



## Perennial Pasture Systems 8<sup>th</sup> Annual Study Tour; Central NSW, August 2016



PPS Study Tour supported by



*Report compiled by PPS Project Manager Rob Shea from notes supplied by PPS study tour members and NSW host farmers. Photos; Rob Shea, Jane Thomas*

PPS is supported by





## 8th Annual Study Tour August 21 – 24<sup>th</sup> 2016 Central NSW

### ***Introduction***

Since the group's inception in 2007, PPS has recognised the value in members visiting leading farms in other regions as well as being informed of research projects with tours of research facilities. In 2009, PPS implemented an annual study tour as part of the group's extension activities and since then has held single and multiple day tours within Victoria, South Australia, Tasmania and New Zealand.

At the planning meeting in February, it was decided that the 2016 study tour would be to the Central NSW region. Twenty members participated in the study tour which in addition to farmers included a banker, a research agronomist and a Regional Landcare Facilitator. The mix of people in the group made for interesting conversations both on farm and socially.

***PPS Thanks Ross (Roscoe) Yelland, Agronomist; YellcoAg Consultancy & EmergeAg Farm Supplies, Manildra, NSW and PPS member Ben Greene; Millbanks, Elmhurst for their assistance in planning the Study Tour.***

***PPS thanks Dion Borg from GHCMA for his assistance with the funding application for the study tour.***



*PPS members and hosts*





## 8th Annual Study Tour August 21 – 24<sup>th</sup> 2016

## Farm Locations

## Wyoming

***Greydene***

***Dalmeney***

**Valehead**

## Macquarie Livestock

**Swatchfield**

### **Sunday 21<sup>st</sup> August: Oberon**

The group car pooled to Oberon with some members leaving the previous prior to explore a bit more of NSW. A social dinner was held in Oberon with guests Ross and Kate Yelland from Manildra, who assisted with the tour itinerary.

**Oberon** has a population of around 2,500 people and is located not far from the Jenolan Caves; it often has snow cover in winter.

Oberon was the birthplace of Greens politician Bob Brown and Sports journalist Ken Sutcliffe. Melbourne Storm rugby league coach Craig Bellamy started his playing career at the Oberon Tigers Rugby Club.

Oberon was where the film clip for the Cold Chisel song "Flame Trees" was filmed, although it is a long held view that the song is about Grafton in Northern NSW.



### **Monday 22<sup>nd</sup> August**

#### **Farm Visit 1**

**Property: Swatchfield Owners: John & Marilyn Baxter**

**Location: Black Springs**

**Farm Size: 2800 ha**

**Enterprise(s): 4000 XBD ewes, 350 breeder cattle, Cattle trading**

Swatchfield is not far from the village of Black Springs, about 35 km south west of Oberon and is situated 1100 metres above sea level; it regularly receives snow. John Baxter introduced the group to the property and told of his background in multiple earth moving businesses in Sydney; new farm manager Scott filled in some of the farm operation details.

John pointed out the stone building which was the original home on Swatchfield built in 1861 and the unusual building beside it, which was built as a bath house by Japanese POW's during World War II when they were interned on the property.

As mentioned above, the property has cold winters which hold back pasture growth and John regards their start of spring as being in mid October, this is tempered by moderate summer temperatures with 28° being a hot day.

Xbd ewes are bought in for the lamb enterprise and produce around 140% lambs; the aim is to increase ewe numbers to 5,000 and double the number of breeder cows. Much of the property is on basalt derived soils and aided by the soft summers, it supports perennial ryegrass, white clover and summer active fescues. These soils are around 5 – 5.2 pH (CaCl) and lime is needed on the lower pH paddocks. A Cowell p of 40 – 50 is maintained with the application of 0.8 kg of p per dse/ha.

Other areas of the farm have granite derived duplex soils and support phalaris pastures as well as several wombats. Most of the soils are deficient in Selenium and supplements are provided as a matter of course in drenches and vaccinations.





*Original homestead at Swatchfield with the bath house built by Japanese POW's during WWII*



*The convoy at Swatchfield*

John spoke of the importance of business relationships and invited Todd Clements from Bowyer & Livermore in Bathurst to discuss the livestock marketing plan on Swatchfield. Todd also gave an overview of the Oberon district which has lamb production as the predominate enterprise as well as large numbers of Angus cattle operations. Todd also discussed land prices which are driven by hobby farms as the area is only two hours from Sydney; prices per acre are \$2,500+.

