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FARMLINK RESEARCH REPORT 2021

LONG SEASON GRAZING TRIAL

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TRIAL SITE LOCATION Junee Reefs, NSW

INTRODUCTION

Annual grazing crops are becoming more popular throughout southern NSW because of their capacity for high production and suitability to a mixed-farming system. Dual-purpose cropping is a proven technique, with both the livestock and grain enterprises complementing each other, it can be a very profitable system. However, as profitable as the system is, it still only offers a short grazing period before livestock need to be removed to protect grain yield. Therefore, other annual grazing crops can improve the carrying capacity of a farming system by offering a longer grazing period, potentially complementing dual-purpose crops by allowing livestock to be removed from dual-purpose crops earlier.

Annual grazing crops could consist of a multi species mix or just a single species such as annual ryegrass. There are benefits to both options however, a mixed species pasture may provide a more balanced diet for livestock, different species in the mix performing well at different stages, providing a longer grazing period.

FarmLink in conjunction with Hart Bros Seeds have been running a long season grazing trial each year since 2019, which include both dual-purpose crops, single species pasture and mixed species pasture. The trial includes treatment entries from various seed company sponsors. The aim of the trial is to take dry matter and grain yield measurements and compare the gross margins of the different systems.

PROJECT PARTNERS

FarmLink

HART BROS SEEDS It all begins with Seed

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KEY POINTS

- A dual-purpose canola crop was the most profitable crop overall due to current grain prices
- The correct sowing date is important to maximise dry matter production and grain yield
- Grazing mixes produce similar dry matter to a single species pasture but over a larger grazing window
- Ryegrass results depended on the growth stage at cutting time

Trial Methodology

The trial was sown on the 15th March as a replicated small plot trial at Hart Bros Seeds. There were a range of dual-purpose crops and both single species and mixed species annual pastures. All treatments are listed in Table 1.

Table 1 - All treatments in the 2021 Long Season Grazing Trial

Canola		Pastures		Oats		Wheat	
1	RGT Nizza CL	6	Common Vetch	21	SF Regency	26	RGT Cesario
2	Phoenix CL	7	SF Adrenalin	22	Yiddah	27	SFR86-085
3	Hyola Feast CL	8	SF Sultan	Triticale		28	Anapurna
4	Hyola 970CL	9	Redgum 2 (12kg)	23	Kokoda	29	Illabo
5	HyTTec Trifecta	10	Redgum 2 (25kg)	24	Cartwheel	30	DS Bennett
		11	Grazing Mix 1	25	Normandy	31	Severn
		12	Grazing Mix 2			Barley	
		13	Grazing Mix 3			32	Urambie
		14	Grazing Mix 4			33	Harpoon
		15	Grazing Mix 5				
		16	Grazing mix 6				
		17	Arrowleaf Clover				
		18	ARSSHZ253				
		19	Kiwi Chicory				
		20	Atomic Ryegrass				

As shown in table 1 there were 6 grazing mixes put together. These mixes had set seeding ratios, outlined in Table 2, representing mixes that have performed well in previous trials and mixes that growers from around the southern NSW region are using.

Table 2 - Grazing mixes with seeding rates used

Grazing Mix 1	kg/ha	Grazing Mix 2	kg/ha	Grazing Mix 3	kg/ha
Kokoda Triticale	20	Ryecorn	5	Ryecorn	10
Tillage Radish	1	Planet	20	Bennett	20
Arrowleaf Clover	1	Eurabbie Oats	20	Vetch	30
Atomic Ryegrass	2	Vetch	30	Tillage Radish	1
Vetch	15	Tillage Radish	1	Purple Top Turnip	0.2
		Purple Top Turnip	0.2	Retain Canola	3
		Retained Canola	2.5		
Grazing Mix 4	**kg/ha**	**Grazing Mix 5**	**kg/ha**	**Grazing Mix 6**	**kg/ha**
Retained Canola	3.5	Planet Barley	30	Arrowleaf Clover	4
Vetch	15	Vetch	30	Atomic Ryegrass	12
Eurabbie Oats	20				

The trial was treated as nutrition and disease non-limiting therefore adequate fertiliser and fungicides were applied to maintain maximum yield potential. All treatments are treated equally meaning there is no difference between fertiliser rates or fungicide applications across the whole trial. Due to cold and wet conditions during autumn and early winter as well as a high stubble load from the previous crop, high urea rates were used to increase dry matter production across all treatments. Each treatment received 350kg/ha of urea and an additional 100kg/ha in September.

