Innovative Use of Gibberellic Acid

PPS GA Demonstration Interim Report November 2016

The project is funded through the MLA EPDS program; and is being conducted in collaboration with Agriculture Victoria

Interim report prepared by Rob Shea; PPS Project Manager and Rachael Campbell; **Extension Officer Agriculture Victoria, Ballarat**

Abstract

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The Perennial Pasture Systems (PPS) group is conducting a three year demonstration of the use of Gibberellic Acid (GA) on winter pastures, funded by the MLA Enhanced Producer Demonstration Site (EDPS) program.
GA is made naturally in plant roots and stimulates shoot and cell elongatation promoting plant growth; this occurs naturally in plants during spring. The application of manufactured GA, sold commercially as “Pro Gibb™” and “Gala™” in winter stimulates plant growth and creates an increase in winter feed availability. The demonstration has two parts and each was replicated at five sites in year one (2016).

Demonstration one compared the extra winter feed produced using GA to nil and nitrogen treatments. All sites showed an increase in winter feed in response to the GA treatments in percentage terms, although the actual amount of extra dry matter produced seemed to be influenced by the amount of kg DM/ha at the time of treatment.
The response to nitrogen was low with four sites recording an increase of less than 30% compared to the nil treatment. Responses to the GA + N treatments showed large percentage increases, but it is expected that this was a response to the GA component; only one site showed the GA + N treatment to be superior to GA alone.
All host farmers were satisfied with the amount of extra winter feed grown and regard the use of GA as a useful tool in their pasture management. However, they do emphasise that the effective use of a GA program does require a fair degree of pre planning and flexibility to get the best results.

The second set of demonstration sites were looking at the effect of GA on annual grass weeds. This demonstration set out to assess whether GA application increased growth and palatability, therefore allowing the weeds plants to be grazed heavily enough to affect their recovery and therefore be an aid to weed reduction in pastures. The concept of the demonstration came from observed results from GA use on a PPS member property in 2014.
Five sites were replicated to show the effect of GA treatment and grazing on silver grass (vulpia spp.), annual ryegrass (Lolium rigidum) and barley grass (Hordeum leporinum) using replicated nil and GA treatments followed by grazing with sheep.
No discernible differences were found at any of the sites in 2016, the reasons for this are analysed in the summary on page 24.

Background

The Perennial Pasture Systems (PPS) group was successful in an application to the MLA Enhanced Producer Demonstration Site (EDPS) program in 2015 to commence a gibberellic acid (GA) demonstration.

The project is titled "innovative use of gibberellic acid" and proposed a three year, two part demonstration of the potential benefits of GA in the PPS member region and beyond.

The use of GA to promote winter growth in perennial grasses was well documented by CSIRO in the 1950's and 1960's but due to its cost it was not taken up by the grazing industry as nitrogen fertilizer was a much cheaper alternative. In recent years the cost of GA has reduced and it has now become a useful tool in perennial grass management.

Although GA has re-emerged as a pasture management option, information on its use tends to be of a very general kind and PPS believes that there needs to be more specific guidelines for its use in our region.

As far as PPS is aware the only Victorian trial information available is from South West Victoria which is a much more favourable environment for pasture production. PPS is conducting demonstrations to produce a set of guidelines for GA use in less favourable environments as well as looking at both physical and economic aspects of its use.

PPS is also demonstrating the use of GA as a non toxic annual weed control measure in addition to the best practice GA use for our region. PPS plans to assess the effectiveness of GA as a non-toxic control measure for annual grass weeds. The demonstration will include measurements that will reveal any impact of GA applications on the control of annual weeds; this concept comes from observed effects in the region where silver grass (vulpia spp.) infestations have been reduced by a combination of GA applications and heavy grazing. The observations showed that GA sprayed areas of silver grass were suppressed by sheep grazing after the GA application while the adjacent unsprayed area remained ungrazed and grew strongly into the spring. Andrew Speirs from Meridian Ag confirmed that GA does have an effect in increasing growth in annuals when he was questioned at a PPS/Grasslands Society MLA Pasture Update in Stawell in March 2015

PPS believes that GA will be an important component in the region's pasture systems with added winter feed availability enhancing animal welfare at critical times such as lambing. GA has the added environmental benefit of being a naturally derived product with no known detrimental effect to plants or animals.

Use of Gibberellic Acid (GA)

GA is made naturally in plant roots and stimulates shoot and cell elongatation promoting plant growth; this occurs naturally in plants during spring. The application of manufactured GA, which sold commercially in granular and liquid form as "Pro Gibb™" and "Gala™," in winter stimulates plant growth and creates an increase in winter feed availability. The best responses occur when there is adequate soil moisture and temperatures between 5 – 15° Celsius and the pasture is ungrazed for 21 days post treatment.

Project Oversight and Design

As with all PPS projects an advisory group of PPS members was appointed to oversee the project and assist the PPS project manager in the implementation and management of the project.

GA Advisory Group;

Simon Brady "Jallukar Park" Rhymney

Jodie Greene "Millbanks" Elmhurst

Dennis Harrington "Tirranna" Mt Cole Creek

The project design, technical advice and dry matter assessments are being provided by Andrew Speirs; Meridian Agriculture Casterton.

Project data collection, recording, analysis and reporting are being carried out by PPS Project Manager; Rob Shea and Agriculture Victoria Extension Officer; Rachael Campbell.

Demonstration Site Locations

In 2016, five sites were selected for each demonstration and the treatments were as follows.

Phalaris based pasture production demonstration

1. Nil
2. Gibberellic Acid only – optimum timing mid to late June, rate 10 g ProGibb/ha (40 ml Gala/ha at Cuyuac site).
3. Nitrogen only @ 30kg N/ha liquid or granular
4. GA + N treatment which is commonly used by dairy farmers

3 replicates were implemented at boom spray width (dependent on the size of the host farmer's equipment).

A planned split treatment of GA applications was not possible due to the late autumn break.

An example of the phalaris based pasture production demonstration is shown below in figure 1

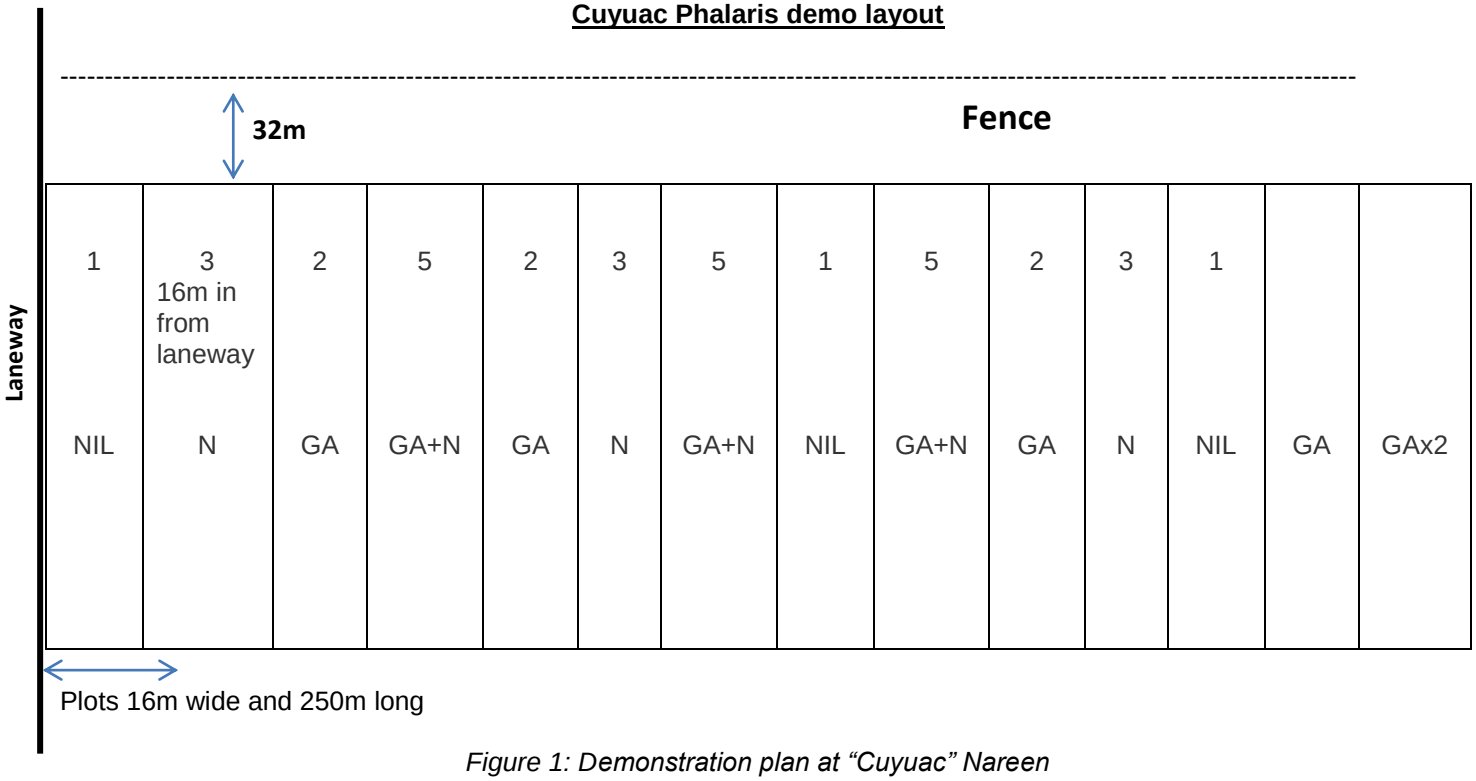

Figure 1: Demonstration plan at "Cuyuac" Nareen

Annual weed reduction demonstration

1. Nil
5. Gibberellic Acid only – optimum timing mid to late June, rate 10 grams of ProGibb/ha (40 ml Gala/ha at Cuyuac site).

3 replicates were implemented at boom spray width dependent on the size of the host farmer's equipment.

