

*Driven by an early winter feed gap, mixed farmers are demonstrating increased interest in early sowing and using cereals for grazing before then locking the stock out to allow the crop to recover for grain harvest. Trials at Minlaton, Yorke Peninsula (medium rainfall) and Riverton (high rainfall) looked at the question of which cereals and varieties were able to provide early grazing with the least impact on subsequent grain yield.*

## YP and Mid-North trials highlight benefits of Grain & Graze

Written for Grain & Graze 2 by  
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### Treatments:

At both sites, a range of wheat, barley and triticale varieties were sown, all at 300 seed/m<sup>2</sup>. Treatments were nil grazing, continuous grazing or late grazing at about GS30. Mowing was used to simulate grazing. Dry matter production was measured during the growing season and grain yield and quality was determined at harvest.

### Minlaton Results:

Table 1. Dry matter production from cereals (kg/ha) when cut twice to simulate continuous grazing or once to simulate late grazing at Minlaton, 2012

Wheat						
Variety	17-Jul-12 kg/ha	12-Aug kg/ha	Total kg/ha		Variety	12-Aug kg/ha
Cobra	352	949	1301		Cobra	2573
Estoc	272	862	1134		Estoc	1545
Justica	375	809	1183		Justica	1630
Mace	371	1189	1561		Mace	2392
Scout	338	999	1337		Scout	2134
Site mean	342	962			Site mean	2055
CV%	11.3	4.8			CV%	10.37
Isd(0.05)	74.8	140.9			Isd(0.05)	512.1

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Barley						
Variety	17-Jul-12 kg/ha	12-Aug kg/ha	Total kg/ha		Variety	12-Aug kg/ha
Bass	599	646	1245		Bass	2122
Commander	842	981	1823		Commander	3148
Hindmarsh	556	1483	2039		Hindmarsh	3273
Scope	670	1591	2261		Scope	2976
Site mean	667	1175			Site mean	2880
CV%	6.8	14.1			CV%	8.6
Isd(0.05)	101.4	367.9			Isd(0.05)	494.5

Triticale						
Variety	17-Jul-12 kg/ha	12-Aug kg/ha	Total kg/ha		Variety	12-Aug kg/ha
Chopper	632	1527	2159		Chopper	3245
Jaywick	513	1179	1692		Jaywick	2334
Rufus	555	1331	1886		Rufus	2884
Tobruk	357	545	902		Tobruk	1348
Site mean	514	1145			Site mean	2453
CV%	12.4	5.805			CV%	6.2
Isd(0.05)	121.7	178.3			Isd(0.05)	289

Table 2. Grain yield from cereals (kg/ha) when cut twice to simulate continuous grazing or once to simulate late grazing at Minlaton, 2012

Wheat variety	Grain yield (kg/ha) Grazing treatment		
	Nil	Continuous	Late
Cobra	4792 a	2864 de	2743 def
Mace	4485 a	2969 de	3053 d
Scout	4100 b	2682 ef	2821 def
Justica	3684 c	2532 f	2748 def
Estoc	3626 c	2856 def	3030 d

\*Different letters indicate significant differences in grain yield within each cereal type.

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	Grain yield (kg/ha) Grazing treatment		
Barley variety	Nil	Continuous	Late
Commander	4943 a	4041 bc	3625 cde
Scope	4854 a	3878 bcd	3621 cde
Hindmarsh	4784 a	3320 e	3514 de
Bass	4563 a	4010 bc	4068 b

	Grain yield (kg/ha) Grazing treatment		
Triticale variety	Nil	Continuous	Late
Chopper	4756 a	2753 gh	2605 h
Jaywick	3959 b	3365 cde	3011 efg
Rufus	3621 c	2847 fgh	2605 h
Tobruk	3267 de	3144 def	3413 cd



Table 3. Protein content (%) from cereals when cut twice to simulate continuous grazing or once to simulate late grazing at Minlaton, 2012

	Protein content (%) Grazing treatment		
Cereal	Nil	Continuous	Late
Wheat	11.19 a	10.8 b	10.65 b
Barley	12.31 a	10.98 b	10.83 b
Triticale	10.81 a	10.16 b	10.06 b

\*Different letters indicate significant differences in protein within each cereal type.

