final report

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Coordination of participatory R&D in Western Australia

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Executive summary

In 2014 Meat and Livestock Australia (MLA) introduced a participatory research program to enable producer involvement in the Feedbase Investment Plan (FIP). This program was the "Producer Research Sites" (PRS) program, which had the aim of involving producers in design, implementation and interpretation of the FIP research.

25 producer groups from across Southern Australia worked with research leaders funded via the Feedbase Investment Plan.

The objectives of the PRS program was to:

- Add value to the existing research under the FIP
- Test if and how new research fits or could fit within farm systems if modified
- Speed up the development and adoption of new research
- Involve innovative, information seeking producers in research funded by MLA
- For producers to influence future research agendas

Planfarm Pty Ltd were contracted to coordinate the delivery of the PRS program for Western Australia during the period 2014-2017. Nine Western Australian grower groups were identified, engaged, contracted and supported to deliver Producer Research Sites within this period. These groups represented a large geographical area of the sheep and grain belts of the southern regions of the State, and a wide array of production-related topics, including;

- improving the feed-value, establishment and persistence of perennial pastures (two groups);
- soil-borne root disease of sub-clovers;
- real-time biomass estimation of pastures using a low-cost hand-held imaging device and a smart-phone App;
- best use of hard-seeded annual legumes in a tight crop / pasture rotation;
- phosphorus-use-efficiency in pasture legumes;
- comparing legume types, establishment, persistence, feed value and contribution of N to subsequent crops (two groups);
- and the costs vs benefits of grazing commercial cereal crops.

The Project B.FDP.0019 has been successfully completed with all objectives being met, and nine valuable Producer Research Sites being delivered by grower groups in Western Australia.

Three key recommendations have been identified through this project that may assist in guiding the delivery of future R&D programs:

1. The value of a three-year time-frame
2. The value of higher-level communication and collaboration within research topic groups
3. Ensure provisions (funding & contractual commitments) for Researchers to be involved and invested in the success of Producer Research Sites.

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1 Background

In 2014 MLA introduced a participatory research program to enable producer involvement in the Feedbase Investment Plan. This program was the Producer Research Site program and aimed to involve producers in design, implementation and interpretation of the research.

25 producer groups from across Southern Australia worked with research leaders funded via the Feedbase Investment Plan.

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- and the costs vs benefits of grazing commercial cereal crops.

2 Projective objectives

The Objectives of the Project B.FDP.0019 were:

By 30 Nov 2017:

1. As part of a national call managed by MLA, identified, coordinated and liaised with farmer groups in Western Australia who wish to participate in Participatory Research and Development projects
2. Facilitated nine workshops with relevant WA farmer groups and FIP researchers as part of the establishment of Participatory R&D sites
3. Established, monitored, evaluated and reported nine Participatory R&D sites in operation throughout the agro-ecological zones of WA
4. Organised, in collaboration with MLA, at least one regional events every year for farmers and researchers which allow for networking between farmers from different Participatory R&D sites

3 Results

The Project B.FDP.0019 has been successfully completed with all objectives being met, and nine valuable Producer Research Sites being delivered by grower groups in Western Australia. Individual project objectives, and how they have been achieved, are outlined below:

1. As part of a national call managed by MLA, identified, coordinated and liaised with farmer groups in Western Australia who wish to participate in Participatory Research and Development projects

Information was distributed through the Western Australian Grower Group Alliance, to a list of 40 grower groups across the state. A Farmline article released to all Planfarm clients was also produced, as well as emails sent to a range of people in Planfarm's local networks, and informal discussions at field days and similar events.

A reminder email was send to all registered grower groups one week before deadline including all the information again, links to EOI form and bold reminder of closing date.

Assistance was provided to groups who had queries on the EOI forms and follow up discussions were held with some groups who needed to alter their application or form a combined application with another group.

A ranking table was designed and each group's application was assessed against the selection criteria with a ranking of one (not met) to five (completely satisfied). These scores were used to decide which groups would be put through to the next stage, and presented to the applicable researchers.

18 expressions of interest from grower groups were received, assessed and ranked for suitability, and of those, nine groups were chosen to proceed to the stage of project development and funding submission to MLA.

2. Facilitated nine workshops with relevant WA farmer groups and FIP researchers as part of the establishment of Participatory R&D sites

Nine workshops were held with each of the relevant WA grower groups in their local towns, with researchers attending, between September 2013 and March 2014. During these meetings, research priorities and topics were decided on for each group, and subsequently a detailed Project Plan and budget was developed for the nine Producer Research Sites, and submitted to MLA for approval. All nine PRS Project Plans were accepted by MLA and trials began in the 2014 growing season.

3. Established, monitored, evaluated and reported nine Participatory R&D sites in operation throughout the agro-ecological zones of WA

The WA PRS State Coordinator oversaw the successful establishment, monitoring, evaluation and reporting of nine PRS sites in the 2014-2017 period in Western Australia. These nine Sites covered a wide array of production-related Feedbase topics, and represented a broad geographical spread across the southern areas of the State (see Figure 1). An overview of the nine Producer Research Sites, including the main outcomes / findings of each project, has been provided below.

Figure 1. *A broad variety of topics and wide geographical spread amongst the nine W.A. Producer Research Sites (image courtesy MLA)*

3.1 Lake Grace Development Association

Research question: *Which hard-seeded legume varieties are best suited to the Lake Grace area of Western Australia?*

Project Leader: Grant Marshall / Ed Riggall

Site	Soil types	Rainfall
Lake Grace WA	shallow loamy duplex (Kellerberin No 407)	300mm/year

Background: Including legume pastures within a crop rotation can provide a valuable contribution of soil nitrogen for subsequent crops. When new legume species become available, farmers want to know how well they will perform under local conditions, what contribution they can make to overall farm productivity and the appropriate management practices to achieve best results (especially sowing time).

Project objectives:

1. The impact of early or late sowing on legume production for nitrogen fixation for subsequent crops.
2. The performance of different legumes and sowing times in terms of nitrogen production and animal production.
3. Whether any varieties in the trials are tolerant to sulfonylurea (SU) herbicides.

Research approach

This trial was conducted in two stages:

1. Plot trials at Hakuna Matata, Lake Grace, comparing varieties and sowing times. 2014: establishment; 2015: oversown with barley; 2016: regeneration.
2. In 2015 and 2016, multiple site trials conducted by members of the Lake Grace Development Association, following the 'best bet' variety combinations determined from the results of the 2014 plot trials.

The following legumes were sown in the 2014 plot trials:

- March: Margarita serradella pod and unscarified Bartolo Bladder Clover seed
- April (dry sowing): Izmir sub-clover, Dalkeith sub-clover, Angel Medic, Casbah biserrula, Cadiz serradella and a mix developed by the host farmer.