Host Farms

The Phalaris based pasture production demonstration sites were implemented by PPS members as follows,
Brady Family "Jallukar Park" Rhymney
Burton Family "Marenda" Mt Dryden
De Fegely Family "Quamby" Dobie
Edgar Family; "Cuyuac" Nareen
Greene Family "Millbanks" Elmhurst

The Annual weed reduction demonstration sites were implemented by PPS members as follows,
Brady Family "Jallukar Park" Rhymney
Edgar Family; "Cuyuac" Nareen
Greene Family "Millbanks" Elmhurst
Harrington Family "Tirranna" Mt Cole Creek.
Holden Family "Overdale" Stawell

Figures 2 & 3: Site preparation at Marenda

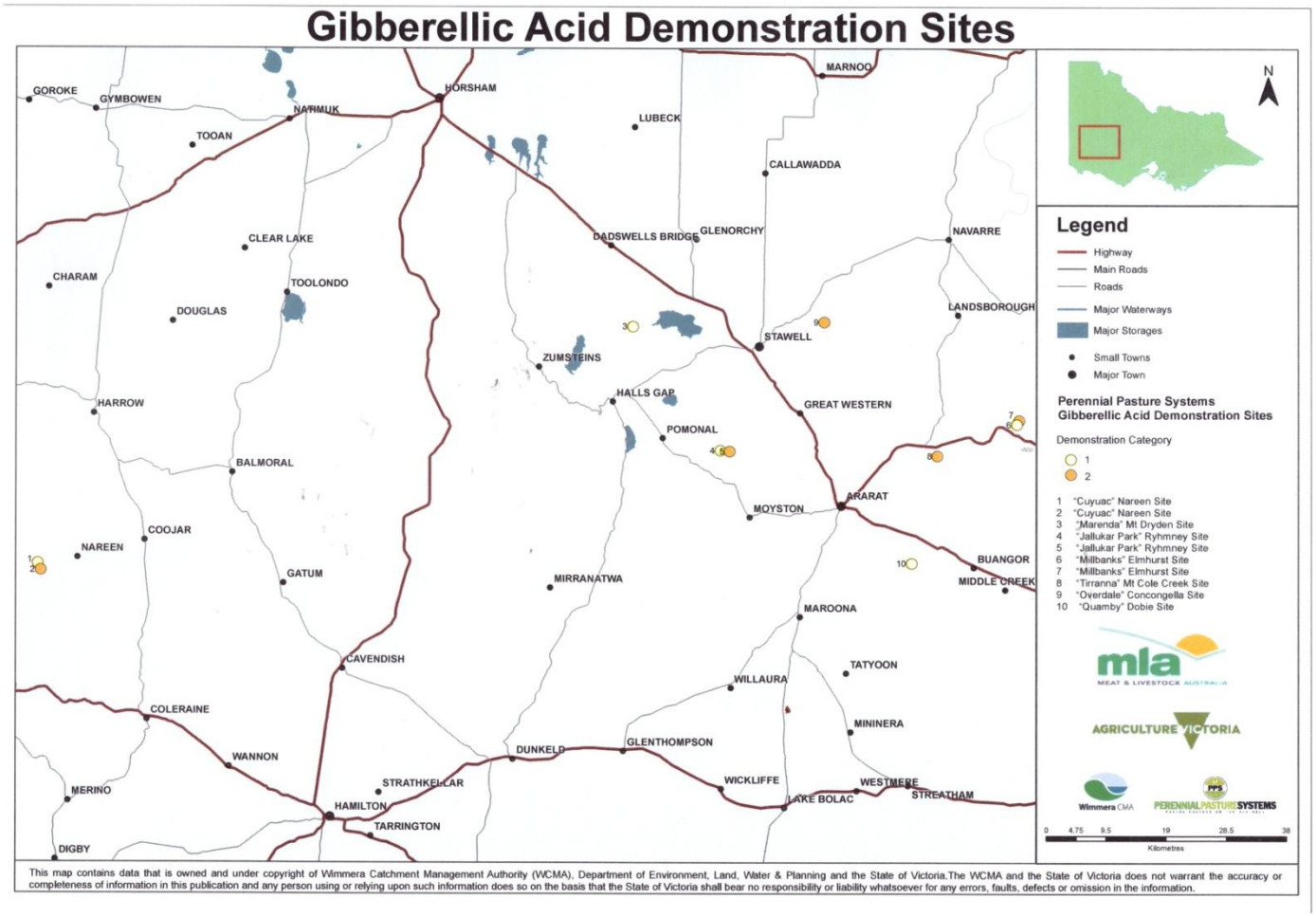

Figure 4: Map of PPS GA demonstration sites 2016, where category 1 represents the Phalaris demonstration and category 2 represents the annual weed demonstration.

Phalaris based pasture production demonstration

Data Collection

All sites had pasture composition measured using the pasture stick method. This was conducted before and after treatments and the Phalaris based pasture production demonstration sites were cut and had dry matter results calculated. Feedtests were conducted on the treatments at all sites in July as well as phalaris tissue tests and a Feedtest in mid spring at Millbanks.

Results and Observations (to date);

Although there were differences in the quantities of dry matter collected at the sites there was a fairly consistent pattern in the responses to the treatments. The exceptions to this trend were at Jallukar Park where the GA + N treatment yielded the highest dry matter production and at Quamby where there was a larger response to N than at the other sites. These results are shown in figures five and six where the percentage of dry matter production increase is shown against the Nil treatment which is listed at zero.

Figure 5: GA treated phalaris at Marenda showing short term yellowing of the leaves which occurs with GA application. It has no long term effect on the plant.

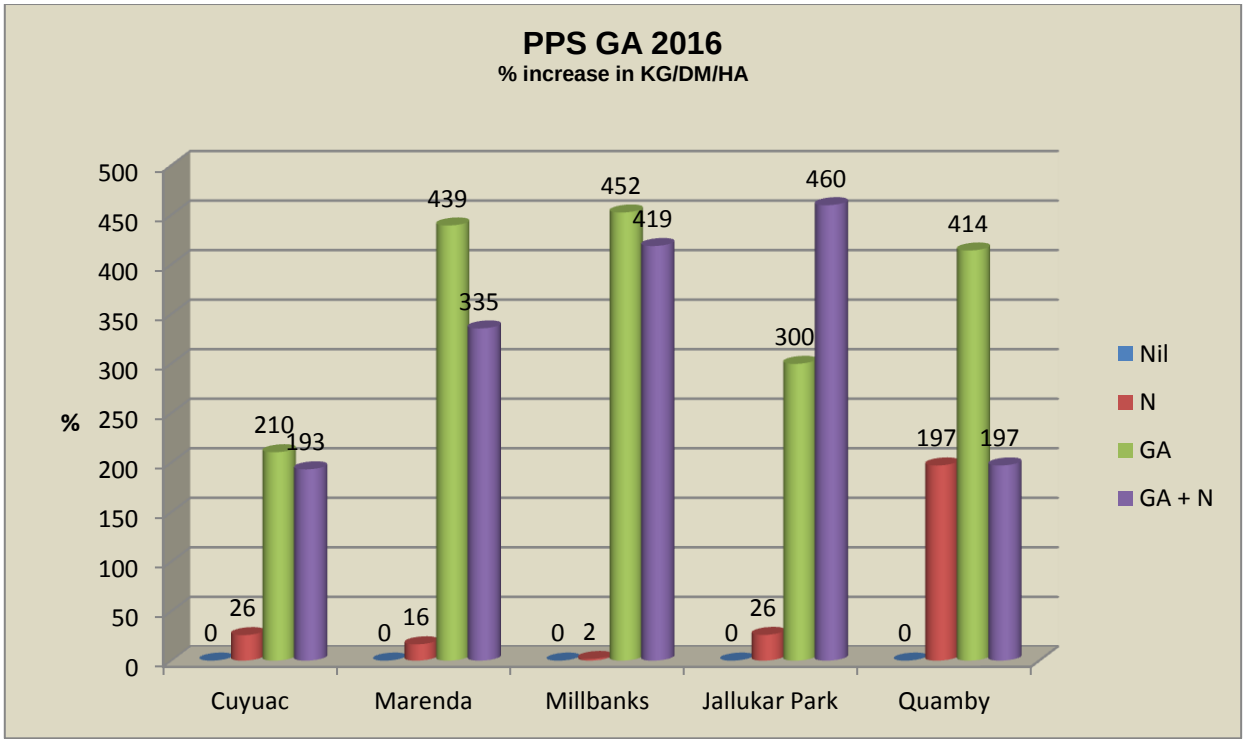

Figure 6: Graph showing the percentage gain in kg DM/ha at each site.
NB: Different method of DM assessment means that the graph for Quamby cannot be directly compared to the other site graphs

Site Results

Cuyuac: Nareen

The products used at Cuyuac differed slightly to the products used at the other sites. Gala™ GA and liquid nitrogen supplied the GA and N products while Pro Gibb™ was used at the other four sites, liquid nitrogen was used at Jallukar Park and urea at the other three sites; this was not expected to affect the results.

The Cuyuac pasture is a high quality two year old Holdfast GT phalaris based pasture which received a spray graze capeweed control treatment prior to the GA treatment, which occurred on June 27th. The pasture had an estimated 1100 kg/dm/ha when the treatments took place. A single replicate of double the rate of the specified GA treatment was also applied.

The site produced a notable visible response to the GA treatments although the measured additional dry matter was less than expected. A review of the dry matter collection method suggested that some of the extra growth may have occurred at a point lower than the measurement cuts; the measurement method will be refined in 2017.

Figure 7: Untreated replicate at Cuyuac, eight days after treatments

Figure 8: GA replicate at Cuyuac, eight days after treatment

A section of each replicate was cut, weighed and then dried to produce a dry matter estimate for each treatment. The cuts took place on the 21st of July, 24 days after treatment applications.

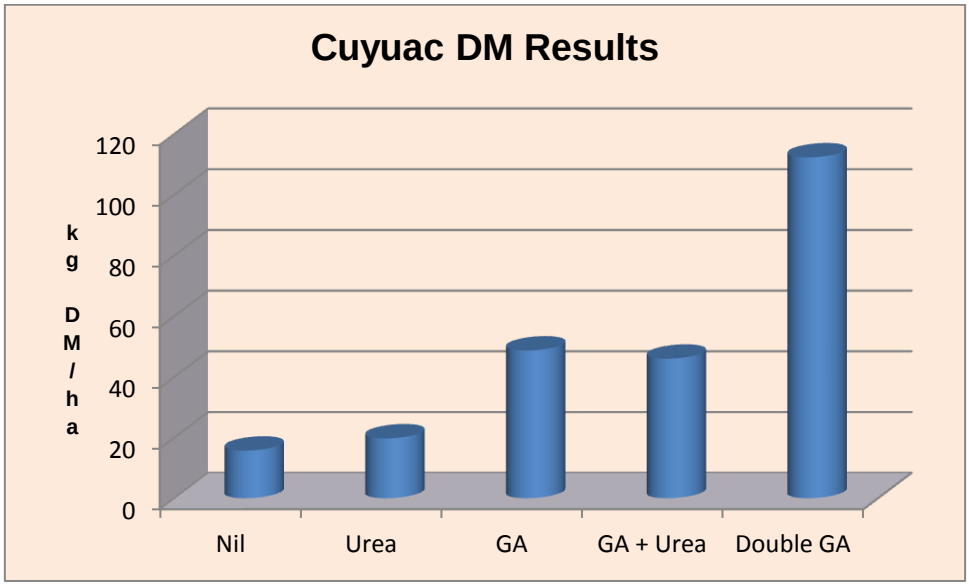

Figure 9: Cuyuac Dry Matter results

The GA at Cuyuac was applied with the liquid product Gala™ at a rate of 40 ml/ha which is the GA equivalent to 10 gm/ha of Pro Gibb™ which was applied at other sites. This is in line with the product recommendation of 40 – 80 ml/ha for perennial grasses; the lower is generally considered to be sufficient for phalaris.
The result from the single replicate at Cuyuac suggests that there may be a gain in using the higher rate of Gala™ and this will be factored into the planning of the 2017 demonstrations.

Host farmer comments; Andrew Edgar
The paddock grew a lot of feed and carried a large number of ewes through the lambing period in what was a cold, wet winter. We use GA regularly and regard it as a useful tool in our pasture management. We also use nitrogen on pastures in early winter when conditions are suitable and produce more additional feed than with GA applications.
I am a bit puzzled by the result of the higher rate of Gala™ and think that we need to add different rates to the demonstration next year".

Jallukar Park: Rhymney
The Holdfast GT phalaris and clover pasture at Jallukar Park was established in 2012 and after a tough start due to a dry spring, it has developed into a highly productive perennial pasture. At the time of treatment it had the highest estimated DM of the five paddocks in the Phalaris based pasture production demonstration with approximately 1400 kg dm/ha.

