Sub-tropical pasture assessments demonstrate a need for feed budgeting to deliver value.

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Background

A small sub-project trial was conducted as part of the Holbrook Landcare Network MLA funded sub-tropical pasture PDS. The aim of the trial was to establish the value of sub-tropical pastures when compared to other temperate feed base options at a point in time.

The study was conducted at Scotts Angus located at Henty owned and managed by Steven and Cindy Scott and the Scotts Angus team. A paddock rotation consisting of three similar-sized paddocks within rotation but different aggregated size between rotation were used to compare weight gains of steers grazed between February and April.

The Phalaris pasture consisted of three paddocks, 23, 20 and 17 hectares in size giving a total rotation area of 60 hectares. This rotation was grazed with 122 angus weaner steers averaging 230.4 kilograms per head on 12 February 2024. This delivered a stocking rate of 2 steers per hectare or 13.2 DSE per hectare assuming steer DSE ratings of 6.5 DSE per head.

The Lucerne ryegrass pasture consisted of three paddocks all equivalent in size at 9 hectares per paddock giving a total rotation area of 27 hectares. This rotation was grazed with 55 angus weaner steers averaging 235.1 kilograms per head on 12 February 2024. This delivered a stocking rate of 2 steers per hectare or 13.2 DSE per hectare assuming steer DSE ratings of 6.5 DSE per head.

The Digit (sub-tropical) pasture consisted of three paddocks, 16, 16 and 8 hectares in size giving a total rotation area of 40 hectares. This rotation was grazed with 81 angus weaner steers averaging 233.2 kilograms per head on 12 February 2024. This delivered a stocking rate of 2 steers per hectare or 13.2 DSE per hectare assuming steer DSE ratings of 6.5 DSE per head.

Outputs

Production per hectare or per head did not differ significantly between pasture types with variation of only 5% between treatments. Lucerne delivered marginally superior results per head and per hectare (Figure 1).

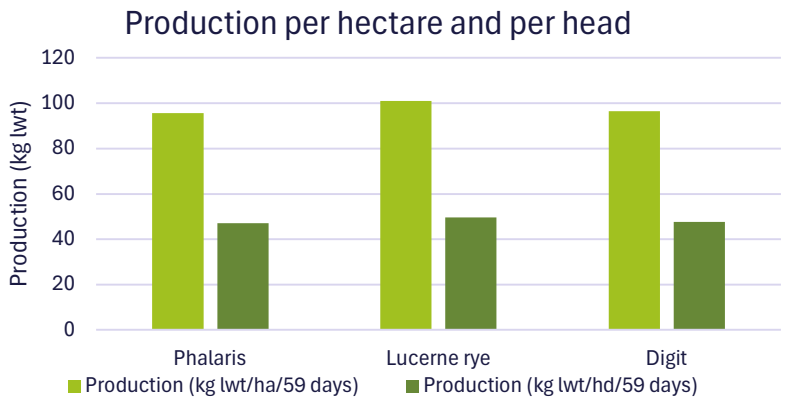

Figure 1. There was very little difference in production between feed types for the trial period

The benefit of lucerne was a function of a combination of 14 percent better growth during the first 29 days of grazing (P1) and 44 percent lower growth during the second 30 days of grazing (P2) relative to phalaris. All treatments delivered little growth in the second grazing period. As the 44 percent lower growth rate for P2 was compared to a very low growth rate the relative difference in growth rate was low. The average daily gain per head over the whole 59 day grazing period did not differ significantly between treatments with a slight 5% advantage to those livestock grazing in the lucerne rye pasture (Figure 2).

