

Tottington PPS/EverGraze Supporting Site

Final Report ~ February 2014

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PPS Tottington

EverGraze Supporting Site

2009 -2013

Final Report

Abstract

The productive and environmental benefits of perennial pastures are well documented but there are areas in the central region of Victoria where these pastures are difficult to establish successfully. These areas typically have a low fertility shallow topsoil overlaying impermeable clay layers which do not store moisture and allow the soils to dry out quickly. The typical unimproved pastures have a low legume content and contain low productive annual weeds.

A three year system to establish perennial pastures in these conditions is currently being promoted consisting of a crop phase to reduce weed infestation, a legume phase to aid weed control and fix nitrogen in the soil for the perennial grass establishment before the perennial grass establishment in year three.

PPS believes that the system is soundly based and could prove to be a valid method for perennial pasture establishment in these areas. PPS undertook to trial the system against a conventional establishment method.

During the period of the trial, the Tottington area experienced extreme seasonal conditions which compromised any valid conclusions being made about the establishment method comparisons. Despite this PPS has gathered useful information about these difficult sites for pasture establishment that will contribute to the wider PPS project and future research and extension projects.

PPS Tottington EverGraze Supporting Site Summary

The Perennial Pasture Systems (PPS) group was formed in mid 2007, reacting to concerns about the lack of research and extension into productive pastures in the Upper Wimmera and Central Highlands region of Victoria. PPS now has a membership of ninety farm businesses covering over one hundred thousand hectares, as well as having several agribusiness members. The aim of the group is to push the boundaries of perennial pasture research in the region and to provide information on productive pasture management.

PPS conducts research trials, seminars and an annual conference to present the pasture management information to members. The PPS EverGraze Supporting Sites at Mooneys Gap and Tottington have formed a vital part of PPS activities since their commencement in 2009 and 2010.

PPS identified the problems with establishment and persistence of perennial based pastures as a major barrier to improving profitability. There are paddocks within the region which are producing two to three times the district average and the PPS group believes that with appropriate research, paddock trials and extension that these improvements to productivity can be more widely adopted.

Perennial pasture establishment is expensive and carries a risk of failure due to seasonal conditions, weed infestation and other factors, these risks are much higher in the drier climatic conditions of Central Victoria than those experienced in more favourable rainfall regions.

A system for perennial pasture establishment is being promoted in the central Victorian region known as the *“triple pack pasture program™”*, this system uses a three year program to establish a perennial pasture.

PPS considers that this program could increase perennial pasture establishment success in the drier northern part of our region as well as being a system that would be relevant in other areas, where run down low fertility paddocks have low legume content and have become dominated by annual ryegrass, onion weed & silver grass. As the program is being promoted to PPS members as well as other farmers in our region, PPS concluded that it would be worthwhile to trial the program & test it against a more conventional pasture establishment.

In conjunction with the *“triple pack pasture program™”* trial, PPS conducted grass and legume trials at the trial site.

The *“triple pack pasture program™”* trial was severely comprised by seasonal conditions experienced throughout the duration of the trial and has not allowed PPS to make confident conclusions about the effectiveness of the program but suspects that it should be successful with more favourable seasonal conditions.

The grass and legume variety trial produced some interesting results but was also affected by the seasonal conditions, which affected the ability of PPS to produce conclusive results.

The EverGraze trials have complemented other PPS trials including the PPS MLA Producer Demonstration Scheme sites which trialled recently available perennial grass varieties against phalaris.

The results and information from the PPS projects are being conveyed to members and other producers; and are increasing their perennial pasture knowledge and their confidence in managing productive perennial pastures.

PPS Tottington EverGraze Supporting Site

Key Findings

The Tottington paddock is a particularly tough site for perennial pasture establishment, and it is reflective of the shallow, fast drying soil types which are prevalent in the region.

The extreme wet summer of 2010/2011 followed by drought conditions at Tottington in 2012 until late autumn 2013 severely affected both phalaris establishments. The wet summer conditions allowed the conventional section of the phalaris trial to produce unseasonal growth during its first year. The extreme dry conditions that followed the Triple Pack phalaris establishment severely affected the root development of the plants in that section. This resulted in any comparison of the two systems being comprised, so no valid conclusions have been made.

Perennial grass plant losses occurred in all treatments during the 2012-2013 drought like conditions at Tottington, including the pasture variety demonstration area which included cocksfoot and fescue.

Although the results were inconclusive at the Tottington site, the group believes that use of the triple pack program in normal years is likely to improve perennial pasture establishment in this drier northern region. It could also be relevant in other areas, where run down low fertility paddocks have a low legume content and have become dominated by onion and silver grass.

Further cost benefit analysis is warranted for the *Triple Pack* system before it is widely promoted to producers. PPS were unable to conduct a cost benefit analysis at Tottington due to the extreme seasonal conditions affecting results.

Producers in this region need to consider flexible alternatives when establishing perennial pastures in dry seasons. This could include risk management strategies such as a later sowing time, alternatives such as fodder crops if season is too dry or delaying pasture improvement to a subsequent year.

More research is needed to reduce the risk of failure in perennial pasture establishment in the difficult soils of central Victoria to increase the success rate of pasture improvement in this area.

History of PPS

The Perennial Pasture Systems (PPS) group was formed in mid 2007 after a meeting convened by Julie Andrew and Ewan Letts from the Victorian Dept of Primary Industries was conducted at Hall's Gap reacting to concerns about the lack of research and extension into productive pastures in the Upper Wimmera and Central Highlands region of Victoria

An executive committee was formed at the meeting which initiated the PPS group. Simon Brady from Jallukar became the groups first President and PPS undertook to commence three paddock scale projects to trial new pasture varieties which had recently become available. Planning of the project and paddock walks were the main activities through 2008.

PPS was able to gain funding to progress the group through Project Platypus and in March 2009 it hired a part time project manager who oversaw the establishment of the three PPS/PDS trial sites as well the EverGraze phalaris and lucerne trial site at Mooneys Gap. Also during 2009 the group's newsletter was commenced and PPS held their first annual conference and dinner.

During 2010 PPS continued their extension work with the newsletter, field days and the annual conference. A second EverGraze trial site at Tottington was also commenced.

PPS continued to gain new farmer members as well as attracting several members from industry such as agronomists and seed suppliers who are regular attendees at PPS events. In 2011 a soil amelioration project was commenced with funding from the A W Howard Trust. At the Annual conference dinner Ben Greene from Elmhurst was elected as the group's second president, also in 2011 PPS became an affiliated member of the regional Landcare umbrella group Project Platypus, which was a natural progression of the close cooperation between Perennial Pasture Systems and Project Platypus since PPS was formed.

In 2012 PPS started another major project with the establishment of four replicated plant variety trials set up to test pasture species under the different soil and climatic conditions in the region. 2013 saw the commencement of the Variable Lime Trial and the Stawell Cocksfoot Comparison Project.

PPS currently has a membership of 93 farm businesses across the Southern Wimmera and Central Victoria. PPS members are heavily involved in prime lamb, mutton, wool and beef production. PPS also has 35 members involved in agribusiness and agronomic services and one associate group member; the Yarram Landcare Pasture Group which has 16 farms involved. The total area farmed by group members is 102,423 Ha. PPS members manage approx 652,148 DSE, made up of 385,850 sheep, 8,890 cattle and 1502 goats. Cropping and export hay operations are also conducted on many of the farms. The smallest farm in the group is 20 ha and the largest is 8200 ha. The average farm size is 1101 ha and an average of 7010 dse is managed by group member enterprises.

The aim of the group is to push the boundaries of perennial pasture research in the Upper Wimmera and Central Highlands region of Victoria, and to provide information on productive pasture management to PPS members.

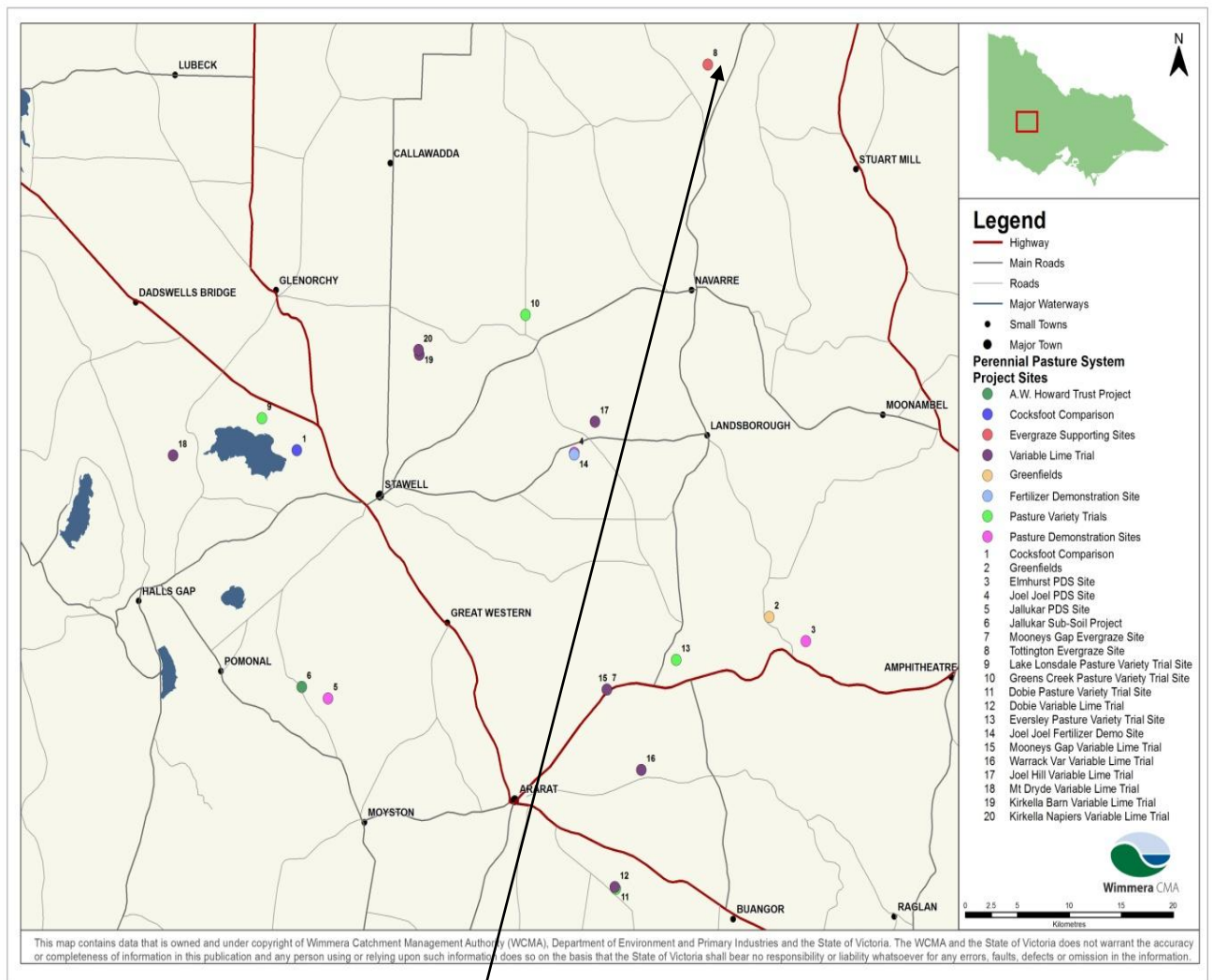
Perennial Pasture Systems Executive Committee 2007-14

Simon Brady	Jallukar	2007 – to date (President 2007 – 2011)
Wayne Burton	Mt Dryden	2012 - to date
Rob Gee	Greens Greek	2007 -2013
Alan Green	Great Western	2007 - 2009
Michael Greene	Elmhurst	2007 - to date
Ben Greene	Elmhurst	2007 – to date (President 2011 – 2013)
Ken Hall	Joel Joel	2007 – to date
Paul Harrington	Mt Cole Creek	2007 – to date (President 2013 – 2015)
Matt Kindred	Stawell	2009 - to date
Ewan Letts	Ledcourt	2007 - 2012
Rebecca McKay	Ararat	2013 - to date
Hayden Price	Crowlands	2013 - to date
Tony Roberts	Glenlofty	2007 - to date
Tom Small	Tottington	2009 – 2013
Project Manager	Rob Shea	Ararat 2009 - to date



PPS Management Committee February 2014

Figure 1 Map of current PPS Projects



**Tottington PPS/EverGraze
Supporting Site location**

PPS Tottington EverGraze Supporting Site

Location

Tottington is a 2200ha property situated on the Ararat-St Arnaud Rd approx 20 km south of St Arnaud. The farm is situated on the upper catchment of the Avon River and the main soil types for the area are classed as red sodosols. Tottington has an average rainfall of 523mm. Tottington is an official BOM weather site with records going back to 1894.

Tottington is owned by the Small family, who conduct a merino sheep enterprise on the property as well as lamb, cropping and hay enterprises.

Tottington is a historic property and is the location of Victoria's oldest working woolshed constructed in 1845.

Tottington was first farmed by Laurence Rostron, the son of a wealthy Lancashire cotton manufacturer, who took up Tottington in 1844. He had disgraced himself by falling in love with a mill worker and he was sent to manage the family interests in Rio de Janeiro. He returned to England and married his sweetheart and took her and his daughter to Rio de Janeiro and amassed a fortune. Returning to England he found the family disapproval had not waned, so he departed for Australia. He first took up Holcombe run near Daylesford, but found this too small and in late 1843 made an expedition to the Northern Pyrenees where he took up 160,000 acres on the Avon River which he named Tottington after his village in England. In 1844 the station was established and flocks moved up to the property. Rostron's diary notes the progress of the construction of the river red gum slab woolshed, which was finished in time for the first shearing on October 16th 1845. The building was extended with a lower ridgeline soon after.

Rostron is credited with having first introduced artificial fertiliser to Australia.

The Small family purchased Tottington in 1956.



Figure 2 – Historic woolshed at Tottington built in 1845

Site details

The site is on the Yolla section of Tottington and is about 4km north east of the Tottington woolshed. It has a shallow topsoil interspaced with quartz stone overlaying a heavy red clay subsoil. The clay layer restricts the absorption of water into the subsoil which forces some water to disperse laterally. Consequently the topsoil layer is prone to drying out very quickly. Short periods of dry weather during the growing season reduce moisture available to plants and places plants under stress reducing their persistence.