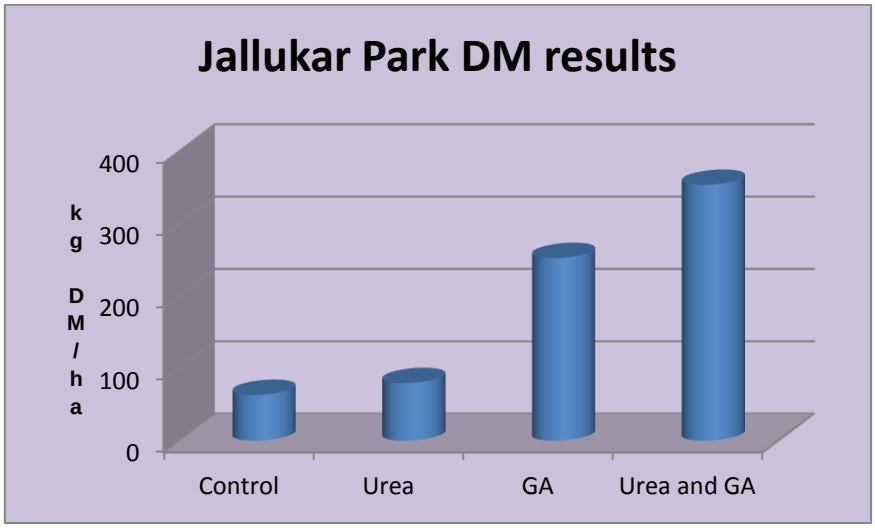

Figure 10: Jallukar Park DM results

The urea treatments at Jallukar Park were completed on June 22nd and the GA treatments were delayed until 25th of June due to heavy rain. The pasture cuts took place on July 18th, 26 days after the urea application and 23 days after the GA was applied.

Host farmer comments; Simon Brady
"I have been using GA for a few years now and it is part of our winter pasture management. We had good late autumn rains this year, so we had more feed going into winter and the paddock where we did the demonstration had more growth than in a normal year prior to the GA. We had a great result and it was still responding to the GA after the measurement date, so we grew even more feed than what was recorded in the dry matter results".

Marenda: Mt Dryden
The treatments at Marenda took place on the 22nd of June on an old phalaris pasture which had an estimated pasture mass of 800 kg/dm/ha. Pasture cuts were taken on July 19th, 27 days after application.

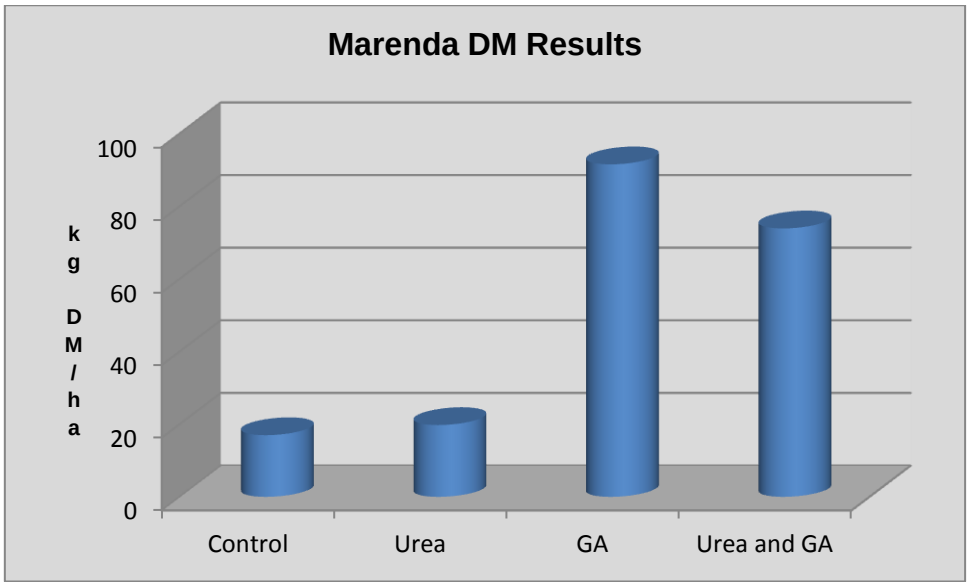

Figure 11: Marenda DM results

Host farmer comments; Wayne Burton
"I hadn't used GA previously but from the results that I have seen from the demonstration, it will now become part of our winter pasture management system. Although it was a good year, it still got tight in July and we needed to get ewes into the paddock for lambing, so I was relived after the 21 days post GA application to put the sheep back in. We had heaps more growth on the GA plots and it kept going after the sheep went in.

Figure 12: Marenda, GA foreground rep, nil GA background rep

Quamby: Dobie
The Quamby paddock was a late addition to the project due to another property's paddock becoming unavailable. The pasture on Quamby is a four year old Holdfast GT phalaris and Trikkalla sub clover pasture. It had been heavily grazed as it had been used for lambing down a mob of ewes. The estimated pasture mass was around 500 kg DM/ha, which is below the level usually recommended for GA application. The urea was applied on June 22nd and the GA on June 25th.
The pasture was assessed on July 20th and it was decided that the pasture was too short to obtain cuts from the standard height being used at the other sites. Instead pasture height measurements were taken; these were converted into estimated DM mass by using the MLA pasture ruler and are shown in the graph below.

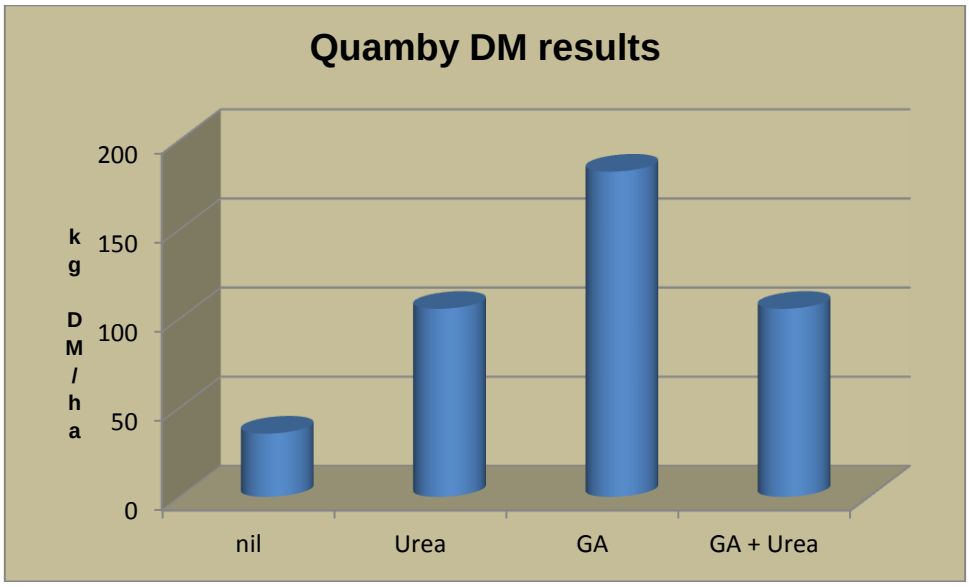

Figure 13: Quamby DM result; NB: Different method of DM assessment means that the graph for Quamby cannot be directly compared to the other site graphs

Figure 14: Quamby, GA foreground rep, Nil GA background rep

Figure 15: GA section 20th July 2016

Host farmer comments; Charlie & Rich de Fegely

"Even though we had good late autumn rains, the feed didn't get away quickly on our heavy basalt soils and things did get a bit tight in mid July. We applied GA to the rest of the paddock where the demonstration site was and even though we didn't grow a lot of extra feed, it was sufficient to get a week's grazing and allow a couple of other pastures to get a GA application and continue with our planned paddock rotation. The kg DM/ha in the paddock at application was below what we would normally be planning for but the GA was still a help. We estimate that having pastures at 800 – 1000 kg DM/ha when applying GA give the best economic response".

Millbanks: Elmhurst

The treatments at Millbanks were completed on the 29th of June and the pasture cuts took place on July 20th, 21 days after the applications. The Millbanks site is an eleven year old Holdfast phalaris and clover pasture and had approximately 900 kg DM/ha when the demonstration was set up.

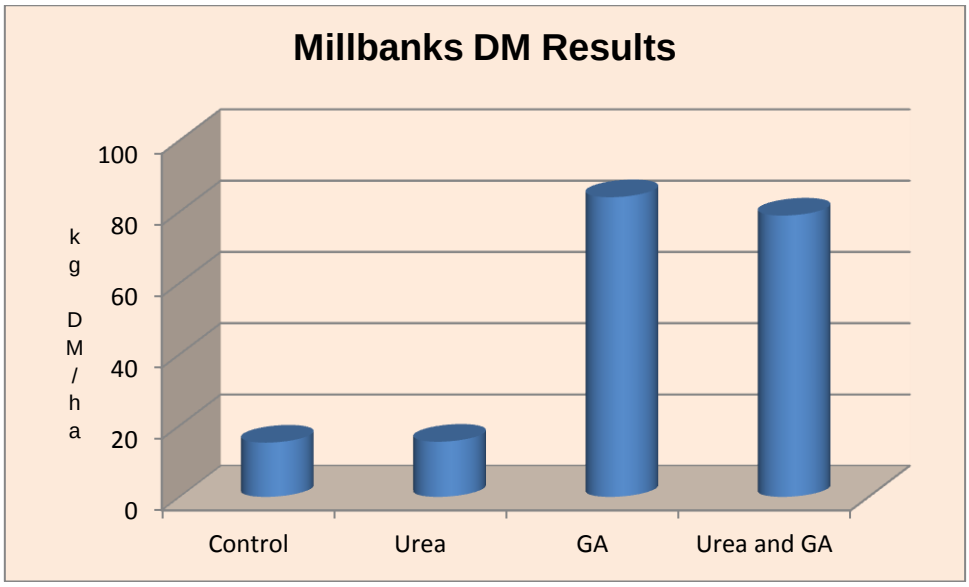

Figure 16: Millbanks DM results

Host farmer comments; Ben & Jodie Greene
"We have used GA in the past and consider it a useful tool in winter pasture management but it isn't the complete answer to winter feed requirements. It is hard to find paddocks in tough winters to take out for the three week period to allow the GA to take full effect so that needs to be considered when planning feed requirements. We weren't surprised by the low response to nitrogen in the cold winter months but we have used it with success in spring to set up phalaris pastures for our bull beef operation".

Figure 17: Millbanks, showing cut area used for DM results

Pasture Quality Effects

Pasture composition counts were undertaken prior to the treatments and in early and late spring, no major differences were recorded between the treatments.

The graphs below show the late spring results, the pasture composition was measured by using the pasture stick technique and also by conducting a visual assessment of the pasture. The results below show the phalaris content and the clover content for each treatment using both assessment methods.

