

Terms of Reference

Matching feed supply to a changing climate

Program of Work

Meat and Livestock Australia (MLA) are investing in research, development and adoption (RD&A) initiatives that contribute to MLA programs of work to increase the productivity, profitability and sustainability of the grassfed beef and sheepmeat sectors. Proposals are sought for developing and executing collaborative and participative research to fit within this program of work. The focus of this terms of reference is to address short and longer-term needs around feedbase production (and ongoing supply of new plant materials) and the utilisation of the research by industry for improved industry outcomes.

Predictions from multiple sources (CSIRO, Bureau of Meteorology and the Intergovernmental Panel on Climate Change) reveal greater seasonal variability with a higher frequency of extreme events. The livestock industry is very exposed to changes in climate, resulting in reduced productivity and profitability. Modelling suggests business risk levels are growing and managing risk will become increasingly challenging with variable climate scenarios.

Livestock producers understand the need for adaptation – such as preparing for drought, improving productivity and reducing costs, whilst avoiding a negative impact on sustainability indicators. This need will be increased with future climates and changing seasonal conditions.

Summary

Across northern and southern Australia, feedbase related research and delivery activities have progressed. Work in this area has been focused on addressing feed gaps, maintaining pasture production and stability to meet the requirements of animal production, and management of the natural resource base.

Over the past decade, pasture and shrub species have been commercialised while other candidate lines have been identified for additional investigation towards commercialisation, evaluation (variety/species comparison) or commercial scale demonstration (that can provide a node for delivery of pasture-animal management messages based around an improved feedbase).

The Feedbase Adoption Plan (FAP) comprises awareness activities, training, related products, and supported learning programs across four themes – “Feedbase Four” – soil health, pasture weeds, plant nitrogen and pasture persistence. Phase 1 of FAP is underpinned by the R&D outputs of the southern Feedbase Investment Plan. The second phase for northern Australia, is under development expanding the key themes identified in the southern model.

This terms of reference requests proposals to support development of pasture mixes and supporting delivery initiatives towards a feedbase that provides for animal production needs and manages the natural resource base into the future.

Impacts

Applications to this terms of reference must contribute to development and demonstrated adoption of technologies and associated knowledge products that will improve the uptake of feedbase research, measured as increased production or decreased cost of production. Specifically, applications must contribute to the following outcomes:

- Alignment of Production and NRM practices with community expectations
- Deliver a demonstrable outcome towards the industry initiative of Carbon Neutral by 2030 (CN30) and the [Beef/Sheep Sustainability Framework](#)
- Improvement in total factor productivity of: 1.75% (southern beef); 0.5% (northern beef); 0.5% (sheepmeat); 1.5% (feedlot); 0.5% (goat)
- Improve business performance by $\geq 5\%$.
- Savings in industry costs due to weeds and feral animals of at least \$150 million by 2030.

Applications must clearly demonstrate how the proposed project will contribute to “Alignment with community expectations, CN30/Sustainability framework”, and at least one other KPI, and by how much.

Priorities

MLA is seeking preliminary RD&A proposals to conduct research, development and participatory demonstration of adoption that improves profitability in beef and sheepmeat production by addressing the following priorities. Researchers are encouraged to address more than one of the following priorities in a preliminary application.

- 1. Develop and trial alternative pasture species combinations to provide pasture quality and quantity to meet animal production needs and enable pasture stability across seasons. The combinations will overcome feed gaps while maintaining or improving regional natural resources, ecosystems or biodiversity.**
 - Mixtures for investigation require a logical (demonstrable) rationale for the mix that will confer a stable production base across seasons, and efficient use of soil moisture and nutrients.
 - In scope are temperate, tropical pasture, Mediterranean, herbaceous and woody species that are persistent under dry and variable climates to optimise year-round dry matter production.
 - A particular priority is the low and medium rainfall (mixed farming) zones due to increased climate variability and associated business risk.
 - Context must be presented of how the targeted mix will address the production gap compared with existing options.
 - Focus on development and trialing with end-user participation (producer, advisor and other stakeholders) to facilitate adoption and build a network of advocates.
- 2. Draft pasture management guidelines for new forage options where they do not readily exist.**
 - Guidelines are to include core content (as a minimum) on pasture description, physiology, adaptation area, establishment, companion species, production issues (e.g. disease susceptibility), production opportunities (e.g. tolerance to sub soil constraints), nutrition and grazing management.
 - Common and priority species are the initial focus, for those not captured by the former Pasture Picker tool. The aim is to populate the guidelines in the Pasture Picker tool.
 - List of guidelines already developed for the Pasture Picker tool is available from MLA.
 - Targeted forage options must be demonstrated to be able to accommodate future climates.
 - This project is to be completed within one year after signing an agreement with MLA.

