final report

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Coordination of Producer Research Sites (PRS) (Initially named Participatory R&D) in NSW

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Executive summary

The producer research sites (PRS) project (originally Producer Participatory Research) was instigated in 2013 by Meat and Livestock Australia (MLA) as an adjunct to the core feed base research plan. PRS was intended to facilitate cooperative research projects on farm which added value to the core feed base investment plan research portfolio.

Producer groups were engaged through an expression of interest process and facilitated meeting held to help the producer groups and researchers formulate research objectives and plans for a full funding submission. A key requirement of the PRS was that projects be conducted in such a way as to give statistically sound results and to add value to the core research. It was also important that a core group of producers was actively involved in the conduct of the research.

Thirteen groups in NSW expressed interest in the program. For some groups the demands of a research project proved too high or the resources deemed insufficient for them to afford the technical assistance they felt was necessary to conduct work to this standard. Others found that the topic areas were too confining and were not able to formulate research plans that met the goals of the group as well as the MLA research areas. These groups withdrew from the project prior to contracting. Five groups were ultimately contracted to the project in NSW and conducted projects related to Phosphorous use efficiency, novel legumes, real time pasture assessment and subtropical pastures (x2).

Seasonal conditions proved difficult for four out of the five groups and impacted on the success of trial establishment (dry conditions) and access to trial sites (flood/waterlogged conditions). In addition to seasonal challenges four of the five projects involved sowing of new pasture trials and with short project lead times, poor weed control had large negative impacts on trial establishment and persistence.

Producer groups with good executive support found the demands of reporting and contractual processes easier to deal with and the groups with the most success in completing research tasks and meeting milestones also had access to more skilled technical assistance. Groups with less skilled assistance found meeting milestone difficult and were more likely to miss planned measurements or diverge from the agreed protocols for measurement techniques.

Results from producer research sites would be enhanced in future by having mechanisms to ensure that producer groups had access to suitably qualified technical assistance with the completion of research activities prior to contracting projects. It must also be recognised that these skills are quite specialised and that sufficient financial resources must be available to contract these qualified technical services. The use of qualified technical assistance need not diminish the producer engagement with the research process but it would ensure a more uniform quality of producer research delivery and a higher likelihood of achieving the stated research objectives trough maintaining data quality.

Overall the PRS process provided a successful medium to engage producers in the MLA's feed base research and very useful and ongoing relationships between the researchers and the producers have resulted. Producers in the participating groups have a far better appreciation for the research process and researchers a better understanding of the difficulties producers have in adapting new research to fit their farm systems.

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1 Background

Each of the producer groups contracted under the MLA's Participatory Research Sites (PRS) Project has submitted their own technical reports and final report which outlines the design and results of their research projects. As such this report will not cover project design and results from individual projects instead focusing on the input of the State Coordinator role in the process of conducting the PRS project and also on elements affecting the successes and failures of the groups with a view to recommending better approaches to engaging producers in the research process in the future.

1.1 Participatory Research

Participatory Research and Development (R&D) within MLA's Feed base Investment Plan (FIP), was identified as a method to provide farmer input into MLA's Feed base R&D. Participatory R&D was intended to foster a collaborative relationship between farmer groups and researchers whereby applied research in line with the FIP research direction could be implemented by groups of farmers in order to try new ideas in the field before the basic research had been completed. This was intended to fast track the feedback between farmers and researchers to test the practicality of the research ideas and ultimately reduce the timeframe for adoption of new technologies as they became available.

Participatory R&D is intended to add value to core research through the input of leading producers throughout the research and development phase and with the ultimate goal of accelerating the adoption of project outcomes.

This contract was initiated to coordinate Participatory R&D for New South Wales as part of the FIP.

1.1.1 Participatory research design.

Producer groups were asked to formulate a research question/s related to the identified pillars of the FIP research with the assistance of the associated research leaders contracted by MLA. Initial guidelines given by MLA clearly identified that the activities needed to give genuine research outcomes and be designed according to proper scientific principles allowing results to be properly analysed and able to add value to the core research outcomes. .

1.1.2 Engagement Process

Expressions of interest were sought from producer groups across Australia. This was intended to give all potential groups equal opportunity to engage with the process. In NSW two existing groups who had participated in the scoping process for Participatory Research had direct communication from FIP core research coordinators as a follow up to

1.1.3 Coordination and Facilitation of groups

The role of the state coordinator was

1) Initially engage with the applicant groups and to short list the applications on the basis of the quality of the application, the alignment of the intended research with the FIP core research and the perceived capacity of the group to deliver against contracted milestones.

2) Facilitate group meetings with the appropriate core researcher to design the research plan and develop the full applications.

1.1.4 Coordination of networking events

Part of the role of state coordinator involved organising events where the contracted producer groups could network with the FIP researchers and with each other.

2 Project objectives

2.1 Key objectives of the NSW Coordination role

2.1.1 As part of a national call managed by MLA, identified, coordinated and liaised with farmer groups in New South Wales who wish to participate in Participatory R&D projects

The role provided a first point of contact for interested producer groups in NSW to learn more about the expression of interest (EOI) process and operational details about the participatory R&D project and the type of projects that were required. The also involved contact with the core research coordinators to gauge the type of project they would see as adding value to the core research with research outcomes that would not otherwise be delivered by the process.

2.1.2 Facilitate ten workshops with relevant farmer groups and FIP researchers as part of the establishment of Participatory R&D sites.

EOI's were short listed and prioritised to ensure a balance between coverage across the different areas of core research and the capabilities of the groups and probabilities of success. It was intended that full research applications would be the product of these workshops with assistance from the State coordinator as well as the associated researcher.

2.1.3 Established, monitored, evaluated and reported at least 10 Participatory R&D sites in operation throughout the relevant agro-ecological zones of New South Wales

Once contracted the role of the state coordinator was to give ongoing assistance to the groups to ensure that research plans were implemented and milestones were met. Where changes to the contracted research plans were deemed appropriate due to seasonal conditions or simply the initial results from the projects the coordinator role also brokered these changes by facilitating communication between the producer groups and the relevant MLA project manager.

2.1.4 Organise, in collaboration with MLA, at least two events annually for farmers and researchers which allowed for networking between farmers from different Participatory R&D sites.

Part of the coordination role was to assist MLA with the organisation of networking events to allow contact between the producer groups and also with other researchers conducting FIP research.

3 Methodology

3.1 Project Planning

Initial planning of the PRS was conducted at a workshop held in Adelaide where the MLA project manager and each of the state coordinators were present. It was decided at this meeting that the circulation of the call for expressions of interest would be done centrally by MLA through their usual channels of communication with their levy payers. The state coordinators initial role was to be a first point of contact for groups in each state and to assist groups with information about the project and with the preparation of the EOI documents where requested. Topic areas available for expressions of interest by producers groups included.

1. **Real time measurement of pasture quantity**, using hand held optical sensor devices to help producers wanting to feed budget with greater precision and repeatability or those who don't measure pasture biomass because it is too difficult, time consuming or inaccurate.
2. **Practices to improve sub clover production by treating root diseases**, which are believed to cause up to 90% losses of germinating seed and 30% production loss in surviving plants.
3. **Identifying the key reasons why pastures establish successfully and persist**, so producers can invest in pasture sowing with confidence and reduce the risk of failure.
4. **Tactics to graze crops,** for producers who are trying to minimise grain loss, spell pastures and optimise animal performance.
5. **Increasing phosphorus use efficiency**, through better understanding of soil benchmarks and critical soil test values and from identifying alternative legumes that have lower phosphorus requirements and can fix nitrogen for their pastures with lower phosphorus inputs.
6. **Establishing and managing subtropical pastures,** to improve feed quality and cool season production through the addition of both tropical and temperate legumes in subtropical grass swards.
7. **Establishing and managing new legume species**, to optimise animal production and ensure long term development of seed banks for mixed farming systems.

3.2 EOI assessment

Some groups submitted expressions of interest for multiple FIP work areas and decisions had to be made regarding which of these was progressed. Projects were limited to ten in NSW and the number of projects within each of the FIP core areas was also limited based on the capacity of the appropriate researcher to provide assistance to the groups. In some cases this meant that groups could not be offered their first choice topic area as the capacity in that area had already been taken up by other groups.

A scoring system to rank expressions of interest was agreed in conjunction with the MLA project manager and group expressions of interest were assessed using this framework. EOI's were scored out of five on five criteria. The scoring criteria included;

1. How well does the EOI outline projects/priority areas and demonstrate an understanding/alignment of group priorities.
2. Does the EOI demonstrate individual and/or the group's ability to be tactical, strategic and innovative?
3. How much does the project add value to the MLA core research?

4. Does the group have and engagement process for enabling access and involvement of the broader industry with the project.
5. Do group producers demonstrate commitment and a mechanism for being effectively engaged in the project

In addition an assessment of the degree to which groups were farmer driven vs adviser/consultant driven and their likelihood to continue to be producer driven also influenced the decision as to which EOI's to progress.

3.3 Facilitated group meetings

At each meeting the producer group was asked to complete a survey which collected the data required for the full application about farm size and enterprises. Questions were also asked about awareness knowledge and aspirations about the research topic and also questions about their knowledge of, involvement and influence in the overall MLA feed base research effort.

Each facilitated session began with an outline of the intent and boundaries of the PRS project so that group participants were fully aware of what the project sought to achieve and to set boundaries around the topic areas that were available to them. The supporting researcher then outlined the core research including the research questions and research process.

Facilitated discussion then identified the questions that the group felt needed answers and which related to the on farm application of the core research. Researcher input was used to help formulate potential research plans and methods. At all times it was stressed to the producers that the intent was to design projects which generated analysable data to add value to the core research. The importance of robust measurement techniques and replication was discussed and suitable techniques agreed upon for most groups before the planning session was finished.

3.4 Preparing Full Applications

As state coordinator, minutes of each of the planning meetings were prepared and circulated to the producer group leaders to assist in the preparation of the full application for funding. Further assistance in wording and structuring of applications was required for most groups particularly those without a paid executive officer. Draft applications circulated several times between the state coordinator and these groups in order to ensure all requirements of the application were met.

3.5 Ongoing support

At each milestone date, support was offered to the groups in the editing of the reports to a standard acceptable to the MLA project manager. In the initial phase the support was mainly around trial design and annual action plans but in later stages support was also required regarding data interpretation and conclusions.

Each year during the life of the PRS research a facilitated annual meeting occurred between the farmers and researchers where the progress of the research was discussed and annual operational plans prepared for approval by MLA to form the basis for milestone assessments. Topics for discussion included measurement methods and frequency, issues with delivering against previous

operational plans and interpretation of data already collected. Support was also required to assist with negotiating technical support for some groups.

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4 Results

4.1 EOI's received

Expressions of interest were received from just 13 groups from around the state covering a wide range of areas in the higher rainfall zones of eastern NSW ranging from Tumbarumba and Bombala in the south to Armidale and Dorrigo in the north. Each of these applications expressed interest in up to three topic areas although some groups had a very specific interest in real time pasture measurement and restricted their application to this area alone. A further two groups had been directly targeted for the sub-tropical pastures topic area due to a prior involvement with Dr Suzanne Boschma and Mr Lester McCormick during the PRS project design process which predated this project. Interestingly these groups did not put forward strong expressions of interest and one in particular did not even meet the essential criteria of being a properly constituted group and hence unable to enter into a formal contract with MLA.