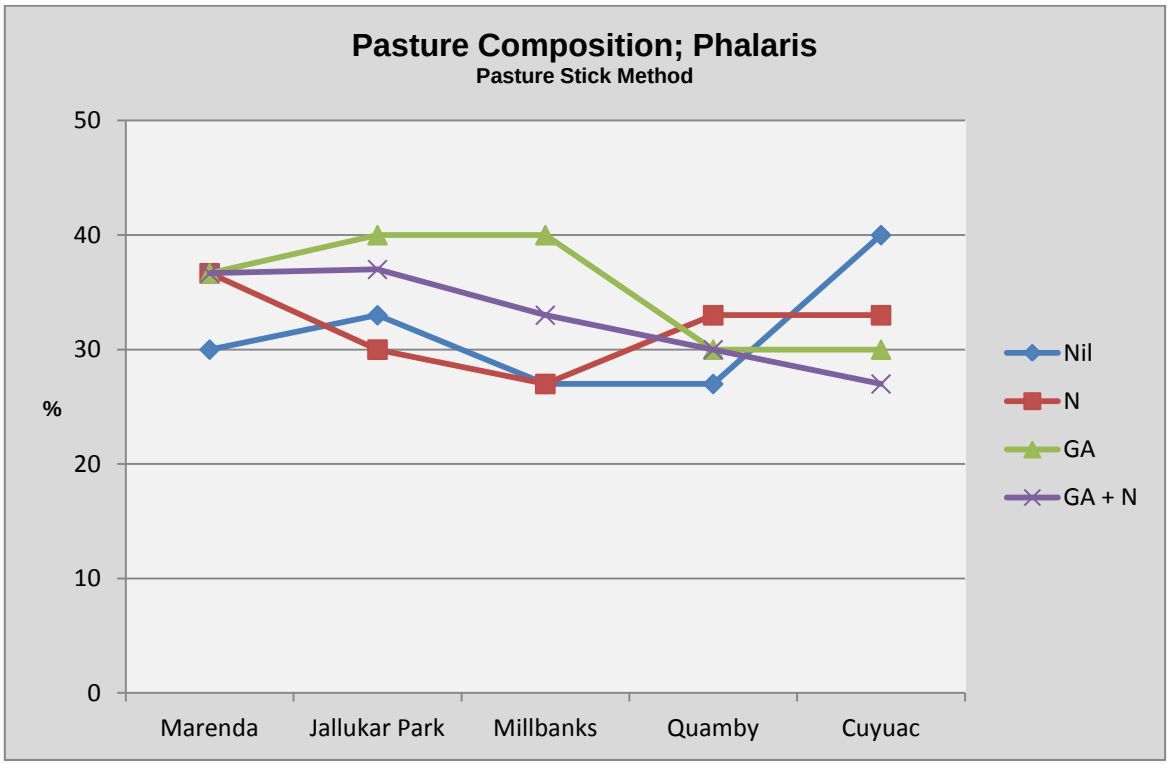

Figure 18: Estimate of phalaris % in the pasture for each site and treatment. Pasture stick method

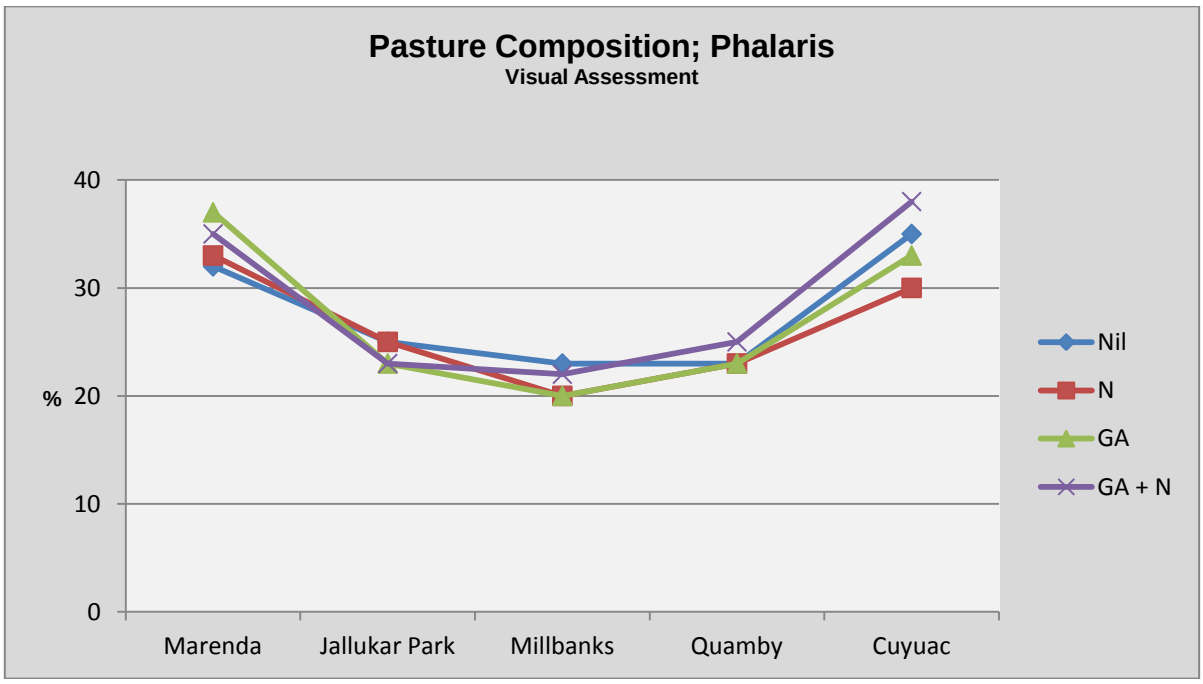

Figure 19: Estimate of phalaris % in the pasture for each site and treatment. Visual assessment method

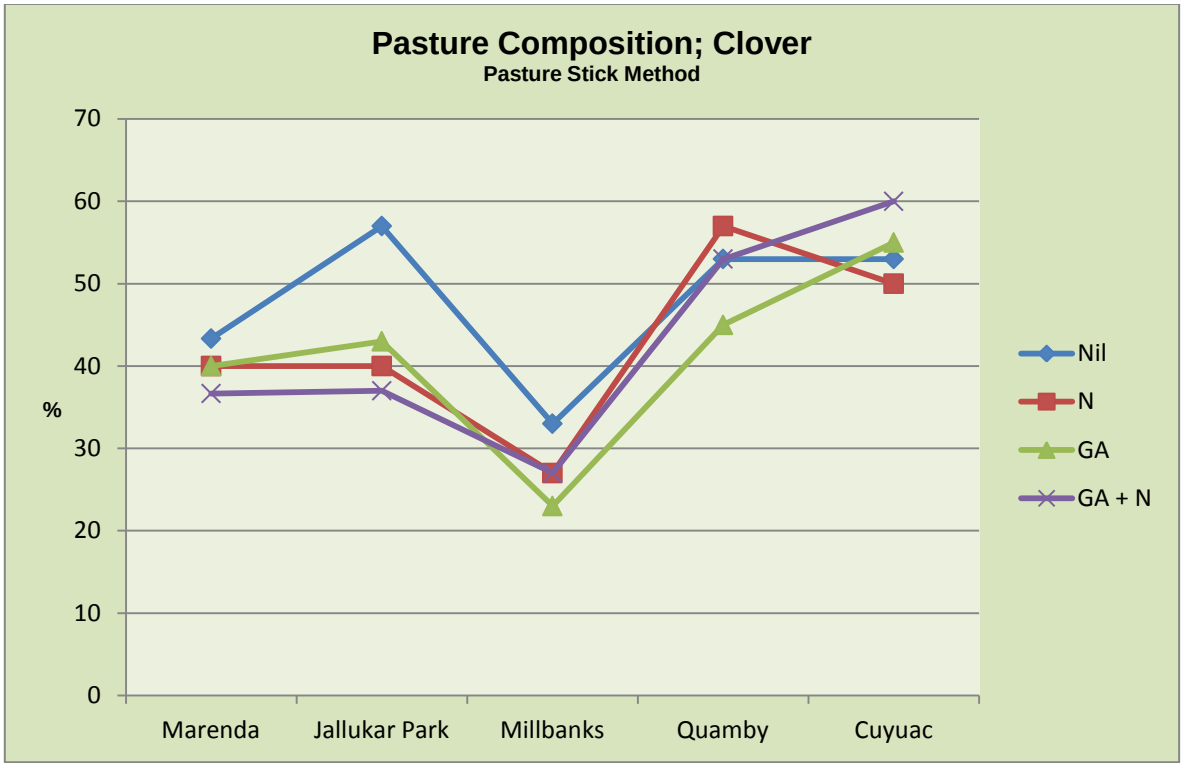

Figure 20: Estimate of clover % in the pasture for each site and treatment. Pasture stick method

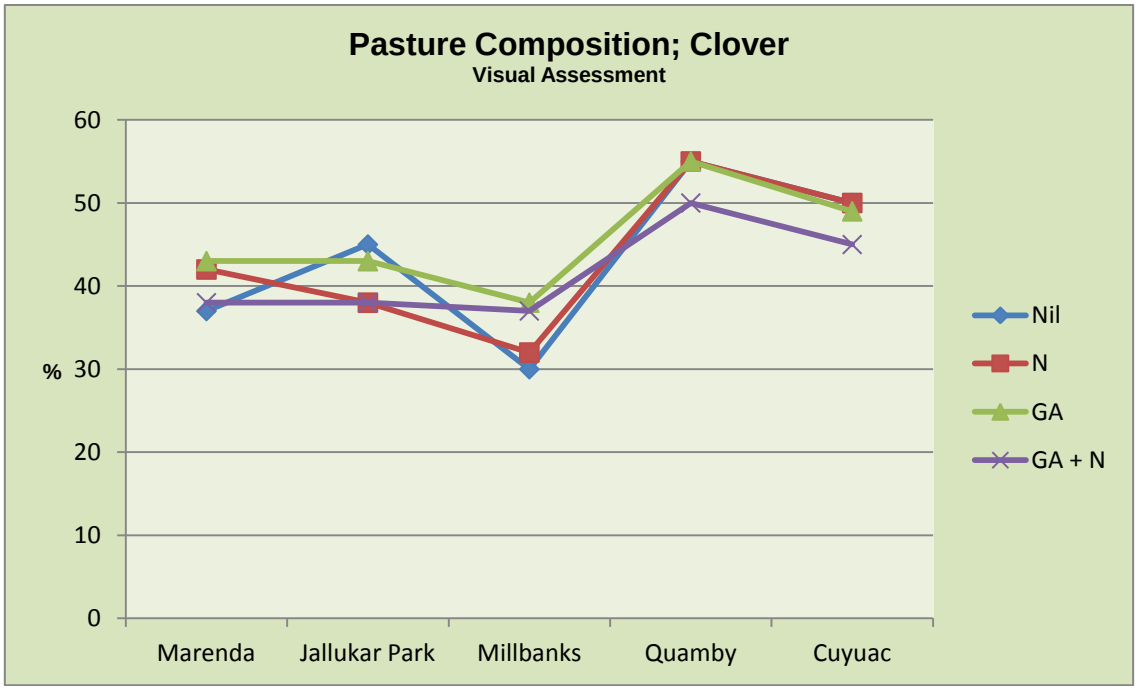

Figure 21: Estimate of clover % in the pasture for each site and treatment. Visual assessment method

Feed tests

Pasture quality tests were done on pasture samples collected at four sites when the DM cuts were conducted in July. They showed no feed quality penalty in the GA treatments; all the GA, N and GA + N had a higher ME value than the Nil reps except the N treatment at Jallukar Park.

