



Final report

PDS - Fodder Systems & Feed Gaps

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Abstract

Gibberellic Acid (GA) and nitrogen (N) products are currently used over the winter period on approx. 3000 hectares (ha) of the Monaro, NSW with an estimate of 30 grazing businesses using these products in some capacity. An increase in dry matter production (DMP) and utilization of winter feed could optimise the condition of breeding stock therefore facilitating the likelihood of a successful lambing or calving in spring. A question was raised whether foliar pasture applications such as N and GA, could significantly increase DMP on pastures on the Monaro over the winter period to optimise stock production and performance relative to untreated winter pastures.

This producer demonstration site (PDS) has demonstrated that for typical phalaris/ocksfoot pastures, the application of GA can make a significant difference in pasture growth over the late winter, and this, in turn, could be translated into higher overall carrying capacity and farm profits. Given the rising costs of fertiliser, GA application is a relatively cheap strategy compared with the application of N with a more reliable increment of production at this critical time of year. The initial unreplicated demonstrations do, however, cast some doubt as to the impact of GA on ryegrass pastures, although without replication, this is difficult to say with certainty. Similarly, the year 1 demonstration would suggest that GA may have a useful impact on fodder oat crops.

Executive summary

Background

Severe cold winter temperatures with a high frequency of frosts lead to low soil temperatures and subsequently restrict pasture growth, creating an inhibitive “winter feed gap” on the Monaro from May to September. This has meant many producers sell crossbred lambs and weaner cattle as stores at significantly reduced gross margins (GM’s) prior to winter rather than opting to finish stock.

Many producers currently use supplementary feeding over the winter period at a major enterprise cost to maintain stocking rate rather than looking at ways to utilise/enhance the feed base by strategically applying pasture growth stimulants such as gibberellic acid (GA) and nitrogen (N). Winter stocking rates generally dictate enterprise production capacity over the spring and summer period therefore winter carrying capacities remains a major profit driver for the whole grazing system.

Anecdotal observations suggest the use of GA and N products to optimise dry matter production (DMP) is significantly underutilised in the Monaro grazing Industry compared to other grazing regions.

Objectives

The aim of this producer demonstration site project was to demonstrate that foliar pasture applications such as Nitrogen and Gibberellic Acid significantly increase DMP on pastures on two soil types on the Monaro over the winter period to optimise livestock production and performance relative to untreated winter pastures.

Previous PDS work on lamb and steer finishing has quantified the profitability (\$/ha) of finishing stock on various Monaro pasture systems to range from \$194/ha - \$667/ha above the baseline system of selling as stores. If pasture growth promotants such as N and GA could further

enhance DMP growth of these pastures over the winter period there is significant potential to value add onto these profits.

An increase in DMP and utilisation of winter feed could also optimise the condition of breeding stock therefore facilitating the likelihood of a successful lambing or calving in spring.

Methodology

Sites were chosen throughout the Monaro, geographically diverse, on three farms for years one and two across a range of pasture/forage types. After two years of equivocal results, in the third year, it was decided to conduct a replicated trial at a single-site.

Yr1 Sites

“Maffra” near Bungarby with a cereal crop on basalt soil.

“Woburn” near Bungarby with a phalaris/cockfoot/sub. clover/lucerne pasture on granite soil.

“Dungaree” near Ando with blackbutt oats on basalt soil.

Yr2 Sites

“Cooroo” near The Brothers with a ryegrass pasture on basalt soil.

“Woburn” near Bungarby with a phalaris/cockfoot/sub. clover/lucerne pasture on granite soil.

“Kydra” near Ando with ryegrass on granite soil.

Yr3 Site

“Woburn” near Bungarby with a phalaris/cockfoot/sub. clover/lucerne pasture on granite soil. This site was chosen as it had already given the most consistent results, used a pasture mix common across the Monaro and was hosted by a cooperator who had a track record of ensuring the site was managed successfully.

Results/key findings

Low winter pasture growth rates are the major factor limiting the long-term carrying capacity of farm systems on the Monaro.

This PDS has clearly demonstrated that for typical Phalaris/cockfoot pastures the application of GA can make a significant difference in pasture growth over the late winter and this in turn could be translated to higher overall carrying capacity and farm profits.

Benefits to industry

Given the rising costs of fertiliser, GA application is a relatively cheap strategy compared with the application of N with a more reliable increment of production at this critical time of year. The initial unreplicated demonstrations do however cast some doubt as to the impact of GA on ryegrass pastures although without replication this is difficult to say with certainty. Similarly, the Yr 1 demonstration would suggest that GA may have a useful impact on fodder oat crops.

Future research and recommendations

The ability to conduct a replicated trial after two years of equivocal demonstration results gives the Monaro region suitable data upon which to promote the economic use of GA on improved perennial

pastures. It is not envisaged that there would be any further work required on GA in our region although it should be noted that if such work was undertaken or any other work where small pasture growth differences are expected it would be advantageous to consider replicated trials from the outset to avoid wasted time and resources.

Extension and communication

Presentations were provided at three (3) MFS on-farm Field Days, in newsletters to a distribution list of upwards of 241 pax, the MFS 2022 and 2023 Annual Reports, as well as being published on the MFS website which is accessible to the public.

Monitoring and evaluation

All field measurements and data analysis were completed in line with the project objectives and undertaken by well-respected local consultant, Doug Alcock of GrazProphet Consulting. All findings and results are stored securely on the MFS SharePoint and one drive.

PDS key data summary table

Project Aim:

To trial the use of foliar pasture applications such as Nitrogen and Gibberellic Acid to assess the increase of DMP on pastures on two soil types on the Monaro over the winter period to optimize stock production and performance relative to untreated winter pastures.

	Comments		Unit
Production efficiency benefit (impact)	<i>Use of GA allows extra pasture accumulation in winter and a potential doubling of ewe stocking rates in lambing paddocks. Herbage accumulation increased with GA but not with applied N.</i>	500-700	kg DM/ha
Increase in income	Extra feed grown valued at \$0.03 /MJ	\$196.00	/ha
Additional costs (to achieve benefits)		\$27.00	/ha
Net \$ benefit (impact)		\$169.00	/ha
Number of core participants engaged in project		5	
Number of observer participants engaged in project		21	
Core group no. ha		15,443	
Observer group no. ha		54,374	
Core group no. sheep		26091	hd sheep
Observer group no. sheep		158,788	hd sheep
Core group no. cattle		1,724	hd cattle
Observer group no. cattle		6,190	hd cattle
% change in knowledge, skill & confidence – core	<i>E.g. Grow fodder crops to finish lambs on</i>	66%	
% change in knowledge, skill & confidence – observer	<i>E.g. Grow fodder crops to finish lambs on</i>	50%	
% practice change adoption – core	<i>E.g. Grow fodder crops to finish lambs on</i>	%	
% practice change adoption – observers	<i>E.g. Grow fodder crops to finish lambs on</i>	25%	
% of total ha managed that the benefit applies to	<i>E.g. % of total ha, fodder crop is grown on</i>	17%	
Key impact data			
<i>Delete lines that are not applicable to your project.</i>			
Net \$ benefit /ha (impacted ha)	\$169.00/ha		

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1. Background

1.1 Previous Trial Results

Previous PDS work on lamb and steer finishing has quantified the profitability (\$/ha) of finishing stock on various Monaro pasture systems to range from \$194/ha - \$667/ha above the baseline system of selling as stores. If pasture growth promotants such as N & GA could further enhance DMP growth of these pastures over the winter period, there is significant potential to value add onto these profits.

An increase in DMP and utilization of winter feed could also optimize the condition of breeding stock therefore facilitating the likelihood of a successful lambing or calving in spring.

1.1.1 Opportunity

This challenge affects the entire Monaro grazing Industry encompassing the Cooma/Monaro, Bombala and Snowy River shire districts. A Monaro analysis (2005) showed the total number of livestock producers in these areas to equal 605.

GA and N products are currently used over the winter period on approx. 2700-3000 ha of the Monaro with an estimate of 30 grazing businesses (i.e. only 5% of total producers) using these products in some capacity. Costs vary depending on target species but ranges from \$6-\$14/ha for GA and \$15-20/ha for N plus operational costs.

There has been no scientific based, trial work on a paddock scale done for our local area or cost benefit analysis to determine if N & GA applications are translating into additional, measurable DMP and therefore improving animal performance and enterprise net profit. Some strip trials conducted in the Monaro region that have been done on improved pasture suggest increases of 200-600 kg/DM/ha are possible using GA however this data has not been integrated into livestock performance or gross margin comparisons.

Many producers add GA to pastures 6 weeks prior to commencement of lambing or calving to boost production and eliminate feeding requirement however no analysis has been performed on this technique. There is a lot of interest in this area amongst MFS members and others in the grazing community however not a lot of uptake due to the lack of credible on-ground data or evidence that it is an economically astute investment.

2. Objectives

The main objective of this producer demonstration site project was to demonstrate that foliar pasture applications such as Nitrogen and Gibberellic Acid significantly increase DMP on pastures on two soil types on the Monaro over the winter period to optimise stock production and performance relative to untreated winter pastures.

Undertaken in the Monaro region of the Southern Tablelands, the objectives included:

Objective 1:

Validate and assess the potential to increase DMP by applying granular Nitrogen (N) and Gibberellic Acid (GA) to the following fodder systems;

Perennial Pasture (Phalaris and cocksfoot)

Ryegrass

Cereal Crop

Objective 1 was delivered successfully over a three- year period, results were evident at the conclusion of Year 3.

Objective 2:

Conduct a series of cost benefit analysis to determine the relative economic value of applying these inputs to boost DMP over winter months to address the winter feed gap and improve the GM performance of growing and breeding stock enterprises.

Objective 2 was successfully completed as part of the project by Doug Alcock, GrazProphet Consulting

Objective 3:

Implement a variety of educational activities to increase the knowledge, skills and confidence of six core and 150 observer producers in the best options to address the winter feed gap in terms of economic value and boosting pasture and animal performance.

Objective 3 was successfully undertaken and completed through a series of educational presentations at on-farm field days by well-respected agronomist, Douglas Alcock of Grazprophet Consulting, distribution of information and data through email and social media, with an upwards reach of 241 pax.

Objective 4:

50% per cent of core producers will have adopted strategies (N + Gibb Acid) to increase the utilisation of pasture growth over the winter period inputs and 30% of observers intend to.

Objective 4 was successfully achieved with over 75% of core producers indicated that they intend to adopt strategies to increase the utilisation of pasture growth over the winter period. This equates to 2 out of 3 survey results. For observers, 5 out of 9 indicated their intention to adopt practice.

Objective 5:

Conduct two annual field days to showcase the demonstration site results and encourage adoption of key practices by 110 attending producers.

Objective 5 was met with Douglas Alcock of Grazprophet Consulting presenting data and information for three years at the conclusion of each winter period over Years one, two and three with 49, 107 and 64 respectively, in attendance.

3. Demonstration Site Design

3.1 Methodology

Sites were chosen throughout the Monaro, geographically diverse, on three farms for Years one and two, and a single site in Year three, using four pasture/forage types.

Site 1 – Phalaris – basalt soil

Site 2 – Ryegrass (medium/long term) – granite soil

Site 3 – Cereal (oats) – basalt soil

The following methodology was applied to the trial sites:

1. Coordinate pasture/crop establishment at all sites and document site descriptions (soil tests, uniformity of landscape soil type, aspect, slope, temperature etc.).
2. Identify & map/peg out demonstration area within each system ensuring uniformity of area and erect temporary fence.
3. Apply 4 treatments to each of the three sites using the following timing;
 - TMT 1)** Nitrogen (liquid) - April
 - TMT 2)** GA (foliar spray) – mid/late June
 - TMT 3)** Nitrogen (liquid) – April
 - + GA (foliar spray) - mid/late June **
 - TMT 4)** Control
 - **ensure site is crash grazed to control biomass prior to GA application
4. Conduct a pre-application baseline measurement (late April) recording pasture height and biomass
5. Apply N (late April) then allow 4-6 weeks growing period
6. Conduct biomass assessment (early/mid June) then crash graze prior to applying GA treatments
7. Apply GA treatments (late June) – allow 4-6 weeks growing period
8. Measure biomass dry matter yields 4 - 8 weeks post treatment to derive pasture growth for the three systems and record feed quality (DMD, ME etc) for each system
9. Crash graze each trial area with recorded number of livestock (sheep or cattle depending on site chosen)
10. Calculate additional input costs, additional grazing value and model livestock weight gain (pregnant and lactating ewes and cows) on extra DM using Grazfeed and steer/lamb GM data (current and previous PDS) to calculate overall gross margins (\$/ha, \$/kg) for each of the three systems.
11. Use feed budgets to value the extra biomass in terms of improved carrying capacity for each of the three systems.
12. Measurements will be taken over the winter season (April to Sept) and will be recorded for at least two consecutive seasons to capture anticipated variations in season and livestock market prices.

Treatments

At each location in years 1 and 2 a uniform site was identified to contain four plots one being a control plot “Nil” and three plots each receiving a different treatment. Treatments included an application of liquid Nitrogen (N), an application of Gibberellic acid (GA) and a combined application of both N and GA.

- T1. N
- T2. GA
- T3. N + GA
- T4. Nil

The plots were prepared for application of treatments by prior grazing.

Nitrogen was to be applied in May and ProGibb applied in late June.

In year 3 the same treatments were applied in a fully replicated design with the treatments blocked to account for any impact from landscape changes. Treatments were randomised within blocks and there were four replicates.

Measurements

Biomass assessments were conducted in June and August, 6 weeks after the actual treatment applications. A third biomass assessment to determine any flow through impacts of the treatments on spring pasture growth were conducted in October again at least 6 week after exclusion of grazing. Herbage mass was assessed by walking the length of the plots and placing a median quadrat ten times at even intervals taking the median cut and so creating a composite of 10 samples from a quadrat size of 50cm x 30cm. The aggregate sample was weighed on site and then a thorough mixing and subsampling process conducted to take a representative sample to determine herbage dry matter % and to provide the sample for feed quality testing. Each sub sample was weighed wet and then taken to the Sydney University facility at “Coolringdon” to be dried before being sorted into green and dead components. In years 1 and 2 the feed test sample was sorted fresh and the green component frozen for sending to the Feed Quality Service at Wagga Wagga in accordance with their general instructions. Due to difficulties with slow postage and deterioration of some frozen samples in year 3 the feed quality samples were oven dried before dispatch to the lab.

After each biomass assessment the plots were opened to background grazing to reduce biomass this was important to prepare the plots for application of GA in winter in years 1 and 2 although in year 3 there were no animals in the surrounding paddock and no grazing was applied after the June biomass assessment. This was not an issue as the green herbage mass was already at about the correct level recommended for application of GA. It also by coincidence allowed for the calculation of additional biomass accumulation post GA application rather than simply the analysis of total and green biomass present at the end of winter cut.

3.2 Economic analysis

Statistical Analysis

There was no statistical analysis possible for the first two years of the trial, but the third year’s replicated trial was analysed using GenStat using both two-way and one-way analysis of variance. Most results shown are from a two-way ANOVA utilising both sampling date and treatment. A one-

way ANOVA was completed for the calculated biomass accumulation and calculated accumulation of Digestible Dry Matter and Crude Protein due to treatments.

3.3 Extension and communication

Monaro Farming Systems developed and implemented a detailed communications plan (Appendix 6.1) to engage the broader farming community.

Table 1 Planned communication and extension activities

Activity	Target Audience	Key messages and must-have elements	Estimated reach
On-going communication with site hosts and project team	Steering committee	Progress and seasonal updates, on-going planning discussions	3 individuals
Two (2) field days in Monaro region	MFS members and Monaro grazing Industry	Presentation of results and feedback from hosts	90 producers
3 media opportunities / 2 print articles in local papers and 1 radio interview (SE ABC)	MFS producers & graziers in the broader Monaro region	Raising awareness and communicating results and findings	Entire Monaro Community Approx. 4000 individuals
2 Newsletter publications and 3 case studies/video testimonials	MFS producers & Livestock producers in the broader Monaro region Red meat levy payers	Raising awareness and communicating results and findings	MFS members (70+ farm businesses - approx. 400 individuals) & Entire Monaro Community Approx. 4000 individuals
Case Studies	Core Producers	Case study summaries will be produced for the three site hots	
Social Media – Facebook and Instagram	MFS producers & graziers in the broader Monaro region	Regular face book posts will be uploaded to the MFS face book page with brief data updates and observations as well as information about upcoming field days.	MFS members (70+ farm businesses - approx. 400 individuals) & Entire Monaro Community Approx. 4000 individuals

Website mentions and dedicated page on MFS website	MFS producers & graziers in the broader Monaro region	A specific page will be created on the MFS website to detail this project and provide a platform for results, information exchange and all outputs from the project.	MFS members (70+ farm businesses - approx. 400 individuals) & Entire Monaro Community Approx. 4000 individuals
Producer guides/fact sheets	MFS producers & graziers in the broader Monaro region. All members of the public who visit the Monaro Farming Systems website.	A producer guide/factsheet will be developed out of the results summaries and presentations and be available for publication.	MFS members (70+ farm businesses - approx. 400 individuals) & Entire Monaro Community Approx. 4000 individuals

3.4 Monitoring and evaluation

The project included the development of a Monitoring, Evaluation and Reporting (MER) Plan (Appendix 6.2) which included pre and post project surveys (Appendix 6.3) to measure and demonstrate the changes in knowledge, skills and confidence for the core and observer producers. The project also included the development of a number of case studies to capture the demonstration site results. A consultant was engaged to collect data from six demonstration sites, the following metrics being measured:

(a) Dry Matter Production (kg DM/ha/year)

Key Performance Indicators:

(a) income (\$/DSE) and income/HA

(b) enterprise expenses (\$/DSE) and per HA

(c) gross margin (\$/DSE) and per HA

(d) net profit (\$/DSE)

Practices being demonstrated include:

- Soil sampling, pasture composition assessments and ground cover % pre and post application
- Biomass measurements (using median quadrant sampling technique across a transect)

4. Results

4.1 Demonstration site results

Document site descriptions

Initial soil tests were taken on three (3) trial sites – Wyalla, Dungaree and Woburn on the 26th July 2021, the results of those tests as presented:

Figure 1 2021 Soil test results for three demonstration sites

Sample Name	pH (1:5 W)	pH (1:5 Ca)	Electrical Conductivity (dS/m)	Phosphorus (mg/kg)	Available Phosphorus (mg/kg)	Calcium (A) (cmol(+)/kg)	Potassium (cmol(+)/kg)	Magnesium (cmol(+)/kg)	Sodium (A) (cmol(+)/kg)
Myalla	5.8	5.1	0.14	180	380	14.0	0.97	7.2	0.08
Dungaree	5.9	5.3	0.42	170	600	22.0	1.50	24.0	0.75
Woburn	5.9	5.1	0.07	73	220	5.2	0.57	0.9	0.03

Sample Name	Calcium (V) (cmol(+)/kg)	Aluminium (cmol(+)/kg)	Cation Exchange Capacity (cmol(+)/kg)	Sodium %	Aluminium %	Sulphur (K) (mg/kg)	Aluminium (mg/kg)	Calcium (A) %	Magnesium %
Myalla	1.9	<0.1	22.6	0.35	<1.0	10	<9.0	63.0	32.0
Dungaree	0.9	<0.1	48.5	1.50	<1.0	10	<9.0	45.0	50.0
Woburn	6.0	<0.1	6.7	0.38	<1.0	5	<9.0	78.0	13.0

Sample Name	Potassium %	Phosphorus (mg/kg)	Potassium (mg/kg)	Phosphorus (mg/kg)	Grass Tetra (mg/kg)	Total Carbon (Combustion) %
Myalla	4.30	110	410	0.61	0.05	3.70
Dungaree	3.10	150	580	0.88	0.03	5.10
Woburn	8.50	22	260	0.30	0.09	2.70

At each location a uniform site was identified and fenced which contained four plots one being a control plot “Nil” and three plots each receiving a different treatment. Treatments included an application of Liquid Nitrogen (N), an application of Gibberellic acid (GA) and a combined application of both N and GA.