Table 4. 1000 grain weight (g) from cereals when cut twice to simulate continuous grazing or once to simulate late grazing at Minlaton, 2012

	1000 grain weight (g) Grazing treatment		
Cereal	Nil	Continuous	Late
Wheat	39.12 a	36.41 b	36.00 b
Barley	34.30 a	33.87 a	33.15 a
Triticale	39.47 a	34.90 b	33.70 b

\*Different letters indicate significant differences in 1000 grain weight within each cereal type.



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### Riverton (Mid North High Rainfall Zone) Results:

Table 1. Dry matter and grain yield production from cereals (kg/ha) when cut twice to simulate continuous grazing or once to simulate late grazing at Riverton, 2012

	DM (kg/ha) @ GS 61		Grain Yield (kg/ha)		Protein (%)	
	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed
Commander	7608.9	5208.0	6241.6	7929.0	8.8	8.4
Correll	5878.3	5404.4	6439.4	5869.8	9.3	9.2
Hindmarsh	6969.9	4934.8	7081.9	6446.1	9.8	9.7
Naparoo	8438.5	7261.1	7330.4	5384.0	8.0	7.6
Orion	7772.5	6491.6	7558.4	7308.3	8.4	8.5
Estoc	7133.5	5121.4	6865.2	6505.4	9.6	8.9
RAC 1500	6953.0	5830.7	7591.6	6587.6	8.1	8.8
RAC 1569	6937.8	6111.0	6520.3	6452.2	9.6	10.7
RAC 1664	6323.2	5973.3	6928.4	5998.3	8.8	8.5
Kord	6244.8	5484.2	4658.4	5055.6	9.6	10.6
RAC 1671	5988.3	5870.7	6456.4	5842.8	10.2	9.6
Justica	6023.8	5496.2	6863.2	5377.4	10.5	9.6
RAC 1848	7279.6	7715.4	7794.6	6401.5	9.4	8.2
Rufus	7437.5	5476.0	8255.9	7067.7	10.4	9.0
Scout	6752.4	5359.4	6289.9	6545.6	8.6	8.8
SUN 577D	8136.0	6549.6	6654.3	7017.6	8.9	8.5
UA 28	7681.0	5386.3	4681.6	4977.3	10.4	9.4
UA 39	7310.6	7105.1	5836.4	4527.5	9.8	8.7
UA 40	7063.3	6732.2	6129.6	4921.1	8.6	8.3
UA 47	8448.3	7129.0	6491.5	6360.0	10.3	9.9
VW0703	7818.6	6564.4	7824.1	6472.2	9.3	8.5
Wedgetail	6571.7	6688.5	7753.2	6476.1	8.5	8.6
Wintaroo	8272.5	8256.8	4867.1	3652.2	8.4	7.8
Wrangler	7876.8	6218.7	6153.0	5358.6	8.4	7.9
Wyalkatchem	7247.9	5137.0	6483.3	6369.3	9.9	10.9
<b>LSD (P=0.05)</b>	<b>1231.9</b>		<b>611.4</b>		<b>NS</b>	

At harvest, the highest yielding wheat, barley and triticale varieties produced very similar grain yields when not subjected to grazing (Table 2). The barley varieties all yielded similarly when grazed compared to plots that were not grazed, but there was a significant difference (reduction) in yield when wheat and triticale varieties were grazed.

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Grazing timing and intensity had no significant effect on grain yield with any cereal variety, as there was no significant yield difference between continuous and late grazed treatments for each variety.

The highest yielding varieties (when ungrazed) for each cereal species tested, also experienced the greatest yield decline when they were grazed. For instance, grazing Cobra wheat, or Chopper triticale resulted in reduced grain yields of around 2 t/ha. However, varieties such as Estoc wheat and Tobruk triticale had little or no yield loss when grazed.

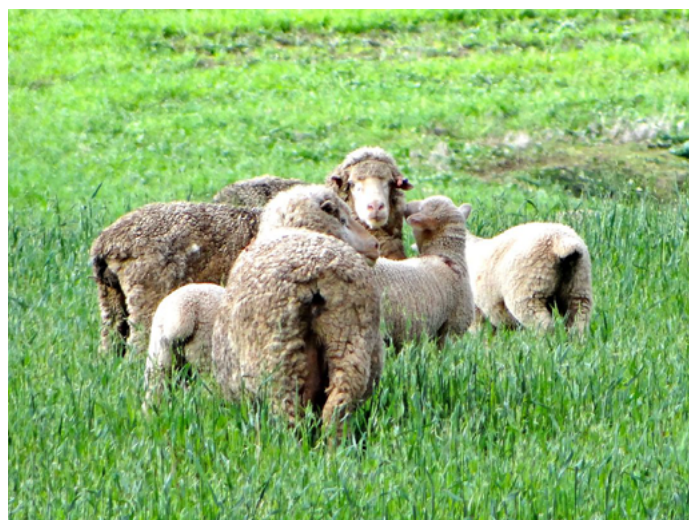
For all cereals, grain protein content was significantly reduced by grazing, but there was no difference between the two grazing treatments (Table 3). Grazing treatment also reduced 1000 grain weight in wheat and triticale but not barley (Table 4). There was little effect of grazing treatment on other quality characteristics.