Biomass cut measurements were completed at different stages across all treatments depending on the available dry matter. The assessment to make a cut was based on whether there was enough feed in the plot for livestock to be put on for grazing, i.e., mowed. Each time a biomass cut was taken the whole plot was mowed to simulate a real grazing event. Dual-purpose crops only received one cut so that they could be taken through to a grain harvest. Continual cuts were taken on the pastures until October before they were terminated.

Results

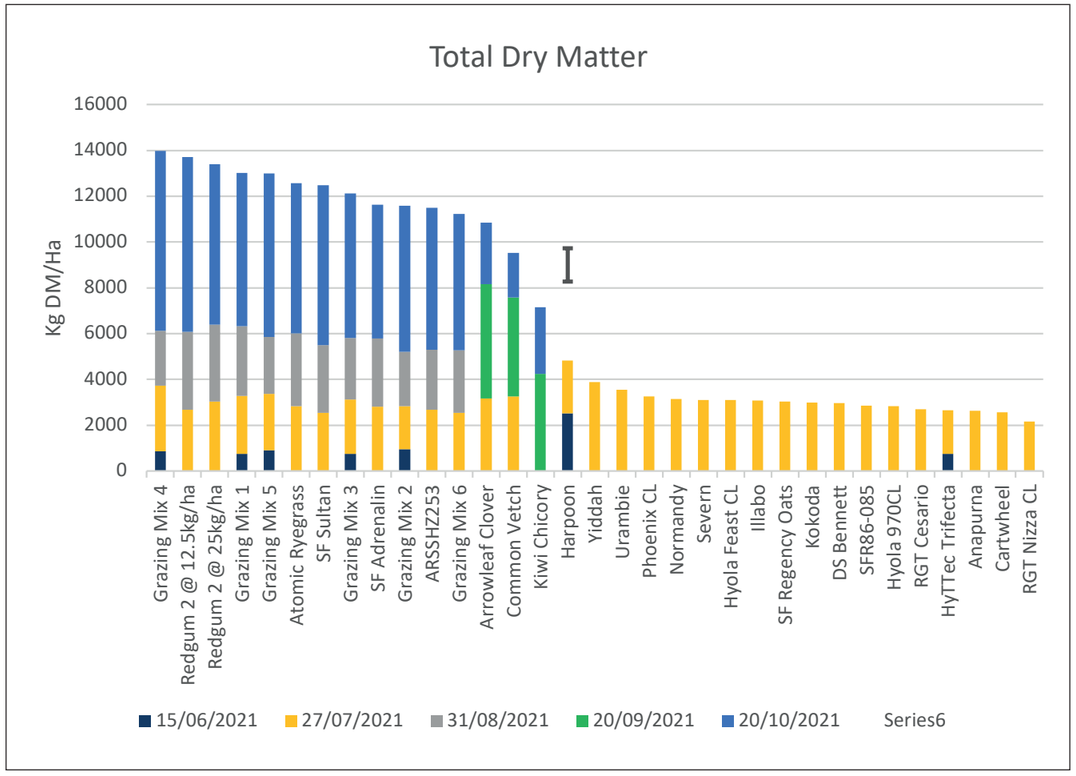

Figure 1 - Total dry matter recorded for each treatment across 5 cutting dates. An LSD bar of 1460kg is shown (P<0.05)