The plots were prepared for application of treatments either by prior grazing (Cooroo and Woburn) or by mowing (Dungaree)

After application, the plots were excluded from grazing and allowed to accumulate biomass. Before a measurement of herbage mass was taken and samples collected of the green component for testing of feed quality. This first assessment was done in the week of the 16th of August 2021.

Herbage mass was assessed by walking the length of the plots and placing a median quadrat 10 times at even intervals taking the median cut and so creating a composite of 10 samples from a quadrat size of 50cm x 30cm. The aggregate sample was weighed on site and then a thorough mixing and subsampling process conducted to take a representative sample to determine herbage dry matter % and to provide the sample for feed quality testing. Each sub sample was weighed wet and then taken to the Sydney University facility at “Coolringdon” to be dried before the sample was

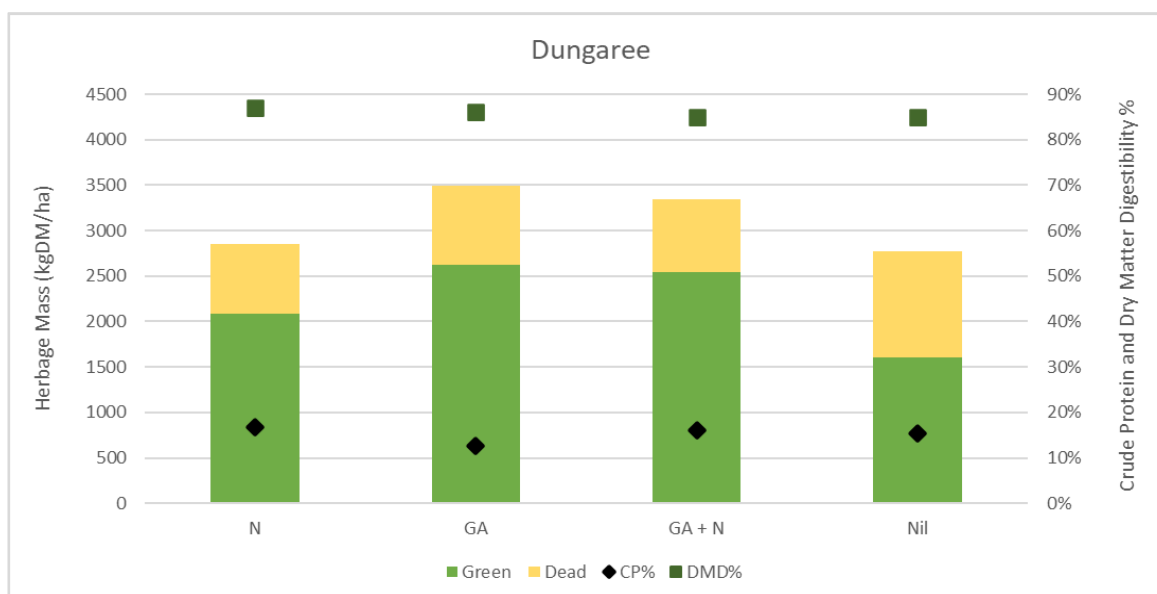
dry and separated into green and dead components and the green component sent to the Feed Quality Service at Wagga Wagga for testing.

Plots were then grazed or mowed to even them up again and again excluded from grazing in the lead up to a spring assessment where the sampling procedure was repeated.

Year 1 Results

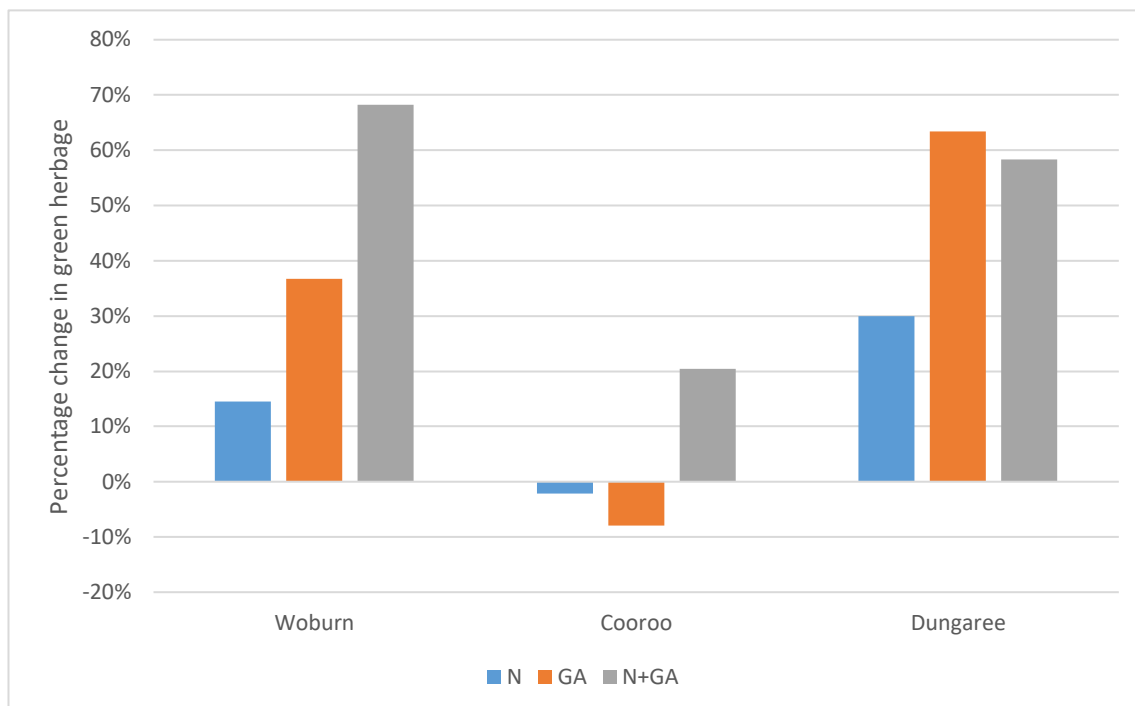
Results from the winter cut in August showed that there was a likely response to both the application of N and the application of Pro Gibb (GA). Absolute differences in herbage mass were greatest in the Blackbutt oats at “Dungaree” but there appeared to be no additive effect of applying both N and GA over that of GA alone. At “Woburn” however the response from the addition of both N and GA was approximately the same as the sum of the individual responses for each treatment. On the oats there was no indication that application of any treatment had made a difference to feed quality while at Woburn on the perennial pasture the plots with N applied were generally higher in both crude protein and digestibility this is probably due to a combination of soil type (inherent fertility) and nutrient application at sowing of the oats meaning the oats were inherently less limited by N. Treatments included an application of Liquid Nitrogen (N), an application of Gibberellic acid (GA) and a combined application of both N and GA.

Figure 2 Herbage mass and quality at each location in the week of the 16th of August, 2021



Interestingly at the “Cooroo” site there was little indication of a response of any kind to either individual treatment but the combined N + GA treatment gave a minor lift in biomass. Given that there was no replication it is difficult to say whether this difference was real or a matter of chance in the choice of plot.

As a raw comparison between the treatments and the Nil plots at Woburn (Fig 2.) the application of both N and GA increased green herbage mass by 68% compared with a 37% increase with GA alone. N alone lifted green herbage by just 15%

Figure 3 Difference in green herbage mass relative to the Nil plot at each site 16th Aug 2021

At “Cooroo” the data was quite confounded with the individual treatments giving a slight decrease in yield relative to the nil plot while the combined treatment gave a 20% increase in green herbage. The oats at “Dungaree” responded with a 30% increase in green herbage for N alone while the GA application gave more than twice this response however the combination of N + GA gave no additional response compared with GA alone.

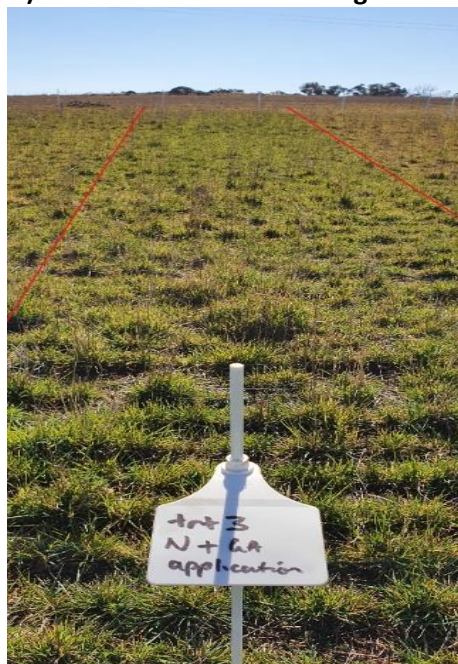
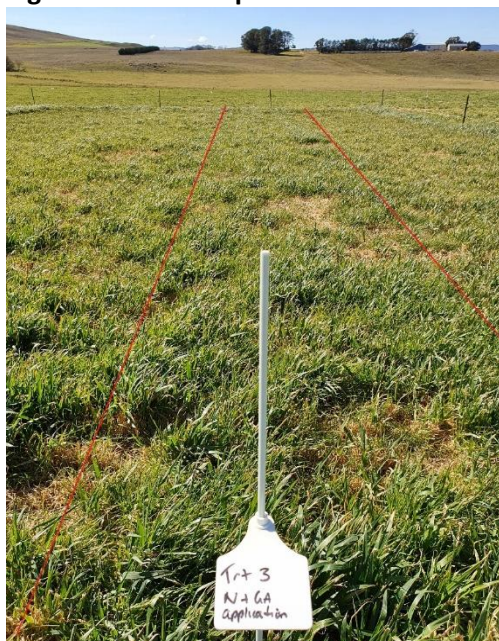
Figure 4 Visual response for N+GA at the “Dungaree” (left) and “Woburn” sites in August 2021.

Figure 5 View across the “Woburn site showing clear treatment boundaries”



Results from the spring cut were equivocal and only the Blackbutt oats at “Dungaree” showed an advantage to the treatments over the Nil. Unlike the winter cut, the advantage to the application of N was greater than that of GA although again the impact was greater for the N+GA combined. The amount of green biomass accumulated was about 25% higher for GA, 38% higher for N and nearly 50% higher for the combined N+GA treatment relative to the nil treatment. There was little difference in crude protein between treatments, but dry matter digestibility may have been a little higher than for the Nil plot.

At “Cooroo” and “Woburn” sites at the spring measurement there was no real difference between the treatments and the nil plot for either biomass or feed quality.

Figure 6 Herbage mass and quality at each location in the week of the 11th of October.

Figure 7 Accumulation of Oats biomass at Dungaree 11th Oct



Figure 8 Accumulation of pasture biomass at "Cooroo" 13th of October 2021



Figure 9 View across the site at “Woburn



Due to unforeseen seasonal conditions, the project was put on hold during 2020 and resumed in 2021 (Year 1). There were no preliminary findings to comment on.

Year 2 project results

Year 2 Results

The plots were prepared for application of treatments by prior grazing with the application of N occurring on the 19th of May 2022. At this point the Maffra site was still unfenced, but an undertaking was given that the site would be fenced before any further grazing occurred in the paddock.

GA was applied in late June with measurements planned for June and August, 6 weeks after the treatment applications.

The spring biomass assessment was done in early November.

The first biomass assessments were undertaken on the 28th and 29th of June 2022. Maffra was the first site visited but unfortunately the site had still not been fenced on the premise that the whole paddock would be excluded from grazing however a miscommunication at Maffra meant that sheep had already grazed and removed any green so that taking measurements would be meaningless. The site owner, Andrew Rolfe, undertook to complete the fencing of the Maffra plots so that the GA could be applied and the second set of measurements taken.

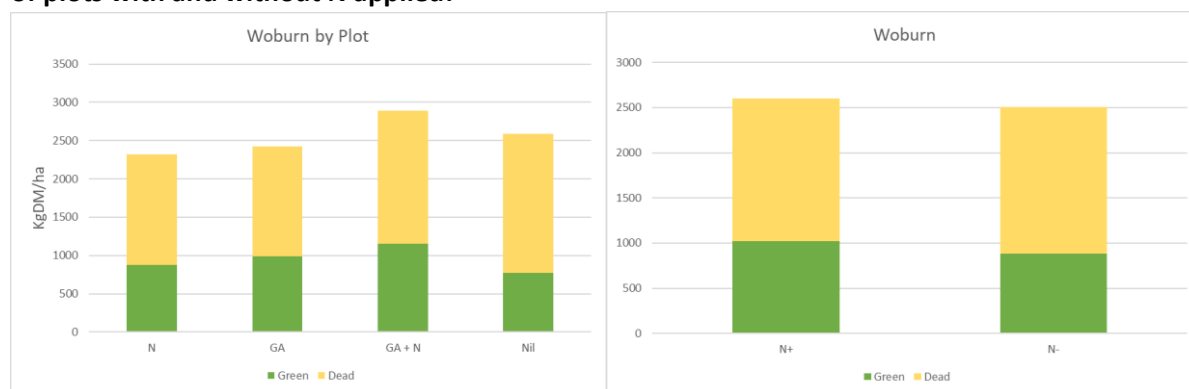
Figure 10 Maffra Site on the 28th of June 2022. Heavily grazed with insufficient herbage to sample.



Herbage mass assessments and feed quality samples were undertaken at Woburn on the 28th of June and Kydra on the 29th of June 2022 respectively. Feed test samples were frozen and retained to send to Wagga Feed testing laboratory. Unfortunately, the samples were delayed in the post for more than a week and were unfit for testing when they reached the lab and by this time the dried sample had been discarded. For this reason, unfortunately there are no feed test results for the June sampling in the second year.

At Woburn the green biomass again supported the premise that there had been a response to applied N however it should be noted that at this point effectively there are two Nil plots as the GA had not yet been applied. There was a 210kg Green DM/ha difference between these two plots and similarly a 275kg Green DM/ha difference between the two plots that had N applied. This amount of noise in the data makes it difficult to be certain of the impact of applied N.

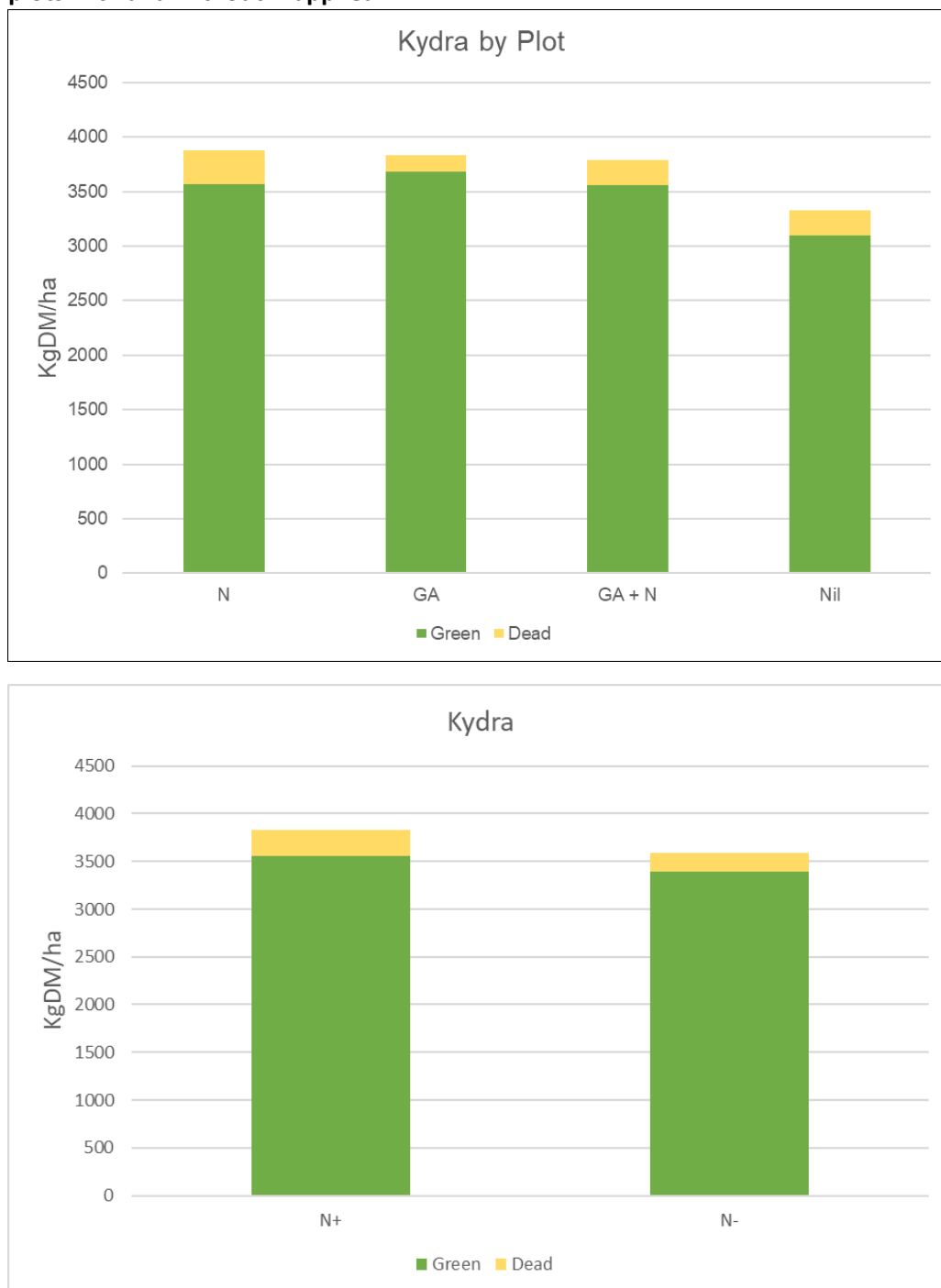
Figure 11. Autumn Growth Results for Woburn showing the individual plots as well as the average of plots with and without N applied.



If the two plots without N and the two plots with N are averaged, we can see that there is only 135kg Green DM/ha difference between N+ and N-.

Similarly, for Kydra the treatment plots showed consistently higher green biomass compared with the Nil plot however the highest biomass was on the GA plot which at that stage had not had any treatment applied. Again, if the N+ and N- plots were averaged there was only a 170kg Green DM/ha advantage to the N+ treatments.