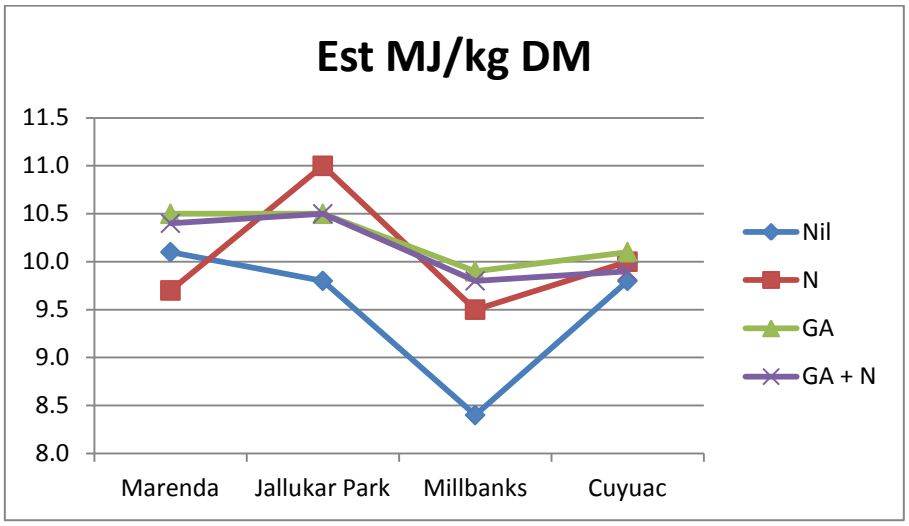

Figure 22: Est. metabolisable energy from post treatment Feed Tests

Cuyuac: Nareen

CUYUAC	Nil	N (urea)	GA	GA + N
Crude Protein	30.1	30.0	27.6	27.5
Neutral Detergent Fibre (NDF)	49.6	51.2	52.1	52.2
Digestibility (DMD) (% of dry matter)	66.4	67.6	67.8	66.8
Est. Energy (MJ/kg DM)	9.8	10.0	10.1	9.9

Jallukar Park: Rhymney

JALLUKAR PARK	Nil	N (urea)	GA	GA + N
Crude Protein	25.0	28.3	30.6	23.6
Neutral Detergent Fibre (NDF)	47.7	45.0	45.1	47.5
Digestibility (DMD) (% of dry matter)	66.5	73.5	70.2	70.7
Est. Energy (MJ/kg DM)	9.8	11.0	10.5	10.5

Marenda: Mt Dryden

MARENDA	Nil	N (urea)	GA	GA + N
Crude Protein	30.5	30.2	30.5	30.0
Neutral Detergent Fibre (NDF)	46.7	47.0	45.7	45.9
Digestibility (DMD) (% of dry matter)	68.3	65.8	70.4	70.1
Est. Energy (MJ/kg DM)	10.1	9.7	10.5	10.4

Millbanks: Elmhurst

MILLBANKS	Nil	N (urea)	GA	GA + N
Crude Protein	30.2	31.5	29.7	30.9
Neutral Detergent Fibre (NDF)	50.3	48.4	49.7	49.2
Digestibility (DMD) (% of dry matter)	58.3	64.4	67.0	66.5
Est. Energy (MJ/kg DM)	8.4	9.5	9.9	9.8

Figure 23: Summary of post treatment Feed Test results

Total Nitrogen
The samples taken in July were tested for total nitrogen; all were within or above the adequate range.
(The standard for adequate nitrogen in ryegrass is 3.5 to 4.5).

Client	Nil	Urea	GA	Ga + Urea
Millbanks	4.35	4.25	4.56	4.58
Jallukar Park	3.59	4.42	4.21	3.67
Cuyuac	4.62	4.89	4.30	4.64
Marenda	4.79	4.9	4.74	4.96

Figure 24: Total Nitrogen results

Spring
Feed Test
A spring feed test was conducted on phalaris plant samples taken from a GA replicate and a nil replicate at Millbanks Elmhurst. The results showed little difference between the samples which suggests that there is no feed quality reduction in using GA during winter.

Feed test results 4/11/16

TEST	**+GA**	**NIL GA**
Dry Matter %	*20.6*	*20.7*
Moisture %	*79.4*	*79.3*
Crude Protein (% of dry matter)	*23.6*	*22.3*
Acid Detergent Fibre (% of dry matter)	*18.2*	*18.0*
Neutral Detergent Fibre (% of dry matter)	*41.1*	*39.1*
Digestibility (DMD) (% of dry matter)	*82.0*	*79.8*
Digestibility (D)MD)(Calculated) (% of dry matter)	*76.3*	*74.4*
Est. Metabolisable Energy (Calculated) (MJ/kg DM)	*12.5*	*12.1*
Fat (% of dry matter)	*4.0*	*4.0*
Ash (% of dry matter)	*14.6*	*15.0*

Figure 25: Spring Feed Test results on GA & non GA phalaris plants

Plant Tissue tests
Plant tissue tests were also conducted on phalaris samples collected from the GA and nil treatments at Millbanks in late October. These showed little difference in the major nutrients but a few in the trace elements.

Tissue test results 4//11/16

ANALYSIS	**+GA**	**NIL GA**
Total Nitrogen % (Dumas)	*3.5 Marginal*	*3.3 Marginal*
Phosphorus %	*0.32 Sufficient*	*0.37 Sufficient*
Potassium %	*3.10 Sufficient*	*3.30 Sufficient*
Sulphur %	*0.33 Sufficient*	*0.42 Sufficient*
Cobalt (mg/kg)	*0.31 High*	*0.09 High*
Molybdenum (mg/kg)	*0.530 Sufficient*	*0.770 Sufficient*
Selenium (mg/kg)	*0.030 Marginal*	*0.078 Sufficient*

Figure 26: Spring Tissue Test results on GA & non GA phalaris plants

Spring growth
There were no visual DM differences between treatments in spring at any of the sites.

Phalaris based pasture production demonstration; **Summary**

All sites showed an increase in winter feed in response to the GA treatments ranging in percentage from 210% to 460%, the response to nitrogen was low with four sites recording an increase of less than 30%. The Quamby site showed a larger percentage increase to nitrogen, this may have been due to the smaller leaf area with only 500 kg DM/ha reducing the effectiveness of the GA.

Responses to the GA + N treatments showed large % increases but it is expected that this was a response to the GA; only one site showed the GA + N treatment to be superior to GA alone.

The extra feed produced when measured in dry matter varied and seemed to be influenced by the amount of kg DM/ha at the time of treatment. The site with the highest kg DM/ha at treatment time (Jallukar Park) recorded the highest DM increase and the site with the lowest (Quamby) had the lowest increase; this was in line with anticipated results.

The results at Cuyuac show mixed results with the measured dry matter results not reflecting the visible growth on the GA replicates, the response in the single replicate of double the GA rate was also unexpected. The site will be included in the 2017 demonstration so these factors can be explored by altering the trial site design.

All host farmers were satisfied with the amount of extra winter feed and regard the use of GA as a useful tool in their pasture management but emphasise that effective use of a GA program does require a fair degree of pre planning and flexibility to get the best results.

Figure 27: Pasture inspection at Marenda post treatment; GA in foreground, Nil in background.

Annual weed reduction demonstration

Background: The concept of the GA annual pasture demonstration sites came following observations made by PPS members during a farm inspection as part of the "EverGraze Whole Farm Grazing Strategies" course conducted by Geoff Saul and facilitated by PPS in 2014. During the inspection of a productive phalaris pasture at "Overdale" Concongella which been treated with GA, it was noted that an area of silver grass (vulpia spp.) near a rocky outcrop, which was not part of the phalaris pasture, had been preferentially grazed by sheep and had plant numbers reduced compared to the main area of silver grass around the rocks.
Mal Nicholson from "Overdale" explained that the area of affected silver grass had received an overspray of GA during the phalaris treatment and must have been subsequently grazed out by sheep when they were put into the paddock.
PPS considered that this may be a method of suppressing problem annual weeds at the same time as providing a small amount of extra winter feed for stock.

Data Collection
All sites had pasture composition measured using the pasture stick technique as well as a visual assessment. This was conducted before the GA was applied to three replicates and both the GA and nil replicates were assessed in late October – early November to evaluate the effect of the GA on annual weeds.

Results and Observations (to date);
Five sites were selected to demonstrate the technique; unfortunately the year one results have shown little difference between the treated and control areas at all sites.

Site Results

Jallukar Park: Rhymney
The pasture is an old phalaris stand with a variety of annual weeds in the paddock.

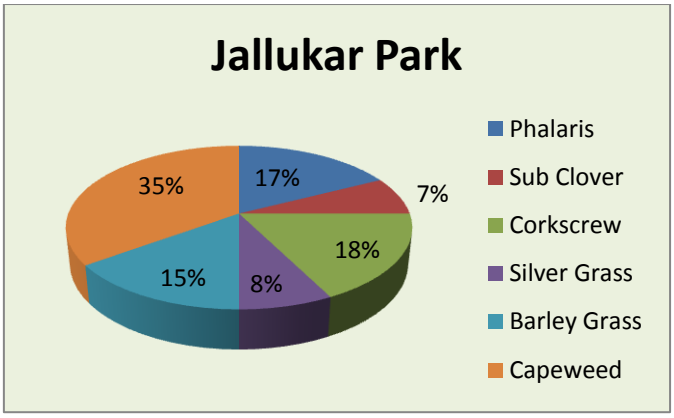

Figure 28: Jallukar Park pasture composition 20/6/2016 (pasture stick method)

The pasture had 3 replicates of GA applied on June 25th and was set stocked with ewes, which exerted moderate grazing pressure on the pasture. The plan to use the paddock as part of a rotational grazing plan was altered when higher than expected winter and spring growth allowed the ewes to remain in the paddock with more than sufficient feed to meet their requirements.
The pasture was assessed on the 20th of October using both the pasture stick method and a visual assessment. Both methods showed a slight reduction in silver grass (vulpia spp.) in the GA treated replicates but it was not considered a sufficient result to be of a consequence to the pasture quality.

Host farmer comments; Simon Brady
"The much greater than average winter feed growth meant that we were unable to put the grazing pressure on the paddock that we had planned. There didn't look to be much difference between the GA and nil areas, so it was interesting to see the pasture assessments showing a small reduction in silver grass".