All varieties were sown with the recommended group of inoculant and with a base rate of fertiliser (50kgs/ha CSBP double phos as per farmer standard practice).

Because Prickly Saltwort is a prevalent local weed, legumes were planned to be assessed for tolerance to SU herbicides. Red-legged earthmite control was undertaken where required.

Sheep were allowed to graze the whole trial area in winter/spring but were removed to allow seed set. Grazing days were recorded and observations made to determine whether or not there was any preferential grazing.

In 2015 the site was sown with barley with strips of different rates of nitrogen to determine the benefit to the crop from the different legume sowings. The project also assessed the difference in grain production associated with nitrogen application.

In 2016 the paddock was left to regenerate as a pasture.

Information collected during the trials aimed to provide an insight into the different legume varieties in terms of:

- Preferred sowing date.
- Feed on offer and capacity to fill the early season feed gap.
- Nitrogen fixation and contribution to soil N levels.
- Amount of legume nitrogen used by the following crop.
- Legume regeneration.
- Yield of legume seed harvest.
- 'Best bet' legume variety combinations and sowing times

Key findings:

The results of this trial were not conclusive however there were indications that sub clovers and biserrula are best suited to the Lakes Information and Farming Technology (LIFT) group area.

The site showed that there was little difference in soil nitrogen fixation across the 11 different treatments and therefore the focus of pastures should be for livestock feed, with nitrogen benefiting the following crop simply an added bonus. However, there was a positive link between crop tissue nitrogen and the previous year's pasture biomass. The project failed to investigate the impact of various sowing times, and of tolerance to SU herbicides, due to false breaks, and an absence of prickly saltwort on site.

The project was initially run by grower participants, however midway through, it was identified that a coordinator was required to improve the management of the site. This led to a facilitator being bought on board, from which the group found great value. Participants also found value in learning feed quality and quantity measurement techniques as well as legume nodulation scoring, and how these could be applied to their pasture management.

3.2 Nyabing Farm Improvement Group Inc. (NFIG)

Research Question: *Which new pasture legumes are best suited to include in a cropping rotation in the Nyabing area of Western Australia? And what management practices achieve the best results?*

Project Leader: Braden Johnston / Fiona Martin

Site	Soil types	Rainfall
Nyabing, WA	Trial strips will cover a soil gradient from gravel to partial clay	400mm/year

Background:

Including legume pastures within a crop rotation can provide a valuable contribution of soil nitrogen for subsequent crops. When new legume species become available, farmers want to know how well they will perform under local conditions, what contribution they can make to overall farm productivity and the appropriate management practices to achieve best results (eg sowing time, sowing method etc).

Project objectives:

1. To establish the value of alternative legumes and their appropriate sowing times for the Nyabing district.
2. To determine the value of alternative legumes for adding nitrogen to soil.

Research approach:

Legumes were sown in 2014 into paddocks that had a rotation of canola/barley/barley for the previous three years.

This project is assessing two sowing options: sowing after a cereal crop, and twin sowing where the legume is undersown with a cereal crop the year before pasture is needed.

Legumes in the trial include: Margarita serradella and Bartolo bladder clover; scimitar medic, Casbah biserrula, prima gland clover and Eliza French serradella.

Varieties were sown in 450m strips with the recommended inoculant and a base rate of fertiliser (80kg/ha of K-till). Redlegged earth mite control was performed. The site was fenced to allow sheep to graze during winter/spring and be removed before legume seed set.

In 2015, the main trial site (all strips except twin-sown Margurita Pod) was sown to crop and strips of fertiliser were applied at varying rates to establish where a nitrogen response occurs.

Twin sown strips were left uncropped in the second year to assess the germination achieved and early season feed production.

Information collected will provide an insight into the performance of different varieties in terms of pasture production, nitrogen fixation and changes in soil nitrogen levels, seedset, regeneration and harvestable seed.

Key findings:

- Margarita for sandy country has been taken up by growers.
- Bartolo was looking good as an alternative, however less tolerant of herbicides.
- Harvesting with a conventional was header not as easy as anticipated but more economical than clover harvester
- Dalkeith sub clover appears to be a robust pasture species that offers comparable feed value and nitrogen contribution to the new legume species.
- Bartolo Bladder Clover, Margarita Serradella, Dalkeith sub clover, Scimitar Medic and Prima Gland regenerated with good early plant numbers and biomass.
- This higher N content in the soil and plant tissue N appears to have increased barley crop yields slightly higher in comparison to the lower biomass pastures which had lower N contribution to the system, however this trend was not significant.
- The use of ALOSCA and Nodulator on Serradella and Bartolo performed similar under dry sowing.
- Twin sowing pastures with a crop could be a viable establishment option
- Dry sowing early using pod seed for Serradella and unscarified Bartolo bladder clover regenerated adequate pastures by the third year, but less growth in establishment year.
- Frost impacted all pasture species except Dalkeith sub clover and Scimitar Medic which could limit the adoption of aerial seeded varieties in the Great Southern Region in WA
- Grazing crops fills the feed gap enabling sheep grazing pressure to be removed and pastures to bolster growth
- Pasture seeding with disc machines is increasing in the area, along with direct harvest of aerial seed pastures with conventional harvesters.

3.3 Southern DIRT Incorporated

Research question:

Can a lower rate of phosphorus fertiliser produce as much biomass from pastures with new legume species?

Does phosphorus application form (granular or liquid) affect pasture performance?

Project Leader:

Emma Russell

Site	Soil types	Rainfall
Kojonup, WA	Low critical phosphorusvalue	528mm/year

Background:

Early results from research indicate that French serradella has a lower critical phosphorus value than traditionalsub-clover, and under suitable environmental conditions can yield a similar amount (refer joint MLA/AWI project: *Phosphorus-efficient legume pasture systems*). If this is the case, producers may be able to reduce fertiliser costs on French serradella pastures.

Project objectives:

1. Compare alternative legume species with potentially lower critical P values with sub-clover.
2. Evaluate the performance of alternative legume species and sub-clover when P is applied in either liquid or granular form.
3. Determine if a lower level of P than the recommended rate can produce as much biomass from pastures.

Research approach:

2014

Three treatments were sown next to each other in strips, repeated three times. These treatments were Dalkeith sub-clover, Margurita French serradella and a Self-Regeneration mix (SafeGuard annual ryegrass, Border clover, Hykon Rose clover and Dalkeith sub-clover). All seed were treated with the appropriate inoculant at seeding. Spray strips were applied across the seeding strips at two rates of P – recommended rate and half recommended rate, and in two formulations – liquid and granular. A control of no P treatment was kept as a baseline. Initial soil tests were taken to ensure no other nutrients were limiting. If limitations were found, all plots were treated to remove the limiting factor.