Figure 12. Autumn Growth Results for Kydra showing the individual plots as well as the average of plots with and without N applied

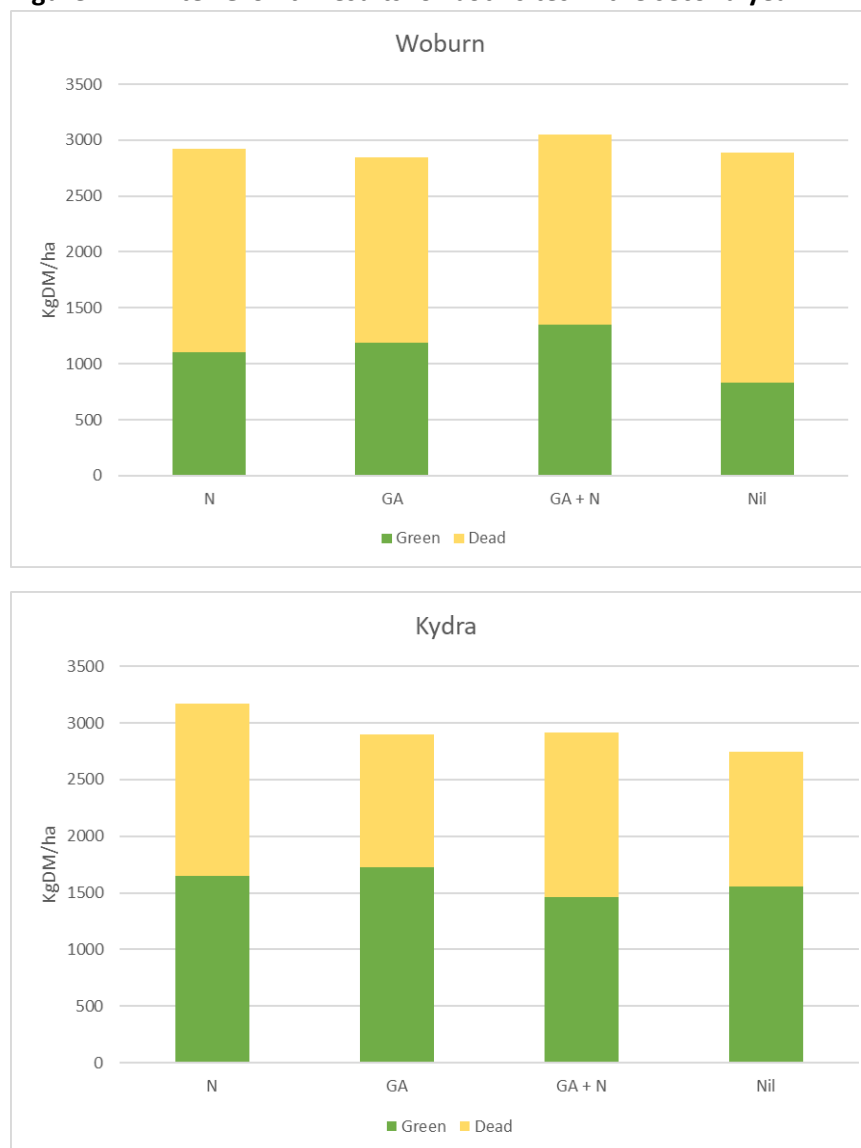


Plots were then grazed to even them up before the GA was applied and grazing was again excluded prior to an early spring assessment. The grazing and application of GA took a little longer at Kydra so the sampling was delayed by 2 weeks.

Figure 13. View of plots at Woburn 28th June 2022

The second biomass measurement occurred on the 31st of August at Maffra and Woburn and the 14th of September for Kydra. Unfortunately, the fence at Maffra had still not been erected and the plots were again heavily grazed and unsuited for any measurements leading to the abandonment from the 2022 demonstration as no meaningful data could be gleaned.

Biomass data from the end of winter at Woburn showed that both the application of GA and N had generated extra growth and that the impact of applying both GA and N was approximately the same as the sum of the differences when applied alone. The impact of GA appeared to be between 250 and 350kg Green DM/ha of additional herbage accumulation.

Figure 14 Winter Growth results for both sites in the second year.

At Kydra however the GA + N treatment was the lowest green biomass while the GA alone was the highest. Without replication it is impossible to determine whether there is any response to treatments.

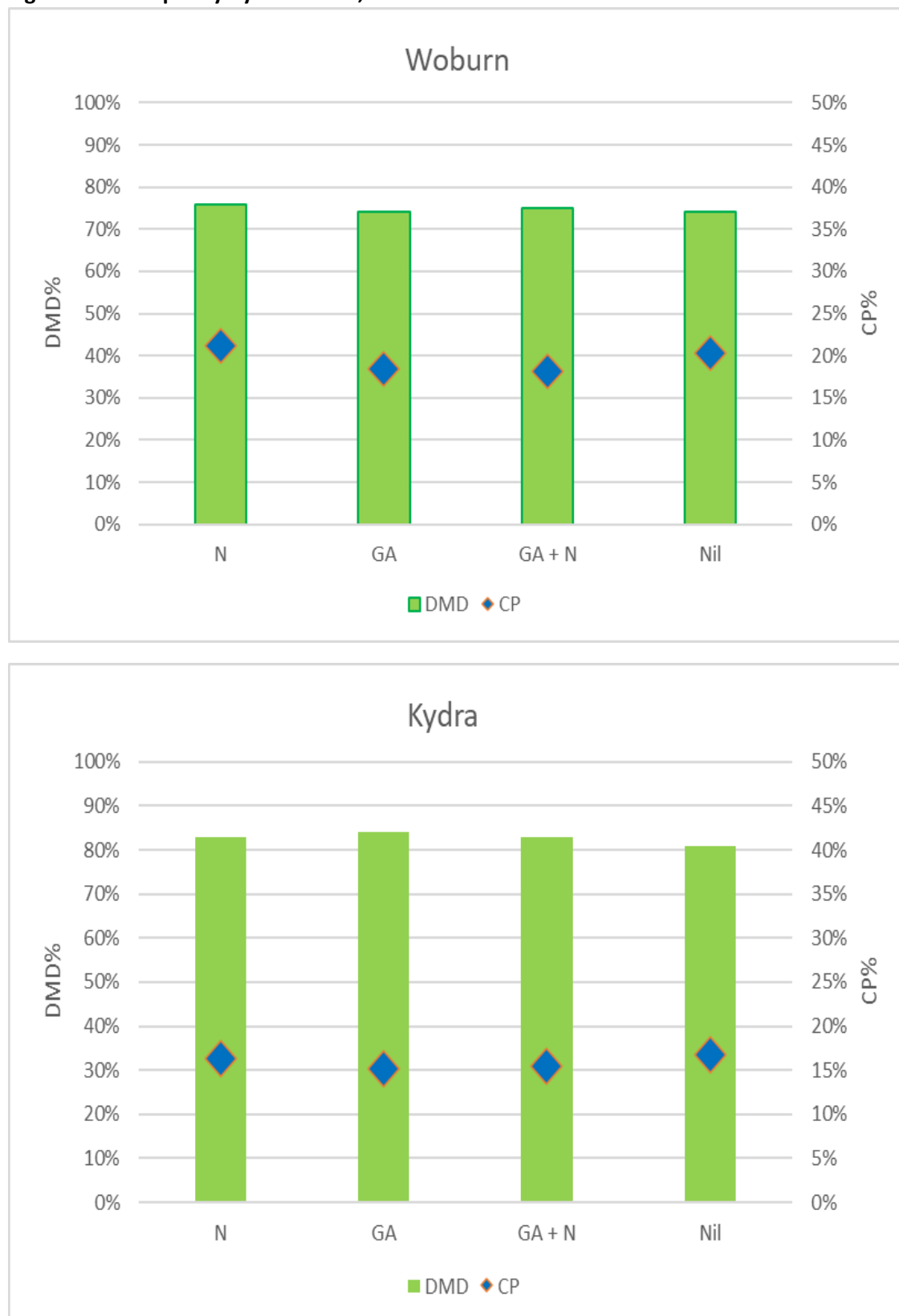
For the end of winter sampling visual treatment differences were present at the Woburn site.

Figure 15 Woburn T3 and T4 showing the visual boundary between the two adjacent plots



Again, a fresh green sample of pasture were prepared and frozen pending transport to Wagga for testing. Unfortunately, Australia Post took a week to deliver the package and the samples had fully thawed and begun to decompose. Thankfully for this sampling date the dried subsamples had been retained and green from the dried samples were resorted and sent to Wagga to replace the original frozen samples. Subsequent samples were prepared by drying to avoid further issues.

There were no clear differences in either dry matter digestibility or Crude Protein for the end of winter sampling at either site.

Figure 16 Feed quality by treatment, of biomass accumulated over winter for Woburn and Kydra

Both Woburn and Kydra sites were opened to grazing for around a week before being closed again pending a spring assessment.

Figure 17 Overview of the Kydra site at the end of winter showing no visible difference between treatments



The Spring assessments of Kydra and Woburn were conducted on the 2nd and 4th of November 2022. Unfortunately, the surrounding paddock at Kydra was being grazed with composite ewes and little respect had been paid to the temporary fence. The plots were grazed about the same as the surrounding paddock. Nevertheless, there was still a considerable amount of biomass present, so the sampling was completed but it was decided not to waste resources on feed testing samples that had been already compromised. No visual differences were detectable.

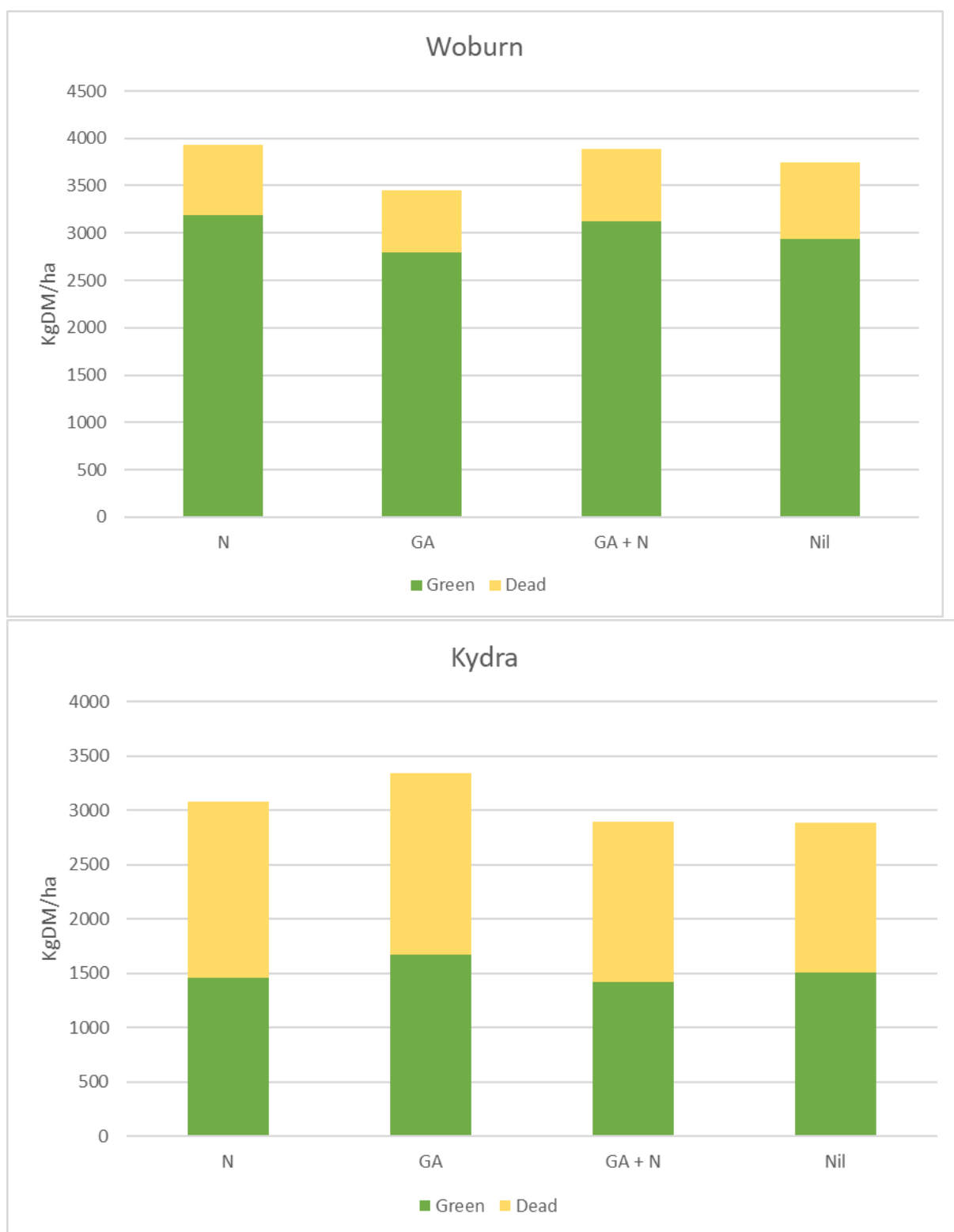
Figure 18 Woburn plots 4th November 2022



At Woburn considerable biomass had accumulated but there were no visible differences detectable between plots. Samples were prepared as described above and dried green samples were sent to the Wagga lab for feed testing.

Figure 19 Kydra on the 2nd November 2022 showing the state of the fencing and the level of grazing in the plots



Figure 20 Spring Biomass at Woburn and Kydra 2022

Herbage mass results show no differences consistent with the treatment applied suggesting there was no carry over effect of treatment into the spring growth period.

The differences in accumulation of biomass over winter at one site, Woburn at Bungarby were in line with expectations. N and GA treatments were higher than the Nil and the combined GA+N was incrementally higher still. It is still noteworthy that the Nil treatment had just over 800 kg DM/ha and the combined treatment had accumulated an extra 520kg DM/ha however it should be noted that the pre-winter cut had already established the GA+N plot as the highest performer prior to the application of GA and that the plots ranked in a similar fashion prior to the GA treatment being applied. Without replication of treatments, it is difficult to be certain that the observed differences are really the result of the treatments.

Differences in winter biomass accumulation at the second site, Kydra at Nimmitabel were less apparent. The Nil and N treatments were very similar while one GA plot was higher than these and one was lower. To summarise it is very difficult to conclude a definitive statement about any treatment differences.

Expressed as a percentage of the NIL treatment the difference in apparent response between the two sites is stark with good improvements in green DM in line with expectations at Woburn and very small and inconsistent changes at Kydra.

Year 3 Results

This year was reduced to a single site where a replicated trial was conducted using the same treatments as the previous two years.

To give the longest reasonable time for the impact of Nitrogen on Autumn growth the Easy N was applied at 100 L/ha on the 21st of April 2023 with the first biomass assessment occurring on the 14th of June. While there was considerable carry over of dead herbage from the previous lush Spring and Summer conditions with some differences between treatment there was only a small and not significant difference in the green biomass resulting from the application of Nitrogen in Autumn.

Feed testing of the green component of the dried pasture samples showed there was a small but not significant difference in dry matter digestibility in favour of all the treatment plots but given the GA treatment plot (no treatment applied at this time) was higher than the GA + N treatment it is assumed that this was normal between plot variation.

In terms of crude protein only the N+GA treatment was significantly higher than the Nil and the differences were very small. In terms of animal production as all treatments had crude protein of 17% or more there will be no advantage in production stemming from any increase.

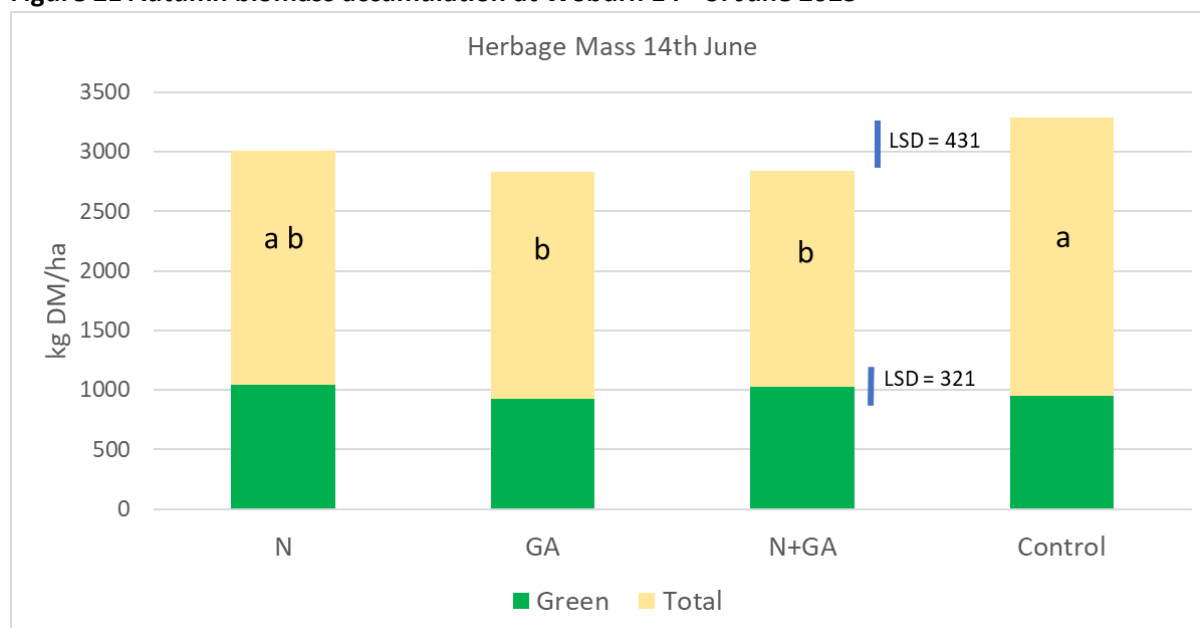
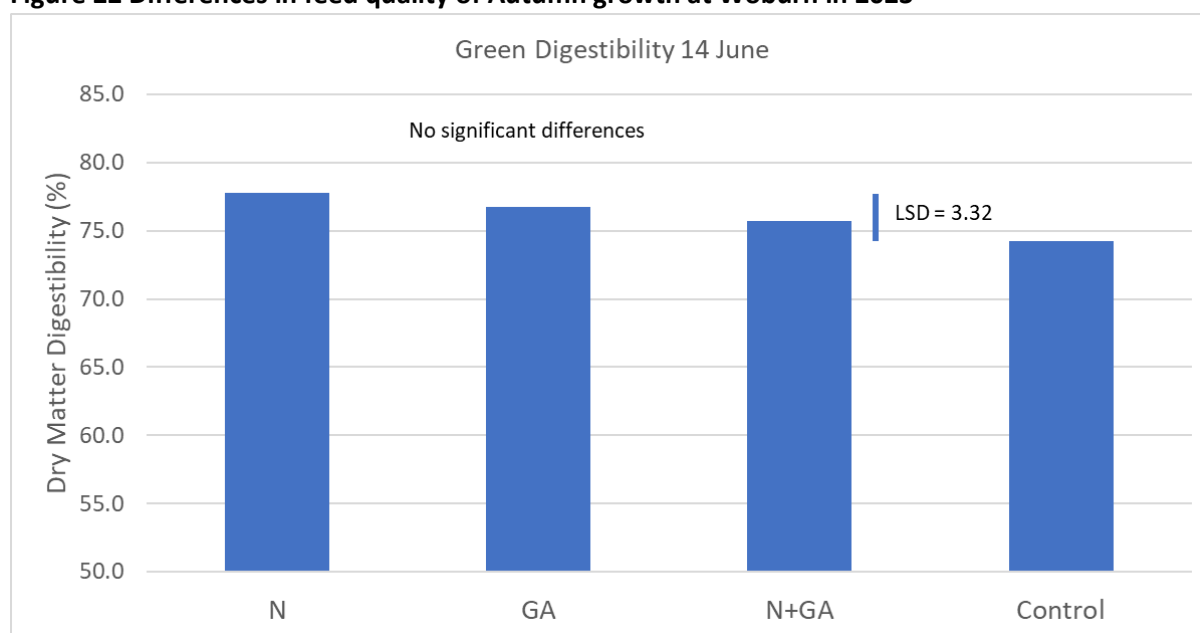
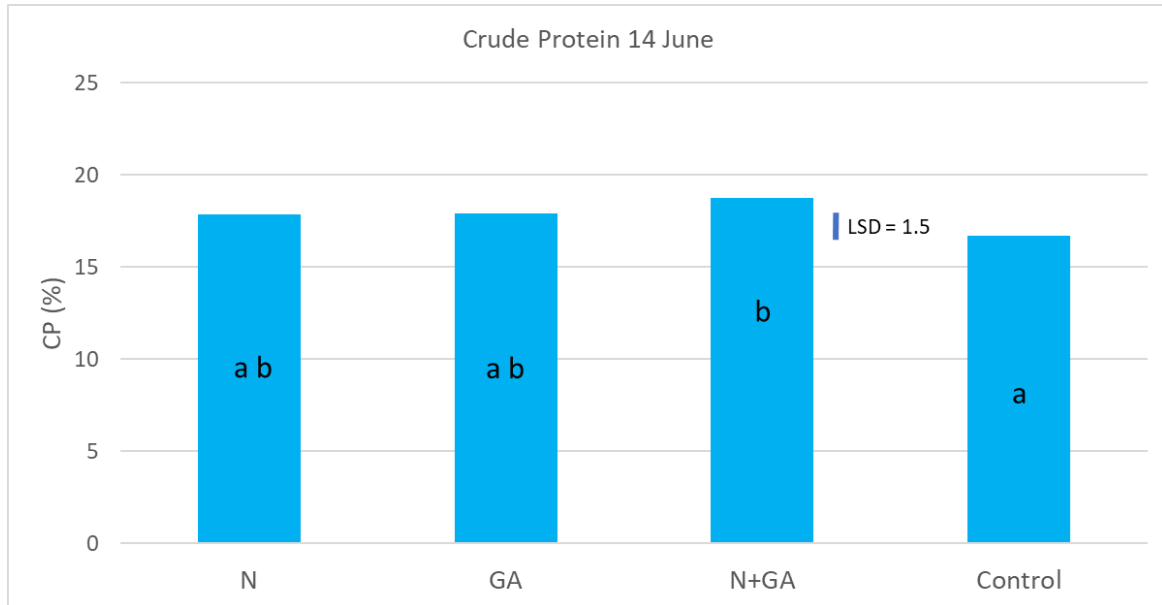
Figure 21 Autumn biomass accumulation at Woburn 14th of June 2023**Figure 22 Differences in feed quality of Autumn growth at Woburn in 2023**

Figure 23 Differences in crude protein from Autumn growth at Woburn in 2023

Plots were not grazed after the June assessment firstly because animals were not in the surrounding paddock at the time and secondly because the amount of green herbage was already at the ideal level for application of GA (1000kgDM/ha). The plots were kept closed and GA was applied on the 12th of July. The second herbage assessment was conducted about 6 weeks later on the 31st of August.