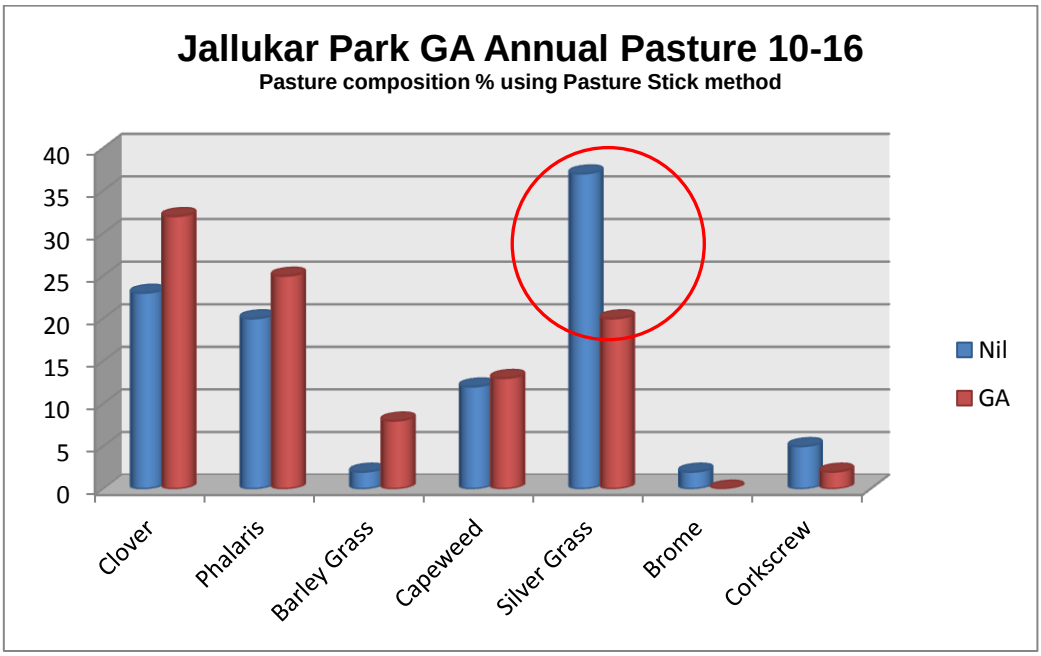

Figure 29: Jallukar Park pasture composition (pasture stick method)

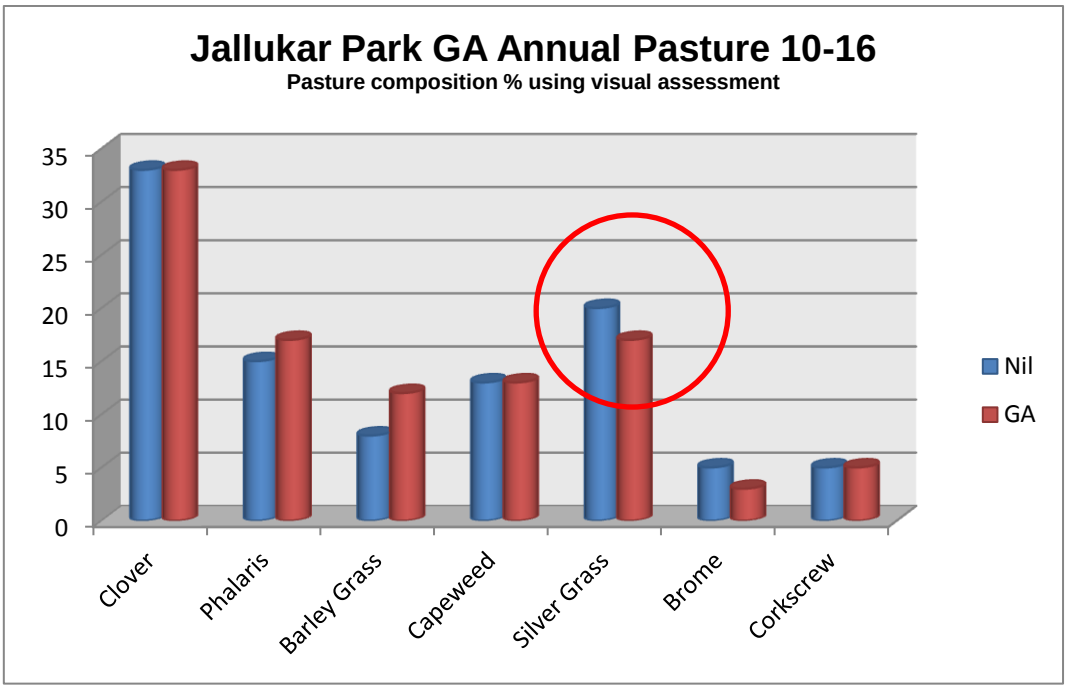

Figure 30: Jallukar Park pasture composition (visual assessment)

Millbanks: Elmhurst

The annual weed reduction demonstration paddock at Millbanks is the pasture established in 2009 as part of the PPS pasture variety site project funded by the MLA PDS program. It is a Holdfast GT phalaris and sub clover pasture which has proven to be a highly productive pasture since establishment. The pasture has had an increase in barley grass in recent years and it was included in the annual weed reduction demonstration to measure any effect that GA application combined with heavy grazing had on the barley grass. The pasture had 3 replicates of GA applied on June 29th and was stocked with ewes and lambs through late winter and early spring.

Pre treatment pasture composition

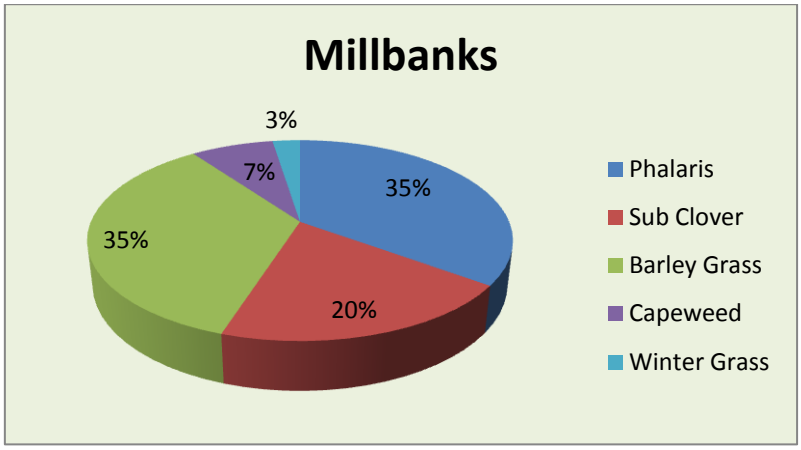

Figure 31: Millbanks pasture composition 21/6/2016 (pasture stick method)

Spring pasture composition

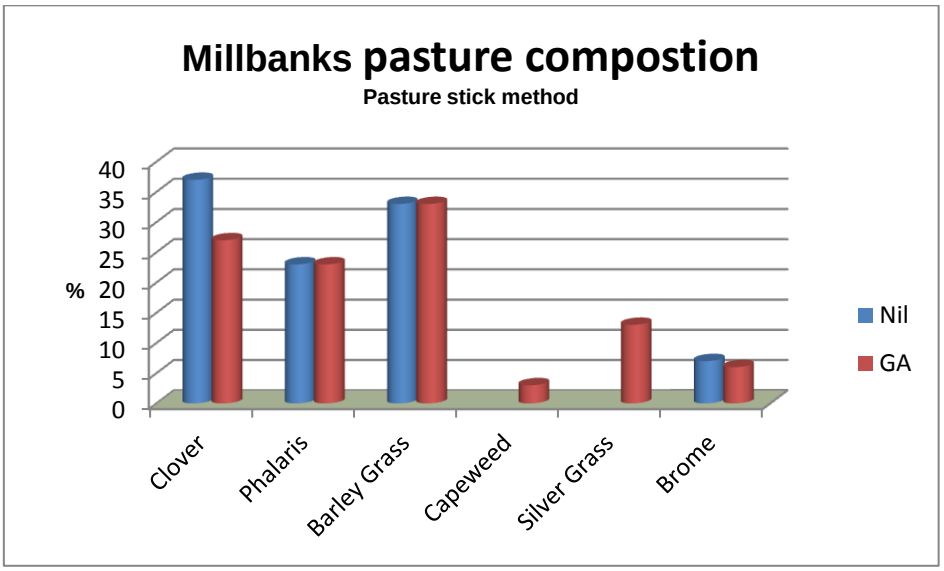

Figure 32: Post treatment pasture composition; pasture stick method

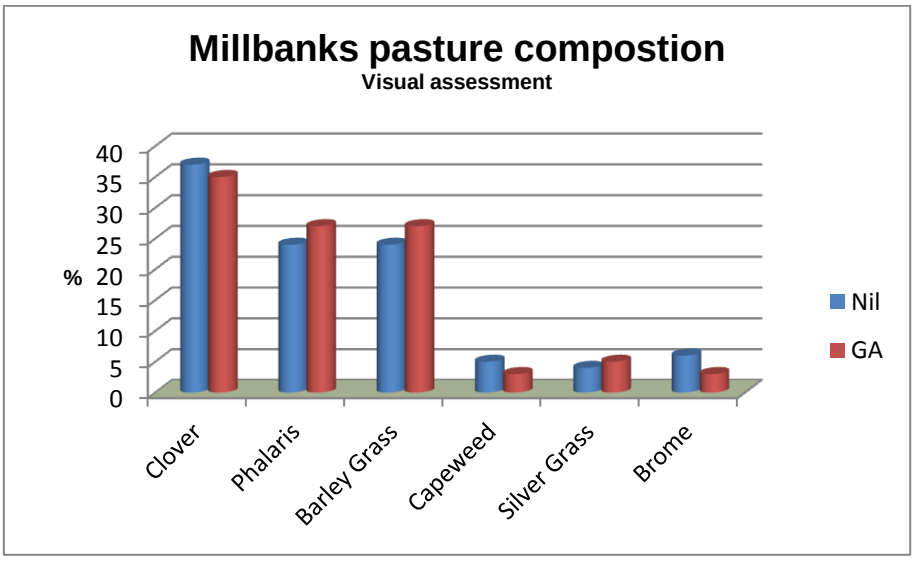

Figure 33: Post treatment pasture composition; visual assessment method

Overdale: Concongella

The pasture at Overdale is an 20 year old Australian phalaris paddock which received a successful onion grass (Romulea rosea) eradication treatment in 2015.

Pre treatment pasture composition

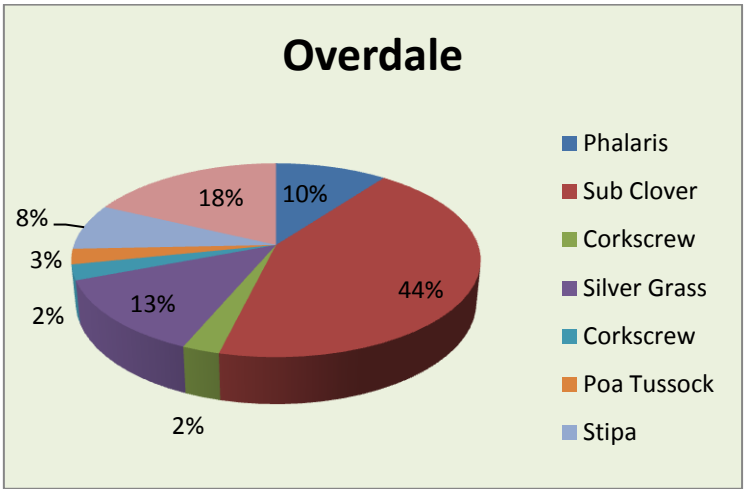

Figure 34: Overdale pasture composition 20/6/2016 (pasture stick method)

Spring pasture composition

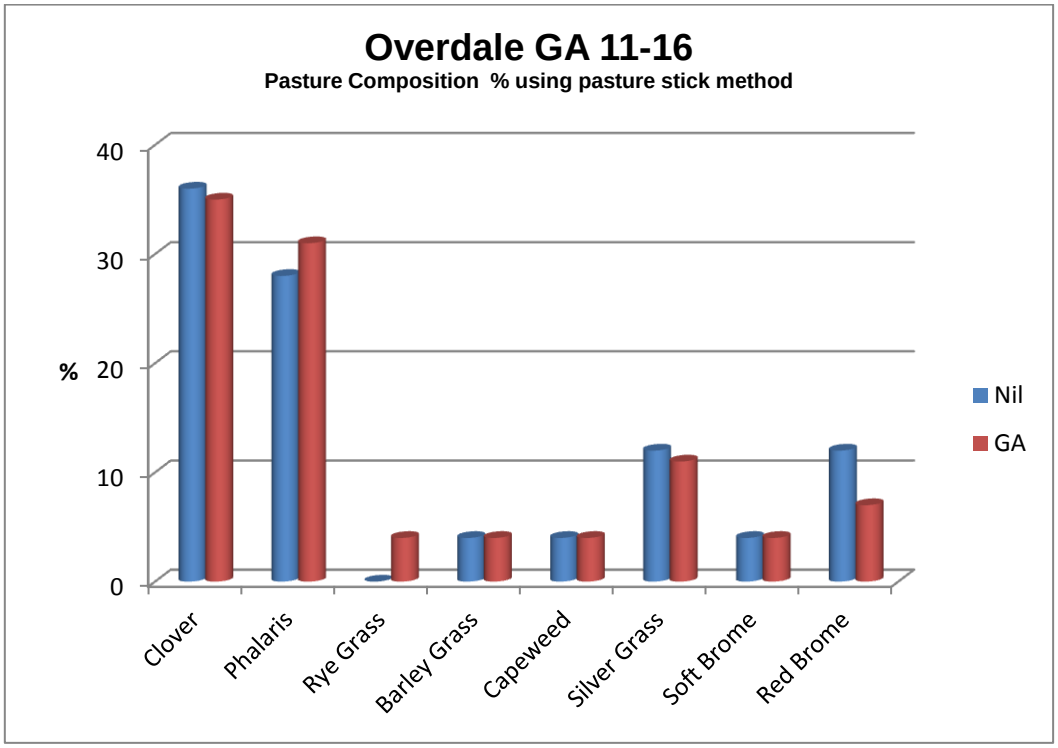

Figure 35: Post treatment pasture composition; pasture stick method

Overdale cont.