Groups expressing interest ranged from production based groups such as Monaro Farming Systems (MFS), Agricultural Information and Monitoring Systems (AIMS), Tablelands Farming Systems (TFS) to land management / conservation groups such as Cook's Myalls, Holbrook and Harden Landcare groups. It should be noted what although established as Landcare groups these groups had expanded into productivity based activities as a natural progression and as a result of difficulty in sourcing resources for Landcare style projects.

In all the 13 groups expressed interest in 28 different project areas including options which were not their first choice of topic area. One group (Paraway Pastoral) had expressed interest verbally through the MLA project leader but despite being given extended time to both apply in writing and to organise planning meetings with their farm managers none of these offers were taken up. For this group it is impossible to say which topic area may have been their highest priority.

Table 1. Summary of group first three choices (excluding Paraway Pastoral)

	Number of groups ranking		
Topic Area	1st	2nd	3rd
Real time pasture measurement	7	0	1
Sub clover root disease	0	0	0
Pasture establishment and persistence	1	1	1
Dual purpose crops	0	0	1
P use efficiency	1	4	2
Sub-tropical pastures	3	1	1
New Legumes	0	2	

Clearly the topic which sparked the greatest interest was real time pasture measurement. Unfortunately it was only possible for two groups in NSW to be part of this project due to the limited capacity of the researchers to allocate sensors and personnel. This meant that many of the applicants could not be awarded projects which were their first choice in terms of interest.

4.2 EOI assessment

Expressions of interest were collated and results are shown in Appendix 1. NSW Ranking Sheet for EOIs.xlsx. A combination of the group scores for each of the topic areas nominated and the level of producer involvement in driving the group agenda were used to make a decision as to whether to progress groups to the level of a full project proposal. Of the 13 groups which expressed interest in the PRS projects 11 were progressed and forwarded to the appropriate researchers for comment and confirmation of a willingness to assist in the PRS process. Facilitated workshops were held for nine of these 11 groups.

The two groups which were not progressed missed out for a number of reasons. One group was small and constituted of small and non-commercial operations which would have limited their ability to influence larger scale producers outside their immediate area. The other group had limited producer involvement in the application phase being largely driven by state agency extension staff and a local reseller.

There were two groups which were offered an opportunity to submit a full application but ultimately did not participate in a facilitated planning meeting. One group had nominated for the pasture establishment and persistence topic area but unfortunately MLA withdrew from this research area at the FIP core research level and therefore there was no researcher available to assist and collaborate with the group. Other options such as becoming part of the pasture variety evaluation network were considered for this group but ultimately local technical support in lieu of researcher involvement could not be organised.

The second group consisted solely of farm managers from a single pastoral company which had verbally expressed interest but had not completed the required formal application, this group did not responded to offers to hold a facilitated meeting to help formulate a clear proposal and in the absence of a clear goal or interest area the group could not be progressed further.

4.3 Facilitated Workshops

Facilitated workshops were organised for 9 groups

Minutes regarding the discussion were taken and circulated to assist the group coordinators develop a full application as the basis for MLA contracts. Summarised outcomes from the facilitated meetings are shown in Appendix 8.2 Summary of facilitated meeting outcomes.

Table 4.3.1 List of groups and topic areas progressed and the date of the facilitated meeting.

Group Name	***Topic Area***	***Cooperating Researcher***	***Date***
Holbrook Landcare	Dual Purpose Cropping	Michael Friend (CSU)	
Tumbarumba Beef Group	P use efficiency	Richard Simpson (CSIRO)	17th Dec 2013 28th Jan 2014
Tablelands Farming Systems	P use efficiency	Richard Simpson (CSIRO)	30th Jan 2014
Monaro Farming Systems	New Legumes	Belinda Hackney	4th Feb 2014
AIMS	Real time pasture measurement	Mark Trotter (UNE)	17th Mar 2014
Harden–Murrumburah Land Care	Real Time Pasture Measurement	Andrew Robson (UNE)	10th Mar 2014
Cook's Myalls Landcare	sub-tropical pastures	Suzanne Boschma (NSW DPI)	18th Feb 2014
Borah Land Management	sub-tropical pastures	Suzanne Boschma (NSW DPI)	30th Jan 2014
Dungog–Gresford Land & Beef Inc	sub-tropical pastures	Suzanne Boschma (NSW DPI)	31st Jan 2014

4.4 Progression to contract

The group expectations and understanding of the PRS project were varied but as expected the producer appreciation of the research process and the need to include control treatments and replication caused some consternation. This requirement to produce research of a quality necessary to allow proper statistical analysis and peer reviewed publication did cause some groups to ultimately withdraw from the process. Holbrook Landcare, Tumbarumba Beef Group, Harden Murrumburrah Landcare and Borah Land Management all ultimately withdrew their interest in the program at varying times after the facilitated meetings. The Tumbarumba group did not make sufficient progress toward a plan at their first meeting and a second meeting was held with that group before a decision was made to withdraw their interest in the project.

Properly constituted groups with professional executive officers in general had no difficulty producing full applications to a suitable standard. Other groups with part time producer member coordinators had much more difficulty in producing supportable applications without considerable input from the state coordinator.

Contracts were sent to the five contracted groups for signing on 9 of June 2014

4.5 Operational planning and review

Once contracts had been exchanged operational plans and measurement protocols were agreed for each of the groups for the first 12 months of their projects. Some groups such as the AIMS groups and Monaro Farming Systems (MFS) already had clear operational plans and protocols spelled out in their applications which only required adopting while other groups had been contracted with only very general plans for the establishment and measurement of trials. Groups such as the Dungog Gresford group Cooks Myalls and Tableland Farming Systems (TFS) groups required considerably greater assistance in developing these plans to a suitable standard.

Once established a review meeting was held with each group on an annual basis to review progress of the research and to plan the following year's operations and activities. In some cases significant changes were made to the research plans and even the research objectives. MFS, while meeting all the milestones required in terms of trial establishment and measurement, had significant establishment and persistence failures with their new legumes research which required the re-sowing of one trial with significant modification in year two of the project and the abandonment of another trial in year three of the project due largely to weed competition. In the case of MFS the resources were reallocated to conduct clover nodulation surveys which represented a significant change in the project objectives and realignment to a different key research area. This was done with agreement of MLA and a contract variation signed.

The Cooks Myalls group also had a failure of establishment with their tropical legume trial and due to seasonal conditions re-sowing was not possible. In this instance a contract variation was negotiated which reduced the commitment of this group to only one of its two planned trials. Another reason for this decision was the difficulty this group had in sourcing reliable technical skills to conduct trial measurements.

4.6 Impact of resourcing difficulties

In many instances the contracted groups ran into difficulties due to resource limitations. In particular the sowing of trials proved difficult for the MFS and TFS groups with no suitably sized machinery available within the group's resources for sowing. In the case of MFS, NSW DPI sowing equipment was hired at considerable expense which had not been factored into the original cost of the project. Due to clashes of commitments the DPI gear could not be made available to the TFS group and no other suitable gear was available in the district for sowing of small plots. TFS opted to hand sow in the first year which proved a significant compromise in terms of establishment success. The main trial was re-sown in the second year using plot sowing equipment provided by a commercial seed company.

While Cook's Myalls was able to sow trials at a scale suited to their available gear (the group members are large scale croppers) their most limiting resource was a suitably qualified person with the technical skills to assist with taking trial measurements. At the same time the original group coordinator withdrew from the management of the group leaving less experienced members to take over the running of the trial. While it was believed a suitable technical person had been contracted, the performance of this individual was poor and required the group to instigate disciplinary action in line with their contract with this person. Once this issue had been resolved it became necessary for staff from the NSW DPI sub-tropical pastures research team to take over the measurement of the trial. Overall these events made it difficult for this group to meet milestones and significant negotiations were required to enable the group to continue.

4.7 Impact of Seasonal Conditions

All groups experienced some difficulty in meeting their desired goals due to the impact of weather events on their projects.

As mentioned above Cook's Myalls experienced a run of dry and hot summers throughout the period of their project which made it extremely difficult to establish both the Desmanthus in their tropical legume trial and also the sub-tropical grasses in their temperate legume trial.

The Dungog Gresford group experienced both drought and flood during the period of their project making the establishment of their sequence of trials difficult for numerous reasons. Floods prevented timely access to the trial sites and also made it difficult for the group members to focus on their project at critical times. Drought conditions made establishment of the sub-tropical grasses trials difficult with sowing and establishment running into the late summer leaving less than ideal time for establishment before the cold of winter.

Again due to unseasonably dry conditions the AIMS group found it difficult to test the intended range in Biomass at each of the calibration measurements taken using the optical sensor equipment. The dry conditions made it impossible to find high biomass quads to cut on a number of occasions although ultimately this did not significantly affect the results or conclusions from this project.

5 Discussion

5.1 The producer engagement process

5.1.1 Time of change in NSW

At the time of contracting these PRS projects the nature of support for producer groups was in a state of major flux. Until March 2013 many producer groups had enjoyed the technical and coordination support of extension staff from NSW Dept. of Primary Industries (DPI). In early 2013 DPI was undergoing a major restructure which removed extension as a function of DPI and instead transferred this function in a much reduced capacity to a newly formed organisation called Local Land Services. Unfortunately this process meant that at the time of calling for expressions of interest for PRS in NSW many existing farmer groups were unsure of where they could source the support they needed to participate in a program like PRS.

5.1.2 The call for expressions of interest

At the time of calling for expressions of interest a very generic approach was taken to raising awareness of the program. In hindsight it would have been useful to flag an upcoming funding opportunity with farmer groups giving them more time to look into the feasibility of participating in PRS. Awareness was largely confined to internal MLA communications channels using the MLA member database. In hindsight it may have been useful to advertise more broadly in mainstream media and perhaps utilise some of the core research partners to champion the PRS process and attract people and groups that otherwise were not aware of PRS or unsure of what PRS was.

5.1.3 Producer expectations

In this first round of PRS projects many producer groups were quite used to the process of producer demonstration sites but were not really familiar with the increased expectations of MLA in regard to the more robust design and measurement protocols needed for PRS projects. In the process of applying and participating in the initial facilitated meeting I believe a number of the groups who

expressed initial interest decided that the expectations of MLA regarding their active participation in conducting the research was beyond their capacity or interest. All groups were interested in the research questions and willing to host research in their own environments and cooperate with regard to the physical management of the trials but they were much less confident and interested in the taking of detailed measurements and analysing data.

5.1.4 Engagement through advisers and consultants

While the initial desire of MLA was to engage directly with groups of producers and have them participate directly in the research process, in fact the most functional groups in terms of meeting their commitments and completing the research in a timely and robust manor where those who had good technical and organisational support from advisers/consultants. In these instances a significant portion of the budget was consumed in fees however in general the level of interest and producer participation in these well supported groups actually remained higher than in groups with poor support. This is probably due to the general lack of experience of farmers in the conduct of properly constituted and replicated research and their reliance on good technical support to plan and conduct the trials.