2015 - 2016

It was decided in a meeting that was held in early 2015 between the growers and researcher that were involved in the trial in 2014 that the trial needed to be simplified. The amount of multiple repetitions was reduced while increasing the repetitions for the remaining treatments. This meant omitting the liquid phosphorous (P) plots and using only granular P.

Six granular P treatments (0, 5, 10, 20, 40, 60kg's per ha), applied at sowing, over three pasture varieties (Santorini yellow Serradella, Margurita French Serradella, and Dalkeith sub-clover). Each of the P treatments were replicated twice within the trial. All seed were treated with the appropriate inoculant at seeding. Initial soil tests were taken to ensure no other nutrients were limiting. If limitations were found, all plots were treated to remove the limiting factor and to control weeds within the trial. Data that was collected through the growing seasons were biomass samples and they were collected and weighed in August. September nodule scoring was completed and analysis of P uptake in the plant tissue in October.

Both trials were conducted on sites with a very low initial soil P level (<10mg/kg Colwell P) to ensure that for the nil and low P treatments, P was limiting to plant growth.

Key findings:

The primary expected result of the trial – that Serradella species would show higher biomass at lower applied P levels compared to sub-clover, was not consistently seen. In 2015 the sub-clover plots had higher biomass at lower P levels than either of the Serradella species; while in 2016 the reverse was true.

In all pasture species the 0 – 10kg/ha P applied treatments showed little difference, where in the 20 – 60kg/ha the species showed an increase in biomass, with the exception of Yellow Santorini Serradella in 2015 and the sub –clover in 2016. This is an expected result as the higher P application, the more biomass is produced, as it is no longer a limiting factor.

The soil results however show an unexpected result. The amount of applied P in the higher application treatments (20kg/ha – 60kg/ha) should show a significant increase in the Colwell P values. Despite P inputs of 170, 365, and 620 kg/ha Double Phos over the two growing seasons and minimal uptake by plants, the final Colwell P soil test values were much lower than expected (9-42 mg/kg).

In both 2015 and 2016, root nodules on the Serradella plants late in Spring (October), were pink and healthy, while the nodules on the sub-clover plants were whitish and anaemic.

The project has identified that producers need to select a pasture based on soil type, limiting nutrient, and rainfall. Serradella species achieve best results when sown on sandy more acidic soils, whereas the sub clovers out compete serradella species on clay and moderately acidic to neutral soils. Producers should treat their newly established pastures like they would a crop (weed & insect control, nutrition) to achieve the best outcomes, particularly in a nutrient limiting environment.

3.4 Stirlings to Coast Farmers Incorporated (SCF)

Research question: *Can new pasture legume and grass varieties establish and persist within a cropping phase?*

Project leader: John Hood & John Blake

Site	Soil types	Rainfall
John and Ashton Hood's property, 'Sand Paddock', South Stirling	Acid soils with low plant available waterholding capacity	400mm during the growing season

Background:

Including legume pastures within a crop rotation can provide a valuable contribution of soil nitrogen for subsequent crops. When new legume species become available, farmers want to know how well they will perform under local conditions and how they compare with other options for feed production eg grass pasture or a grazing cereal. Local farmers are also interested to see the performance of newer pasture establishment approaches such as twin sowing in an existing crop.

Project objectives:

1. To assess which of the newer legume varieties (hard seeded) are more suited to the area's dominant soil types, within a tight crop:pasture rotation.
2. To compare local legumes sown to a mix of legume varieties with a grazing cereal or Italian ryegrass for their potential to provide feed on offer early in the season without reducing seed regeneration.
3. To investigate the impact of more recent methods of establishing legume pastures (eg twin sowing in a previous crop, summer sowing, or autumn sowing) on production under local conditions.

Research approach:

This trial comprised of six sub-trials (M1-M6) at four grower sites:

2014-17

- **M1**: Pasture mixes versus single cultivar (Growers: John & Ashton Hood)

2015-17

- **M2 & M4**: Serradella establishment methods (twin sowing & summer pod sowing vs autumn sowing of dehulled seed) (Growers: John & Ashton Hood)
- **M3**: Using Precision Planter for non-wetting soils (Growers: Peter & John Diprose)

2016-17

- **M5**: pasture mixes with cereal vs summer sown Serradella pod (Grower: Mal Thomson)
- **M6**: Options for waterlogged/marginally saline pastures: Messina vs Balansa (Grower: Iain Mackie)

Site M1 was sown conventionally (April to June 2014) with plots of the following legumes and appropriate inoculant:

- Santorini yellow serradella with Alosca inoculant (sown 19 April 14).
- Santorini serradella, Bladder clover with peat inoculant and Drummer ryegrass. No pre-plant Propyzamide spray (sown 19 April 14).
- Santorini serradella with peat inoculum (second time of sowing 6 June 14).
- Margurita French serradella with Alosca inoculant (sown 19 April 14).
- Margurita French serradella with Peat inoculant, (sown 19 April 14).
- High seeding rate of the mix: Santorini serradella plus Bladder clover (sown 19 April 14).
- Serradella/ bladder clover mix at regular seeding rate: 5kg + 5kg/ha,(sown 19 April 14).
- Lucerne + Chicory + Santorini (sown 26 April 14). Control - volunteer pasture – with fertiliser.

In 2015, Site M1 paddock was sown to canola and in 2016 the pasture was allowed to regenerate.

Site M2 comprised two replicates of the following treatments plus buffers:

- Santorini treated pod broadcast in crop July 2014
- April 2015 sowing of Serradella – Santorini seed
- Summer sowing of Santorini (treated) in pod January 2015
- Summer sowing of Margurita serradella pod January 2015
- Margurita pod broadcast in crop July 2014
- Avila pod broadcast in crop July 2014
- Summer sowing of Bladder clover January 2015

Site M3 tested the efficacy of precision planting serradella seed in April 2015 with the following treatments:

- Margurita Serradella precision sown with rows 250mm apart
- Margurita Serradella precision sown with rows 500mm apart
- Santorini Serradella precision sown with rows 500mm apart

Site M4 tested three varieties of serradella broadcast in pod form prior to a barley crop being sown in May 2015, for pasture establishment in 2016. Each treatment had two replicates.

- Margurita pod top-dressed before barley sown
- Santorini pod top-dressed before barley sown
- Avilla pod top-dressed before barley sown

Site M5 tested low (25kg/ha), medium (38kg/ha) and high (50kg/ha) seeding rates of Serradella pod, summer sown in February 2016, with a conventionally sown annual pasture mix sown in April 2016. Each treatment was replicated twice.

Site M6 compared Balansa clover and new legume variety Messina on a saline and waterlogged site.