On the 31st of August there was more biomass accumulated on the GA treatments with the GA and GA+N treatments having significantly higher green herbage mass than the Nil or N plots with 500 – 700kg of extra green DM accumulated. Overall the digestibility of this extra green herbage was also significantly higher than the Nil. The combined effect gave an even larger lift in digestible dry matter due to GA treatments. This data was converted to total additional Metabolisable Energy (ME) Mj/kg DM.

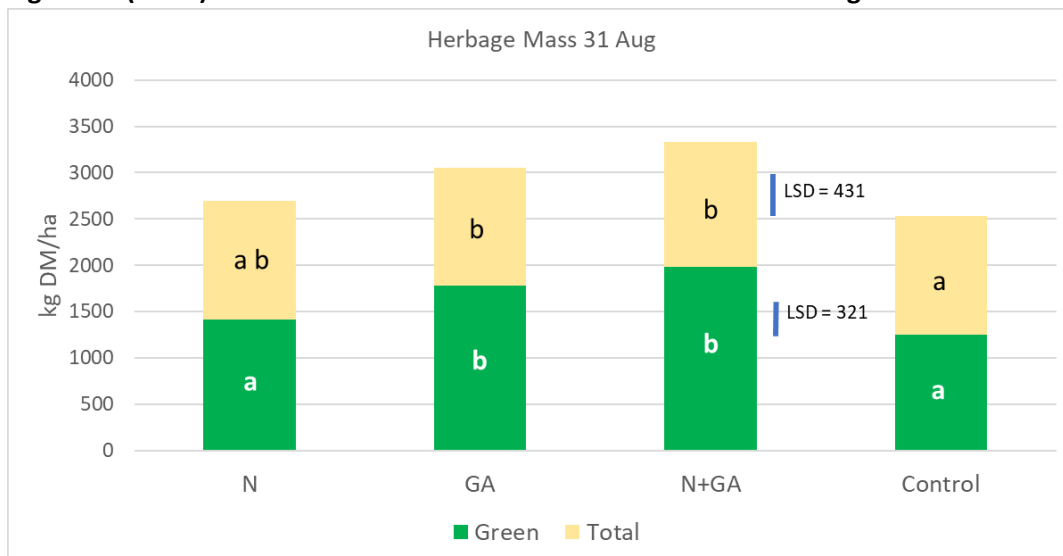
Figure 24 (a & b). Winter biomass accumulation at Woburn 31st of August 2023 – Herbage mass

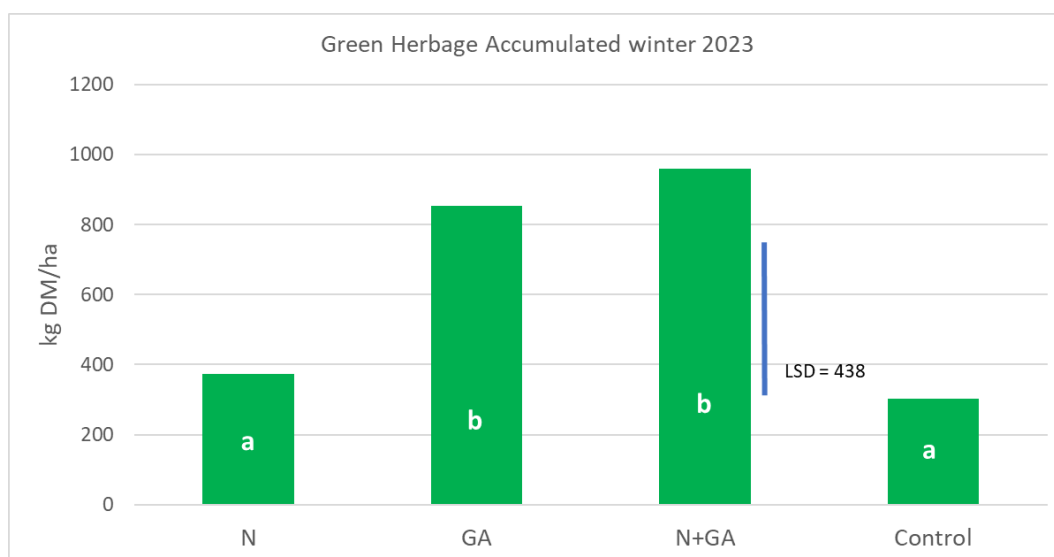
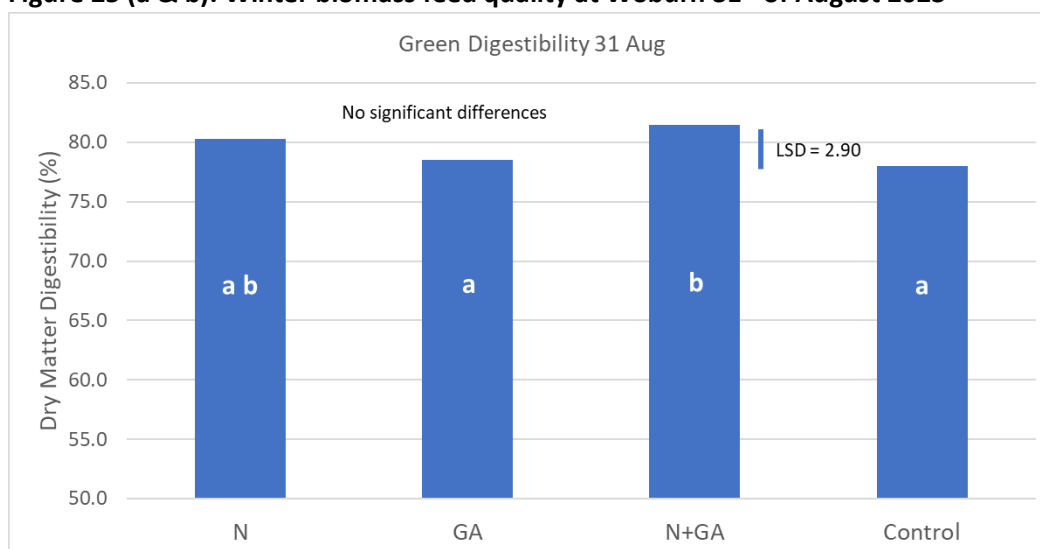
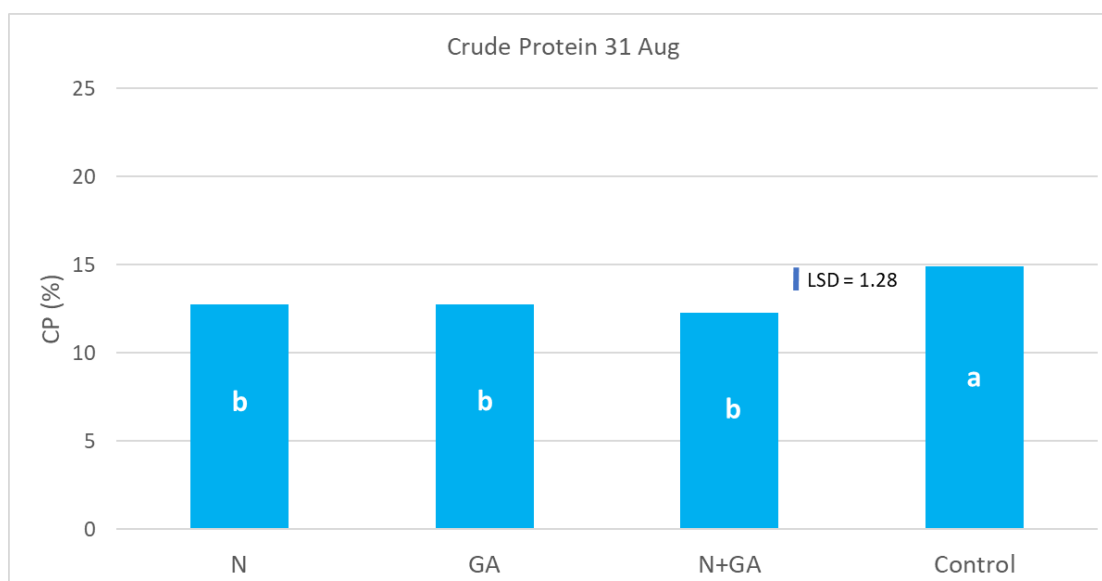
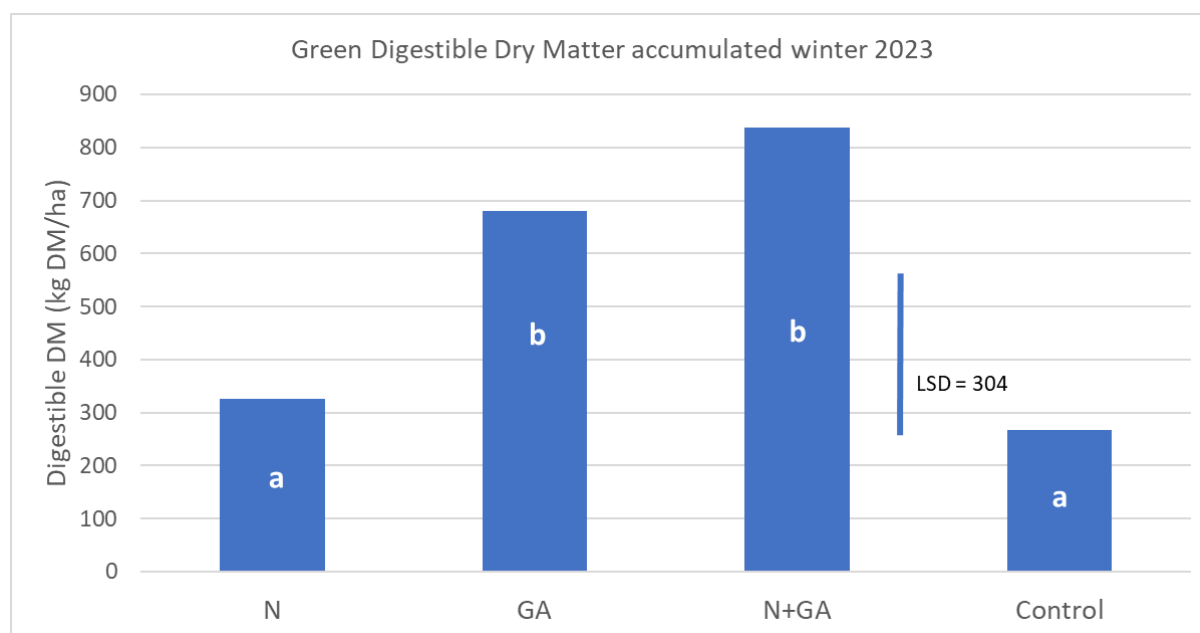
Figure 24 Winter 2023 biomass accumulation at Woburn – Green herbage**Figure 25 (a & b). Winter biomass feed quality at Woburn 31st of August 2023****Figure 4 Percentage of Crude Protein at Woburn 31st August 2023**

Figure 27 Impact on digestible dry matter accumulation

Spring measurements of the impact of treatments on growth were taken on the 1st of November after plots were grazed between the 1st and the 18th of September before again being closed.

There were no significant differences in either green or total herbage mass at the spring measurement, nor were there any significant differences in the digestibility of green herbage. There was however a small but significant difference in Crude Protein content with the N+GA treatment being slightly lower than the control. All other treatments were not significantly different to the control. In any case the Crude Protein levels on all treatments were adequate to balance digestibility levels and would not have compromised animal production.

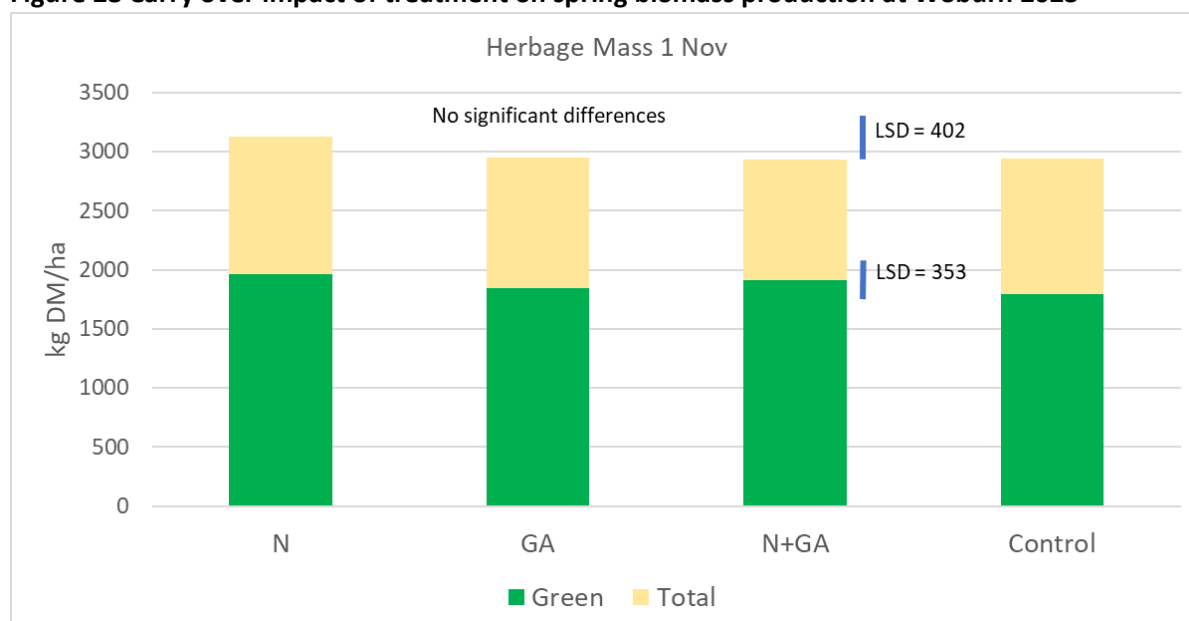
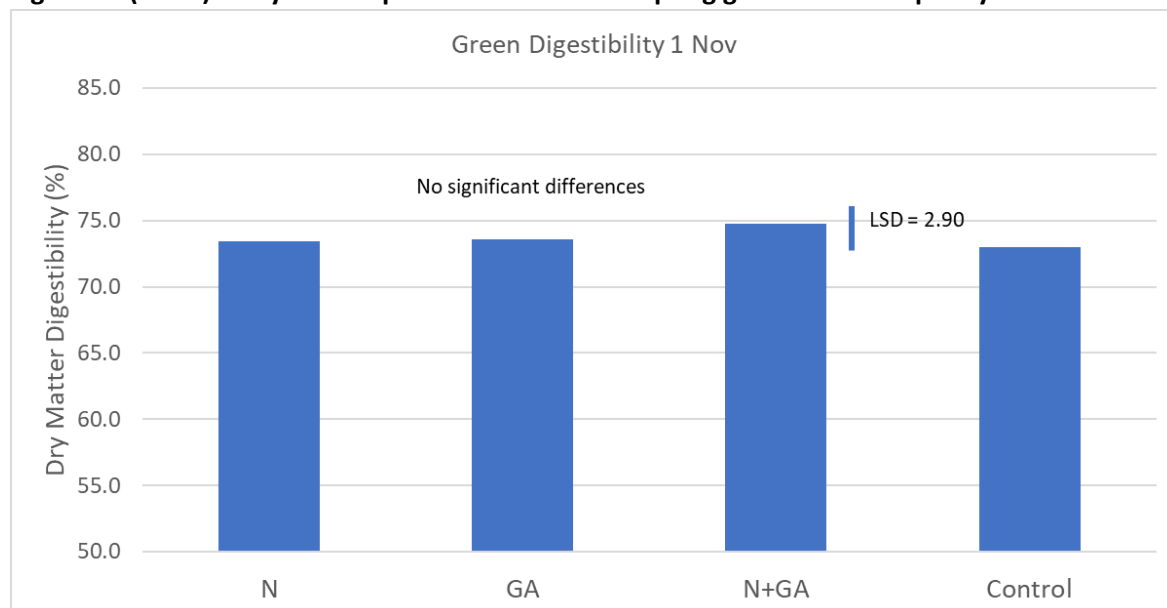
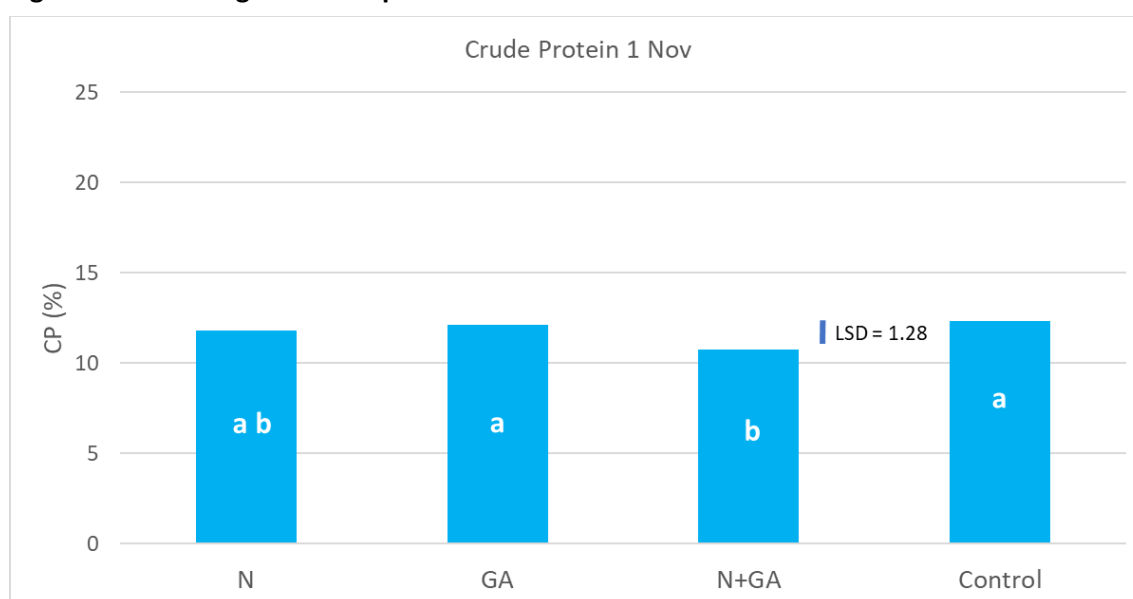
Figure 28 Carry over impact of treatment on spring biomass production at Woburn 2023

Figure 29 (a & b) Carry over impact of treatment on spring green biomass quality at Woburn 2023**Figure 30 Percentage of Crude protein at Woburn November 2023**

4.2Economic analysis

Economics

The cost of the treatments was calculated based on local prices as at December 2023.