There were 5 different cutting dates for biomass measurements throughout June to October. The treatments cut was determined by the amount of standing biomass and the strategy, e.g. grazing only or dual-purpose (graze and grain). On 15th June, after a slow start to the season due to cold, wet and overcast conditions, only some of the grazing mixes (harpoon barley and trifecta canola) were cut. This indicated which treatments might provide good autumn growth and early grazing opportunities. Every treatment was cut in July (except chicory) with no significant difference between the dry matter of each treatment. This was the only cut taken on the dual-purpose treatments. The annual ryegrass and grazing mixes were cut again in August but the legume treatments and chicory needed to wait until September to have enough biomass for cutting. The final cut for all the pasture treatments was taken in October. There were significant differences (P<0.001) between dry matter production at this cut, which meant there was also a significant difference in the total biomass production of all pastures. Grazing mixes 4, 1 and 5 were the standout pasture mixes, performing above the mean biomass level. The ryegrass treatment results were dependant on the growth stage of the variety, meaning there was inconsistency in dry matter production overall and any other single species pasture performed below the mean.

Results

The grain yield results shown in Figure 2 show that the yield of 970CL and Phoenix CL performed higher than the mean yield but Hyola Feast and HyTTec Trifecta were below the mean. However, this is reflective of how the sowing date used (15th March) impacted these varieties. Trifecta canola is not normally a variety considered for dual-purpose cropping because it is more suited to a later sowing date (reference) as this trial has proven. The cereals had a similar result for grain yield which is shown in Figure 3. The longest season varieties were the best performing and the shorter season wheats not suited to a 15th March sowing were below the mean. Triticale varieties performed above all other cereal varieties.

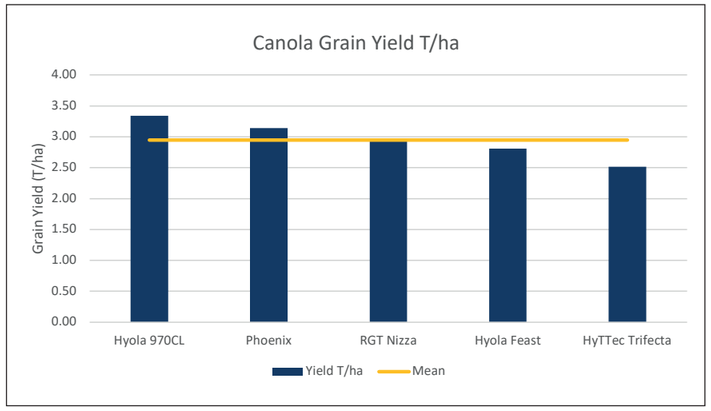

Figure 2 - Canola grain yield in T/ha. The yellow line represents the mean yield of 2.95T/ha

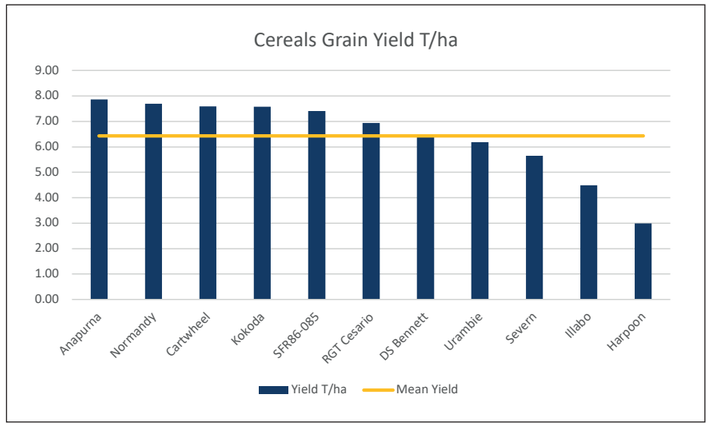

Figure 3 - Cereal grain yield results including wheat, triticale and barley. The yellow line represents the mean result