Key findings:

This project had five trials which included the newer Serradellas and one trial on Neptune Messina. The summer sowing of Margurita Serradella pod was the most successful in terms of legume biomass on light soils. The dry sowing (in < decile five Autumns) of Serradella bare seed in early autumn (April) the least successful. The harder-seeded Serradellas are less suited to summer pod sowing and so Santorini is better sown as bare scarified seed into moist soil and treated as a crop.

The late-maturity Serradellas are affected (reduced pod set) by spray topping late ryegrass cohorts at the end of the growing season. This remains an impediment especially for later French Serradella types to full adoption as a pasture phase within a tight cropping rotation. In these tight rotations growers need minimise the use of selectives as ryegrass resistance to such herbicides is steadily emerging.

Among group members there has been increased awareness of the limits in dry seeding light soils. Twin sowing with Serradella in the trial mirrored the poor results growers were experiencing. Seeder configurations and herbicide regimes were not suited to twin sowing and especially the summer weed control programs which means early cohorts of Serradella also get knockdown. Growers are reluctant to use selectives over partial germinations of pasture and summer weeds.

An outcome of this trial has been increased awareness and understanding of the options. Follow-up extension is required to generate change of practice in the regional industry and on-farm.

Annual clover-based pasture mixes were demonstrated as a more robust system across the usual mix of soil types in paddocks and the range of seasons. Pasture mix plots out produced summer pod sown Margurita Serradella and also dry sown serradellas for total biomass (FOO) in the front half of the growing season however Serradella pod set in pasture mixes is severely reduced because of need to spring graze to limit ryegrass seed set.

Observations in this trial and in other paddocks is that claying has highly beneficial impacts on the regeneration of pastures (especially Serradellas).

Integrated Weed Management trials were implemented across the broad-scale MLA pasture trials. Weed control in the pasture phase remains a priority (especially in a season where non-wetting causes staggered germinations for both the pasture species and the weeds. Herbicide resistance testing (HRT) is an essential part of testing new rotational systems. There is need to monitor changes in HR status as an overall impact of system changes such as introducing a pasture phase in a cropping rotation. Ongoing HRT is undertaken in a separate self-funded SCF project and the trial sites were included in this program.

Messina has proved a very viable option for the marginally saline and waterlogged areas.

3.5 Fitzgerald Biosphere Group Inc

Research question:

How can feed periods be most effectively extended throughout high and low rainfall areas of the Jerramungup Shire?

Site One (low-mid rainfall): Can new sowing methods improve the establishment of panic grass and kikuyu?

Site Two (mid-high rainfall): Can serradella and oats provide additional winter feed within an existing kikuyu pasture and which seeding method works best to establish these species?

Project leader: Karryn Dorrell

Site	Soil types	Rainfall
Site 1	Sand over clay	350–400mm
Site 2	Sand over gravel	450–500mm

Background:

Improving the persistence and productivity of perennial pastures will contribute to improved farm profitability.

Sowing into wide furrows has achieved better establishment of perennial pastures such as panic grass in the northern agricultural area of WA. This project will investigate its value in the Jerramungup area.

Project objectives:

1. Determine if sowing panic grass with a wetting agent into wide furrows achieves better establishment than the standard farmer practice (tine seeder and no wetting agent).
2. Compare the effect of different machinery configurations on the establishment of new species when sown into a Kikuyu pasture.
3. Compare the performance of serradella and oats in providing winter feed within an existing kikuyu pasture.

Research approach:

Between 2014 and 2016 three different ways of improving feed value of perennial grasses were trialled at three different sites; one in the mid to low rainfall zone (450 – 350 mm) and two in the high rainfall zone (600-450 mm).

The aim of the project at **SITE One** was to trial a non-traditional perennial sub-tropical grass species (Gatton Panic). The objectives were;

1. To determine if seeding with a winter cover grass helps to establish Gatton Panic.
2. To determine if seeding with a soil wetter helps establish Gatton Panic better.
3. To determine if Gatton Panic could effectively extend the feed period and value of a pasture paddock over a two to three year period in either quantity or quality.

The soil type in the trial paddock was sand over gravel and consistent throughout the paddock. It was extremely prone to water repellence and wind erosion.

The aim of the project at **SITE Two** was to investigate methods of establishing annual pasture species into long term (10-15 year) kikuyu stands to increase the amount of winter feed generated. The objectives were:

1. To determine what seeding method provides the best establishment of alternative pastures into a long term (eight year) Kikuyu stand.
2. To determine which species would establish better into the kikuyu stand: oats or serradella.
3. To determine if a knockdown on the kikuyu followed by soil disturbance would create an environment that entices pre-existing clover in the seed bank to germinate.

The aim of the project at **SITE Three** was to investigate persistence, pasture yield and pasture quality by establishing legumes into a long term (10-15 year) kikuyu. The objectives were:

1. To determine which pasture species (bladder clover or serradella) is the most persistent species when sown into kikuyu.
2. To determine which pasture composition would give the highest feed quantity over the life of the trial.

3. To determine which pasture composition would give the highest feed value.

Key findings:

Barley was successfully used as a cover crop to help establish Gatton Panic, which in turn raised both the quality and quantity of pasture production. Digestibility and energy increased marginally but the biggest gain was in the increased overall bulk yield compared with the annual pasture.

The equipment that provided the most successful establishment of oats and Serradella into an eight year old kikuyu stand was knife points with double disk openers and press wheels. Serradella pasture established a better stand than oats, while soil disturbance instigated growth of clover seed in the seed bank.

Comparison of two legume species sown into a ten year old kikuyu stand showed bladder clover persisted slightly better than serradella. Although straight kikuyu pasture produced the highest feed quantity, it was only marginally higher in digestible fibre than other pasture compositions.

3.6 Moore Catchment Council/Moora-Miling Pasture Improvement Group

Research question: *Can dual purpose crops contribute to increased whole farm profit in the Moore region of WA?*

Project Leader: Edward Riggall

Site	Soil types	Rainfall
Moora region, WA	Duplex loam over clay	300mm/year

Background:

Dual purpose crops can play an important role in mixed farming systems. To decide whether dual purpose crops suit a farm business, producers need local information about the potential effect of grazing on crop yield, the potential effect of deferring pasture grazing (when grazing crops) on pasture quantity and the effect of sowing time on feed on offer early in the season.

Project objectives:

1. The effect of crop grazing on crop yield.
2. The potential effect of deferring pasture grazing (while grazing crops) on pasture quantity.
3. The effect of sowing time on feed on offer early in the season.

Research approach:

The main aim of this trial was to identify the effect that crop grazing has on ewe condition score (therefore productivity) and crop yield in the Moora-Miling area of WA to determine a whole-farm perspective. This included potential changes to pasture quantity as a result of deferring pasture grazing through the use of grazing crops. The effect that time of sowing has on available Feed on Offer (FOO) of crops early in the season was also investigated.