Notwithstanding the success of well supported groups, there were groups who had good technical and organisational support who withdrew from the EOI process. In those instances a significant factor discouraging participation was an inability of the quite restricted PRS budget to afford the services of their preferred consultant/contractor.

5.2 The researcher engagement process

5.2.1 Involving producers groups in the research planning.

Due to the timing of the planning of FIP research over the past five years the core research was largely contracted before the involvement of producers in the PRS project. For this reason the scope of the PRS research was already limited at the point of engaging with producers and this limited scope did serve to discourage the participation rates. It is difficult to see how this could have been avoided since bringing individual producers from already identified groups to help with the planning, while potentially meeting the desires of the groups and individuals engaged, would still almost certainly not have met the specific interests of other groups who might wish to conduct PRS style projects.

5.2.2 Including PRS in the researcher contracts

Unfortunately the inception of the PRS project occurred subsequent to the contracting of researchers and agencies to conduct the core FIP research. This meant that for most of the researchers there was no formal agreement or resource allocation for their involvement in PRS. Unfortunately the lack of formal contractual arrangements or milestones for the researcher involvement in PRS meant that PRS was not prioritised by the researchers who instead focused on delivery against their contracted projects both FIP and others before contributing to the PRS groups with technical support. This was especially important to the selection of field sites, timely design of trials and also support in collation and analysis of data. Where the involvement of the researcher

was subject to contractual arrangements such as the real time pasture measurement and subtropical pastures research areas research involvement was much more timely and targeted.

5.3 Resourcing

5.3.1 Contract periods and preparation

One of the greatest challenges to research involving the sowing of new pastures is achieving effective weed control prior to sowing. Weed incursion was a significant challenge for all four of the PRS groups which sowed new pasture (MFS, TFS, Cooks Myalls and Dungog Gresford). In all cases the preparation for sowing was over too short a period and weed control was poor. It would be better if weed control on the plot areas could begin a full 12 months earlier. While a difficult issue for MLA due to planning and budget horizons, it would significantly enhance results if contracted research involving the sowing of new pastures could include a lead in year where local best practice weed control could begin at least 12 months prior to the sowing event.

Another issue arose around the timing of milestone dates. In most cases these dates were determined by contract start dates and desire to have them reasonably evenly spaced. For some groups this lead to milestones falling at very busy times on farm (e.g. crop harvest) making it difficult to submit reports on time.

5.3.2 Human Resources

Farmers are necessarily and rightfully give priority to managing their own farm enterprise in front of managing any cooperative research they may host on their farms. They are generally not skilled in the research process, or in the measurement techniques required for robust research. This means producer groups involved in PRS projects need both input from experienced researchers in the design of any on farm research and also access to suitably qualified and experienced technical staff/consultants to assist with the more intensive measurement processes. In some cases producer groups have ongoing relationships with appropriate consultants but in many cases they will not especially in the years following the demise of government extension services in NSW.

In order to ensure any future PRS is properly supported it would be useful for MLA to develop and maintain a register of appropriately qualified and experienced consultants with the technical skills to support field based research from which producer groups could select a technical support person appropriate for their needs. Creating this register might involve an application process and provision of references which evidence a contractor's skills and experience. If a group has a person they wish to use who is not on the register that person should be required to complete the application process and become part of the register prior to contracting. This process should ensure on-farm research projects are better supported and ensure a higher standard in data collection and handling. By the same token MLA may need to recognise that payment for these higher quality services may cost more than previous PRS budgets could cover.

5.3.3 Technical resources

Sowing of pasture trials is often a difficult and very time consuming process with commercial sowing machinery. Large scale drills are difficult to calibrate and use in smaller areas and producers and

commercial contractors are often not equipped to clean out seed boxes properly between plots and hence research involving sowing of pasture trials can pose significant difficulty for farmers. Research organisations however do have suitable resources and experience but increasingly are not able to enter into commercial arrangements to sow trials. It may be useful to include in contractual arrangements with core researchers that PRS trial sowing might form part of their obligation to supporting PRS groups in future.

6 Conclusions/recommendations

6.1 Researcher Involvement

All core researchers involved in future PRS projects should have that involvement specified in their contractual arrangements to ensure that support for PRS groups is given appropriate priority. Support required should be specified including (but not limited to) trial design, trial sowing, data collation and analysis (biometrics), assistance with interpreting results. These should all occur in consultation with the producer group as part of a participatory process.

6.2 Human resources

All groups should have appropriately qualified and experienced technical support and a process should be developed to vet the bona fides of any nominated support person prior to contracting with a PRS group. Some groups had difficulty sourcing appropriate local technical support so assistance from MLA in sourcing appropriate contractors may be useful in future

6.3 Financial resources

Sourcing appropriately qualified and skilled support for producer groups can be expensive. PRS budgets should appropriately reflect that cost. Focus should be on value for money and ensuring the highest possibility of successful outcomes rather than just meeting budget constraints. This approach may mean funding fewer projects at a higher level. In the case of NSW, only five of the desired ten PRS groups were ultimately funded, hence only half the available budget for the project was expended. Yet financial resources was a major influence in the withdrawal of interest of some groups when they realised they couldn't afford to deliver their desired outcome within the budget.

For groups who proceeded to contract a PRS project, the limited budget influenced the choice of technical assistance and in some cases to the detriment of data quality.

6.4 Contract timeframe

In projects involving the sowing of pastures the contract period should involve sufficient lead time to ensure appropriate weed control can be achieved. In many instances this would add a full 12 months to the period of the contract however the resources required in this initial year would be minimal. Pre-sowing lead time should be flexible and related to the control of the most problematic weeds present at the site rather than just a fixed timeframe.

Milestone dates for PRS projects should be negotiated to occur at times which do not clash with the busiest times of year on farm.

7 Key messages

7.1 Benefits to producers

Involvement in the PRS project benefited the producer groups in different ways. For the most part it allowed the groups to try new and unproven technologies well ahead of when they might otherwise have them available. Another significant benefit was an improved understanding of how research needs to be conducted especially the need for replication. Variance between replicates was large at a number of sites around NSW which demonstrated that paired paddock demonstrations of unproven technologies could easily lead to spurious conclusions about the likely effectiveness of that technology.

The PRS process also allowed the groups involved to build a relationship with researchers that they would not have been able to do otherwise. This will no doubt serve to give producers an ongoing conduit into the research planning process as time goes by.

7.2 Benefits to researchers

Involvement with the PRS groups gave the core researchers an opportunity to appreciate the opportunities and challenges for the application of their research on commercial farms. The relationship built with the farmer groups also provided an ongoing sounding board for research ideas and the effective interpretation of research data. When planned and implemented effectively the PRS process gives researchers an opportunity to test the practical application of research solutions in a way that would otherwise not be available and should in many instances influence the way research solutions to production issues are extended and adopted.

7.3 Benefits to industry

Well conducted PRS projects gather practical information about the impact of new ideas and technology in farms systems and the practical aspects of their application and usefulness. This information should ensure that adjustments to the direction of research may occur sooner making the use of the limited research dollars more effective and stretch further. It should be noted that a new idea shown at an early stage by PRS projects to be ineffective or not able to be adopted within farm systems is just as valuable as research that demonstrates unequivocal success.

8 Appendix

8.1 NSW Ranking Sheet for EOIs.xlsx.

See file ***NSW Ranking Sheet for EOIs.xlsx*** attached.

8.2 Summary of facilitated meeting outcomes

8.2.1 AIMS group meeting sumary

Location: Armidale Bowling Club 17/3/14 9am – 12:30pm

Attendance:7 Farmers, Mark Trotter and 2 other researchers from UNE, Lewis Khan, AIMS Consulting, Doug Alcock, Graz Prophet Consulting

Group Stats:
Area: 1200ha - 2,800 ha
Grazing %: 95% -100%
Total Sheep: 0 – 14,500
Total Cattle: 200 - 1500

Participatory Research Benchmark Questions

1. How would you rate the potential of real time pasture measurement to improve the productivity of your farming business?

Average: 4.4 Range: 4 - 5

2. How would you rate your current knowledge about real time pasture measurement and its place in your farming business?

Average: 3.2 Range: 2 - 4

3. How would you rate your confidence in adopting real time pasture measurement in your farming business?

Average: 3.9 Range: 3 - 4

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 3 Range: 2 – 5

5. How involved are you in the current research and development projects funded by MLA?

Average: 1.7 Range: 0 - 5

6. How would you rate your influence on research projects funded by MLA?

Average: 2.6 Range: 0 - 5

Workshop Discussion / Outcomes

Data Handling and Decision Making

Workshop time was limited to a half day however the group had already met with Mark Trotter in December to gain insight into the Real-time Pasture Measurement research.

For this reason the bulk of the time was spent discussing the nature of the participatory research. An outline presentation was given of the expectations of participatory research and the projects that would potentially be funded. Mark Trotter then gave a recap of the research project before discussion focussed on the work that the Participatory research group might do.

Discussion commenced with a view that the most important missing link in the use of biomass data was the link between collection (regardless of method) and it's use to make timely tactical and strategic decisions. Current systems were seen as labour intensive and less than timely as a result. Most producers present had some kind of paddock recording system for planning grazing and for feed budgeting usually in an excel spreadsheet. Development of better recording (automatic data download from an AOS tool and APP) and data interrogation methods were seen as a priority parallel development to the tool development.

The above graphic outlines the process discussed with NDVI data converted to Biomass data by the Phone App and then transferred to the cloud (or perhaps directly to computer) where calculations are made to create indices that can be used to make grazing decisions. There were many ideas as to what these indices might look like but it seemed they would need to be paddock scale and include information about stock numbers and movements as well as historical biomass data in order to help anticipate the progress of the season and to conduct simple feed budgets. It was seen that the need for this kind of "expert system" was a parallel development to the AOS calibration work and the group was keen to work on developing specifications for this including exploration of what computer based recording / feed budgeting tools were already out there. It was seen as an important project that farmers from other P R&D groups involved with the Realtime Pasture Assessement should also be involved with.

Action: Doug Alcock to discuss with Linda Hygate how a joint approach to this need might be facilitated.

AOS Calibration

While understanding the relevance of calibrating the tool to single species swards the group was not interested in conducting these calibrations themselves. Instead two areas of calibration were of greatest interest to them.

1) The calibration of the tool for fertilised naturalised pastures including species such as Microlaena with some improved grasses and white clover.

2) Comparison of grazing method (Techno grazing vs less intensive). It was considered that the grazing method had sufficient impact on the sward structure (even with the same species) that grazing method may need to be a variate in the calibration equations.

Critical times of the year when the tool must be accurate were considered to be Autumn (April) to assess the feed going into winter, Late winter / spring (Sept/Oct) to assess the adequacy of feed for lambing and perhaps December/ January to determine the likely carry over into summer dry spells and also the impact of any masking by dead material in the sward. It was decided that any calibration cuts would be confined to these times of the year.

