs. It is not clear how these fit compared to winter wheats in warmer environments when flowering dates are similar and exposed to more heat than environments in the east of NSW.

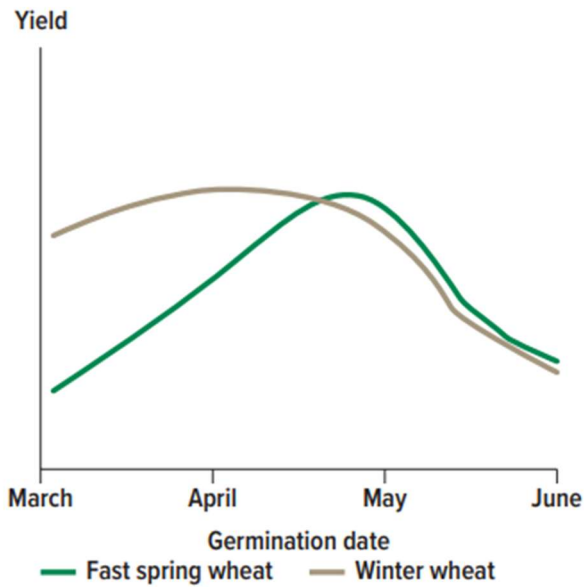


Figure 1. Relationship between germination date and yield for winter and fast spring wheat from previous GRDC Investments. Note the stable flowering time of winter wheat gives it a stable yield over a wide range of sowing dates. However, this was conducted prior to the release of newer spring cultivars.

Grain only crops should seek to sow (and germinate) crops in the earlier part of their optimum period. The current guide from the NSW DPI sowing guide gives an indication of relative development differences in current varieties. It should be noted that these dates change with region due to frost, heat and drought risk and should only be used a guide.

Variety	Weeks	March				April				May				June				July		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Slopes																				
Anapurna ¹ , Mackellar ¹ , Manning ¹ , RGT Accroc ¹ , RGT Cesario ¹	>	★	★	★	★	★	★	★	★	<										
BigRed ¹ , DS Bennett ¹	>	★	★	★	★	★	★	★	★	<										
EGA_Wedgetail ¹ , Illabo ¹ , Kittyhawk ¹ , Naparoo ¹ , Severn ¹	>	>	★	★	★	★	★	★	★	<										
Nighthawk, Sunlamb				>	★	★	★	★	<											
Longsword ¹				>	★	★	★	★	★	<										
Sunmax				>	★	★	★	<												
Cutlass, DS Pascal, Sunflex, Valiant CL Plus				>	★	★	★	★	<											
Catapult, Coolah, Coota, DS Faraday, EG Titanium, EGA_Gregory, Flanker, Gazelle, Lancer, RGT Zanzibar, Raider, Rockstar, Sheriff CL Plus, Stealth					>	★	★	★	★	<										
Beckom, Sunblade CL Plus, Sunmaster, Suntop, Trojan					>	★	★	★	<											
Boree, Calibre, Corack, DS Tull, Elmore CL Plus, Impala, Oryx, Parakeet, Reliant, Scepter, Sunchaser						>	★	★	★	★	<									
Condo, Emu Rock, Hammer CL Plus, Hellfire, LG Gold, Mustang, Razor CL Plus, Spitfire, Suncentral, Sunprime, Vixen							>	★	★	★	★	<								
Plains																				
DS Bennett ¹				>	★	★	★	★	<	<										
EGA_Wedgetail ¹ , Illabo ¹ , Kittyhawk ¹ , Nighthawk, Sunlamb				>	★	★	★	★	<	<										
Longsword ¹				>	★	★	★	★	★	<										
Sunmax				>	★	★	★	<												
Cutlass, DS Pascal, Raider, Sunflex, Valiant CL Plus				>	★	★	★	★	<											
Catapult, Coolah, Coota, DS Faraday, EG Titanium, EGA_Gregory, Flanker, Gazelle, Lancer, Rockstar, Sheriff CL Plus, Stealth					>	★	★	★	★	<										
Beckom, Boree, Elmore CL Plus, Reliant, Scepter, Sunblade CL Plus, Sunchaser, Sunmaster, Suntop, Trojan						>	★	★	★	<										
Ballista, Calibre, Cobra, Corack, DS Tull, Hammer CL Plus, Impala, Mace, Oryx, Parakeet							>	★	★	★	<	<								
Condo, Emu Rock, Hellfire, LG Gold, Mustang, Razor CL Plus, Spitfire, Suncentral, Sunprime, Vixen								>	★	★	★	★	<							

> Earlier than ideal, but acceptable.
 ★ Optimum sowing time.
 < Later than ideal, but acceptable.
¹ Winter wheat sowing window can be extended earlier, provided crops are grazed to delay reproductive development.
 Note: For durum suggested sowing times see Table 19, Suggested sowing times, Durum wheat varieties, on page 45.