3. Replacement product for the “Rainfall to Pasture Growth Outlook” Tool

- MLA’s Rainfall to Pasture Growth Outlook tool has been ‘retired’.
- The underlying question of the Pasture Rainfall Outlook tool by livestock producers, was “how much pasture may I have into the future?”
- MLA is seeking to build a replacement tool that has a national focus to fill the gap of the tool
- The Rainfall to Pasture Growth Outlook tool presented the actual rainfall and indices of soil moisture and pasture growth for the past nine months and an outlook for the next three months for over 3,300 locations across southern Australia.
- The tool provided an index of potential pasture growth, not a prediction of actual growth.
- The index enabled producers to factor this information in their enterprise planning.

4. Develop and deliver a program that demonstrates improvements from regionally specific new forage options for related pasture/animal/natural resource management outcomes

Meat and Livestock Australia recently called for Producer Demonstration Site (PDS) projects addressing feedgaps, management and utilisation of regionally relevant pasture/shrub options; See the link [here](#). There is also opportunity to develop larger producer engagement programs to drive adoption of existing research outputs, which could link multiple locations and regions. Optimally these programs would run for at least four years and demonstrate methodology for an impact that is larger than if the individual PDS projects were executed independently.

Partnership proposals for this initiative are sought that would satisfy funding via MLA Donor Company ([MDC](#)).

From commercially available lines where uptake has been limited but the feedbase change presents value for regional producers, this project is to establish commercial scale demonstrations and utilisation of pastures, forage shrubs, perennial grasses, legumes and fodder trees that address productivity, business risk (e.g. via future climates) and natural resource management outcomes.

Deliverables

1. Develop and trial alternative pasture species combinations

- Applied R&D in association with producer groups to address regionally defined feed gaps, extending the growing season and availability of required pasture quality and quantity.
- All regions are within scope; initial preference is towards low to medium rainfall zones
- The proposed work is to accommodate/address known regional constraints to production.

2. Draft pasture management guidelines for new forage options where they do not readily exist.

- Following consultation with pasture specialists, advisors or seed companies, and the list of management guidelines already drafted for the Pasture Picker tool, identify the gaps / new pasture species that require guidelines.
- Draft the guidelines. The exact number will be defined by the project and so is not yet defined. The proposal should outline an anticipated unit cost.
- Technical management guidelines (including establishment, companion species, nutrition and grazing management) for prospective new forage options and combinations to support a stable pasture. Forage options must address feed gaps, considerably increase forage production and profitability of red meat enterprises, while maintaining or enhancing natural resource management and ecosystem services.
- Targeted forage options must be demonstrated (based on available evidence) to be able to be managed to ensure they do not affect ecosystems or biodiversity, whilst accommodating future climates, seasonal variability and extreme events.

3. Replacement product for the functionality of the “Rainfall to Pasture Growth Outlook” Tool

- Input data (e.g. localised sensors), improved seasonal forecasts, pasture growth models communications technology provide new methods and opportunities to address the underlying question of the Pasture rainfall Outlook tool “how much pasture may I have into the future?”.
- This tool is to provide national capability to inform enterprise decisions
- The tool should provide utility at regional level, to farm, and to paddock. There may be prerequisites (e.g. paddock sensors) to enable paddock estimates. Varied data sources could be recognised in the tool (e.g. access publically available data inputs (larger scale) or paddock level).

4. A program that demonstrates improvements from regionally specific new forage options

Working with producer groups, this project is to effectively demonstrate pasture and/or shrub production in a commercial context – benchmarked with a realistic control.