It was decided that baseline soil fertility data would be collected even though it may not have direct relevance to the level of biomass cut due to the need to select quadrats that represent the full range in biomass available on each occasion.

These full calibration cuts will use the frame mounted sensors as used by the research protocol however it was expressed that the farmers would all like some active involvement in the project and it was decided to collect some paddock scale data comparing the current visual assessment of herbage with the NDVI figure collected for the paddock. This should be done for a many paddocks as possible to gather as many paddock scale data points for each operator as possible. While this data can't be used to calibrate the tool as such it was seen as useful particularly if the calibration cuts prove a solid relationship but the paddock scale assessments don't match up this would tend to indicate that the either the visual assessment skill of the operator is not as good as they would like indicating current decisions may be compromised by the quality of subjective data or that there are other between paddock confounding factors that had not been considered.

Research Question 1.

Can the GreenSeeker AOS technology be used to reliably measure biomass in naturalised pastures on the New England.

Protocols for measurements to be taken are to be negotiated between Lewis Kahn and the research group within the next 2 weeks. Parallel to the cut and weigh calibrations there will also be paddock scale qualitative data collected on the same pasture and on similar pastures across the range of properties.

Research Question 2.

Does grazing intensity affect the sward structure and the subsequent calibration?

Height and density of the pasture is impacted by intensive grazing methods compared to less intensive grazing methods which would potentially need to be accounted for in formulating calibrations.

Research Question 3.

What should be included in a package to integrate AOS data with decision making process? What packages already exist?

The group is keen to pursue developing specifications for a data collation and interpretation tool. An analogy was drawn with the Sheep Genetics data base where raw data goes in and ASBV's and Selection indices come out. It was seen as desirable to work collaboratively with the other P R&D groups on this.

Actions:

Lewis Kahn to liaise with the Research group to develop sampling protocols for research questions 1 and 2.

Lewis Kahn and Martin Oppenheimer to develop the full project proposal and costings.

Doug Alcock to discuss with Linda Hygate the potential for developing an across group approach to the development of a decision support framework to link with the AOS data.

8.2.2 Borah Land Management Group Meeting Summary

Location: Manila Hall 30/1/14 (8:30-1:30)

Attendance: 6 Farmers, 1 Consultant, Researcher Dr Suzanne Boschma, Doug Alcock (State Coordinator)

Group Stats:
Area: 320 - 1900 ha
Grazing %: all 95% -100%
Total Sheep: 0 - 2200
Total Cattle: 140 – 280

Participatory Research Benchmark Questions

1. How would you rate the potential of sub-tropical pastures to improve the productivity of your farming business?

Average: 4.3 Range: 3 - 5

2. How would you rate your current knowledge about sub-tropical pastures and their place in your farming business?

Average: 3.3 Range: 2 - 4

3. How would you rate your confidence in including sub-tropical pastures in your farming business?

Average: 4.0 Range: 3 - 5

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 2 Range: 0 – 4 (Questions asked before the presentation Zero responses indicate lack of awareness of what is in the FIP.)

5. How involved are you in the current research and development projects funded by MLA?

Average: 1.1 Range: 0 - 4

6. How would you rate your influence on research projects funded by MLA?

Average: 1 Range: 0 - 3

Workshop Facilitation

The group were asked to discuss a number of questions to provide focus on the issues around sub tropical pastures leading to a discussion on the research question they would like to answer in the P R&D project

Question 1: What do you see as the potential of Sub-Tropical (ST) pastures in local farm systems?.

The group identified the following as potential impacts from ST pastures.

- Better Sustainability.
- Protection of Soil
- Better persistence.
- Less grass seed in wool (than native pastures)
- Green over summer (but not this one)
- More biomass production
- Rehabilitation of run down soils
- Deeper rooted so better nutrient cycling
- Good potential now that quality seed in available
- Better water penetration into soil.

Question 2: Have you already sown ST pastures on your farm?

100% of participants had sown ST pastures. Experience ranged from 2 years since the first sowing through to 18 year since the first sowing.

Question 3: What are the unknowns / uncertainties of the practice?

The group identified the following:

- Establishment risks – rainfall at germination and follow up
- Grazing management to improve feed quality / animal performance.
- Poor utilization
- Plant nutrition S & N ok? But what about other elements.
- Establishing legumes – at sowing - after sowing (established swards)

Question 4: What is currently the main limitation to the performance of these pastures?

- Rainfall
- Insufficient nutrients (soil) unsure of economics of plant nutrition.
- Lack of legume. N fixation - most common legumes are barrel and burr medic is there something better?

Question 5: What areas of research into ST pasture would make the greatest difference on your farms?

- Species (grasses) mix
- Ground cover
- Live-weight gain potential
- Ways to establish legumes into existing ST pastures
    - Nutrition
    - Species
    - Timing
    - Sowing methods
    - Preparation
    - Competition from existing ST grass pastures
    - Prior management of existing ST grass pastures

Progress on Full Participatory research submission

After hearing from Suzanne Boschma about the core FIP research the group was lead in discussion about the type of project they would like to conduct and the prime focus of the work.

After some discussion it was agreed that he project should have the following aim

Aim: To establish persistent new legumes in existing sub tropical grass swards to improve feed quality and nitrogen fixation.

The key research questions to be addressed for the project were decided and are as follows

Research Question 1. Which are the best new legume species / varieties in the local environment (based on establishment, persistence and production)?

Discussion around this question indicated an interest in sowing some larger scale plot trials of a range of new legume species outlined by Dr Boschma.

Research Question 2. Is establishment success affected by sowing time?

Discussion on this question revolved around a second round of trial sowing in year 2 of the project looking at comparing the establishment performance (using the most promising species from the first years results) when using a range of sowing times.

Actions

The original group coordinator (Robert Bowman) expressed some concern for his energy levels having driven local group activities for some time. Interest was assessed within the group for a replacement coordinator for the P R&D work and a willing and capable replacement was found in Mr Trevor Birley. Mr Birley has been in the district some 7 years and has a science / research background.

Trevor was to communication with group members unable to be present on the day and also to begin the drafting of the full application as well as investigating the suitability of a number of potential sites. It is intended that the project submission be ready in March with ongoing communication between Mr Birley, Dr Boschma and Doug Alcock.

8.2.3 Cooks Myalls Group Meeting Summary

Location: Hotel Graceland Parkes, 18/2/14 9:30am – 3:30pm

Attendance: 6 Farmers, Daryn Tanswell (Landmark Agronomist), Researcher Dr Suzanne Boschma, Doug Alcock (State Coordinator)

Group Stats:
Area: 640ha - 2,500 ha
Grazing %: 55% -90%
Total Sheep: 0 - 6000
Total Cattle: 0 – 210

Participatory Research Benchmark Questions

1. How would you rate the potential of sub-tropical pastures to improve the productivity of your farming business?

Average: 4.2 Range: 3 - 5

2. How would you rate your current knowledge about sub-tropical pastures their place in your farming business?

Average: 2.5 Range: 1 - 3

3. How would you rate your confidence in including sub-tropical pastures in your farming business?

Average: 3.7 Range: 2 - 5

Program Questions

4. How applicable is current MLA feed base research (as outlined in the FIP) to your farming business?

Average: 3.7 Range: 1 – 5

5. How involved are you in the current research and development projects funded by MLA?

Average: 0.2 Range: 0 - 1

6. How would you rate your influence on research projects funded by MLA?

Average: 0.2 Range: 0 - 1

Workshop Facilitation

The group were asked to discuss a number of questions to provide focus on the issues around the use Sub-Tropical Pastures leading to a discussion on the research question they would like to answer in the P R&D project

Question 1: What do you see as the potential of sub-tropical pastures in local farm systems?

- Good to make use of summer rainfall
- Provides a green feed option to offset clean stubble.
- Improving productivity on non-cropping country
- Possibly add S/T legumes into native/natural areas.
- Capturing storm rain with good summer ground cover.
- Soil reconditioner / adding soil carbon.
- Carry over feed into winter.
- Standing grass is good shelter for lambing.
- Make more money.

Question 2: Have you already sown sub-tropical pastures on your farm?

- 5 out of 7 in the group had already sown S/T grasses
- Nemkat and Katambora Rhodes grass.
- Premier Digit
- Bambatsi Panic
- Between 14ha and 80ha already sown.

Question 3: What are the unknowns / uncertainties of the practice?

- Best sowing time.
- Preparation / weed control
- Ongoing management.
- Nutrient requirements.
- Establishing legumes with them.
- How to fill the winter feed gap (3 months: June, July, August)
- Can you broadcast S/T legumes in the same way you would Sub Clover?

- What legume species grow best in the environment?
- What nutrient requirements do the legumes have?
- Weed control in established stands
    - Spear grass
    - Summer B/L weeds

Question 4: What areas of research into sub-tropical pastures would make the greatest difference on local farms?

- Bullet proof establishment methods.
- Drilled vs broadcast.
- Winter production for year round feed supply
- Measures of feed quality year round
- What Species are best in the area
- Legumes
- Grasses.

Discussion

After hearing from Suzanne Boschma, a range of potential research topics were discussed to try and focus on a specific area. It was agreed that there was enough information about establishment methods and preparation for sowing S/T grasses it was more that these were sometimes not followed which caused the problems.

It was then agreed that the greatest issues to be addressed both related to the introduction and maintenance of legumes within S/T pasture swards with perceived benefits accruing from..

1. Filling the winter feed gap with some high quality herbage.

2. Fixing nitrogen to increase the growth and quality of S/T grasses over summer.

The group decided to focus on the introduction of legumes and 4 producers in the group indicated that they would be interested in sowing trial areas to address the key issues of what legume species are best in the area and there potential to increase overall production through fixing N.

Each potential host farmer was asked to choose their particular interest area within the constraints of the project being about sowing non-traditional legume species.

Progress on Full Participatory research submission

After some discussion the following project aim was agreed to

Aim 1: To find legume species to grow with sub-tropical grasses that are adapted to our environment and fix nitrogen cost effectively and/or fill the winter feed gap in these pastures.

Research Questions:

- Which temperate legumes establish and persist to fill the winter feed gap with quality feed.
- Can S/T legumes establish and survive in this environment fix Nitrogen and improve feed quality.
- How effectively does the addition of new legumes increase pasture growth and feed quality compared to the use of N fertilisers

The objectives of this research:

- Assess the suitability of a range of unconventional legumes to produce quality herbage over winter within mixed sub-tropical grass swards.

Trials

Design

Significant discussion resulted in four producers expressing interest in sowing trials.

Trials proposed include

a) Peter Thompson: Sowing temperate legumes into existing pastures for winter feed and nitrogen value.

b) Gary Obrien: Sowing a new S/T grass pasture with new S/T legumes. Interested in the value of nitrogen fixation to growth and feed quality.

c) Chris Cole: Sowing S/T legumes into existing pastures

d) Glen Woods: Under sowing non-traditional temperate legumes with a cereal crop to set seed and then over sowing S/T grasses after harvest. This idea generated robust discussion about the wisdom of under sowing due to crop competition but Glen was clear that this had to be possible in order to fit his enterprise priorities and it was the fit into his (fairly typical) farm system that was important.