The research sites were set up for a paired paddock trial. Each paddock was approximately 30ha, with similar historic yields, to allow realistic comparisons. One was dry sown on 1 May and the other sown after the break of the season (Mid May), with Hindmarsh barley. Normal pasture paddocks were also set up.

A mob of twinning ewes of equal condition score, due to lamb in June/July, were split between one of the crop paddocks, and the pasture they would normally be grazing. They were both grazed at the same stocking rate (10DSE/ha) for the same duration. This was until they were two weeks from lambing (or they/the crop was showing signs of distress), a duration of three to four weeks.

All ewes were condition scored before and after the crop grazing period to enable comparisons to be made. The condition of the sheep and crop were checked regularly by the farmer to minimise any risks involved with the experiment, such as sheep or crop stress.

Measurements of 0.1 square metre cuts were taken from the crop paddock as sheep were about to enter it to commence grazing, as well as from the pasture paddock. When grazing finished, samples were taken again from the deferred pasture cages. These feed samples were tested for quantity of FOO (kg/ha of dry matter) and quality (crude protein as a percentage of dry matter, metabolisable energy as a percentage of dry matter). This enabled us to monitor the impact of grazing on FOO, as well as the impact of feed quality and quantity on sheep condition changes.

Harvest yields were recorded in the grazed and non-grazed barley crops on each farm through use of a weigh trailer.

All factors that may have affected the trial results were recorded, such as climatic conditions and supplementary feeding.

Key findings:

Climatic conditions over the three years of data varied considerably, causing inconsistent results. Crop grazing was found to be consistently beneficial to the sheep enterprise and of particular value in tighter feed years. In general, the drier the year and less abundant the feed, the greater the benefits of crop grazing to the sheep enterprise. However, in drier years, the crop was less able to compensate for the effects of grazing, resulting in lower yields but overall a modelled net gain for the mixed farm enterprise.

Selective grazing was an issue in one of the years, with one area of the crop heavily grazed. This resulted in weeds out-competing the crop, reducing overall yields. The impact on crop yield outweighed the benefit to sheep, and a modelled net loss was the result.

This reinforced the guidelines for crop grazing: 1) paddocks should have low weed burdens, and 2) paddocks should be grazed early and with a medium intensity to minimise the risk of selective crop grazing. This was one of the main learnings from the group's participation. If farmers adhere to these, the risk of reducing crop yield should be minimised.

The final year of the trial produced interesting results. A wet year with an abundance of feed, higher protein and energy levels in the crop enabled the ewes to gain slightly from grazing the barley compared with the pasture. The crop however benefited from being grazed. This was due to the impact of frost, which was avoided in the grazed crop, as grazing deferred flowering and therefore minimized the frost's impact. This resulted in a much higher modelled net income of $322.50/ha as a result of the crop grazing.

It was only possible to trial the effect of different sowing times in the final year of the trial. The favourable season reduced the effects of crop grazing on the ewes, although, on both farms, the ewes benefitted slightly from crop grazing compared to going straight onto pasture. Crop FOO was higher where the crop was sown earlier.

This project showed that mixed farming systems have a feed source that can be utilised to improve lambing ewes' condition scores, and therefore lamb survival. Having abundant feed on offer during lambing by deferring pasture during crop grazing can lead to increased lamb survival rates, especially in twins. If managed correctly, crop grazing can lead to overall net profits as the benefits to the sheep outweigh the impacted of crop grazing on yields (when managed appropriately). This will help reduce time and money spent on supplementary feeding, as well as increasing ewe productivity.

Further research is required to validate these results, due to so much weather variation, as well as looking into the impact of crop type and variety, sowing time, climatic impacts and the potential to reduce frost risk.

3.7 Southern DIRT/Muchas Gracias

Research Question: *Can producers use the handheld Greenseeker for accurate real time biomass measurement to aid grazing and stocking rate decisions at critical times of the year?*

Project Leader: Paul Omodei / Brad Wooldridge

Site	Soil types	Rainfall
Katanning, WA	Gravelly loam	450mm/year
Arthur River, WA	Gravelly sands and loams	350mm/year

Background:

Having an easy way to accurately measure biomass can help producers make grazing and stocking rate decisions at critical times such as autumn and late spring/summer.

Project objectives:

1. Determine the influence of pasture type, location and seasonal conditions on the relationship between Greenseeker readings (normalised difference vegetation index – NDVI) and green biomass.
2. Develop calibrations between Greenseeker NDVI readings and green biomass produced from key pasture species relevant to the sampling area at critical animal production time if the year (Autumn/Early Winter)
3. Test how the handheld Greenseeker tool can be used to improve decision making regarding pasture and stubble use through Summer periods
4. Assess the value of a mobile application device using Greenseeker information output for the red meat industry.

Research approach:

The project ran for three years in duration, commencing in 2014, initially at two sites in the South West of Western Australia to allow for a cross section of results. After the first year, the decision was made to continue research on just one of these sites, located in Arthur River, as extended travel was adding a large time component that people could ill afford.

Primarily, the focus was on collecting biomass cuts to determine the application and viability for the use of the Greenseeker tool on a variety of single and mixed species pastures. From then, each preceding year's data was utilised to inform farmers of feed availabilities and feed budgets. The final year of the project the group provided critical feedback on a feed budgeting App that drew from the Greenseeker data.

The timing of measurements occurred mainly in June, July, September and November to represent the seasons accordingly. Each year the cuts, measurements and calibrations were added to and refined as required to assist with accuracy of data.

Physical measurements being taken during the trials included:

- Visual assessment of feed on offer (FOO).
- Pasture cuts for biomass assessment and analysis of dry matter, metabolisable energy and pasture composition.
- Greenseeker readings (NDVI).

Guided by research collaborator, Mark Trotter, the group were able to reflect and refine some of the issues that arose during the course of the project, such as; problems with cut pasture samples,

cumbersome steel stands and time constraints, in ways that were effective but did not deviate from project protocols.

Key findings:

The research has laid the foundation that the Greenseeker tool, accompanied by an application device to convert NDVI to pasture biomass, is a vital step towards assisting farmers estimate their in-paddock feed availability and subsequent management processes. This will ultimately benefit the grazing industry to whom the farmers support and supply. It is important to note that there are several factors that will greatly influence the potential of this technology, which will need further exploration. Variations that will need to be considered include;

- The accuracy of the green dry matter
- The allowance of an offset algorithm of the mobile device to allow for broader calculations
- The ability to share data between handheld units.

Research results indicate there is potential wide-ranging benefits that Greenseeker can deliver to farmers. It is the belief of all parties involved that the use of Greenseeker devices will check all the boxes regarding the necessity for accuracy, precision, clarity and simplicity with the design of Mobile Device Application outputs in mind.