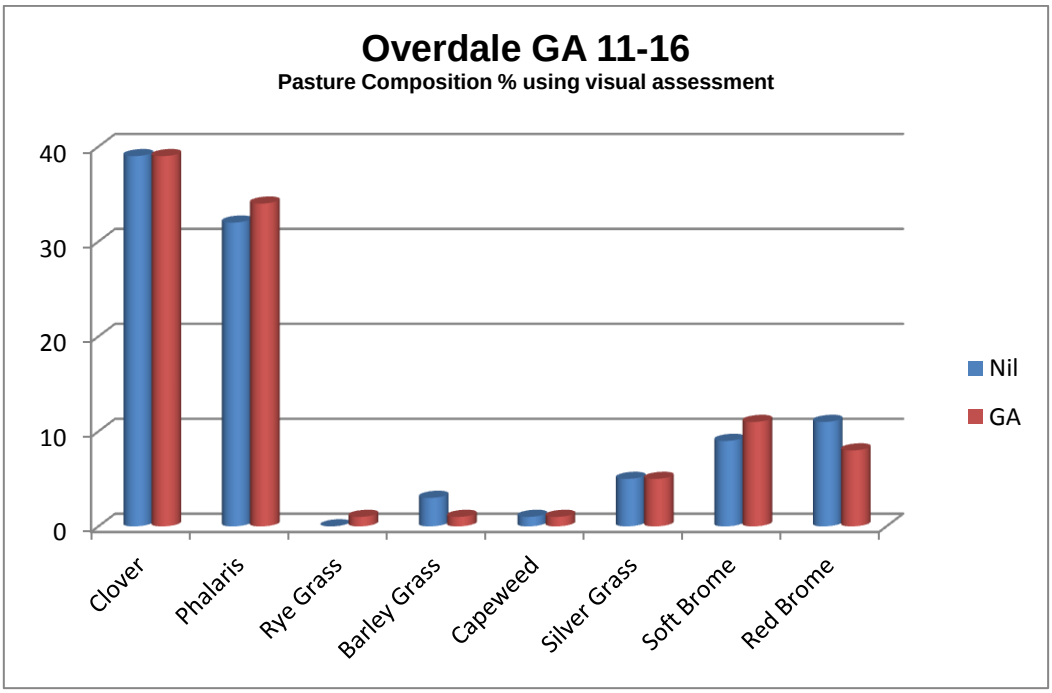

Figure 36: Post treatment pasture composition; visual assessment method

Host farmer comments; Mal Nicholson
"While we don't seem to have had much effect on the annual grasses, applying GA to the old phalaris got us a lot more feed, the paddock was grazed with ewes and lambs and the lambs from the paddock averaged 4kg heavier than those from the rest of the farm".

Cuyuac: Nareen
The treatment at Cuyuac focused on annual ryegrass and was set up with three GA replicates and three nil replicates in a farm laneway. The site received intermittent periods of heavy grazing. No major differences were recorded between the GA and nil treatments.

Pre treatment pasture composition

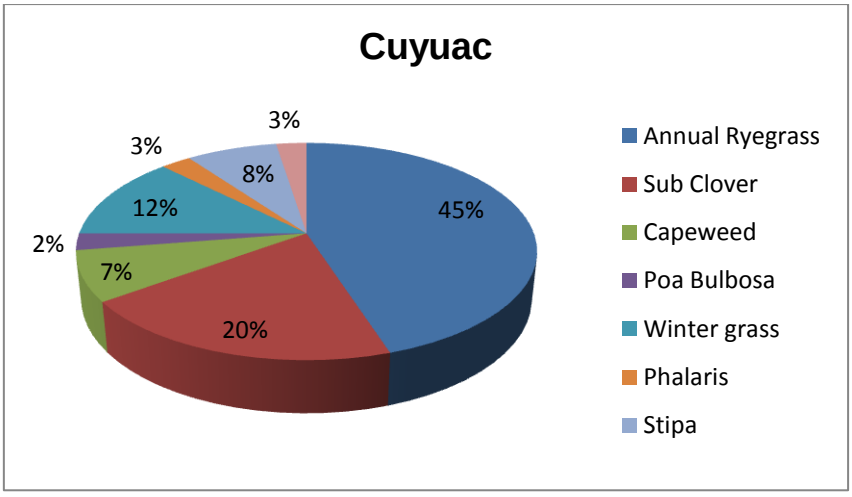

Figure 37: Cuyuac pasture composition 15/6/2016 (pasture stick method).

Cuyuac cont.

Spring pasture composition

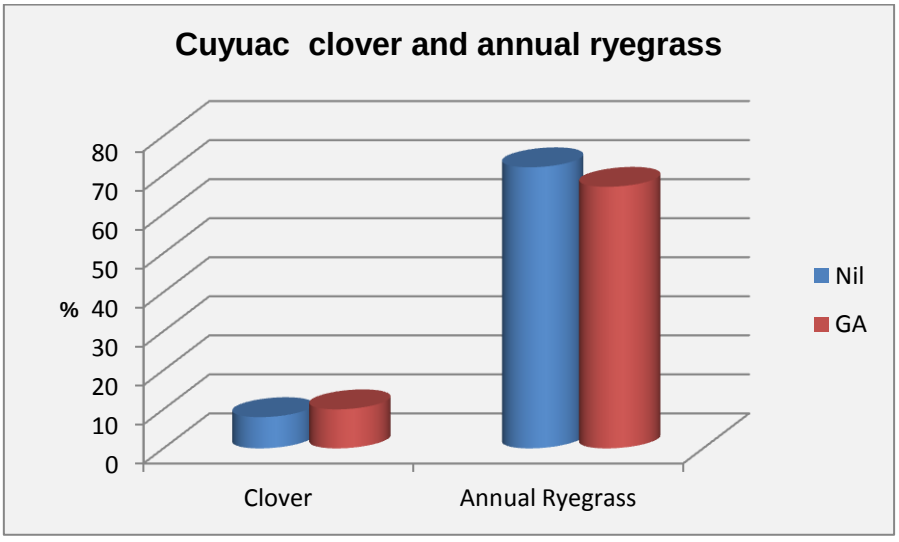

Figure 38: comparison of clover and annual ryegrass component of pasture composition between treatments. Visual assessment method

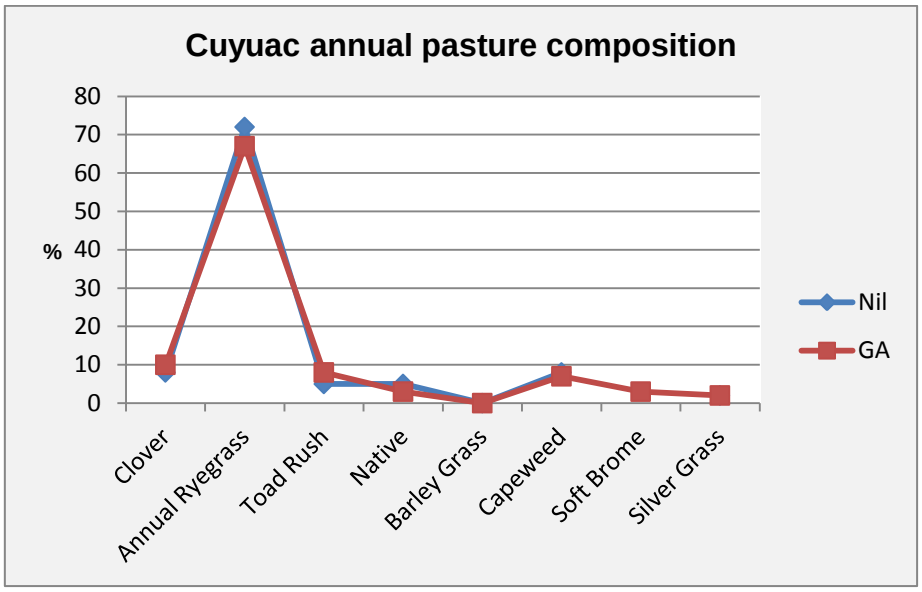

Figure 39: Post treatment pasture composition; visual assessment method

Figure 40: Cuyuac annual weed reduction demonstration site

Cuyuac cont.

Figure 41: Cuyuac annual weed reduction demonstration site

Tirranna: Mt Cole Creek

The Tirranna pasture is an old phalaris stand with a heavy infestation of silver grass (vulpia spp.), it was sprayed on June 21st and while Dennis Harrington noted that the sheep initially appeared to favour the GA treated areas, there was no noticeable reduction in silver grass by the spring.

Pre treatment pasture composition

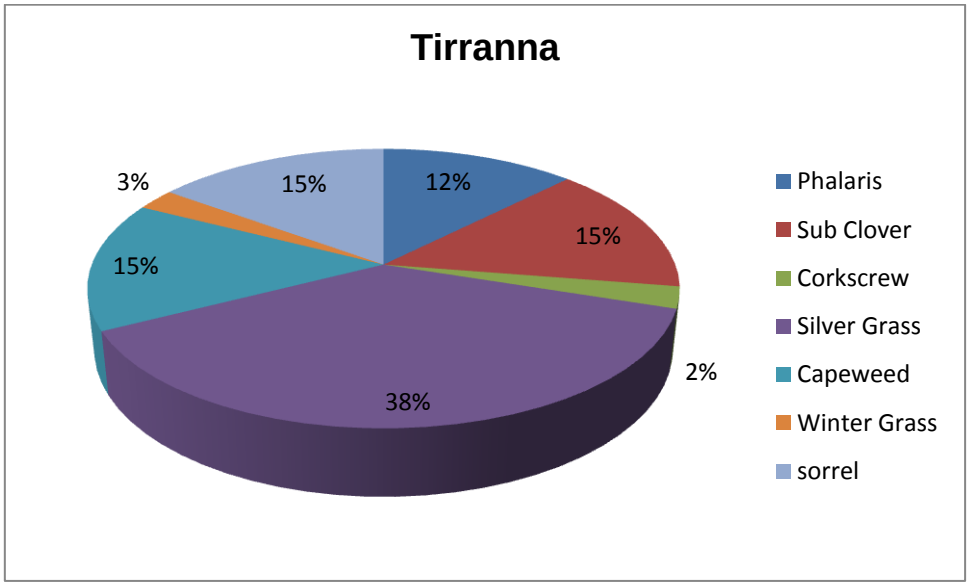

Figure 42: Tirranna pasture composition 21/6/2016 (pasture stick method).