All trials proposed would be assessed regarding the impact of N fixation on the growth and quality of S/T grasses over the summer. Trials using temperate legumes would be assessed for their winter growth and ability to feed the traditional feed gap in S/T pastures.

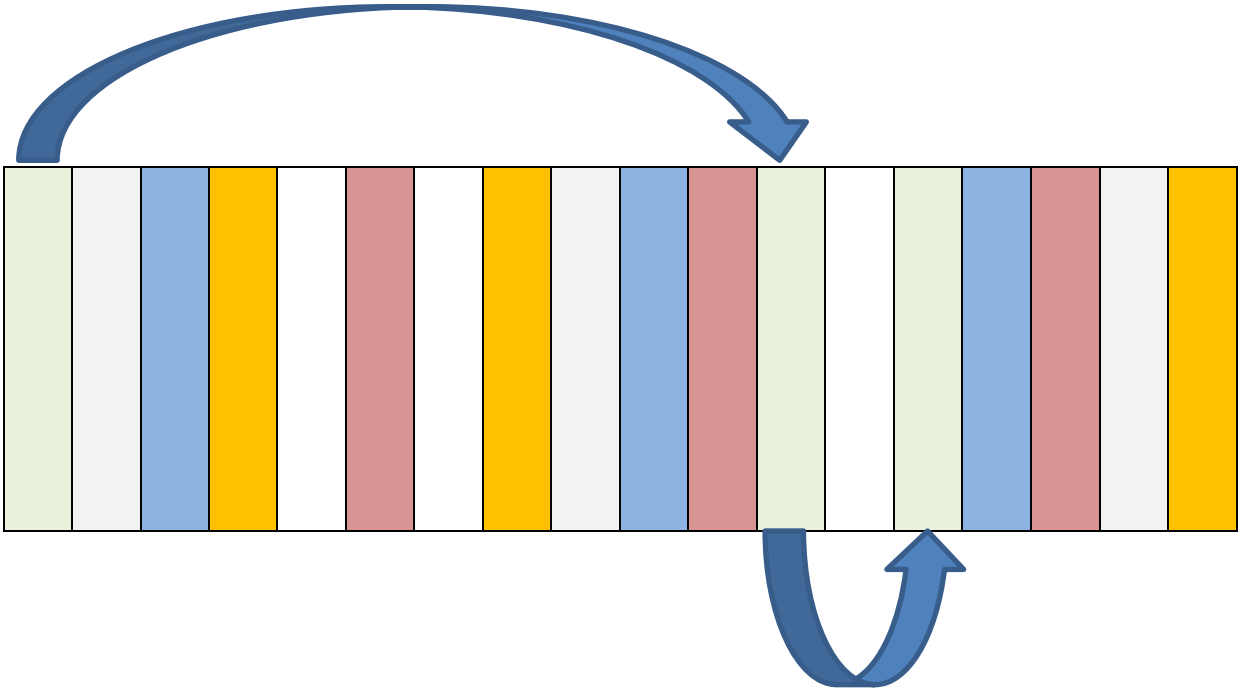
Temperate legumes short listed as having potential included

- French Serradella
- Yellow serradella
- Biserrula
- Bladder clover
- Gland Clover
- Arrow Leaf Clover

A traditional mix of sub clovers should be sown to give a point of comparison.

Sub-tropical legumes suitable to the area worth trying are limited to 2 varieties of Desmanthus (recommended by Suz Boshcma) These should be tried in comparison with a typical mix of Lucerne used in the area to provide benchmark.

Plots to be sown with existing farm equipment so need to be of a scale suited to this. Most were comfortable with sowing into 10 – 15 ha paddocks. Plots to be laid out so that all reps of each treatment can be easily sown at the same time so as to minimize changing over of seed.



It was suggested that to keep trials to a manageable size on each farm there should be no more than 4 legume mix treatments and to address the added value of these legumes there should also be a control with grasses but no legume. To assess the relative value of N fixed by the legumes there will also be a treatment that has N fertilizer applied in the early growth phase of the grasses each year. Dr Suzannne Boshma will provide assistance with trial design once the trial areas are mapped out.

Temporarily fence and water may be required if…

1. The overall paddock is too large to enable rapid and uniform grazing after biomass measurements are taken
2. The relevant producer cannot aggregate sufficiently large mobs to effect rapid and even utilization of biomass after trial measurements are taken.

Sites selected should currently be relatively free of legumes.

Site measurements will need to be taken prior to grazing after a significant rest period to allow herbage to accumulate.

Measurements to be taken will include:

Soil Tests: Prior to trial commencement and annually after that at a consistent time (preferably in late spring).

Biomass Assessments: Taken prior to each grazing of the paddock. The number of times will be dependent on season. It was suggested that the method used be a calibrated biomass ranking method (simplified botanal) that would allow herbage mass and the relative contribution of the grasses and the legumes to be assessed.

Feed quality: Timing of feed quality testing was discussed and it was decided that sufficient is already known about the feed quality of the alternate temperate legumes that there value to winter production could be evaluated without feed quality testing. It was seen that the most important consideration in terms of feed quality would be to determine if the addition of legume had fixed nitrogen leading to an improvement in feed quality of the S/T grasses in their growing season. A typical ruminant forage quality test (measures including Neutral Detergent Fibre, Dry Matter digestibility, Crude protein and calculated metabolisable energy) through a NATA accredited laboratory would be sufficient for the purpose. Samples should be taken both early and late in the growth season of the S/T grasses to determine firstly whether there are any quality differences with fixed or applied N and secondly whether these differences persist throughout the growing season.

These measures should suffice to make conclusions about the successful establishment and persistence of the relevant new legumes and also to be the basis of a simple economic analysis.

Actions

Doug Alcock to summarise outcomes of the meeting and foward to the group coordinator Chris Cole.

Doug Alcock to discuss with Belinda Hackney the best bet combinations of Temp. Legumes for the group to try. Also to discuss the plan to under sow these with a cereal crop and the appropriate associated agronomy.

Mr. Chris Cole with the assistance of Daryn Tanswell to draft the Cooks Myalls Participatory Research plan and distribute to the group, Suzanne Boschma and Doug Alcock for comment and assistance.

Daryn Tanswell to visit the potential trial paddocks and to select the most appropriate area for the trial and provide a site plan to Suzanne Boschma to assist with trial randomization / design.

Final draft Project Plan to be completed by mid-March for submission to MLA before the end of March. (Trials a) and d) intended to be sown this autumn)

8.2.4 Dungog–Gresford Land and Beef Inc. Group Meeting Summary

Location: NSW DPI Advisory Office, Tocal 31/1/14 9:00am – 2:30pm

Attendance: 7 Farmers, Neil Griffiths, NSW DPI, Researcher Dr Suzanne Boschma, NSW DPI,Doug Alcock (State Coordinator)

Group Stats:
Area: 131ha - 10,000 ha (large area also includes country owned outside of the local area)
Grazing %: 50% -100%
Total Sheep: 0 - 200
Total Cattle: 80 – 2500

Participatory Research Benchmark Questions

1. How would you rate the potential of sub-tropical pastures to improve the productivity of your farming business?

Average: 3.3 Range: 1 - 5

2. How would you rate your current knowledge about sub-tropical pastures and their place in your farming business?

Average: 1.9 Range: 1 - 3

3. How would you rate your confidence in including sub-tropical pastures in your farming business?

Average: 2.6 Range: 1 - 5

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 1.6 Range: 0 – 5 (Zero responses indicate lack of awareness of what is in the FIP. 3 out of 7 were not aware of the FIP)

5. How involved are you in the current research and development projects funded by MLA?

Average: 1.0 Range: 0 - 4

6. How would you rate your influence on research projects funded by MLA?

Average: 0.3 Range: 0 - 2

Workshop Facilitation

The group were asked to discuss a number of questions to provide focus on the issues around sub tropical pastures leading to a discussion on the research question they would like to answer in the P R&D project

Question 1: What do you see as the potential of Sub-Tropical (ST) pastures in local farm systems?.

- Kikuyu good on lower slope country
- Oversown
- Need to establish and maintain legumes
- Newer ST on weedy less arable country to help exclude weeds (eg Blady grass)

Question 2: Have you already sown ST pastures on your farm?

- 100% of participants had Kikuyu pastures either naturalized or sown (var Whittet)
- Setaria by broadcasting (4 farms)
- Premier Digit in light country with some fertilizer (2 Farms)
- Green Panic (1 farm)
- Paspalum (naturalized)

Question 3: What are the unknowns / uncertainties of the practice?

- Can we use some of the unconventional legumes (serradella, biserrula)?
- Persistence and establishment of new ST spp
- Tolerance of dry seasons / low rainfall.
- Use under irrigation.
- Value in hay / silage.
- Frost tolerance of newer ST species.
- Choice of fertilizer.

Question 4: What is currently the main limitation to the performance of these pastures?

- Lack of fertilizer (cost)
- Don't know how to manage them.
- Insufficient strategic rest.
- Rainfall (lack of it)
- Need a legume that doesn't need extra P
- Recycling of nutrients (poor dung beetle performance)

Question 5: What areas of research into ST pasture would make the greatest difference on your farms?

- Replacing invasive weeds (eg couch, blady grass etc) with a ST
- Both arable and non arable country
- Often poor soils.
- Managing Kikuyu to retain clover.
- Not having to resow to fill the winter feed gap. (Currently resow with Ryegrass but expensive to do every year).
- Appropriate fertilizer to enhance persistence.
- ST to persist on frequently flooded country.
- Use of supplements on ST to increase production

Progress on Full Participatory research submission

After hearing from Suzanne Boschma about the core FIP research the group was lead in discussion about the type of project they would like to conduct and the prime focus of the work.

After some discussion two project aims were agreed to

Aim 1: To replace low palatability weedy species on arable soils with a persistent mix of ST grasses and legumes.

Research Question: Can new ST grasses be successfully established on sites currently dominated by unpalatable species?

The objectives of this research

- To determine how well these ST species establish using best bet management techniques and resist reinvasion by unpalatable weedy species
- 2nd year to determine the impact of a range of site preparation treatments on the establishment of new pasture..

Aim 2: To fill the winter feed gap in Kikuyu pastures with one or more persistent legumes.

Research Question: Are any of the unconventional temperate legume species able to establish and produce herbage over winter without the need for annual resowing?

The objectives of this research will be to

- Assess the suitability of a range of unconventional temperate legumes to produce quality herbage over winter within an existing Kikuyu sward without the need to repeatedly resow.

Actions

The producer admin contact Mrs Nerelle Hand will draft the full application with assistance from Neil Griffiths and Doug Alcock. The proposal will be developed for Aim 1 initially and for the second aim pending the ablity to fit both aims within the budget available. It was seen as important to address both aims if possible in order to engage the whole group across the landscapes they manage. It is intended that a forward draft of the proposal be prepared by early March which would be circulated to group members for comment.

Issues yet to be finalised

- Species to be sown (suggestions were Setaria, Premier Digit, Rhodes, Creeping Bluegrass, Bambatsi Panic. To be sown with appropriate legumes)
- Appropriate (best bet sowing preparation and techniques)
- Who would possibly be engaged to take measurements and any necessary samples.