3.8 Facey Group Incorporated

Research question: *What is the most successful method for reducing the impact of root disease in sub-clover paddocks without resowing?*

Project leader: Edward Riggall

Site	Soil types	Rainfall 500–550mm/year
Site 1	Sandy loam	400mm
Site 2	Sandy loam	350mm

Background:

Farmers in the Wagin area all have existing sub-clover dominant pastures and therefore wish to test methods to reduce the impact of root disease without re-sowing.

This project will examine the value of cultivation within an existing paddock and the application of fungicides following sub-clover emergence. It will also evaluate the tolerance of three cultivars of sub-clover to fungal root pathogens when sown with and without fungicidal seed treatments.

Project objectives:

1. To determine the effectiveness of two fungicide sprays at different stages of sub-clover growth at reducing the impacts of root disease.
2. To determine whether cultivation of the top 10cm of soil can reduce the impact of root disease either alone or in combination with fungicide sprays.
3. To determine if any of the three cultivars of sub-clover that typically perform well in the area are more tolerant to root disease than others.
4. To assess whether the application of a seed treatment reduces root disease damage.

Research approach:

Site One investigated the effect of cultivation and fungicide treatment on existing pasture to manage root disease.

Trial strips were cultivated in May 2014 using a flexicoil seeding par with knife points. Two types of fungicide treatments (phosphorus acid and matalaxyl) were applied at two different stages of sub-clover growth:

- When the sub clover plants were at the cotyledon plus one leaf emerging stage.
- At the two–three leaf stage (about two weeks after the first spray).

The trial areas were soil tested and fertiliser applied to ensure nutrients were not limiting pasture growth. PreDicta B tests were done to obtain a background reading of soil borne diseases.

Other than this, the pasture was managed according to the farmer's normal practices throughout winter and spring, including grazing, insect control and fertiliser application. Each treatment had two pasture cages to measure biomass production.

In year two, the clover was left to regenerate. Cultivations were carried out to depths of 5cm and 10cm before any rainfall (15 May) and after the first significant rain event, on 20 May. Fungicide treatments were simplified from the previous year to applications immediately after the break and second cultivation, at the highest recommended rate.

In year three, the clover planted in year one was left to regenerate at the trial site. The first rains came earlier than expected so it was not possible to carry out a dry cultivation. Fungicide treatments were carried out in the same way as previous years.

The following measurements were collected:

- Pasture cuts were taken from each of the treatment plots, to allow for comparison of biomass growth. These were taken from within the pasture cages where no grazing had occurred.
- Nodulation scores were performed in late September to determine whether any of the treatments resulted in different levels of pasture root nodulation.
- Seed counts were collected following seed set of the sub-clover.
- Root disease levels were measured using PreDicta B testing.

Site Two

In year One, two cultivars of sub-clover known to grow in the area and one new to the area were sown into a prepared paddock; Dalkeith, LOSA and Nungarin. Treated and untreated seed of each cultivar was sown in strips 15m wide and 300m long, over two soil types, allowing a representation of the two main soils found in Wagin. Pasture cages were spread across the site as non-grazed areas and a five-metre-wide strip was fenced off across the strips to allow a visual comparison of the cultivars and treatments.

The site was sown in April, prior to the cropping program, with no fertiliser as per the farmer's normal management. This site was fenced off, so no grazing could occur. In year Two, the same site was used, with the re-generated clover and no further treatment.

In year three, a new site was chosen, with confirmed presence of root disease. Dalkeith sub-clover was sown at a shallow depth (1-2cm), to reduce the cultivating impact of seeding, at 10kg/ha. Half was treated with Thiraflo seed treatment, the other half left with no seed treatment as a control, as shown in Appendix 4 (8.4).

The following measurements were collected:

- Two Pasture cages per treatment were used to measure plant biomass and quality.

- In years one & two, visual comparison was carried out over a five-metre-wide strip fenced off across the trial site.
- In year three, the number of plants that had germinated per 30m strip was counted in the treated and un-treated Dalkeith strips (8 June 2016).

Key findings:

Results showed that cultivation such as seeding is an effective, but temporary, root disease control. This makes seed dressings unnecessary. Very little difference was found between dry and wet seeding, with slightly more root disease in the late seeded plots. No significant difference in plant health was found as a result of the use of fungicides.

Future research is required to validate the results, with the group interested in more projects. This project had many positive outcomes, with participants learning that seeding is a cheap, effective cultivation tool that can be used to reduce root disease, one that can be easily manipulated to suit their systems and paddock rotations. Other benefits included increased interest from the group in their pasture health, greater understanding of trial methodology and cooperation between group members leading to the continued exchange of information and ideas.

3.9 Association for Sheep Husbandry Excellence Evaluation and Production (ASHEEP)

Research question: *Can legumes be incorporated into kikuyu pastures to provide year-round green feed?*

Project leader: Anita Chalmer/Emma

Site	Soil types	Rainfall
Condingup	Sand	600-700mm/year

Background:

The incorporation of winter active legumes such as serradella and bladder clover into a kikuyu pasture has two potential benefits:

- The legumes provide feed during winter when kikuyu is typically dormant.
- The nitrogen produced by the legumes could boost kikuyu production during the summer.

Combined, they have the potential to achieve a pasture that provides green feed year-round.

Project objectives:

1. To compare the effectiveness of sowing legumes in summer (February) with the more conventional time in autumn (April/May).
2. To monitor kikuyu production and determine the benefits of incorporating legumes to support a higher stocking rate.
3. To demonstrate the management practices to maintain the legume seed bank for continued regeneration in kikuyu based pastures.

Research approach:

A 22ha paddock with kikuyu and sub-clover is being used for the trial. An adjoining paddock is being used as a control (for comparison).

Summer sowing (10 March 2014)

Kikuyu was suppressed with glyphosate on 1 March 2014. The following legumes were sown strips to compare performance:

- Unscarified Margurita Serradella (25kg/ha, ALOSCA S 10kg/ha).
- Unscarified Bartolo Bladder clover (20kg/ha, ALOSCA S 10kg/ha).
- Avilla Serradella (20kg/ha, ALOSCA S 7kg/ha)

Both legumes were sown with a double disc seeder and 75kg/ha superphosphate. Kikuyu was suppressed again on 15 May 14.

Autumn sowing (17 June 2014)

Kikuyu was suppressed on 13 May 2014. The following legumes were sown in strips to compare performance:

- Scarified Bartolo Bladder clover (20kg/ha)
- Scarified Santorini Serradella (8kg/ha)
- Dalkeith sub-clover (20kg/ha)
- Scarified Margarita Serradella (20kg/ha). Legumes were seeded with 20kg/ha Alosca.

Key results/findings:

Year 2014- establishment

A good strike of all legumes seeded. Most impressive was Bartolo Bladder clover and Margurita serradella. The paddock was excluded from grazing and legumes were allowed to set seed. Towards early spring, it became apparent that there was a background sub-clover present although this was not obvious in previous years.