Figure 2. Suggested sowing times and developmental differences in current wheat varieties (Adapted from NSW DPI 2022 Sowing Guide).

Variety	Weeks	March				April				May				June				July		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Northern region																				
Urambie ①		>	★	★	★	★	★	★	★	★	★	<								
GrangeR								>	★	★	★	★	<							
Alestar, Bottler, Commander, Laperouse, Minotaur ②, Nitro ②, RGT Planet												>	★	★	★	★	★	<		
Commodus CL ②, Compass, Cyclops ②, Hindmarsh, La Trobe, Leabrook, Maximus CL, Rosalind, Spartacus CL												>	>	★	★	★	★	<		
Beast ②, Fathom, Shepherd, Yeti ②													>	★	★	★	★	★	<	
Central region																				
Urambie ①		>	★	★	★	★	★	★	★	★	★	★	<							
GrangeR, Nitro ②										>	★	★	★	★	<	<				
Bottler, Commander, Laperouse, Minotaur ②, RGT Planet												>	★	★	★	★	<	<		
Commodus CL ②, Compass, Cyclops ②, Leabrook, Rosalind													>	★	★	★	<	<		
Beast, Fathom, La Trobe, Hindmarsh, Maximus CL, Shepherd, Spartacus CL, Yeti ②													>	★	★	★	★	<	<	
Southern region																				
Urambie ①		>	★	★	★	★	★	★	★	★	★	★	<							
GrangeR								>	>	★	★	★	★	★	★	<	<			
Bottler, Commander, Laperouse, Minotaur ②, Nitro ②, RGT Planet													>	★	★	★	★	★	<	
Beast, Commodus CL ②, Compass, Cyclops ②, Fathom, Hindmarsh, La Trobe, Leabrook, Maximus CL, Rosalind, Shepherd, Spartacus CL, Yeti ②													>	>	★	★	★	★	<	

- > Earlier than ideal, but acceptable.
- ★ Optimum sowing time.
- < Later than ideal but acceptable.
- ① Dual-purpose varieties that can be grazed. Urambie^① can be sown from mid-late March, if grazed.
- ② Limited information available on performance in NSW.

Figure 3. Suggested sowing times and developmental differences in current barley varieties (Adapted from NSW DPI 2022 Sowing Guide).

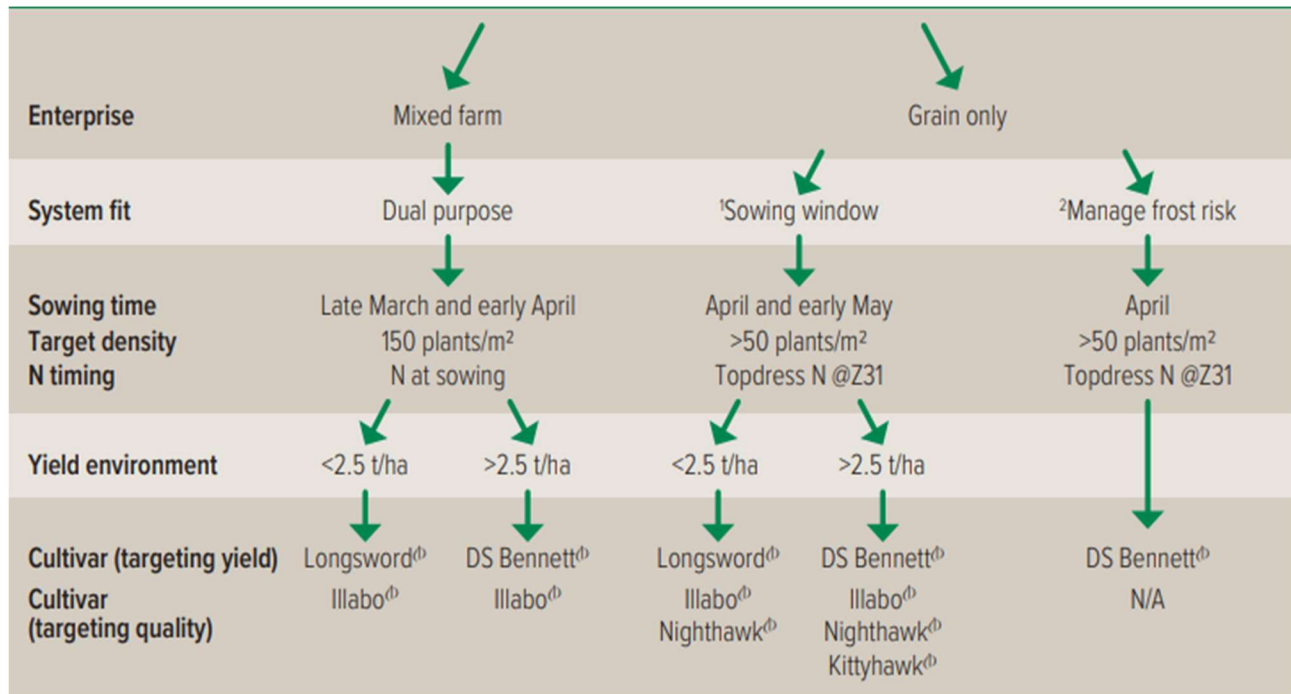
Management of early sown crops - adjusting plant density and nitrogen