PPS Tottington EverGraze Supporting Site

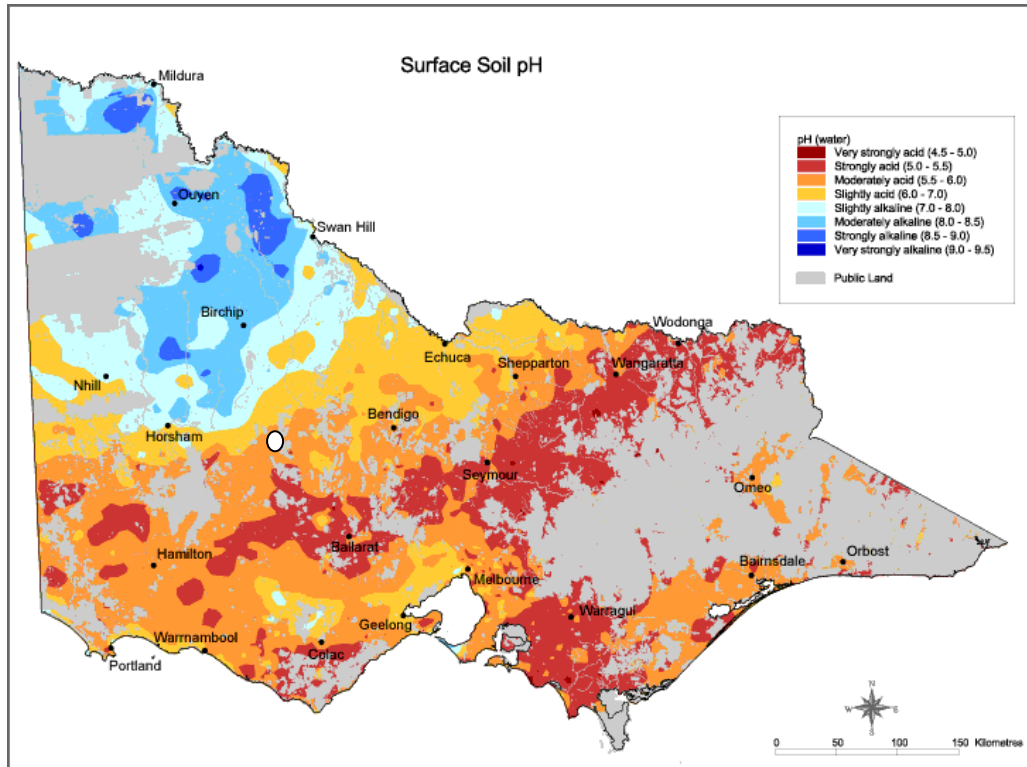


Figure 3 Soil pH Map of Victoria with approxamete site of Tottington circled

Rainfall map

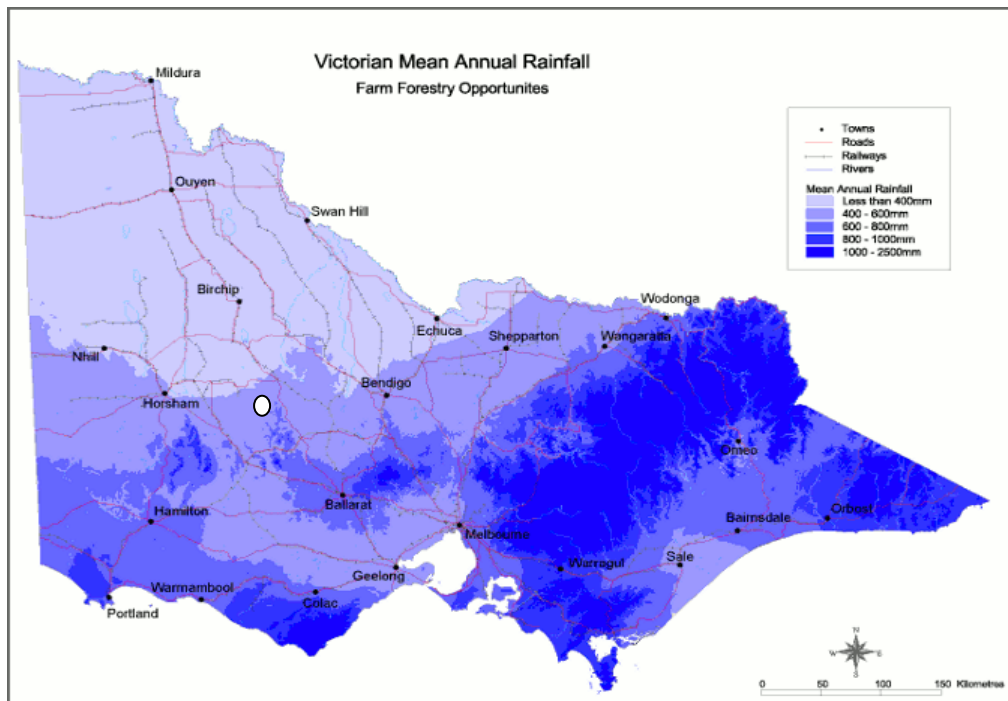


Figure 4 Mean Annual Rainfall map of Victoria with approxamete site of Tottington circled

PPS Tottington EverGraze Supporting Site

Project Summary

The main production issues being addressed by the Supporting Site are summarised below.

Producers in the drier regions of Central Victoria have issues in establishing and maintaining productive perennial grass pastures. The short growing season combined with difficult soils make it challenging to get long term pastures to produce at a level that provides an economic return on the investment involved in establishing them.

The project consisted of three parts, the main focus was one trialling the “*triple pack pasture program™*” and as part of the main trial sowing; different legume and grass varieties to test their ability to produce in the tough conditions at the Tottington EverGraze site. A small weed control demonstration was also conducted at the site in 2010.

The trial commenced in 2009 with establishment of an oat crop in the paddock.

Project consultants

Karl Drever, from Stephen Pasture Seeds Ballarat, was the initial project consultant until 2011, when he left the company and was replaced by Michael Grant also from Stephen Pasture Seeds. Brett Douglas and Hugh Russell from Harberger Farm Supplies St Arnaud also provided agronomic advice for the site.



Figure 5 Tottington project consultants Karl Drever and Michael Grant relaxing at a PPS BBQ in February 2011, after planning the next stage of the trial.

Seasonal conditions 2009-2012

2009

All months except October had good rains which made for an above average growing season (figure 6). Late spring rains created conditions that allowed growth through until late spring when the oat crop in the paddock was cut for hay.

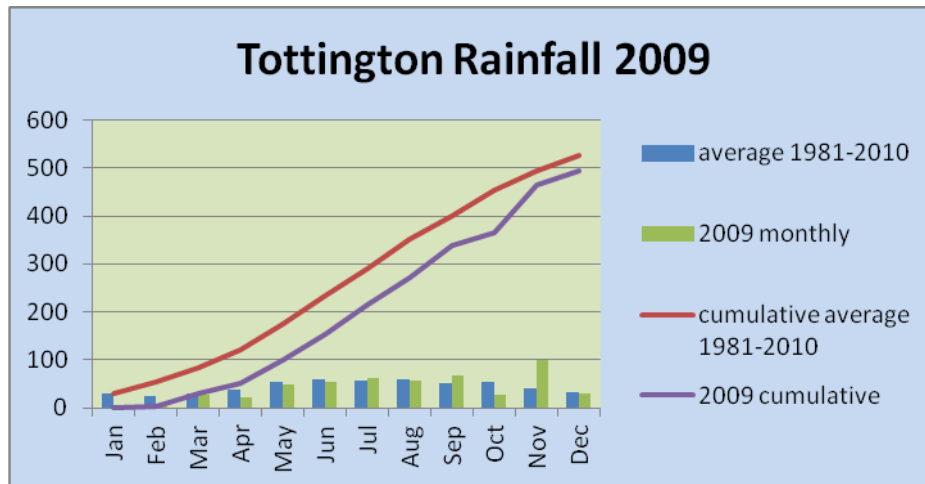


Figure 6 Tottington rainfall 2009

2010

2010 was an average year until above average late winter and spring rains occurred (figure 7). This late rain helped to produce exceptional growth in the late spring and early summer.

Early spring growth was restricted by a dry spell from 11th of September until the 6th of October when only 3.2 mm of rain fell.

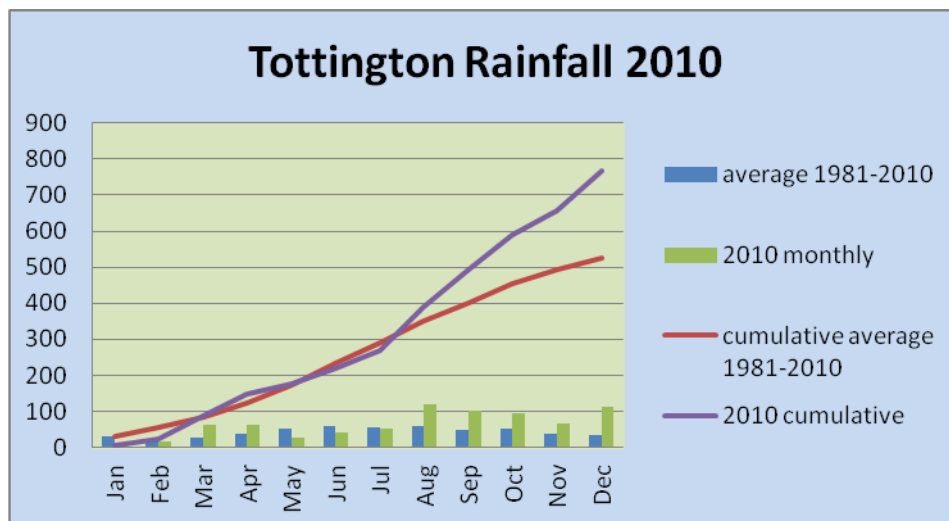


Figure 7 Tottington rainfall 2010

2011

The summer of 2010/11 was one of the wettest on record with 242 mm of rain recorded well in excess of the average of 106 mm; (figure 8). This allowed the perennial grasses to continue to grow right through the summer and autumn. Rainfall was then slightly below average for the rest of the year (figure 8).

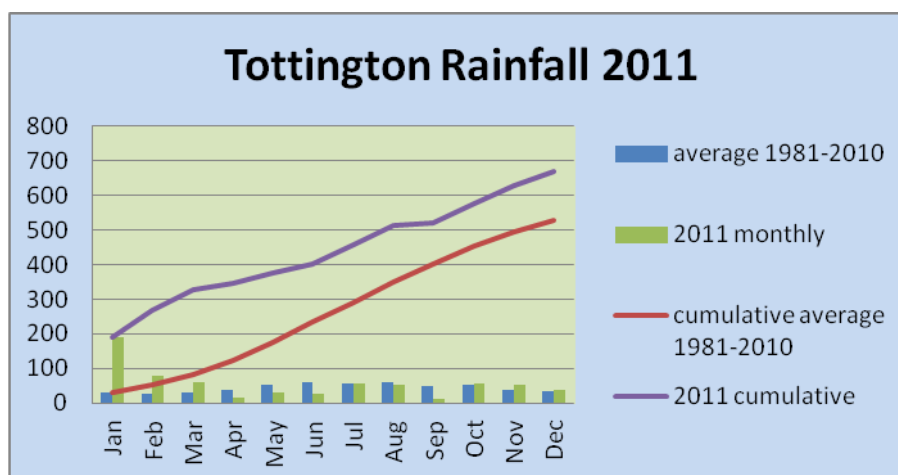


Figure 8 Tottington rainfall 2011

2012

The region experienced a very patchy autumn break with some areas receiving insufficient rain to call an autumn break until mid June. Late summer and early autumn rains at Tottington gave promise of an early autumn break but this did not eventuate as April and May were very dry negating the effect of the early rains. Tottington went into winter with very little feed growth. Although there were reasonable winter rains they did not allow for sufficient moisture to be retained in the soil for adequate growth and low spring rains meant that drought like conditions continued for all of 2012.

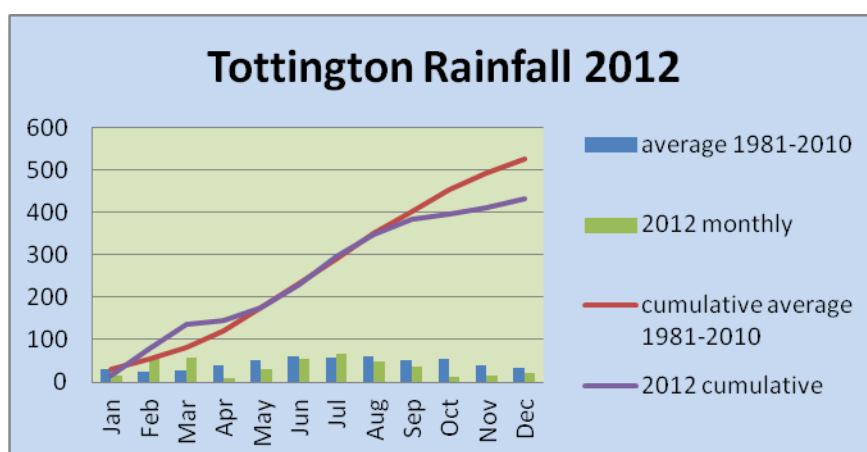


Figure 9 Tottington rainfall 2012

2013

Most of the Western part of Victoria had a very dry summer and autumn period. The autumn break did not occur until June 1st when a rain event of 31mm was sufficient to start adequate plant growth for stock feed. The rest of 2013 had good rainfall and pasture growth through winter and spring created very good conditions for the remainder of 2013.