N was applied as Easy N at 100L/ha. The local price for Easy N was \$1254/1000L this equates to an applied cost of **\$140/ha** including a \$15/ha application cost.

GA was applied as the proprietary ProGibb-SG (400g/kg) cost 62c/gram. Applied at 20g/ha including the \$15/ha application cost this treatment came in at just **\$27/ha**. The use of a generic liquid GA product could reduce this cost further to around \$22/ha.

The extra green herbage grown was valued at its ME replacement value by comparison with Feed Barley with an ME of 13MJ/kgDM and a cost of \$350/tonne. This is equivalent to \$0.03 per MJ of ME.

The extra ME accumulated over the winter period was calculated for the straight N and GA treatments compared with the control then valued at \$0.03 per MJ.

It is clear that notwithstanding the additional ME from the application of N was not statistically significant, besides this the cost of N application far outstripped the value of the extra ME by 4:1. By comparison there were real significant differences in production due to GA application in winter and the value of this extra production exceeded the cost of application by a factor of 7:1.

Figure 31 Extra ME accumulated and Benefit:Cost at Woburn due treatment over the winter period of 2023

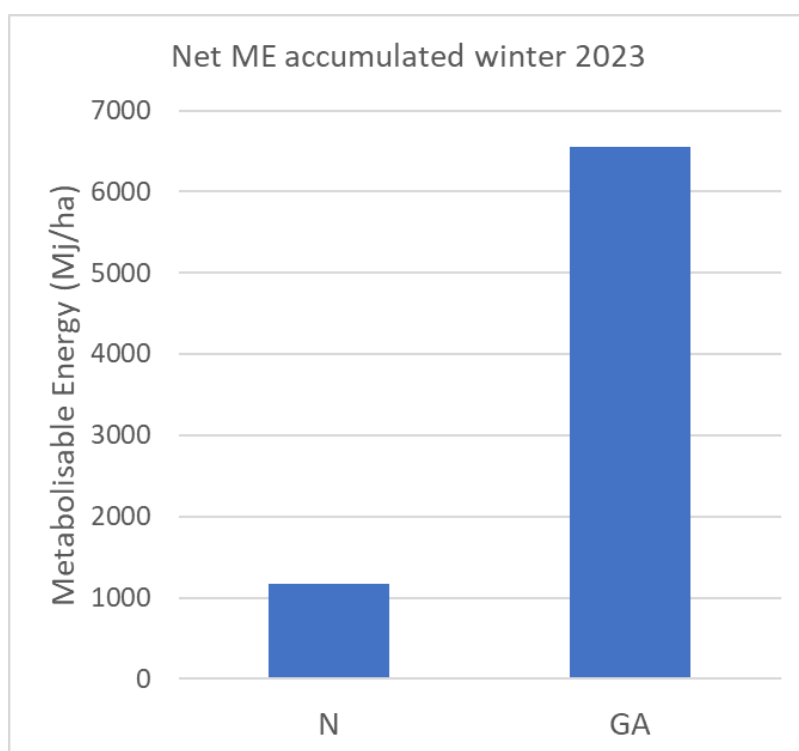
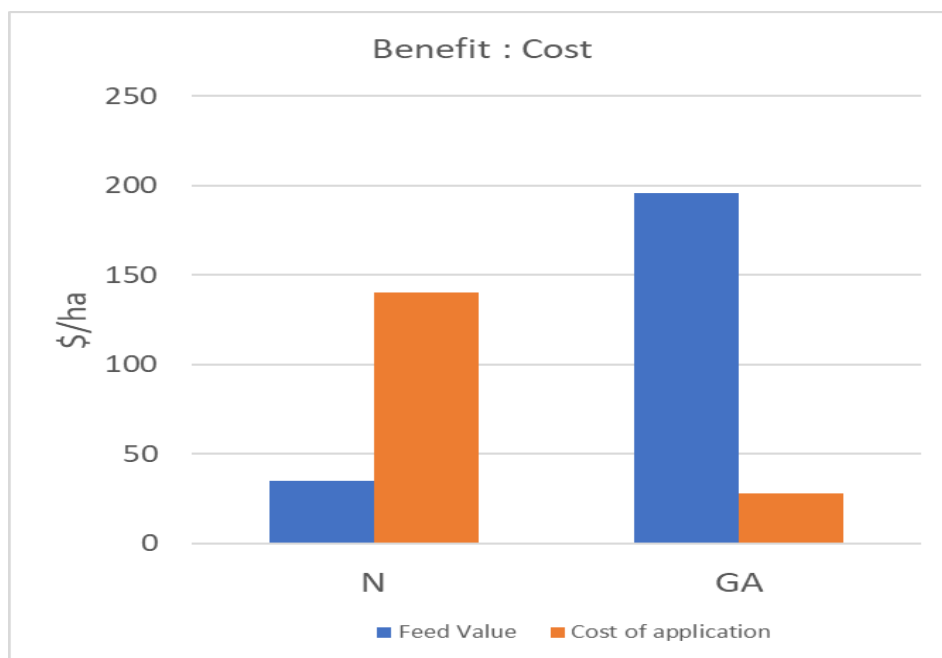


Figure 32 Benefit/Cost Woburn

Impact on Livestock

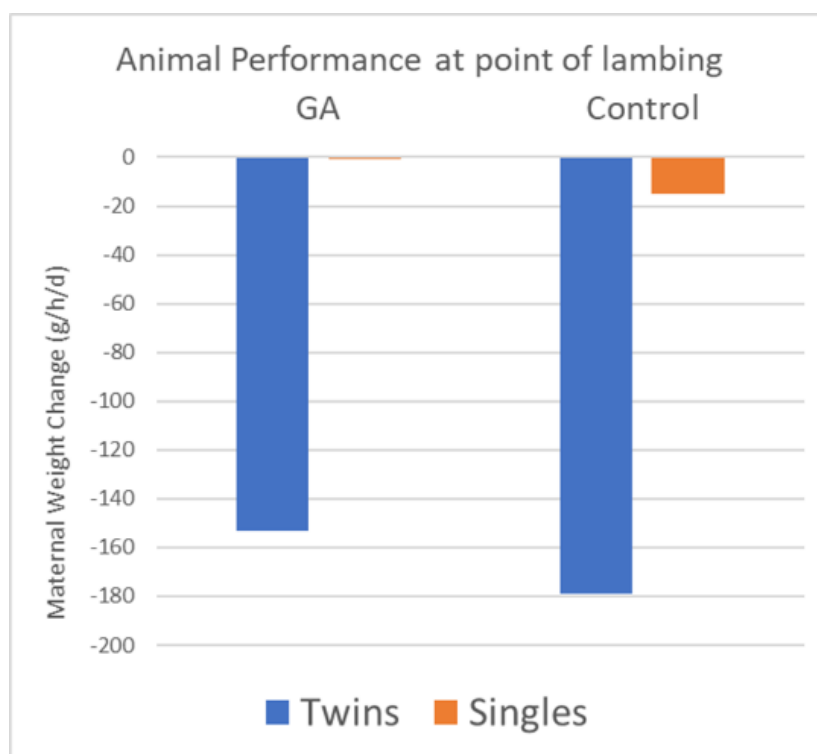
The impact of the application of GA on livestock performance was calculated using the GrazFeed decision support tool. The characteristics of the pasture available at the end of winter was entered into the model

- 1250kgDM/ha (control) vs 1770 kgDM/ha (GA)
- Both at 78% Digestibility
- Control 6cm tall GA 8cm Tall

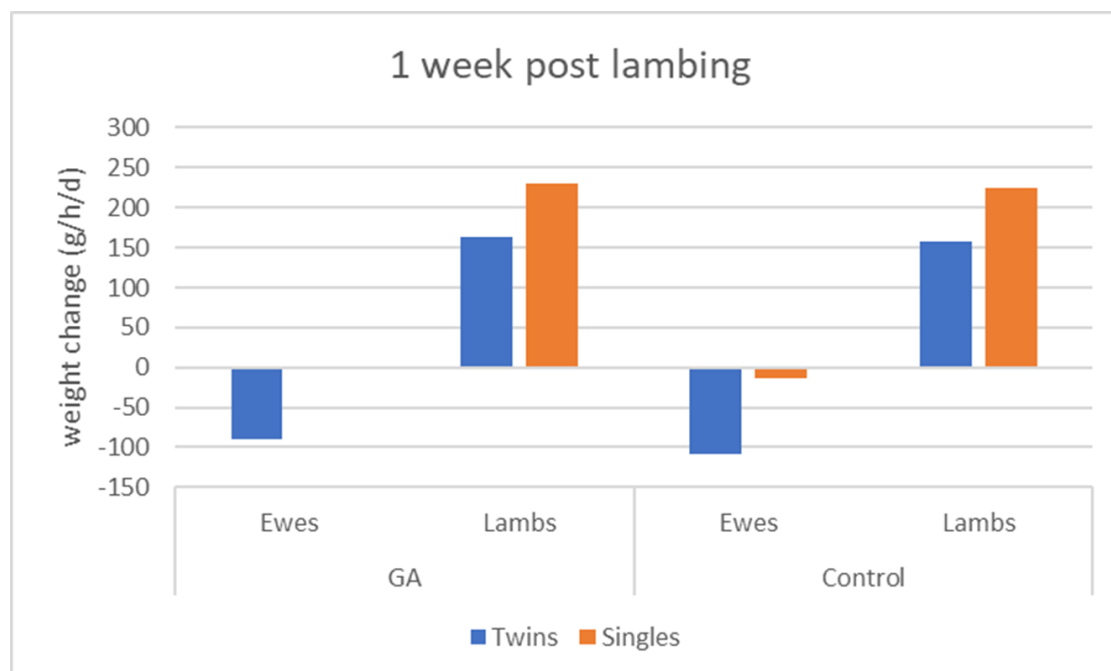
Merino ewes at various production stages were also characterised to determine the potential impact on their production.

- Merino Ewes (55kg SRW)
 - Pregnant at the point of lambing (Twins and Singles)
 - 1 week post lambing (Twins and Singles)
 - Peak Lactation (Twins and Singles)

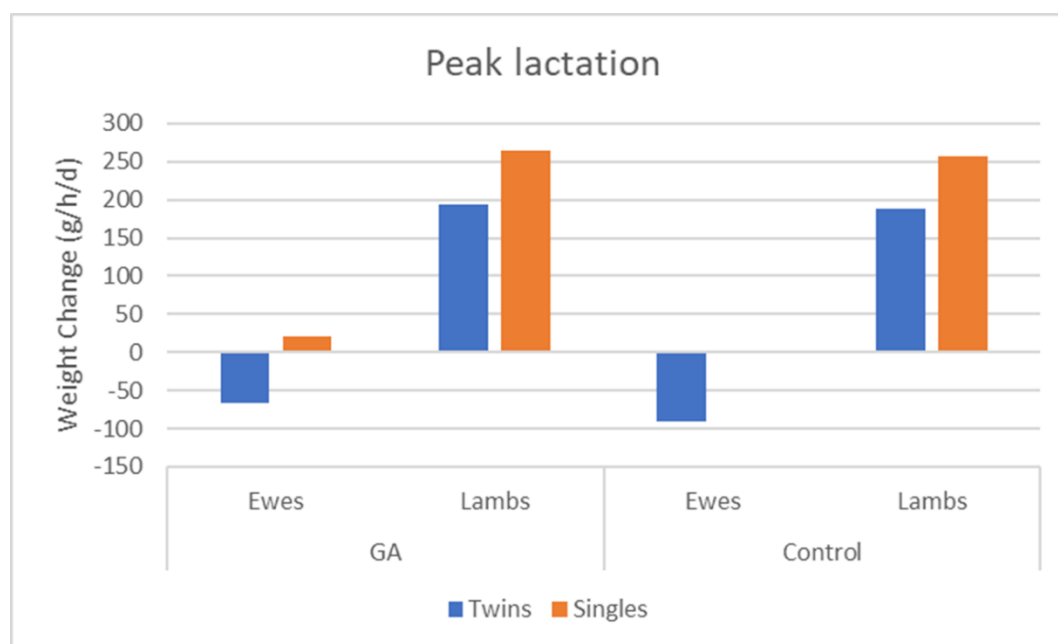
At the point of lambing the extra feed available due to GA application only made a small difference in performance with twin bearing ewes still losing significant amounts of maternal weight even on the GA treatment. For single bearing ewes both pastures were able to achieve close to maintenance.

Figure 33 Animal Performance at point of lambing

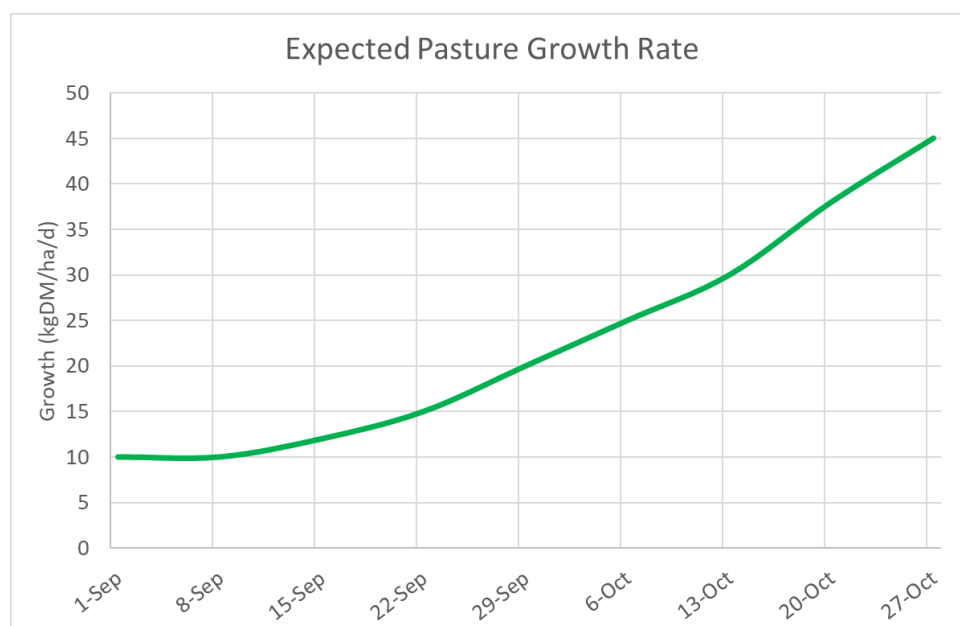
1 week postpartum, the differences were also very small between the GA and control treatments. This is largely due to the control treatment in the specific circumstances having reached very close to the optimal level of green herbage mass for lambing ewes. The difference was minimal in the offspring and largest in terms of maternal weight loss in the twin bearing ewes.

Figure 34 Animal performance 1 week post lambing

At the peak of lactation the same trends were apparent again because the ewes were largely able to reach their intake limits on the control pasture description.

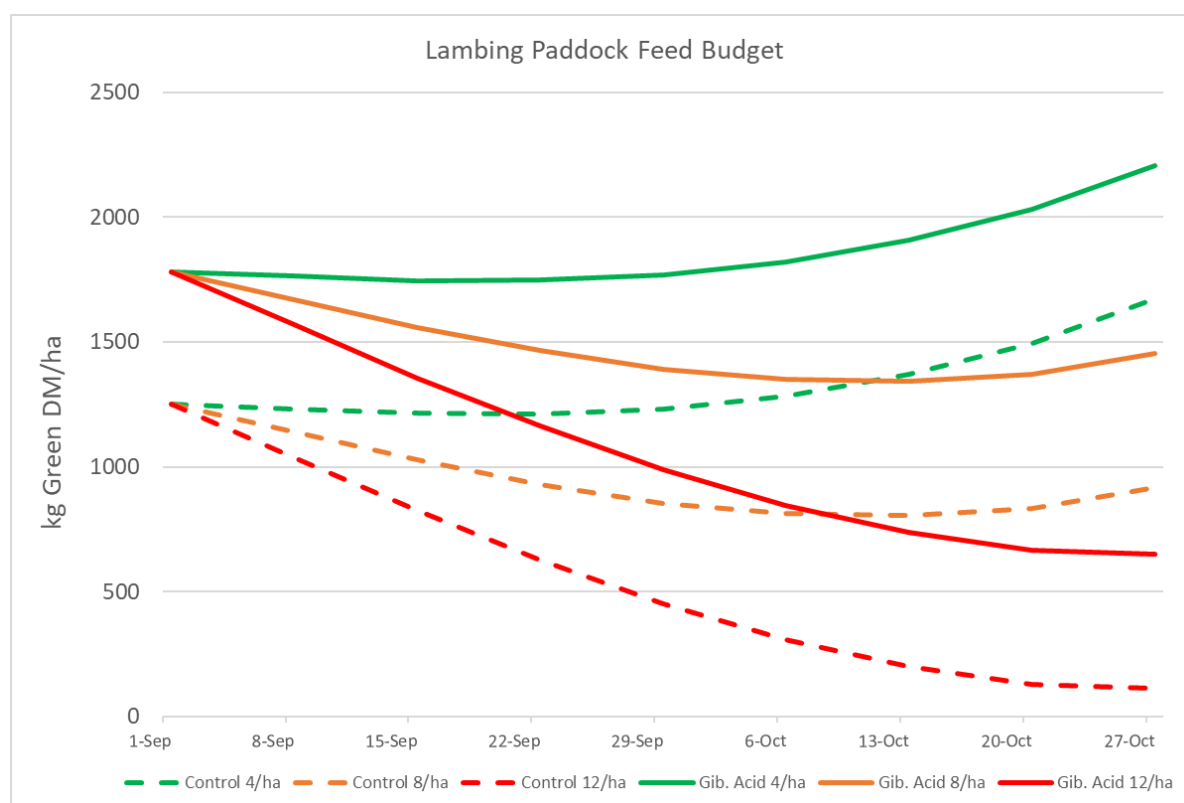
Figure 35 Animal Performance at peak of lactation**Impact on carrying capacity**

The GrazFeed results above are simply a snap shot of animal performance at a point in time given the availability and quality of herbage. In reality the extra accumulation of biomass on the GA treatment has greater value when considered in terms of a fodder budget and the stocking rate that can be grazed and still meet the optimal feed availability for the class of stock. To determine this impact, some feed budgets were prepared on the premise of the starting herbage mass described above in addition to an average expected spring pasture growth curve for the pasture type at Woburn. The likely pasture growth was extracted from the long term Bungarby improved pasture model used in the Farming Forecaster and is shown below.

Figure 36 Expected Pasture Growth Rate

Feed budgets were prepared on this basis by stocking with ewes at the point of lambing on the 1st of September and running a feed budget through to the end of October for systems stocked at 4, 8 and 12 ewes/ha. It can be seen that at 4 ewes/ha there is sufficient feed on the control pasture to sustain the ewes above the desired minimum of 1200kgDM/ha but that at 8 and 12 ewes/ha the available green herbage rapidly falls below these benchmarks. By comparison the GA treatment is predicted to remain above the critical pasture benchmarks even at 8 ewes/ha. Given that on the Monaro the herbage available at the end of winter is the main limiting factor for annual stocking rate this extra accumulated biomass from the use of GA could make a significant difference to the long term carrying capacity enabling higher numbers to be carried through winter and hence better utilisation of pasture grown during the main growing season over the Spring thru Autumn period.

Figure 37 Lambing paddock feed budget



4.3 Extension and communication

Throughout the duration of this PDS project, educational and information activities were delivered at an on-farm event, via email communication and through a Q & A presentation. Members and non-members were provided with an opportunity to interact and ask questions, discuss results and seek clarification where necessary on the data provided.

Updates and data were provided to members through face-to-face attendance at three (3) field days with a total attendance of 223 individuals. Each report was also emailed to a distribution list of 241 inclusive of MFS members, the broader community, sponsors and industry representatives. The final report being delivered to the MFS Summer Field Day held at one of the site host property, "Woburn" Bungarby.

Three case studies were written up for the three sites.