Results

To compare each crop type an estimated gross margin for each treatment was calculated with the results shown in Figure 4. This combines the estimated income if the grazing crops were grazed with trade lambs and if the grain harvested was sold at a nearby receival site. The costs also considered the inputs into the trial as well as estimated costs associated with trade lambs. The grazing value was calculated with the help of Agrista. These calculations consider factors such as the potential stocking rate, the amount of feed that could be utilised by livestock and the feed conversion efficiency. It also considers when lambs could be sold and what was the average price at the time minus what would be paid to purchase the lambs, since this is a trade lamb scenario. Other input costs include the price of seed, fertiliser and pesticides. Canola is very clearly the most profitable crop in 2021 which is largely due to a very high grain price of $800/tonne. Without the grain component, the pastures are not as profitable in a single year operation. However, when looking at the combined data in Figure 4 grazing mixes have proven to be more profitable than a single species pasture.

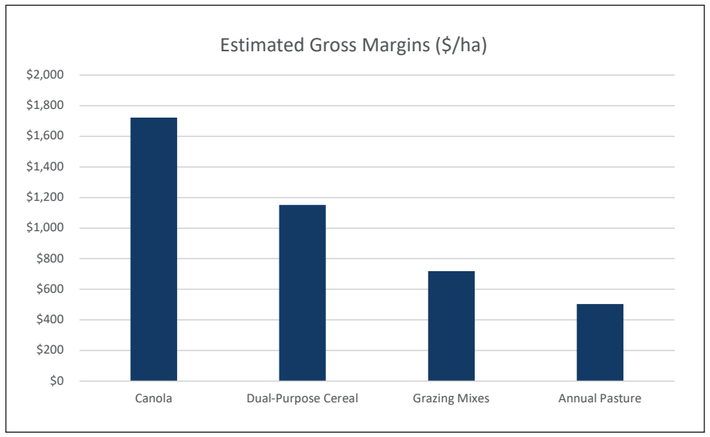

Figure 4 - Estimated gross margin for each crop type. This includes an estimated grazing value sourced from Agrista

Figure 6 – The highest performing ryegrass for dry matter but the variety was just before head emergence, beginning to lodge and most likely lower feed quality.

Discussion

Figure 5 – (Left to Right) Grazing mix 5, 4 and 1 taken in August.

2021 was another high rainfall season throughout southern NSW and grain prices and lamb prices very high, which meant that it was a very profitable year for dual-purpose crops. This is reflected in the results of the trial where dual purpose canola is by far the most profitable crop to grow, representing the southern NSW region in recent seasons. This has resulted in the grazing mixes being less than half as profitable than dual-purpose canola. However, the gross margins are based on trade lambs, which adds substantial costs to the system. If the gross margins were calculated based on self-replacing merino production the costs would be reduced because lambs do not need to be purchased. There are also the farming systems benefits that are generated from having a grazing mix with legumes. The trial showed the length of grazing time which would result in an increased carrying capacity of livestock across a mixed farming enterprise by having biomass cuts taken from June through until October.

Another clear message that the trial data is displaying is how important sowing date is for maximising the performance of both dual-purpose crops. A 15th March sowing date for all treatments is not suitable for some dual-purpose crops as there is likely to be a yield penalty when sowing some varieties prior to early April (Harris et al., 2021). This is because the vernalisation response may be less stable and stem elongation may occur earlier which will increase the risk of frost damage. This can be controlled with heavy grazing at the right time but because of the difficulty of doing this successfully across a whole paddock, choosing the correct sowing date is a more profitable management technique.

The most dominant single species pasture in the trial was annual ryegrass. However, the management of the ryegrass is important to note. There were only three cuts taken through the season which meant that there was a high dry matter quantity each cut. There may have been even more dry matter produced if the ryegrass were cut more frequently and the feed quality could have been improved. Also, during the last cut in October, the plants were all past a stem elongation growth stage and some varieties were close to head emergence. The difference in phenology would have largely contributed to the difference in total dry matter, as the varieties which were almost at head emergence had the highest total dry matter. Cutting the grass more frequently and at a shorter sward height would both improve feed quality but may also mean that different varieties will perform better in this environment than what the results reflect.

Acknowledgments

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