Year 2015

The very hardseeded legumes were all but absent this year due to the seedbank remaining too hard for significant numbers of germination. In a mixed cropping/grazing situation this year would be a good one to plant a crop and control weeds to prepare for future pasture phase. Kikuyu growth was

impressive where sprayed out. Control plot was looking pretty average- sheep seemed to avoid grazing or camping on it all year.

Year 2016

Kikuyu has almost reverted back to starting cover levels before spraying out. There is a noticeable difference in length of kikuyu between control and treatment plots and a slightly darker green colour. The topsoil band is not as clearly defined and the subsoil is slightly darker in colour, suggesting deposition of carbon from root decomposition. Legumes are flourishing with a rejuvenation of background subclover and introduced Santorini and Margurita serradella performing better than Avilla. No sign of Bartolo.

Year 2017

Santorini Serradella has increased in number and is spreading through the paddock in dung. Avilla Serradella has emerged and is looking good. Margurita numbers are reduced but is still plentiful. Red clover was found on the sub-clover in May and has reduced numbers but towards the end of the year some plants had recovered and new plants have germinated and grown unaffected. Some Bartolo was found in October (this is the first time it has been found since seeding) but plants were noticeably smaller and not thriving despite successful nodulation. Bartolo is susceptible to potassium and phosphorus deficiency and this could be causing these symptoms. Kikuyu is back to original groundcover levels but does appear to be performing better than before the trial commenced.

Industry benefit

Kikuyu is a widespread pasture species across the coastal sandplain in Esperance and in many higher rainfall areas. In the past, there has been a lot of discussion about the ideal legume partner for kikuyu and serradella appears to be favoured in many instances on the sandplain. Improved breeding of new serradella species can perform remarkably well as shown in this project. By integrating a suitable partner legume for kikuyu, farmers can keep the benefits of kikuyu based pasture while reaping the benefits of having a productive winter legume as well.

4. Organised, in collaboration with MLA, at least one regional events every year for farmers and researchers which allow for networking between farmers from different Participatory R&D sites

A total of three Annual Networking Meetings were held in Perth for all farmers, researchers and project managers involved with the nine PRS sites. These meetings were held on 13 August 2014, 1 October 2015, and 7 April 2017. There was no event held in 2016 as the groups decided it would be better value to meet at the culmination of the project, once all results were in and final report writing was underway. All nine Grower Groups were represented at each of the Networking meetings, and the majority of Researchers associated with the trial sites were also in attendance. The National PRS Coordinator from MLA attended and presented at two of the three events, in 2014 (Linda Hygate) and 2017 (Irene Sobotta). The agendas for all three Networking Events are provided in Appendix 1.

The Annual Networking Meetings were a valuable chance for the nine grower groups to interact, share their progress, learnings and results with the other groups and researchers, and also get input and suggestions as they progressed and made plans for each growing season. Western Australia was the only State to hold these Annual Networking Meetings, and from the positive feedback that was

received it is suggested that this type of event would be a valuable addition to any future on-farm research/extension programs that involve multiple groups and sites in one State.

4 Conclusions/Key messages/Recommendations

The annual role of the State PRS Coordinator was to assist with management and administration of the nine contracted W.A. PRS projects to assist both MLA and the groups achieve their project aims, fulfil all reporting requirements, and act as the main communication point.

All four Project Objectives have been successfully met, with the delivery of nine valuable on-farm trials across the southern farming regions of Western Australia during the period 2014-17.

Three key recommendations have arisen out of this project, they are outlined below.

4.1 Key recommendation one: The value of a three year project time-frame

The Producer Research Sites Program had a distinct advantage to other research and development programs by offering grower groups the opportunity to conduct on-farm trials over a three year time period, or three full growing seasons plus time before the first growing season to plan and set up the project, and time after the end of the third growing season to finalise data collation and reporting. For most groups involved in the program, this was the first opportunity they had had to enact a trial over three growing seasons, and all expressed how valuable that aspect had been.

Groups significantly increased their capacity for on farm trials, because they had the opportunity to make mistakes and rectify them within the same trial. Also seasonal conditions were highly variable, but the three year timeframe meant that a complete failure in one season didn't mean failure of the trial. This also added to the confidence of the farmers and project managers involved, and allowed them to iron out 'teething issues' and influences of a bad season on overall results. For example, the first year of the Southern DIRT Phosphorus-Efficiency trial was almost a write-off: they were unable to get results of any significance because their project design had so many treatments that the number of replications was too low to show any patterns or correlations. In a one-year trial this would have been a failure and money invested would have been a complete loss. However, because of the three year time-frame Southern DIRT was able to re-group, re-design their trial with fewer treatments and more replications, and re-sow on a neighbouring paddock in the following year, which allowed for two good years of data collection on a trial that was able to give the results that were intended.

The three year timeframe also added rigour and depth to the outcomes of the trials; more data was able to be collected meaning more robust and conclusive results; meaningful follow-up monitoring of persistence of pasture species into the third growing season was enabled (especially useful for summer-sown hard-seeded legume trials); and reducing the influence of seasonal factors, which can be significant when primary research, which is often undertaken in 'pot trials' in a controlled growing environment, is transferred to paddock trials.

It is a credit to both the MLA National Coordinator and State Coordinator roles that all nine W.A. grower groups continued with their trials for the full three years, a fantastic result that deserves acknowledgement.

4.2 Key recommendation two: The Value of higher-level communication and collaboration within research topic groups.

Although this project provided some great results from individual trials, and communication within the W.A. PRS groups was sufficient, more value could have been obtained if there was a greater level of communication and collaboration within research topic groups across Australia. The potential value of such an approach was seen in the success of the Realtime Biomass Project, which had the outcome of the development and calibration of a Smartphone App to accurately predict biomass in real-time, using a portable low-cost imaging device. This outcome has huge potential benefit for graziers across the country and is ground breaking in the sense that it will allow farmers to more accurately match grazing pressure to feed availability, and create feed budgets months in advance.

This was the only W.A. PRS project where groups working on the same topic across Australia collaborated meaningfully, ensuring consistent methodologies and collating data for a greater outcome. This collaboration was primarily driven by the Researcher, Mark Trotter from the University of New England, who was proactive in communicating with all groups and farmers, and visited the sites regularly to ensure data collection was being done correctly, and took a central role in collating and analysing the data. This collaborative approach could have been used within several other of the FIP research topics i.e. Sub-clover root disease, crop grazing, and P-use efficiency. For future programs it is suggested that a focus in the early part of the project on setting up robust framework for within-topic collaborations and communications pathways, would lead to greater outcomes and industry benefit.