Tirranna cont.

Spring pasture composition

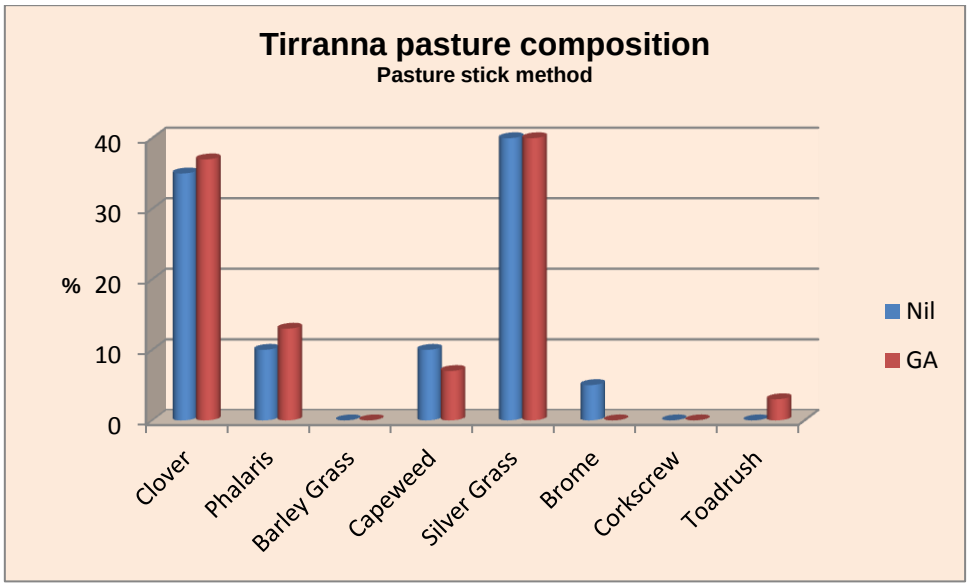

Figure 43: Post treatment pasture composition; pasture stick method

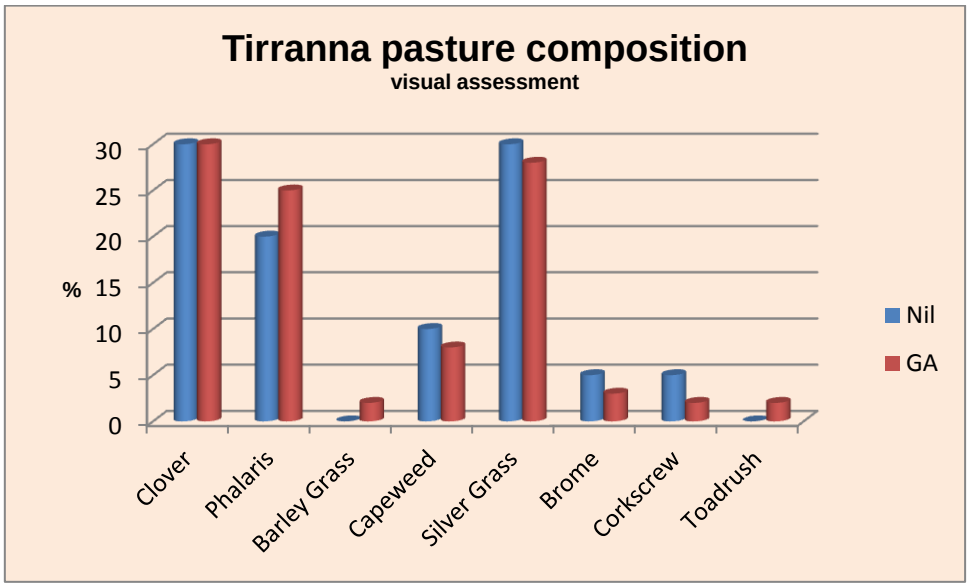

Figure 44: Post treatment pasture composition; visual assessment method

Figure 45: Silver grass in pasture

Tirranna cont.

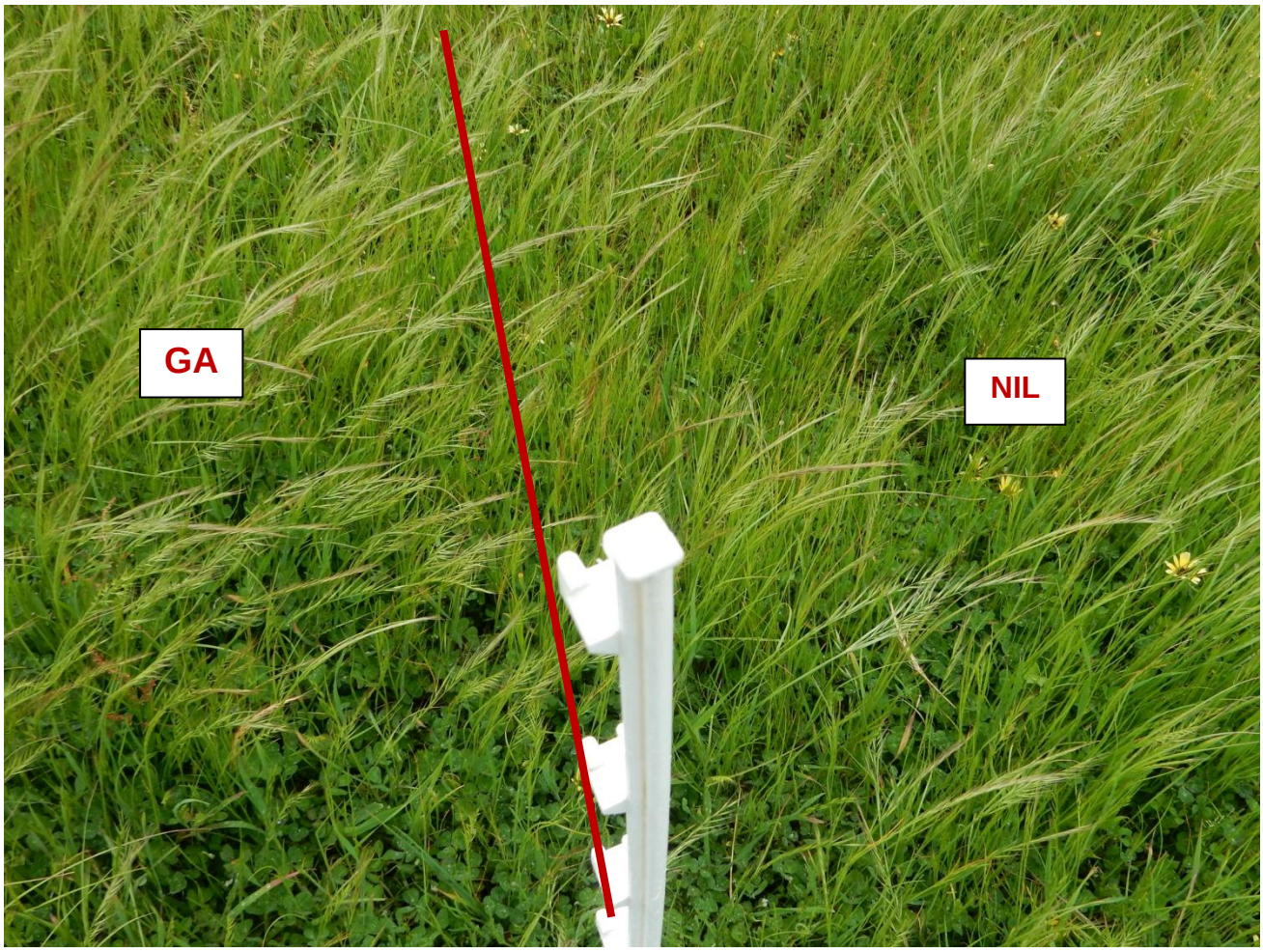

Figure 46: Tirranna annual weed reduction demonstration site

Annual weed reduction demonstration; summary

The annual weed reduction demonstration sites failed to replicate the effect seen on silver grass at Overdale in 2014. It also failed to produce any meaningful reduction in the other targeted annual grasses; barley grass and annual ryegrass.

There are four possible explanations to the failure of the treatment to produce the desired results in relation to the observed effects on silver grass.

1 The timing of the GA treatment may not have been at the time when the silver grass is vulnerable to being “grazed out” after a period of induced growth.

2 The GA treatment may have had a growth and/or palpability effect on the silver grass but there was insufficient grazing pressure able to be applied in what was a winter with above average pasture growth.

3 The interval between the GA treatment and grazing pressure on the silver grass may not have been the correct timing to commence the grazing.

4 It may be a case of the "null hypothesis", which refers to a general statement or default position that there is no relationship between two measured phenomena, or no association among groups. The null hypothesis is generally assumed to be true until evidence indicates otherwise. Therefore it may be that there was no association between the GA application and the fact the silver grass was suppressed when observed on the property in 2014.

Future Planning

The project advisory group and GA demonstration coordinators Rob Shea; PPS Project Manager and Rachael Campbell; Extension Officer Agriculture Victoria will analyse the 2016 results and plan to meet with project advisor Andrew Speirs in early 2017. The trial results and design will be discussed and plans for the 2017 demonstrations and potential sites will be decided.

Future Planning cont

Phalaris based pasture production demonstration

Discussion will include the DM measurement methods and whether nitrogen treatments need to be included. The 2016 results confirmed that adding nitrogen in mid winter is of little benefit to pastures and if it is to be used it needs to when soil temperatures are higher. The advisory group will also assess which pasture composition measurements are useful and necessary.

A financial and animal performance analysis using production data (dry matter production, pasture composition, benchmarking against LTEM FOO guidelines) will be conducted at the completion of year three of the demonstration.

Annual weed reduction demonstration

Discussions will include the timing of the GA treatments and the post grazing management. Different timing of GA treatments on the same pasture prior to grazing may be included. PPS will hold discussions with a leading expert in grass weeds to seek further information on possible changes to the demonstration.

References

Gibberellic Acid; its history and how does it work – Presentation by Andrew Speirs, PPS/GGSA MLA Pasture Update Stawell 24/3/15

ProGibb™; Product label

Gala™; Product label

PPS wishes to acknowledge the following people for their assistance with year one of the PPS GA demonstration project.

PPS Project Advisory Group: Simon Brady, Jodie Greene, Dennis Harrington

Host Farmers: Brady Family, Burton Family, de Fegely Family, Edgar Family, Greene Family, Harrington Family, Holden Family

Site selection assistance: Tim Leeming

Project design and advice: Andrew Speirs; Meridian Agriculture, Casterton

Project measurement assistance: Lisa McDonald, Peter Flavel & Daryl Kirkwood; Meridian Agriculture, Casterton

Project management assistance: Rachael Campbell; Agriculture Victoria, Ballarat

Project coordination assistance: Martin Dunstan & Gervaise Gaunt; Agriculture Victoria, Renelle Jeffery: MLA

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