After an extensive farm tour through the picturesque property, PPS members were invited into the converted shearers' quarters where Marilyn Baxter treated everyone to a welcoming and tasty smoko. It was then onto Bathurst for the next farm visit.



*Corey Price, Ross Yelland and Ben Greene discussing pasture selection at Swatchfield*



*Ross Yelland with the team at Swatchfield*

## **Farm Visit 2**

**Property: Macquarie Livestock**

**Owner: Matthew Burns**

**Location: Bathurst Farm Size: 500 ha + Leased and share farmed land**

**Enterprise(s): Lamb and Cattle trading**

Matt operates a trading operation on light granite soils just west of Bathurst, growing cereals and forage crops on almost the entire farm to feed trade lambs and cattle. The soils have low fertility in their unimproved state and Matt has incorporated chicken litter and lime to improve soil quality. Biosolids, the by product from sewerage farms, has also been used but being sourced from Sydney at a cost spread of \$500/ha it has become too expensive to use. Compost, also sourced from Sydney, has been used costing \$150/ha.

Phosphorus fertilisers have improved p levels from a Cowell p of 8 to 20 – 30 in most paddocks but seems to have hit the point of diminishing rate of return to take it any higher.

Timely sowing of the grazing cereals and fodder crops is the key to the operation to get sufficient feed to start trading before the majority of other traders. Matt has no sheep on the farm by late November each year and only runs cattle over summer which arrive on the farm at 300 kg and go out at 500kg. A feed mix supplemented by a corn silage by-product is used in the cattle operation.

Matt has used leasing land as part of the business operation but became frustrated by short term leases and the lack of return to inputs like lime. He has now entered a share farming contract on a nearby property which allows the sharing of input costs as well as a profit sharing agreement. Matt had very good handle on his feed base which is essential in a trading system with tight margins.



*Macquarie Livestock lambs*



*Grazing cereal and fodder crops*



*Matthew Burns from Macquarie Livestock*



*Dion Borg from GHMA impressed everyone on the tour by going everywhere in a tee shirt. An icy shower at Bathurst had him rugging up*



The group then headed for Orange but not before a lap of the Mount Panorama scenic road which doubles as the Bathurst 1000 car race track. Any thought of a few hot PPS laps was dampened by Kate Yelland's advice that that Bathurst police use the road as easy pickings to collect speeding fines. Tour participants had a little time to have a look around Orange before dinner.



*Mt Panorama; Bathurst*

### Orange

Orange is one of NSW's largest inland cities with a population of nearly 40,000 people. It has an elevation of 862 metres above sea level and with the 1395 metre Mt Canolobas nearby. August temperatures have an average high of 10.7° and an average low of 1.4°.

The poet A B (Banjo) Patterson was born near Orange but moved as a child and Red Wiggle, Murray Cook, grew up in Orange.

The area is well known as a fruit & wine growing region; no oranges are grown, though because it is too cold. The Cadia gold mine, which is the second largest open cut mine in Australia, is a large employer in the area.



*Mt Canolobas*



*Turners Vineyard Orange*

### Orange Dinner and Presentation

The study tour group stayed at Turners Vineyard and had a social dinner with guests Cameron Allen, MLA Sustainable Feedbase Resources Program Manager, who resides in Orange and Richard Hayes, NSW DPI Research Agronomist, based at Wagga Wagga.

After dinner, Richard Hayes did a presentation for the group covering three topics; phalaris in acid soils, pasture seed coating and perennial wheat.

Richard has reviewed phalaris research trial literature after extension agencies including the NSW DPI had recommended that phalaris was unsuitable for use in acid soils. He had felt this was misleading advice and has produced results showing phalaris does survive and produce productive pastures in very acid soils especially where the Advanced AT and Landmaster cultivars are used. The NSW DPI advice has now changed as a result of his work.

### **Orange Dinner and Presentation (cont.)**

Richard then moved onto a more controversial topic, the use of commercial seed coating on pasture seeds. He produced some interesting figures on the weight of the coatings and the subsequent need to increase the recommended sowing rates to get the required amount of seed in the ground when using coated seeds. He also discussed the short shelf life of rhizobia coatings and suggested that farmers need to get the coating done to order, so that the timing of the treatment is still viable or alternatively inoculating bare seed themselves to ensure that the treatment is effective.

The final part of his presentation was about his involvement with American scientists in “blue sky” research into perennial wheats. He gave a fascinating insight into this project and the possibility of perennial cereals being developed some time in the future.

A few social drinks followed Richard’s presentation and members were able to inquire further into his research projects.