Table 2 Communication and extension activities completed and impact/reach

Activity	Target Audience	Key messages and must-have elements	IMPACT/REACH
On-going communication with site hosts and project team	Steering committee	Progress and seasonal updates, on-going planning discussions	Regular contact was maintained with Contractors, consultant, site hosts through Zoom meetings, emails and calls.
Two (2) field days in Monaro region	MFS members and Monaro grazing Industry	Presentation of results and feedback from hosts	Three (3) Field Days were held: Year 1 – 22 March 2022 at ‘Woburn’ Bungarby with 49 in attendance. Year 2 – held 15 March 2023 at ‘Hazeldean’ Cooma with 107 in attendance. Year 3 (additional year) – Final – held 6th December 2023 at ‘Woburn’ Bungarby with 67 in attendance.
3 media opportunities / 2 print articles in local papers and 1 radio interview (SE ABC)	MFS producers & graziers in the broader Monaro region	Raising awareness and communicating results and findings	Although media were present at the three (3) field days, no specific article was published.

2 Newsletter publications and 3 case studies/video testimonials	MFS producers & Livestock producers in the broader Monaro region Red meat levy payers	Raising awareness and communicating results and findings	Three (3) case studies have been produced. One (1) newsletter was distributed to a database of 241 – Spring 2022. Two (2) MFS Annual Reports have been produced for the years 2022 and 2023. Each report included an update on the PDS. 75 hard copies were provided at each event and the document emailed to a database of 241 and is also held on the MFS website.
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Social Media – Facebook and Instagram	MFS producers & graziers in the broader Monaro region	Regular face book posts will be uploaded to the MFS face book page with brief data updates and observations as well as information about upcoming field days.	MFS advertised on Facebook and Instagram for each event where a report was provided – March 2022, March 2023 and Summer 2023. MFS Facebook account has 1018 followers, Facebook posts occurred on the following dates, with post reach and engagement: 4 March 2022 Post reach 20 Engagement 4 2 November 2023 Post reach 674 Engagement 46 24 November 2023 Post reach 571 Engagement 32 6 December 2023 Post reach 1064 Engagement 481 Instagram has 121 followers.
Website mentions and dedicated page on MFS website	MFS producers & graziers in the broader Monaro region	A specific page will be created on the MFS website to detail this project and provide a platform for results, information exchange and all outputs from the project.	MFS has a dedicated page on the MFS website - https://www.monarofarmingsystems.com.au/winter-feed-gap-trial/

Producer guides/fact sheets	MFS producers & graziers in the broader Monaro region. All members of the public who visit the Monaro Farming Systems website.	A producer guide/factsheet will be developed out of the results summaries and presentations and be available for publication.	Copies of the Final Reports for Years 1, 2 and 3 will be housed on the MFS website with a potential reach of upwards of 500 people.
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4.4 Monitoring and evaluation

Monitoring and evaluation was undertaken throughout the project cycle in alignment with the project MER. The project data and findings were stored in the MFS One Drive account. Due to unprecedented weather conditions, the project was extended for a further 12-month period on one site only. This enabled a clearer and more defined outcome of the project, details of which were provided at an on-farm event held on the 6th of December 2023.

All field measurements and data analysis were completed in line with the project objectives and undertaken by well-respected local consultant, Doug Alcock, GrazProphet. All findings and results are stored securely on the MFS SharePoint and one drive.

A total of 25 pre-project surveys were completed, and 12 post-project surveys returned.

Core pre-project survey results have shown that approximately 66% of the core group use pasture stimulants to improve DMP during winter. Nitrogen and GA are used with the biggest impediment being rain and time (for those who use them) and cost (for those who don't).

Observer pre-project survey results have shown that approximately 50% of observers use pasture stimulants to improve DMP during winter (mainly N and GA). Skills, knowledge and confidence rating among observers is average (5/10). The biggest impediment is unreliable rainfall. Post-project survey results show that participants were generally satisfied with the involvement in the PDS with the average being 7/10.

The survey data indicated a general increase in knowledge, skills and confidence across both observer and core participants. Table 3 below shows the breakdown of data.

Table 3 Producer knowledge, skills and confidence results

Number of surveys collected			Knowledge & Skills (average)		Confidence (average)	
	PRE	POST	PRE	POST	PRE	POST
CORE	3	2	47%	65%	57%	60%
OBSERVER	22	10	50%	66%	50%	68%

Summary

There has been an overall increase in knowledge and skills across all participants of 26%.

There has been an overall increase in confidence across all participants of 10.5%.

5. Conclusion

5.1 Key Findings

Overall, the project provided substantial learning opportunity for the region with a positive impact for building capacity and knowledge.

For the perennial grass pasture tested, the following was identified:

- a. N gave a poor response due to a dry Autumn and potential for legume derived N
- b. Response to GA was in the order of an extra 500kg DM/ha which is in line with claims.

The use of GA was viable in 2023 (Year 3) given its relatively cheap cost compared with N.

5.2 Benefits to industry

Benefits to industry

Low winter pasture growth rates are the major factor limiting the long term carrying capacity of farm systems on the Monaro. This PDS has clearly demonstrated that for typical phalaris/cockfoot pastures the application of GA can make a significant difference in pasture growth over the late winter and this in turn could be translated in higher overall carrying capacity and farm profits. Given the rising costs of fertiliser, GA application is a relatively cheap strategy compared with the application of N with a more reliable increment of production at this critical time of year. The initial unreplicated demonstrations do however cast some doubt as to the impact of GA on ryegrass pastures although without replication this is difficult to say with certainty. Similarly the Yr 1 demonstration would suggest that GA may have a useful impact on fodder Oat crops.

The ability to conduct a replicated trial after two years of equivocal demonstration results gives the Monaro region suitable data upon which to promote the economic use of GA on improved perennial pastures. It is not envisaged that there would be any further work required on GA in our region although it should be noted that if such work was undertaken or any other work where small pasture growth differences are expected it would be advantageous to consider replicated trials from the outset to avoid wasted time and resources.

6. Appendix

6.1 Communication plans

Original Communications Plan: Producer Demonstration Sites

Project name: 2019 MFS PDS. Fodder Systems and Feed Gaps

Date: 2 March 2020

Project overview

MLA Program Manager	Alana McEwan Brown (Russell Pattinson – PDS national coordinator)
MLA \$	\$36,783
In kind investment \$	\$109,970
Project objectives	By March 2022, in the Monaro region of the Southern Tablelands MFS will; Validate and assess the potential to increase DMP by applying granular Nitrogen (N) and Gibberellic Acid (GA) to the following fodder systems; Perennial Pasture (phalaris) Ryegrass Cereal Crop Quantify the following targets; Production / biomass A 30% increase in biomass versus the control Livestock performance (modelled by Grazfeed) a 10-15 % increase in liveweight for sheep and cattle versus the control Conduct a series of cost benefit analysis to determine the relative economic value of applying these inputs to boost DMP over winter months to address the winter feed gap and improve the GM performance of growing and breeding stock enterprises. Implement a variety of educational activities to increase the knowledge skills and confidence of 3 core and 200 observer producers in the best options to address the winter feed gap in terms of economic value and boosting pasture and animal performance. 25% per cent of observer producers will have adopted strategies (N + Gibb Acid) to increase the utilisation of pasture growth over the winter period. Conduct two annual field days to showcase the demonstration site results and encourage adoption of key practices by 110 attending producers.
What are the 'outcomes' for producers?	1. Publication of the trial results identifying the most optimal "pasture promotant" to address the winter feed gap for meat

	enterprises on the Monaro in terms of businesses profitability. 2. Extension of these results throughout the Southern Tablelands grazing community via ABC Radio, Print media outlets (three local papers), MFS Website, email, through partner and stakeholder networks. 3. Delivery of a Field Day in Dec 2020 and Dec 2021 to showcase results and document feedback from farmers. 4. Via the above, increase the percentage of producers integrating some form of pasture inputs (GA / N) over winter into their meat enterprise systems from 5% to 25% within the next 5 years. 5. Provide 75 farm businesses with the skills and knowledge to manipulate pasture promotants to increase the profitability of their meat enterprise systems.
Measure of success of communication plan and / or activities(KPIs and how measured)	• Regular planning and update meetings with project steering committee (MFS project manager, site hosts and project consultant Doug Alcock) • The three (3) demonstration sites [on three host properties] will provide the basis for extension activities including case-studies and producer publications. • To promote the outcomes to the wider producer community (within and outside of MFS); ➤ One (1) radio interviews with SE NSW ABC rural reporter ➤ Two (2) media releases to local print outlets (Bombala Times and Monaro Post) ➤ Project page created and maintained on the MFS website and regular updates via MFS face book page ➤ Public access to results via the MFS website and links to the case study and final evaluation reports will be made available to partner and sponsor websites such as South East LLS, NSW DPI, Sydney University, CSIRO, Meridian Ag, Boyce Chartered Accountants, Tablelands Farming Systems, Holbrook Landcare Network, Cooma Rural, Elders Cooma, Landmark Bombala, LambPro, Zoetis and agribusiness sponsors such as Rabobank and NAB.

	- A producer guide/factsheet will be developed out of the results summaries and presentations and be available for publication. - Articles will also be supplied to local Landcare groups (Upper Snowy Landcare, Snowy River Interstate Landcare) and an article prepared for MLA Feedback magazine. - Three (3) case studies / video testimonials will be recorded for each trial site property and uploaded to the MFS website.
Primary audience (include regions/species)	MFS Members (Bombala, Delegate, Cooma, Nimmitabel, Berridale, Dalgety)
Secondary audience (include regions/species)	Monaro grazing Industry. All graziers in the Snowy Monaro Shire.

Communications Plan / Activities

Activity	Responsibility	Target Audience	Key messages and must-have elements	Timing	Estimated reach
On-going communication with site hosts and project team	MFS Project Manager (Zoe)	Steering committee	Progress and seasonal updates, on-going planning discussions	August 2019 August 2020 August 2021	3 individuals
Two (2) field days in Monaro region	MFS Project Manager (Zoe)	MFS members and Monaro grazing Industry	Presentation of results and feedback from hosts	Dec 2020 Dec 2021	90 producers
3 media opportunities / 2 print articles in local papers and 1 radio interview (SE ABC)	MFS Project Manager (Zoe)	MFS producers & graziers in the broader Monaro region	Raising awareness and communicating results and findings	Dec 2020 Dec 2021	Entire Monaro Community

2 Newsletter publications and 3 case studies/video testimonials	MFS Project Manager (Zoe)	MFS producers & Livestock producers in the broader Monaro region Red meat levy payers	Raising awareness and communicating results and findings	April 2020 Dec 2020 April 2021 Dec 2021	MFS members (70+ farm businesses) & Entire Monaro Community
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6.2 Monitoring and evaluation plan

MER Plan: Producer Demonstration Sites

Project name 2019.MFS.PDS. Fodder Systems and Feed Gaps

Date: 2 March 2020

Evaluation level ^[1]	Project Performance Measures (Please fill in and delete example)	Evaluation Methods (Please fill in and delete example)
Inputs – What did we do? <i>Describe the planned and expected inputs involved in your project, including funds, resources, development & projects structures</i>	• Trial site hosts selected and appointed • Initial steering committee meeting followed by regular progress meetings with project team (1 per year). • 3 core producers managing approximately 55,000 sheep, 4,500 cattle and covering 26,500ha. • 6 demonstration sites: 3 core producers with 2 on-farm trial sites each. • 70+ farm business observers managing approximately 375,500 sheep, 25,000 cattle and covering 123,988ha. • \$37,783 total funding from MLA to be used for professional technical expertise, data collection, project management, travel, field days and case study publications. • \$17,590 in-kind, per site host, per year contributed for pasture preparation, sowing, seed, fertiliser, stock management and fodder costs (total \$52,770 over two years) • \$57,200 in-kind contributed by MFS members to attend field days and provide survey results.	• Records and documentation of all project activities including individual notes / files for all six demonstration sites • Documentation of all meeting notes • Financial records
Outputs - What did we do? <i>Describe the outputs planned/expected from your project, including engagement activities & products from demonstration sites</i>	Collection of data from six demonstration sites Metrics being measured include: (a) Dry Matter Production (kg DM/ha/year) Key Performance Indicators:	• All data recorded from trial sites (including milestone reports) in central data base • Media activities recorded in project file and reported in milestone reports • Information documentation and compilation on-going throughout project

^[1] Note: The headings in column 1 are also listed in the PDS Final Report template.

	(a) income (\$/DSE) and income/HA (b) enterprise expenses (\$/DSE) and per HA (c) gross margin (\$/DSE) and per HA (d) net profit (\$/DSE) Practices being demonstrated include: • Soil sampling, pasture composition assessments and ground cover % pre and post application • Biomass measurements (using median quadrant sampling technique across a transect) Communications: • Two (2) field days targeting 45 producers. • One (1) radio interview with SE NSW ABC rural reporter • Two (2) media releases to local print outlets (Bombala Times and Monaro Post) • Three (3) case studies / testimonials published • Project page created and maintained on the MFS website and regular updates via MFS Facebook page • Two (2) newsletter articles • A producer guide / fact sheet will be developed out of the results • Result summaries will be promoted through partner and sponsor networks	
Changes in knowledge, attitudes and skills - How well did we do it? <i>Describe the changes in KASA that you are planning to achieve.</i>	• The actual increase in DMP is quantified to the entire MFS membership (70+ farm businesses). • The actual economic benefits (increase in nett profit) from the increase in livestock performance compared to a baseline of no foliar pasture application is quantified to the entire MFS membership (70+ farm businesses). • 100% of core producers and 25% of observer producers have additional confidence and capacity to increase DMP by applying granular Nitrogen (N) and Gibberelic Acid (GA) to their fodder systems.	• Narratives / testimonials and case studies from the three trial site hosts involved in the PDS (using MLA proforma / template) • Pre-project surveys (capture baseline) and post project surveys with trial site hosts and wider membership base to assess changes in knowledge, skills and attitude • Post event feedback surveys and skills audit following field days with questions targeted to assess changes in knowledge, skills and attitude

	110 farm businesses outside of the producer group provided with the skills and knowledge to adopt some level of supplementation into their farm management when finishing lambs.	
Practice changes – Has it changed what people do? <i>Describe the practice changes that you are expecting to achieve by the end of your project</i>	3 core participating producers will successfully demonstrate that foliar pasture applications such as N and Gibb Acid significantly increase DMP on pastures on the Monaro over the winter period to optimise stock production and performance relative to untreated winter pastures 25% of observer producers will have adopted strategies (N + Gibb Acid) to increase the utilisation of pasture growth over the winter period - Provide 75 farm businesses with the skills and knowledge to manipulate pasture promotants/stimulants to increase the profitability of their meat enterprise systems.	- Benchmarking / baseline surveys (as above) but questions targeted to capturing information about practice change and impact versus attitude and awareness change - Longer term surveys conducted by MLA (secondary impact information)
Benefits – Is anyone better off? <i>Describe the benefits that you are expecting to achieve as a result of the project</i>	Previous modelling work and MFS PDS trials, exploring both steer and lamb finishing systems on the Monaro has produced the following results; Lamb finishing - Average net profit (\$/ha/yr) Lucerne – \$319/ha and \$425/ha Pasture – \$1492/ha and \$519/ha and \$305/ha Forage brassica - \$347/ha and \$706/ha and \$324/ha Herb mix (plantain, chickory, clover) - \$1239/ha Baseline system of selling as stores (modelled) - \$161/ha (29kg lamb) Steer Finishing – Total enterprise GM (\$/ha/yr) (Modelled results) - Baseline weaner system - \$166/ha - Pasture - \$199/ ha - Oats - \$262/ ha - Average increase in farm gross margin of 20% on pasture - Running these steers on an oats crop over winter at 2.5 steers/ha	- Data (enterprise profitability measured in terms of whole farm gross margin (\$/ha)) will be recorded for the six (6) PDS demonstration sites - Profitability and production gains for the six systems will be quantified against the current baseline system as currently documented in a previous lamb PDS. - Comparative analysis / benchmarking data collated and documented at enterprise level - Longer term surveys conducted by MLA (secondary impact information)

	increased farm profit by an additional 38 percentage points due to a 32 kg/ head increase in sale weight and a decrease in the area needed to run the steers An increase in DMP would also have the following advantages; • allow greater stocking rate to be run over winter thereby increasing enterprise production capacity over the spring and summer period (winter carrying capacities are a major profit driver for the whole grazing system for the Monaro) • optimize the condition of breeding stock therefore increasing chances of successful lambing or calving in spring. • decrease the requirement for supplementary feeding over winter and early spring • improving feed base utilisation of winter feed thereby allowing a higher number of stock to be carried over winter and lifting whole-farm carrying capacity	
General observations / outcomes – Is the industry better off?	• The challenge of increasing DMP and utilizing winter feed to maintain and finish stock during the harsh winters on the Monaro is relevant to the entire (100%) grazing community (605 graziers) • If adopted by the target audience, it has the potential to deliver industry benefits of nett profits per ha of between \$194 and \$667 above the baseline system of selling stores • Capture of key lessons (expected and unexpected) from the PDS that can be shared across the network	• Surveys with key stakeholders involved in the project ie. professional experts (Doug Alcock / Grazprophet) following completion and longer term • Dissemination of comparative analysis results to the relevant wider grazing industry • Longer term surveys conducted by MLA (secondary impact information) • Feedback from steering committee

Final MER Update

MER Plan: Producer Demonstration Sites

Project name 2019.MFS.PDS. Fodder Systems and Feed Gaps

Date: 7th January 2024

Evaluation level ^[1]	Project Performance Measures	Evaluation Methods	Updated as at 7 th January 2024
Inputs – What did we do?	• Trial site hosts selected and appointed • Initial steering committee meeting followed by regular progress meetings with project team (1 per year). • 3 core producers managing approximately 55,000 sheep, 4,500 cattle and covering 26,500ha. • 6 demonstration sites: 3 core producers with 2 on-farm trial sites each. • 70+ farm business observers managing approximately 375,500 sheep, 25,000 cattle and covering 123,988ha. • \$37,783 total funding from MLA to be used for professional technical expertise, data collection, project management, travel, field days and case study publications. • \$17,590 in-kind, per site host, per year contributed for pasture preparation,	• Records and documentation of all project activities including individual notes / files for all six demonstration sites • Documentation of all meeting notes • Financial records	Year One (resumed) 2021 • Trial site hosts changed slightly due to seasonal conditions (Platts/Dungaree-Oats still going ahead, Keighley/Worburn-Phalaris still going ahead, Cay/Pineleigh has been replaced with Litchfield/Coroo-Ryegrass) • Phone and email conversations have been held with all site hosts to discuss progress and coordinate project (Josh Barron and Doug Alcock) • Files have been set up for all six sites with raw data documented to date. • Results of Year 1 presented at Autumn Field Day (Delegate Station) on 23 March 2022. Year Two (commenced) March 2022 • Trial site hosts for Year 2 established and commenced in March 2022. Project Team met with Hosts to set Protocols and define

^[1] Note: The headings in column 1 are also listed in the PDS Final Report template.

