5.1 IS IT WORTH REPLACING OLD AUSTRALIAN PHALARIS WITH NEW WINTER ACTIVE CULTIVARS?

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Keywords: pasture, phalaris, growth

BACKGROUND

Is it worth replacing old Australian phalaris pasture, which is semi-winter dormant, with newer winter active phalaris cultivars? A long-term trial was established in 2022 at the Rokewood trial site to investigate this question. In the trial, four winter active cultivars of phalaris were sown next to an existing Australian phalaris pasture.

The newer varieties promise additional pasture growth of up to 20% during winter which is highly regarded because of winter feed shortages/gaps. It is expected that with appropriate rotational grazing management, these varieties can match the persistence of Australian phalaris.

Pastures, however, are costly and time-consuming to establish. It is not only the direct cost of the weed control, seed and fertiliser but also the lost production during the preparation and early establishment phase.

METHOD

Trial Design

The existing pasture on the site consisted of old Australian phalaris (Figure 1). Four newer winter active varieties of phalaris were sown in strips adjacent to it, so they could be compared to the existing phalaris pasture. Phalaris varieties used in the trial are detailed in Table 1. To allow a direct comparison of phalaris varieties, the new pasture sown did not contain any sub clover, which is commonly sown in a mix when renovating a pasture.

Trial Establishment

Pre-Sowing Preparation

In 2021, an application of insecticide occurred across the paddock in October to kill red-legged earth mites and prevent eggs from being laid as part of a TimeRite program. The site was prepared for sowing using a knockdown herbicide in December 2021. Figure 1 shows the pasture before the knockdown. Figure 2 shows the results of the knockdown pre-cultivation in April and the high level of pasture trash in the paddock.

Black field cricket baiting occurred in February 2022 in an attempt to lower population numbers (Table 2). It was scarified three times to prepare the seedbed on 6 April 2022. Figure 3 shows the cultivated seed bed. A further knockdown occurred in May 2022.

Table 1. *Phalaris varieties, associated companies and growth habits.*

Treatments	Seed Company	Growth
1. Holdfast GT	Barenbrug	Winter active
2. Existing old Australian		Semi-winter dormant
3. Confederate	DLF Seeds	Winter active
4. Horizon	Barenbrug	Winter active & strong summer dormancy
5. GT070 (currently unnamed)	DLF Seeds	Winter active. New trial line.

Figure 1. *Phalaris paddock before knockdown on 16 December 2021.*

Figure 2. *Post knockdown on 6 April 2022 showing trash levels before cultivation.*

Figure 3. *Cultivated seed bed on treatment 1 (Holdfast GT) with control (existing Australian phalaris) next to it. Photo taken 28 April 2022.*

Sowing

Four winter active phalaris cultivars were sown in 6 by 30 m strips using the SFS cone seeder on 13 May 2022 at 4 kg/ha with MAP at 100 kg/ha. Insecticide and slug bait were applied post-sowing to protect seedlings. All treatments received the same amount of phosphorus (P) fertiliser (42 kg P/ha) to boost P levels from a Cowell P of 27 mg/kg to 35 mg/kg. This equated to capital applications of single superphosphate (0-9-0-11) applied to newly sown plots at 244 kg/ha and 368 kg/ha on the control. Figure 4 shows slow establishment on 27 May 2022. Urea was applied to all plots in July 2022 to help boost the establishment.

Figure 4. *Photo taken 27 May 2022 showing slow establishment with phalaris 1 leaf, and onion grass emerging as the main weed.*

Grazing Management

A quick grazing was done in August 2022 to try and reduce weeds that emerged with the newly established phalaris. The trial was accidentally overgrazed, possibly hindering the establishment, as shown in Figure 5. It was grazed again on 6 September 2022 and then spelled to allow the pasture to run up to seed head and set dormant buds.

Figure 5. *Plots were overgrazed, photo taken 4 August 2022.*

Pasture Management

Single superphosphate was applied in autumn in 2023 and 2024. Urea was applied post-harvest in October to boost nitrogen levels after dry matter removal. A high number of broadleaf weeds emerged after the very wet October and November in 2022, Legacy MA was applied in June 2023 to remove dock, lesser loosestrife and thistles. Black field cricket baiting occurred again in February 2024. Detailed in Table 2.

Measurements

Pasture production was collected using a ride-on mower with a built-in weighing system to measure standing pasture in each plot. A hand-cut sub-sample was also taken and weighed and dried to measure moisture content. The two measurements were used to determine the kg DM/ha for the treatment. Cutting occurs when pasture is about 2000 kg DM/ha (approximately 10 cm) to a residual height of 5 cm.

RESULTS

Pasture Production

There were limited production cuts in the first year as the pasture established. A pasture cut was taken on 1 December 2022, which reflected spring growth (spelled from September 7) but there were no significant differences in pasture production in year one with growth of all species ranging from 1560 kg DM/ha to 1865 kg DM/ha.

In year 2, autumn to mid-winter in 2023, the newer varieties were showing less dry matter production than the existing Australian phalaris which was expected.

Table 2. Trial inputs and applications.