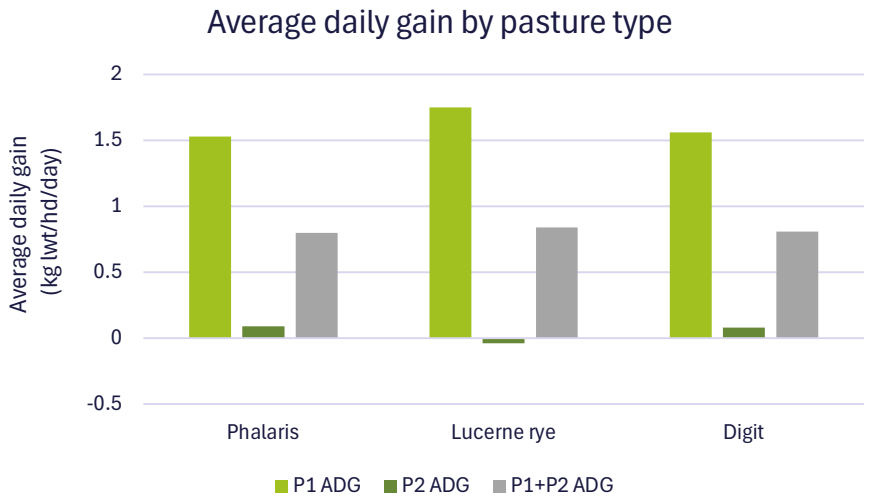

Figure 2. The average growth rate was made up of some very high average daily gains and some very low average daily gains.

The growth rates of the livestock (Figure 2) delivered by the different pasture types appear not to be well correlated with pasture quality (Figure 3) however it should be noted that the timings of the feed test data collection do not correspond precisely with the trial period.

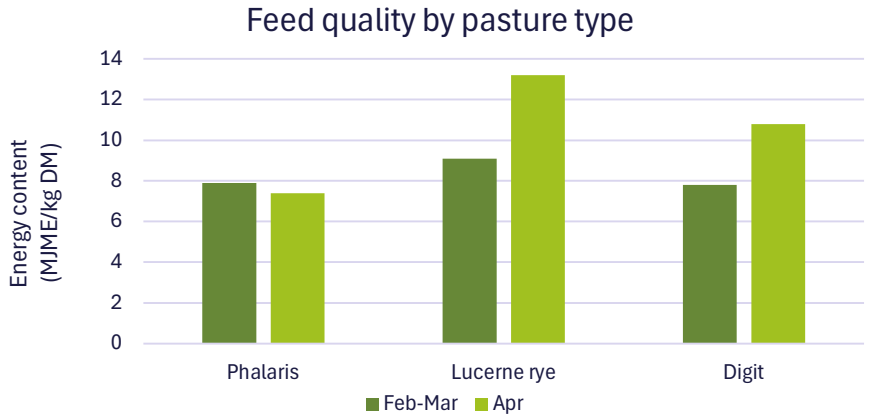

Figure 3. Pasture quality did not change regardless of timing for the Phalaris but it improved significantly at April for the Lucerne and Digit.

A pasture cut was taken on 6 and 22 February 2024 (Figure 4). The pasture cut showed a difference between opening and closing pasture inventory of 340, 247 and 1,807 kilograms dry

matter per hectare for Phalaris, Lucerne rye and Digit pastures respectively. The difference between opening and closing pasture inventory at any point in time is a function of intake, pasture growth and waste including decay. Figure 4 shows that there were relatively small differences between opening and closing biomass in the Phalaris and Lucerne pastures but an extremely large difference in the Digit pasture.