	sowing, seed, fertiliser, stock management and fodder costs (total \$52,770 over two years) • \$57,200 in-kind contributed by MFS members to attend field days and provide survey results.		responsibilities and parameters of trial. • All trial sites pre tests recorded and attached. • All data, application methods and engagement with hosts is documented and stored securely. • Project team met on the 28th November 2022 to discuss the ongoing viability of the trial, and whether extending one site into 2023 would provide clear findings. • Project team met again on the 15th December 2022 to re-establish guidelines and define responsibilities for continuing the trial on one site in 2023. • Doug Alcock and Josh Barron working closely with Hosts to ensure project remains on track and within the parameters of the trial. Year 3 – Single Host Only – Woburn • Trial site continued for 2023 on one site only, 'Woburn' Bungarby. • Project team met with hosts to set protocols and responsibilities. • Site pegged and refenced. • Project team working closely with consultants to ensure project is on track and within scope of the agreement. • Results of Year 3 were presented at the MFS Field Day held on 6th December 2023 at "Woburn" Bungarby, host site of trial, with 63 participants in attendance.
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Outputs - What did we do? <i>Describe the outputs planned/expected from your project, including engagement activities & products from demonstration sites</i>	Collection of data from six demonstration sites Metrics being measured include: (a) Dry Matter Production (kg DM/ha/year) Key Performance Indicators: (a) income (\$/DSE) and income/HA (b) enterprise expenses (\$/DSE) and per HA (c) gross margin (\$/DSE) and per HA (d) net profit (\$/DSE) Practices being demonstrated include: • Soil sampling, pasture composition assessments and ground cover % pre and post application • Biomass measurements (using median quadrant sampling technique across a transect)	• All data recorded from trial sites (including milestone reports) in central data base • Media activities recorded in project file and reported in milestone reports • Information documentation and compilation on-going throughout project	Year 1 Outputs • Sites have been pegged, mapped and fenced. • Pasture/crops are established and inputs have been recorded. • Soil samples have been taken and sent for analysis • Nitrogen (easy N) applied with specifically constructed 2metre hand boom 28 June 2021 to all sites • Giberallic Acid (progibb) applied with specifically constructed 2metre hand boom after crash grazing/cutting on 9 July to all sites • Biomass measurements have been completed by Doug Alcock Year 2 Outputs • Three Sites have been pegged, mapped and fenced. • Pasture/crops are established and inputs have been recorded. • Soil samples have been taken and sent for analysis • Pesticide application record attached. Application date 19 May 2022. • 1st Biomass measurements have been completed by Doug Alcock on 28 & 29 June 2022.
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	Communications: • Two (2) field days targeting 45 producers. • One (1) radio interview with SE NSW ABC rural reporter • Two (2) media releases to local print outlets (Bombala Times and Monaro Post) • Three (3) case studies / testimonials published • Project page created and maintained on the MFS website and regular updates via MFS Facebook page		• 2nd Biomass completed by Doug Alcock on 31st of August at Maffra and Woburn and the 14th of September for Kydra. • Spring assessments of Kydra and Woburn were conducted on the 2nd and 4th of November 2022. • Soil samples were sent for analysis on 20 September 2022. Year 3 Outputs (Winter 2023) • 21 April 2023 - Trial site was pegged, treatments were applied and area was fenced off. • N applications went out at 100L/ha of EasyN using Streamjet nozzles. • 4 reps randomized but not stacked to better utilize the space and make it easier for grower to fence. Rep 1 and 2 and beside rep 3 and 4 as per the site layout above. • First biomass cuts and feed samples were taken on the plots on the 14th June 2023. • The second application was applied on 12th July 2023, GA on two of the four
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	• Two (2) newsletter articles • A producer guide / fact sheet will be developed out of the results • Result summaries will be promoted through partner and sponsor networks		sites. Soil samples for nitrogen were also taken as a result of additional funding from LLS. • Second cuts will be six weeks from the 12th July 2023, approximately 1st September 2023. • Matter has been dried and is yet to be calculated and reported. • Period 3 cuts - From end of Winter (31 August 2023) to 1st November 2023. • Grazed during the period 31 August to 18th September 2023. • Field Day held on 6th December 2023 at Woburn Bungarby with 63 attendees, where Year 3 results and data was presented. • Presentation was distributed to 241 recipients on 11 December 2023 and will be uploaded to MFS website in mid January 2024. Communications • Autumn Field Day held 23 March 2022 showcasing Final results of Year 1. • Copy of presentation held on 23 March 2022 by Grazprophet emailed to MFS Members, Industry Representatives and
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			Sponsors and housed on website. • Spring Field Day being held in conjunction with AGM on 14 September 2022. 53 people in attendance. • Some activities have commenced in line with Autumn Field Day presentation of data. • Website currently being redeveloped with training needed for MFS staff on back end. • Spring Field Day was held on 14 September 2022, with a summarised presentation on data received to date. • The MFS Annual Report containing a summary report on PDS 2019 was tabled at the Annual General Meeting in conjunction with the Spring Field Day 14 September 2022. • Autumn Field Day scheduled for 15 March 2023 at Hazeldean, Cooma to showcase findings for 2nd year 2022. • EventBrite invitation has been distributed to database, approx 237 pax. Posted on Facebook and Instagram and shared through the SNSW Innovation Hub partners and
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			Farming Systems Group. • Winter Feed Gap Year 2 results presented at MFS Field Day held on 15 March 2023 at Hazeldean, Cooma, with 107 pax in attendance. Copy of presentation attached. • Year 2 results in PDF distributed to membership database of 198 pax and through partner and sponsor networks. • Winter Feed Gap Year 3 results presented at MFS Field Day held on 6th December 2023 at “Woburn” Bungarby with 63 in attendance. Copy of presentation attached. • Year 3 results in PDF distributed to membership database of 241 pax and through partner and sponsor networks. • Year 3 results will be uploaded to MFS website in mid January 2024. • Final Report will be produced in accordance with MLA Agreement and where allowable, will be distributed to MFS database.
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Changes in knowledge, attitudes and skills - How well did we do it? <i>Describe the changes in KASA that you are planning to achieve.</i>	• The actual increase in DMP is quantified to the entire MFS membership (70+ farm businesses). • The actual economic benefits (increase in nett profit) from the increase in livestock performance compared to a baseline of no foliar pasture application is quantified to the entire MFS membership (70+ farm businesses). • 100% of core producers and 25% of observer producers have additional confidence and capacity to increase DMP by applying granular Nitrogen (N) and Gibberellic Acid (GA) to their fodder systems. • 110 farm businesses outside of the producer group provided with the skills and knowledge to adopt some level of supplementation into their farm management when finishing lambs.	• Narratives / testimonials and case studies from the three trial site hosts involved in the PDS (using MLA proforma / template) • Pre-project surveys (capture baseline) and post project surveys with trial site hosts and wider membership base to assess changes in knowledge, skills and attitude • Post event feedback surveys and skills audit following field days with questions targeted to assess changes in knowledge, skills and attitude	• 3 core producer pre-project surveys complete representing 6 sites • 22 pre-project observer producers surveys have been completed
Practice changes – Has it changed what people do? <i>Describe the practice changes that you are expecting to achieve by the end of your project</i>	• 3 core participating producers will successfully demonstrate that foliar pasture applications such as N and Gibb Acid significantly increase DMP on pastures on the Monaro over the winter period to optimise stock	• Benchmarking / baseline surveys (as above) but questions targeted to capturing information about practice change and impact versus attitude and	• 3 core producer pre-project surveys complete representing 6 sites • 22 pre-project observer producers surveys have been completed

	production and performance relative to untreated winter pastures • 25% of observer producers will have adopted strategies (N + Gibb Acid) to increase the utilisation of pasture growth over the winter period • Provide 75 farm businesses with the skills and knowledge to manipulate pasture promotants/stimulants to increase the profitability of their meat enterprise systems.	awareness change • Longer term surveys conducted by MLA (secondary impact information)	
Benefits – Is anyone better off? <i>Describe the benefits that you are expecting to achieve as a result of the project</i>	Previous modelling work and MFS PDS trials, exploring both steer and lamb finishing systems on the Monaro has produced the following results; Lamb finishing - Average net profit (\$/ha/yr) • Lucerne – \$319/ha and \$425/ha • Pasture – \$1492/ha and \$519/ha and \$305/ha • Forage brassica - \$347/ha and \$706/ha and \$324/ha • Herb mix (plantain, chickory, clover) - \$1239/ha • Baseline system of selling as stores (modelled) - \$161/ha (29kg lamb) Steer Finishing – Total enterprise GM (\$/ha/yr) (Modelled results) • Baseline weaner system - \$166/ha	• Data (enterprise profitability measured in terms of whole farm gross margin (\$/ha)) will be recorded for the six (6) PDS demonstration sites • Profitability and production gains for the six systems will be quantified against the current baseline system as currently documented in a previous lamb PDS. • Comparative analysis / benchmarking data collated and	• Economic analysis for Year 1 results have been processed – will be presented at Autumn 2022 Field Day. • Economic analysis for Year 1 results were presented at Autumn 2022 Field Day. • Year 2 results were presented at the Autumn Field Day on 15 March 2023. • Economic analysis for Year 2 results were not conducted due to the inclusive evidence of benefit. • Economic analysis for Year 3 results were presented at the Summer Field Day held on the 6th December 2023.

	• Pasture - \$199/ ha • Oats - \$262/ ha • Average increase in farm gross margin of 20% on pasture • Running these steers on an oats crop over winter at 2.5 steers/ha increased farm profit by an additional 38 percentage points due to a 32 kg/ head increase in sale weight and a decrease in the area needed to run the steers An increase in DMP would also have the following advantages; • allow greater stocking rate to be run over winter thereby increasing enterprise production capacity over the spring and summer period (winter carrying capacities are a major profit driver for the whole grazing system for the Monaro) • optimize the condition of breeding stock therefore increasing chances of successful lambing or calving in spring. • decrease the requirement for supplementary	documented at enterprise level • Longer term surveys conducted by MLA (secondary impact information)	
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	feeding over winter and early spring improving feed base utilisation of winter feed thereby allowing a higher number of stock to be carried over winter and lifting whole-farm carrying capacity		
General observations / outcomes – Is the industry better off?	- The challenge of increasing DMP and utilizing winter feed to maintain and finish stock during the harsh winters on the Monaro is relevant to the entire (100%) grazing community (605 graziers) - If adopted by the target audience, it has the potential to deliver industry benefits of nett profits per ha of between \$194 and \$667 above the baseline system of selling stores - Capture of key lessons (expected and unexpected) from the PDS that can be shared across the network	- Surveys with key stakeholders involved in the project ie. professional experts (Doug Alcock / Grazprophet) following completion and longer term - Dissemination of comparative analysis results to the relevant wider grazing industry - Longer term surveys conducted by MLA (secondary impact information) - Feedback from steering committee	

6.3 Pre and post-project survey templates

Pre project survey template



MLA Producer Demonstration Sites Skills Audit Template - Pre-activity CORE

PDS Name: Fodder Systems and Feed Gaps

PDS Code: 2019.MFS.PDS

The following questions are used to determine your level of understanding of foliar pasture application / pastures stimulants to increase dry matter production (DMP) over the winter period on the Monaro.

The knowledge and skills audit is used at the start and completion of the program to allow individuals to track their skill development and adoption of new practices. It will also be used:

1. To improve the content of future project meetings; and
2. As part of the evaluation process for the project

The information will be completely confidential and individuals will not be identified in the analysis of data.

Name: _____

Date: / /

MLA may contact me to further assess the impact of their programs? ☐ Yes ☐ No

MLA may send me newsletters and inform me of future events? ☐ Yes ☐ No

The information you are providing to Meat & Livestock Australia Limited ABN 39 081 678 364 ("MLA") may be personal information under the Privacy Act. We will collect, hold, use and disclose the email address you have given us and the personal information you provide in the manner set out in MLA's privacy policy (located at <http://www.mla.com.au/General/Privacy>). If you provide a telephone number, you consent to MLA contacting you for an indefinite period about future products and services that may be of interest to you.



Section A – Demographic Information

A1. Your contact details

- a. Property name
- b. Business / trading name.....
- c. Property address
- d. Postal address
- e. Email address
- f. Phone
- g. Mobile

A2. What area do you manage? *(please write the number of hectares that you managed)*

- a. Hectares

A3. What numbers of livestock do you run? *(please write the number of head against each of the categories of livestock that you run)*

- a. Number of beef breeders.....
- b. Number of cattle turned off per year.....
- c. Total number of cattle
- d. Number of ewes
- e. Number of lambs turned off per year
- f. Total number of sheep
- g. Number of goats turned off per year
- h. Other



Section B – Knowledge and Skills

B1. Do you use any products (*pasture stimulants*) to improve Dry Matter Production (DMP) during winter?:

Yes..... ☐

No ☐

B2. If you do use *pasture stimulants* over the winter period to enhance Dry Matter Production, what do you normally use:

Nitrogen ☐

Gibberellic Acid..... ☐

Other..... ☐

None ☐

B3. If you do use *pasture stimulants* to increase Dry Matter Production, what pasture do you utilise them with:

Perennial Pasture..... ☐

Ryegrass ☐

Cereal Crop..... ☐

Other ☐

B4. How would you rate your knowledge and skill in utilising *pasture stimulants* over the winter period to increase Dry Matter Production?

(please rate out of 10, with 1 being poor or not applicable and 10 being excellent)

1 2 3 4 5 6 7 8 9 10

Poor
N/A

Excellent



Section C – Confidence and Practices

C1. How confident are you in utilising *pasture stimulants* over the winter period to enhance *Dry Matter Production*? (please rate out of 10, with 1 being poor or N/A and 10 being very confident)

1 2 3 4 5 6 7 8 9 10

Poor
N/A

Very
Confident

C2. What do you think is the biggest impediment to utilising pasture stimulants on the Monaro? (mark as many as necessary)

- a. Cost..... ☐
- b. Time available..... ☐
- c. Lack of objective data on this enterprise ☐
- d. Lack of knowledge on the topic..... ☐
- e. Other ☐

C3. What is the most important aspect in determining your use of pasture stimulants? (mark as many as necessary)

- a. To allow greater stocking rate over winter ☐
- b. To optimise the condition of breeding stock..... ☐
- c. To decrease the requirement for supplementary feeding ☐
- d. To improve feed base utilisation ☐
- e. To finish supplementing stock ☐
- f. To create a feed wedge ☐
- g. N/A I don't use them ☐

C4. If you DO use pasture stimulants, which of the following *performance data* do you record (if any)?

- a. Dry Matter Production (kg DM/ha/year) ☐
- b. Income (\$/DSE)(Ha)..... ☐
- c. Enterprise Expense (\$/DSE)(Ha) ☐
- d. Gross Margin (\$/DSE)(Ha)..... ☐
- e. Net Profit (\$/DSE)..... ☐

4

Post-project survey template



Post-Project Survey – {Core/Observer} Participants

PDS Project Code : L.PDS.2019 PDS Project Name : Fodder Systems and Feed Gaps (Winter Feed Gap)

The following questions are used to determine your level of understanding of Fodder Systems and Feed Gaps (Winter Feed Gap) following your participation in the above producer demonstration site project. The knowledge and skills survey is used at the start and completion of the program to allow individuals to track their skill development and adoption of new practices. The information will be used as part of the evaluation process for the project and MLA's PDS program. The information will be completely confidential, and individuals will not be identified in the analysis of data.

Participant Name: _____

Company/Business Name: _____

Section A - Your thoughts on the PDS

Please rate each of the questions below out of 10 (where 1 is negative and 10 is positive)

A1. Overall, how **satisfied** are you with this PDS? _____/10

A2. How **valuable** was this PDS in assisting you manage your livestock enterprise? _____/10

Please tick your response and provide short answer responses for the below questions

A3. Would you **recommend** MLA's PDS program to others? ☐ Yes ☐ No ☐ Not Sure

A4. Please provide any feedback to help us improve the PDS program:



Section B – Knowledge and Skills *(If you do not know, please select the 'Unsure' option)*

B1. Overall, how well has this PDS project increased your knowledge of Dry Matter Production (DMP) during winter?

Please rate out of 10 by marking your choice below, 1 = No Increase, 10 = very large increase

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

B2. Overall, how well has this PDS project increased your skills in Dry Matter Production (DMP) during winter?

Please rate out of 10 by marking your choice below, 1 = No Increase, 10 = very large increase

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

B3. As a result of the PDS project, what, if any, pasture stimulants will you use to enhance Dry Matter Production over the winter period?

Nitrogen.....	☐
Giberellic Acid	☐
Other	☐
None	☐

B.4 If you choose to use *pasture stimulants* to increase Dry Matter Production following the PDS project, what pasture will you utilise them with:

Perennial Pasture	☐
Ryegrass.....	☐
Cereal Crop	☐
Other	☐



Section C – Confidence and Practices

C1 How confident are you in utilising pasture stimulants over the winter period to enhance Dry Matter Production?

Please rate out of 10 by marking your choice below, 1 = Not at all confident, 5 = somewhat confidence, 10 = very confident

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

C2 As result of participating in this PDS have you adopted any of the following practices relevant to using pasture stimulants to enhance Dry Matter Production:

Practices	Practice Implemented?	Indicate on what % of your enterprise this practice has been adopted. (if not adopted leave blank)	Frequency of use? (if not adopted leave blank)
As a result of the PDS project, do you intend utilising pasture stimulants to enhance Dry Matter Production on the Monaro?	☐ Yes, practice implemented ☐ I intend to implement ☐ No, I have no intention to implement ☐ Adopted prior to PDS	☐ Less than 25% ☐ Between 25% - 50% ☐ 50% ☐ Between 50% - 75% ☐ Greater than 75% ☐ 100%	☐ Normal Practice ☐ Sometime ☐ Rarely
	What are the reasons you have not implemented this practice on your property prior to participating in this PDS project? ☐ Not a significant issue on my property ☐ Limited funds ☐ Lack of confidence ☐ Limited time ☐ Lack of skills ☐ Other (please specify)		

C3. As a result of participating in this PDS and if you do NOT intend to implement the practice, what do you think is the biggest impediment preventing you from utilising pasture stimulants on the Monaro? (mark as many as necessary)

☐ Cost
☐ Time available
☐ Lack of objective data on this enterprise
☐ Lack of knowledge on the topic
☐ Other



C4. As a result of participating in this PDS, what is the most important aspect in determining your intention of implementing the use of pasture stimulants?

☐ To allow greater stocking rate over winter ☐ To optimise the condition of breeding stock ☐ To decrease the requirement for supplementary feeding ☐ To improve feed base utilisation ☐ To create a feed wedge ☐ N/A (if you tick this box please answer the question below).		
What are the reasons you do NOT intent to implement this practice on your property?		
☐ Not a significant issue on my property ☐ Limited funds	☐ Lack of confidence ☐ Limited time	☐ Lack of skills ☐ Other (please specify)

C5. If you have adopted the use of pasture stimulants, please provide performance data below if you have it available

Before adoption of pasture stimulants		After adoption of pasture stimulants	
		Please outline what pasture stimulant was used:	
Dry Matter Production (kg DM/h/year)		Dry Matter Production (kg DM/h/year)	
Income (\$/DSE/ha)		Income (\$/DSE/ha)	
Enterprise Expense (\$/DSE/ha)		Enterprise Expense (\$/DSE/ha)	
Gross margin (\$/DSE/ha)		Gross margin (\$/DSE/ha)	
Net Profit (\$/DSE)		Net Profit (\$/DSE)	

6.4 Monaro Farming Systems project site

[Winter Feed Gap Trial - Monaro Farming Systems](#)

6.5 Case Study/Demonstration site project summaries

6.5.1 Woburn

L.PDS.2019 Winter Feed Gap

Producer case study: Woburn

Charles and Hilary Keighley

Woburn was the home of the Laikipia Dorper & White Dorper Sheep Stud that was established on the Monaro in Southern NSW in 2005 by the Keighley family. Since 2015, the Woburn Australian White flock has been developed, the Dorper flock has been ceased and the White Dorper ewes have been used to develop the base of Australian White commercial flock.

“Woburn”, Bungarby was planted with a cocksfoot and phalaris pasture mixed with subterranean clover on a granite soil.

PDS aim

The producer demonstration site (PDS) project “Fodder Systems and Feed Gaps” (Winter Feed Gap) aimed to demonstrate that foliar pasture applications such as Nitrogen (N) and Gibberellic Acid (GA) significantly increase Dry Matter Production (DMP) on pastures on two soil types in the Monaro district of NSW over the winter period to optimise stock production and performance relative to untreated winter pastures.



Image 1 Phalaris site showing pasture density

Woburn – Year 1

Preliminary findings were delayed until spring 2021 when there was an expected response in pasture growth due to an increase in temperature and day length.

As there was a delay in application timings, there was no increase in biomass leading into winter for 2021.