4.3 Key recommendation three: Ensure provisions for Researchers to be involved & invested in Producer Research Sites.

One significant issue that was faced by several of the W.A. PRS groups is that there appeared to be no provision in the contracts or budgets of the assigned Researchers, to provide practical and physical assistance to those groups. The Grower Groups, when writing their project plans and budgets, were also unaware that they needed to allow provisions to cover the cost of the Researchers' involvement. Therefore, in almost all instances, the Researchers had to travel to the project site and meetings at own cost and on their own time, which was a significant sticking point for those who run on very tight budgets and manage numerous other projects and trials. As a direct result, the Researchers' often weren't as involved or invested in the oversight of the PRS trials as they could have otherwise been, and the scientific rigour of some of the trials was lacking as a result. It is suggested for future programs that provision for the travel and time of the Researchers' involvement in the on-farm trials is made clear at the very beginning of the program, and funding is made available in either the Grower Groups' or the Researchers' budgets to ensure that this relationship is maximised.

5 Appendix

Appendix 1: ***Agendas for W.A. PRS Annual Networking Meetings 2014, 2015 & 2017***

MLA Participatory R&D

2014 Networking Event

Wednesday 13th August 2014 9.00am-3.30pm

Ascot Quays (150 Great Eastern Hwy) Marina/Forest Room

Contact: Alana Starkie 0406 494 927 or alana@planfarm.com.au

Agenda

8.45am: Arrival, tea and coffee

9.00am: Introductions – Greg Kirk (Planfarm), Alana Starkie (Planfarm), Linda Hygate (MLA), each of the 9 groups & researchers.

Overview of the day *(Alana Starkie)*

9.15am: Introduction to Producer Research Sites *(Linda Hygate)*

- Overview of the MLA Feedbase Investment Plan & where Producer Research Sites fit into that across Australia
- MLA's expectations of Producer Research Sites: reporting & communication
- Communications Pack

10.00am: Morning tea

10.30am: Group presentations (10-15 mins each + questions)

- Pen picture of your group's research project. Why? How? Who?
- What difficulties have you faced to date?
- What would you do differently/better?
- Plans for the rest of this year?

1. Southern DIRT *(Kayla Kingrose, John Tuckett & Megan Ryan)*

   "Phosphorus Efficiency in Pastures"

2. Lakes Information & Farming Technology *(Grant Marshall & Royce Taylor)*

   "New Legumes in Farming Systems"

3. Nyabing Farm Improvement Group *(Braden Johnson)*

   "New Legumes in Farming Systems"

4. ASHEEP *(Emma James & Ron Master)*

   "Legumes in Kikuyu"

12.00am: Lunch

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2015 Producer Research Sites Networking Forum

Assured Ascot Quays (Waterside Function Room)

Thursday, 1st Oct. 2015, 10am-3pm

Agenda

9.30am:	Arrival, tea & coffee, morning tea
10am:	Welcome & overview *Alana Starkie*
10.10am:	Muchas Gracias "Realtime Biomass Assessment" *Brad Wooldridge & Paul Omodei*
10.30am:	Southern DIRT "Phosphorus efficiency in pastures" *Ed Riggall*
10.50am:	Wagin "Root disease in sub-clover" *Ed Riggall*
11.10am:	Stirlings to Coast Farmers "Optimal pasture phases for livestock" *John Blake & John Hood*
11.30am:	ASHEEP "Legumes in Kikuyu" *Alana Starkie on behalf of Anita Chalmer*
11.50am:	Nyabing Farm Improvement Group "New legumes in farming systems" *Fiona Martin & Braden Johnston*
12.10pm:	Miling Pasture Improvement Group "Whole farm profit of grazing crops" *Ed Riggall*
12.30pm:	Lunch
1.10pm:	Other trial updates (FBG & LIFT) *Alana Starkie*
1.30pm:	Pasture Cuts & the FOO App: how to make your efforts count
1.50pm:	Seed Yield measurements & 'harvestability' of legumes
2.00pm:	Legume nodule assessments
2.10pm:	Data Analysis – simple methods
2.20pm:	Open discussion
2.50pm:	Scheduling of Annual Review Meetings
3pm:	Afternoon tea & close

Time: 9.30am for a 10am start – finish at 3pm

Location: Assured Ascot Quays Hotel
(150 Great Eastern Hwy, Ascot WA
Phone: 9479 0000)

Contact: Alana Starkie 0406 494 927

The WA Producer Research Sites Program is delivered in conjunction with: PLANFARM

For further information contact Alana Starkie on 0406 494 927

MLA Participatory R&D

2017 Final Presentation Event

Friday 7th April 2017 9.00am-3.30pm

Ascot Quays (150 Great Eastern Hwy)

Contact: Colin Rose 0413 343 888 or colin@planfarm.com.au

Agenda

8.45am: Arrival, tea and coffee

9.00am: Introductions – Colin Rose (Planfarm), Alana Starkie (Planfarm), Irene Sabatta (MLA), each of the 9 groups & researchers.

Welcome *(Colin Rose)*

Overview of the day *(Alana Starkie)*

9.15am: Introduction to Producer Research Sites *(Irene Sabatta)*

- The National perspective and outcomes of the National PRS Project

9.35am: Group presentations (10-15 mins each + questions) *(Alana)*

- Overview of your group's research project. Aims (trial objectives) Why?
- How you went about it? (Process)
- What worked well and what didn't?
- Outcomes of project (refer to objectives)?
- Where to from here?

1. Southern DIRT *(Emma Russell)*

   "Phosphorus Efficiency in Pastures"

2. Lakes Information & Farming Technology *(Grant Marshall & Ed Riggall)*

   "New Legumes in Farming Systems"

10.00am: Morning tea

10.20 am: Resume presentations

3. Stirlings to Coast Farmers *(John Blake & Ashton Hood)*

   "Optimal Pasture Phases for Livestock"

4. ASHEEP *(Anita Chalmer)*

   "Legumes in Kikuyu"

5. Nyabing Farm Improvement Group *(Fiona Martin)*

   "New Legumes in Farming Systems"

6. Wagin *(Ed Riggall)*

   "Root Disease in Sub-clover"

7. Fitzgerald Biosphere Group *(Leonie McMahon)*

   "Improving Feed Value of Perennial Grasses"

12.00am: Lunch

12.30pm: Group Presentations *(continued)*

8. Muchas Gracias *(Paul Omodei & Brad Woolridge)*

   "Real-time Biomass Assessment"

9. Moora Miling Pasture Improvement Group *(Ed Riggall)*

   "Whole-farm Profit of Grazing Crops"

1.30pm: Extraction of messages (*Irene Sobotta)*

2.30pm: R & D for me (Erin Carter)

2.45pm: Wrap-up of the day and What next? *(Alana Starkie)*

3.15pm: Afternoon tea

3.30pm: Finish