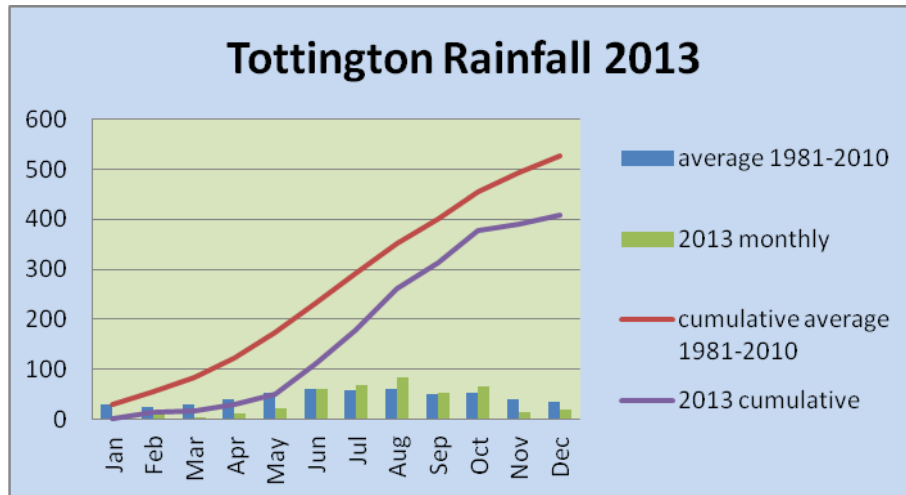


Figure 10 Tottington rainfall 2012



Figure 11 Sub Clover spring 2013 at Tottington reflecting the good growing season experienced after a very dry autumn

Triple pack pasture program™ trial



Figure 12 Project consultant Karl Drever and site host Tom Small calibrating seeder prior to legume sowing April 2010.



Figure 13 Legume sowing April 2010

Background

Issues with perennial pasture establishment and persistence restrict their adoption in Central Victorian regions of Victoria. The soils are typically duplex with shallow topsoil overlaying poorly drained clays. They are usually low in phosphorus and sulphur and can also be deficient in molybdenum and other trace elements. The soils are also highly acidic and may contain sodic subsoils and they are also often high in aluminium. The soils are prone to drying out rapidly when there is insufficient rain.

Rainfall in the region can be unreliable creating difficulties in pasture establishment and persistence. Easily established species such as Ryegrass have proven to only have short term persistence and while other species are more suited for long term pasture, several issues restrict their use by producers in the region.

Phalaris is slow to establish and the success of any sowing can be severely affected by weed invasion or low rainfall. High aluminium levels can reduce phalaris root development which reduces its persistence. These paddocks also typically have a low legume content resulting in low soil nitrogen levels.

The *Triple pack pasture program*[™] is designed to overcome some of the issues involved in establishing perennial grass pastures in these conditions.

The Triple pack pasture program[™]

The *Triple Pack Pasture Program* was developed as a joint venture between Stephen Pasture Seeds and Grassmanship (Nufarm solutions for productive pastures)

The system uses a three year program to establish a perennial pasture.

Year 1 is a cereal crop which allows the start of a weed control program as well as conducting soil tests to assess fertiliser requirements.

Year 2 is the sowing of a legume pasture to provide nitrogen for the subsequent perennial grass establishment as well as allowing for a wider range of weed control options.

Year 3 is the sowing of a perennial grass into the legume pasture.

Trial Aims

The trial aims to test the *“triple pack pasture program[™]”*, against the usual pasture establishment system of one year’s weed control and sowing of a perennial pasture.

The trial will assess the result by comparing the two systems with approximately one fifth of the paddock sown in a conventional way and the rest of the paddock established with the *“triple pack pasture program[™]”*.

The trial will also try to ascertain whether the claimed benefits of the *“triple pack pasture program[™]”*, outweigh the extra costs of a three year establishment system.

Trial Control

Approximately one fifth of the paddock was sown in a conventional way and the rest of the paddock was sown with the *“triple pack pasture program[™]”*. The two areas were separated by a drainage line and dam. The control area was sown with the methodology typically used when direct drilling perennial grasses in the region, where crop is grown for one to two years prior to sowing to reduce weed burden and the pasture grass is sown with sub clover following a knockdown weed spray after the autumn break in the year following the final crop.

Figure 14 Triple pack pasture program™ promotional brochure

Triple Pack Pasture Program™

3 Years
3 Sowings
3 Clean Ups

Cleaner and Successful Highly Productive
Long Term Perennial Pasture




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Triple Pack Pasture Program™

A system for improved success
and profitability for perennial
pasture renewal.







Year 1

- Soil test – correct any major deficiencies in fertility and pH – contact local fertiliser agronomist for advice.
- Complete knockdown spray (refer agronomic tips)
- Apply lime (refer soil test)
- Prepare paddock for sowing

Drill

Forage Cereal
 TARGA OATS
 Sowing Rate: 80 – 100 kg/ha

5. Post sowing inspect for insects and undertake post emergent weed control

Benefits

- Highly palatable bulk feed for winter grazing
- Produces excellent high yielding quality hay
- Onion grass control options
- Broadleaf weed control options

Agronomic Tips

Knockdowns

- Roundup PowerMAX + Spike (if required)
 - Surpass – General broadleaf weeds
 - Kamba 500 – wireweed, sorrel
 - Invader – melons

Insects – Monitor

- Crickets – prior to sowing
- Early post emergent: such as Redlegged Earthmite and lucerne flea & aphid populations

Post Emergent Weed Control

- Oniongrass
 - Lusta + LVE Agrilone

(Note: this may reduce dry matter production. Consult with your local agronomist)

- Broadleaf weeds
 - Broadside (Oats > than 5 leaf stage)



Year 2

- Complete knockdown spray
- Fertiliser strategy at sowing and prior to sowing (refer soil test)

Direct Drill

High Density Legume Blends

Early Season Blend 480 – 600mm Rainfall
 URANA SUB CLOVER
 RIVERINA SUB CLOVER
 BORDER BALANSA CLOVER
 THUNDER PERSTIAN CLOVER

Late Season Blend – 600mm+ Rainfall
 COOLAMON SUB CLOVER
 RIVERINA SUB CLOVER
 VILPER BALANSA CLOVER
 ARROTAS ARROWLEAF CLOVER

All clovers  treated

Sowing Rate: 12 – 15 kg

3. Post sowing inspect for insects and undertake broadleaf & grass weed control

Benefits

- High quality legume pasture for stock finishing
- High nitrogen fixation for following pasture (every tonne of legume/ha grown fixes approximately 25kg/ha of nitrogen)
- Able to control most grass weeds easily
- Broadleaf weed control options if required

Agronomic Tips

Knockdowns

Grazing legume crop until annual clovers start flowering, take stock off paddock for full seed set of legumes. Re-introduce stock when seed heads are dry to clean up trash, allowing for good regeneration the following year. Summer fallow is required for moisture conservation.

Knockdowns – see Year 1 Options

Insects – Monitor

- Crickets – prior to sowing
- Redlegged Earthmite / Lucerne flea populations
- Grubs – eg Pasture Looper

Broadleaf Weed Control – seedling weeds

- Butress + LI 700 – warmer conditions

Note: Butress can suppress Aroclor growth

- Bromicide 200 – temperatures < 18°C
- Nugrex

(Note – these options may require the addition of a second herbicide – consult your agronomist for possible options)

Grass Weed Control

- Use an appropriate grass herbicide or refer year 3 – Nuquelt/Simazine options.
- Silvergrass control – Simazine 900DF



Year 3

- Herbicide options prior to sowing
- Fertiliser strategy prior to sowing - refer soil test for long term maintenance of future pasture. Contact local fertiliser representative for advice (general recommendation at sowing 100 kg/ha M.A.P fertiliser)

Direct Drill

Deep Rooted Perennial Grass
 FLECHA TALL FESCUE

 Sowing Rate: 15 - 20 kg/ha

Benefits

- Mediterranean Tall Fescue with summer dormancy and reliable drought tolerance – includes quality clover component from previous year sowing
- High winter/spring production
- Excellent persistence
- High animal performance

Agronomic Tips

- Sow in warm, moist soils (15°C+) at 10mm sowing depth, following autumn rains and knockdown spray
- Allow Flecha Max P* to reach 10-15 cm high before first grazing
- Winter-Spring maintain pasture height between 5-15 cm
- Graze harder in late Spring (< 10cm)

Knockdowns – see Year 1 Options

Broadleaf Weeds – see Year 2 Options

NB: If competition from annual clovers & broadleaf weeds occur when establishing Flecha MaxP Tall Fescue then a strategic use of a broadleaf herbicide can be used. Consult your local agronomist for possible options.

Annual grasses – in autumn Year 2 onwards

- When annual grasses < 3 leaf
 - Nuquelt
- If Silvergrass is also an issue
 - Simazine 900DF + Nuquelt

Insects – Monitor

- Crickets in mid-late autumn
- Redlegged Earthmite / Lucerne Flea



Pasture seeds used and recommended in the Triple Pack Pasture Program™ are treated with




Benefits:

- Protection against Redlegged Earthmite attack for 3-4 weeks after sowing.
- Stress Shield effects, assisting plants to overcome environmental stress during establishment, such as a lack of moisture from extended dry periods, assisting in successful establishment of crops and pastures.




SPS Demonstration Site – Nattai Yallock Vic




SPS Demonstration Site – Western Victoria

Trial area

*Triple pack pasture program*TM area - 10.3 ha

Control area – 3.1 ha

Establishment

Year 1 - 2009

Paddock was sown to crop of Kangaroo Oats. Crop growth was average and the paddock was cut to produce oaten hay and yielded 4.5tonnes/ha

Weed Control - 1.2 l/ha Glyphosate and 12 gms/ha Glean

Fertiliser – 80 kg/ha MAP

Year 2 – 2010

Lime was surface applied prior to sowing @ 2.5 tonnes/ha.

Weed knockdown spray 16th April - 3 l/ha Roundup powermax.

The Triple Pack legume pasture was direct drilled on 22nd April.

The Conventional phalaris pasture sown on 22nd April.

150 kg/ha single super applied with sowing to both sections.

The Triple Pack legume section was sprayed for annual grass control 25/7/10.

A small area was sprayed with different combinations as a demonstration of various annual weed control options, see page 41

The remainder of the Triple Pack legume section was sprayed with 550 ml/ha simazine+700ml/ha MCPA+200 ml/ha astound.

Legume sowing

The legume sowing consisted of establishing a sub clover pasture over the entire site, the opportunity was also taken to sow other clovers to use as a comparison during the legume phase. The legume was direct drilled with an Agrowplow seeder.

The site was sown with 5 kg/ha of Urana sub clover. Six other legumes were added to the Urana sub clover in separate strips across the paddock.

Mintaro sub @5kg/ha Coolamon sub @ 5 kg/ha Riverina sub @5 kg/ha

Border balansa @ 5 kg/ha Flash Persian @ 7 kg/ha Arrowleaf @ 7 kg/ha

All seed was inoculated with “Gaucha” & “Kickstart”.

Conventional phalaris sowing

Holdfast GT phalaris was sown at 5 kg/ha with Urana, Mintaro & Coolamon sub clovers. A small area was also sown with Australian phalaris and Trikkalla sub clover due to insufficient seed available. The pasture was direct drilled with an Agrowplow seeder. The conventional phalaris sowing area is separated from the legume area by a drainage line and dam.

Year 3 – 2011

Weed knockdown spray 25th June -1 l/ha Gramoxone.

RLEM spray 25th June - 0 ml/ha Dimetholate

Legume pasture was direct drilled with an Agrowdrill machine on 27th June.

80 kg/ha DAP applied with sowing

1ha areas sown as a variety trial

Area 1 - 3 kg/ha Uplands Hispanic cocksfoot & 8 kg/ha Fletcha winter active Fescue

Area 2 - 3 kg/ha Uplands Hispanic cocksfoot & 4 kg/ha Holdfast GT Phalaris

Area 3 – 5 kg/ha Australian Phalaris

Remainder of paddock - 5 kg/ha Holdfast GT Phalaris

Figure15 Establishment cost for the Tottington paddock establishment. Calculated with the EverGraze pasture cost calculator

Pasture Establishment/Paddock Development Costs					
Paddock Name:					
Paddock Development (incl. fencing, levelling, water supply etc)			Price		Cost \$/Ha
Fencing		kilometres		per Km	\$0
Pipes		metres		per metre	\$0
Levelling		hectares		per Ha	\$0
Troughs		troughs		per trough	\$0
Other infrastructure				per Ha	\$0
Type		Rate			
Cultivation					
		passes		per Ha	\$0
					\$0
Lime/Gypsum Application					
Lime	2.5	T/ha @	\$50.00	per tonne	\$125
Cartage and Spreading (if not already included)				per Ha	\$0
					\$150
Seed					
phalaris + legume	10.0	kg/ha @	\$32.00	per kg	\$320
Contract sowing cost			\$50.00	per Ha	\$50
					\$370
Fertiliser (incl. cartage)					
DAP	150	kg/ha @	\$0.70	per kg	\$105
Spreading (if not already incl.)				per Ha	\$0
					\$105
Spring spraying (year before establishment)					
		L/ha @		per L	\$0
Application costs				per Ha	\$0
Pre-sow spraying					
Roundup	1.5	L/ha @	\$12.00	per L	\$12
Application costs			\$15.00	per Ha	\$15
Post-sow spraying					
RLEM	0.5	L/ha @	\$6.00	per L	\$3
winter spray - legume	1.0	L/ha @	\$10.00	per L	\$10
Application costs			\$30.00	per Ha	\$30
					\$70
TOTAL ESTABLISHMENT COST PER HA					\$670

Note phalaris seed prices were very high in 2010 and 2011 >\$20per kg

Soil tests

Soil deficiencies were addressed on the basis of the 2010 tests, and the 2011 and 2012 results show changes in soil pH, Olsen P, sulphate sulphur, potassium and aluminium levels. *Note* Olsen P result in 2012 may have been affected by the dry conditions at sampling.