*Richard Hayes presentation; Orange*

### **Tuesday 23<sup>rd</sup> August: Manildra, Molong region**

#### **Farm Visit 3**

**Property: Greydene      Owner: Salter Family**

**Location: Manildra**

**Size: 1700 ha + 270 ha leased**

**Enterprise(s): 4000 Merino Ewes, 100 Angus X Cows joined to Charolais bulls, 300 – 400 Trade Cattle, Cropping, Contracting**

After a 45 km trip west from Orange the group reached the Gumble Creek valley near Manildra; a very scenic part of Central NSW with productive pastures and canola crops running up to hills still covered with native bushland.

The first farm visit was at Greydene where Phil Salter outlined his sheep, cropping and contracting business. He described the region as having light granite soils and a reliable 675 mm rainfall with this year the best in his farming career. He did point out that the last couple of years were much more difficult with lack of spring rains shortening the growing season. Phil and other locals described them as “bob tail” springs; Mal Nicholson responded that PPS members have had their last two springs “tail docked”.

Phil spoke about his sheep enterprise and his aim of lifting his average lambing above the current 100%; lambing at Greydene is split to fit in the cropping system. Greydene crops around 650 ha, some of which is devoted to grazing cereals. Phil also operates a large contracting business with 800 ha of crop sowing and 7000 ha crop windrowing and harvesting annually.



Greydene's phosphorus levels range from 30 – 40 Cowell P on the home farm and 15 – 20 Cowell P on recently purchased land. Chicken manure is used in addition to other fertilisers on the property, it adds P at around \$1.20 per unit and is applied at 48 units of P per ha.

Pastures consist of a fescue, chicory and clover mix on the heavier country with a phalaris and sub clover mix on the light soils. Clover and vetch sowing follows cropping when paddocks go back into the pasture phase.

The group inspected a pasture sowing which had phalaris and sub clover with a trial addition of hard seeded legume - *Biserrula pelecinus*. *Biserrula* is native to Mediterranean areas of Europe and Africa, the Canary Islands and highland areas of Kenya, Ethiopia and Eritrea and has been developed for pasture use in W.A.

While it looked impressive, Phil pointed out that it does have a bitter taste at certain times of its growth and animals tend to avoid it; he is still evaluating its potential in his systems.

Brassica and lucerne pastures as well as a new phalaris sowing were inspected as we drove through the property which showed the dedicated and professional approach of the Salter family.



*Phil Salter; host farmer at Greydene*



*Greydene*



*Biserrula trial pasture*



*One year old merinos in top quality pasture*

#### **Farm Visit 4**

**Property: Wyoming      Owner: Yelland Family**

**Location: Manildra**

**Enterprise(s): Cattle Trading and Cropping**

It takes a brave person to help organise a PPS study tour taking people to a region's leading farm businesses and then including your own farm on the tour. This wasn't an issue with Roscoe's farm as it stood up very well with all the others visited.

Roscoe got the farm tour off to a great start as the first stop was at his mother Carmel's house where a vast array of goodies was sitting out for smoko. Carmel's scones were a particular highlight with most members going back for seconds; Mick Greene, showing his usual dedication to PPS activities went the extra yard and managed to sneak a third. Members who missed the trip can rest easy as Carmel's secret scone recipe has made its way south and hopefully they will appear at a local event soon. Carmel met all the PPS members but had a long conversation with Greg Coburn about some of her family connections in the Stawell area and they came to the realisation that they were long lost cousins, a few times removed.

It was then out into the paddocks where Roscoe explained the working of his agronomic business YellcoAg Consultancy & EmergeAg Farm Supplies and the whole farm consulting approach rather than just looking at individual pasture issues. Roscoe and his brother Pete operate Emerge Ag and given the huge off farm commitment they have set up the on farm business to operate with 0.6 of a labour unit.

Part of the property is used for cropping which is conducted on a share basis with Phil Salter and a cattle trading operation is carried out on the remainder. The Yelland's took an equity partner into the cattle trading business who is also a commission cattle buyer and sources the stock for the operation. Roscoe described the cattle selection as not front paddock stock as they seek to buy in low and sell out higher. The average buy in for the last year was 292 kg cattle @\$1.89 kg and a sell out at 440kg and \$2.11 kg; this gave a buy price of \$550 and a sell of \$930, it will be interesting to see the effect of the current record beef prices on the business. Cattle are also agisted in other regions as part of the cattle trading.