Input	Application Date	Product	Rate/ha
Herbicide	17-Dec-21	Crucial	1.8 L
	11-May-22	Crucial + AMS (adjuvant)	1.8L 2 L
	1-Jun-23	Legacy MA	1 L
Fertiliser	13-May-22	MAP	100 kg
	17-May-22	Single superphosphate	244 kg to sown plots, 368 kg to existing Australian
	22-July-22	Urea	53 kg
	23-May-23	Single superphosphate	369 kg
	12-Oct-23	Urea	30 kg
	16-May-24	Single superphosphate	270 kg
Insecticide	12-Oct-21	Alpha Duo	50 mL
	19-May-22	Pyrinex Super	1 L
Bait	23-Feb-22	Hy-Mal treated grain	110ml per 10kg grain
	20-May-22 26-May-22	Metarex Inov	5kg
	15-Feb-24	Hy-Mal treated grain	110ml per 10kg grain

Table 3. Dry matter production (kg DM/ha) for the six phalaris treatments at different timings during 2023-24.

Treatment	Autumn to Mid-Winter 2023	Late Winter 2023	Early Spring 2023	Late Spring 2023	Summer 2023/24
Holdfast GT	241 b	134 b	296 -	1422 -	2586 a
Australian	403 a	260 a	297 -	1765 -	1848 b
Confederate	197 b	121 b	262 -	1617 -	2739 a
Horizon	181 b	165 b	287 -	1532 -	2835 a
GT070	225 b	165 b	275 -	1626 -	2611 a
LSD P=0.05	56	60	50	268	337
p-value	>0.001	>0.001	0.571	0.14	>0.001
CV (%)	4	30	15	13	10

Means followed by the same letter do not significantly differ (p>0.05).

From autumn to mid-winter, the Australian phalaris produced the highest dry matter of 403 kg DM/ha, compared to the newer varieties which produced 241 kg DM/ha or less shown in Table 3. Australian was also the highest producer in late winter at 260 kg DM/ha compared to 165 kg DM/ha or less for the newer varieties. There were no significant differences between varieties and dry matter production for both the early spring and late spring cuts.

The summer cut then showed the Australian phalaris as the lowest producer of DM, 1848 kg DM/ha, whilst the winter active varieties produced over 2568 kg DM/ha (Figure 6). Table 4 shows results for the cumulative dry matter produced in 2023, with Australian producing the highest amount of dry matter. However, when the 2023-24 summer cut is added, none of the varieties were significantly different.

Table 4. Phalaris varieties x total DM production (kg DM/ha) for 2023 and the total DM production 2023 including total DM from summer 2023-24.

Treatment	Total DM Production 2023		Total DM 2023 + Summer DM 2023-24	
Holdfast GT	2129	b	4716	-
Australian	2757	a	4605	-
Confederate	2228	b	4967	-
Horizon	2170	b	5006	-
GT070	2290	b	4901	-
LSD P=0.05	306		414	
p-value	0.002		0.241	
CV (%)	10		7	

Means followed by the same letter do not significantly differ (p>0.05).

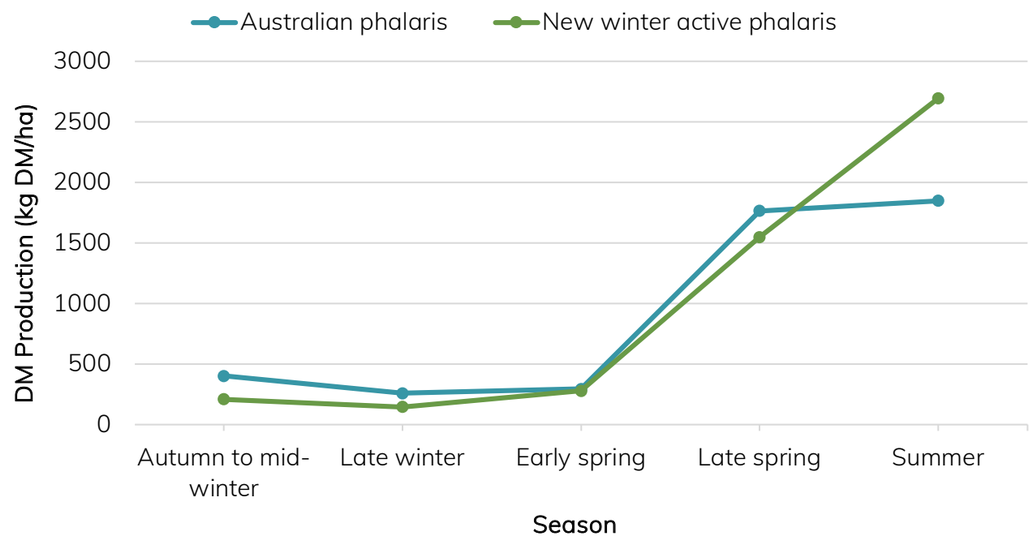

Figure 6. The average seasonal dry matter (DM) production (kg DM/ha) of the four new winter active varieties in comparison to the old Australian phalaris pasture.

CONCLUSION

With only two seasons of data, the results are currently inconclusive, this trial is a long-term trial and the production benefits of the new versus old phalaris varieties will continue to be monitored. The costs and benefits of both will be compared using a discount cash flow analysis in the future.

ACKNOWLEDGEMENTS

Thanks to MLA for funding this trial. Thanks to Cam Nicholson (Nicon Rural) for project leadership and guidance. Thanks to Luke Rolley and family for hosting the trial site.