Figure 16 - 0 / 10 cm soil tests

Paddock:	McCallums	0-10cm	0-10cm	0-10 cm
Test	Unit	April 2010	April 2011	May 2012
Soil Texture		2.5	3.0	medium clay
pH (CaCl)		4.4	5.3	4.6
Organic Carbon	%	1.37	2.31	2.65
Phosphorus Buffering Index				63.1
Olsen Phosphorus	mg/kg	10	11.3	23.4
Nitrate Nitrogen	mg/kg	21	11	7
Sulphur (KCL 40)	mg/kg	10.5	11	25
Potassium (Colwell)	mg/kg	216	261	220
Calcium	meq/100g	3.14		4.81
Magnesium	meq/100g	0.96		1.06
Potassium	meq/100g	0.48		0.56
Sodium	meq/100g	0.30		
Aluminium	meq/100g	0.25	0.16	0.07

Figure 17 Deep Soil test taken in 2010

Paddock:	McCallums	10-60cm
Test	Unit	April 2010
Soil Texture		3
pH (CaCl)		5.1
Organic Carbon	%	0.32
Olsen Phosphorus	mg/kg	1.9
Nitrate Nitrogen	mg/kg	2
Sulphate Sulphur	mg/kg	23.8
Potassium	mg/kg	146
Calcium	meq/100g	3.17
Magnesium	meq/100g	2.15
Potassium	meq/100g	0.39
Sodium	meq/100g	3.58
Aluminium	meq/100g	0.18

Figure 18 Legume and Control

Site map
Sown 2010 (not to scale)

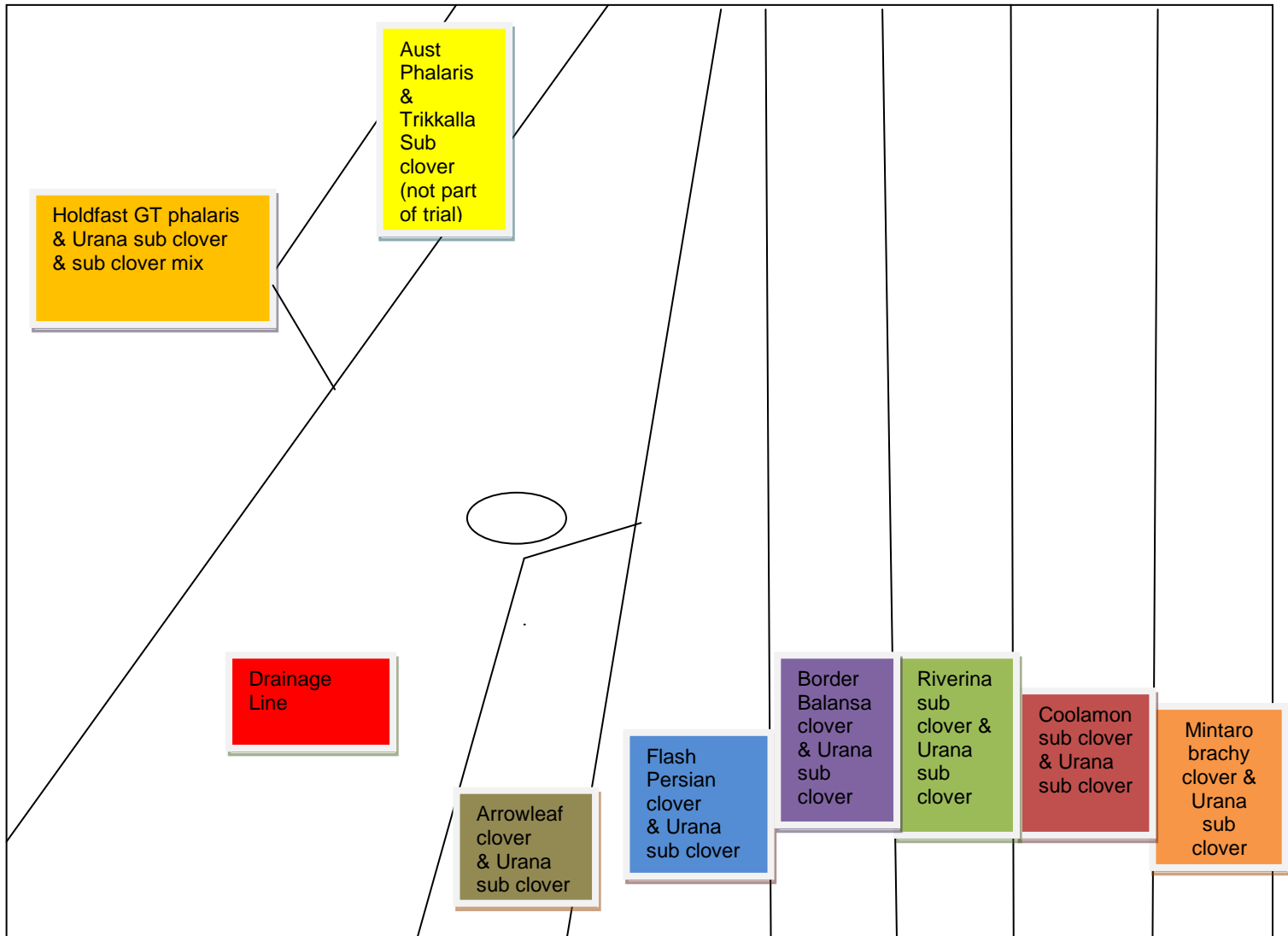


Figure 19 Grass Trial

Site map

Sown 2010 and 2011(not to scale)

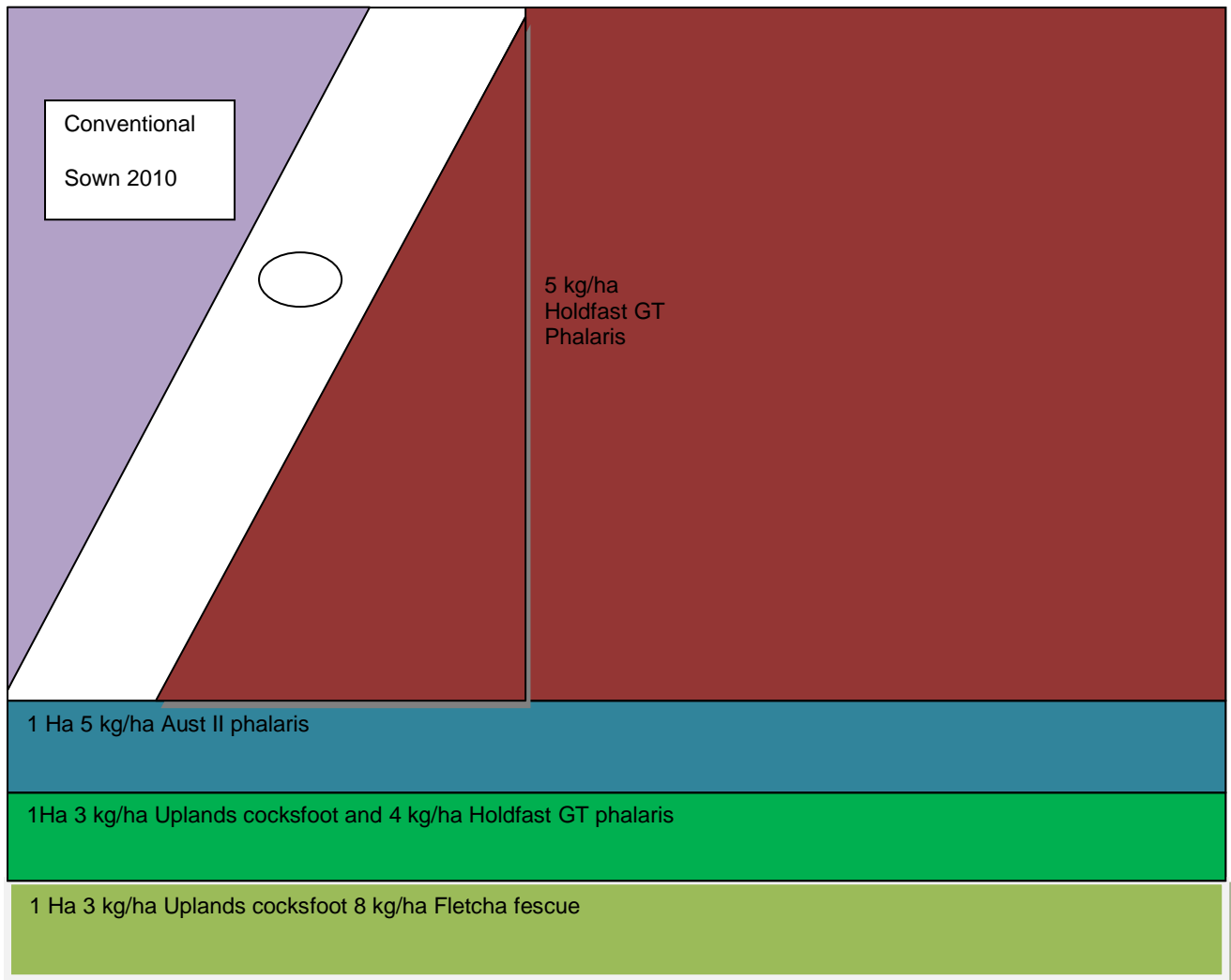


Figure 20***Phalaris Pasture Maintenance Operations 2010 – 2013***

2010	Date	11/03/2010		18/5/2010	12/07/2010
	Action	Fertiliser		RLEM control	Winter clean
	Application	150 kg/ha single super		100ml/ha Fastac TM	500ml/ha Gramoxone TM + 300 ml/ha Simazine TM
	Cost	\$533/tonne		\$36/litre+\$15/ha spraying	\$40/litre+\$15/ha spraying
	Cost/ha	\$80		\$3.60+\$15	\$28+\$15
	Total cost	\$1072		\$242	\$388
2011	Date	20/05/2011		26/07/2011	26/07/2011
	Action	Fertiliser		Annual weed knockdown	RLEM control
	Application	80 kg/ha DAP		Gramoxone	100ml/ha Fastac TM
	Cost/unit	\$900/tonne		\$11.20/litre+\$15/ha spraying	\$28/litre+\$15/ha spraying
	Cost/ha	\$72		\$26.20	\$2.80+\$15
	Total cost	\$969		\$1123	\$235
2012	Date	28/04/2012	2013		11/4/2013
	Action	Fertiliser		Action	Fertiliser
	Application	200 kg/ha single super		Application	100 kg/ha PasturePhos
	Cost/unit	\$500/tonne		Cost/unit	\$400/tonne
	Cost/ha	\$100		Cost/ha	\$40
	Total cost	\$1890		Total cost	\$480

Pasture management

Both the conventional and *Triple Pack* phalaris pastures were managed with the aim of maximising phalaris persistence. This aim was compromised by the seasonal conditions at Tottington experienced over the duration of the trial.

The wet summer of 2010/2011 allowed the phalaris in the conventional section to grow rank and reduce sub clover germination in the following autumn.

The *Triple Pack* phalaris, which was sown in autumn 2011 has suffered from moisture stress for most of its life and has only had a few short periods of grazing.

Weed management

Annual grasses have been controlled by the pre establishment sprays on both trial sections and the dry autumns have also reduced annual grass establishment.

Both sections had an annual weed control spray in autumn 2010 prior to the control section phalaris and the *Triple Pack* legume section establishments.

The *Triple Pack* section received a “winter clean” annual grass control spray during the legume phase in July 2010 and received a knockdown annual grass control in autumn 2011 prior to the phalaris sowing.

The newly pasture had problems with Annual Ryegrass infestation during its first year which were partially controlled by strategic grazing.

The wet summer of 2010/2011 caused some summer weed infestation in the *Triple Pack* section prior to phalaris establishment, but these did not cause any serious problem as they were controlled when they died off at the end of the wet summer conditions.



Figure 21 summer weeds at Tottington February 2011

Left Hairy Panic grass (*Panicum effusum*)

Right Wireweed (*Polygonum aviculare*)

Production

Due to the drought conditions in 2012 and early 2013 there has been very little production from the trial paddock. Production has been restricted to short periods of sheep grazing and the dry conditions did not allow the planned grazing rotations to be implemented.

Pasture measurements

Measurements of the pasture were made in line with the requirements of the EverGraze Supporting Site protocols. The measurement protocols extracted from the “EverGraze Supporting Sites Monitoring Protocol” are noted below.

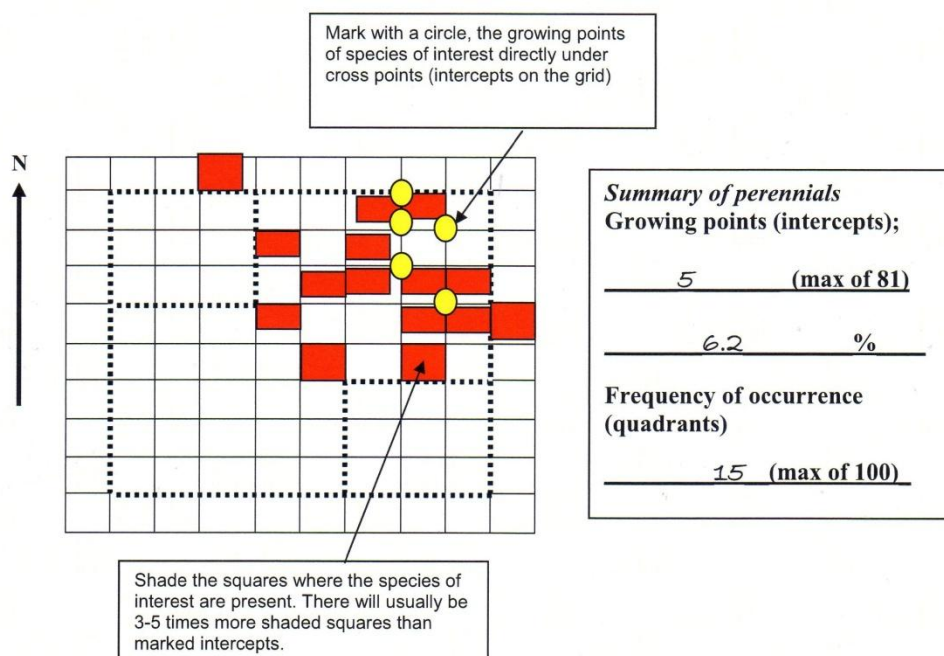
Measurements taken were perennial plant persistence, autumn and spring ground cover, % of green at the autumn break and food on offer at the end of spring.

It should be noted that no animal exclusion cages were used, so the measurements may be affected by grazing.

2. Monitoring frequency of occurrence of perennial species

Monitoring frequency of occurrence of perennial species is a quick method to assess the presence or absence of perennial species of interest. This monitoring system works better with grasses like kikuyu where there are no obvious plant crowns.

- Assess each square in the Fixed Point grid (ie 100 squares) to determine if a live piece of the perennial species of interest is attached to soil in the square. If a leaf is attached in one square but is pushed into a second square by the frame, the species is only counted in the square where the plant is growing from. For this measurement technique, expect high values with good perennial pastures getting scores of 70% or greater.
- On the Perennial Species Recording Sheet, colour in the squares where the species of interest occur. Again, different colours can be used for different species.



An example of how to record growing points and frequency of occurrence of perennial species

Figure 22 EverGraze perennial species frequency monitoring

EverGraze Quickchecks 4

Pasture condition

Why monitor pasture condition?