The proposal and implementation of the project must ensure the targeted plants contribute to providing regionally specific grass/legume species that:

- Provide quantity and quality of forage to increase animal performance during feedgaps – now and anticipated with variable seasons and future climate
- Are demonstrably better (e.g. dry matter production, quality, persistence)
- Address regionally specific production constraints and maintaining or enhancing natural resource management and ecosystem services.

Candidates for demonstration could include, but are not limited to, commercially available:

- Saltbush (NSW, SA, WA)
- Tedera (WA)
- Leucaena (Northern Australia)
- Legumes - Clitoria, Desmanthus, Stylos, Macroptilium (Northern NSW / Northern Australia)
- Tropical grasses - Bothriochloa, Brachiaria, Digitaria, Panicum, Urochloa
- Temperate grasses - Cocksfoot, fescue, phalaris,
- Annual legumes including - sub-clovers, medics (southern Australia)
- Forages- Brassicas, High performance forage oats (Queensland);
- ARGV resistant ryegrass (Western Australia).

The output of the project will describe the value proposition including costs/method of establishment, management, persistence, dry matter production, quality, animal production, system ‘fit’ and valuing ‘spill over benefits’ (e.g. decreased liming, nutrient efficiency to habitat benefits, shade, shelter, out of season feeding etc.).

Applicants to the terms of reference must clearly identify:

- which of the priority outcomes and RD&A gaps their application is seeking to address
- MDC funding partners. It is an expectation that prior to submission of a preliminary proposal applicant/s provide demonstrable evidence that producers have been engaged through a regionally relevant research advisory council i.e. NABRC, SALRC or WALRC and other industry stakeholders (consultants, merchants, service providers) to also identify extension and adoption pathways. Applicants must demonstrate how end users will be engaged throughout delivery of any funded work, and what will translate into practice change on

farm. This should include:

- A clearly articulated value proposition
- Net benefit, (per head, per hectare, per year, per kg LW gain or product) of the research output if adopted
- An adoption method and predicted adoption rate including time to peak adoption. Where outcomes are earlier stage applied research, the applicant should demonstrate that they have considered potential adoption pathways.

Scope

The work is national in scope although the applications and solutions within each project may be regional and focused on enterprises growing grassfed cattle and sheepmeat.

Collaborative teams across institutions are encouraged to apply to take advantage of complementary skills including research, development, adoption and expertise in the use of technologies.

Participation of producers and formal producer networks is encouraged, especially in setting and reviewing the direction of research, development and adoption of practical, on-farm practices.

Projects with budgets ranging from \$50,000 to \$500,000 per year across 1-5 years will be considered. Value for money will be objectively assessed, with project costs and outputs generated. Where a project is considered to be directly related to the 'core business' and prevailing strategic objectives of an organisation recovery of staff salaries should be minimal.

Confidentiality and intellectual property

Successful projects will be funded with sheepmeat and/or grassfed beef levies. MLA will also consider MDC applications outside of the specific terms of reference but consistent with the program objectives and provided that applicants are able to demonstrate how the project will contribute to industry impact.

Applicants must identify any background intellectual property (IP) they bring to the project.

All data and cited references must be acknowledged appropriately in the final publication and it is the sole responsibility of the applicant to ensure copyright laws are not breached.

Where further information is available which may assist the successful applicant in meeting the requirements of the project, MLA will provide such information to the successful applicant.

The successful applicant will be required to enter into a standard agreement with MLA.

MLA will share and discuss this proposal with producers, technical experts, other research organisations and research and development corporations. Please acknowledge this freedom to operate.

Deadline for submissions

Preliminary proposals must be received by MLA before 11.59pm (NSW time) Wednesday, 16 October 2019. Late proposals will not be accepted.

Use the preliminary proposal template to submit proposals electronically to MLA at:
projectcall@mla.com.au

Preliminary Proposals will be acknowledged and recorded on the MLA project information system. Applicants will be advised in writing of the success or failure of their Preliminary Proposal in January 2020.

Further information

If you have questions regarding these terms of reference Items 1 or 4, contact:

Cameron Allan
Program Manager – Sustainable Feedbase Resources
Telephone: +61 419 469 246
Email: callan@mla.com.au

If you have questions regarding these terms of reference Items 2 or 3, contact:

Mick Taylor Project Manager – Feedbase
Telephone: +61 439 847 575
Email: mtaylor@mla.com.au