At that time, core producer survey results indicated that approximately 66% of the core group use pasture stimulants to improve DMP during winter. N and GA are used with the biggest impediment being rain and time (for those who use them) and cost (for those who don't).

Observer producer survey results indicated that approximately 50% of observers use pasture stimulants to improve DMP during winter (mainly N and GA). Skills, knowledge and confidence rating among observers was average (5/10). The biggest impediment was unreliable rainfall.

Woburn – Year 2

Woburn was sampled and visual differences were present at the time of sampling. Again, a fresh green sample of pasture was prepared and frozen pending transport to Wagga Wagga for testing. Both Woburn and Kydra sites were opened to grazing for around a week before being closed again pending a spring assessment.



Woburn – Year 3

Results of Year 3 for Woburn, for the perennial grass pasture tested indicated that N gave a poor response due to a dry autumn and potential for legume derived N. It was apparent that the response to GA was in the order of an extra 500kg DM/ha which is in line with claims. It was also noted that the use of GA was viable in 2023 given its relatively cheap cost compared with N.

Overall benefits

Cost benefit - data equivocal

Each year some data looked promising where other data showed little or counter-intuitive response.

- Easy N at 100L/ha
 - Currently \$1,254 for 1,000L
 - Cost \$140/ha (including \$15/ha application cost)
- Gibberellic Acid
 - ProGibb-SG (400g/kg) costs \$0.62/g
 - @ 20g/ha cost \$27/ha (including \$15/ha application cost)

Value of feed grown

- Value as a sub for grain supplements
- Barley (ME = 13 MJ/kg DM) at \$350/tonne
- Value feed grown at \$0.03 / MJ

Individual changes to be made as a result of PDS

“Overall, hosting the PDS was most interesting, although initial results were lacking in years one and two due to wet weather. In the past, Woburn applied Gib, usually presenting good results, not so with urea. Most likely we will use Gib in the future.” **Charles Keighley, Owner Woburn**

6.5.2 Dungaree

L.PDS.2019 Winter Feed Gap

Producer case study: ‘Dungaree’

Dungaree Past Co - "Allawah", Bombala, NSW

Blackbutt oats on basalt soil

PDS aim

The producer demonstration site (PDS) project “Fodder Systems and Feed Gaps” (Winter Feed Gap) aimed to demonstrate that foliar pasture applications such as Nitrogen (N) and Gibberellic Acid (GA) significantly increase Dry Matter Production (DMP) on pastures on two soil types in the Monaro district of NSW over the winter period to optimise stock production and performance relative to untreated winter pastures.

Dungaree – Year 1



Image 1 Dungaree Oat site before slashing to stimulate grazing

Results from the winter cut in August 2021 showed that there was a response to both the application of N and the application of ProGibb (GA). Absolute differences in herbage mass were greatest in the Blackbutt oats at “Dungaree” but there appeared to be no additive effect of applying both N and GA over that of GA alone.

Results from the spring cut are equivocal with the Blackbutt oats at “Dungaree” showing an advantage to the treatments over the Nil. Unlike the winter cut, the advantage to the application of N was greater than that of GA although again the impact was greater for the N+GA combined. The

amount of green biomass accumulated was about 25% higher for GA, 38% higher for N and nearly 50% higher for the combined N+GA treatment relative to the nil treatment. There was little difference in crude protein between treatments, but dry matter digestibility was a little higher than for the Nil plot.

6.5.3 Maffra

L.PDS.2019 Winter Feed Gap

Producer case study: ‘Maffra’

Andrew Rolfe “Maffra” Springfield Road, Maffra

Cereal crop on basalt soil

PDS aim

The producer demonstration site (PDS) project “Fodder Systems and Feed Gaps” (Winter Feed Gap) aimed to demonstrate that foliar pasture applications such as Nitrogen (N) and Gibberellic Acid (GA) significantly increase Dry Matter Production (DMP) on pastures on two soil types in the Monaro district of NSW over the winter period to optimise stock production and performance relative to untreated winter pastures.

Maffra – Year 2



**Image 2 Cereal Maffra at Maffra. Aspect: SW
Elevation 879m**

Trial sites for Year 2 were identified and pegged in March 2022 (4 treatment strips per site). The site was securely fenced, and initial soil tests were conducted and temperatures taken.

During April, Nitrogen was applied to treatment strips 1&3 - excluded grazing of trial area. Biomass assessments were initially delayed and occurred on 28 and 29 June 2021, due to the later than anticipated application of N, which was applied in mid-May.

The site was well grazed down with even biomass across each treatment.

Overall benefits/results

Unfortunately, due to an unintended grazing in the treatment paddock at Maffra, insufficient biomass had accumulated at this site to make an assessment at the planned date.

With a distinct plummet in temperature and the onset of a series of large cold fronts and some associated snow, soil temperatures in the top 20cm plummeted from around 10°C in the first two weeks of May to just 5°C by the end of the month.

This, along with the potentially anaerobic wet conditions, is likely to have led to some losses of N through denitrification but also the potential growth of the plants in the six weeks between application and biomass assessment may also have been hampered directly by the onset of very cold conditions.

Individual changes to be made as a result of PDS

Not applicable to this particular trial due to unforeseen grazing.

6.6 Field day presentations

6.6.1 [Field day presentation - Year 1 March 2022](#)

6.6.2 [Field day presentation - Year 2 March 2023](#)

6.6.3 [Field day presentation – Year 3 December 2023](#)

6.7 MFS newsletter articles –

Thursday 20th
October 2022

NEWS TODAY

Latest News & Upcoming Events

Issue #3

Expressions of Interest

“Serradellas for new environments”

MFS are involved in a new project ‘Serradellas for new environments’. The project is funded by Meat and Livestock Australia and involves researchers from CSIRO, NSW DPI and the Tasmanian Institute of Agriculture.

Serradellas present many potential benefits for mixed pastures including providing high quality dry matter, fixing nitrogen and lowering the requirement for phosphorus fertiliser relative to subterranean clover. Serradellas also have a low bloat risk and low oestrogenic activity and are adapted to both sandy and duplex soil types. The project aims to develop serradellas as viable legume options for permanent pasture systems in south-eastern Australia. Current research activities aim to identify the cultivars and agronomy required to successfully establish serradellas in permanent pasture systems.

MFS are seeking a member to host a serradella Producer Demonstration Site.

The site would comprise replicated strips of different cultivars of yellow and French serradella grown in a mixture with grass, along with a control treatment of subterranean clover. The total site area would range from 50 x 50m to 100 x 100m and have prior weed control.

The site would be run under normal farm management. The trial site does not need to be fenced separately but will need to be closed to grazing to allow establishment and seed set. The site will be sown in autumn 2022 and the project team will monitor the site for 2-3 years (until at least 2025).

If you are interested in hosting this demonstration site, please reply to executive@monarofs.com.au by 4th November with your location and brief description of the current status of the site (soil type, existing species, site history).

Following your expression of interest, a representative from the research team will visit your farm to take soil tests and determine suitability. If you are interested in trialling serradella but do not want to host a formal trial, the research team would still like to hear from you. Please let Frances know via executive@monarofs.com.au.

From the Chair

I hope this finds everyone well and enjoying a few rare fine days finally, we can all maybe catch up on those many jobs delayed by the rain!

A busy month for MFS since my last message. Along with Frances’ news, I would like to let you know about a few of the key projects and issues we (the Board) are currently working on:

- We welcomed Julie Schofield (Partner at Boyce Accountants) to the Board. Julie comes onto the board as an Industry Director, and we look forward to putting her financial knowledge to work.
- We also welcomed Darcy Larritt and Lisa Phillips to their first Board Meeting. We still have an Industry Rep vacancy, and if any members know of someone that can offer the MFS Board knowledge and skills that we don’t currently cover, please get in touch.
- Our Soils Field Day is set for 7th December, and we are in the process of finalising speakers, venue, and the program. Richard Simpson, as well as reporting on our soil tests, will be telling us about the new LIS Soil Test Monitoring tool he has helped develop. I’ve done one of the test runs for it and can report that it will greatly help us all record and make sense of our soil test data. Richard has also just completed a massive “clean-up” of the Soils database – we are so fortunate to have him giving his valuable time and expertise to MFS.
- We will also at the Field Day have on display a few different kinds of Fly Jets and demonstrate their application efficacy. With the summer shaping up to be another wet one, fly chemical resistance and fly management are important issues to look at.
- Subject to successful funding, we are very excited to be in the process of organising our first “MFS Tour”, scheduled for early next year. We are planning a two-day Prime Lamb Tour across to Gundagai Meat Processors, to look at their innovative and cutting-edge business. We will also visit a top producer over that way and have a top-notch speaker. Many thanks to John and Will Jeffreys for their input and contacts into this project.

Thank you to those members who have given us their feedback and ideas recently. Keep it coming!

Kind regards, Mandy

Mb: 0427 587293 | 02 64587293
chair@monarofs.com.au



Summer ‘Soils’
Field Day
7 December 2022
Venue TBC

Soil Tests 2022

2022 Soil kits have been sent out so hopefully you should be receiving them any day now. You will see that this year we are offering 3 options:

Test Option 1: Best suited for monitoring soil fertility of paddocks with a history of soil tests where soil pH and PBI are known from previous testing.

Test Option 2: Likely to be useful for monitoring paddocks where soil pH and PBI are not known or have only been tested a few times.

Test Option 3: Most useful when starting to monitor the soil fertility of a paddock; a cost-effective package that covers most issues that should be checked when getting started.

Any questions you know where to find us.

Please remember all tests are due back by Friday 4 November 2022.

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Behind the Scenes

As with any organisation, a lot has been happening behind the scenes. We are close to finalising a number of resources that will be housed on our website. It is hoped that we can continue to grow this library and provide topical and easily accessible material for members and non-members.

We are delighted to announce that the first of these resources will be our 'Mental Health and Wellbeing Workbook'. We hope that you find it an excellent resource to maintain and improve your mental health, the health of your families and your teams.

The second resource is material, including audio, for assistance with Droughtpack, Impact and demonstrates a link for the use of Farming Forecaster and Stockplan.

These resources are made possible with the support of the Foundation for Rural & Renewal.



PDS Winter Feed Gap

The producer demonstration site project "Fodder Systems and Feed Gaps" (Winter Feed Gap) is aiming to demonstrate that foliar pasture applications such as Nitrogen and Gibberellic Acid significantly increase Dry Matter Production (DMP) on pastures on two soil types in the Monaro district of NSW over the winter period to optimize stock production and performance relative to untreated winter pastures.

Results from two of three trial sites during the winter of 2022 (Year 2), have indicated that while the N+ treatments do have slightly higher total and green biomass at the end of June the difference is minor and variation between plots would suggest insignificant. N was not applied until the third week of May and although there was plenty of soil moisture, there was a distinct plummet in temperature with the onset of a series of large cold fronts and some associated snow. Soil temperatures in the top 20cm plummeted from around 10°C in the first two weeks of May to just 5°C by the end of the month. This along with the potentially anaerobic wet conditions is likely to have led to some losses of N through denitrification but also the potential growth of the plants in the 6 weeks between application and biomass assessment may also have been hampered directly by the onset of very cold conditions.

Unfortunately, due to an unintended grazing in the treatment paddock at Maffra insufficient biomass had accumulated at this site to make an assessment at the planned date.

MFS is currently organising a meeting with MLA to discuss the PDS and the impact of the seasonal conditions and unintended grazing setbacks. MLA have indicated that the set back is minor, and we will be able to continue and/or modify the trial.

Thanks must be given to the MLA team for providing ongoing support of MFS.

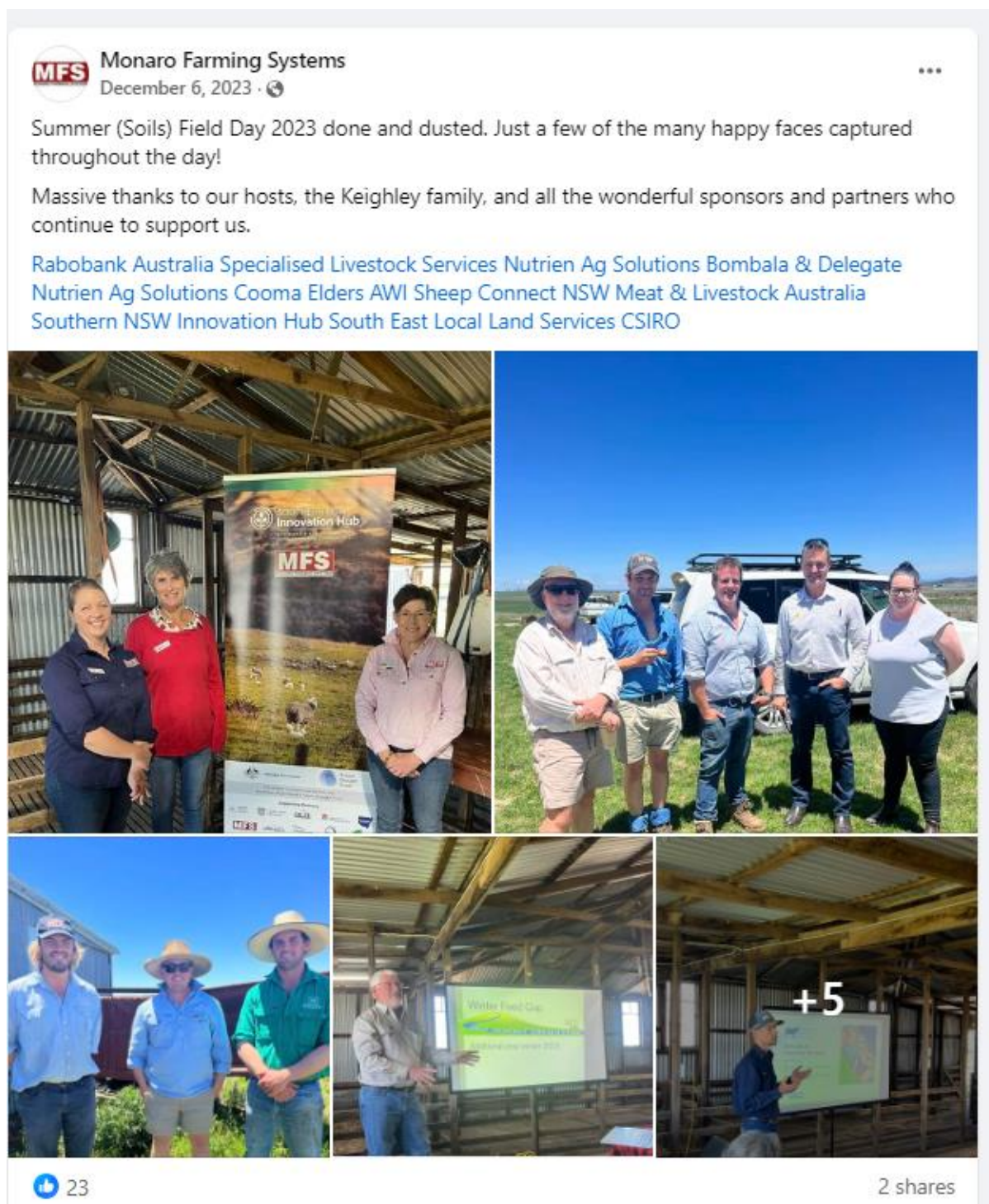
6.8 MFS annual reports

6.8.1 [Annual report 2022](#)

6.8.2 [Annual Report 2023](#)

6.9 Social Media

6.9.1 6th December 2023



6.9.2 24th November 2023

MFS Monaro Farming Systems
November 24, 2023 · 🌐

MFS Summer (Soils) Field Day - 6th December 2023 - "Woburn" Bungarby.
RSVP's due ASAP: to Frances on executive@monarofs.com.au or
☎ 0456 948 892



MONARO FARMING SYSTEMS

The board and staff of Monaro Farming Systems
invite you to celebrate

MFS Summer Field Day 2023

(World Soil Day)

Date: Wednesday 6th December 2023
Time: 9.00am—3.30pm
Location: "Woburn" 98 Gadens Road Bungarby

Presentations from:

- Dr Richard Simpson – 2023 Soils Report & results from plant tissue testing (boron deficiency)
- Edward McGeoch, Rabobank – commodity outlook
- Doug Alcock, Grazprophet Consulting – findings and results of MLA Producer Demonstration Site 'Winter Feed Gap 2019'
- Rebecca Haling, CSIRO – updates on serradella trial and other factors important for successful establishment of serradellas.
- Richie Cartwright, Specialised Livestock Services - in-depth analysis of trends in previous WEC's, discuss best practice worm control strategies and present private drench resistance database.

This event received funding from the Australian Government and is supported by Rabobank, Dawbuts, CSIRO, Meat & Livestock Australia, Local Lands Service, Specialised Livestock Services and Incitec.







Photo courtesy "Woburn" (www.woburn.com.au)





👍❤️ 9 3 shares

6.9.3 2nd November 2023


Monaro Farming Systems
 November 2, 2023 · 🌐

Save the date: MFS Summer (Soils) Field Day - 6th December 2023
 "Woburn" 98 Gadens Road Bungarby





Monaro Farming Systems

2023 Summer (Soils) Field Day

 **Wednesday 6 December 2023** | Time: 9.00am – 4:00pm
 "Woburn", 98 Gadens Road, Bungarby, NSW

COVID-safe rules will apply for this event – please do not attend if you are unwell.

MLA's Producer Demonstration Site (PDS) program supports producers to adapt, validate and demonstrate the business value of integrating new management practices/skills into their local systems.

Overview of the PDS

- Demonstrate effective management strategies to address the autumn/winter feed gaps in the Mediterranean zone to increase productivity, reduce risk and improve profitability.
- Demonstrate the application of improved grazing practices to benefit productivity and sustainability, including the use of commercial tools and technologies.
- Demonstrate adaptation to climate variability within a region through business planning, enterprise mix and risk management strategies.

What's on the agenda?

- Grazprophet Consulting – findings and results of MLA Producer Demonstration Site 'Winter Feed Gap 2019'
- Dr Richard Simpson – 2023 Soils Report and results from plant tissue testing (boron deficiency)
- Edward McGeoch, Rabobank – commodity outlook
- Rebecca Haling, CSIRO – updates on serradella trial and other factors important for successful establishment of serradellas
- Specialised Livestock Services – parasite control advice with a focus on worm control, utilising data from diagnostics with the Monaro, and trends from previous worm egg counts.

This event is funded by Meat & Livestock Australia with the support of:




For more information:
 Frances Lomas
 0456 948 892
executive@monarofs.com.au

 8
  3 shares

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6.9.4 4th March 2022

MFS Monaro Farming Systems
March 4, 2022 · 🌐

Change in date: NOW Tuesday 22 March.

Please join us for the MFS Autumn Field Day & Containment Feedlot Tour - Wednesday 23 March 2022

Buses will depart Cooma at 8am and return 4.30pm
Lunch at Delegate Station @ 12.30pm... See more

**MFS & Southern NSW Innovation Hub
proudly presents the**

MFS Autumn Field Day & Containment Feedlot Tour

**Wednesday 23 March 2022
8.00am to 4.30pm**

MFS
MONARO FARMING SYSTEMS

*** Containment Feedlot Tour - SMRC Bushfire Community Recovery
& Resilience Fund**

*Visit purpose built and improvised containment feeding lots used during
the previous drought and walking through lessons learned, best practice
and considerations.*

Presented by Phil Graham (Graham Advisory)

*** Merino Weaner Survival**

Presented by Phil Graham (Graham Advisory)

*** Seasonal Outlook - supported by MLA & FRRR**
Soil moisture, pasture growth, stock condition

*** Results of Winter Feed Gap - supported by MLA**
Presented by Doug Alcock

Buses departing Cooma at 8am, pick up at Nimmitabel to Bungarby then
to Delegate Station and returning to Cooma by 4.30pm
(Bookings essential for the bus & catering)

Morning Tea and Lunch provided

Please RSVP by 16/3/2022
For further information please contact Frances via email on
executive@monarofs.com.au

👍 3 1 share