Neil Griffiths agreed to assist the group by visiting potential sites and by providing comment and agronomic advice to Mrs Hand in the preparation of the full submission.

8.2.5 Harden - Murrumburrah Landcare Group Meeting Summary

Location: Harden Shire Council 10/3/14 1pm – 5pm

Attendance:5 Farmers (recent rain meant several other keen participants were busy sowing crops), 2 LLS officers, Louise Hufton and Janelle Jenkins, Rsearcher Andrew Robson (UNE),Doug Alcock (State Coordinator)

Group Stats:
Area: 700ha - 2,600 ha
Grazing %: 60% -77%
Total Sheep: 3000 - 9000
Total Cattle: None - 750

Participatory Research Benchmark Questions

1. How would you rate the potential of real time pasture measurement to improve the productivity of your farming business?

Average: 4.6 Range: 4 - 5

2. How would you rate your current knowledge about real time pasture measurement and its place in your farming business?

Average: 3.2 Range: 2 - 4

3. How would you rate your confidence in adopting real time pasture measurement in your farming business?

Average: 3.7 Range: 3 - 4

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 3.8 Range: 3 – 4

5. How involved are you in the current research and development projects funded by MLA?

Average: 0.9 Range: 0 - 3

6. How would you rate your influence on research projects funded by MLA?

Average: 1.6 Range: 0 - 3

Workshop Discussion / Outcomes

Workshop time was limited to a half day and participation was hampered at the last minute by excellent rainfall 4-5 days prior and therefor the need for some participants to be sowing crops.

The group had previous experience with remote sensed NDVI data and had already given considerable thought to the nature of the project they might undertake. Because the group

members present had already discussed this it was decided to dispense with facilitation of the ideas generation and consensus about priorities was easily attained.

Principle interest areas for the use of the technology revolved around linking yield mapping from the AOS tool to other measures such as EM38 surveys and soil moisture probes to progress toward a version of precision management for pastures. The group has already done work collecting EM38 soil surveys as well as pH mapping and soil moisture probes in situ in some members paddocks. The group felt it was desirable to leverage what they do with the AOS tools by using them in the paddocks that have these extra data already collected and being collected. It was clearly understood by the group that the most important first step was to establish the "skill" of the technology in assessing biomass in significant pasture types. Therefore it was agreed that other interest areas would be deferred to years 2 and three of the project

Andrew Robson gave a rundown on the core research project which made it clear that Participatory group participation in collecting data to calibrate the tool for the 6 key pasture types was important and an expectation of the researchers. Andrew indicated that the core research project would provide the P R&D group with calibrated sensors (including the GreenSeeker) mounted on a precision designed frame to allow for pasture cutting to be properly aligned with the foot print of the tool. This data would then be fed into a data interface to provide information about the skill of the tool and ultimately a localised calibration for the pasture type. Andrew suggested that there would need to be a number of sampling times throughout the year and that there would need to be 15 cuts taken in each pasture type on each sampling occasion. This would be confirmed in a full site protocol that was yet to be finalised.

The group agreed that it was important to establish the ability of the tool to accurately measure biomass for key pasture species before spending extensive effort evaluating its application across a broader range of species or in the development of decision making applications and linkages to other grazing decision support tools. It was agreed that the P R&D project should focus on assisting the core research as much as possible and for the Harden area the most important species to calibrate ohe tool in the research list were Phalaris and Lucerne. The group also discussed the utility of testing the tool in a clear monoculture situation such as a grazing crop and decided they would like to add winter wheat to the list of species to calibrate in year 1.

Progress Toward a full funding application

Two research questions were identified

Research Question 1: Can the GreenSeeker AOS tool be calibrated to reliably assess biomass in pure Phalaris and Lucerne pastures and winter wheat crops at strategically important times in the production cycle?

Protocols for measurements to be taken are to be supplied by the research group within the next 2 weeks (as soon as they are finalised) . Given budget limitations it was discussed as to how many times samples would be taken during the year and also what times of the year it was most critical for the biomass assessment to be accurate. It was agreed that the critical times are the times when feed availability most limits intake of breeding ewes at critical times in their breeding / management cycle.

These are

1) Between the autumn break and when pastures have grown sufficiently to meet requirements (0 – 600kg DM/ha, around the start of May depending on rainfall)

2) Mid June (500 – 1000kg DM/ha, The time when critical decisions are needed regarding allocation of paddocks or supplements to twin vs single bearing ewes.

3) Mid August (800 – 1500kg DM/ha, Early to mid lactation)

4) Late October (2500 – 4000kg DM/ha, peak feed on offer which usually determines the amount of feed available to carry stock through the summer)

The ability of the tool to assess at the lower end of the range in biomass is the most important (ie 0 – 1500 kgDM/ha) therefore sampling times 1, 2 and 3 are considered most important by the farmer group.

The group mentioned the use of GrassMaster capacitance probes as an alternative mature technology and discussed the possibility of calibrating this tool against the same cut quadrats while conducting the calibration of the GreenSeeker.

Research Question 2: Is the Green Seeker potentially better or more flexible than existing pasture probe technology?

This activity would require clarification on the footprint of the Grass Master in order to make a valid comparison on the same cut area. It is not envisaged that this activity would add much cost to the project.

Other potential research questions

Some key interest areas outside of the basic tool calibration were identified by the group as potential additional activities in the project in years 2 and 3.

1) Calibration in species / swards other than the core research priorities. Interest was expressed in calibrating the tool for use in dual purpose canola's which the producers find more difficult to assess visually. Also there are still considerable areas of nativel pastures in the region and while the native / naturalised pastures are seen as contributing less to production there was still some interest in assessing the capacity of the GreenSeeker in these pastures that typically carry more dead material throughout the growing season.

Research Question: Can the green seeker be used successfully to assess other herbage including herbaceous crop species (Canola) and mixed swards of natural pasture.

2) Soil moisture probes are installed in a number of group members paddocks so there was interest in using the calibrated GreenSeeker to make more frequent sequential paddock assessments to derive pasture growth data which might be compared with the soil moisture probe data. It is hoped that this might provide information that could establish a predictive relationship between measured soil moisture and pasture growth.

Research Question: Can soil moisture probe data be used to predict paddock scale pasture growth (measured using the GreenSeeker).

Additional Ideas

A number of the producers paddocks have in addition to moisture probes also had EM38 soil surveys and soil pH mapping along with GreenSeeker mapping (raw NDVI) with the intention of creating zones for variable rate fertiliser use. There is interest in linking these data layers with calibrated GreenSeeker data to explore the correlations between measured pasture growth and these other measures. (Adrian, I wasn't sure how to turn this idea into a research question and thought you would better to define it yourself)

The group considered the calibration of the tool to fall short of something of use to farmers. It is important to adoption that applications for the data are demonstrated at the same time as simply providing more accurate biomass assessments. The group was keen (perhaps in year three) to take the tool and undertake to actively use it on farm to feed better data into decision support tools such as ProPlus and GrazFeed in order to make the link from data through to better management practises. Case study style recording of outcomes were envisaged as the potential vehicle for this to evaluate whether the more accurate measurement of biomass alone made the outcome of management decisions more predictable.

Research question: If the GreenSeeker provides more accurate biomass assessments how does this translate into higher / more efficient livestock production.

Actions

Research group to provide "Gold Standard" measurement protocols to the HMLC group within 2 weeks to enable proper costing of time requirements in year 1 activities.

Adrian Roles and Louise Hufton to confirm with owners of the potential sites for measurement who were unable to be present at the planning session.

Adrian Roles and Louise Hufton to draft the application for submission over the coming month.

Research group to provide comment on how measurements might be taken and analysed with regard to the other key interest areas 2 and 3.

Doug Alcock to provide feedback on progress and assistance where required.

8.2.6 Holbrook Landcare Group Meeting Summary

Location: Holbrook LHPA and Landcare Office, 7/2/14, 1pm – 4pm

Attendance: 5 Farmers (unfortunately a last minute clash with two other events in town), 1 Agronomy consultant/reseller, Researcher Michael Friend, CSU plus PhD Student, Raylene Brown (HLCN Project Officer),Chris Cumming (HLCN CEO),Doug Alcock(State Coordinator)

Workshop Facilitation

Limited time was available for this meeting in the afternoon on this date but due to the need to progress the application without any further delay it was decided to stay with this date. Unfortunately the overall attendance was still not desirable but did include the group's chairman and others who were particularly interested in the Dual Purpose Cropping P R&D.

On this occasion after a presentation outlining the P R&D project was given the floor was given to Michael Friend who briefly the core research activities with a particular focus on the work at Wagga. Information about the modelling work and also conclusions drawn as the suitability and risks involved in grazing pregnant and lactating ewes on winter wheats were discussed.

Producer interest was shown in the potential for modelling farm systems in the Holbrook area to look at how the dual purpose crops might fit into a higher rainfall area than Wagga work. It was clear however that the group was divided on this issue with half the group expressing reservations about the level of engagement that a project focus on modelling would not have sufficient general interest within the group.

To provide an alternate focus for discussion participants were then asked the question

For what purpose in the grazing system would dual purpose crops give the best return?

Uses for DP crops were seen to include

- Spreading production risks compared to pasture alone
- Managing the crop for the livestock benefit.
- Crop to finish carry over lamb (early sown)
- Crop to utilise N after the Lucerne phase.
- Winter wheats to graze pregnant Merino ewes (crossed to terminal sires)
    - Paddocks and stock density seen as not suited to lambing ewes.

Other issues were identified as limitations or constraints or knowledge gaps.

- Problems with BL weed control in grazing canola.
- Need for disease sprays (rust) and interactions with grazing withholding periods.
- Ideal number of days to grazing (early feed vs total seasonal production)
- Benefits of rotational grazing vs set stocking.
- Potential growth vs pasture under similar management.

Discussion on the last point above identified an underlying resource allocation question about Autumn / early Winter N applications. It was suggested by one farmer that he wasn't sure whether when he fertilised with N he should put it all on the crop or for a limited amount of N he would he get a better marginal return from applying some of the N to an area of permanent pasture (phalaris). Ideas around this concept lead to agreement on a project proposal that involved measuring the response to a arrange of N applications on crop and pasture in adjacent paddocks.

Progress toward a full application

Aim: To determine the point at which the marginal response to application of Nitrogen on permanent pasture exceed the additional response from the dual purpose grazing crop.

Research Question: At what rate of autumn Nitrogen application is the marginal response in crop growth less than the extra herbage growth generated if the extra Nitrogen was spread on permanent pastures.

Trial Design: It was recognized that some work would need to be done to generate a full trial design however in principle once fertilizer application rates were determined that the treatments would be replicated and that there would be a number of trial sites on a range of group members farms. Measurements of growth will require exclusion from grazing in the period after N application and herbage growth will be assessed as the difference between herbage available at the time of application and that available at the time of intended grazing.

Actions

The Holbrook LCN project coordinator, Raylene Brown, will progress the writing of the full application for comment by group members before submission to MLA. To allow for work to be done in the coming Autumn / winter this application will need to be prepared within a month.