### Conclusions and into the paddock

#### Comments from Trent Potter on trials:

Varying amounts of dry matter were produced by the different cereals tested. By GS31 the best producing varieties had up to 2-3 t/ha Dry Matter available for livestock production.

Grain yields were generally reduced by grazing, possibly because the latest “grazing” occurred at or about GS31. This is likely to have resulted in the removal of the growing point of the primary tiller, resulting in fewer productive heads. Varieties that produced the highest grain yield when not grazed actually had the greatest yield loss when grazed. Protein content was reduced by grazing in all cereals while 1000 grain weight was reduced by grazing in wheat and triticale.



So long as farmers graze their cereals before they get to GS30-31 they can get a reasonable amount of grazing from that cereal. Once you get past that stage you are likely to have an impact on grain yield in the end. It is a matter of farmers trying to get some grazing in winter (when dedicated pastures are growing slowly and under pressure due to low dry matter levels) and then removing the stock to harvest a reasonable grain yield.

Trent Potter says that their first cut simulating grazing could have been done a fraction earlier. However, there wasn't a massive amount of dry matter to cut at that early growth stage. There were still some barley varieties that produced nearly a tonne to the hectare of dry matter during this early growing period. That can be very useful at that stage in the year when farmers are looking to rest their pastures to let them accumulate a decent amount of dry matter before grazing.

The main point is that farmers can utilise that tonne per ha of feed without impacting greatly on the grain yield. The higher yielding varieties suffered more yield loss than the lower yielding ones. Wheat varieties like

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Cobra and Mace were significantly higher yielding than other varieties when ungrazed. However, when subject to grazing, yields of these varieties generally declined to the point where there was little difference between the varieties.

Trent believes it is still important to grow the varieties that are going to give you the highest grain yield. In many instances you can make a decision as to whether you are going to graze or not depending on seasonal conditions. If you don't necessarily need the feed then maybe you don't graze them.

If we look in the high rainfall zone near Naracoorte, farmers could probably graze a canola crop and then put their livestock onto a wheat crop and get a couple of lots of grazing. That would mean they could spell their pastures for significantly longer periods of time. Whereas in the medium rainfall districts farmers would probably get some grazing off them early and then have to lock them up again to not significantly impact yield.

Weighing it all up, Trent says that farmers need to balance up what they can potentially lose in protein and yield versus the feed that they gain. You need to work out how much that grazing is worth to you.

Trent pointed to work that CSIRO's John Kirkegaard has done on grazing canola in the high rainfall zone. "They have looked at the number of sheep grazing days that they can get on the cereal or canola being grazed. Importantly, he has also done dry matter cuts on the "resting" pastures to look at how deferring grazing by grazing crops instead has increased its production value."

That's two ways that farmers can actually benefit from grazing their cereals. One is that they are spelling their pastures and are likely to get increased production from them but two they are also picking up grazing while they have got their livestock on the cereal. That's what has to be balanced against yield loss.

Seasonal variability can play a big part. In some years you will get a dry matter production benefit and you may not get a yield loss whereas last year, on YP with the dry finish, a yield loss was experienced after a dry matter benefit.

### Some comments from Jeff Braun's Mid-North High Rainfall Zone trials (Riverton):

- Select varieties for grazing and grain recovery based on trial results. Varieties that produce plenty of biomass, do not necessarily recover well for grain yield production
- Maintain adequate nitrogen fertility post grazing to ensure minimal yield decline (approximately extra 20-30 kg/ha N per grazing)
- Follow withholding periods for pre-seeding herbicides and seed/fertiliser treatments. Some products have lengthy withholding periods that may preclude grazing.
- Grass weeds can flourish under cereals that are grazed and intended for grain recovery. Ensure paddocks to be grazed are clean and be prepared to crop-top or otherwise manage weed seed set if the paddock develops a grass problem.

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