Cattle coming onto Wyoming receive a strict induction moving through yards and holding paddocks with hay feeding for a week to calm them before going in the paddock system. They receive a vaccination and worm drench as well as B12 and vitamin supplements. They then move onto the high quality pastures which were inspected by the tour group.

Pastures consist of a mix of winter active fescues, chicory, white clover, sub clover and lucerne. Prairie grass is also included in some of the pasture mixes, it usually lasts around 4 years and is very responsive to GA treatments and provides good cattle feed. Grazing oats are also part of the system with new varieties being trialled on the property. Most pastures are sown with the aim of around 8 years of production which raised the question of why they didn't aim for longer term pastures using phalaris or cocksfoot. The response was that phalaris has poor winter growth in the region compared to fescue which surprised the group who were standing in boot high winter feed. Roscoe pointed out that it was one of the best seasons on record and that winter growth on Wyoming is usually restricted by the average annual 40 frosts; this year they had only had 10, which seemed plenty for their southern visitors.



*Vetch at Wyoming*



*Oat crop for cattle grazing*





*Cereals and canola on Wyoming*



*Ross Yelland, Ben Greene and Dion Borg*



*Fescue, Prairie Grass, Chicory and  
White Clover pasture*



*Cows grazing cereals*



At the end of the tour of Wyoming the group returned to the Salter's property Greydene to have lunch where Phil's dad John had a couple of fires ready to warm everyone before a free roaming inspection of Phil's cropping contract business was taken; happy hour for the blokes!



*Machinery complex at Greydene*

#### **Farm Visit 5**

**Property: Valehead      Owner: Pepper Pastoral Co Pty Limited**

**Location: Molong**

**Farm Size: 800 Ha**

**Enterprise(s): Egg Production, Lamb, Cattle, Cropping**

Valehead is a family owned and operated poultry and mixed farming business operated by the Pepper Pastoral Co Pty Limited which was started in 1955 by Ivo and Marie Pepper with six chooks on a patch of farmland which is now part of suburban western Sydney. The diversified agricultural activities include production of merino wool, prime lambs and beef as well as wheat and canola crops.

Valehead is situated just outside Molong and was originally granted to one of Rev Samuel Marsden's daughters in the 1830s. Rev Marsden was a major church, business and political figure in the early colonial settlement of Australia.

Josh Pepper and Luke Kerin outlined the egg enterprise which includes a rearing shed which takes one day old chicks through to egg producing age when they are transferred into the production system. 30,000 chicks are reared annually and a new rearing shed has just been completed which was inspected by PPS members. It is an impressive set up with automated watering, feeding, temperature control and walk over weighing systems. Feed for the 130,000 egg producers is prepared on farm through a feed mill which processes 5,000 tonnes per year including wheat grown on farm which provides 45% of the total wheat used in the feed mix; sorghum and other feeds are bought off farm. The egg business is marketed as Canobolas Eggs and uses a vertically integrated transport system to supply major supermarkets in Sydney and throughout NSW. Josh described Canobolas Eggs as being at the big end of small egg producers.

A couple of pasture inspections and a discussion of the cropping, sheep and cattle enterprises were then undertaken and a new lucerne, plantain and chicory pasture was a stand out. The farm receives 55 tonnes of chicken manure per week from the egg enterprise and it plays a huge part of the fertility regime on the farm. The aim of the "outside" farm enterprises is a \$500/ha net return and a very compressive system of analysis is undertaken to measure the systems. The visit to Valehead showed a very focused and structured system across all enterprises.



*New Lucerne, Plantain and Chicory pasture at Valehead*

### **Molong**

Molong is a town of around 1600 people, Molong means “all rocks” in indigenous language; maybe a good indicator of what is called granite country. The town began life as a Government stockyard and now has many historic buildings in its main street listed by the National Trust. Average August temperatures are a bit lower than Orange!



*Freemasons Hotel Molong*



*Main Street Molong*

### ***Molong Dinner with local farmers***

The final evening was a social dinner at the Freemasons Hotel with around 16 local producers invited by Roscoe to meet with the PPS group. They were invited to speak briefly about their operations and then the discussion moved to their interest in forming a group along the lines of what they had learnt about PPS. Inaugural PPS President, Simon Brady and Project Manager, Rob Shea were asked to speak about how PPS was formed and its evolution to its current position within the farming community in Central Victoria. PPS members were sure that with the enthusiasm and dedication that they show to agriculture that they could be successful in their ambitions but pointed out the massive amount of planning that went into the early stages of PPS to get the group operating.