Comment on trial design and measurement techniques will be sought from Michael Friend before the submission is sent to MLA.

Doug Alcock will liaise with Raylene to progress the application in a timely manner.

8.2.7 Monaro Farming Systems Group Meeting Summary

Location: Nimmitabel Community Centre, 4/2/14 8:30am – 3:00pm

Attendance: 6 Farmers,Mrs Nancy Spoljaric, MFS Project Coordinator and farmer member, Researcher Belinda Hackney, Charles Sturt University,Doug Alcock(State Coordinator)

Group Stats:
Area: 1000ha - 7,200 ha
Grazing %: 95% -100%
Total Sheep: 0 - 35000
Total Cattle: 78 – 2400

Participatory Research Benchmark Questions

1. How would you rate the potential of efficient P use to improve the productivity of your farming business?

Average: 4.5 Range: 2.5 - 5

2. How would you rate your current knowledge about efficient P use and its place in your farming business?

Average: 3.0 Range: 1 - 4

3. How would you rate your confidence to improve P use efficiency in your farming business?

Average: 4.3 Range: 3.5 - 5

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 3.9 Range: 2 – 5

5. How involved are you in the current research and development projects funded by MLA?

Average: 1.15 Range: 0 - 3

6. How would you rate your influence on research projects funded by MLA?

Average: 0.9 Range: 0 - 5

Workshop Facilitation

The group were asked to discuss a number of questions to provide focus on the issues around the use of new legumes leading to a discussion on the research question they would like to answer in the P R&D project

Question 1: What do you see as the potential of unconventional legumes in local farm systems?

- More biomass from legumes.
- Better feed quality and animal production
- N fixation and the effect of this on other pasture species.
- Ability to fill feed gaps
    - Seasonal
    - Extraordinary
- Spreading risk by having a more biodiverse legume component.
- Perennial legumes might work better and be more reliable over years

Question 2: Have you already sown any unconventional legmes on your farm?

- 1 tried wool pod vetch.
- Strawberry clover
- Arrowleaf clover
- Gland Clover (after seeing it in Bungarby trials)
- Jemalong (after seeing it in Bungarby trials)
- Tallish
- Lucerne (unconventional agronomy by sowing into established swards)
- American varieties of Lucerne with claims of better persistence.

Question 3: What are the unknowns / uncertainties of the practice?

- How to introduce them into established pasture swards.
- How persistent are they – do they self-perpetuate / reproduce.
- Are there problems with plant toxins?
- Cost to establish
- What species are there?
- Do they actually increase production.
- Adaptation to soil type / rainfall / enterprise type?

Question 4: What is currently the main limitation to the performance of legumes in pastures?

- Rain
- Do we actually know what legumes are out there?
- Poor re-establishment of annuals
    - Biomass overburden in Autumn
    - False breaks
    - Poor seed set.
- Poor growth of sub in heavy soils
- Root diseases?
- Poor nodulation.
- Cost to establish and poor persistence in perennials
- Non arable country
- Soil Fertility
- Broad leaf weed competition.

Question 5: What areas of research into new legumes and their agronomy would make the greatest difference on local farms?

- In the long term
    - Value to the whole farm system (modelling)
    - Agronomy of establishment
        - Knock down sprays to establish in perennial grass swards
        - Timing of sowing into established swards?
        - Minimizing the opportunity cost (lost grazing at critical times)
- Medium Term
    - Perennial introduction
        - Species / variety choice
        - Agronomy
        - Persistence (Lucerne adaptation to lighter/ shallow soils)
- Short Term
    - Suitable new annual legumes
    - Establishment techniques.
    - Ability to reestablish over time
    - Ability to handle dry times and still produce biomass.

Individual Ideas

At the request of the chairman of the group each producer was asked to highlight what they would like to get out of new legumes in their own farm system. (not all producers participated in this.

Producer 1.

The main issue was how to successfully reintroduce legumes into established but rundown perennial grass pastures without having to fully re-sow. This involved chemical strategies to set back established perennial grass plants as well as trialing non traditional species.

Producer 2.

Higher rainfall area (700mm+)

Have been resowing pastures but struggling to get good legume content and pasture gives way to grass weeds such as bent grass within 2- 3 years. Want to get better pastures to raise overall stocking rate from around 6dse/ha to 10 dse/ha.

Producer 3.

Granite country 750mm + rainfall.

Use of new legumes for late summer / autumn production to finish lambs.

Currently using short term Ryegrass but hot summers have been a problem for production even with rain.

Would like to see how new legumes go with chicory and/or plantain.

Discussion around these ideas concluded that testing the alternatives in a mixed pasture sward would give sufficient information for an assessment of their late summer forage potential so it was decided to focus on the two fundamental issues of including alternative legumes in new sowing of mixed pastures as well as exploring the issue of establishing them in existing pastures.

Progress on Full Participatory research submission

After hearing from Belinda Hackney about the core FIP research, the group was lead in discussion about the type of project they would like to conduct and the prime focus of the work.

After some discussion two project aims were agreed to

Aim: To explore the establishment, persistence and production of new legumes compared to traditional legumes on the Monaro.

Research Questions:

- Are some of the alternative species better than traditional species and/or each other?
- Do the new legumes coexist, produce and persist better then traditional legumes in newly sown improved pasture mixes?.
- Can non-traditional legumes be established more easily into existing pasture swards than traditional pasture legumes?

The objectives of this research:

- Assess the suitability of a range of unconventional temperate legumes to produce quality herbage in autumn and early winter within mixed improved grass swards.

Trials and design

Significant discussion resulted in a draft trial design for two sites.

Site 1. High rainfall granite. Preparations have already been put in place on a property around 30km east of Cooma for the sowing of new pasture this Autumn. It is proposed that a range of pasture mixes be trialed in this paddock sown this Autumn.

Producers were asked what scale the plots would need to be to provided confidence in the results and the plans made in light of these deliberations.

7 pasture sowing mixes were identified with the assistance of Belinda Hackney, utilizing the base perennial grass species that will be sown across the whole paddock.

1) A baseline mix of Phalaris, Fescue and Ryegrass with sub clovers and white clover

2) A mix including Phalaris and Fescue with sub clovers and white clover

3) A mix including Phalaris and Fescue with Lucerne.

4) Grasses as above with French Serradella and Gland clover.

5) Grasses as above with Biserrula.

6) Grasses as above with gland and balansa clovers.

Grasses as above with all annual legumes and Lucerne.

Baseline sowing rates were very high in Ryegrass and it was seen as important to trial with and without the ryegrass to assess potential impacts on the other grasses and the clover establishment.

Total trial size will be 50m x 63 metres and allow for 3 replicates of each treatment.

Site 2. Medium rainfall Shale soil. Existing cocksfoot pastures have been identified that have some bare ground and very little clover over the past few years.

The trial will look at the interaction between herbicide strategies to set back existing perennial grasses and the resowing of new pasture mixes into the old pasture.

Two herbicide treatments (Gramoxone and Glyphoshate at best bet rates) plus a nil herbicide treatment will be used to assess the effectiveness of setting back the existing perennial grasses in early spring for a spring sowing of 8 different pasture mixes. It is understood many of the new legume species are indeterminate in their growth patterns and will successfully set seed from spring sowings. The eight pasture mixes tentatively selected are

1. Prarie Grass, Serradellla and gland clover.
2. Prairie Grass, Biserrula.
3. Phalaris, Serradella and gland clover.
4. Phalaris, Biserrula.
5. Biserrula alone.
6. Serradella and gland clover.
7. Prairie Grass and Lucerne.
8. Phalaris and Lucerne.

The size of the plots is a compromise between being of scale suitable for the farmers confidence and fitting within the constraints of the equipment required. Gramoxone must be applied using professional equipment with air conditioned enclosed cabin so plots will have to fit within multiples of boom widths (one pass = 18m). Belinda Hackney will make a cone seeder available for the trials which sows 1.5 m width so it has been decided to do 2 seeder widths for plots 3m wide.

Actions

The MFS project coordinator, Mrs Nancy Spoljaric, will progress the writing of the full application for submission to MLA as soon as possible with a view to sowing trial one into pre-prepared country this Autumn. As part of a service arrangement with the Local Land Services, LLS pasture specialist Luke Pope will inspect the two sites and lay out the appropriate areas for the proposed trials.

Belinda Hackney has undertaken to assist with the sourcing of appropriate seed and inoculant for the non-traditional legumes as well as provide the loan of a cone seeder for the sowing at both sites.

Host farms will be responsible for providing adequate rest from grazing during the establishment phase and then ensuring that when grazed the paddocks containing the trials will be rotationally grazed to reduce the impact of selective grazing on the plots. It was not seen as desirable to exclude grazing because persistence under grazing is an important characteristic to asses.

The group would like to have the project submitted and approved for an Autumn sowing on the higher rainfall site by mid April.

8.2.8 Tablelands Farming Systems Group Meeting Summary

Location: Crookwell Services Club, 5/2/14 10:00am – 3:30pm

Attendance: 6 Farmers (the group had already held a workshop of their own prior to this meeting), Researcher Richard Simpson, CSIRO, Doug Alcock(State Coordinator)

Group Stats:
Area: 303 ha - 1,200 ha
Grazing %: 75% -100%
Total Sheep: 0 - 10500
Total Cattle: 0 – 312

Participatory Research Benchmark Questions

1. How would you rate the potential of efficient P use to improve the productivity of your farming business?

Average: 3 Range: Unsure - 5

2. How would you rate your current knowledge about efficient P use and its place in your farming business?

Average: 3.4 Range: Unsure - 5

3. How would you rate your confidence to improve P use efficiency in your farming business?

Average: 4.2 Range: Unsure - 5

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 2.25 Range: 0 – 5 (2 out of 6 were not aware of the FIP)

5. How involved are you in the current research and development projects funded by MLA?

Average: 2 Range: 0 - 5

6. How would you rate your influence on research projects funded by MLA?

Average: 2.5 Range: 0 - 5

Workshop Facilitation

This group had already organised a facilitated session to gather ideas and to prioritise potential research areas. The following is a summary of key indicators within the group and the facilitated session to determine priorities.

Farm benchmarks in the group

There were 12 participants representing 14 farms between 130 and 2000ha
Enterprises

Enterprise	Number of Farms
Prime Lamb	9
Wool	10
Stud Sheep	1
Beef Cattle	10
Stud Cattle	2
Horses	1
Hay	3

Soil Testing Practises

All of the participating farms have done soil testing

Time Frame	Percentage of Farms
Last 12m	31
Last 2 – 4yrs	46
Last 5 – 10yrs	23

Fertiliser applications

Fertiliser Type	Percentage of Farms
Superphosphate	83
MAP / DAP	25
Poultry Litter	23
Other	17
None	17

Interval of application on at least some part of the Farm

Annual	83%
2-3 year	8%
4-5	8%
Never	17%

Rationale for application

Based on soil test	100%
Professional advice	25%
According to land class	58%
According to nutrient budget	25%
Entire Farm	58%

Results from P use Efficiency facilitated discussion

Q1 What is limiting livestock production in this area?