The Griffith site will focus on adjustments in seeding density and nitrogen. Previous research has shown that the yields of early sown crops are unaffected by plant population because they spend a long time in the vegetative phase and can compensate for low density with a large number of tillers. Early sown crops can still achieve potential yield from as few as 30 plants/m², but crops with these low plant densities compete poorly with weeds. High plant densities produce more early dry matter if grazing is expected. If sowing the crop for grain only, aim for 50 to 100 plants/m². If the crop is for grain and grazing, aim for at least 150 plants/m². Early sown crops are very efficient at accumulating nitrogen (N). Deferring nitrogen fertilizer applications until after the start of stem elongation can help reduce excessive early growth and water use. Like low plant density, deferring nitrogen inputs reduces the amount and quality of dry matter available for grazing. If growing crops for grain only, apply nitrogen fertilizer during early stem elongation (Z30–32). If grazing is expected, applying nitrogen at seeding and a total nitrogen supply (soil mineral nitrogen plus fertilizer) of more than 150kg/ha will normally maximise forage yield.

Management of early sown crops

In the previous early sown investment the following decision tree provides a summary of the overall management package for dual purpose use, opening up the sowing window, and for managing frost from early sowing and can be used as a guide on how to get the most out of early sown winter wheat crops in conjunction with spring wheats.

1. For grain only systems winter wheats can exploit early sowing opportunities (1) and increase the amount of available calendar time for sowing.
2. Frost risk can be reduced by sowing slow developing winter wheats which will delay stem elongation and flowering without compromising yield through delaying sowing.



What about barley?

Apart from Urambie there has been limited release of slow developing options for earlier planting. However, barley is generally considered more tolerant to heat and frost and has been achieving higher yields than wheat from a wider range of sowing dates despite flowering at less than optimum times. Other factors such as disease management and managing head loss become more important factors for barley.

2022 trials at Finley

In 2022, 3 trials have been established to look at phenology, crop structure and dry matter production of wheat and barley in 3 different scenarios.

Trial 1 – April sown dryland (Sown 29th April)

Trial 2 – April sown irrigated (Sown 29th April)

Trial 3 – Late sown dryland (Sown 28th May)

The following cultivars will be tested and assessed in the three scenarios outlined above.

Table 1. Cultivars under test – Finley 2022

	Cultivar	Maturity	Trial 1	Trial 2	Trial 3
1.	RGT Accroc	Long season winter	✓	✓	✓
2.	DS Bennett	Intermediate winter	✓	✓	✓
3.	Illabo	Short season winter	✓	✓	✓
4.	Longsword	Short season winter	✓	✓	✓
5.	Rockstar	Mid/slow spring	✓	✓	✓
6.	V12167-048	Mid/slow spring	✓	✓	✓
7.	Boree	Mid spring	✓	✓	✓
8.	Scepter	Mid spring	✓	✓	✓
9.	Coota	Mid/slow spring	✓	✓	✓
10	Valiant	Mid/slow spring	✓	✓	✓
11.	Sunflex	Mid/slow spring	✓	✓	✓
12.	Vixen	Short season spring			✓
13.	RGT Planet	Spring barley			✓
14.	Cyclops	Spring barley			✓
15.	Leabrook	Spring barley			✓
16.	Beast	Spring barley			✓

This trial will examine the same plant types (short season winter, long season spring and short season spring) but will compare them to barley sown at the same time so that dryland performance can be tested under greater heat stress caused by later development of the late sowing.

The wheats at all three starting points will be compared to May sown barley (Early May sowing comparing dryland and irrigated will be provided by an existing NGN project: Barley Management options to close the yield gap and reduce pre harvest losses). At the late May sowing date, the same barley cultivars will be sown again as part of the same trial as the wheats being tested.

The National Grower Network (NGN) trials at Finley and Griffith being run by FAR Australia and AgGrow Agronomy & Research will be fully labelled and demonstrated with other research trials at the following Field Days:

Finley, NSW – 15th September 2022

Griffiths, NSW - September 2022 (date TBA)



The primary role of Field Applied Research (FAR) Australia is to apply science innovations to profitable outcomes for Australian grain growers. Located across three hubs nationally, FAR Australia staff have the skills and expertise to provide ‘concept to delivery’ applied science innovations through excellence in applied field research, and interpretation of this research for adoption on farm.

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