Pasture condition gives important information about the sustainability of the grazing system. It is determined by measuring four characteristics of the pasture.

1. % ground cover

High levels of ground cover are important to protect the soil from erosion and add carbon to the soil. Decaying material provides nutrients for soil organisms and so improves the health of the soil.

2. % green pasture

The amount of green herbage present over summer relates to how much soil water is used by the pasture. Green herbage is also the most important component of the pasture for animal production.

3. % legume

Legume content is important to fix nitrogen for use by perennial grasses. High legume content also increases animal production.

4. Feed on offer

Feed on offer (FOO) provides an indication of the grazing pressure being applied in the paddocks, ie if paddocks are over or under grazed, and it will help explain changes in the persistence of perennial species.

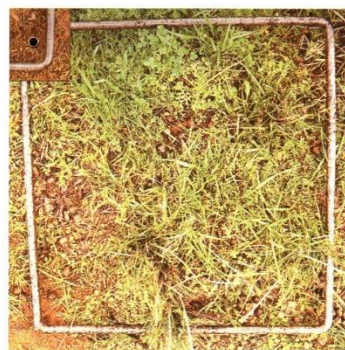
What you will need

- Fixed Point grid (pages 4 & 5)
- Good quality digital camera
- Ruler or pasture stick to provide a scale in photos
- Cards to write on and place in the quadrant, providing a title for photo's
- Pasture Condition Recording Sheets (page 17)
- Photo's of examples of pasture FOO and % ground cover

Two photo galleries are included with this manual and provide examples of different FOO values for common pasture types. A second set of photos gives examples of % ground cover. It is not possible to provide examples of the wide diversity of pastures that occur at Supporting Sites. Local agriculture department or private agronomists can help finetune pasture estimates of % ground cover, % green, % legume and FOO.



40% ground cover



70% ground cover

Figure 23 EverGraze pasture condition monitoring (1)

How to monitor pasture condition

- Place the Fixed Point grid down at the Fixed Point locations so that the same area of pasture is assessed each time.
- Use the two 30 x 30 cm quadrants marked on the Fixed Point grid (as shown on page 4).
- For each quadrant, record the level of the following four pasture characteristics, using the Pasture Condition Recording Sheet.

1. % ground cover

Record the amount of ground covered by plant or other organic material, ie green pasture, dead pasture, litter or dung. For consistency, ground cover is reported as, eg 75% or 85% ground cover, not 25% or 15% bare ground. Ground cover includes anything protecting the soil surface of the soil. The soil surface needs to be carefully observed to ensure that bare ground is really bare and not covered by plant material.

The nature of non-attached ground cover also needs to be recorded, ie dead material or dung. This material can be blown or washed away more easily than attached material and so while it provides some protection to the soil, it does not provide that same quality ground cover as attached material.

2. % green pasture

Assess the proportion of green and dead herbage in the pasture *on a dry matter basis*, ie if the pasture present was all cut and dried. Record the proportion of green herbage as 20%, 40%, etc.

When the pasture contains a mixture of green and dead herbage it is important to look into the bottom of the pasture as the green pasture may be "hidden" by taller dead material. However, remember that green pasture if cut and dried will "shrink" and so will be a smaller proportion of the pasture than first appearance.

3. % legume

Assess the proportion of green legume in the pasture *on a dry matter basis*, ie if the pasture present was all cut and dried. Record the proportion of legume as 10%, 20%, 30%, etc.

Clover is very "showy" in the pasture, ie there looks to be more there than there really is. The leaves are often raised above the rest of the pasture and are horizontal so very obvious. A pasture that looks to be virtually pure clover often contains 30–40% grass under the clover! A rule of thumb is that there may be only half the amount of clover on a dry matter basis as what appears visually.

4. Feed on offer (FOO)

Estimate the total amount of pasture present – include all herbage present: green and dead, weeds, desirable species, annuals etc. Also, include all herbage right to ground level not just that which sheep or cattle might select.

Feed on offer is expressed in kilograms of dry matter per hectare (kg DM/ha), ie the weight of herbage from 1 ha, if it was cut and dried.

Consistent estimates across both paddocks at a Supporting Site are more important than the absolute value at each Fixed Point.

Figure 24 EverGraze pasture condition monitoring (2)

Conventional Sowing Phalaris Results

Establishment details are on page 18.

Conventional Sowing 2010

The conventional sowing was undertaken after the autumn break and the phalaris established well and made good growth through to early spring when it was grazed along with the legume section of the *Triple Pack* section.

The phalaris recovered well after grazing and was able to continue growing right through late spring and summer due to the exceptional rains that were recorded during this period. The summer rainfall was 250% of the average and the summer growth of the phalaris allowed it to become very rank. This affected sub clover germination in the conventional section in 2011.

The phalaris in the conventional section showed large plant losses during the drought conditions of 2012 but there are still sufficient plants for a viable perennial pasture. The subclover content was satisfactory in 2013 despite the tough years since establishment.

The design of the trial and the drought conditions made the grazing management of the conventional phalaris section difficult.



Figure 25 Rank phalaris in conventional section Growth in February 2011 after the wet summer of 2010/2011



Figure 26 Phalaris in conventional section February 2012

Triple Pack Sowing Phalaris Results

Establishment details are on page 18.

Triple Pack Sowing 2011

The phalaris in the *Triple Pack* section germinated well but never had sufficient soil moisture to establish the deep root systems to allow it to survive the drought conditions experienced at Tottington from spring 2011 to late autumn 2013.

The phalaris was lightly grazed in spring 2011 and left to flower, no further grazing was possible until early September 2012 when the paddock was grazed heavily prior to anticipated spring rains. The rains were well below average and plants became moisture stressed and there was a large decline in plant numbers during the summer of 2012/2013. The average of the plant counts in November 2013 were 11 phalaris plants per square metre, which is still sufficient for a viable perennial pasture but the average is skewed by higher results in some parts of the paddock and very low counts in other parts; see figure 31 on page 31.



Figure 27 *Triple Pack* phalaris section May 2012 showing poor plant vigour due to moisture stress



Figure 28 May 2012 phalaris plant in *Triple Pack* section showing moisture stress.

Trial Measurements

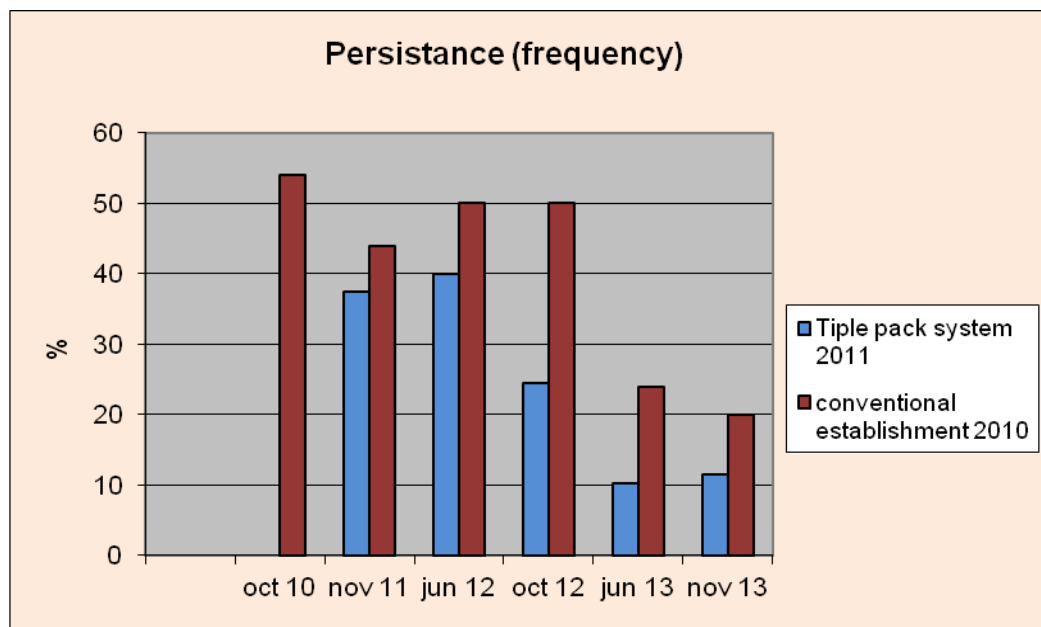


Figure 29 Frequencies of Phalaris Plants

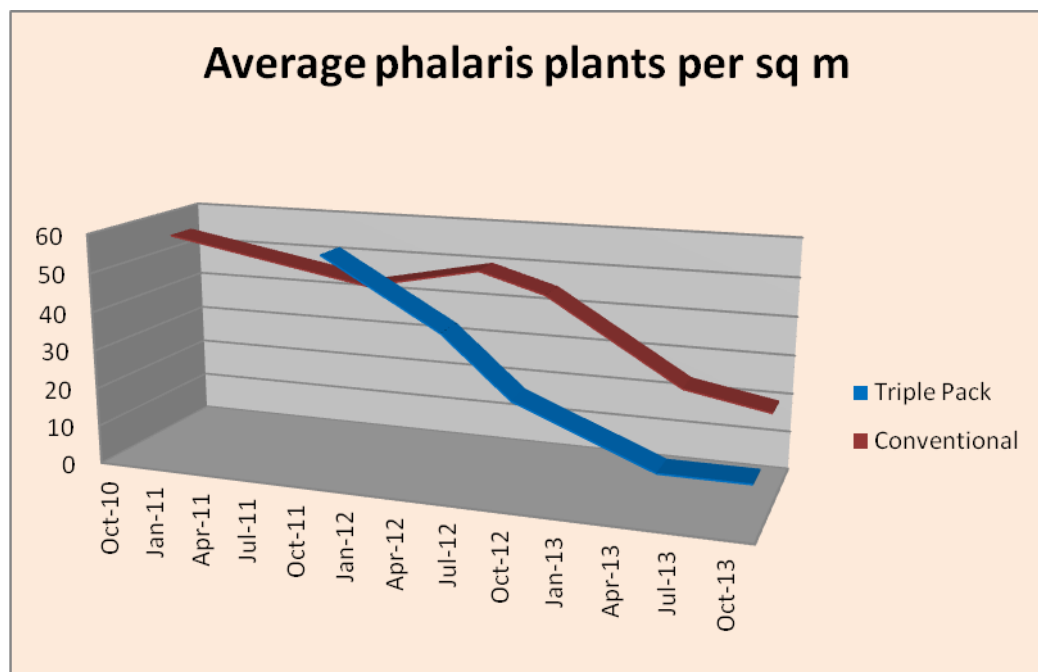


Figure 30 average frequency of phalaris plants

Trial Measurements continued

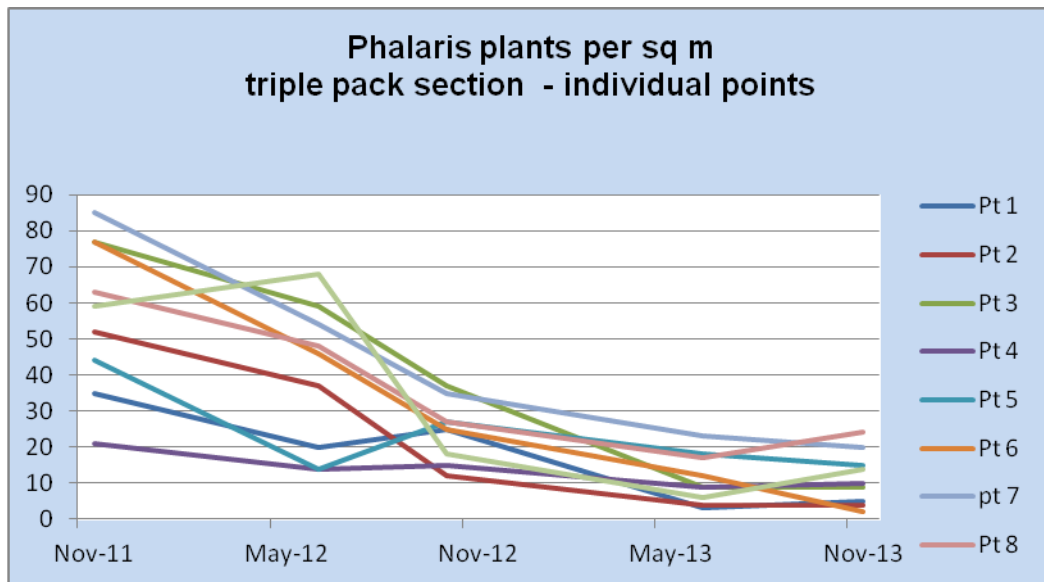


Figure 31 average frequency of phalaris plants at individual measurement points – *Triple Pack* section

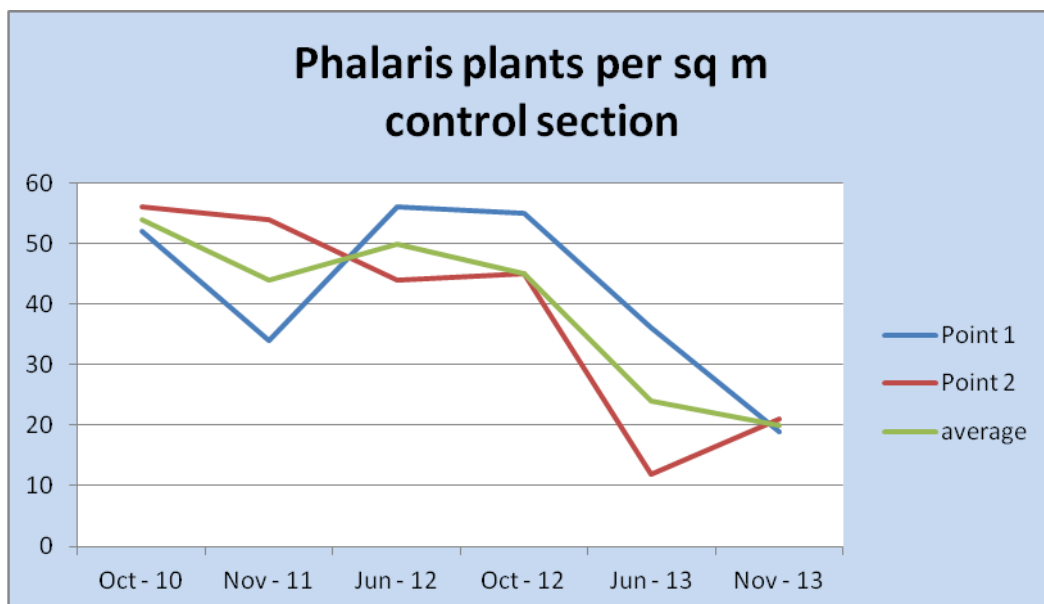


Figure 32 average frequency of phalaris plants at individual measurement points – *Control* section