- Phosphorus
- feed availability
- feed gaps,
- pasture production
- livestock health and condition
- management
- moisture
- general soil fertility
- climate

Q2 Why is there not more pasture improvement in the district?

- cost of production and “out of play paddocks”
- desire to keep native pastures especially for drought periods
- fear of failure
- lack of knowledge and skills
- lack of independent advice
- terrain and topography
- sustainability (desire to have long term perenniality)
- age of manager
- complacency
- pressures from other priorities (young families)
- generational loss of drive
- off farm pressures

Q3 Are clovers as good as they used to be?

- No
- competition from grass species
- nutrition (S, K and trace minerals)

- keen to investigate other legumes suitable for the district (French (pink) Serradella) that have non-destructive establishment and can compete with pastures.

Q4 If superphosphate was cheaper would we use more?

- Yes: still target application, price drive quantity
- No: based on soil test or other fertilisers that can supply more nutrients

Q5 Are we getting the response to superphosphate that we used to?

- no, some farms have reached critical P
- others deficient in other nutrients (S, K, other)
- not sure (no way to measure)

Q6 What alternatives to superphosphate would you consider using?

- poultry litter
- reactive rock phosphate
- agri-ash
- compost
- lime
- other constraining nutrients

Other issues of interest that might be relevant

- Cost effective P sources
- Lack of skills in taking soil tests and interpreting the results
- Finding a way to unlock the P already applied or native without losing production and sustainability (environmental and economic)
- Uptake of BMP, increase soil organic matter
- Bacteria, fungi to break down P
- Compaction causing increased run off, decreased soil health

Progress on Full Participatory research submission

There were many ideas coming from the group but it became clear to all producers present after Richard Simpsons presentation that many were not really within the scope of the P use efficiency project. Discussion quickly focused on two main areas.

1) The efficiency of P use from alternative sources of P (superphosphate as the benchmark).

Richard Simpson indicated that it is not clear whether soil tests gave as reliable indication as to P sufficiency for alternative sources of P and that some data in this area would be useful. Given the acid nature of most of the regions soils it was also decided to test the interaction between alternative source of P and the use of surface applied lime.

Aim: To determine whether applications of novel forms of P at the same rates will lead to equal response in both pasture and soil test over time.

Research Questions:

- Does the calculated P value of some alternative P source match up in terms of pasture and soil responses.
- Are there differences in the efficiency of P use of pastures fertilized with alternative P sources?

2) Alternative legumes with lower critical P requirements.

Considerable interest was shown in using new legumes that operate at lower critical soil P levels. Reasons for wanting to use these species were 2 fold.

Firstly people with currently high soil P are interested in was that they may be able to "extract" (mine) some of that P. Using lower requirement plants with lower rates of ongoing P should achieve this.

Secondly people who currently have low soil P might avoid as large a capital P expenditure by using legumes with lower P requirements (those which might approximate the critical P requirements of the companion grasses.

Aim: To determine whether alternate legumes with lower critical P requirements will establish and produce well on the Southern Tablelands in soils with P levels significantly lower than the calculated critical level.

Research Questions:

- Will legumes with lower critical P establish and grow in southern tableland soils.
- Do they grow as well at 70% of the current critical soil P level?
- Can they produce as much biomass over time as properly fertilized traditional species (sub clover)

Trials and design

1) A trial looking at the impact of a range of fertilizer sources interacting with lime was designed on the basis of finding a site that is currently far below the technical optimum soil P. It was also decided to apply other nutrients as appropriate that other soil nutrients become non-limiting (Richard Simpson will provide advice on appropriate rates) It is intended that rates of application should achieve the same overall P application to allow calculations as to whether soils test changes are in line with expectations and to allow calculation of overall P use efficiency (kg feed produced per Kg P applied)

The trial will take the form of a randomized replicated plot trial but if possible with larger sized replicates to allow producers greater confidence in the results.

Measurements taken will focus on herbage production and quality to allow some assessment of potential differences in enterprise productivity. Soil tests over time will indicate whether the change in available P is in line with expectations and or whether the herbage production is more or less than expected for the level of the soil test.

2) A trial to assess the adaptation of legumes with lower P requirements is planned where the choice of site is dependent on current soil test being significantly lower than the technical optimum for sub and white clovers. For example on a soil with a PBI around 120 the Critical colwell P would be about 32 ppm. The site selected would need to be around 70% of this critical value (22ppm) based on both historical and current soil tests. In theory this should meet critical P requirements of the low P requirement legumes but be insufficient for best production from sub clovers.

A range of pasture mixes including both traditional legume species as well as species such as French and Yellow Serradella, Biserrula etc. will be sown as treatments and fertilized differentially with P fertilizer to requirements to maintain current P level as well as capital P and subsequent maintenance P applications to achieve a soil test near the calculated critical P for sub clover growth.

Actions

The TFS project coordinator, Ms Helena Warren, will progress the writing of the full application for submission to MLA as soon as possible with a view to setting up the alternative fertilizer P efficiency trial this Autumn and to commence preparation to sow the alternative legumes trial next Autumn after appropriate site preparation (weed control, fallow moisture conservation etc). Helena has professional experience from work with NSW DPI in setting up trials and will also undertake potential site inspections on member properties.

Once a draft project plan is ready, it will go out to the TFS Participatory R&D project group for final comment before submission to MLA.

8.2.9 Tumbarumba Beef Group Meeting Summary

Tumbarumba Beef Group Meeting Summary

Location: 1)Dalkieth Tumbarumba 10am – 12:30pm 17/12/13 and

2)Kooyong, Tooma 8:30am – 10:30am 28/1/14

Attendance: 10 farms, 2 Consultants/group coordinators, Researcher Richard Simpson, CSIRO, Doug Alcock (State Coordinator)

Group Stats:
Area: 136ha - 1,200 ha
Grazing %: 95% -100%
Total Sheep: 0 - 780
Total Cattle: 230 - 1800

Participatory Research Benchmark Questions

1. How would you rate the potential of new legumes to improve the productivity of your farming business?

Average: 4.4 Range: 4 - 5

2. How would you rate your current knowledge about new legumes and their place in your farming business?

Average: 1.9 Range: 1 - 3

3. How would you rate your confidence in including new legumes in your farming business?

Average: 2.0 Range: 1 - 3

Program Questions

4. How applicable is current MLA feedbase research (as outlined in the FIP) to your farming business?

Average: 2.1 Range: 0 – 4 (Zero responses indicate lack of awareness of what is in the FIP. 2 out of 7 were not aware of the FIP)

5. How involved are you in the current research and development projects funded by MLA?

Average: 1.1 Range: 0 - 4

6. How would you rate your influence on research projects funded by MLA?

Average: 0.9 Range: 0 - 3

Workshop Facilitation 17/12/13

Just two and a half hours were available to conduct the session despite a request for between 4 and 5 hours. This constraint was not communicated by the group coordinator until a few days before the meeting date.

Due to the limited time frame allowed at the first meeting the group questioning prior to Richard Simpsons presentation was limited. The group were asked a number of questions to provide focus on the issues around P use efficiency before hearing from Richard Simpson about the core research project.

Question 1: Do you apply P fertilisers annually on your farm?

- All but one participant had applied P fertilisers. More than half applied some fertiliser every year.

Question 2: Do you regularly soil test on your farm?

- Around 30% of farms soil tested some paddocks every year
- Most of the remainder had soil tested for specific reasons but did not have a regular program.

Question 3: List up to three problems that if solved would most improve P use efficiency on your farm? Rank them according to their suitability to participatory research

After allowing thinking time participants were asked to share their ideas for topics of research.

- Overcoming landscape differences.
    - How to target applications of fertiliser to different parts of the landscape
- Cost effectiveness of supra optimal initial applications then maintenance.

    - What is the best pathway toward the target P
- Better understanding of PBI
    - What does it measure.
    - How to interpret.
- Efficient species / requirements of different species.
    - Are there species that use less P or can survive and produce with less P
- Interaction of pH and Al saturation % with high rainfall.
    - Species grow that apparently shouldn't
    - Is there a different interaction between the value of Lime and Phosphrous in this high rainfall area (750mm+)
- Variable rate applications.
    - Can principles of precision agriculture be applied in the grazing landscape?
- Does P fixation (PBI) vary with soil depth?
    - Would placing P deeper in the soil profile at sowing reduce the conversion of soluble P into unavailable forms.
- Closing the loop. Return of P from the consumer end.
    - Ways to retrieve P from urban consumers / waste.

After the presentation by Richard Simpson these ideas were revisited in an attempt to prioritise. There was a general consensus that perhaps the group had not done sufficient soil testing to have a good understanding of their current soil nutrient status. The group was keen to pursue some strategic benchmarking of soil nutrient status as a way of identifying appropriate sites for further trials. Despite intense discussion consensus was not reached as to the prime focus area for their participatory research project. The areas of greatest interest however were the issues of making economic decisions about fertiliser rates for different parts of the landscape, exploring the interaction between soil acidity and P efficiency and the possibility of testing alternative legumes with lower critical P requirements.

Subsequent talks with Richard Simpson after the meeting lead to the conclusion that there could be some useful data collected across a range of farms using existing paddocks and monitoring results paddocks of lower potential production. Data collected on stock carried would be used as the measure of production and to ground truth whether the theoretical carrying capacity had been reached. It may be possible to use properties as pseudo replicates as long a consistent protocols were adhered to.

Workshop Facilitation 28/1/13

The issues list from the first meeting was revisited in order to refresh thinking and to bring everyone back up to speed on the process.

Highest priority issues.

- Fertilise different landscapes according to productivity Interaction with pH & Al% with rainfall. Impact on plant species what's limiting?
- How is our P management impacting on pH /Al%? (or vice versa)
- Correcting pH & the interaction on P efficiency.

    - Correcting pH then need to increase P to match carrying capacity, soil tests on some farms indicate P levels not changing even with higher P applications.

Potential Questions for Group Research

- Improving P efficiency through correcting pH and applying P to match DSE/ha in high rainfall environment.
- Producing more kg beef without applying more P to do it.
    - Potential of legumes with lower critical P levels
- When does it become unprofitable to increase P & productivity
- Correcting pH to improve productivity what P rate is optimal with and without lime.
    - What impact does it have on pasture feed quality.
    - Model the cost to correct pH & optimum 'critical P' level.

During this discussion it became apparent that many group members had been re-thinking what had been discussed in the first meeting with a heavier weighting toward exploring the impact on P use efficiency of using lime on strongly acid soils with high Al%. Strong agreement was reached on this being the highest priority are but producers were concerned as to the commitment of time to record stock numbers and performance for paddock scale trials and also the disturbance to management routines. Some had already had experience of similar approaches in the Triple P program.

Actions

Without Richard Simpson at this second meeting it was resolved that Doug Alcock would discuss possible trial protocols to meet the goals with Richard to come up with some suggestions for the group to consider.

If it appears impractical to implement larger scale trials involving animal measurements then a reversion to trials that measure herbage production and quality to explore the interaction of pH/Al% with P level using species with differing critical P levels. Some soil fertility benchmarking on participant farms would be needed in year one to allow for appropriate selection of trial paddocks on a range of farms