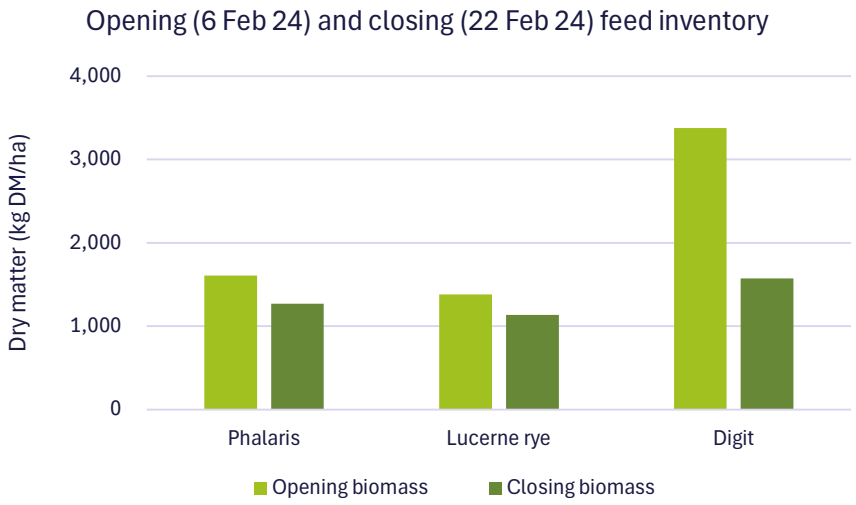

Figure 4. A pasture cut was undertaken 16 days apart at 6 and 22 February 2024.

Figure 5 shows intake, pasture growth (estimated) and waste for the different pasture types over the assessment period. This data shows that very high levels of waste and decay were experienced in the Digit pasture relative to the Phalaris and Lucerne pastures. The key learning from this insight is that Sub-tropical pastures require higher levels of management with higher stocking rates when biomass levels are high to avoid high losses to decay and wastage.

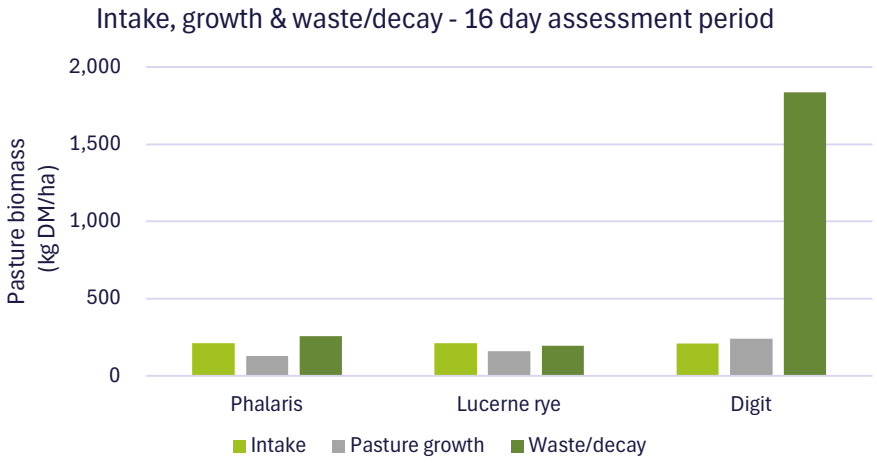

Figure 5. Waste and decay are low in the Phalaris and Lucerne pastures but is excessive in the digit pasture.

Cost benefit analysis

The options for feedbase types for Scotts Angus were Sub-tropical pasture grasses, Lucerne or Phalaris based pastures. The cost of establishment were not significantly different between pasture types. The choice of Steven Scott to sow Sub-tropical grasses was influenced by changing weather patterns with greater intensity summer rainfall. Also influencing the choice was the desire to investigate the production outcomes of the choice in his own environment, under his own management with his own livestock production system.

This, point-in-time trial demonstrated that there was no significant production increase at the same stocking rate between pasture treatments. Thus, there was no marginal benefit to the sowing of sub-tropical pastures in this very short period.

The wastage and decay rates experienced in this trial however suggest the real benefit of the Digit pasture was possibly not captured in this trial. Whilst not demonstrated in this trial, it is highly likely that a higher stocking rate in the Digit pasture to better utilise feed and deliver lower wastage rates would have delivered more production at least in the early grazing treatment.

The real take home message from this trial is feed demand must be matched to feed supply to capture the benefits of any feed source. Sub tropical grasses have very rapid growth rates delivering high levels of pasture biomass over summer and early autumn. To optimise the financial value of sub-tropical pastures the manager must be adept in the use of livestock and pasture management skills.