After dinner Kate Yelland and her business partner Katie Foy, who have formed a farmer health service, spoke about the issues involved in healthy farming families and how they are often ignored.

**Wednesday 24<sup>th</sup> August**

**Farm Visit 6**

**Property: Dalmeney Owners: Luke & Melissa Gibson**

**Location: Molong**

**Farm Size: 480 Ha + 260 ha leased**

**Enterprise(s): 2000 Merino ewes, Cropping; cereals and canola**

While all the farm speakers were informative and inspirational, there is no doubt that Luke “Red” Gibson will be talked about by the PPS members for a long time. If his farming dream doesn't work out he has a great future on the agricultural stand up comedy circuit, if such a thing exists! The Gibson's is a very good story of a young family starting from scratch and taking on the world. They are using a heavy debt load to achieve their aims and are very focused on their dream of farming.

Red told of his passion to become a farmer growing up on a small family farm but struck a problem on leaving school and realising that it would not be viable to join the family business. He immediately set to work in solving this by spending a few years as a shearer as he and his wife Melissa built up enough funding to purchase their first small farm. After a period of improvement they were able to sell the property and purchase a bigger farm and then repeat the process to end up on Dalmeney. Red and Melissa still work off farm to help fund the purchase and farm improvements although Red's shearing days are over and not missed.

Red outlined his farm operation which currently consists of 2,000 ewes and a cropping regime to increase cash flow and used to prepare for productive pastures. Their aim of is to have 4,000 merino ewes producing quality 20 micron wool with high lambing percentages and a turn off of wethers to the meat trade at 10 – 13 months.

The discussion then progressed to farm finance and the difficulty in getting a bridging loan whilst purchasing “Dalmeney” prior to selling their previous property. His original lender wasn't willing to fund the deal and Red and Melissa had to approach other banks and were finally successful in gaining an interest only loan which was at a higher interest rate than the original lender. Red made the point that “it is no good getting the best rate if you can't get the money”. Red also pointed out that he wasn't the best student in his younger days and likes to keep his financial dealing pretty simple.



*Luke “Red” Gibson with Gavin Svanosio and Dion Borg*



*In the paddock at “Dalmeney”*

PPS members think that he is underestimating himself but were amused by the description of his two page cash flow report accepted by the new bank. It is still remembered by the agricultural lending department as it was written with a purple pen; sometimes it helps to stand out by doing things a bit differently.

Red moved onto family matters and described combining farming, Mellissa's off farm work and raising four young children. He had two years as a full time dad with one of his sons while still full time farming. It was obviously a special time with the young fellow heading off with Red every day with his little lunchtime esky in hand.



Before moving off on the farm tour, a question was asked about water supply and while the property has good surface water catchment, the Gibson's are looking to drought proof the property with a 50 metre bore. Red received plenty of advice from water supply businesses who questioned his plan of a solar powered system due to the bore depth and the lift required to an elevated storage. Red rejected the advice and set up his own design which is working well. He described some of the suggestions as "grown men saying stupid things" a comment immediately entrenched in the PPS members minds especially those in the newly formed PPS "Girls 'N' Grass" group. It was then out into the paddocks looking at a new chicory, plantain and clover pasture which will provide high quality feed for their pasture systems. A stop was then made in one of the lucerne paddocks which are part of the 100 ha of lucerne stands on Dalmeney; an impressive canola crop adjoined the lucerne pasture.



*New Chicory, Plantain and Clover pasture*



*Lucerne pasture*

After a bit of discussion of Red's use of containment areas and some anecdotes of successful use of them by PPS members, it was on to the enterprise's lease block where we were met by Greg Miller from Auswest Seeds whose family owns the property. An inspection was made of a long established fescue pasture before Greg took the group through a lucerne cultivar trial.

The study tour members will long remember the visit to Dalmeney with the full on approach to improving the farm pastures and infrastructure while running a low equity, high risk financial model. Red's down to earth humour in telling their story was both entertaining and inspirational. People with the passion of the Gibson's deserve to be successful in their farming endeavours; agriculture needs them.



*Inspecting the lucerne trial with Greg Miller Auswest Seeds*



### Key Messages from Study Tour

- Use of “medium” term, high production pastures in farming system.
- Integration of grazing cereals into the animal production system.
- Integrated use of chicken manure and biosolids as alternative fertilisers.
- The revaluation of phalaris in soils with high acidity.
- Understand the use of seed coating methods and timing.
- Use of systems approach to agronomy rather than paddock based system.
- Find financial institutions that fulfil your business requirements.