Trial Measurements continued



Figure 33 Measuring pasture persistence November 2011

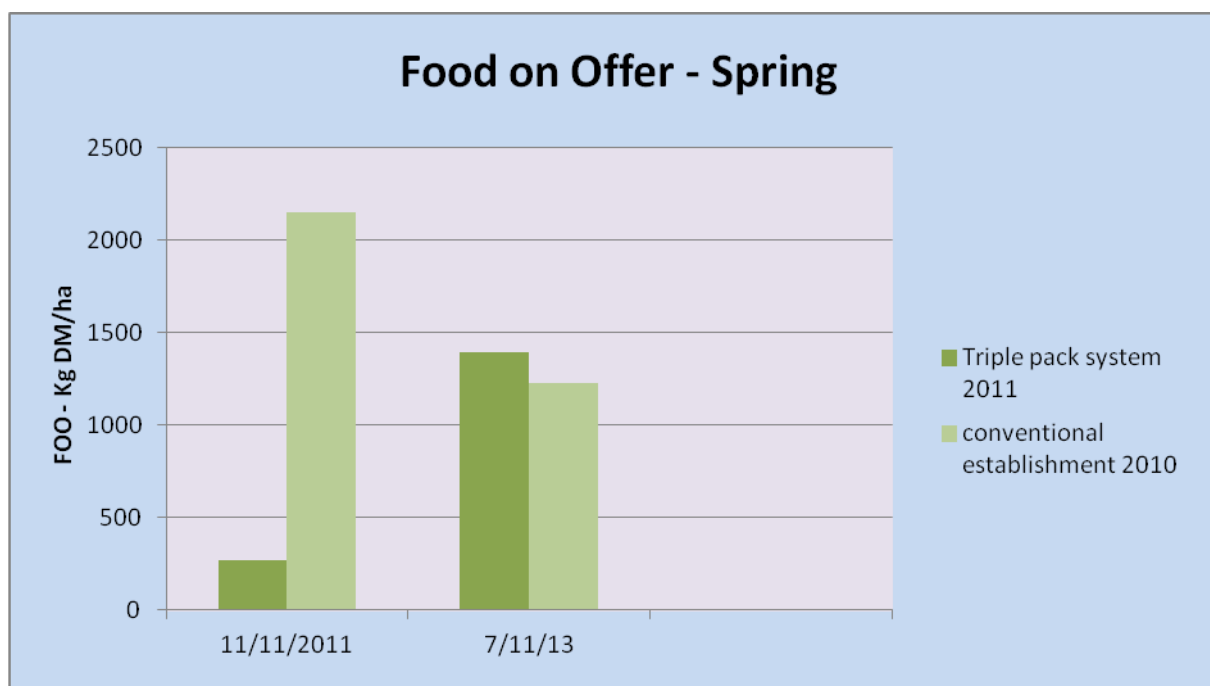


Figure 34 Food on offer end of spring. Note no measurement taken in 2012 due to drought conditions

Trial Measurements continued

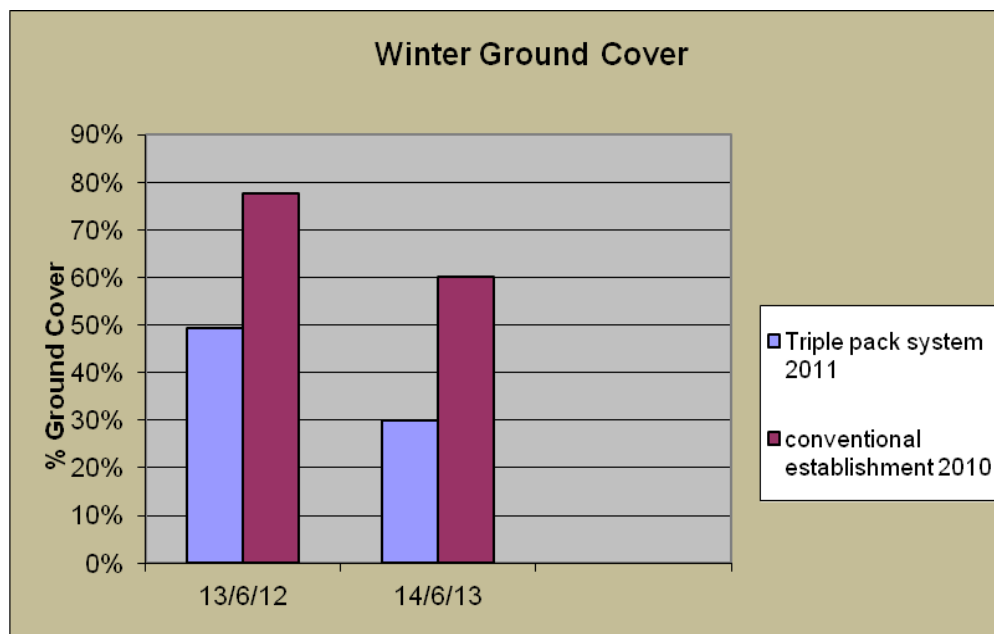


Figure 35 winter ground cover

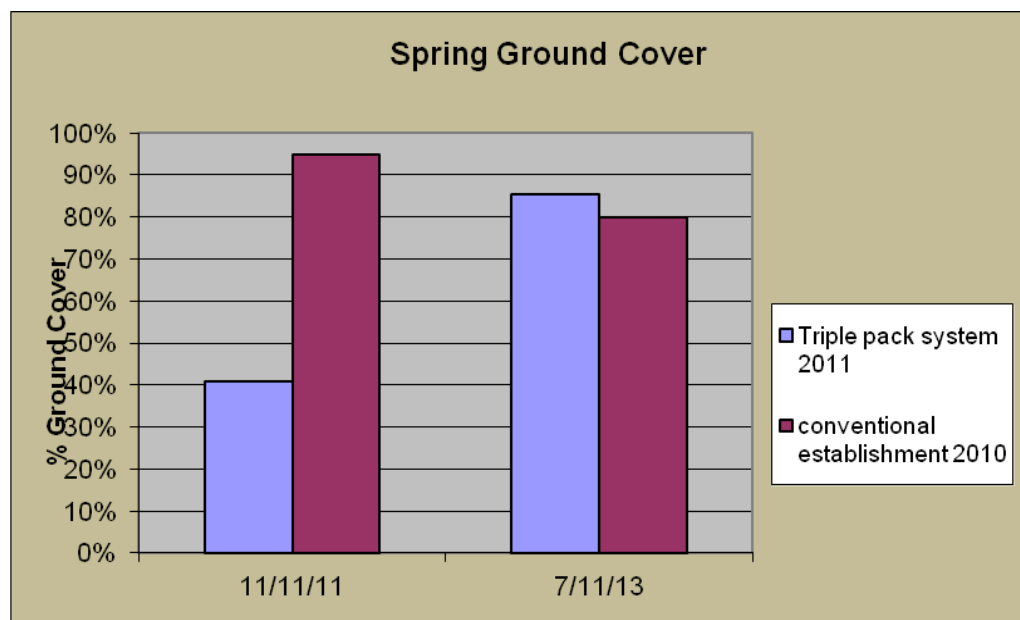


Figure 36 spring ground cover

Note the pastures were established in different years and the ground cover figures reflect this rather than being a direct comparison between the establishment techniques.

Legume Results

Triple Pack legume sowing 2010

All varieties established well with a favourable season until a dry spell between September 11th and October 6th produced only 3.2 mm of rain, this produced a period of moisture stress in the difficult soil type in the trial paddock. The sub clover plots went to seed with reduced dry matter during this period, while the later flowering varieties produced right through the remainder of spring which received above average rains. The dry matter estimates for each variety is shown in the graph below. It is estimated that approximately 20 kg of nitrogen per tonne is fixed by the legumes. *Note all varieties sown with Urana sub clover.*

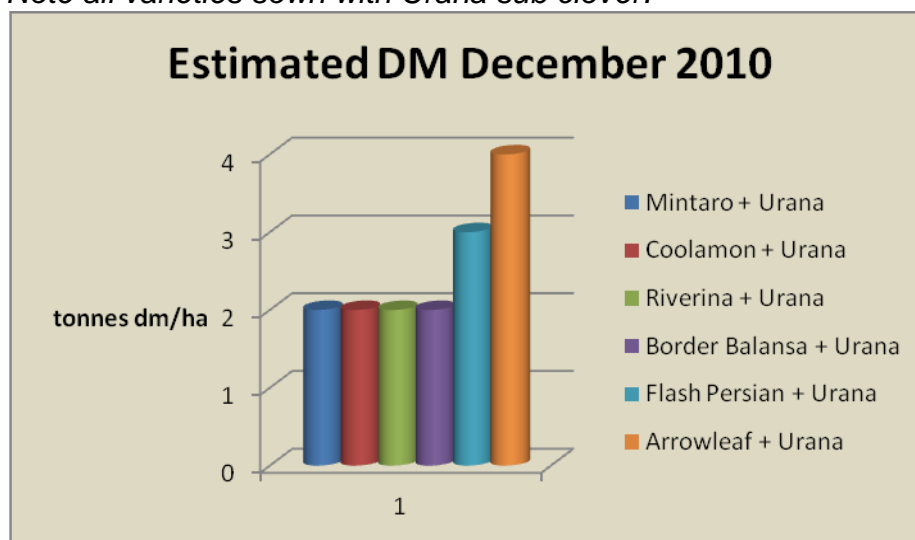


Figure 37 estimated DM production of legumes in Triple Pack section 2010

Conventional legume sowing 2010

Holdfast GT phalaris was with Urana, Mintaro and Coolamon sub clovers were sown at 5 kg/ha with the Holdfast GT phalaris. A small area was also sown with Australian phalaris and Trikkalla sub clover due to insufficient seed available. The pasture was direct drilled with an Agrowdrill seeder. Due to the good growing conditions the phalaris became dominant and reduced the clover growth.



Figure 38 Arrowleaf Clover 14th December 2010.

Legume Results continued

Triple Pack legume 2011

The *Triple Pack* section was sown with grasses in autumn 2011, legume performance was reasonable but as shown in figure 39 below, the percentage of legume was below expectations

Conventional Legume 2011

The exceptional late spring and summer rains of 2010 – 2011 allowed the phalaris to grow continuously through to early autumn 2011. As the two trial sections are in the same paddock and are unfenced, it was difficult to graze the conventional section to the level required for clover germination. This meant that clover was generally absent from the conventional section in 2011.

2012

Clover growth at Tottington was poor during 2012 due to the drought conditions. This can be reflected in the legume percentage of pasture mass presented in figure 39 below.

2013

The good growing season rains of 2013 allowed for good legume growth at Tottington in both the *Triple Pack* and conventional sections. The good growth allowed PPS to assess the different legume varieties in the *Triple Pack* section three years after sowing.

Figure 40 on page 36 combines a visual assessment of mean growth and mean ground cover estimates of the different varieties. Note the performance of the Border Balansa clover which was outstanding during spring 2013.

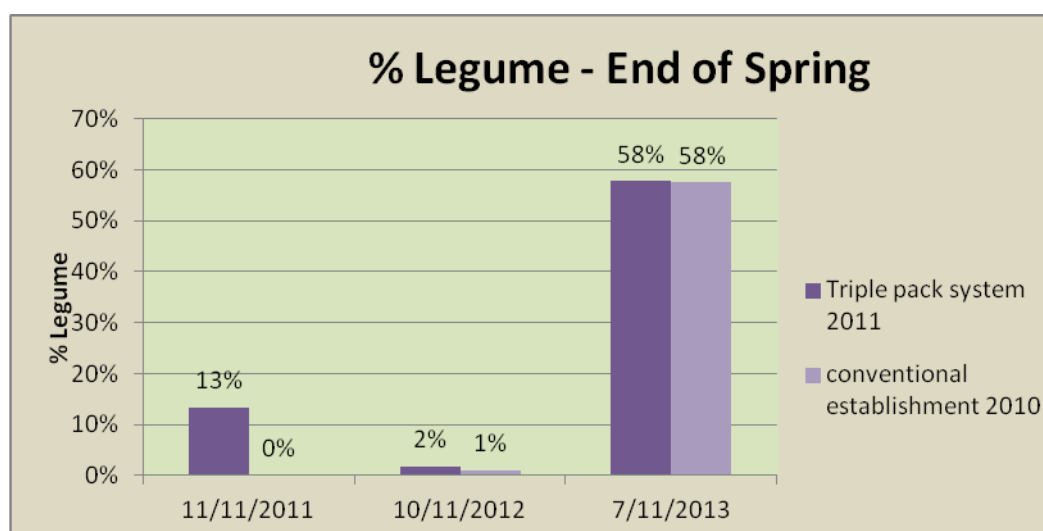


Figure 39 legume % at end of spring 2011 -2013.

Legume Results continued

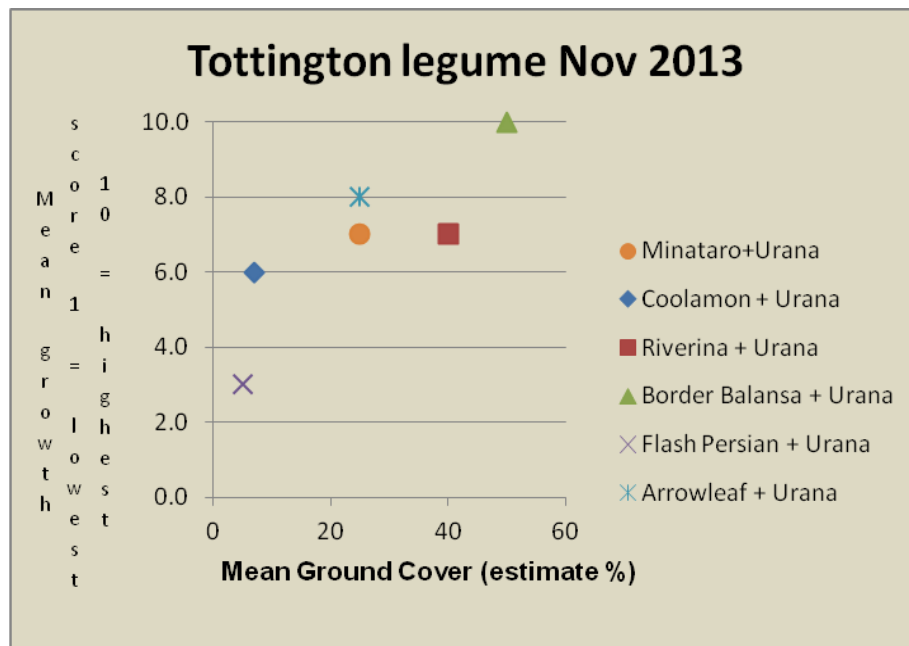


Figure 40 Legume mean growth and mean ground cover November 2013



Figure 41 Border Balansa clover 2nd November 2013

Discussion

The comparison between the “*triple pack pasture program*™” sowing with a legume phase and the conventional sowing was compromised by the very wet summer of 2010/11. The timing of the control grass establishment comparison meant that the conventional phalaris was sown in 2010 and had growing conditions that were probably in the top 90% deciles for the area.