Appendix

First period of grazing treatment (P1)			
	Phalaris	Lucerne rye	Digit
Start	12-Feb-24	12-Feb-24	12-Feb-24
End	12-Mar-24	12-Mar-24	12-Mar-24
Days	29	29	29
Number head in rotation area	122	55	81
Weight in (kg lwt/hd)	230.4	235.1	233.2
Weight out (kg lwt/hd)	274.8	285.8	278.4
ADG (kg lwt/hd/day over period grazed)	1.53	1.75	1.56
Area (ha) Rotation 1	23	9	16
Area (ha) Rotation 2	20	9	16
Area (ha) Rotation 3	17	9	8
Total rotation area (ha)	60	27	40
Stocking rate/period (Strs/ha)	2.0	2.0	2.0
Stocking rate (DSE/ha)	13.2	13.2	13.2
Intake (kg DM/ha)	383.3	384.0	381.7
Opening biomass (kg DM/ha)	1,607	1,380	3,377
Opening biomass assessment date	6-Feb-24	6-Feb-24	6-Feb-24
Closing biomass (kg DM/ha)	1,267	1,133	1,570
Closing biomass assessment date	22-Feb-24	22-Feb-24	22-Feb-24
Difference	340	247	1,807
Days in assessment period	16	16	16
Intake over assessment period	211	212	211
Assumed growth rate (kg DM/ha/day)	8	10	15
Assumed growth (kg DM/ha/period)	128	160	240
Waste over assessment period	257	195	1,836
Rainfall over period (mm)	7	7	7

Second period of grazing treatment (P2)			
	Phalaris	Luc rye	Digit
Start grazing	12-Mar-24	12-Mar-24	12-Mar-24
End grazing	11-Apr-24	11-Apr-24	11-Apr-24
Days in grazing period	30	30	30
Number head in rotation area	122	55	81
Weight in (kg lwt/hd)	275	286	278
Weight out (kg lwt/hd)	272	287	276
ADG (kg lwt/hd/day over period grazed)	0.09	-0.04	0.08
Area (ha) Rotation 1	23	9	16
Area (ha) Rotation 2	20	9	16
Area (ha) Rotation 3	17	9	8
Total rotation area (ha)	60	27	40
Stocking rate/period (Strs/ha)	2.0	2.0	2.0
Stocking rate (DSE/ha)	13.2	13.2	13.2
Intake (kg DM/ha)	396.5	397.2	394.9
Opening biomass (kg DM/ha)	No data	No data	No data
Closing biomass (kg DM/ha)	No data	No data	No data

Feed quality and pooled weight gain data			
	Phalaris	Lucerne rye	Digit
Date of feedtest result	8-Mar-24	8-Mar-24	9-Feb-24
NDF	64.2%	45%	68%
Protein	4.9%	18.9%	7.5%
DMD	55%	63.6%	51.8%
MJME/kg DM	7.9	9.1	7.8
Date of feedtest result	22-Apr-24	22-Apr-24	22-Apr-24
NDF	68.0%	25%	53%
Protein	10.6%	37.0%	21.3%
DMD	49%	85.6%	73.6%
MJME/kg DM	7.4	13.2	10.8
Weight gain Feb-Mar 29 days (kg lwt/ha)	90	103	92
Weight gain Mar-Apr 30 days (kg lwt/ha)	5	-2	5
P1 average daily gain (kg lwt/hd/day)	1.53	1.75	1.56
P2 average daily gain (kg lwt/hd/day)	0.09	-0.04	0.08
Production (kg lwt/ha/59 days)	96	101	96
Combined number of days grazed Feb-Apr	59	59	59
Total lwt gain per rotation (kg/rotation area)	5,743	2,725	3,859
Production (kg lwt/hd/59 days)	47	50	48
Average daily gain (kg lwt/hd/day)	0.80	0.84	0.81