### Possible Further PPS Action

- Investigate use of high production medium term pastures in local region.
- Trial Prairie Grass under local conditions (Duncan Thomas commented that there is probably a low chance of success in our region).
- Have another look at plantain and chicory in pasture mixes (chicory is summer active so it may have limited success in our region).
- Continue evaluation of acid tolerant phalaris cultivars (PPS Tottington Pasture Variety Site).
- Get up to date Victorian information on biosolids availability (Project Manager to contact Dr David Nash; Ag Victoria Ellinbank to follow up on his discussion with members of the PPS management committee in 2010).
- Provide information to PPS members on the effective use of seed coatings (PPS Project Manager & Dion Borg GHCMa to liaise with Richard Hayes to produce an update to PPS pasture establishment guidelines).
- Conduct a demonstration, directly related to Richard Hayes’s presentation on seed coatings, looking at coated plantain and grass Vs uncoated. This should demonstrate that there is no reason to coat herb or grass seeds (tropical seeds may be an exception to help them flow through a seed drill).
- Host a study tour for Central NSW farmers.
- Provide scones, made with Carmel Yelland’s recipe, at PPS management committee meetings.

## PPS 8<sup>th</sup> Annual Study Tour Participants

Dion Borg	Glenelg Hopkins CMA Hamilton	Simon Brady	Rhymney
Wayne Burton	Mt Dryden	Greg Coburn	Ararat
Ben Greene	Elmhurst	Jodie Greene	Elmhurst
Michael Greene	Elmhurst	Dennis Harrington	Mt Cole Creek
Sue Holden	Concongella	Ann Howell	Amphitheatre
Peter Howell	Amphitheatre	Matt Kindred	Stawell
Mal Nicholson	Concongella	Corey Price	Eversley
Hayden Price	Eversley	Rob Shea	PPS Project Manager Ararat
Gavin Svanosio	Rural Bank Ballarat	Duncan Thomas	PGG Wrightson Ararat
Jane Thomas	Ararat	Rod Vearing	Ararat

*All tour costs were met by the participant's contributions and the tour grant; no PPS funds were committed to the tour.*

PPS Thanks Ross Yelland; Agronomist YellcoAg Consultancy & EmergeAg Farm Supplies, Manildra, NSW and PPS member Ben Greene; "Millbanks" Elmhurst for their assistance in planning the Study Tour.

PPS thanks the host farmers and others that we met on the tour for their welcome, shared information and fellowship on the study tour.

PPS thanks the car pool drivers who took on their role in a safe and proficient manner.

PPS thanks Dion Borg from GHCMa for his assistance with the funding application for the study tour.

*The 8<sup>th</sup> Annual PPS Study Tour has been supported by Glenelg Hopkins CMA, through funding from the Australian Government's National Landcare Programme.*



*PPS acknowledges the continued support of the Wimmera CMA in supporting the PPS Project Manager's role.*





*PPS Study Tours require deep concentration*

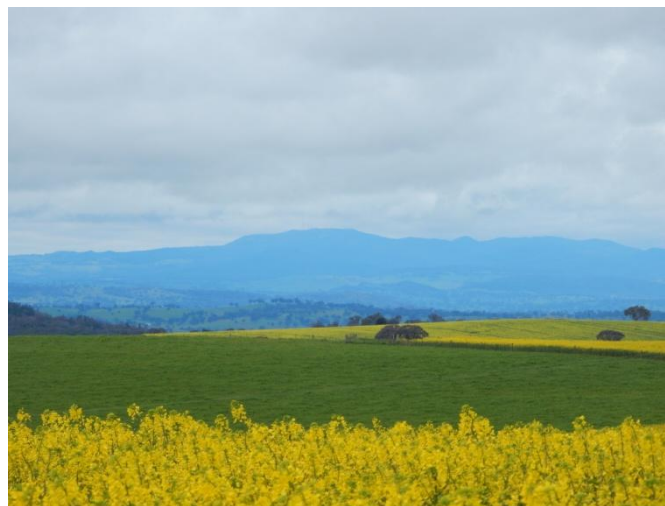




*PPS vehicles under threatening skies at Bathurst*



*In the cattleyards at "Wyoming"*



*View of Mt Canolobas "Wyoming"*



*"Dalmeney" Molong*



*Local produce from PPS members  
was presented to host farmers:  
Bests Wine and Red Rock Olive Oil*



**PERENNIALPASTURESYSTEMS**

MAKING PASTURE GO THE DISTANCE