The *Triple Pack* trial grass sowing in 2011 experienced severe moisture stress from August 2011 onwards, preventing any valid comparison of the treatments. The *Triple Pack* trial grass sowing was further complicated by an infestation of summer weeds due to the unseasonal rains, although this did not affect the overall result.

In retrospect it may have been better to hold the conventional sowing over for another year, however, this would have created a similar mismatch in comparison because the control area would have carried an extra year of crop, which would have skewed the results. The growing seasons of 2012 and early 2013 were particularly dry which has further compromised any meaningful comparison of the two systems results at the site.

The decline in perennial grass plant in both the conventional phalaris, *Triple Pack* phalaris as well as the variety trial section after successful establishment show how tough the conditions have been in the trial paddock during 2012 and early 2013.

The risk and return for establishing perennial pastures in this and similar regions creates difficult decisions for producers when they are looking to improve the productive and environmental outcomes that come with perennial pastures. Any technique that reduces risk and produces a more successful establishment is a great addition to their farming system. PPS believes that the *Triple Pack* system is soundly based and could provide a useful method of perennial pasture establishment but due to the extreme climatic conditions experienced over the duration of the trial, valid conclusions could not be made.

Host Farmer Comments

Tom Small February 2014

“Over the past five years, we have participated in the Evergraze/PPS trial. We have found it a thoroughly rewarding exercise. The years in which we established pasture were challenging to say the least; being some of the most difficult I’ve seen in my farming career. Whilst having difficulty in establishing a pasture may seem to limit this trial somewhat; I would contend that has made the trial more successful. Unlike proving that cultivars will establish and grow well in ideal conditions in paddocks of perfect fertility and high rainfall as is often the case with seed company trials.

The seasons put varieties under significant stress and made it obvious which plants were suited to our area. Often we learn more from our failures than our successes.

It is refreshing to have PPS’s impartial research that is lead by producers for producers in real world conditions, rather than having seed companies and government departments dictate what producers need. This should be a model for the implementation of R&D in agriculture. I would like to thank the PPS team for their excellent work on the trial; as an organisation to work alongside I cannot fault them.

We are still determined to continue to establish improved perennial pastures on Tottington and we plan to again sow perennial grasses into the PPS/EverGraze paddock in 2015 as part of our pasture program.”



Figure 42 Tom and Jenny Small with Henry, Lara and Mabel at Tottington

Adoption of results

While the results at the Tottington PPS/EverGraze site have comprised by the different extremes of seasonal conditions when establishing the control and the *Triple Pack* phalaris pastures, variations of the technique have been adopted by PPS members.

One of the most successful of these systems is on the Jallukar Park property of Simon and Yvette Brady near the Grampians approximately 25 km north west of Ararat. Sections of Jallukar Park are on light sandy loam soils and have similar issues to the Tottington site. The soils have low fertility in their natural state and are prone to drying out quickly when there is insufficient rainfall; the growing season at Jallukar Park is similar to Tottington.

Jallukar Park uses Arrowleaf clover in a similar method to the legume phase in the Triple Pack system. An Arrowleaf clover pasture is established in the year prior to a pasture or crop establishment and the subsequent pasture or crop benefits from the weed free paddock for establishment and the stored nitrogen from the legume pasture the year prior. The Arrowleaf then forms the legume base for the new pasture or crop and continues to provide nitrogen to the system as well as supplying high protein sheep and cattle feed.

This system is proving very successful at Jallukar Park as well as on other PPS member's properties.



Figure 43 Arrowleaf clover at Jallukar Park

Further research at the Tottington site

PPS were able to add some further research at the Tottington site to complement the main trial.

Annual weed control demonstration

A small annual weed control demonstration site was established in the trial paddock during the legume phase in 2010 by agronomists Brett Douglas and Hugh Russell from Harberger Farm Supplies St Arnaud. The demonstration site was used as part of a presentation by Phil Jobling of Nufarm at a field day at Tottington on 20th August 2010. The site plan is included on page 41 of this report.

DPI Soil Carbon Project

PPS participated in the Victorian soil carbon project in 2010; 50 paddocks were sampled as part of the state wide project measuring base line soil carbon levels in different soil types. The Tottington PPS/EverGraze paddock was tested as part of the project. The results are listed on page 42.

Legume Trial

A section of the *Triple Pack* section was sown to alternative legume varieties to assess them during the legume phase. A map of the variety trial section is included on page 21 and results from the evaluation are included on pages 34 – 36.

Perennial Grass Trial

A section of the *Triple Pack* section was sown to alternative perennial grass varieties to evaluate them in the tough conditions at the Tottington site.

A map of the perennial grass trial is included on page 22 and results are presented on page 40.

Australian Phalaris was sown in rows adjacent to the Holdfast GT Phalaris in the main section of the paddock, no differences were observed in the survival rates between the phalaris varieties.

Fletcha Fescue was established in rows in the *Triple Pack* section but was unsuccessful in the drought conditions. Only two plants per square metre were recorded in November 2013.

Uplands Hispanic Cocksfoot established well at the site and persisted well until the long dry period between October 2012 and May 2013 when there were several plant losses. This is illustrated in figure 44 on page 40. Despite these results PPS believes that Uplands Hispanic Cocksfoot may have a role in the shallow soils in the region as a pasture variety. The conditions experienced at Tottington over the duration of the trial were extreme and should be taken into account when assessing the results.

Further research at the Tottington site continued

Perennial Grass Trial

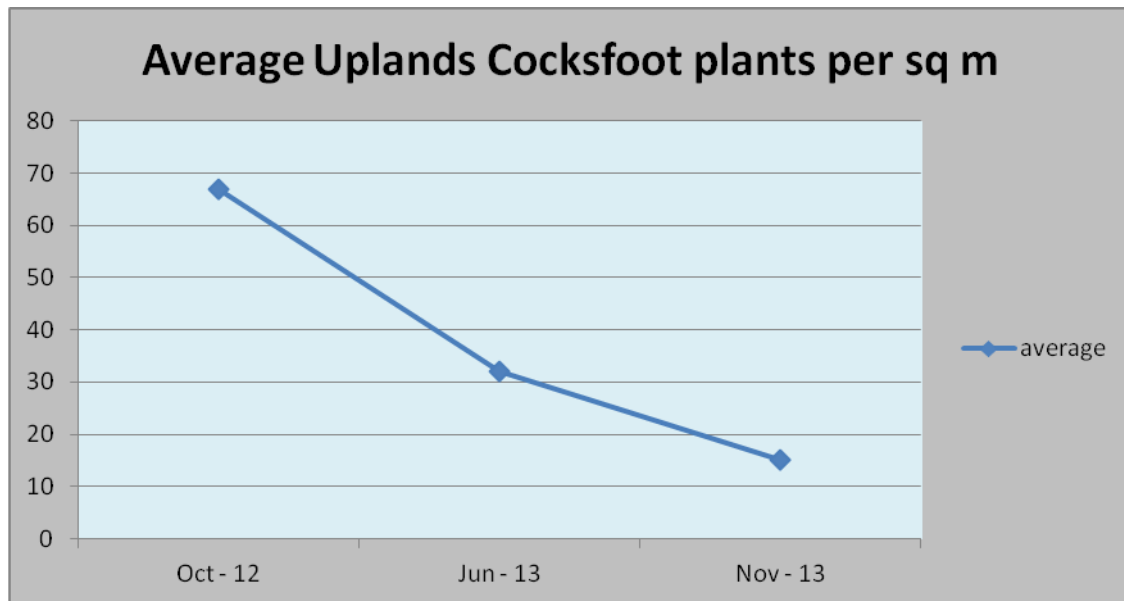


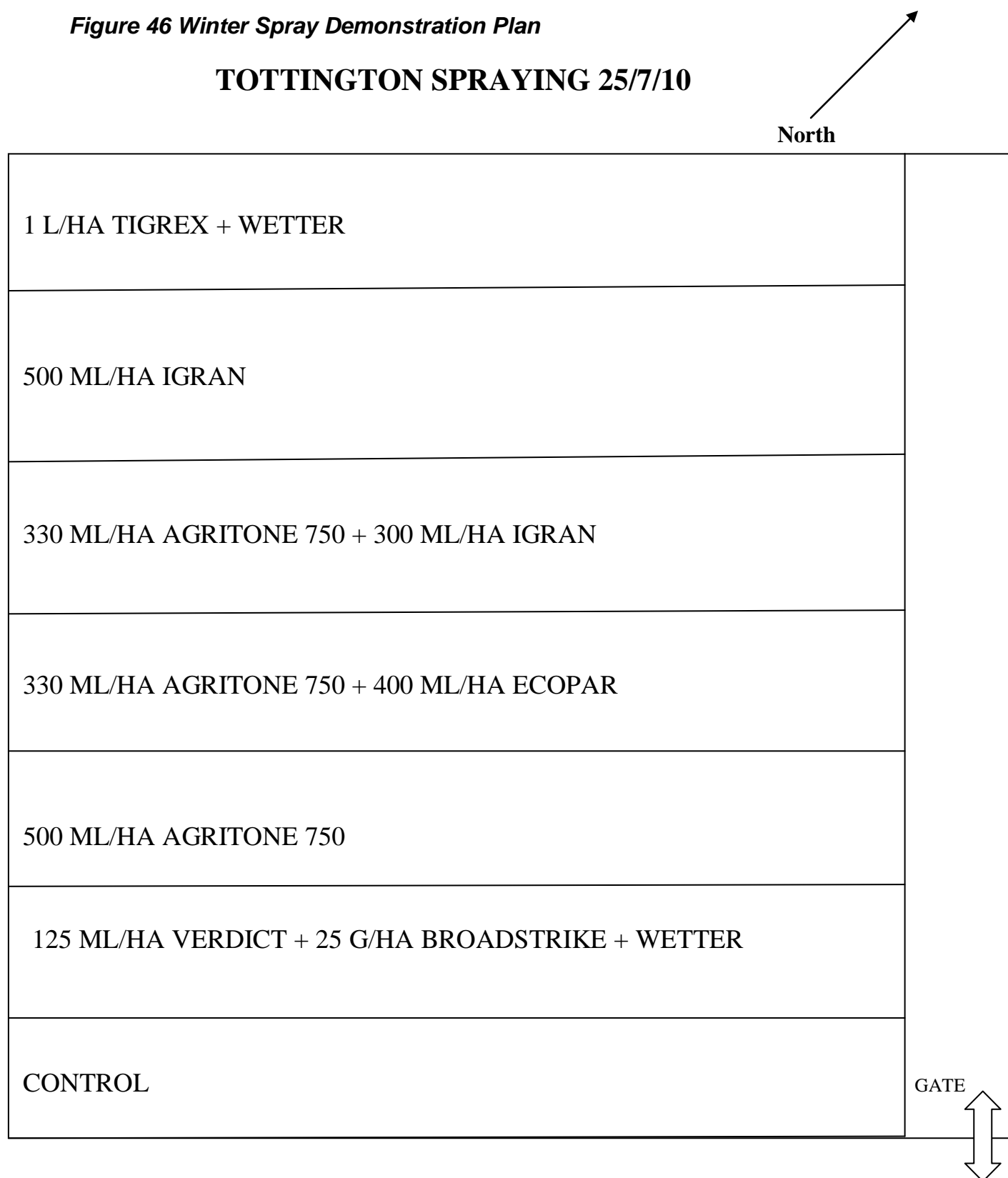
Figure 44 Uplands Cocksfoot plant counts



Figure 45 Uplands Cocksfoot at Tottington Spring 2012

Figure 46 Winter Spray Demonstration Plan

TOTTINGTON SPRAYING 25/7/10



Remainder of paddock to be sprayed with –
550 ml/ha simazine+700ml/ha MCPA+200 ml/ha astound.

Trial spray area also to be sprayed with 550 ml/ha Simazine

Figure 47 Victorian Soil Carbon Project results for the Tottington trial paddock

Tom Small Beazleys Bridge Y

Victorian Soil Carbon Project

Individual soil carbon results

These are the carbon results for:

Site: 349

Paddock name: McCallums Evergraze

Sample date: 18-Oct-2010

Region: Northern & Southern Slopes

Soil Type: Sodosol

Management: Crop-Pasture Rotation

Depth (cm)	TOC (Mg/ha)	POC (Mg/ha)	HOC (Mg/ha)	ROC (Mg/ha)	TOC (%)	IC (Mg/ha)	TN (Mg/ha)
0-10	20.4	3.6	6.2	2.4	1.5	0.0	0.8
10-20	5.4	0.7	2.7	0.7	0.4	0.0	0.3
20-30	4.5	0.2	4.2	1.0	0.3	0.0	0.2
0-30	30.3	4.4	13.0	4.2	0.7	0.0	1.3

TOC = Total organic carbon (expressed as t/ha and as %)

POC = Particulate organic carbon

HOC = Humic organic carbon

ROC = Resistant organic carbon

IC = Inorganic carbon

TN = Total nitrogen

Notes: Carbon in the soil may be organic (part of the soil organic matter) or inorganic (carbonates, mostly in dry climates). Soil organic carbon is a mixture of material of varying stabilities; represented here as three fractions: particulate organic carbon that decomposes relatively quickly, humic organic carbon with an intermediate decomposition time and resistant organic carbon that decomposes extremely slowly. Total nitrogen levels are closely related to organic carbon levels, with most of the nitrogen also being part of the soil organic matter.

Thank you for contributing to the Victorian Soil Carbon Project. For further information please contact Dr Fiona Robertson at DPI Hamilton on (03) 5573 0900 or email: fiona.robertson@dpi.vic.gov.au.



DEPARTMENT OF
PRIMARY INDUSTRIES

future farming
systems research

Communication of Results

The project has been continuously reported to PPS members, EverGraze, CHAF and other interested people throughout the trial in conjunction with the wider PPS project. This communication has taken various forms which are summarised below.

PPS newsletters

The 4-page PPS newsletter is produced quarterly and 114 copies are posted to PPS members and sponsors. The newsletter is also sent by email to another 179 people who have shown interest in the PPS project. These include Dept of Primary Industry and Catchment Management Authority staff, CSIRO pasture scientists, MLA staff and pasture industry contacts. Copies are also sent to others groups who have links with PPS including Evergreen in Western Australia, Victorian No Till Farmers Association, Yarram Landcare Pasture Group, and the Holbrook Landcare Group.

Email copies are sent to several EverGraze contacts.

Progressive results and observations from the two PPS/Evergraze Supporting sites have been regularly reported in the newsletter and this will continue as PPS continues to monitor the progress of the pastures at the sites.

Field Days

PPS used the site for two field days in the first year of the project and planned to continue to do so for the rest of the trial, but the dry conditions experienced at the site were not conducive to field day inspections.

A Field day was conducted at Tottington on August 20th 2010 see flyer on page 44, Approximately 50 people attended the field day which also included an inspection of Agrowdrill seeding equipment and a herbicide demonstration inspection.

A site inspection was held on 18th October 2010 to view progress of the trial. See flyer on page 52.



Figure 48 Field day participants tottington 20th August 2010



EverGraze Field Day

Right Plant, Right Place, Right Purpose

TOTTINGTON SUPPORTING SITE

When	Friday 20th August 2010
Where	Tottington Ararat - St Arnaud Rd (15 km north of Navarre - follow signs)
Time	12.00 noon – 4.00pm (BBQ lunch provided) Lunch courtesy of Stephen Pasture Seeds, Nufarm & Harberger Farm Supplies
What	<ul style="list-style-type: none"> • Trial design and aims ~ Rob Shea (<i>Perennial Pasture Systems</i>) and Tom Small (<i>Tottington</i>) • Inspection of legume phase of three year pasture establishment trial with Karl Drever & Michael Grant (<i>Stephen Pasture Seeds</i>) and Cam Conboy (<i>PlantTech/Seedmaster</i>) • Weed control options ~ Phil Jobling (<i>Nufarm</i>) and Brett Douglas (<i>Harberger Farm Supplies</i>) • Winter grazing crop inspection with Karl Drever & Michael Grant (<i>Stephen Pasture Seeds</i>) and Tom Small (<i>Tottington</i>) • Agrowdrill demonstration ~ Colin Hercott (<i>Agrowplow</i>) • Seeder set up ~ John Nicholls (<i>Hewitt & Whitty</i>)
Contact	<p>Please RSVP for catering purposes by Tuesday 17th August to;</p> <p>Name: Rob Shea Phone: 03 5352 1357 Mobile: 0438521357 Email: yadin@netconnect.com.au</p>

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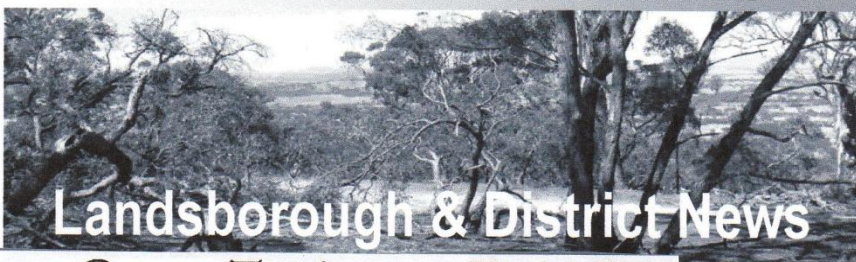
Figure 49 Tottington field day flier August 2010

September 2010

Free
Circulation 250 copies

Contributions for October
News close 12 October

Landsborough Community Resource Centre



Landsborough & District News

Big Turn Out at Tottington Field Day

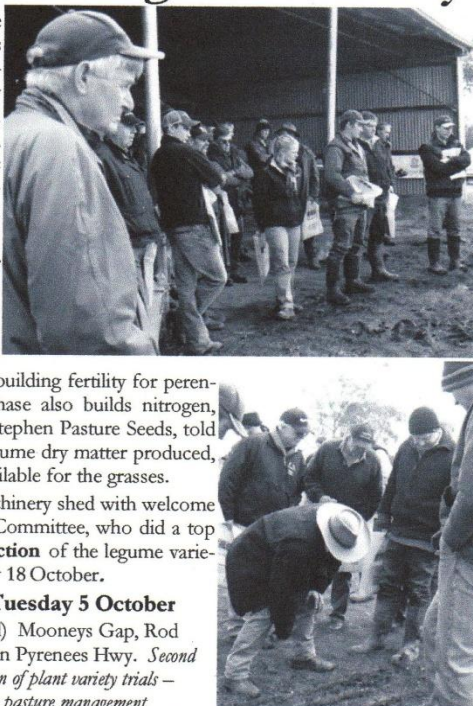
Cold and wet weather didn't deter a large turnout at the Perennial Pasture Systems (PPS) field day at the *EverGraze* Supporting Site at Tottington recently. Over fifty people started the day with a BBQ lunch provided by Harbergers Farm Supplies, Nufarm and Stephen Pasture Seeds before hearing details of the site from PPS President Simon Brady, site owner Tom Small and Karl Drever, Stephen Pasture Seeds.

The site is trialling the 3 year pasture *triple pack*TM establishment method against more conventional methods. The first year consists of a cropping phase followed in the second year with a legume sowing. This allows for two years of weed control and building fertility for perennial grass establishment. The legume phase also builds nitrogen, essential for the grasses. Michael Grant, Stephen Pasture Seeds, told the participants that for every tonne of legume dry matter produced, 25kg/ha of nitrogen is fixed in the soil, available for the grasses.

The day ended in the shelter of Tom's machinery shed with welcome hot drinks provided by the Paradise Hall Committee, who did a top job catering for the day. A **second inspection** of the legume varieties at Tottington will be held 4pm Monday 18 October.

Next Perennial Pasture Field Day: Tuesday 5 October

2010 7.30am–12 noon (breakfast provided) Mooneys Gap, Rod Vearing's woolshed - 10km NE of Ararat on Pyrenees Hwy. *Second year management of lucerne and phalaris: Inspection of plant variety trials – legumes and perennial grasses: Onion grass control, pasture management*
More information and RSVP for catering purposes by Friday 1 October to Rob Shea Phone: 03 5352 1357; mob: 0438 521 357 Email: yadin@netconnect.com.au



EverGraze
More feedback from participants

Figure 50 Article on Tottington field day from Landsborough & District News. Similar articles appeared in the Ararat Advertiser, Stawell Times-News and North Central News.



Figure 51 Field day participants inspection Agrowdrill demonstration



EverGraze Field Day

Right Plant, Right Place, Right Purpose

TOTTINGTON SUPPORTING SITE

When	Monday 18th October 2010
Where	Tottington St Arnaud – Navarre Rd (18 km north of Navarre - follow signs)
Time	4.00pm – 5.00pm
What	<ul style="list-style-type: none"> • Inspection of legume phase of three year pasture establishment trial. • Comparison of legume varieties. • Inspection of phalaris control sowing. <p>Guest speakers ~ Karl Drever and Michael Grant (Stephen Pasture Seeds)</p>
Contact	<p>Name: Rob Shea Phone: 03 5352 1357</p> <p>Mobile: 0438521357 Email: yadin@netconnect.com.au</p>

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Figure 52 Tottington Site Inspection flier October 2010

PPS Annual Conferences

A progress report on the site was included in the PPS Project Manager's report at the 2011, 2012 and 2013 PPS Annual Conferences.

Several photos of the site were included in slide show presentations.

Personal communication

The host farmer is an enthusiastic member of PPS and was a Management Committee member from 2009 to 2013; he has communicated the progress of the site to other district farmers. The trial site and the entrance to the Yolla section of Tottington have displayed an Evergraze Supporting Site sign. The Yolla sign is visible from the Ararat-St Arnaud Road.

Other Group Visits

The Tottington site was used as part of a pasture session by the Coonoeer Bridge Best Wool Best Lamb group in 2012.

Media articles

Articles on the PPS project including information on the Tottington site appear regularly in the Ararat Advertiser and the Stawell Times-News. PPS Articles have also been included in the Weekly Times, Stock & Land, Ballarat Courier, Yarram Standard, Hamilton Spectator and the Wimmera Mail Times.

An article on the Tottington site appeared in the North Central News in August 2010 and the Landsborough News in September 2010. See page 45.

External Presentations

The PPS Project Manager gave a presentation on the PPS project including information on the Tottington site to the Victorian Lime Producers Annual Meeting in Melbourne in November 2011.

The PPS Project Manager gave a presentation on the PPS project including information on the Tottington site to the Upper Barwon Landcare Pasture Group at Winchelsea in August 2012.

The PPS Project Manager gave a presentation on perennial pastures to the Project Platypus "chicks in the sticks" group farm tour in October 2012. The presentation was done at the Elmhurst PPS/PDS site and included information from the Tottington site. Thirty one women attended the tour.

The PPS Project Manager gave a presentation on perennial pastures to the Farmplan 21 group at Joel Joel in May 2013 which included information from the Tottington Gap Supporting Site.

External Displays

PPS has prepared a series of posters for display at events, as part of this series, individual posters for each of the PPS sites were made; the Tottington poster is reproduced on page 48

During 2012 they were displayed at
Project Platypus Agrifest
Tatyoos sheep fair seminar in July.
Lake Bolac sheep fair seminar in July.
PPS 4th Annual Conference September

The host farmers also have a copy of their site poster and they are displayed in their woolsheds and offices.

PPS EverGraze Supporting Sites

Mooneys Gap

The Mooneys Gap site is 10 km north east of Ararat and was established in 2009. It has a phalaris trial demonstrating best practice management. There has been an increase of over 100% in stocking rate compared to the control pasture of annual grasses. The lucerne paddock is trialling the viability of introducing lucerne pastures into the Ordovician foothills common in the region. It has proven successful in it's first three years providing quality feed for lamb finishing as well as two hay crops.

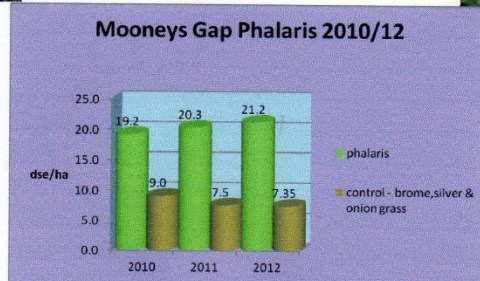
Technical assistance for the Mooneys Gap site is provided by Cam Conboy of Gorst Rural.



Mooneys Gap
Phalaris



Mooneys Gap
Lucerne



Tottington

The Tottington site is 20 km south west of St Arnaud and is trialling methods of pasture establishment in the drier central area of Victoria. The trial has a three year establishment period with a crop year to reduce weeds followed by a legume phase to build soil nitrogen, the perennial grasses are sown in year three. The grasses were sown in 2011 and established well and appear to have survived their tough first spring at Tottington.

Technical assistance for the Tottington site is provided by Michael Grant of Stephen Pasture Seeds.



Tottington
legume year 2



Tottington perennial
grasses year 3



Figure 53 PPS EverGraze Supporting Sites poster

Communication to other groups.

PPS has formed links with other farm groups and exchanges newsletters, field day information and research results with them. This includes information on the Mooney Gap sites. These groups are

Evergreen Western Australia
Holbrook Landcare Group NSW
Yarram Landcare Network Pasture Group
Victorian No Till Farmers Association
Birchip Cropping Group

Website

PPS launched its website in November 2012 and it includes information from the Tottington site. The website address is www.perennialpasturesystems.com.au

EverGraze Recognition

Bi annual reports on the Tottington gap site were provided to CHAF for CFOC reporting.

EverGraze has been acknowledged in PPS newsletters, field days, seminars and media articles as providing support for the Tottington project.

An EverGraze banner has been displayed at the PPS Annual Conference in 2011 and 2012.

Final Report

This final report will be distributed to EverGraze and CHAF and copies will be printed for PPS records and be presented to the host farmers in recognition of their contribution to the project.

A link to the final report will be included on the PPS website for members and other interested people to access.



PPS thanks the Rural City of Ararat, Rural Finance, Stephen Pasture Seeds and EverGraze for supporting the annual conference



Figure 54 EverGraze acknowledgement at the 3rd & 4th Annual PPS Conferences in the Gum San Chinese Heritage Centre Great Hall Ararat September 2011 & 2012

References and Acknowledgements

References

EverGraze Tottington final milestone report June 2012 - Rob Shea PPS Project Manager
EverGraze Supporting Sites Monitoring Protocol – EverGraze 2008 Compiled and edited by Geoffrey Saul
EverGraze Pasture Cost Calculator
Victorian Heritage Register (HO305) Victorian Government Gazette October 1981

Acknowledgments

PPS wishes to acknowledge the following people for their assistance throughout the project.

Brett Douglas, Harberger Farm Supplies St Arnaud – agronomist for Tottington
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Michael Grant, Stephen Pasture Seeds Ballarat – Trial advice
Anita Morant DPI Hamilton - EverGraze South West coordinator
Patrick Murphy, Ballarat – Executive Officer CHAF
Laurie Norman, Learmonth – former Executive Officer CHAF
Geoff Penna, Hansen Print Ararat and PPS member – assistance with report design
Peter Ring, Victoria University – Tottington photos
Hugh Russell, formerly Harberger Farm Supplies St Arnaud – agronomic advice
Kate Sargeant DPI, Benalla - National EverGraze Coordinator
Geoff Saul Hamilton – former EverGraze National Coordinator
Small Family, Tottington –site hosts
Tom Small, Tottington – PPS liaison

Report prepared by Rob Shea PPS Project Manager

Reviewed by

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& Michael Grant Agronomist Stephen Pasture Seeds Ballarat*

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